

Lewis County 2007 Flood Disaster Recovery Strategy



April 2009

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Executive Summary

In the aftermath of the December 2007 storm and subsequent flooding in Lewis County, the Seattle Region X office of the Economic Development Administration approached the Cowlitz-Wahkiakum Council Governments to prepare an economic recovery strategy for Lewis County. In response to three storm events and subsequent flooding which occurred within the State of Washington from December 1 to 3, 2007, Governor Christine Gregoire requested on December 6, 2007, that President Bush declare a major disaster for the State of Washington under Section 401 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U. S. C. && 5121-5206.

President Bush declared six southwestern Washington counties, including Lewis County, a major disaster area on December 8, clearing the way initially for federal recovery aid to the state in the hardest-hit areas. The President's declaration allows the Federal Emergency Management Agency to provide a range of assistance to public and private flood victims under the provisions of applicable laws.

This report has been prepared to: (1) document the kinds of damages and their extent from recent and historical flooding in Lewis County, particularly the December 2007 flood, and (2) provide an economic recovery strategy and action plan for local officials to alleviate damages from the December 2007 flood.

Flood events have occurred frequently in Lewis County, and have been recorded as far back as far as the 1880s. This is an average of 4.7 years between significant flood events from 1880 to 2008 with a total of 27 flood events. Data compiled by the Long Term Recovery Project in Lewis County estimated total damages from the December 2007 flooding at about \$166 million, private residential damages at about \$69 million (126 claims), and total business damages at about \$45 million (239 claims). As of August 18, 2008, Federal allocations totaled \$208,257,934 to Washington State. Of this total, \$93,729,878 was allocated to address damages within Lewis County.

Total federal funds allocated to Lewis County and Washington State is as follows:

	Total WA State Funds Allocated	Total Lewis Co. Funds Allocated	% Lewis Co. Funds Allocated
IHP Totals (HA + ONA)	\$20,814,604	\$12,219,655	58.7%
SBA Disaster Laons	\$35,637,700	\$23,314,900	65.4%
Public Assistance Obligated	\$38,390,984	\$11,025,140	28.7%
Federal Highway Admin..	\$62,811,814	\$6,832,107	10.9%
National Flood insurance	\$50,602,832	\$40,338,076	79.7%
Total	\$208,257,934	\$93,729,878	44.9%

The total estimated lost economic output within the State of Washington from closures of Interstate 5 and SR 6 are estimated to be \$47 million, while estimated state tax revenue loss is \$2.4 million. Reduction in personal income is estimated to be \$15 million. The cost of the four day closure of I-5 for automobiles is estimated to be \$72,414,981, and the cost of the 26 day closure of SR 6 for both trucks and automobiles is estimated to be \$18,214,560. The cost of direct damages to I-5 and SR 6 is estimated to be \$4,479,000. Direct damages to local roads in Lewis County are estimated to be \$1,524,960. Storm damages closed SR 7 north of Morton and US12 from Elma to Morton.

According to a Weyerhaeuser Company report, the December 1-3, 2007 storm event began as a typical mid-latitude storm in the mid-Pacific. Two typhoons (Hagibus and Mitag) brought a major infusion of moisture, causing the storm to grow in both size and intensity. The first part of the storm brought wind; the second part brought hurricane force wind along the coast, and also abundant rain and some snow which contributed to early runoff and rapid rise in the flood peak.

The 2007 flood event was fed primarily by the precipitation falling west of I-5 in the Willapa Hills. Twenty-four hour rainfall intensities were 140% higher than the 100 year amounts for areas in Southwest Washington. In the

upper Chehalis, flood peaks were twice the previous flood of record, and were estimated to have recurrence interval of 500 years, to its record height of 74.78 feet.

The information in this report comes from a variety of sources, some quantitative and some qualitative from a variety of different local, state, and federal agencies and private sources.

Significant areas of the Centralia and Chehalis Urban Growth Area were inundated in 2007. Twenty five percent and 33% of the Centralia-Chehalis Urban Growth Area was flooded and 34% of the County Urban Growth Area. Over half the commercial land use and up to 32% of the industrial area fall within the common footprint of the two floods.

In the unincorporated Chehalis-Centralia urban area, those areas flooded were:

- 3,534 residential structures
- 490 commercial or industrial structures
- 1,792 were detached structures.
- 5,816 total number of structures flooded
- 34% of commercial land zoned
- 13% of industrial land zoned
- 47% of agricultural land zoned
- 4% of residential land zoned

Additional losses due to the flood are:

- The total loss or shift in taxing responsibility was \$548,297.
- The total loss or shift in taxing responsibility for residential structures was \$480,776.
- The total loss or shift in taxing responsibility business structures was \$49,315.
- Flooded businesses average total loss of 38 percent of their gross annual sales as of mid-February.
- 50 % of the flooded businesses and 30 % of the unflooded businesses experienced worse than average sales.
- Businesses surveyed found road access to be the most detrimental infrastructure loss.
- Four houses were damaged or destroyed by landslides, primarily around Pe Ell and at least one section of electrical power lines was affected.
- Cost of the four day closure of I-5 for automobiles is estimated to be \$72,414,981.
- Cost of the 26 day closure of SR 6 for trucks and automobiles is estimated to be \$18,214,560.

Within the Chehalis River headwaters area, 1,645 landslides were recorded:

- 71 shallow undifferentiated landslides
- 667 debris flows, 901 debris slides
- 6 hyper-concentrated flows.

With 12 feet of flowing water on I-5 in some places, a 20 mile section of the freeway was closed on December, 3-7. Approximately 10,000 trucks and 49,000 cars sought alternate routes. SR 6 between Centralia/Chehalis and Raymond/Hoquiam/Aberdeen was closed both ways to all traffic from December 3-29. The Curtis Industrial Park rail line and eight culverts, which connect the Port of Chehalis to the Curtis Industrial Park near Pe Ell, received flood damages. Total cost of repair to the rail line, and improvements to several deteriorated railroad bridges, is estimated by the port to be \$1,513,307. The Chehalis-Centralia airport levee failed and water covered most of the airport during the four days of flooding along I-5. Total damages approved by FEMA were \$346,164.

Efforts to address flooding and flood mitigation in Lewis County are currently being explored and/or carried out by:

- The Chehalis River Basin Flood Control Authority is evaluating a variety of options for the entire Chehalis River Basin before endorsing any flood control project, including the levee project proposed by the Corps of Engineers.

- The Corps of Engineers is evaluating three structural options for flood control in the Centralia-Chehalis Urban Area. They include levee construction, increasing capacity of water retention at Skookumchuck Dam, and elevating several structures which would incur damages as a result of the proposed Corps levee project.
- The Lewis County Comprehensive Flood Hazard Management Plan identifies and recommends a number of structural and non-structural flood control options for future action.
- The State of Washington, Lewis County Public Utility District, and Lewis County are examining water retention possibilities for flood control in the Upper Chehalis Basin area.
- Lewis County is evaluating Chehalis River upstream storage alternatives through a contract with Northwest Hydraulics Consultants.

Recommendations

- Federal, state, regional and local government flood protection and mitigation efforts in Lewis County should be carefully coordinated to create a comprehensive strategy to protect communities and their residents from the impacts of future flooding.
- Structural and non-structural approaches should be included in a comprehensive strategy to address flood protection and mitigation in Lewis County. The following are strategies and recommendations for flood mitigation and recovery.
 - The National Flood Insurance Agency should complete its update of the Lewis County Chehalis River Flood Insurance Study within the projected timetable for this project.
 - Lewis County should work with the Chehalis River Basin Flood Control Authority and the towns and cities of Lewis County to evaluate, adopt, and implement, where appropriate, the recommendations and flood hazard management policies, programs and projects identified in the Lewis County Comprehensive Flood Hazard Management Plan.
 - Lewis County should implement the data collection and mapping recommendations included in the Lewis County Flood Hazard Management Plan.
 - Adequate funding should be provided by Congress for a Doppler warning system to monitor the duration and severity of incoming storms from the Pacific, and for rain and water level gauges to replace and adequately monitor water levels within the Chehalis River Basin.
 - An adequate supply of prime developable commercial and industrial land, free of environmental constraints and ideally with infrastructure either in place or planned, should be provided to meet the demand for these kinds of developments over the next 20 years.
 - Identify and designate large-scale (5+ acre) sites for future industrial development.
 - Update the Lewis County Industrial Lands Analysis to reflect the availability of new industrial sites.
 - Several transportation projects are currently in design and/or construction, and a number of others are being executed.: (1) improvements to I-5, (2) the South Lewis County Arterial Plan, (3) a new Mellen Street Interchange and collector-distributor lanes between Centralia and Chehalis, (4) a new North Lewis County interchange linking Port of Centralia Industrial Park with a possible connection to the proposed TransAlta Industrial Park, and (5) Harrison Street improvements in Centralia.

- Seek financial assistance for infrastructure and facilities to address the impacts of the 2007 flooding on rural jurisdictions, including fire and water districts, within the Upper Chehalis Basin Watershed.
- Seek, via a multi-jurisdiction effort, federal and state funding through special appropriations, and through national and state economic stimulus packages.
- Submit applications for categorical grant programs possibly linked to national and state economic stimulus packages.

Section I

Introduction



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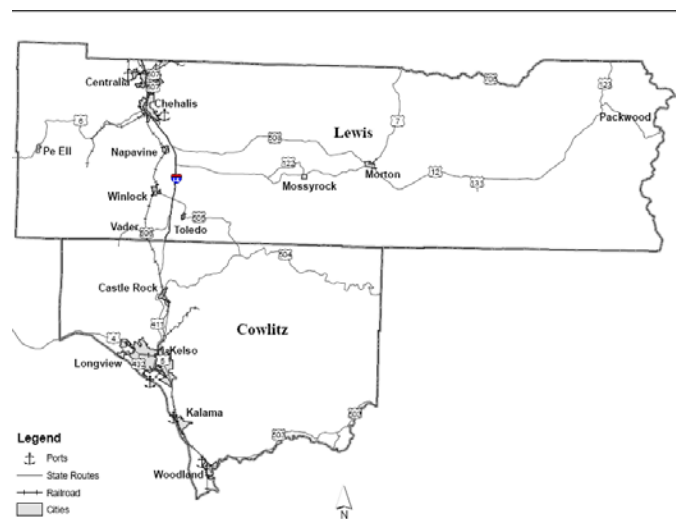
Chapter 1

Report Purpose & Overview

Initiation of Recovery Strategy: In the aftermath of the December 2007 storm and subsequent flooding in Lewis County, the Seattle Region X office of the Economic Development Administration approached the Cowlitz-Wahkiakum Council Governments to prepare an economic recovery strategy for Lewis and Cowlitz Counties. The Cowlitz-Wahkiakum Council of Governments is the sponsoring agency for the Cowlitz-Lewis Economic Development District. District boundaries are shown in Figure 1.1.

Figure 1.1 Boundaries of the Cowlitz-Lewis Economic Development District

Purpose of Report: This report has been prepared: (1) to document the kinds of damages and their extent from recent and historical flooding in Lewis County, particularly the December 2007 flood, and (2) to provide an economic recovery strategy and action plan for local officials to alleviate damages from the December 2007 flood. The strategy will also offer guidance to reduce or prevent damages from future flooding within the study area, an essential element in economic recovery in Lewis County.



Overview of Report: The report is divided into four sections. Section I has one chapter, and describes the initiation, purpose and overview of the contents of the report, as well as a brief description of the federal and state disaster declaration, a brief overview of study area characteristics, and the history of flooding in Lewis County going back into the last century. Section II describes the storm event and the hydrology of the Chehalis River Basin, and provides an overview of the impacts of the disaster on Lewis County. Section III describes current local, state and federal efforts to provide flood protection and offers policy recommendations to strengthen these efforts in Lewis County. Finally, Section IV describes specific economic development projects proposed by jurisdictions within and outside of Lewis County to move the county towards strengthening the local economy in the future. It also offers specific guidance regarding funding opportunities for these projects.

Federal and State Natural Disaster Declaration

In response to three storm events and subsequent flooding which occurred within the State of Washington from December 1 to 3, 2007, Governor Christine Gregoire requested, on December 6, 2007, that the President of the United States declare a major disaster for the State of Washington under Section 401 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U. S. C. & 5121-5206.¹

President Bush declared six southwestern Washington counties, including Lewis County, a major disaster area on December 8, clearing the way initially for federal recovery aid to the state in the hardest-hit areas. The President's declaration allows the Federal Emergency Management Agency to provide a range of assistance to public and private flood victims under the provisions of applicable laws.²

Study Area Characteristics and Boundaries

The study area for this report is limited to Lewis County, as the presidential disaster declaration included Lewis County but excluded Cowlitz County. Contact with the Cowlitz County Emergency Services Director and the Cowlitz County Public Works Director confirms that damages within Cowlitz County were minimal.³ Figure 1.2 is a location map of Lewis County within the State of Washington. Figure 1.4 is a map of Lewis County, with the location of major roads and highways, the cities of Lewis County, and national parks and forests.

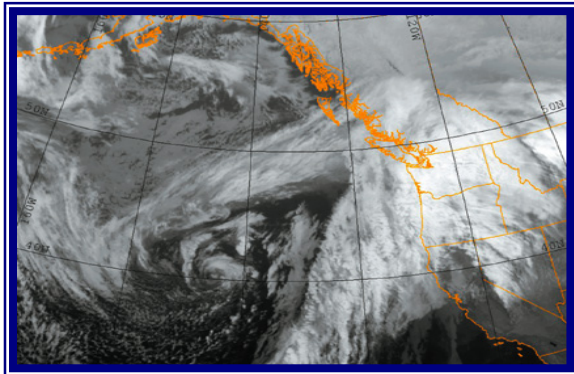


Figure 1.3 (above): Satellite weather map of the December 2007 storm

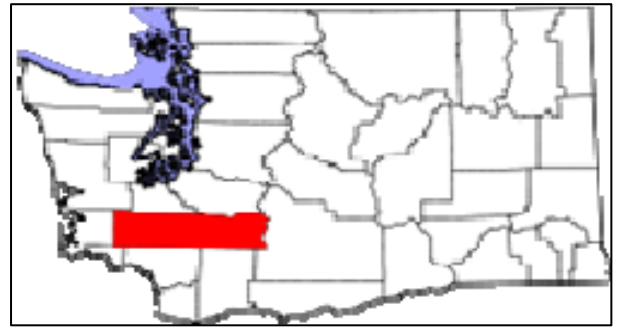
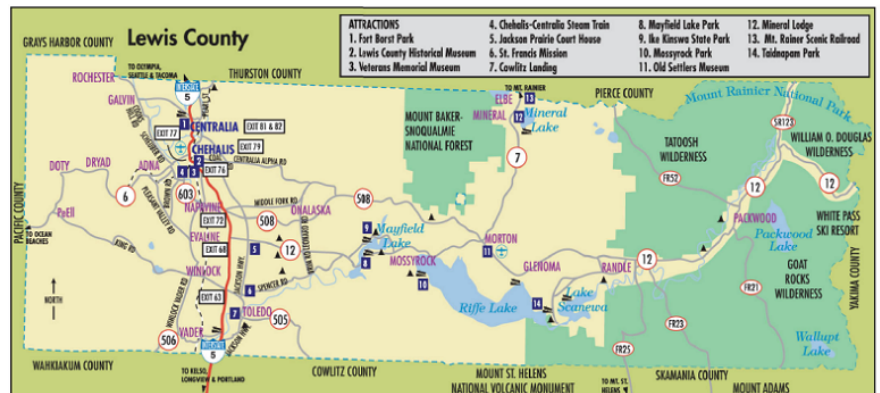


Figure 1.2 - Lewis County Location Map (above)⁴

Figure 1.4: Overview of Lewis County (right)⁵

Detailed information on the demographics and economy of Lewis County is provided in 2008 updated and adopted Cowlitz-Lewis Comprehensive Economic Development Strategy prepared by the Cowlitz Wahkiakum Council of Governments, for the Cowlitz-Lewis County Economic Development District.⁶ Those wishing more information on these topics are referred to this document. This document, The Lewis County Flood Disaster Economic Recovery Strategy, will be included as an appendix in the 2009 updated Cowlitz-Lewis Comprehensive Economic Development Strategy.



History of Flooding in Lewis County

Legends of the Chehalis and Cowlitz Indians identify flooding within Lewis County and the Chehalis and Cowlitz basins during the period before written records of flood events were kept. Formally documented flood events have occurred frequently in Lewis County and have been recorded as far back as far as the 1880's. A photo exhibit in the Lewis County Historical Museum during the late winter and spring of 2008, as well as the Chronicle's The Flood of 2007,⁷ identify repeated flood events within Lewis County and the Chehalis river basin in 1880, 1887, 1900, 1906, 1909, 1910, 1915, 1919, 1921, 1933, 1937, 1939, 1946, 1948, 1953, 1958, 1959, 1965, 1972, 1975, 1976, 1986, 1990, 1995, 1996, 2006, and 2007. This is an average of 4.7 years between significant flood events from 1880 to the present.

Comprehensive historical data on the extent of flood damages from these events in Lewis County, particularly those to the commercial, industrial and agricultural sectors of the economy, is not available. In some cases data is inconsistent. However, the following historical information has been compiled to provide an "order-

of- magnitude” feeling for the severity of economic impacts which typically occur in Lewis County as a result of flood events in that area.

Table 1.1 provides a general estimate of flood damages occurring during previous flood events dating back to 1970, correlated with the height of the river at maximum flood stage in the Centralia-Chehalis area. In comparing these data with information on the total damages incurred in the December 2007 flooding, which have been estimated at between \$166 million and \$500 million (see Chapter 3, page 18), it would appear that these numbers are undercounted by a substantial amount.

Table 1.1: Flood Damages for Historic Floods

Flood Stage at Centralia-Chehalis, WA ⁸ Event Date	Water Elevation	Estimated Damages
12/3/07	74.78 ft.	NA
2/9/96	74.78 ft.	\$18-30 million
1995	74.31 ft.	\$13,000,000
1/12/90	73.4 ft.	\$19,000,000
12/4/82	65.8 ft	minor damage
12/3/77	68.7 ft.	\$5,000,000
12/5/75	71.2 ft.	\$1,500,000
1/16/74	69.0 ft.	Unknown
1/21/72	71.7 ft.	\$3,300,000
1/26/71	70.2 ft.	\$2,250,000
12/9/70	67.3 ft.	29,000 acres flooded

Note 1: Flood stage at Centralia-Chehalis is 65 feet; value of the dollar is specific to each year. Note 2: Damages were not identified in source as public or private. Sources: Unpublished and undated working document in Lewis County Emergency Management Department files, recorded May 31, 1996; The Chronicle, Centralia, WA, quoted in, February 14, May 2, 1996; Lewis County officials; Five County Economic Recovery Strategy, Cowlitz-Wahkiakum Council of Governments, 1996.

Flood Events of 2006 and 2007

Map 1, in Appendix 1, shows the December 2007 inundation area estimate within the Centralia-Chehalis urban area and in the flooded agricultural area from Adna west and south to Curtis, Boistfort, Dryad and Pe Ell. Map 2, in Appendix 1, shows the 1996 and the 2007 inundation areas in the Centralia-Chehalis Urban Area. This map also shows the common inundation area which was flooded in both 1996 and in 2007. The boundaries of the urban growth areas are also shown for both the cities of Centralia and Chehalis. In Section II, additional maps of these urban growth areas are provided to illustrate these flooded areas by generalized existing land use and zoning categories. Estimated acreages of flooded areas are also provided by generalized land use and zoning categories.



Conclusion

- ❖ *Lewis County and the cities of Centralia and Chehalis have experienced repeated and significant flooding and flood damages on an average of every five years from 1880 to 2007*



Section II

Impacts of the December 2007 Lewis County Flood



Chapter 2

River Basin, Storm Event and Hydrology Information

Limitations in Information on Damages and Funding Allocations

There is no consistent source of information on flood impacts within Lewis County for the flood events of 2007 or 1996, or for the numerous flood events prior to 1996.⁹ In addition, most agencies do not track total damages to their assets. Instead, they track total allocation of funds by FEMA and other federal and state organizations rather than their actual damages. The following information on impacts from these events come from a variety of sources, some quantitative and some qualitative. These data have been collected by a variety of different local, state, federal and private agencies. They measure different variables using different types of measurement units which are not always consistent or compatible with each other. For example, there is no single source of the dollar value of impacts of flooding on the different sectors of the Lewis County economy. Damages are therefore estimated in dollar values, miles of fence line, numbers of animals lost, and numbers of parcels or structures impacted.

There is also a lack of reference to the level of inundation and/or value of impacts on different structures. In some cases, damages are measured from hydrological and economic impact models which use both field data collected by the U.S. Army Corps of Engineers staff and consultants, and national data and standards formally adopted by the Corps or other federal agencies. These data are partial and do not provide a comprehensive view of impacts to the flooded areas. These measures should therefore be considered as measures which give a general feel for the extent of damages rather than a way to compare quantitative damages and impacts from one flood with floods in different areas of the country.

For individuals and businesses in the private sector, there is no way to estimate their actual damages other than by contacting each disaster victim and collecting the information. The maximum FEMA award to individuals in the form of grants is limited to \$28,800. While a few disaster victims received that maximum amount, it is important to realize that those receiving the maximum amount have likely experienced much larger total damages to their homes, perhaps up to \$100,000 or more. The average award for the December 2007 disaster was just over \$5,000. Furthermore, housing assistance is 100% federal funds, but Other Needs Assistance (ONA) is a 75/25 cost share program with the state putting up 25 percent. Therefore, ONA expenditures have a negative economic impact on the state's budget.

The Small Business Administration (SBA) makes disaster loans to eligible applicants (homeowners, renters, and businesses) and generally the loans they make more accurately reflect the actual loss. However, out of nearly 8,000 loan applications sent out, approximately 2,000 were returned and a very low percentage was approved. This data too is likely to be undercounted. Flood insurance also paid for damages in this event, but participation was low. While information from the Federal Flood Insurance Program was forthcoming, there is no single source of information for amounts paid out by private home insurance programs, and confidentiality rules make it impossible to obtain such data.

Donations also created both a positive and negative economic impact. The donation dollars that flowed in and were spent locally were a positive factor. The donated goods that were provided often times were a negative factor. Disaster victims received federal funds to purchase replacement items, but in many cases acquired donated goods instead. This had a negative impact on local businesses because federal money that should have been spent to purchase personal property was unavailable for that purpose.

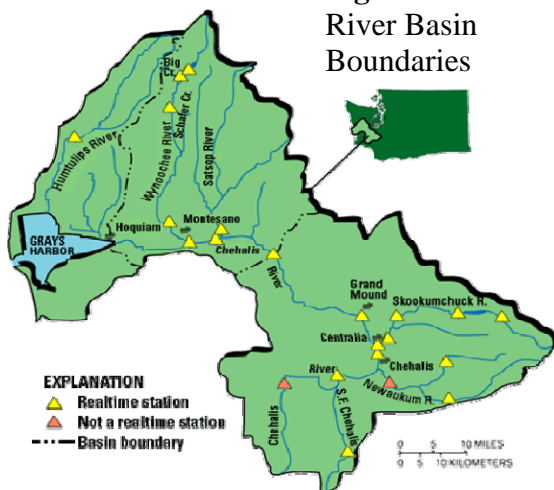
Chehalis River Basin

The Chehalis River Basin is located in Western Washington and is the second largest basin in the state, covering five counties. The basin is divided into two watershed areas, the Upper and Lower Chehalis River Watersheds. Figure 2.1 shows the boundaries of the Upper and Lower Chehalis River Watersheds within the

State of Washington. Most of the flood damage from the December 2007 storm event occurred in the upper Chehalis watershed.

The upper Chehalis River watershed is fed by a complex network of rivers, streams and creeks which contribute to the flow of the Chehalis River as it enters the Lower Chehalis Watershed West of Thurston County in Grays Harbor County (Figure 2.1)¹⁰. West of I-5, the rural agricultural area from Pe Ell to Dody and Dryad, including the Boistfort Valley and Adna, is fed by the two major streams of the Chehalis River: the main stem of the Chehalis River flowing from south and west to the east, and the South Fork of the Chehalis flowing from the south and west to the east. At Adna, the co-joined stems of the Chehalis turn north and traverse the Centralia-Chehalis urban area before turning west towards the lower watershed, Grays Harbor County and the Pacific Coast.

Figure 2.1 Chehalis River Basin Boundaries



East of I-5, a more complex system including the Nehalem River on the south end of the Centralia Urban Area, Salzar and China Creeks, and the Skookumchuck River to the north flow into the Chehalis River; the Chehalis continues north and then west near Grand Mound towards the coast.



The Storm Event of December 2007

According to a Weyerhaeuser Company report, the December 1-3, 2007 storm event began as a typical mid-latitude storm in the mid-Pacific. Two typhoons (Hagibus and Mitag) brought a major infusion of moisture, causing the storm to grow in both size and intensity. The first part of the storm brought wind. The second part brought hurricane force wind along the coast, and abundant moisture in the form of rain and some snow contributing to early runoff and rapid rise in the flood peak. Moisture runoff was mostly rain-dominated.¹¹ During the course of its development this storm grew to a diameter of several thousand miles.¹² The Weyerhaeuser report goes on to explain:

“This storm produced concurrent extreme magnitude events; hurricane-strength winds along the coast and an estimated 500-year flood further inland in the upper Chehalis River basin. High winds impacted the coasts of Oregon and Washington from Newport to Hoquiam. This storm produced a maximum recorded wind gust of 147 mph and was the first ever hurricane force wind warning issued by NWS in the Pacific Northwest. While maximum speeds may have been higher in the 1962 Columbus Day storm, this event was of longer duration, which led to extensive damage. The rain portion of the storm produced not only high storm totals, but also twenty-four hour rainfall intensities that were up to 140% higher than the 100-year amounts for areas in southwest Washington. Two weather stations with records back to the late 1800s broke all-time records. This high rain led to extensive flooding with ten rivers in

Washington exceeding their flood of record. In the Chehalis River basin five all-time high records were broken. For the stations in the upper Chehalis River, flood peaks were twice the previous flood of record and estimated to have a recurrence interval of 500-years. Either one of the events, the windstorm or the flooding, would have been notable individually, but taken together, they compounded the extreme nature of the storm.”¹³

Most of the impacts in Lewis County occurred as a result of flooding from the rain, with some lesser amounts of melted snow, rather than from the effects of wind. The storm event was characterized by three surges of moisture. The most significant of the three surges arrived December 3 with near record high temperatures and moist tropical air, leading to record rainfall in many areas of southwestern Washington and northwestern Oregon.¹⁴ The most intense rainfall amounts were generally west of I-5 in the Willapa Hills, including the upper Chehalis basin to the west of Chehalis-Centralia and in the Kitsap Peninsula area of Washington.

Peak Stream Flows during 1996 and 2007 Storm Events¹⁵

During the 2007 flood event in Lewis County, the highest rain intensity in the Chehalis Watershed occurred within the Willapa Hills west of I-5 from Chehalis and Centralia. Consistent with this pattern of heavier runoff from the main stem of the Chehalis River, USGS station 1202000 near Doty, rose rapidly from about three feet to thirty feet in seventeen hours. The estimated discharge increased from 500 cubic feet per second (cfs) to 63,100 cfs or 2.2 times the February 1996 peak, an increase of 118% over the 28,900 cfs peak discharge in 1996 (Table 2.1). The South Fork of the Chehalis River (USGS Station 12020800) also saw a dramatic rise in stage to 12,200 cfs during the December 2007 event, approximately twice the 1996 event of 5,620 cfs.

Table 2.1: Comparison of Peak Discharge and Stage Data in Upper Chehalis Watershed for 1996 and 2007 Floods

USGS GAUGE	1996 Discharge (cfs)	1996 Stage (ft)	2007 Discharge (cfs)	% change discharge	2007 Stage (ft)
USGS 12027500 Chehalis R. near Grand Mound	74800	19.98	79100	6%	20.23
USGS 12025000 Newaukum R near Chehalis	13300	13.54	12900	-3%	13.45
USGS 12024000 SF Newaukum R near Onalaska	4200		6660	59%	537.35
USGS12025700 Skookumchuck R. near Vail	8350	11.24	5010	-40%	9.61
USGS12026400 Skookumchuck R. near Bucoda	11300	17.87	3600	-68%	13.03
USGS 12020800 S.F. Chehalis near Wildwood	5620	363.6	12200	117%	365.98
USGS 12020000 Chehalis R nr Doty	28900	20.37	63100	118%	30.27

Source: [12-07 storm-doc](#), unpublished WA Dept. of Ecology document, 12-07-2007.

The Skoomumchuck River at Bucoda peaked at only 3,600 cfs during the 2007 event, in contrast to the much higher peak of 11,300 cfs in 1996. The bulk of the flow from the Chehalis River, with some contribution from the Newaukum River, drove the Chehalis River at Centralia to its record height of 74.78 ft in 2007. This was 0.47 feet higher than the previous record stage for this station set in 1996.¹⁶ Finally, the Chehalis River gauge near Grand Mound, northwest of the Centralia-Chehalis urban area, peaked at 79,100 cfs, 6% higher than the peak flow of 74,800 in 1996. Please note that these gauge and stage data are provisional data and have not yet been

corrected by the United States Geological Service (USGS). The data, while not corrected, still do provide a preliminary comparison of discharge and stage between 2007 and 1996.

The magnitude of this event west of I-5 should not be underestimated. Larry Schick of the Army Corps of Engineers said shortly after the 2007 flood: "This is an extraordinarily rare event. A huge event. Double the previous record."¹⁷ In a press release dated February 5, 2008 the USGS stated, "A new record was set in peak stream flow in the upper watershed of the Chehalis River, according to preliminary calculations made after the December 3, 2007, storm event. The stream flow indicates a pattern resulting from a very intense rainstorm."¹⁸ According to a Washington Department of Ecology (DOE) report, the force of the moving water was great enough to scour out a 37,000 pound concrete anchor block at the Doty gauging station and move it from one side of the river to the other.¹⁹

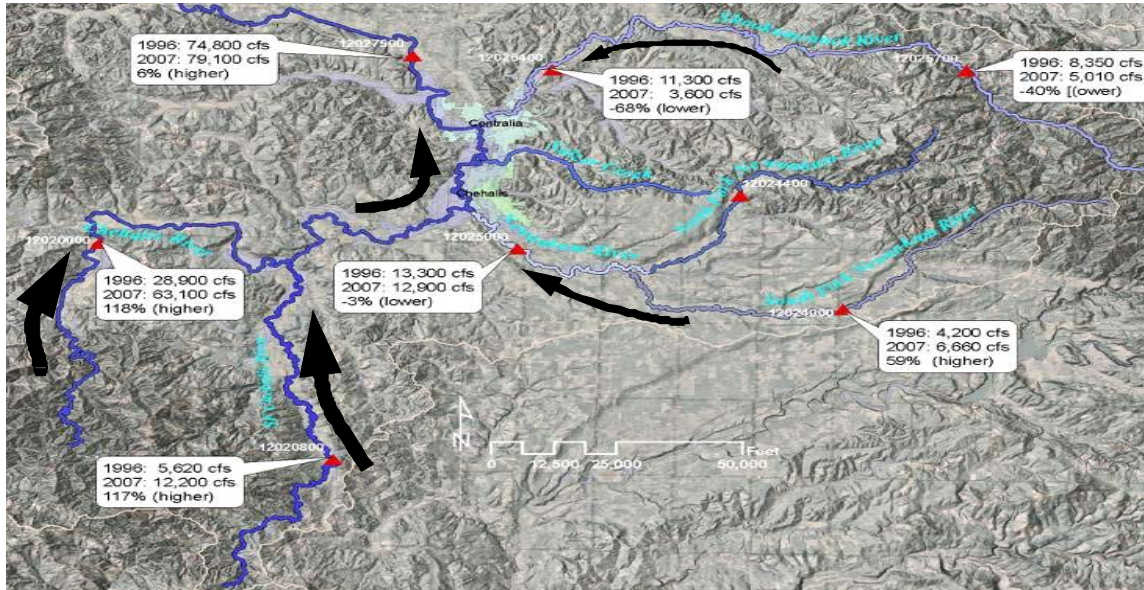


Figure 2.2: Comparison of Peak Flows for 1996 and 2007 Flood Events For Major Rivers, Streams and Creeks of the Upper Chehalis Basin

Source: [Outline Physical Conditions](#), op. cit, p. 6. Note 1: T

The 1996 and 2007 maximum peak flows are compared for each gauge where data are available. The size of the arrows and percent indicates the change in contribution between 1996 and 2007 floods. The Skookumchuck near Bucoda contributed 68% less in 2007 than 1996 and so has a small arrow. The SF Chehalis and Upper Chehalis near Doty contributed substantially more (117-118%) in 2007 than in 1996, and have larger arrows.

These 2007 data are still provisional and may be changed. USGS researchers indicated in a news report that this was a 500-year storm,²⁰ although this designation appears to be more appropriate in the Doty-Dryad-Boistfort area. According to the previously cited sources, the flooding in the Centralia-Chehalis urban area appears to be more appropriately in the range of a 100-year flood.

Surging downstream from the headwaters, the flood destroyed the gauge at Adna. The Newaukum River joined the Chehalis River just south of Chehalis, contributing to a smaller rise in the Chehalis River though it only had a flow 12,900 cfs as compared to 13,300 cfs in 1996.

Conclusion

- ❖ *There is no consistent source of information on flood impacts within Lewis County creating reporting and data availability concerns..*

- ❖ *Data regarding damages are calculated through funding allocations rather than total damage estimates. The lack of pertinent damage reports and data provides inconsistency in reporting methods.*
- ❖ *Expenditures paid by FEMA and other federal agencies (e.g., individual housing and other needs assistance) do not provide an accurate estimate of actual damages incurred from a disaster event, and are substantially undercounted relative to the level of damages actually incurred.*
- ❖ *The 2007 storm event broke historical records for rainfall and flooding in Southwest Washington and in the upper Chehalis River basin. Twenty-four hour rainfall intensities were 140% higher than the 100-year amounts for areas in Southwest Washington. In the upper Chehalis, flood peaks were twice the previous flood of record, and were estimated to have recurrence interval of 500 years.*
- ❖ *The 2007 flood event was fed primarily by the precipitation falling west of Interstate 5 in the Willapa Hills, with some precipitation from the Newaukum River, rather than the discharge from the Skookumchuck River, as happened during the 1996 event.*

Chapter 3

Damage Estimates

Overall Estimates of Damages

Assessments of Total Damages: Table 3.1 below is an assessment by the Lewis County Long Term Recovery Organization, a coalition of Lewis County churches, showing total damages to homes, businesses, and public structures as a result of the December 2007 flooding of the Chehalis River. This information is the most comprehensive data on actual damages available at the current time. While the estimate below totals about \$166 million, the Chronicle in Lewis County reports that the Lewis County Department of Emergency Management cited a total cost of flood damage in Lewis County nearing \$500 million.

The Lewis County Emergency Management Department said the flood's cost in Lewis County alone is nearing \$500 million. McDowell said that figure came through the state Department of Emergency Management, first from the initial FEMA reports that there were \$166 million in private and public damages. said the department indicates that the figure has grown since adding the cost of supplies and the cleanup of hazardous waste and the heaps of woody debris that came to rest on farm fields after they were ripped from the Willapa Hills, where most of the storm's 20 inches of rain was focused.²¹

Table 3.1: Overall Lewis County Damage Assessment of the December 2007 Flood

Category	Reported Claims	Estimated Structural Loss	Estimated Property or Inventory Loss	Total
Residential	1,262	\$37,617,301	\$31,298,933	\$68,916,234
Business	239	\$11,862,800	\$40,337,800	\$52,200,600
Public	NA	\$45,046,686	NA	\$45,046,686
TOTAL				\$166,163,520

Sources: Lewis County Health Department, February 10, 2008; Long Term Recovery Project, a coalition of Lewis County churches, Mission # 07-38984, February 10, 2008.

Assessment of Total Public Sector Impacts to Specific Lewis County Jurisdictions: It is important to distinguish the difference between total damages to a jurisdiction and the federal, state and local expenditures provided to address specific damages which were determined to be eligible by FEMA. Total damages to a jurisdiction measure more accurately the actual damages incurred by the jurisdiction, while federal, state and local expenditures reflect those damages which are eligible for FEMA funding. Total damages are higher than the actual expenditures.

Lewis County, the City of Centralia, and Fire Districts 6, 11, 13 and 16 were able to provide the most comprehensive data on total public sector damages to their jurisdictions. Table 3.2 shows the Lewis County Health Department estimates that preliminary total flood damages to facilities are about \$21,541,929. This number is still being updated.

Table 3.2: Total Lewis County Damages December 2007 Flood Event

2007 Flood Cost Estimates	Amounts
Contracts/Invoices	\$2,583,229
Regular Time	\$1,577,033
Overtime	\$606,667
Construction.Repair Projects	\$16,775,000
Total	\$21,541,929

Source: Emails from Chris Cooper, Lewis Co. Health Department, 8/15/2008, 8/18/2008.

Upper Chehalis Fire Districts: Flooding in December 2007 seriously impacted the four fire districts which provide fire protection services to the rural agricultural areas west of Chehalis in the upper Chehalis Drainage sub-basin. In addition, the earthquake of February 28, 2001 impacted Fire District 11's facilities and equipment; the district lost its station and equipment and keeps its vehicles in an unlighted barn. These events have limited the ability of these fire districts to provide fire protection services in this rural and agricultural area of Lewis County. With the exception of District 11, the facilities of all the other fire districts are located in areas impacted by the December 2007 event. These same facilities were flooded during the 1996 event as well.

The fire districts serve significant agricultural enterprises within the Upper Chehalis Sub-basin, as well as the Curtis Industrial Park and commercial businesses within the city of Pe Ell. Fire protection services are currently impaired by substation and station locations which are in the floodplain and subject to future flooding. In addition, these locations do not provide optimum response time to specific areas within the districts, resulting in a poorer fire rating equaling higher insurance premiums for residences and businesses in the districts. These damages and costs to restore the fire districts to full capacity are summarized in Table 3.3.

Table 3.3: Preliminary Costs to Restore Full Fire Protection by Rural Fire Districts within the Upper Chehalis Drainage Sub basin²²

Fire Districts	Location	Vehicles Lost or Damaged	Stations/Substations Damages/ Destroyed	Total Estimated Damages
6	Adna	2	1	
13	Boistfort	3	2	
16	Doty	2	1	
11	Pe Ell	3	1	
Totals		10	5	~\$6,000,000

City of Centralia and Other Jurisdictions: The City of Centralia indicates that total damages to the city totaled \$857,992. Information on total damages was not available from other jurisdictions, but information on federal and state allocations to these jurisdictions is provided below.

Estimates of Federal Allocations

Total Federal Expenditures to Date: Table 3.4 below identifies total federal allocations from the 2007 storm event to Washington State and to Lewis County as of August 18, 2008. The amount given to Lewis County is 45% of the total federal funding allocated to the 12 counties, the largest amount allocated to a single county. The business sector of Lewis County was allocated the largest amount of SBA loan funding, 65.4% of the total allocated to Washington State, while assistance to individuals and households in Lewis County received 59% of the Washington State total. Public assistance to Lewis County was 29% of the state total.

A total of 10,735 individuals and families registered for disaster assistance, receiving over \$57 million in assistance ranging from rental housing and emergency repairs, to SBA disaster loans. In all, ten counties were designated for Individual Assistance (IA) and Public Assistance (PA). Two counties, Jefferson and Skagit, were designated for PA only.

Table 3.4: Total Federal Funds Allocated to Lewis County and Washington State December 2007 Storm Event²³²⁴

Type of Program	Total Funds Allocated to WA State	Total Funds Allocated to Lewis County	% Lewis County Funds Allocated
IHP Totals (HA + ONA)[i]	\$20,814,604	\$12,219,655	58.70%
SBA Disaster Loans	\$35,637,700	\$23,314,900	65.40%
Public Assistance Obligated ¹²	\$38,390,984	\$11,025,140	28.70%
Federal Highway Admin.	\$628,118,141	\$68,321,072	10.90%
National Flood Insurance[ii]	\$50,602,832	\$40,338,076	79.70%
Total	\$208,257,934	\$93,729,878	44.90%

Note 1: IHP = Individuals and Households Program; HA = Housing Assistance provision of IHP, ONA= Other Needs Assistance provision of IHP; SBA = U.S. Small Business Administration disaster loans; PA = Public Assistance programs include support for state and local governments, tribes and non-profits (75% federal share of completed Project Worksheets).
 Note 2: Public assistance obligated funds include only

the FEMA portion which is obligated, and exclude the 12.5% Washington State allocation provided to local entities as a part of this program.

Total Small Business Administration Loans and Expenditures: Table 3.5 shows Washington State and Lewis County business/working capital and home loan applications submitted, received, and approved by SBA. These percentages range from 33% for home loans to 50% for business/working capital loans in Lewis County. Table 3.6 shows the total dollar amounts of business/working capital and home loans approved by SBA in Washington State and Lewis County from the December 2007 storm event

Table 3.5: Number of Businesses/Working Capital and Home Loans in Lewis County December 2007 Storm Event

Applications	Applied For			Received by SBA			Approved by SBA		
	State	Lewis	%	State	Lewis	%	State	Lewis	%
Home Loans	6,574	1,359	20.70%	1,588	537	33.80%	649	216	33.30%
Business/ Working Cap.	2,180	651	29.90%	438	196	44.70%	158	80	50.60%
Total	8,754	2,010	23.00%	2,026	733	36.20%	807	296	36.70%

Source: Email from Richard Jenkins, Small Business Administration, Sacramento, CA, 8/20/2008.

Table 3.6: Total Dollar Amounts of Business/Working Capital and Home Loans in Lewis County December 2007 Storm Event

Lewis Co. Applications	State Amount Approved	Lewis Co. Amount Approved	Lewis Co. % Approved
Home Loans	\$21,950,600	\$12,956,900	59.00%
Business/Working Cap.	\$16,702,600	\$10,212,000	61.10%
Total	\$38,653,200	\$23,168,900	59.90%

Source: Small Business Administration email, Sacramento, CA, 8/20/2008.

Public Assistance Funds Allocated to Lewis County Jurisdictions: Table 3.7 provides an estimate as of August 14, 2008, of total federal funds allocated to Lewis County jurisdictions and non-profit corporations as a

result of the December 2007 storm event. These numbers do not reflect total actual damages incurred by local jurisdictions for several reasons: (1) Private insurance payments have been deducted from the damage totals by FEMA, (2) Disallowed costs and costs under appeal are not included in these amounts, (3) Some of these costs are based on preliminary estimates and will likely increase as final design and construction change orders are completed, and (4) some damages, such as damages known by local governments to be ineligible, and staffing costs for local government response to the disaster, are not reflected in these estimates.

Table 3.7: Total Federal Funds Allocated by Lewis County by Local Jurisdictions and Non-Profit Corporation: December 2007 Storm Event

Applicant	Eligible Costs¹ (FEMA + WA State)	Totals
Local Governments		
Adna School District # 226	\$106,579	
Boistfort School District #234	\$71,811	
Boistfort Valley Water Corp	\$700,300	
Centralia Public School Dist #401	\$70,928	
Centralia, City Of	\$789,852	
Chehalis, City Of	\$754,567	
Chehalis-Centralia Airport	\$346,164	
Lewis County	\$8,194,067	
Lewis County Fire District # 12	\$10,971	
Lewis County Fire District #13	\$61,196	
Lewis County Fire District #16	\$4,159	
Lewis County Fire District #6	\$1,800	
Lewis County Fire District #8	\$400	
Lewis County PUD No. 1	\$219,885	
Napavine, City Of	\$17,743	
Pe Ell, Town Of	\$1,706,512	
Port Of Chehalis	\$1,359,181	
Vader, City Of	\$14,327	
Winlock, City Of	\$203,636	
Subtotal For Public Entities		\$14,634,079
Private Nonprofit Organizations		
Alano Club (12 Step Club)	\$12,725	
Centralia Christian School	\$275,804	
Providence Health System-WA	\$11,174	
Subtotal For Private Non Profits		\$299,703
Total: Public and Private		\$14,933,782

Note 1: These numbers include both obligated projects and unobligated projects, such as projects under appeal. These projects also include both the FEMA and Washington State allocation of 12.5% provided in this program.

Total Inundation Estimated for 1996 and 2007 Flood Events

Map 1, in Appendix 1, shows the extent of flooding which occurred in Lewis County as a result of the December 2007 storm event. As can be seen from the inundation area identified on the map, both the Centralia-Chehalis urban area, and the rural areas from Pe Ell to Adna, including Pe Ell, Dody, Dryad, Curtis, Boistfort and Adna, were significantly impacted by this event.

Map 2, in Appendix 1, shows the extent of flooding which occurred in the Centralia-Chehalis urban area during both of the significant storm events which occurred in 1996 and 2007. The common areas flooded in 2007 and 1996 are shown in brown, while the flooding in 1996 is shown in yellow and in 2007 in purple. In 1996, extensive flooding occurred in the northern and northwest area of Centralia due to high water from the

Skookumchuck River. According to reports from local officials in Lewis County and the cities, runoff from China Creek accentuated this pattern of flooding in downtown Centralia and northern Centralia during the 1996 flooding. This northern and northwest Centralia area was not flooded in 2007, as the majority of the runoff during this event came from the Chehalis River, the South fork of the Chehalis River, and the Newaukum River rather than from the Skookumchuck Drainage Sub-basin. This map shows that the flooding within the Centralia area was significantly affected by the runoff from the Skookumchuck River. This runoff occurs when a storm event happens in the Skookumchuck Drainage Sub-basin, which is located east of I-5.

This conclusion is reinforced by the data from Tables 3.2 and 3.3, which compare peak flows for 1996 and 2007 for the Chehalis River, South Fork of the Chehalis, the Newaukum River and the Skookumchuck River. The Skookumchuck, near Bucoda, contributed 68% less runoff in 1997 than in 1996, whereas the South Fork of the Chehalis and the Upper Chehalis contributed 117% to 118% more runoff in 2007 than in 1996. Peak flow data for China Creek is not available because there is no gauge to provide data during these phenomena.

Map 3, in Appendix 1, provides an overview of the locations of sites where public/governmental facilities and roads were damaged by the 2007 inundation. Some of these sites are located outside the areas of actual inundation. These sites represent culvert, landslide and road damages which occurred as a result of runoff outside the areas of actual inundation.

Flooding Impacts by Existing Land Use

Existing Land Use Impacts in Centralia-Chehalis Urban Growth Area: Map 4, in Appendix 1, shows the areas of the Centralia and Chehalis Urban Growth Area which were inundated by the flood during 1996 and 2007, by generalized existing land use categories. The land use categories used in this map, the following maps, and the following figures are: residential, commercial, industrial, public, agriculture, forest, other and vacant. Table 3.8 below shows the total acreage in the Centralia-Chehalis Urban Growth Area, by existing land use categories that flooded in 1996 and in 2007. The term “both” refers to the common footprint of the flooded areas in 1996 and in 2007. This total area, as well as the 1996 flooded area and the 2007 flooded acreages, are also shown on Map 4.

Table 3.8: Amount of Flooded Acreage within Centralia-Chehalis Urban Growth Area by Generalized Land Use Category: 1996 and 2007

Land Use Category	Total Flooded Acreage in UGA			Total Acreage in UGA	% Flooded Acreage in UGA		
	1996	2007	Both ¹		1996	2007	Both ¹
Residential	1,329	707	1,455	4,930	27%	14%	30%
Commercial	631	588	675	1,119	56%	53%	60%
Industrial	160	77	172	507	32%	15%	34%
Public	721	694	757	1,198	60%	58%	63%
Agriculture	348	310	357	941	37%	33%	38%
Forest	27	16	27	1,194	2%	1%	2%
Other	115	77	125	300	38%	26%	42%
Vacant	1,524	1,238	1,574	4,731	32%	26%	33%
TOTAL	4,855	3,708	5,142	14,920	33%	25%	34%

Source: Lewis County Geographic Information Services, December 9, 2008.

Rural Land Use Impacts on Unincorporated Area from Adna to Pe Ell: Map 5, in Appendix 1, shows the unincorporated areas outside the Centralia-Chehalis Urban Growth Area and within the Upper Chehalis Watershed Resource Inventory Area 23 which were inundated by the 2007 flood. This information is provided by generalized existing land use categories. This map illustrates the flooding that occurred within the area from Adna west to Pe Ell. Table 3.9 below shows the total acreage in WIRA 23, by existing land use categories that flooded in 2007. Data for the 1996 flood event is not available.

Table 3.9: Flooded Acreage within Rural Unincorporated Lewis County Watershed Resource Inventory Area, by General Land Use Category: 2007 Flood Event Only

Land Use Category	Total Flooded Acreage	Total Acreage in WRIA 23 ¹	% Flooded Acreage
Residential	2,181	27,814	8%
Commercial	10	323	3%
Industrial	109	321	34%
Public	412	1,446	29%
Agriculture	9,227	39,861	23%
Forest	1,219	395,667	0%
Other	169	656	26%
Vacant	2,223	24,726	9%
Total	15,550	490,814	3%

Source: Lewis County Geographic Information Services, December 9, 2008.

1. WRIA 23 = Upper Chehalis Watershed, Watershed Resource Inventory Area 23, Washington State Department of Ecology, <http://www.ecy.wa.gov/services/gis/maps/wria/wria.htm>; <http://www.ecy.wa.gov/services/gis/maps/wria/number/wria23.htm>

Flooding Impacts by Zoning Category

Centralia-Chehalis Urban Growth Area Zoning Impacts: Map 6, in Appendix 1, shows the areas of the Centralia and Chehalis Urban Growth Area, by generalized zoning category, which were inundated by floods during 1996 and 2007. The generalized zoning categories are the same as the generalized land use categories in the previous section. Table 3.10 below shows the total acreage in the Centralia-Chehalis Urban Growth Area, by existing generalized zoning categories that flooded in 1996 and in 2007. The term “both” again refers to the common footprint of the flooded areas in 1996 and in 2007.

Table 3.10: Flooded Acreage within Centralia-Chehalis Urban Growth Area by Generalized Zoning Category: 1996 and 2007

Land Use Category	Total Flooded Acreage in UGA			Total Acreage in UGA	% Flooded Acreage in UGA		
	1996	2007	Both		1996	2007	Both
Residential	1,567.40	887.5	1,693.20	7,607.50	21%	12%	22%
Commercial	1,259.10	1,164.70	1,360.90	2,570.30	49%	45%	53%
Industrial	793.2	448.6	820.1	3,049.60	26%	15%	27%
Public	441.5	409.5	454.1	662.8	67%	62%	68%
Agriculture	NA	NA	NA	NA	NA	NA	NA
Forest	NA	NA	NA	NA	NA	NA	NA
Other	NA	NA	NA	NA	NA	NA	NA
Vacant	793.6	797.3	814.3	1,029.10	77%	77%	79%
Total	4,855.00	3,707.80	5,142.50	14,919.40	33%	25%	34%

Source: Lewis County Geographic Information Services, December 9, 2008. Note: The term “both” refers to the common footprint of the two flooded areas, one in 1996 and the other in 2007.

Zoning Impacts on Unincorporated Area from Adna to Pe Ell: Map 7, in Appendix 1, shows the unincorporated areas of Lewis County from Adna west to Pe Ell inundated by the 2007 flood within the Upper Chehalis Watershed Resource Inventory Area (WIRA) 23. This information is provided by generalized existing zoning categories. This map excludes incorporated cities and their respective urban growth areas. Table 3.11 below shows the total acreage in WIRA 23, by existing generalized zoning categories that flooded in 2007. Data for the 1996 flood event is not available.

Table 3.11: Flooded Acreage within Rural Unincorporated Lewis County Area by Zoning Category: 2007

Land Use Category	Total Flooded Acreage	Total Acreage	% Flooded Acreage
Residential	5,433.0	151,201.9	4%
Commercial	211.1	629.2	34%
Industry	157.0	1,220.1	13%
Public	NA	NA	NA
Agriculture	10,702.2	22,919.4	47%
Forest	155.0	292,250.3	0%
Other	64.0	5,378.6	0.5%
Vacant	NA	NA	NA
TOTAL	16,722.4	473,599.6	4%

Source: Lewis County Geographic Information Services, December 9, 2008. Note: WRIA 23 = Upper Chehalis Watershed, Watershed Resource Inventory Area 23, Washington State Department of Ecology, <http://www.ecy.wa.gov/services/gis/maps/wria/wria.htm>

Impacts on Commercial, Industrial and Residential Structures

Impacts on Structures: Table 3.12 provides an estimate of the number and kinds of structures within the Centralia-Chehalis Urban Growth Area which were located within areas flooded in December 2007. This data is for commercial, industrial, residential and other (detached) categories. The extent of flood damages for a given structure cannot be estimated from this data, as structures might be elevated above the flood level, or water levels might be from several inches to several feet on some parcels.

Table 3.12: Number and Types of Structures Located Within Flooded Areas of Centralia-Chehalis, December 2007

Kind of Structure	Damage Reports Submitted	Parcels in Flooded Areas with Structures ¹
Commercial/Industrial	178	490
Residential	779	3,534
Other (Detached)	NA	1,792
TOTAL	957	5,816

Source: Lewis County Geographic Information Services, December 9, 2008. Note: This is a count of parcels located within the area flooded in 2007. Structures on these parcels were not necessarily damaged by flooding.

Corps of Engineers Damage Estimates from 1996 Flood Event: Economic estimates of flood damages from the 2007 flood were not available from the Corps of Engineers and have not yet been completed by the Corps as part of their 2008 design project authorized in the Water Resources Development (WRDA) of 2007.

Business Impacts

The Institute for Global and Community Resilience, Huxley College of the Environment, Western Washington University, carried out an analysis of business impacts in the aftermath of the December 2007 flood. The study states:²⁵

“Flooded businesses experienced an average of 3 feet of water inundation. Almost all flooded businesses were forced to close; about 40 percent of the businesses that were not flooded were also forced to close due infrastructure disruption. All unflooded businesses reopened within the first two weeks of closing. A little over 70 percent of the flooded businesses surveyed reopened within the first five weeks of closing. Three percent of the surveyed businesses remained closed at the time of the survey, eleven weeks after the flood event.

Flood water and debris caused damage to inventory, equipment and the buildings in which businesses operated. Damage, infrastructure disruption, and perception of damage led to loss in

sales, even for the unflooded businesses surveyed. Losses varied greatly from business to business. On average, flooded businesses surveyed lost about 10% of their inventory, 15% of their equipment and about 15% of annual sales in the two months following the disaster.

Flooding impacted sales for both flooded and unflooded businesses. Of the flooded businesses surveyed, 6 percent had better than typical sales two weeks post flood, increasing to 18 percent two months after the flood. Eighty-two percent had worse sales two weeks after the flood, about 50 percent still had worse sales at the time of the survey. Two weeks after the flood, 17 percent of the unflooded businesses experienced better than typical sales; 83 percent had worse sales. Two months after the flood, 23 percent of the unflooded businesses surveyed experienced better than typical sales and 32 percent had worse sales. The increase in sales for some flooded and unflooded businesses could be attributed to customer redistribution and recovery spending.”

Impacts to Assessed Valuation

Table 2A, 2B and 2C, in Appendix 2, show the changes in assessed valuation for residential structures in 2007 and in 2008 resulting from the December 2007 flood event. Change in assessed valuation for businesses is provided for 2008.



Agricultural Impacts

Total Agricultural Land Inundated: Maps 8, 9, and 10 in Appendix 1, illustrate the extent of flooding on agricultural land from the December 2007 flood. Based on these maps, about 10,702 acres of agricultural land of the total of 22,919 acres zoned agricultural within western Lewis County was flooded. Within the Centralia-Chehalis Urban Growth Area about 340 acres of urban agricultural land was flooded (See Tables 3.8 and 3.11). This is about 47% of the total agricultural land in western rural Lewis County. According to the USDA, a total of about 10,077 acres of farm property was impacted by the flooding in December 2007. These farms and ranches include dairy, cattle, horse, sheep, and llama ranches, and crop farms producing hay, peas, corn and organic

vegetables.²⁶

Silt and Debris Damage: In the areas Pe Ell downstream, erosion of soil and wood material from the forest lands in the upper Chehalis River Basin resulted in the deposition of a substantial amount of silt and wood debris on agricultural lands on the flood plain of the Chehalis River. This included the agricultural lands around Doty, Dryad, Boistfort, Curtis and Adna. According to the Lewis County Conversation District, a total of 4,776 acres of agricultural land was impacted by silt and wood debris. The total cost of cleanup of this situation and debris is estimated to be \$2,388,000.²⁷



Fence Damage Estimates: According to the USDA, 227,778 linear feet of fences were damaged by this flood event. The total damage to fences ranges between \$797,223 and \$1,025,001, based on a cost of between \$3.50/foot and \$4.50/foot.²⁸

Re-seeding Flooded Acreage: The USDA estimates the cost of re-seeding the 1,886 acres of cropland which were inundated was between \$188,600 and \$490,360²⁹.

Ditch Cleaning: A total of 1,836 linear feet of ditches were impacted by silt and wood debris from the 2007 flood. Because of the variability in the type of impact on different reaches of ditches, no estimate of costs was provided by USDA for this type of damage.³⁰



Commercial Livestock Lost: The Lewis County Health Department counted a total of 1,600 commercial livestock that were disposed of as a result of the flooding. These included cattle, horses, sheep goats, pigs and llamas. Of this 1,600, about 400 were commercial dairy cattle.³¹ The dairy industry in Lewis County is small, but the overall impact of this loss was substantial.

Landslides³²

Large areas of land stretching from the base of the Olympic Mountains to the south past Pe Ell and Napavine are made up of marine sedimentary deposits of clay, silt, and sand with some interspersed basalt. These deposits, which include the Willapa Hills in the Upper Chehalis watershed, are relatively prone to landslides and surface erosion.

A sample of 1,685 landslide processes was mapped by the Washington State Department of Natural Resources (DNR) between December 21, 2007 and January 17, 2008, using aerial photography and on-site investigation. Of these, 1,655 occurred in Lewis County (See Tables 3.13 and 3.14). The DNR estimates that this represents between 30% and 50% of the landslides that occurred as a result of the storm event of December 2007.

The most common landslides observed were debris slides, many of which transformed into debris flows. Deposits created temporary dams in streams that later burst, creating a debris torrent or debris flow downstream. Local residents have commented extensively on the character and intensity of these debris surges which broke loose and came downstream during the flood event. Those slides dumped mud and debris into swollen rivers, helping fuel the floods that slammed houses, barns and farm fields downstream. Debris from these slides also caused substantial local damage to roads and bridges and left debris deposits at bridges or other blockage points along the river. Where landslide debris accumulated on the floodplain, both sediment and woody debris were deposited along the riverbanks and on the agricultural lands from Doty to Boistfort and Adna.



Table 3.13: Summary of Mass Wasting Features Mapped in Lewis County

Feature Type	Number Mapped	Area (Sq. Ft.)
Shallow undifferentiated landslides	85	203,599
Debris flows	675	39,493,476
Debris slide/avalanche	915	16,116,655
Hyper-concentrated flow	10	4,601,429
Total	1,685	60,415,159
Source : WA State Department of Natural Resources, see footnote 22.		

Table 3.14: Summary of the Loss Associated with Mass-Wasting Features Mapped in Western Washington

County	Structures Impacted	Road Sections Impacted	Utilities Impacted	Human Fatalities	Landslide Processes Recorded
Thurston	5	4	0	0	13
Mason & Jefferson	11	13	1	1	17
Lewis	4	6	1	0	1,655
King	0	5	0	0	?
Total	20	28	2	1	1,685
Source: WA State Department of Natural Resources, see footnote 22					

Ten landslides in Lewis County, outside of the Chehalis River headwaters area, were recorded: 6 shallow undifferentiated landslides, 1 debris flow, and 3 debris slides. At least three sections of SR 6 were impacted by landslides that blocked or damaged the road. Within the Chehalis River headwaters area, an additional 1,675 landslides were recorded.³³ At least two sections of SR 6 and one on a local road were impacted by landslides that blocked or damaged the road. Four houses were damaged or destroyed by landslides, primarily around Pe Ell and at least one section of electrical power lines was affected.

Transportation Impacts

Impacts to Federal Highways and Local Roads: Table 3.15 on the next page identifies the cost of direct damages to I-5 and to SR 6. Table 3.16 displays a total of direct damages to local roads in Lewis County.

Transportation Delay Costs Due to Closure of I-5 and SR 6: The Washington State Department of Transportation reported that with 12 feet of flowing water on I-5 in some places, a 20 mile section of the freeway was closed on December, 3, 2007. The highway remained closed for four days, with approximately 10,000 trucks and 49,000 cars seeking alternate routes around the closed segment of I-5. A similar four day closure of I-5 occurred during the 1996 storm. It is important to note that this interstate is the principle north-south commercial corridor on the West Coast linking Canada to Mexico. I-5 also connects major regional urban areas such as Seattle, Washington, San Francisco and Los Angeles, California.

The WSDOT, with the assistance of the Washington State University Social and Economic Sciences Research Center, conducted surveys, research and economic analysis of impacts of the 2007 flood event on the economy of the state. This analysis provided a reality based, comprehensive analysis of the effects of the I-5 closure on the state's freight-dependent industries and the economy as a whole. Table 3.17 on the following page, provides a summary of statewide freight related economic impacts from the 2007 closure of I-5 in Lewis County.

Table 3.15 Direct Damage to State & Federal Highways in December 2007 Flood Event

Highway Impacted	Damages
I-5 Flood Repair	\$200,000
I-5 Flood Clean-up	\$115,000
SR 6 MP 25.75 Slide	\$145,000
SR 6 MP 27 Slide	\$3,661,000
SR 6 MP 44 Small Slide	\$40,000
SR 6 MP 27.75 Small Slide	\$13,000
SR 6 MP Bridge 6-102 Scour	\$200,000
SR 6 MP 46 Pavement	\$35,000
SR 6 MP 50 Pavement	\$70,000
Total	\$4,479,000

Table 3.16: Direct Damages to Local Roads in Lewis County December 2007 Flood

Jurisdiction	Damages	Amount
Centralia	Galvin Road Flood Repair	\$10,380
Chehalis	Airport Way Flood Damage Repair	\$176,200
	National Ave. Flood Damage Repairs	\$515,800
Lewis County	Newaukum Br #20 Bank Stabilization	\$38,405
	Wildwood Rd Repair Project	\$147,400
	Lincoln Ck Rd repair Project	\$35,000
	Boistfort Br #89 Scour Repair	
	Hwy 603 Rd Repair Project	\$179,500
	Boistfort Rd Repair MP 3.6 to 4.58	\$7,600
	Boistfort Rd Repair MP 1.29 to 2.14	\$9,400
	Winlock Vadar Rd Slide Repair	\$308,000
	Rush Rd	\$33,375
TOTAL		\$1,524,960

Table 3.17: Summary of Statewide Freight Related Flood impacts from the 2007 Closure of Interstate 5 ³⁴

Type of Impact	Interstate 5 Closure Impact
Total Lost Economic Output	\$47,070,000
Employment Loss	290
State Tax Revenue Loss	\$2,390,000
Reduction in Personal Income	\$14,550,000

The WSDOT did not estimate delay costs for automobiles and occupants for the 2007 flood event; however these delay costs were estimated for the 1996 flood event in the Five County Economic Recovery Strategy, prepared by the Cowlitz-Wahkiakum Council of Governments in the aftermath of the 1996 flooding in Southwest Washington. These figures were calculated using a methodology used by the WSDOT to estimate costs and benefits related to road closures. This approach has been used to estimate auto delay costs for the 2007 flood event in Lewis County. Appendix 4 estimates the costs associated with automobiles delayed for the four day period I-5 was closed in Lewis County.

As a result of the storm and consequent massive landslide at mile post 27 and various other smaller slides and flood debris, SR 6 between Centralia/Chehalis and Raymond/Hoquiam/Aberdeen was closed both ways to all traffic from December 3 through December 29, 2007. The road was opened with flaggers for daytime traffic only

from December 29, 2007 through February 13, 2008. Appendix 4 provides an estimate of delay costs for truck and automobile traffic on SR 6 for the period from December 3 to December 29.

Storm & Flood Damage to Eastern Lewis County & National Forest Roads:³⁵ Heavy rains and wind events from the November and December 2006 storms resulted in significant road, trail, bridge and other facilities damage on the Gifford Pinchot National Forest. The damages closed SR 7 north of Morton and SR12 from Elma to Morton. The closure of Forest Road 23 over an extended period of over a year, resulted in significant sustained impacts to rural and small town businesses in the area. Forest Road 23 is a major north-south road connecting Randall north of the Mt. St. Helens National Monument to Swift Reservoir to the south of the monument. The Gifford Pinchot National Forest received numerous calls from Randle and Packwood in Lewis County and in Trout Lake and Cougar in Skamania and Cowlitz counties indicating that their businesses were negatively impacted by the loss of access. Additionally, numerous public calls to the Forest Service's front desks highlighted the public's concerns with loss of access to the forest for recreation, hunting and travel purposes. Initial road repair estimates prepared by the Forest Service was \$11.4 million, of which \$6.3 million was approved by the Federal Highway Administration, leaving a \$5.1 million shortfall.

Impacts to Rail Facilities: Both the Burlington Northern Santa Fe and Union Pacific Railroads have been asked to document direct damages and delay costs resulting from the flooding in December 2007. No information has been received as of the time of publication of this document. The Curtis Industrial Park rail line and eight culverts, which connect the Port of Chehalis to the Curtis Industrial Park near Pe Ell, were damaged as a result of the flooding. In addition, several wood railroad bridges are in need of repair due to age and use which has caused deterioration on these bridges. Total cost of repair to the rail line, and improvements has been estimated by the Port of Chehalis to be:

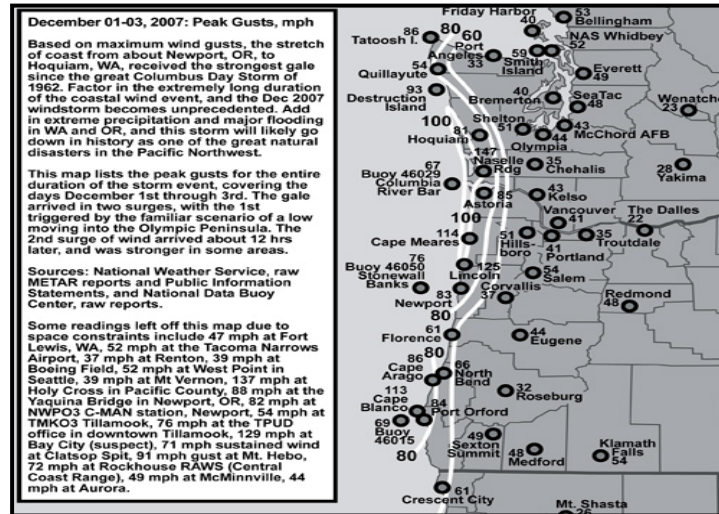
Rail Line Repairs:	\$1,273,307
Rail Bridget Repairs:	<u>\$240,000</u>
Total	\$1,513,307

Impacts to Airport Facilities: The Chehalis-Centralia airport levee failed and water covered most of the airport during the four days of flooding along I-5. Total damages approved by FEMA were \$346,164. Total actual damages, including unfunded damages, were not available at the time this document was published.

Forest Impacts

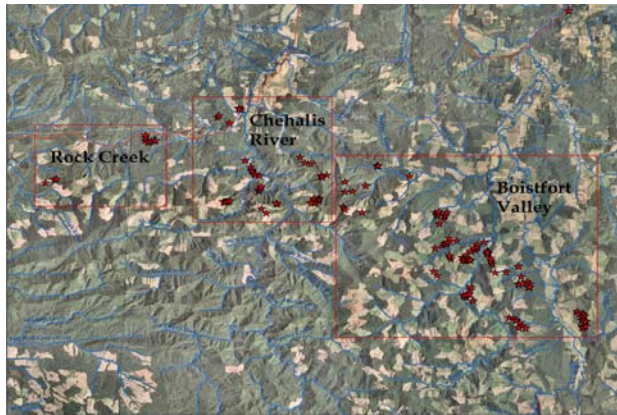
Windstorm Damage: While the coasts of Oregon and Washington, from approximately Newport, Oregon to Hoquiam, Washington received the strongest wind since the Columbus Day wind storm of 1962, Lewis County was relatively unscathed by the wind component of this Pacific storm. According to the Department of Natural Resources, larger private forest industry companies operating in Lewis County and the Washington Farm Forestry Association, windstorm damage to forest lands in Lewis County was minimal.³⁶ The dramatically lower wind velocities in Lewis County compared to the coastal areas is clearly documented in Figure 3.1 on the following page:

Figure 3.1: Wind Velocities in Washington and Oregon December 2007 Storm Event



Source: [December 1-4, 2007 Storm Events Summary](#), Weyerhaeuser Co. Marianne Reiter, Hydrologist, February 8, 2008, page 4.

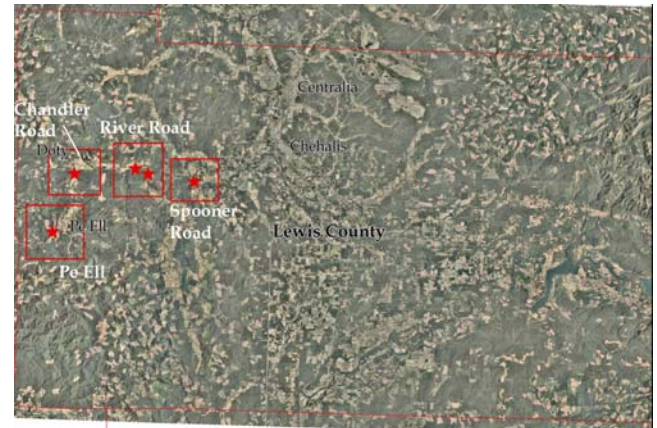
Picture 1



Picture: 1 Landslide areas in upper Chehalis River Basin head waters

Quick report: Landslide Reconnaissance following the December 3, 2007 Storm
<http://www.dnr.wa.gov/Pages/default.aspx>

Picture 2



Picture 2: Landslide areas in Chehalis headwaters (Boistfort Valley, Stillman Creek, Rock Creek, Chehalis River) Quick Report: Landslide Reconnaissance Following the December 3, 2007 Storm
<http://www.dnr.wa.gov/Pages/default.aspx>

Landslide Debris Impacts on Forest Lands: As previously cited in Tables 3.13 and 3.14, a sample of 1,685 landslide processes were mapped by the DNR between December 21, 2007 and January 17, 2008. Of these, 1,655 occurred in Lewis County. The DNR estimates that this represents between 30% and 50% of the landslides that occurred as a result of the storm event of December 2007. Contacts with larger private timber companies operating in this area did not result in any specific information on the extent or cost of these damages, or how these impacts might affect timber harvest yields in the future.

Headwaters Flood Warning system Impacts and Deficiencies

Warning systems require both river stage gauges and precipitation gauges to warn authorities about high intensity or sustained rain, as well as fast rising water in streams and rivers. Several areas of Lewis County are

lacking these types of gauges. For example, there is only one river stage gauge in each of the following rivers: mainstream South Fork of the Chehalis at Wildwood and near Adna. The two flood stage gauges at Doty on the upper Chehalis and Adna on the South Fork of the Chehalis were destroyed by the December 2007 flood and have not been replaced. There is also a lack of precipitation gauges in the areas of these two upper headwaters.³⁷

Health and Social Services Impacts

Hazardous Waste Impacts: Tables 3.18 and 3.19 identify amounts of hazardous materials such as fluids, oily debris, empty containers, and tires which were recovered in the cleanup after the December 2007 flood event. This amount is much smaller than the actual amount of material which was dispersed in the flood, but an estimate of the actual amounts of hazardous material amounts is unavailable.

Table 3.18: Lewis County oil and Hazardous Materials Recovery

Types of Materials Recovered	Amounts	Totals
Paints, Aerosols, flammables, corrosives, pesticides	635 gal.	
Oil, gasoline, anti-freeze, paint, miscellaneous	2,010 gal.	
Total liquids recovered		2, 645 gal.
Oil contaminated debris (vegetation, soil, etc.)	~1,000 lb.	
Empty drums/containers	6,940 lb.	
Total solids disposed		~7,940 lb.

Source: Lewis Co. Health Department email, April 7, 2008.

Table 3.19: Lewis County Drums, Containers & Tire Recovery

Type of material Recovered	Amounts	Total
55 gallon metal & poly drums	184	
5 gallon containers	541	
1 gallon containers	494	
Misc. small containers	1,299	
Propane tanks	34	
Total number of containers		2,552
Tires	793	793

Source: Email from Lewis Co. Health Department, April 7, 2008.

Impacts on Emotional Health: The Washington State Department of Social and Health Services, in cooperation with Cascade Mental Health Care in Lewis County, responded to the 2007 flood disaster by providing crisis counseling services to victims of the disaster. These agencies estimated that the number of people who would benefit from crisis counseling services in Lewis County was 3,188 individuals. Of these, the program estimated that 1,984 individuals would benefit from both primary and secondary crisis services. Crisis counseling services are comprised of primary and secondary services. Primary services include individual crisis counseling; group crisis counseling, assessment, referral, community networking, basic supportive/educational contacts, and public education. Secondary services include media/public service announcements and distribution of educational materials (including e-mail and web sites).

Table 3.20: Primary and Secondary Services

	Period From 1/06/08-5/22/08	Period From 5/23/08-10/22/08	Totals
Primary Services			
Individual crisis counseling	1,339	1,225	2,564
Group crisis counseling	147	0	147
Referral	2,616	808	3,424
Community networking	468	1,382	1,850
Basic supportive-educational contacts	831	1,712	2,543
Public education	45	0	45
Secondary Services			
Distribution of educational materials (pieces)	3,507	2,425	5,932

Sources: Three emails from WA State DSHS dated 12/2/2008

Table 3.20 above shows the number of individuals served through primary services. Since the program tracks encounters and not individuals, these numbers represent duplicated counts of total encounters, and not total individuals served by primary services. The agencies track the number of materials distributed rather than the number of individuals who benefited from secondary services.

Contaminated and Damaged Wells Map 11 in Appendix 1 shows the locations of contaminated and damaged wells resulting from the flooding. The wells identified on the map show wells with positive coliform test results after the flooding.

Conclusions

- ❖ *Data compiled by the Lewis County Health Department and the Long Term Recovery Project in Lewis County estimated total damages from the December 2007 flooding at about \$166 million, private residential damages at about \$69 million, and total business damages at about \$45 million. Other sources have estimated damages to be \$500 million in Lewis County.*
- ❖ *For the December 2007 flood event, the largest percentage of federal expenditures, \$93,729,878, or 45% out of a state total of \$208,257,934, was spent in Lewis County, suggesting that the largest damages from this storm event occurred in Lewis County.*
- ❖ *The largest dollar amount of SBA business/working capital and home loan funds approved for the December 2007 flood event, almost 60%, were allocated within Lewis County, again suggesting that a larger portion of the damages in the state occurred in Lewis County.*
- ❖ *Total FEMA and Washington State eligible costs for both public jurisdictions and non-profit corporations total \$14,933,782 as of August 14, 2008. This number does not reflect actual damages, which are measurably higher than these approved costs. Of this amount, \$14,634,079 reflects eligible costs to public jurisdictions and \$299,703 are costs to private non-profit corporations.*
- ❖ *The extent of flooding within the Centralia-Chehalis urban area, particularly the northern and northwest part of Centralia, from the upper Chehalis Basin is significantly increased by amount of runoff from the Skookumchuck River Drainage Sub-basin and by China Creek.*
- ❖ *Twenty five percent (25%) and 33% of the Centralia-Chehalis Urban Growth Area were flooded in 1996 and 2007. The common footprint of these two floods inundated 34% of the Urban Growth Area.*
- ❖ *Major portions of the Centralia-Chehalis Urban Growth Area, ranging from between 27% and 14% for residential, 56% and 53% for commercial, 32% and 15% for industrial, 60% and 58% for public, and*

32% and 26% for vacant, were inundated during the floods of 1996. These percentages increase to 30%, 60% and 34%, for the common footprint flooded by both the 1996 and 2007 floods.

- ❖ About 34% of industrial land, 29% of public land, 26% of “other” land, 23% of agricultural land and 8% of residential land, in the unincorporated Upper Chehalis Watershed Resource Inventory Area were flooded in the 2007 flood event.
- ❖ Thirty-three percent (33%) and 25% of the Centralia-Chehalis Urban Growth Area that is zoned was flooded in the 1996 and 2007 floods. The common footprint of these two floods inundated 23% of the Urban Growth Area.
- ❖ Major portions of the Centralia-Chehalis Urban Growth Area that is zoned, ranging from between 21% and 12% for residential, 49% and 45% for commercial, 26% and 15% for industrial, and 67% and 62% for public, and 77% and 77% for vacant, were inundated during the floods of 1996 and 2007. Percentages increase to 22%, 53% and 27%, for both the 1996 and 2007 floods.
- ❖ About 34% of commercial land, 13% of industrial land, 47% of agricultural land and 4% of residential land, in the unincorporated Upper Chehalis Watershed Resource Inventory Area were flooded in the 2007 flood event.
- ❖ Flooded businesses surveyed experienced an average total loss of 38% of their gross annual sales as of mid-February, 2008.
- ❖ Two and a half months after the flood, about 50 % of the flooded businesses and about 30% of the unflooded businesses were experiencing worse than average sales.
- ❖ Businesses surveyed found road access to be the most detrimental infrastructure loss.
- ❖ The total loss or shift in taxing responsibility in 2007 was \$548,297. The total loss or shift in taxing responsibility in 2008 for residential structures was \$480,776, and for business structures was \$49,315.
- ❖ The total estimated lost economic output within the State of Washington is estimated at about \$47 million, while estimated state tax revenue loss is \$2.4 million. Reduction in personal income is estimated to be \$15 million. The cost of the four day closure of I-5 for automobiles is estimated at \$72,414,981, and the cost of the 26 day closure of SR 6 for both trucks and automobiles is estimated to be \$18,214,560.

Section III Economic Recovery Strategy



Chapter 4

Economic Recovery Strategy

Overview

Adequate flood protection and mitigation is perhaps the single most pressing issue to be resolved to effectively promote economic recovery and development within Lewis County. An economic recovery strategy which provides mitigation and flood protection from the extensive, repetitive storms and flood events should be comprehensive, providing an integrated set of objectives and projects consistent with the 2008 Cowlitz Lewis Comprehensive Economic Development Strategy (CEDS). To meet these criteria, the strategy includes the following elements:

- An effective flood control strategy;
- Provide developable industrial and commercial sites;
- Emphasize marketing efforts to increase business development in surrounding flood prone areas;
- Increase tourism and community revitalization efforts;
- Support a comprehensive transportation strategy;
- Upgrade and enhance rail transportation;
- Seek additional air transportation opportunities;
- Expand mass transit opportunities;
- Enhanced technical assistance to businesses,
- Strengthen workforce and labor supply;
- Financing small business and economic recovery, particularly with working capital loans, and
- Support for Upper Chehalis agricultural area.

This chapter addresses each of these elements, and, in Appendix 8 for the Action Plan Project Descriptions, includes a description of specific economic development projects. The proposed projects by the different Lewis County jurisdictions and state agencies should move the county towards strengthening the local economy.

An Effective Flood Control Strategy

Efforts to address flooding and flood mitigation in Lewis County are currently being explored and/or carried out by the Chehalis River Basin Flood Control Authority, the State of Washington, the Corps of Engineers, and the Bureau of Reclamation. There are, quite importantly, a number of structural and non-structural approaches to take to address flood control, prevention and mitigation. Each of these efforts is briefly discussed below.

Chehalis River Basin Flood Control Authority: In response to the need for a coordinated approach to the flood control projects in the Chehalis River Basin, legislative representatives from Lewis, Thurston and Grays Harbor Counties, the cities of Centralia, Chehalis, Montesano, Aberdeen, Pe Ell, Bucoda, and Oakville and the Confederated Tribes of the Chehalis have entered into an inter-local agreement pursuant to RCW 39.34.030 to form the Chehalis River Basin Flood Control Authority. The Authority is committed to evaluating options for the entire Chehalis River Basin before endorsing any flood control project, including the levee/dam project proposed by the Corps of Engineers. The Authority has employed a professional facilitator to oversee this process. Lewis County, as lead agency for the Authority, compiled a comprehensive list of possible flood protection and mitigation approaches which will provide background for this process. A consultant, ESA Adolfson, has been chosen to prepare a comprehensive flood protection strategy and facilitate the strategy development process. The process will:

- Assist in the formation of a Flood Control District;
- Identify flood control projects and implementation plans to address the flood problems in the basin;

- Ensure that good public policy supports environmentally sensitive responses to protect communities and their residents from flooding;
- Ensure that state and federal funding sources are well-informed and will support Chehalis River Basin Flood Control Authority or Flood Control District recommendations; and
- Ensure that the design for basin flood control projects, individually or collectively, incorporate options, features and betterments that are cost effective and provide broad and effective flood relief and other benefits to basin communities.

Corps of Engineers Proposed Project: The September 2004 Corps of Engineers Decision Documents³⁸ that were completed in response to the 1996 flood, have been modified by the 2007 Water Resources Development Act. Three structural options for flood control in the Chehalis Centralia Urban Area are being evaluated, including levee construction, increasing capacity of water retention at Skookumchuck Dam, and elevating several structures which would incur damages as a result of the proposed Corps of Engineers project. These options are described in more detail in Appendix 6.

Current funding for the Corps of Engineers recommended project includes updating current land use, hydrological, economic and engineering analysis, and development of final design documents. Updating is currently underway and updated cost estimates will be available at the completion of the study. Construction funding for this project has not yet been appropriated by Congress. Three groupings of options for structural flood control measures are being evaluated by the Corps of Engineers. They are described in Section IV of this document: Economic Recovery Projects in Response to the Lewis County 2007 Flooding,³⁹ and include:

- Option 1: Water Resource Development Act 2007 Approved Plan,
- Option 2: National Economic Development (NED) Plan, and
- Option 3: Locally Preferred Plan (LPP).

State of Washington Legislature: The 2008 Washington State Legislature, through House Bills 3374 and 3375, appropriated \$50 million in state general obligation bonds to the Office of Financial Management (OFM). Of the authorized funding, \$2.5 million is intended for basin-wide study and projects. Of the remaining funds, as much as needed can be used for identification of the non-federal sponsor share of the Corps of Engineers 2007 Water Resource Development Act authorized project.⁴⁰

To support this effort, Lewis County, acting as the lead agency for the Authority, entered into an inter-local agreement with the State of Washington for the purpose of receiving the \$2.5 million in state funds authorized by the Washington State Legislature under House Bills 3374 and 3375.⁴¹ The State of Washington also entered into a second agreement with the Corps of Engineers to develop a flood control project at Centralia and Chehalis. The first step will be to examine all the new data from the recent flood to re-evaluate past project proposals and determine which projects should proceed.⁴²

The June 17, 2008 Project Management Plan (PMP) prepared by the Corps of Engineers describes the work to occur during the pre-construction phase of the flood project at Centralia and Chehalis. The pre-construction phase will have two parts: part one will consist of an evaluation and update of the project in light of the 2007 flood event, and part two will include design work for the project to be constructed. This document states clearly that: "All activities described in this plan will be coordinated with the flood mitigation basin study being conducted concurrently by the Chehalis River Basin Flood Control Authority."⁴³

Lewis County Flood Hazard Management Plan: The Lewis County Comprehensive Flood Hazard Management Plan was developed by Brown and Caldwell under contract with Lewis County. A Planning Action Committee of local officials and citizens participated in a process to develop this plan, and a number of structural and non-structural projects were identified and prioritized for future action. While Lewis County will continue to examine potential structural projects, it has also begun to focus more on non-structural opportunities and policies

as well. In addition, lists of these projects, including both structural and non-structural projects, were ranked by Lewis County and the stakeholder group which guided this process. This list is included in Appendix 6.⁴⁴

Upper Chehalis Flood Retention Structures: Lewis County, in cooperation with the Lewis County Public Utility District, has employed Northwest Hydraulics Consultants (NHC) to carry out a preliminary feasibility analysis of construction flood retention structures in the headwaters of the Upper Chehalis River in the forestland above Pe Ell, and upriver from Boistfort along the South Fork of the Chehalis River. A preliminary hydraulic presentation by NHC evaluates these upstream storage alternatives and their effects on flood levels from the Upper Chehalis Basin extending to the Centralia Chehalis Urban Area. Determining the technical and financial feasibility of this approach would require a more detailed analysis taking into consideration both Upper Chehalis Basin flood control structure options and alternatives previously identified as being under consideration by the Corps of Engineers. The potential environmental impacts from construction of new flood control structures within the Upper Chehalis Basin would be challenging to mitigate in the event that this alternative were found to be technically and financially feasible.

Bureau of Reclamation: There is interest in flood retention structures for flood control within the Upper Chehalis Basin. Funding options are being explored by Lewis County elected officials with the Bureau of Reclamation among other sources of funds, to determine the feasibility of water retention projects which might help mitigate flooding while providing additional benefits such as to fish, hydroelectric power and agricultural irrigation.⁴⁵

Coordination and Structural and Non-structural Measures:

- ❖ **Recommendation:** Federal, state, and local government flood protection and mitigation efforts in Lewis County should be carefully coordinated to create a comprehensive strategy to protect communities and their residents from the impacts of future flooding.
- ❖ **Recommendation:** Structural and non-structural approaches should be included in a comprehensive strategy to address flood protection and mitigation in Lewis County.

Structural approaches provide immediate protection from rising water, including such things as levees, retention structures and filling to raise developable land within the floodplain to safe levels for development. As previously mentioned, there are multiple efforts currently underway to address structural flood control and mitigation within the Chehalis River Basin and Lewis County. These are being carried out by the Army Corps of Engineers, the Chehalis River Basin Flood Control Authority, the Washington State Legislature, Lewis County and the Lewis County Public Utility District. The resources needed to address the question of flood protection and mitigation in Lewis County will have to come from federal, state and local sources. Coordination of program development and resources is essential to maximize the benefit produced from these efforts.

Non-structural approaches include flood warning systems, completion by FEMA of updated floodplain maps, and regulations local government is to use to guide appropriate development in Lewis County. According to the Lewis County Comprehensive Flood Hazard Management Plan, jurisdictions have begun to focus on non-structural opportunities and policies in addition to new infrastructure and capital facilities. “In general, nonstructural recommendations are more procedural or policy-oriented, and therefore, do not always focus on a specific flood location. They also do not require any in stream modifications and therefore have minimal, if any, environmental impacts. Some of the nonstructural opportunities include mapping and database projects, maintenance programs, natural resource projects, and programmatic projects such as public awareness, regulations, and emergency preparedness.”⁴⁶

A number of non-structural recommendations have been made and are addressed below. They include updating the FEMA National Flood Insurance Study, re-establishing the warning system for flood events that may occur in the future, implementing non-structural recommendations from the Lewis County Flood Hazard Management Plan and regulatory provisions.

Update FEMA National Flood Insurance Study: The FEMA National Flood Insurance study and maps for Lewis County are currently out of date and do not accurately reflect the actual flood footprints from the 1996 and 2007 floods. Maps 12 and 13, in Appendix 1, identify the FEMA 100 and 500 year flood zones and the areas of inundation during the 1996 and 2007 inundations. Map 12 covers the Centralia/Chehalis urban growth area, and Map 13 covers the West Lewis County area. These maps identify areas of flooding from the 1996 and 2007 flooding that are not included in the FEMA 100 and 500 year flood zones.

To address this problem, FEMA has contracted with Northwest Hydraulic Consultants (NHC) to update the Chehalis River Flood Insurance Study within Lewis County. This work includes performing hydrologic analyses (taking into account the December 2007 event), hydraulic modeling (using the Army Corps of Engineers HEC-RAS model), and floodplain mapping of the 100-year and 500-year events. The hydraulic model of the Chehalis River extends from approximately Doty downstream to Porter and includes major tributaries. NCH will be developing floodplain maps for the Chehalis River from approximately Doty downstream to the county boundary as well as maps for the South Fork Chehalis River, Salzer Creek, Lincoln Creek and portions of Skookumchuck and Hanaford Creeks, within the county limits. China Creek, which bisects the Centralia downtown commercial district, is not included in this study. These studies will be based on historical gauged flows in the basin, including the December 2007 event back to the 1930's. Hydrology and hydraulics was to be completed and approved by FEMA toward the end of 2008. Mapping will be completed by early 2009. NHC's mapping work will eventually be incorporated by FEMA into the digital flood mapping products (DFIRM) for Lewis County.

- ❖ **Recommendation:** The FEMA National Flood Insurance Agency should complete its update of the Lewis County Chehalis River Flood Insurance Study within the projected timetable for this project.

In addition, adequate resources should be provided to the National Weather Service to fund a Doppler radar system for monitoring the severity of the storm systems coming from the Pacific Ocean that contribute to the flooding within the Chehalis River Basin.

Re-establishing the Storm and Flood Warning Systems:⁴⁷ Adequate warning of incoming storm events and flooding potential is essential for adequate flood protection within the Chehalis River Basin. Several flood gauges which measure water levels within the Upper Chehalis River Basin were destroyed by the flooding in December 2007. Replacement of these gauges is essential to provide adequate warning downstream, both within the Chehalis-Centralia urban area and at downstream locations within Thurston and Grays Harbor Counties, after a storm event in the Chehalis Basin. Currently, there is a need for an agency to take the lead in developing a specific plan and budget. Upon completion, Senator Patty Murray's office indicates a willingness to push for an appropriation to address this problem.

- ❖ **Recommendation:** Resources should be provided by the federal government to the USGS to replace river level gauges and adequately monitor water levels on the tributaries that feed the Chehalis River Basin.

The lack of Doppler radar made it difficult to anticipate the magnitude of the event before the storm actually arrived, decreasing the ability of the National Weather Service to provide adequate warning of the nature and magnitude of the event before the fact. The Washington and Oregon coast is the largest single expanse of coastline within the continental United States that does not have Doppler radar coverage. Efforts have been made for several years to fund Doppler coverage in this area, without success. Currently, Senators Patty Murray and Maria Cantwell have earmarked a \$2 million appropriation to fund this needed project.⁴⁸

- ❖ **Recommendation:** Adequate funding should be provided by Congress for an adequate Doppler warning system to monitor the duration and severity of incoming storms from the Pacific.

Lewis County Comprehensive Flood Hazard Data Collection & Mapping: Brown and Caldwell's Lewis County Comprehensive Flood Hazard Management Plan (LCCFHMP) recommended several data collection and

mapping needs for Lewis County that have been included as priorities to address flood mitigation. These priorities are described in more detail in Appendix 6, and include:

- Continue Channel Migration Zone (CMZ) mapping on the Cowlitz River. Begin and complete CMZ mapping for all Lewis County rivers,
- Update hazards data sets/maps, identify data gaps and collect mission data sets,
- Upper Cowlitz hydrologic data collection/hydrologic model creation and FEMA FIRM re-mapping,
- Evaluate various stream inputs to the Cispus and Cowlitz Rivers and select priority streams for data collection,
- Create a hydrologic and hydraulic model and initiate a request to FEMA for re-mapping,
- Develop the Berwick Creek Drainage Basin Plan, and
- Develop the China Creek Drainage Basin Plan.
- **Recommendation:** Lewis County should implement the data collection and mapping recommendations included in the Lewis County Flood Hazard Management Plan.

Flood Hazard and Land Use Management Policies: The LCCFHMP recommends flood hazard management policies in the following topic areas to minimize future impacts of flooding to Lewis County communities: hazard identification, education and outreach, planning, regulations and development standards, corrective (mitigation) actions/repetitive loss, infrastructure, and emergency services.⁴⁹ These policies should be carefully evaluated by Lewis County and adopted and implemented where appropriate.

Recommendations: The following are recommendations on planning, regulations and development standards, infrastructure, and local ordinances which are recommended in the LCCFHMP that are pertinent to the economic recovery strategy proposed in this report:

- The recommendations and findings on surface water management and hazard mitigation planning, including multi-objective basin planning, comprehensive flood hazard management planning, and hazard mitigation in the CHMP and the Multi-Jurisdictional Hazard Mitigation Plan, should be incorporated into the next update of the Lewis County Comprehensive Plan.
- Lewis County should minimize adverse impacts to conveyance and storage within the floodplain resulting from floodplain development impacts (e.g., relocation of flood paths) by requiring all developments in the floodplain to be consistent with federal standards, or as identified and adopted by the Chehalis River Basin Flood Control Authority.
- Based on its updated ordinance, the county should develop a model floodplain ordinance for other county jurisdictions. These ordinances should comply with federal and state standards. The county should then hold a series of informational meetings with the incorporated jurisdictions and encourage them to adopt relevant sections of the model ordinance into their local ordinances for consistency. The county should solicit the assistance of the Washington State Department of Ecology in encouraging this consistency.
- Policies included in the LCCFHMP should be reviewed by appropriate county department managers, and necessary land use ordinance revisions (as appropriate) prepared for decision-maker review, editing and adoption.
- When planning for and siting all new utility infrastructure, the flood risks to the property that would be serviced by the infrastructure should be considered. Where feasible, new utilities should not be constructed that would lead to increased development of flood-prone lands.
- Lewis County should work with the Chehalis River Basin Flood Control Authority and the towns and cities of Lewis County to evaluate, adopt, and implement, where appropriate, the recommendations and flood hazard management policies, programs and projects identified in the Lewis County Comprehensive Flood Hazard Management Plan.

Consistency with CEDS Goals and Objectives: These recommendations are consistent and support the following adopted 2008 CEDS goals and objectives:

Goal 4: To provide adequate public services, facilities, and infrastructure to support and complement economic growth.

- Work to improve available services and infrastructure to expand business development potential.

Goal 8: To reduce impacts of flooding on industry and business.

- Refine/further develop options for structural solutions for businesses in flood prone locations.
- Assist and support efforts to create a regional Flood Mitigation District.
- Evaluate a variety of regulatory, non-regulatory and infrastructure projects for flood mitigation and reductions efforts.
- Work with federal, state and local leaders for dike-stabilization and levee certification.

Provide Developable Industrial and Commercial Sites

Need for Developable Land: One condition necessary for development to occur is the availability of an adequate quantity of vacant developable land, free of environmental constraints with infrastructure available. In unincorporated and incorporated areas of Lewis County, industrial and commercial developments have occurred both in areas prone and not prone to flooding. Historically, this land has been developed by: (1) providing some level of flood protection by filling in the floodplain in those areas designated for commercial and industrial development, and (2) opening up new developable land free of environmental constraints in upland areas designated for commercial and industrial development.

The Lewis County Economic Development Council's Lewis County Industrial Lands Analysis Update: Final Report (August 2005) concludes that Lewis County does not have a readily available supply of industrial property free and clear of environmental constraints (floodplain and wetlands restrictions). To meet market demands over the next 20 years, the county is short about 420 acres using historic trend demand forecasts, and short as much as 2,580 acres with an economic emphasis forecast. Additionally, Lewis County has a significantly limited inventory of larger sites, which constrains the county's ability to attract large employers and industries with higher wages. The report states that a greater inventory of larger industrial sites is extremely important in establishing a distinct competitive advantage for Lewis County, due to the desire of large users to locate outside of metro areas near major transportation corridors and the increasing lack of large undeveloped sites in the Puget Sound and Portland/Vancouver metro areas.⁵⁰

- ❖ **Recommendation:** An adequate supply of prime developable commercial and industrial land, free of environmental constraints and ideally with infrastructure either in place or planned, should be provided to meet the demand for these kinds of developments over the next 20 years.
- ❖ **Recommendation:** Identify and designate large-scale (5+ acre) sites for future industrial development.⁵¹
- ❖ **Recommendation:** Update the Lewis County Industrial Lands Analysis to reflect the availability of new industrial sites, to include:
 - Those which will become free of environmental constraints upon construction of recommended flood protection and mitigation measures identified by the Chehalis River Basin Flood Control Authority and the Corps of Engineers, and
 - Those sites in upland areas away from the floodplain.

Consistency with CEDS Goals and Objectives: These recommendations are consistent with and support the following adopted CEDS goals and objectives:

Goal 1: To provide economic opportunities, diversification and retention for business development in the region.

- Expand and further develop existing port facilities and industrial sites.
- Identify and maintain a regional inventory of areas suitable for future industrial development.

Emphasize Marketing Efforts to Increase Business Development in Surrounding Flood Prone Areas

Marketing efforts to attract business and industry to start up, expand and locate within Lewis County should be timed to reflect the flood protection and mitigation efforts currently underway. Marketing should highlight the importance of these planning efforts to insure the safety of the area from future storms and flood impacts. Upon construction of flood protection and mitigation measures, the increased safety and protection of the area from future storm events and flood impacts should be emphasized.

- ❖ **Recommendation:** Emphasize the flood planning and implementation actions being carried out by local, state and federal agencies in marketing efforts to attract new business and industry, and in supporting businesses start-ups and expansion.

Consistency with CEDS Goals and Objectives: These recommendations are consistent and support the following adopted CEDS goals and objectives:

Goal 1: To provide economic opportunities, diversification and retention for business development in the region.

- Attract a range of businesses that support or enhance existing industrial base to reduce cyclical swings of traditional industry clusters.
- Encourage start-up and existing businesses to seek assistance through Economic Development District partnerships including, but not limited to, economic development councils, small business development centers, the Economic Development Administration and the Small Business Administration.
- Encourage the creation of a regional identification for Lewis and Cowlitz Counties.

Increase Tourism & Community Revitalization Efforts

The entire Southwest Washington region, including Lewis County, offers a broad variety of destination visitor locations. These include major tourist attractions and activities like Mt. Rainier National Park, Mt. St. Helens National Monument, the White Pass Scenic Byway, Mountains to Sound Greenway/Scenic Byway 6, coastal Washington from Aberdeen/Hoquiam to Long Beach, the Willapa Hills Trail, Lewis County fishing and hunting opportunities, and the Lucky Eagle Casino and the Great Wolf Lodge, both owned and operated by the Confederated Tribes of the Chehalis. A number of historical museums features and sites dot the Lewis County landscape. These amenities attract large numbers of visitors annually and provide an excellent opportunity to support a vital tourism industry in Lewis County and in the region.

Natural beauty and recreational opportunities are abundant. These include rivers, lakes, the Cascade Mountains and foothills and other natural resources. There are also a number of smaller towns such as Packwood, Morton and Pe Ell that provide unique cultural opportunities for visitors to experience. These towns have projects designed to enhance the visitors' tourism experience. City and town revitalization programs create a more attractive and commercially viable environment for both out of town visitors and local residents. They are another important element in Lewis County's economic recovery efforts.

These amenities are promoted and encouraged by several organizations, including the Centralia-Chehalis Chamber of Commerce, the East County Chamber of Commerce, the South County Chamber of Commerce, the Morton Chamber of Commerce, the Mossyrock Chamber of Commerce, the Lewis County Convention & Visitors Bureau, and the Chehalis Visitor's Bureau among others.

- ❖ **Recommendation:** Opportunities for tourism in smaller towns, as well as antique and other retail expenditures within Centralia and Chehalis, should be supported and enhanced to make Lewis County more attractive for tourism.

- ❖ **Recommendation:** Lewis County’s natural beauty, recreational potential and smaller town experiences should be promoted as part of a region-wide tourism marketing strategy.
- ❖ **Recommendation:** City and town revitalization programs should be encouraged and promoted in Lewis County.

Consistency with CEDS Goals and Objectives: These recommendations are consistent and support the following adopted CEDS goals and objectives:

Goal 3: To emphasize regionalism between Cowlitz and Lewis Counties that supports quality of life issues.

- Promote cultural amenities, not limited to the arts, theatre, or historical locations and information centers.

Goal 6: To increase the region’s recreation and tourism activities, and destinations for the arts, markets and unique shopping experience.

- Market the region’s natural beauty and recreational potential,
- Capitalize on the region’s rivers, lakes, other natural resources, and tourism related facilities,
- Encourage and enhance visitor information and interpretive facilities,
- Promote community and downtown revitalization to assist in tourism and marketing opportunities, and
- Promote development of outdoor recreation facilities and activities such as parks and trails.

Support a Comprehensive Transportation Strategy

Interstate and Arterial Transportation An effective economic recovery and development strategy must include improvements to vehicular movement throughout the county. Such a strategy should include improvements to I-5 to insure efficient movement of traffic, efficient interchange connectivity between I-5 and other areas within the county, and an effective arterial street and road system between points in Lewis County. Several transportation projects are currently in various stages of planning, design and construction as described below.

Interstate 5 Improvements: I-5 is the most significant freight freeway on the West Coast, linking markets in Canada, the United States and Mexico, and it is critical to the regional, state and national economy. It is also the busiest commuter roadway in western Washington. A significant portion of the 40-mile long section of interstate is only two lanes in each direction, from the Toutle River Safety Rest Area in Cowlitz County, through most of Lewis County, to the Maytown interchange in Thurston County. There are currently two projects underway to widen the freeway to three lanes in each direction. While eventually there will be a total of six lanes in each direction, congestion will remain a problem for some time, and even minor incidents can result in significant traffic backups. Safety problems and congestion are expected to grow as traffic volumes increase in the future.

As noted above, the Washington State Department of Transportation is in the process of widening 18 miles of I-5 in Lewis and Thurston counties. The following projects are scheduled for completion between 2009 and 2013.⁵²

- I-5: Rush Road to 13th Street,
- I-5: Mellen Street to Blakeslee Junction,
- I-5: Blakeslee Junction to Grand Mound,
- Grand Mound Interchange, and
- Grand Mound to Maytown.

Several other improvements to the interstate system are under consideration, but are not currently included in WSDOT’s work program:

- Improvements to a five mile section of I-5 which flooded in 1996 and 2007, between exits 76 and 81;
- North Lewis County Interchange, with links to Trans Alta site and Port of Centralia Industrial Park; and
- Improvements at Mellen Street interchange to Blakeslee Junction.

Conversations with DOT indicate that improvements along the five mile stretch of interstate between 13th Street and Mellen Street which experienced severe flooding in 1996 and 2007 are pending. A decision on how to approach this segment of the interstate will be made once final decisions are made about flood protection and mitigation measures by local, state and federal authorities.⁵³

South County Arterial Plan: The South County Arterial Plan is being carried out through a joint effort of Lewis County, WSDOT and the Council of Governments. This will identify efficient access and circulation along Avery Road, Military Road, and Jackson Highway between I-5, the proposed Winlock Industrial Park, and future industrial development in South Lewis County.

New Mellen Street Interchange Improvements and Collector-Distributor Lanes: Improvements at the existing Mellen Street interchange will provide the following benefits:

- Improve emergency access to the hospital;
- Reduce traffic backups at the I-5 off-ramps to the Mellen Street interchange;
- Enhance the Chehalis' proposed connection of Louisiana Way to Airport Road over the Airport Road dike, reducing congestion at Chamber Way;
- Avoid negative impacts to Mellen Street businesses;
- Enhance arterial connections between Centralia and Chehalis; and
- Collector-distributor lanes linking Centralia and Chehalis on both sides of the interstate.

New North Lewis County Interchange: The North Lewis County interchange has been under discussion for a number of years, but no decision has been made regarding moving it forward. The project would provide direct I-5 access to and from the Port of Centralia's two industrial parks in northwest Centralia. Discussions with the Southwest office of the WSDOT suggest that officials from this office might be open to seeking funding for initial feasibility studies relative to this project. An arterial from this possible interchange east to State Route 507 and Big Hanaford Road could also serve the proposed Trans Alta Industrial Park.

Improvements to Harrison Street/Old 99: Improvements in Centralia to Harrison Street from the Harrison Street/I-5 Interchange (exit 82) north to the Grand Mound interchange would improve traffic flow along Harrison Street to the Grand Mound Interchange (exit 88). These improvements would also serve as an efficient arterial connection to commercial development along Harrison Street, and improve access to the Port of Centralia's industrial parks in northwest Centralia.

Consistency with CEDS Goals and Objectives: These recommendations are consistent and support the following adopted CEDS goals and objectives:

Goal 4: To provide adequate public services, facilities, and infrastructure to support and complement economic growth.

- Coordinate where opportunities exist, regional planning efforts for sewer, water, storm drainage, energy, solid waste, and transportation with land use planning.

Upgrade and Enhance Rail Transportation

Rail transportation is an important element of an economic recovery strategy for Lewis County. Both mainline rail facilities and service provided by Union Pacific (UP) and the Burlington Northern Santa Fe (BNSF) railroads including Amtrak, and several short line railroads, serve passenger, freight and tourism needs in Lewis County. Mainline rail facilities through Lewis County are owned and maintained by the BNSF, and are used by

both the BNSF and the UP, the latter of which has haulage or trackage rights for the main line from Seattle to Portland, through Lewis County. Information on mainline closures, flood damages, and traffic delay costs were requested but are not available. There is much evidence, however, that flooding and landslides frequently impact rail transportation through Lewis County and Southwest Washington.

- ❖ **Recommendation:** Future flood protection measures should provide protection to mainline rail facilities through Lewis County.

As a result of the December 2007 flooding, the Chehalis-Curtis Industrial park short-line railroad, owned and operated by the Port of Chehalis, was damaged. Railroad bridges along this route are old and in need of repair. Damage to the Tacoma-Morton short-line railroad occurred as a result of the November 2006 flooding as well. The WSDOT has indicated that this rail line serves freight and passenger excursion service, enhancing tourism in Morton and the East Lewis County area. Rail connections in Centralia at Blakeslee Junction between the BNSF, Tacoma Rail, and the Puget Sound and Pacific Railroad (PSAP) need improvement to increase train speeds at the junction. A public-private partnership between the City of Morton, WSDOT, Tacoma Rail, and the Cowlitz River Valley Historical Society has enabled the preservation and relocation of the old Morton railroad station from its original location to downtown Morton as part of an overall downtown revitalization effort. Some of these repairs and improvements are completed or almost completed, and others are pending funding.

- ❖ **Recommendation:** Repairs and improvements should continue to be carried out on the short-line rail facilities within Lewis County to improve and strengthen rail service within the area for both freight and tourism.

Consistency with CEDS Goals and Objectives: These recommendations are consistent and support the following adopted CEDS goals and objectives:

Goal 2: To achieve sustainable growth through public-private partnerships.

- Employ local, state, and federal governmental, non-governmental and private sector programs, resources, and funding sources to approach immediate and long term economic needs, and
- Maintain and strengthen existing economic development organizations and partnerships between public, private and non-profit sectors.

Goal 6: To increase the region's recreation and tourism activities, and destinations for the arts, markets, and unique shopping experiences.

- Capitalize on the region's rivers, lakes, other natural resources and tourism-related facilities; and
- Encourage and enhance visitor information and interpretive facilities. Promote community and downtown revitalization to assist in tourism and marketing opportunities.

Seek Additional Air Transportation Opportunities

Toledo Airport: Lewis County officials have identified the potential for a long term (20+ years) expansion of the Toledo airport to provide air freight service which might be displaced from Portland International Airport and Seattle Tacoma Airport at some point in the future.

- ❖ **Recommendation:** Explore the potential for future expansion of the Toledo airport to provide air freight service which might be displaced from Portland International Airport and Seattle Tacoma Airport at some point in the future.

Consistency with CEDS Goals and Objectives: These recommendations are consistent and support the following adopted CEDS goals and objectives:

Goal 4: To provide adequate public services, facilities, and infrastructure to support and compliment economic growth.

- Evaluate opportunities, and where appropriate, implement expansion of aviation facilities serving the region.
- Capitalize on opportunities to attract major public facilities that generate revenue and provide secure, long-term employment.

Expand Mass Transit Opportunities

Transit is an important component of an economic recovery and development strategy. Adequate transit connections between home and work are essential for those workers who cannot afford to commute by vehicle. Commercial businesses also need transit to bring their customers to and from home or work for shopping. With future increases in fuel costs, more and more people will tend to focus on transit as an alternative to driving in order to lower their fuel expenditures. It is also an important mode for those who choose or are unable to drive a motor vehicle.

- ❖ **Recommendation:** Strengthen opportunities for transit related services and infrastructure to provide alternative ways to move employees and shoppers from their homes to places of employment and shopping.

Consistency with CEDS Goals and Objectives: These recommendations are consistent and support the following adopted CEDS goals and objectives:

Goal 4: To provide adequate public services, facilities and infrastructure to support and complement economic growth.

- Work to improve available services and infrastructure to expand business development potential.

Enhanced Technical Assistance to Businesses

Technical assistance for business recovery from the flood disaster, as well as business start-up and expansion, is a critical component of an economic recovery strategy for Lewis County. This function is carried out by the Small Business Development Center in conjunction with the Lewis County Economic Development Council. Conversations with staff at the Small Business Development Center confirm that the support currently being offered could be expanded and strengthened in the aftermath of the flood disaster of 2007. This support might include business plan and loan application assistance, accounting and finance, special consultation in the area of retail development and marketing, and market strategy development and marketing.

- ❖ **Recommendation:** Strengthen and expand services of the Lewis County Small Business Development Center.

Consistency with CEDS Goals and Objectives: These recommendations are consistent and support the following adopted CEDS goals and objectives:

Goal 2: To achieve sustainable economic growth through public-private partnerships

- Employ local, state, and federal governmental, non-governmental, and private sector programs, resources and funding sources to approach immediate and long term economic needs, and
- Maintain and strengthen existing economic development organizations, and partnerships between public, private and non-profit sectors.

Strengthen Workforce Training and Labor Supply

Workforce training in Lewis County is currently provided by the Pacific Mountain Workforce Development Council and Centralia College. The Pacific Mountain Workforce Development Council serves Lewis County as part of a larger region including Pacific, Grays Harbor, Mason and Thurston Counties. Its mission is to create a workforce development system that enhances economic success for workers and businesses within the communities of the region. Centralia College is located in Centralia, Washington, and operates

Centralia College East, an extension campus located in Morton. The college's service area includes Lewis County and south Thurston County.

Workforce training is a key element of an economic recovery and development strategy to overcome historic and recent layoffs in the county. A workforce training center in Lewis County could focus on skills needed for jobs in specific areas of trade and commerce.

- ❖ **Recommendation:** Conduct a feasibility study to look at vocational training centers in Lewis County as well as in conjunction with Cowlitz County.

Consistency with CEDS Goals and Objectives: These recommendations are consistent and support the following adopted CEDS goals and objectives:

Goal 5: To develop a regional work force to support economic growth, diversity and family wage jobs.

- Encourage schools, training centers, skills centers and employers to develop opportunities that benefit employees through workforce development, re-training, internships, apprenticeships, entrepreneur education and training to assist re-entering and new workforce.

Goal 2: To achieve sustainable economic growth through public private partnerships.

- Employ local, state and federal governmental, non-governmental, and private sector programs, resources, and funding sources to approach immediate and long term economic needs.

Financing for Small Business & Flood Recovery

Adequate financing for new and existing businesses for start-up, expansion and flood damage recovery is an essential component of Lewis County's economic recovery and development strategy. Discussions with the Lending Network in Lewis County indicates that adequate financing resources are available for equipment and structure replacement or repairs, but that adequate operating capital financing is less readily available.⁵⁴

- ❖ **Recommendation:** Expand existing loan programs or create a new loan program to provide adequate operating capital loans to business, industry and agriculture that need to recover or expand in the aftermath of the December 2007 flooding.

Consistency with CEDS Goals and Objectives: These recommendations are consistent and support the following adopted CEDS goals and objectives:

Goal 1: To provide economic opportunities, diversification and retention for business development in the region.

- Direct new and expanding businesses to the Lending Network and Longview Revolving Loan Fund for potential low interest, flexible funding sources.

Support to Upper Chehalis Agricultural Area

The impact of the 2007 flood was particularly severe in the agricultural area of the Upper Chehalis Basin, with reports that flooding in that area reached the 500-year flood stage. Public sector facilities in that area were severely impacted. Capacity of these jurisdictions to finance recovery is limited by their size and smaller tax base. This limited financial capacity for the fire and water districts within this area is compounded by the ineligibility of a number of significant damages for FEMA public works funds..

- ❖ **Recommendation:** Seek financial assistance for infrastructure and facilities to address the impacts of the 2007 flood on rural jurisdictions, including fire and water districts, within the Upper Chehalis Basin Watershed.

Section IV

Economic Recovery Projects

Chapter 5

Funding Strategy and Responsibilities

Implementation & Funding Strategy

Under the Revised Code of Washington, legal responsibility for implementing the kinds of public policies and programs recommended in this economic development strategy rests primarily with state agencies and local government entities such as cities, counties, and special purpose districts. To accomplish implementation, entities are also responsible for planning and designing projects and undertaking fund development and grant writing for those activities. Within Lewis County, there also are a number of private, non-profit organizations that may have projects in need of funds from federal and state sources.

The amount of funding appropriated for federal and state categorical grant programs has historically been small in comparison to the need for financing economic development strategy and disaster recovery projects, be it around the country or in Lewis County. Funding levels are not large and categorical programs have been subject to numerous demands across the nation and state for many years. In other words, competition has been intense for scarce amounts of funding.

However, with the current economic crisis and the stimulus spending program of the new administration, funding levels may increase and provide new opportunities for funding economic recovery and development in Lewis County and elsewhere. The federal stimulus program may provide new opportunities for funding the kinds of programs identified in this report.

Two broad approaches for funding the projects in this economic recovery strategy are:

- A multi-jurisdiction effort to seek federal and state funding through special legislative appropriations, with some of these appropriations linked to national and state economic stimulus packages and existing categorical programs.
- Submitting applications for categorical grant programs again possibly linked to national and state economic stimulus packages.

Responsibilities for Specific Projects

Projects for Individual Jurisdictions: The responsibility to plan, design, and seek funds for specific economic recovery projects are with local government entities and, in some cases, appropriate non-profit organizations. The Cowlitz-Lewis Economic Development District (EDD) should coordinate and/or assist jurisdictions as needed.

Responsibility for coordinating the flood prevention and mitigation projects: The responsibility to coordinate and pursue funding for flood prevention and mitigation projects within Lewis, Grays Harbor and Thurston counties rests with the Chehalis River Basin Flood Control Authority.

Coordinating Economic Recovery Strategy Implementation: A single organization or coalition responsible for economic development planning comprised of staff and players in the local and/or regional economic development arena should help coordinate efforts to implement this Lewis County Economic Recovery Strategy. The EDD, funded by the Economic Development Administration and a local match, is charged with preparing this economic recovery strategy in response to the 2007 flood in Lewis County. EDA has indicated that there is a possibility of Phase II funding to broaden the recovery strategy to include damages from the more recent January 2009 floods in Lewis and Cowlitz Counties. This Phase II could also involve coordination of those aspects in the Lewis County strategy that are considered appropriate for an economic development district. A brief description of this Phase II project is included in Table 5.2 and in Appendix 7.

❖ **Recommendation:** The Chehalis River Basin Flood Control Authority should coordinate flood-related implementation efforts and projects within the basin.

❖ **Recommendation:** The Cowlitz-Lewis EDD staff should work with and assist the Lewis County EDC and local jurisdictions to implement the economic development recovery strategy recommendations, projects and related measures.

Funded and/Completed Projects by Strategic Element

Table 5.1, on page 58, provides list of economic recovery projects within Lewis County which have been funded or are completed. This table identifies project sponsors, project status, the type of project it is, a brief project description, estimates and possible timing for completion. As previously stated, projects are grouped by the strategy elements that make up the strategy.

This table lists the funded and/or completed projects by each element of the proposed strategy recommended in this plan. For those categories where no projects have been identified, the appropriate strategy element is not listed. The strategy elements are:

1. Flood protection
2. Providing developable industrial and commercial sites with infrastructure and with manageable environmental constraints
3. Development marketing
4. Tourism and community revitalization
5. Interstate and arterial roads and bridges
 - a. I-5 corridor projects
 - b. Washington State road projects
 - c. Forest Service road projects
6. Rail transportation
7. Air transportation
8. Transit
9. Financial and technical assistance to business
10. Workforce training
11. Regional Planning: Implementation of Lewis County Economic Recovery Strategy
12. Upper Chehalis agricultural area

Table 5.1: Funded and/or Completed Projects by Strategic Element

Strategy and Project	Possible Project Sponsor(s)	Project Status	Type of Project	Project Description	Cost Estimate	Timing
Flood Protection Strategy						
Flood Control & Economic Recovery Planning, Coordination and Fund Development	Chehalis River Basin Flood Control Authority	Phase I funded to June 30, 2009 Phase II not funded to June 30,2011	Planning, analysis, coordination & Advocacy	1) Review of flood hazard & economic recovery plans & related studies, conduct additional studies, identify, prioritize and develop potential projects; 2) Coordination of federal, state, local efforts to develop & implement comprehensive Lewis Co. flood control and economic recovery strategy; 3) Fund development at federal & state levels for funding to implement flood control projects recommended by Chehalis River Basin Flood Control Authority	\$2,500,000	Phase I: Present to June 2009 Phase II June 2009-June 2011
Federal Flood Control Analysis: Levees, add Skookumchuck Storage, Raise Building Structures	Corps of Engineers	Funded	Feasibility analysis & design	Update economic analysis & prepare final design for flood mitigation projects recommended in Corps 2003 study	Not Available	June 2008 to Dec. 2010
Upper Chehalis Flood Control Retention Structure	Lewis Co. Public Utility District	Funded	Feasibility study	Evaluate feasibility of dam for flood control and power generation on the Upper Chehalis River	Undetermined	Underway
Fed. & State Appropriation for Flood Control	Corps of Engineers; Bureau of Reclamation; Chehalis River Basin Flood Control Authority	Funded	Design & Construction	Implement recommendations of Chehalis River Basin Flood Control Authority, Corps of Engineers, Lewis Co. Public Utility District	Undetermined	Completed
WA State Flood Warning Feasibility Study	WA State Dept. of Emergency Services	Funded	Assessment of flood warning capacity	Compilation of data on the feasibility of a flood warning system statewide, including the Chehalis Basin	\$250,000	Spring 2008 to Feb. 2009
Fund Development for federal and State Appropriation for Flood Control implementation & economic recovery	Chehalis River Basin Flood Control Authority	Funded	Fund development & advocacy	Fund development to implement flood control projects recommended by Chehalis River Basin Flood Control Authority	Included in \$2,500,000 funding to Authority	Jan. 2009 to June 2009
Prepare Industrial & Commercial Land with Infrastructure, in Compliance with Environmental Regulations						
TransAlta Industrial Site Master Plan	Lewis Co. Economic Dev. Council	Funded	Market analysis, site plan & engineering	Carry out environmental review, develop industrial site plan, & prepare prel. Infrastructure design and cost estimates for TransAlta Industrial Site	\$300,000	June 2008 to Sept. 2009
South Lewis Co. Watershed Plan & Econ. Dev. Demo. Project	Lewis Co.	Funded	Planning	1) Prepare an economic development strategy based on a characterization of the watershed, local habitat, an economic forecast, and land use assumptions, developed by abroad based local stakeholder group 2) Project coordinated with I-5-SR-505 Corridor Interchange Plan	\$110,000	July 2008 to July 2009
Programmatic Wetlands Mitigation Project	Port of Chehalis	Funded	Design & Construction	Develop a mitigation strategy of advance wetland creation for about 40 acres of Category II, forested, scrub-shrub, emergent and wet prairie wetlands to offset impacts to about 40 acres of wetland on 9 port parcels	\$1,550,000	Aug. 2008 to June 2009
Tourism & Community Revitalization						

Strategy and Project	Possible Project Sponsor(s)	Project Status	Type of Project	Project Description	Cost Estimate	Timing
Chehalis Renaissance	City of Chehalis	Funded	Citywide visioning & planning	Development of a citywide vision and implementation plan that includes elements such as branding, urban design & landscaping, environmental, housing, transportation, non-motorized transportation, parking, economic development, marketing and utilities	Undetermined	April 2008 to April 2009
Morton Scenic Byway & Downtown Revitalization	Town of Morton, Cowlitz Valley Historical Society, Mt. Valley Arts Council	Partially Funded	Planning & implementation	Downtown revitalization and gateway corridor improvements on SR 7, including historic railroad station relocation and rehabilitation.	\$3-\$4 Million	Underway; completion to be determined
Lewis Co. Community Trails Project	WA State Parks Dept.	\$300,000 Partially Funded	Design, acquisition & construction	Development & construction of an integrated regional network of trails to increase multi-modal transportation systems, recreational opportunities & community health.	To be determined	3 yr. for Willapa trails segment
Interstate & Arterial Roads & Bridges						
I-5, Rush Road to 13 th St.	WA State Dept. of Transportation	Funded	Construction underway	4 mi. of I-5 will be widened from Rush Road Interchange to 13 St. in Lewis Co.	\$51 Million	2007-2009
I-5, Mellen St. to Blakeslee Junction	WA State Dept. of Transportation	Funded	Construction underway	This project will widen approximately 3 mi. of I-5 between Mellen St. Interchange (exit 81) & Blakeslee RR Junction bridge. One lane will be added in each direction. Improvements will be made at the <u>Mellen Stand Harrison Ave Interchanges.</u>	\$133 Million	2011-2014
I-5, Blakeslee Junction to Grand Mound	WA State Dept. of Transportation	Funded	Construction funded	This project will widen four miles of I-5 between the Blakeslee railroad junction in Lewis Co. (milepost 83.5) and just south of Grand Mound Interchange (exit 88) in Thurston Co.	\$63,000,000	2009-2011
I-5 Grand Mound Interchange	WA State Dept. of Transportation	Funded	Construction funded	This project will improve the function and safety of Grand Mound Interchange by upgrading the freeway on-ramps & off-ramps to meet current WSDOT & FHWA design guidelines	\$42,500,000	2010-2012
I-5 Grand Mound to Maytown	WA State Dept. of Transportation	Funded	Construction underway	More than 8 mi. of I-5 will be widened between the Grand Mound and Maytown Interchanges.	\$88,500,000	2008-2010
I-5, Mellen St. to Blakeslee Junction	WA State Dept. of Transportation	Funded	Construction	1) This project will widen 3 mi. of I-5 between Mellen St. Interchange (exit 81) & Blakeslee RR Junction bridge. One lane added in each direction. 2) Improvements will also be made at the Mellen St. and Harrison Ave. Interchanges. 3) Project will include proposed CD lanes between the Mellen St. & Harrison Ave. Interchanges. The CD option provides revised plan in vicinity of Mellen St.(through a Yew St. extension).	\$ 133,000,000	2011 - 2014
I-5-SR-505 Corridor Interchange Plan	Lewis Co. (lead), Toledo, Winlock, SWRPO, Cowlitz Tribe	Funded	Planning	1) Create a corridor management plan supporting new land use development between Winlock & Toledo, along SR-505 from milepost 0.0 to milepost 6.8 2) Project coordinated with South Lewis Co. Watershed Plan & Econ. Dev.	\$575,000	May 2008 to April 2009

Strategy and Project	Possible Project Sponsor(s)	Project Status	Type of Project	Project Description	Cost Estimate	Timing
SR-7 – Route Development Plan - Complete March 2006	WSDOT	Phase I: Funded; Phases II, III not Funded	Planning	Three phase Route Development Plan to identify transportation safety, congestion, mobility improvement opportunities and other roadside issue to guides investments in the corridor over 20 years	\$ 200,000	Ph-1: Completed; Ph-2 & 3
SR-7 - Lewis County Roadside Safety Improvements	WSDOT	Funded	Construction	This project will make safety improvements to reduce severity of accidents in various locations throughout the SR 7 Corridor from US 12 to the Lewis/ Pierce county line.	\$1,700,000	Unavailable
SR-6 - South Fork Chehalis River Bridge Replacement	WSDOT	Funded	Construction	Replace existing narrow South Fork Chehalis River Bridge (22') on SR 6, 15 miles west of Chehalis in Lewis County with a new, wider bridge (40')	\$6,700,000	May 2008 to Summer 2009
SR-6-Rock Creek 6/103 bridge replacement	WSDOT	Funded	Design & Construction	Replace the existing bridge with a new bridge designed to current standards. Lewis SR 6/Rock Creek (6/103)	\$6,000,000	2012
SR-6/Rock Creek (6/102) bridge replacement	WSDOT	Funded	Design & Construction	Pe Ell east: replace the existing bridge with a new bridge designed to current standards	\$6,700,000	2012
Repairs to Forest Service Road 23	Gifford Pinchot National Forest	Funded	Design & construction	Make repairs to Forest Service Road 23 east of Mt. St. Helens, connecting Randall in Lewis Co. to Swift Reservoir in Cowlitz County	Unknown	Completed
Rail Transportation						
Curtis rail line repairs	Port of Chehalis	Partially funded: \$160,000	Design & construction	Repair to Curtis Industrial Park railroad line and bridge(s) from Chehalis damaged by the 2007 flood	\$1,273,307	Immediate
Tacoma Rail-Frederick-son to Morton Phase II Line Repairs	WSDOT	Funded	Construction	After damage during the 1996 flood, project placed thousands of new rail ties and tons of ballast to stabilize aging track bed and prepare line between Tacoma & Morton to carry more freight cars	\$3,180,000	At bid
Chehalis Junction High Speed Crossover	WSDOT	Funded	Design & construction	High-speed crossovers near the Chehalis Junction will allow faster passenger trains, including Amtrak Cascades, to move around slower freight trains	\$3,900,000	2013-2015
Morton rail & downtown tourism development project	WSDOT & Tacoma Tail	Funded; Depot interior not funded	Construction	This project continues railroad rehabilitation work accomplished by the Tacoma RMDRR Morton Line Repairs – Phase 2 project and provides for the restoration work on the relocated Morton depot	\$11,904,000	April 2008 to Oct. 2008
Tacoma Rail & Puget Sound and Pacific (Blakeslee Junction connection & track alignment)	WSDOT	Phases Ia & 1b partially funded	Final design & construction	Five phase project to improve mobility in Centralia area: build a new connection between Tacoma Rail & 34PSAP at Blakeslee Junction in Centralia, & realign tracks in the junction between PSAP & BNSF	Phases Ia & Ib \$24,500,000 Total Project	To be determined

Unfunded Projects by Strategic Element

This section provides an overview of the various projects identified by Lewis County jurisdictions to be included in this implementation section of the economic recovery strategy outlined in this chapter of the Lewis County Flood Disaster Recovery Strategy. Priorities have not been set for several reasons:

1. The Chehalis River Basin Flood Control Authority, which has been recommended to facilitate a joint advocacy effort of multiple jurisdictions, is in the best position to set priorities for flood control and mitigation, based on the flood protection studies which they are carrying out.
2. Categorical funding should be applied for by each jurisdiction based on their individual priorities and the availability of funding through state and federal categorical funding agencies.

Funding sources for different projects vary widely, and the deadlines for seeking categorical funding for specific projects are different for different funding sources. Table 5.2, on page 63, lists the action plan projects by each element of the proposed strategy recommended in this plan. These elements are

1. Flood protection
2. Providing developable industrial and commercial sites with infrastructure and with manageable environmental constraints
3. Development marketing
4. Tourism and community revitalization
5. Interstate and arterial roads and bridges
 - a. I- 5 corridor projects
 - b. Washington State road projects
 - c. Forest Service road projects
6. Rail transportation
7. Air transportation
8. Transit
9. Financial and technical assistance to business
10. Workforce training
11. Regional Planning: Implementation of Lewis Co. Economic Recovery Strategy
12. Upper Chehalis agricultural area

Table 5.2: Unfunded Projects by Strategic Element

Strategy and Project	Possible Project Sponsor(s)	Project Status	Type of Project	Project Description	Preliminary Cost	Timing
Flood Protection						
Flood Control Planning, Coordination & Fund Development	Chehalis River Basin Flood Control Authority	Phase I Funded to June 30, 2009 Phase II not funded to June 30, 2011	Planning, analysis, coordination & advocacy	1) Review of flood hazard plans & related studies, conduct additional studies, identify, prioritize and develop potential projects 2) Coordination of federal, state, local efforts to develop & implement comprehensive Lewis Co. flood control strategy 3) Support federal & state level funding to implement flood control projects recommended by Chehalis	\$2,500,000	Phase I Present to June 2009 Phase II June 2009-June 2011
Implementation of Corps Flood Control Analysis:	Corps of Engineers	Not Funded	Construction	Implement recommendations of economic analysis & final design	\$74,000,000	
Lewis Co. Flood Hazard. Mgmt. Plan Policy & Project Recommendations	Lewis Co.; implementation may be by Lewis Co. or other jurisdictions	Not Funded	Planning, feasibility, prel. & final design & Construction	A) Non-structural policies relating to 1) hazard identification, 2) education and outreach, 3) planning, 4) regulations and development standards, 5) corrective (mitigation) actions/repetitive loss, 6) infrastructure, & 7) emergency services B) Bundle of 15 structural & non-structural projects identified by Lewis Co. Project Advisory committee	\$21145000 to \$21,495,000	To be determined
Headwaters Warning and Flood Alleviation Analysis	Lewis County; implementation may be by Lewis County or other jurisdictions	Not Funded	Analysis, design, construction	Headwaters Warning and Flood Alleviation: Evaluation opportunities for flood warning systems and flood alleviation projects on Lewis Co. rivers: possibly the mainstem Chehalis, South Fork Chehalis, Newaukum, Cispus or Upper Chehalis. Construct appropriate infrastrure.	\$600,000+	To be Determined
OR & WA Coast Doppler Radar	U.S. Senator Murray:NOAA	Not Funded	Purchase & install Doppler Radar	Install WA & OR coastal Doppler radar warning system to monitor the duration and severity of incoming storms from the Pacific	\$2 Million	Upcoming Presidential Budget
Providing Industrial & Commercial Business sites with & in Compliance with Environmental Regulations						
Update Lewis Co. Industrial Lands Analysis	Lewis Co. Economic Dev. Council	Not Funded	Planning & marketing	Update industrial lands analysis to reflect both newly protected areas in floodplain & new upland sites identified in current land use studies; identify larger sites to be included	\$100,000	To be Determined

Strategy and Project	Possible Project Sponsor(s)	Project Status	Type of Project	Project Description	Preliminary Cost	Timing
South Lewis Co. (Winlock) Industrial & Commercial	City of Winlock	Not Funded	Design & construction	Construct Phase I infrastructure (water, sewer, roads) to Winlock highway industrial & commercial park	\$27,338,000	To be Determined
TransAlta Industrial Site Master Plan Implementation	Lewis Co. Econ. Dev. Council	Not Funded	Final design & construction	Implement TransAlta Master Plan recommendation	To be Determined	To be Determined
Port of Centralia Industrial Park Infrastructure Improvements	Port of Centralia	Not Funded	Design & construction	Improvements to road, water, sewer, gas, telephone, fiber optic, street fronts and minor rail extensions at the Port of Centralia Industrial Park	\$15,000,000	Multiple phases over 7 years
Harrison St. Sewer Extension Project	City of Centralia	Not Funded	Conceptual, planning, feasibility analysis, prel.	Construction of a new 36-inch diameter gravity sewer interceptor from the existing Kuper Road pump station south approximately 1.5 miles to the intersection of Harrison Avenue/ Reynolds/Galvin	\$11,000,000	Jan. 2009 to Jan. 2011
Long Road Renewal Project Redevelopment Plan	City of Centralia	Not Funded	Redevelopment plan	Prepare a redevelopment plan for the Long Road Commercial Renewal Project adjacent to I-5 south of Mellen St.	To be Determined	To be
Skookumchuck Bridge Intermodal Access Redevelopment Project	City of Centralia	Not Funded	Concept design, land acquisition, prel. design, final design construction	New bridge over the Skookumchuck to open 70 acres of commercial & industrial land and divert heavy truck traffic away from residential areas	\$5,800,000	3 to 5 years
Implementation for South Lewis Co. Subarea Plan (Watershed Plan & Econ. Dev. Demo. Project)	Lewis Co.;	Not Funded	Implementation	Implement recommended economic development strategy for South Lewis County. Project coordinated with I-5-SR-505 Corridor Interchange Plan	Planning \$110,000 Implementation \$750,000	Unknown
Centralia Sewer Force Main Relocation	City of Centralia	Not Funded	Conceptual, pln., feasibility analysis, prel & final design & construction	Installation of approximately 1400 linear feet of pipeline and a new access road from 80 to 200 feet east of the current location to protect from future flood damage sewer system serving major Centralia commercial, industrial and residential areas	\$2,500,000	2 year project
Packwood-East Lewis Co. Waster Water Treatment System	Lewis Co.	Not Funded	Feasibility, design & construction	Define development scenarios and complete feasibility, design and construction of Packwood wastewater treatment facility to serve business, tourism & residential	\$6,213,600	Complete by Aug. 2009

Strategy and Project	Possible Project Sponsor(s)	Project Status	Type of Project	Project Description	Preliminary Cost	Timing
Toledo Wastewater Treatment Plant Upgrade	City of Toledo	Not Funded	Design & construction	Upgrade original 1963 wastewater treatment plant to serve business, residential, & Toledo Airport industrial growth	\$8,906,000	2009-2011
Toledo Water Tower & Water Rights	City of Toledo	Not Funded	Design & construction	Develop new water tower & obtain water rights for business, residential and Toledo Airport industrial growth	\$916,000	2008-2013
Toledo Area Water & Sewer Extension	City of Toledo & Cowlitz Tribe	Not Funded	Design & construction	Install booster pump station, force mains, water tower, sewer main, collector road with sidewalks for 2 new developments, one for low income housing for Cowlitz Tribe	\$2,640,000	2008-2010
Programmatic Wetlands Mitigation Project	Port of Chehalis & Dept. of Ecology	\$250,000 Not Funded \$1,300,000 Funded	Environmental, Design & Construction	Develop a mitigation strategy of advance wetland creation for about 40 acres of Category II, forested, scrub-shrub, emergent and wet prairie wetlands to offset impacts to about 40 acres of wetland on 9 port parcels	\$1,550,000	Aug. 2008 to June 2009
Development Marketing						
Marketing Program for Industrial & Commercial Development	Lewis Co. Economic Dev. Council	Not Funded	Preparation of new website & marketing brochure	Prepare website & simple marketing brochure and promote the flood planning and implementation actions being carried out by local, state and federal agencies & private sector as a part of ongoing economic development marketing efforts for Lewis Co.	\$30,000	Jan. 2009 to June 2009
Tourism & Community Revitalization						
Chehalis Renaissance Implementation	City of Chehalis	Not Funded	Design, Policy Implementation, Construction	Implementation of approximately 34 projects identified in Chehalis Renaissance (See Appendix 7: Chehalis Renaissance Implementation Projects). Please refer to the City of Chehalis' <u>Action Plan Chehalis Renaissance Project</u> , to be published within about 2 months, for more detail on funding possibilities for this project.	\$5-7 Million	To be determined
Morton Scenic Byway & Downtown Revitalization	Town of Morton, Cowlitz Valley Hist. Society, Mt. Valley Arts Council	Partially funded	Planning and implementation	Downtown revitalization and gateway corridor improvements on SR 7, including historic railroad station relocation and rehabilitation.	\$3-4 Million	Underway; completion to be determined

Strategy and Project	Possible Project Sponsor(s)	Project Status	Type of Project	Project Description	Preliminary Cost	Timing
Pe Ell Trailhead Project	Pe Ell & WA State Parks & Recreation	Not Funded	Final design & construction	Develop trailhead horse & hiking park at trail junction of Chehalis to coast hiking and horse trail	\$500,000	Summer 2009
Lewis Co. Community Trails Project	WA State Parks Dept.	\$300,000 Partially Funded	Design, acquisition & construction	Development & construction of an integrated regional network of trails to increase multi-modal transportation systems, recreational opportunities & community health.	Undetermined	3 yr. for Willapa trails segment
Interstate & Arterials Roads & Bridges						
I-5 N. Lewis Co. Interchange linking to TransAlta site & Port of Centralia Industrial Park	WA State Dept. of Transportation	Not Funded	Planning, alignment & justification Study	New north Centralia Interchange linking I-5 to TransAlta Industrial site and to Port of Centralia Industrial Park. This project is linked with TransAlta Industrial Site Development, and with Lewis Co. arterial linkage from I-5 to TransAlta Industrial Park Site	Planning: \$1.2 Million Construction: \$40-60 Million	To be determined
I-5 Improvements to 5 mi. section which flooded in 1996 & 2007, between Exits 76 & 81	WA State Dept. of Transportation	Not Funded	Alignment, concept, feasibility, preliminary design & construction	Two possible alternatives: 1) Assuming adequate flood control measures, widen interstate & rebuild interchanges 2) Assuming no flood control measures, raise freeway above flood levels & rebuild Interchanges Related elements may include: 1) Freeway construction 2) Possible new interchange between Chamber Way and Mellen 3) collector-Distributor Road along Miracle Mile (~5 mi)	To be determined	To be determined
Implementation of I-5-SR-505 Corridor Interchange Plan	Lewis Co. (lead), Toledo, Winlock, SWRTPO, Cowlitz Tribe	Not Funded	Implementation	1) Create a corridor management plan supporting new land use dev. between Winlock & Toledo 2) Project coordinated with South Lewis Co. Watershed Plan & Econ. Dev	\$650,000	Feb. 2009
SR-7 - Route Development Plan - Complete March 2006	WA State Dept. of Transportation	Phase I: Funded Phase II, III not funded	Planning	Three phase Route Development Plan to identify transportation safety, congestion, mobility improvement opportunities and other roadside issue to guides WSDOT's investments in the corridor over 20-years	\$200,000	Ph-1: Completed Phase II & III unknown
Rail Transportation						
Curtis line rr repairs	Port of Chehalis	Partially Funded: Not	Design & Construction	Repair to Curtis Industrial Park railroad line from Chehalis which was damaged by the Dec. 2007	\$1,273,307	Immediate

Strategy and Project	Possible Project Sponsor(s)	Project Status	Type of Project	Project Description	Preliminary Cost	Timing
Port of Chehalis Truck to Rail Reload Facility	Port of Chehalis	Not Funded	Construction	Construction of intermodal rail reload facility for transfer of products from truck to rail, to attract private company to locate within Port of Chehalis Industrial Park	\$4,041,700	To be determined
Tacoma Rail & Puget Sound and Pacific (Blakeslee Junction connection & track alignment)	WA State Dept. of Transportation	Phases Ia & Ib Partially funded	Final design & construction of	Five phase project to improve mobility in Centralia area: build a new connection between Tacoma Rail and PSAP at Blakeslee Junction in Centralia & realign tracks in the junction between PSAP and BNSF	Phases Ia & Ib \$24.5 million	To be determined
Morton rail & downtown tourism development project	WSDOT & Tacoma Rail	Depot interior Not Funded	Interior construction	Complete rehabilitation of railroad depot interior	\$50,000	Ongoing
Air Transportation						
South Lewis Co. Airport Study & implementation	Lewis County	Not Funded	Planning & implementation	Conduct a feasibility study as Phase I to upgrade existing Toledo-Winlock Ed Carlson Memorial Field Airport to a Regional Airport for general aviation and air cargo.	\$100,000	Study complete: Sept. 2009 Implementation to follow
Transit						
Transit Center	Twin Transit	Not Funded	Design & construction	Construction of new transit center at Port of Chehalis	\$3,000,000	To be determined
Financial & Technical Assistance to Businesses						
McBride Court Commercial/industrial incubator project	Port of Chehalis	Not Funded	Construction	Construction of 3 commercial/industrial incubator buildings on Port of Chehalis Industrial Park land	To be determined	To be determined
Small Business Assistance Program	Small Business Development Center	Not Funded	Technical assistance	3 year technical assistance program for small businesses recovery, expansion & start-up in Lewis Co. in response to flood impacts in county	\$300,000:	To be determined
Operating Capital Loan Program	Lending Network	Not Funded	Funds for operating capital loans	Funds to establish an operating capital loan assistance program for businesses impacted by the recent flood, or wishing to expand their operations	\$1,000,000	Jun-09

Strategy and Project	Possible Project Sponsor(s)	Project Status	Type of Project	Project Description	Preliminary Cost	Timing
Workforce Training						
Workforce Training Center(s)	Lewis Co. with Chehalis & Centralia	Not Funded	Feasibility study	Evaluate feasibility of vocational training centers in Lewis County as well as in conjunction with Cowlitz County.	\$100,000	Undetermined
Regional Planning: Implementation of Lewis County. Economic Recovery Strategy						
Carry out Phase II: Support	CWCOG	Not Funded	Economic	Employ an economic recovery and flood mitigation	\$190,000.00	March 2009 to
Support for Upper Chehalis Agriculture Area						
Upper Chehalis Basin Fire District Planning & Development*	Lewis Co., Fire Districts 6, 11, 13, 16	Not Funded	Planning, design	Planning and development for fire protection coverage for upper Chehalis Basin, including Pe Ell, Dryad, Boistfort, Adna, including relocation of stations & substations, rolling stock replacement, communications, & other equipment	\$6,000,000	Jan. 2009 to June 20011
<i>*NOTE: Boistfort Fire District & Lewis Co. wish to explore this option; no response has been received from the other fire districts</i>						
Boistfort Water System	Lewis County	Not Funded	Feasibility, design, construction	Evaluate water source options, design & build new water supply system for unincorporated community of Boistfort, to replace water system damaged by flood	\$1,500,000	Sept. 2008 to Dec. 2011

Chapter 6:

Project Funding Strategy

Unfunded and Possible Funding Sources by Jurisdiction or Entity

Table 6.1 below lists the projects by each jurisdiction or governmental agency referenced in the plan. These jurisdictions include:

1. Chehalis River Basin Flood Control Authority
2. Lewis County
3. City of Chehalis
4. City of Centralia
5. Smaller cities and towns in Lewis County
 - a. Winlock
 - b. Toledo
 - c. Morton
 - d. Pe Ell
 - e. Napavine
 - f. Vader
6. Lewis County Ports
 - a. Port of Chehalis
 - b. Port of Centralia
7. Special Districts in Lewis County
 - a. Twin Transit
 - b. Boistfort Water System
 - c. Fire districts; Fire district 6; Fire district 11; Fire district 13; Fire district 16
8. Organizations supporting business development
 - a. Lewis County Economic Development Council
 - b. Lending Network
 - c. Small Business Development Center
9. Regional Councils of Government
Cowlitz Wahkiakum Council of Governments
10. Washington State Agencies
 - a. Department of Transportation
 - b. Parks Department
11. Federal Agencies
 - a. Corps of Engineers
 - b. National Oceanic and Atmospheric Administration
 - c. Gifford Pinchot National Forest
12. Railroads
 - a. Tacoma RMDRR
 - b. WSDOT Rail Division, Tacoma RMDRR, Burlington Northern Santa Fe

The federal and state categorical funding programs identified in Table 6.1, on page 62, are listed in the order they appear in the table with the appropriate website or reference for each program:

- FEMA Flood Mitigation
<http://www.dem.dcc.state.nc.us/mitigation/fma.htm>

- CTED Planning Grants
<http://www.cted.wa.gov/site/378/default.aspx>
- DOE Flood Control Assistance Grants <http://www.ecy.wa.gov/programs/sea/grants/fcaap/index.html>
- WA State Emergency Mgmt Division 1) http://emd.wa.gov/grants/grants_index.shtml
- 2) http://www.ojp.usdoj.gov/odp/grants_programs.htm
- FEMA Grants <http://www.fema.gov/government/grant/index.shtm>
- U.S. Bureau of Reclamation <http://www.usbr.gov/main/index/#F>
- CTED Planning Grants <http://www.cted.wa.gov/site/378/default.aspx>
- Community Economic Revitalization Board <http://www.cted.wa.gov/site/64/default.aspx>
- DOE Centennial Clean H2O <http://www.ecy.wa.gov/programs/wq/funding/funding.html>
- WA Public Works Board 1) <http://www.pwb.wa.gov/>
- 2) http://www.cted.wa.gov/portal/alias_CTED/lang_en/tabID_358/DesktopDefault.aspx
- USDA Rural Development <http://www.rurdev.usda.gov/>
- WA Dept. of Health Drinking Water Revolving Fund http://www.doh.wa.gov/ehp/dw/OUr_Main_Pages/dwsrf.htm
- U. S. Environmental Protection Agency State & Tribal Assistance Grant <http://www.epa.gov/compliance/state/grants/index.html>
- USDA Rural Dev. Water & Environmental Program <http://www.usda.gov/rus/water/>
- Washington State Department of Transportation Highways and Local Programs <http://www.wsdot.wa.gov/TA/ProgMgt/Grants/>
- *Federal Highway Administration Scenic Byways Program <http://www.bywaysonline.org/grants/>
- Federal Highway Administration Pedestrian & Bicycle Safety Program <http://www.fhwa.dot.gov/environment/bikeped/>
- WA State Recreation & Conservation Office <http://www.rco.wa.gov/rcfb/grants.asp>
- WSDOT Airports Grant Programs <http://www.wsdot.wa.gov/aviation/Grants/default.htm>
- WSDOT Highway and Local Programs <http://www.wsdot.wa.gov/TA/ProgMgt/Grants/>
- WSDOT State Rail Grant and Loan Programs <http://www.wsdot.wa.gov/Freight/Rail/GrantandLoanPrograms.htm>
- WA State Freight Mobility Strategic Investment Board <http://www.fmsib.wa.gov/main2.asp>
- Economic Development Administration <http://www.eda.gov/AboutEDA/Programs.xml>
 - * Public Works and Economic Development Program
 - * Economic Adjustment Assistance Program
 - * Public Wks & Econ. Development
- Federal Transit Administration http://www.fta.dot.gov/grants_financing.html
- Stimulus Package
- USDA Rural Development Intermediary Relending Program <http://www.ezec.gov/rbs/busp/irp.htm>
- Homeland Security Critical Infrastructure Protection Program <http://www.dhs.gov/xopnbiz/grants/>
- CTED Rural Opportunities Fund—Planning Grants Contact Brent Bahrenberg

Table 6.1: Possible Funding Sources for Unfunded Projects by Jurisdiction

Strategy and Project	Potential Funding Sources	Project Status	Type of Project	Project Description	Prelim Cost	Timing
Chehalis River Basin Flood Control Authority						
Flood Control Planning, Coordination And Lobbying	1) Fed. & State Appropriations 2) Governor's Discretion Fund 3) FEMA Flood Mitigation 4) CTED Planning Grants 5) DOE Flood Control Assistance Program 6) WA ST Emergency Mngt Div. 7) US Bureau of Reclamation	Phase I Funded to June 30, 2009 Phase II not funded to June 30, 2001	Planning, analysis, coordination & construction	1) Review of flood hazard plans & related studies, conduct additional studies, identify, prioritize and develop potential projects 2) Coordination of federal, state, local efforts to develop & implement comprehensive Lewis Co. flood control strategy 3) Support federal & state level funding to implement flood control projects recommended by Chehalis River Basin Flood Control Authority	Not determined	Phase I: Present to June 2009 Phase II June 2009 - June 2011
Implementation of Upper Chehalis Flood Control Retention Structure	Fed. & State Appropriations	Not funded	Design & construction	Implement recommendations of feasibility analysis for flood control and power generation retention structure on Upper Chehalis River	Not determined	Underway
Lewis County						
Lewis Co. Flood Hazard. Mgmt. Plan Policy & Project Recommendations (see Appendix 6)	1) Fed. & State Appropriations 2) FEMA Flood Mitigation 3) CTED Planning Grants 4) DOE Flood Control Assistance Pgm 5) WA ST Ememergency Mgt Div.	Not funded	Planning, feasibility, design, & construction	A) Non-structural policies relating to 1) hazard identification, 2) education and outreach, 3) planning, 4) regulations and development standards, 5) corrective (mitigation) actions/repetitive loss, 6) infrastructure, & 7) emergency services B) Bundle of 15 structural & non-structural projects identified by Lewis Co. Project Advisory Committee	\$21,145,000	To be determined
Headwaters Warning and Flood Alleviation Analysis	1) Fed. & State Appropriations 2) FEMA Flood Mitigation 3) CTED Planning Grants 4) DOE Flood Control Assistance Pgm 5) WA ST Emergency Mgt Div. 6) NOAA	Not funded	Analysis, design & construction	1) Headwaters Warning and Flood Alleviation: Evaluate opportunities for flood warning systems and flood alleviation projects on Lewis Co. rivers: possibly the mainstem Chehalis, South Fork Chehalis, Newaukum, Cispus or Upper Chehalis. 2) Construct appropriate infrastructure	\$600,000+	To be Determined

Strategy and Project	Potential Funding Sources	Project Status	Type of Project	Project Description	Prelim Cost	Timing
Boistfort Water System	1) WA Public Works Board 2) FEMA Pre-disaster Mitigation Grant 3) WA Dept of Health Drinking Water Revolving Fund 4) State & Tribal Assist. 5) USDA RDWEP	Not funded	Feasibility, design & construction	Evaluate water source options; design and build new water supply system for unincorporated community of Dryad, to replace water system damaged by flood	\$1,500,000	Sept. 2008 to Dec.2011
Implementation for South Lewis Co. Subarea Plan (Watershed Plan & Econ. Dev. Demo. Project)	1) CERB 2) DOE Centennial Clean H2O 3) WA Public Works Board 4) USDA Rural Dvt 5) WA Dept. of Health Drinking Water Revolving Fund 6) State & tribal Asst. Grant 7) USDA RDWEP	Not funded	Implementation of policies & capital Imp.	1) Implement recommended economic development strategy for South Lewis County 2) Project coordinated with I-5—SR-505 Corridor Interchange Plan	Planning: \$110,000 Implementation: \$750,000	To be determined
Implementation of I-5—SR-505 Corridor Interchange Plan	1) CERB 2) WSDOT	Not funded	Implementation	1) Create a corridor management plan supporting new land use development between Winlock & Toledo 2) Project coordinated with South Lewis Co. Watershed Plan & Econ. Dev.	To be determined	To be determined
Lewis Co. Community Trails Project	1) WSDOT: Scenic Byways Pgm. Ped & Bicycle Safety 2) WA State Recreation & Conservation Office: Non-highway and Off-Road Vehicle Activities Program 3) WA Wildlife and Recreation Program (WWRP)	\$300,000 Partially Funded	Design, acquisition & construction	Development & construction of an integrated regional network of trails to increase multi-modal transportation systems, recreational opportunities & community health.	To be determined	3 yr. for Willapa trails segment
South Lewis Co. Airport Feasibility Study	• WSDOT Aviation Planning Grant Program	Not funded	Feasibility study	Evaluate feasibility of upgrading Toledo-Winlock Ed Carlson Memorial Field Airport to a regional general aviation & air cargo airport	Study:\$100,000	To be determined

Strategy and Project	Potential Funding Sources	Project Status	Type of Project	Project Description	Prelim Cost	Timing
Packwood-East Lewis Co. Wastewater Treatment System	1) CTED Planning Grant 2) State & Tribal Asst. 3) DOE Centennial Clean H2O 4) WA Public Works Board 5) CDBG 6) USDA RDWEP	Not funded	Feasibility, design & construction	Define development scenarios and complete feasibility, design and construction of Packwood wastewater treatment facility to serve business, tourism & residential	\$6,213,600	Complete by Aug. 2009
Workforce Training Center(s)	1) WA Workforce Training & Ed. Coord. Board 2) Fed & State Appropriations	Not funded	Feasibility study	Evaluate feasibility of vocational training centers or skills centers in Lewis County as well as in conjunction with Cowlitz County.	\$100,000	To be determined
City of Chehalis						
Chehalis Renaissance Implementation	A list of 34 projects and preliminary funding sources are identified in Appendix 7	Not funded	Design, implementation & construction	Implementation of approximately 34 projects identified in Chehalis Renaissance	\$5,000,000 to \$7,000,000	To be determined
City of Centralia						
Harrison St. Sewer Extension Project	1) CTED Planning Grant 2) State & Tribal Asst. 3) DOE Centennial Clean H2O 4) WA Public Works Board 5) CDBG 6) USDA RDWEP 7) CERB 8) USDA Rural Dvt Grants & Loans 9) Fed & State Approp.	Not funded	Conceptual, planning, feasibility analysis, prel. design, final design, construction	Construction of a new 36-inch diameter gravity sewer interceptor from the existing Kuper Road pump station south approximately 1.5 miles to the intersection of Harrison Avenue/ Reynolds/Galvin Road to serve industrial, light industrial & commercial development.	\$11,000,000	Jan. 2009 to Jan. 2011
Long Road Renewal Project Redevelopment Plan	1) CERB 2) CDBG 3) CTED Planning Grants	Not funded	Redevelopment plan	Prepare a redevelopment plan for the Long Road Commercial Renewal Project adjacent to I-5 south of Mellen St.	To be determined	To be determined
Skookumchuck Bridge Intermodal Access Redevelopment Project	1) WSDOT Highway & Local Programs 2) CERB	Not funded	Concept design, land acquisition, prel. design, final design, construction	New bridge over the Skookumchuck to open 70 acres of commercial & industrial land and divert heavy truck traffic away from residential areas	\$5,800,000 to \$6,800,000	3 to 5 years
Centralia Sewer Force Main Relocation	1) DOE Centennial Clean H2O 2) WA Public Works Board 3) State & Tribal Asst. Grant	Not funded	Conceptual, planning, feasibility analysis, preliminary design, final design, and construction	Installation of approximately 1400 linear feet of pipeline and a new access road from 80 to 200 feet east of the current location to protect from future flood damage sewer system serving major commercial, industrial and residential areas of Centralia	\$2,500,000	2 year project

Strategy and Project	Potential Funding Sources	Project Status	Type of Project	Project Description	Prelim Cost	Timing
Smaller Cities & Towns in Lewis County						
South Lewis Co. (Winlock) Ind. Park	1) CERB 2) DOE Centennial Clean H2O 3) State & Tribal Asst. Grant	Not funded	Design & construction	Construct Phase I infrastructure (water, sewer, roads) to Winlock highway industrial park site at SR-505 & I-5 exit 63	\$27,338,000	To be determined
Toledo Wastewater Treatment Plant Upgrade	1) CERB 2) DOE Centennial Clean H2O 3) State & Tribal Asst. Grant 4) USDA RDWEP 5) WA Public Works Board	Not funded	Design, construction	Upgrade original 1963 wastewater treatment plant to serve business, residential, & long term Toledo Airport growth	\$8,906,000	2009-2011
Toledo Water Tower & Water Rights	1) DOE Centennial Clean H2O 2) State & Tribal Asst. Grant 3) USDA RDWEP 4) WA Public Works Board	Not funded	Design, construction	Develop new water tower & obtain water rights for business, residential & Toledo Airport industrial growth	\$916,000	2008-2013
Toledo Area Water & Sewer Extension	1) CDBG 2) WA Public Works Board 3) USDA 4) DOE Centennial Clean H2O 5) State & Tribal Asst. Grant 6) USDA RDWEP	Not funded	Design, construction	Install booster pump station, force mains, water tower, sewer main, collector road with sidewalks for 2 new developments, one for low income housing for Cowlitz Tribe	\$2,640,000	2008-2010
Morton Scenic Byway & Downtown Revitalization	1) WSDOT 2) Transportation Imp. Board	Partially Funded	Planning and implementation	Downtown revitalization and gateway corridor improvements on SR-7, including historic railroad station relocation & rehab	\$3,000,000 to \$4,000,000	Underway; completion TBD
Pe Ell Tourism Destination Project	• WA State Parks & Rec.	Not funded	Planning, design & construction	Develop trailhead horse & hiking park at trail junction of Chehalis to coast hiking and horse trail	\$500,000	Summer 2009
	• WA Recreation and Conservation Office					
	• (WWRP					
Ports in Lewis County						
Port of Chehalis Curtis rail line repairs	1) CERB 2) WSDOT Rail Pgm. 3) WA Freight Mobility Strategic Investment Board	Not funded: \$160,000	Design & construction	.Repair to Curtis Industrial Park railroad line from Chehalis damaged by the Dec. 2007 flood	\$1,273,307	Immediate
Port of Chehalis Truck to Rail Reload Facility	1) EDA 2) WA Freight Mobility Strategic Investment Board 3) CERB	Not funded	Construction	Construction of inter-modal rail reload facility for transfer of products from truck to rail, to attract private company to locate within Port of Chehalis Industrial Park	\$4,041,700	To be determined

Strategy and Project	Potential Funding Sources	Project Status	Type of Project	Project Description	Prelim Cost	Timing
Port of Chehalis McBride Court Commercial/ industrial incubator	1) EDA 2) CERB	Not funded	Construction	Construction of 3 commercial/industrial buildings on Port of Chehalis Industrial Park land	To be determined	2009
Port of Centralia Industrial Park Infrastructure Improvements	1) CERB 2) WA Public Works Board 3) DOE Centennial Clean H2O 4) EDA	Not funded	Design & construction	Improvements to road, water, sewer, gas, telephone, fiber optic, street fronts and minor rail extensions at the Port of Centralia Industrial Park	\$15,000,000	Multiple phases over 7 years
Special Districts in Lewis County						
Twin Transit: Transit Center	• Federal Transit Adm.	Not funded	Design &	Construction of new transit center at Port of Chehalis	\$3,000,000	Unknown
	• Stimulus Package		construction			
	• Fed. & State Appropriations					
Lewis County, Fire Districts 6, 11, 13, 16 Upper Chehalis Basin Fire District Planning & Development*	1) Fed. & State Appropriations 2) USDA 3) Homeland Security Critical Infrastructure Protection Program	Not funded	Planning, design & construction	Planning and development for fire protection coverage for upper Chehalis Basin, including Pe Ell, Dryad, Boistfort, Adna, including relocation of stations & substations, rolling stock replacement, communications, & other	\$6,000,000	Jan. 2009 to June 2011
*Note: Boistfort Fire District & Lewis Co. wish to explore this option; no response has been received from the other fire districts						
Organizations Supporting Business Development						
Lewis Co. EDC: Update Lewis Co. Industrial Lands Analysis	CTED Pln. Grants in partnership w/cities and/or county	Not funded	Planning & marketing	Update industrial lands analysis to reflect newly protected areas in floodplain & new upland sites identified in current land use studies; identify larger sites as well	\$100,000	To be determined
Lewis Co. EDC: Marketing Program for Industrial & Commercial Development	1) Fed. & State Appropriation 2) Rural Opportunity Fund	Not funded	Preparation of simple marketing brochure	Prepare website & marketing brochure and promote the flood planning and implementation actions being carried out by local, state & federal agencies & private sector as part of ongoing marketing efforts for Lewis Co.	\$30,000	Jan. 2009 to June 2009
Lewis Co. EDC: TransAlta Industrial Site Master Plan Implementation	1) EDA 2)CERB 3) Fed & State Stimulus 4) Fed & State Approp.	Not funded	Final design & construction	Implement the recommendations of the TransAlta Master Plan	To be determined	To be determined
Lewis Co. Small Business Dev. Center: Small Business Tech. Assistance Program	1) Rural Opportunities Fund 2) Fed & B State Approp.	Not funded	Technical assistance to small businesses	3 year technical assistance program for small businesses recovery, expansion and start-up in Lewis Co. in response to flood impacts in county.	\$300,000: (\$100,000 per year)	2009

Strategy and Project	Potential Funding Sources	Project Status	Type of Project	Project Description	Prelim Cost	Timing
Lending Network: Operating Capital Loan Program	1) Fed. & State Appropriations 2) USDA 3) Homeland Security Critical Infrastructure Protection Program USDA Rural Development Intermediary Relending Program	Not funded	Funds for operating capital loans	Funds to establish an operating capital loan assistance program for businesses impacted by the recent flood or expansion.	\$1,000,000	As soon as possible
Regional Councils of Governments						
Carry out Phase II: Support for Implementation of Lewis Co. Economic Recovery Strategy	• EDA	Not funded	Economic planning & technical assistance	Employ an economic recovery & flood mitigation manager to provide support to carry out further economic recovery planning, implementation & fund development for <u>Lewis Co. Economic Recovery Strategy</u> .	\$190,000	March 2009 to March 2011
Washington State Agencies						
WSDOT: I-5 N. Lewis Co. Interchange linking to TransAlta site & Port of Centralia Ind. Park	WSDOT	Not funded	Planning & alignment & justification study	New north Centralia Interchange linking I-5 to TransAlta Industrial site and to Port of Centralia Industrial Park.	Planning: \$1,200,000 Construction: \$40-\$60	
WSDOT: I-5 Improvements to 5 mi. section which flooded in 1996 & 2007, between Exits 76 & 81	WSDOT	Not funded	Alignment, concept & preliminary design	Two possible alternatives: 1) Assuming adequate flood control measures, widen interstate & rebuild interchanges 2) Assuming no flood control measures, raise freeway above flood levels & rebuild interchanges	To be determined	Unknown
WSDOT: SR-7 - Route Development Plan	WSDOT	Phase I: Funded Phase II & III not funded	Planning	Three phase Route Development Plan to identify transportation safety, congestion, mobility improvement opportunities and other roadside issue to guides WSDOT's investments in the corridor over 20-years	To be determined	Ph-1: Completed Phase II & III Unknown

Strategy and Project	Potential Funding Sources	Project Status	Type of Project	Project Description	Prelim Cost	Timing
WA State Parks Dept.: Lewis Co. Community Trails Project	WSDOT	\$300,000 Partially Funded	Design, acquisition & construction	Development & construction of an integrated regional network of trails to increase multi-modal transportation systems, recreational opportunities & community health.	To be determined	3 yr. for Willapa trails segment
Federal Agencies						
Corps of Engineers: Implementation of Federal Flood Control Analysis: Levees, add Skookumchuck storage, raise building structures	• Fed. & State Appropriations	Not funded	Construction	Implement recommendations of economic analysis & final design	\$74,000,000	Start in 2011
NOAA: OR & WA Coast Doppler Radar	• Fed. & State Appropriations	Not funded	Purchase & install Doppler Radar	Install WA & OR coastal Doppler radar warning system to monitor the duration and severity of incoming storms from the Pacific	\$2,000.00	Upcoming federal budget
Railroads						
WSDOT: Tacoma Rail & Puget Sound and Pacific (Blakeslee Junction connection & track alignment)	• WSDOT	Phases Ia & Ib Partially funded	Final design & construction of Phase 1a & 1b	Five phase project to improve mobility in Centralia area: build a new connection between Tacoma Rail and PSAP at Blakeslee Junction in Centralia, and realign tracks in the junction between PSAP and BNSF	Phases Ia & Ib \$24,500,000 Total project \$30 million	Project on hold due to lack of funds

Appendix 1:

Maps

Map 1

Lewis County 2007 Inundation Area

Map 2:

Centralia-Chehalis 1996 and 2007 Inundation Area Estimates

Map 3

Lewis County 2007 Inundation of Agricultural Parcels

Map 4

Lewis County 2007 Inundation of Agricultural Parcels Pe Ell to Adna Area

Map 5

Lewis County 2007 Inundation of Agricultural Parcels Chehalis,
Centralia, Galvin Area

Map 6

Inundation Areas by Existing Land Use 1996 and 2007 Chehalis,
Centralia, Galvin Area

Map 7

Inundation Areas by Existing Land Use: 1996 and 2007 Pe Ell to
Adna Area

Map 8

Inundation Areas by Generalized Zoning 1996 and 2007:
Chehalis, Centralia, Galvin Areas

Map 9

Inundation Areas by Generalized Zoning: 1996 and 2007: Pe Ell to
Adna Area

Map 10

Lewis County Public and Governmental Sites and Roads Damaged by 2007 Flood Event

Map 11

Lewis County Wells Contaminated or Damaged by 2007 Flood Event

Map 12

Overlay of 1996 and 2007 Inundation Areas with Existing FEMA 100
and 500 Year Flood Plains: Chehalis Centralia Urban Area

Map 13

Overlay of 2007 Inundation Areas with Existing FEMA 100 and 500
Year Flood Plains: Pe Ell to Adna Area

Appendix 2

Change in Lewis County Property Taxes from 2007 Flood Event

Table 2A
Changes in Lewis County Residential Assessed Valuation in 2007
Before and After December 2007 Flood Event
As of April 1, 2007

Areas	2007 Certified Value	2007 Adjusted Value	2007 Difference by TCA	2007 State Loss	2007 Local Loss	2007 Total Loss
Centralia	\$47,117,900	\$43,899,290	\$3,218,610	\$7,413	\$20,880	\$28,293
Chehalis	\$11,890,080	\$11,258,812	\$631,268	\$1,454	\$5,681	\$7,135
Pe Ell	\$529,100	\$488,894	\$40,206	\$93	\$228	\$320
County- Evaline	\$465,700	\$433,665	\$32,035	\$74	\$188	\$262
County- Adna	\$10,608,400	\$9,840,493	\$767,907	\$1,769	\$6,601	\$8,370
County- Winlock	\$324,200	\$303,524	\$20,676	\$48	\$189	\$237
County- Boistfort	\$6,156,500	\$5,723,017	\$433,483	\$998	\$2,847	\$3,846
County- Boistfort	\$3,583,900	\$3,347,450	\$236,450	\$545	\$1,581	\$2,126
County- Toledo	\$81,200	\$76,431	\$4,769	\$11	\$46	\$57
County- Pe Ell	\$451,400	\$417,996	\$33,404	\$77	\$230	\$307
County- Pe Ell	\$2,609,100	\$2,440,147	\$168,953	\$389	\$1,180	\$1,569
County- Chehalis	\$2,110,000	\$1,977,324	\$132,676	\$306	\$1,282	\$1,588
County- Centralia	\$17,652,200	\$16,251,389	\$1,400,811	\$3,226	\$10,729	\$13,955
County- Rochester	\$132,200	\$124,850	\$7,350	\$17	\$69	\$86
TOTAL	\$103,711,880	\$96,583,282	\$7,128,598	\$16,418	\$51,732	\$68,150
	Total affect on Lewis County by flood in either a loss or shift of tax responsibility			\$130,919	\$418,007	\$548,927

Source: Lewis County Assessor's office.

Table 2B
Changes in Lewis County Residential Assessed Valuation in 2008
Before and After December 2007 Flood Event
As of April 1, 2008

Areas	2008 Certified Value	2008 Adjusted Value	2008 Difference by TCA	2008 State Shift	2008 Local Shift	2008 Total Shift
Centralia	\$52,316,539	\$33,200,711	\$19,115,828	\$41,667	\$125,415	\$167,083
Chehalis	\$17,430,100	\$10,160,618	\$7,269,482	\$15,846	\$50,707	\$66,553
Chehalis	\$577,200	\$409,000	\$168,200	\$367	\$1,070	\$1,437
Pe Ell	\$690,500	\$406,194	\$284,306	\$620	\$1,619	\$2,239
County- Evaline	\$465,700	\$340,265	\$125,435	\$273	\$679	\$952
County- Adna	\$18,000	\$0	\$18,000	\$39	\$149	\$189
County- Adna	\$11,329,172	\$5,267,955	\$6,061,217	\$13,212	\$48,103	\$61,315
County- Winlock	\$324,200	\$201,024	\$123,176	\$268	\$1,087	\$1,355
County- Boistfort	\$7,562,068	\$3,456,691	\$4,105,377	\$8,949	\$26,458	\$35,407
County- Boistfort	\$4,083,100	\$1,186,537	\$2,896,563	\$6,314	\$19,094	\$25,408
County- Toledo	\$250,300	\$206,011	\$44,289	\$97	\$356	\$452
County- Pe Ell	\$451,400	\$112,196	\$339,204	\$739	\$2,355	\$3,094
County- Pe Ell	\$4,272,919	\$1,869,847	\$2,403,072	\$5,238	\$16,123	\$21,361
County- Chehalis	\$61,100	\$17,339	\$43,761	\$95	\$330	\$425
County- Chehalis	\$2,935,399	\$1,603,176	\$1,332,223	\$2,904	\$10,438	\$13,342
County- Oakville	\$152,159	\$141,300	\$10,859	\$24	\$85	\$109
County- Centralia	\$18,714,030	\$10,586,600	\$8,127,430	\$17,716	\$61,697	\$79,413
County- Rochester	\$222,305	\$160,650	\$61,655	\$134	\$507	\$642
TOTAL	\$121,856,191	\$69,326,114	\$52,530,077	\$114,501	\$366,275	\$480,776

Source: Lewis County Assessor's office.

Table 2C
Changes in Lewis County Residential Assessed Valuation in 2008
Before and After December 2007 Flood Event
As of April 1, 2008

Areas	2008 Certified Value	2008 Adjusted Value	2008 Difference by TCA	2008 State Shift for Businesses	2008 Local Shift for Businesses	2008 Total Shift for Businesses
Centralia	\$12,602,400	\$9,165,950	\$3,436,450	\$7,491	\$22,546	\$30,036
Chehalis	\$7,253,100	\$5,388,650	\$1,864,450	\$4,064	\$13,005	\$17,069
Chehalis	\$481,300	\$361,000	\$120,300	\$262	\$766	\$1,028
County- Adna	\$42,300	\$27,200	\$15,100	\$33	\$120	\$153
County- Centralia	\$436,400	\$331,100	\$105,300	\$230	\$799	\$1,029
TOTAL	\$20,815,500	\$15,273,900	\$5,541,600	\$12,079	\$37,236	\$49,315
	2008 Total affect on Lewis County businesses by flood in either a loss or shift of tax responsibility			\$12,079	\$37,236	\$49,315

Source: Lewis County Assessor's office.

Appendix 3

Delay Cost Estimates Based on Washington State Department of Transportation Methodology

Table 3A:
Estimate of auto delay costs on I-5 due to 2007
Flood event in Lewis County

Measures	Estimates
Average Daily Traffic 2007	60,472 ¹
ADT count which are autos (81%) ²	48,982
Estimated cost/hr for car delay (2007)	\$14/hr. ³
Car occupancy	1.1 persons/vehicle ⁴
COST FOR 4 DAYS CLOSURE OF I-5	\$72,414,981⁶

1. WA State Department of Transportation, 2007 Annual Traffic Report, [http://www.wsdot.wa.gov/mapsdata/tdo/PDF and ZIP Files/Annual Traffic Report 2007.pdf](http://www.wsdot.wa.gov/mapsdata/tdo/PDF_and_ZIP_Files/Annual_Traffic_Report_2007.pdf), page 26.
2. Email from Steve Canter, WA State Dept. of Transportation, 10/15/2008..
3. Phone conversation with Dave Bushnell, WA State Dept. of Transportation, 11/26/08.
4. Cowlitz-Wahkiakum Council of Governments, Southwest Washington Flood Disaster Economic Adjustment Strategy: Counties of Grays Harbor, Lewis, Cowlitz, Wahkiakum and Clark, 1996.
5. $(48,982 \times \$14 \times 1.1 \times 24 \text{ hr} \times 4) = \$72,414,981$.

**Table 3B:
Estimate of truck and auto delay costs on SR 6
Due to December 2007 flood event in Lewis County**

Measures	Estimates
Average Daily Traffic 2007	1,500 ¹
ADT count which are autos (90%) ²	1,350
ADT count which are trucks (10%) ²	150
Estimated cost/hr for car delay (1996)	\$14/hr. ³
Estimated cost/hr for truck delay (1996)	\$56/hr ³
Automobile occupancy	1.1 persons/vehicle ⁴
Delay cost for autos/day	\$12,972,960 ⁵
Delay cost for truck/day	\$5,241,600 ⁶
COST FOR 26 DAYS CLOSURE OF SR-6	\$18,214,560⁷

1. WA State Department of Transportation, 2007 Annual Traffic Report, http://www.wsdot.wa.gov/mapsdata/tdo/PDF_and_ZIP_Files/Annual_Traffic_Report_2007.pdf, page 76.
2. Email from Steve Canter, WA State Dept. of Transportation, 10/15/2008.
3. Phone conversation with Dave Bushnell, WA State Dept. of Transportation, 11/26/08.
4. Cowlitz-Wahkiakum Council of Governments, Southwest Washington Flood Disaster Economic Adjustment Strategy: Counties of Grays Harbor, Lewis, Cowlitz, Wahkiakum and Clark, 1996.
5. $(1,350 \text{ auto/day} \times 1.1 \text{ persons/auto} \times 24 \text{ hr./day} \times \$14/\text{person/day/hr.} \times 26 \text{ days}) = \$12,972,960$.
6. $(150 \text{ trucks/day} \times 24\text{hr/day} \times \$56/\text{truck/hr} \times 26 \text{ days}) = \$5,241,600$.

Appendix 4

Landslide Reconnaissance

Landslide Reconnaissance Following the Great Coastal Gale of December 1-3, 2007 in Western Washington, Washington State Department of Natural Resources

by Isabelle Y. Sarikhan, Kelsay M. Stanton, Trevor A. Contreras, Michael Polenz, Jack Powell, Timothy J. Walsh, and Robert L. Logan

RECONNAISSANCE Investigation

The reconnaissance investigation focused primarily on areas hardest hit by the storm. If landslides were deadly or caused damage to property or infrastructure, they were site inspected and critical information was collected. Landslides that were in more isolated or in forested areas were documented by aerial reconnaissance. Mason, Lewis, and Thurston Counties, which had the highest concentration of landslides, were the main target areas for reconnaissance. Mason and Thurston counties were investigated on the ground with some aerial reconnaissance. Lewis County was mostly investigated from the air, due to lack of road accessibility, remoteness, and density of landslides. Our flight paths are shown on Figure 3.

DEFINITION OF LANDSLIDE TYPES

Landslide is a broad term covering a wide variety of ground-movement and mass-wasting processes, including falls, topples, spreads, and flows (Cruden and Varnes, 1996). Generally, the process involves gravity-driven downslope movement of debris, soil, and (or) rock. This mass continues to move until it reaches stability, sometimes traveling a few feet to miles from the original location. The duration of these events can be instantaneous to very prolonged, lasting for years to decades. Landslides are caused by numerous natural and human-influenced factors, including intense rainfall, long-duration precipitation, rapid snowmelt, water-level changes, wave or stream erosion, earthquake shaking, volcanic eruption, water concentration, and removal of lateral strength (Wieczorek, 1996).

For the purpose of this study, landslide processes were grouped in accordance with the Washington State Department of Natural Resources, Division of Geology and Earth Resources landslide database. Shallow landslides are divided into shallow undifferentiated (including shallow colluvial) landslides, debris flows, debris slides (including debris avalanches), hyperconcentrated flows, and block falls and topples. Deep-seated landslides are divided into lateral spreads, undifferentiated deep-seated landslides, earthflows, translational landslides, rotational landslides, composite landslides, and megalandslides/sturzstroms.

During this event, the majority of landslides that occurred were debris avalanches. Debris avalanches are characterized by unconsolidated rock and soil that has moved downslope along a relatively shallow failure plane. Debris avalanches form steep, unvegetated scars (depressions) in the head region and irregular, hummocky deposits (when present) in the toe region. Debris avalanche scars are likely to ravel and remain unvegetated for many years. These scars can be recognized by the steepness of the slope, and the light bulb-shaped form left by many mid- and upper-slope failures.

Debris avalanches are most likely to occur on slopes greater than 65 percent where unconsolidated colluvium overlie a shallow soil or bedrock. The shallow slide surface is usually less than 15 feet deep. However, debris avalanches with slide surfaces in excess of 25 feet deep have been recorded in the Chehalis headwaters (Jim Ward, Weyerhaeuser oral commun., July 2008). The probability of sliding is low where bedrock is exposed, except where weak bedding planes and extensive bedrock joints and fractures parallel the slope.

Debris flows and torrents were also common during this event, many transforming from debris avalanches as the slide material integrated water and gained momentum. Debris-flow and debris-torrent tracks are characterized by long stretches of bare, generally unstable stream channel banks that have

been scoured and eroded by the extremely rapid movement of debris-laden water. They commonly are caused by debris sliding or the failure of fill materials along stream crossings in the upper part of drainages during high-intensity storms.

Debris-flow and debris-torrent tracks are formed by the failure of water-charged soil and organic material down steep stream channels, and in the case of the December 3 storm, by debris avalanches and road failures. They are often triggered by debris-slide movement on adjacent hill slopes and the mobilization of debris accumulated in the stream channels themselves. Debris flows and torrents commonly entrain large quantities of inorganic and organic material from the stream bed and banks. Occasionally, the channel may be scoured to bedrock. When momentum is lost, scoured debris may be deposited as a tangled mass of large organic debris in a matrix of sediment and finer organic material. Such debris may be reactivated or washed away during subsequent events. The erosion of steep debris slide-prone stream banks below the initial failure may cause further failure downstream.

Shallow undifferentiated landslides were not as common as debris avalanches or debris flows, but occurred in small number during this event. Shallow undifferentiated landslides are characterized by very shallow failures composed mostly of soil. These landslides characteristically are above the rooting depth of trees. These landslides can be of various processes, including slump, translational, or flow processes.

Appendix 5

Possible Flood Control Measures for Lewis County

I. STUDY OPTIONS IDENTIFIED BY THE U.S. ARMY CORPS OF ENGINEERS PROJECT MANAGEMENT PLAN FOR CENTRALIA, CHEHALIS RIVER, LEWIS COUNTY, WA: CONSTRUCTION, ENGINEERING AND DESIGN

Three options for structural flood control measures are being evaluated by the U.S. Army Corps of Engineers, and include:^{lv}

Option 1: Water Resource Development Act 2007 Approved Plan

- Levee construction of a 100 year level of protection levee system along the Chehalis River from river mile 75 to river mile 64, and along most of the lower 2 miles of Dillenbaugh Creek and Salzer Creek,
- Levee construction along the lower 2 miles of Skookumchuck River to the confluence with Coffee Creek that would provide 100 year level of protection,
- Modification of the existing Skookumchuck Dam to create about 11,000 acre feet of additional flood control storage, and
- Raising in elevation about eight structures that would incur induced damages from increased inundation as a result of the project.

Option 2: National Economic Development (NED) Plan

- Levee construction of a 100 year level of protection levee system along the Chehalis River from river mile 75 to river mile 64, and along most of the lower 2 miles of Dillenbaugh Creek and Salzer Creek,
- Levee construction along the lower 2 miles of Skookumchuck River to the confluence with Coffee Creek that would provide a 2 foot below 100 year level of protection,
- Modification of the existing Skookumchuck Dam to create about 11,000 acre feet of additional flood control storage, and
- Raising in elevation about eight structures that would incur induced damages from increased inundation as a result of the project.

Option 3: Locally Preferred Plan (LPP)

- Levee construction of a 100 year level of protection levee system along the Chehalis River from river mile 75 to river mile 64, and along most of the lower 2 miles of Dillenbaugh Creek and Salzer Creek,
- Levee construction along the lower 2 miles of Skookumchuck River to the confluence with Coffee Creek that would provide a 100 year level of protection, based on 20,000 AF of storage at the Skookumchuck Dam,
- Modification of the existing Skookumchuck Dam to create about 11,000 acre feet of additional flood control storage, and

- Raising in elevation about eight structures that would incur induced damages from increased inundation as a result of the project.

II. **PROJECTS IDENTIFIED BY BROWN AND CALDWELL IN THE LEWIS COUNTY COMPREHENSIVE FLOOD HAZARD MANAGEMENT PLAN**

Action Recommendations: The Lewis County Comprehensive Flood Hazard Management Plan was developed by Brown and Caldwell under contract with Lewis County. A list of projects identified in this process, including both structural and non-structural projects, including ranking and planning level cost estimates, is shown in Table 5A below:

**Table 5A:
Action recommendations and planning level costs identified in Lewis County Flood Hazard Management Plan**

PROJECTS	RANK	COST ESTIMATE
CMZ Mapping	1	\$750,000
Updating Hazard Databases and Maps	2	\$350,000
Headwaters Warning and Flood Alleviation	3	\$250,000-\$600,000
Regional Flood Alleviation Project Along I-5	4	N/A
Regional Floodplain Storage and Stormwater Detention Facilities	5	\$6,700,000
Upper Cowlitz Hydrologic Data Station	6	\$620,000
Regional Stormwater Detention Facilities	7	\$3,600,000
Salzer Creek Backwater Control Project	8	\$6,100,000
USAEC Flood Reduction Coordination	9	\$400,000
China Creek Drainage Basin Plan	10	\$550,000
Berwick Creek Drainage Basin Plan	11	\$500,000
Public Assistance—Bank Stabilization Projects	12	\$75,000
Toledo Wastewater Treatment Bank Protection	13	\$975,000
Isbell Road/Mossyrock Wellhead Protection	14	\$450,000
City of Toledo Head Start Area	15	\$925,000
TOTAL		\$21,145,000 to \$21,495,000

Recommended Action Descriptions: Fifteen projects and policies were selected by the Planning Advisory Committee and are briefly summarized below:

1. **CMZ Mapping:** Continue CMZ mapping on the Cowlitz River. Begin and complete CMZ mapping for all Lewis County rivers.
2. **Update Hazards Data Sets/Maps, Identify Data Gaps and Collect Mission Data Sets:** Engage in data collection efforts to: 1) progressively compile information (i.e. aerial, topographical and hydrologic), 2) map new hazard areas; and 3) update known hazard areas (e.g., CMZ, flooding, steep slopes, and alluvial hazards.) Collected data should be in a format applicable to multiple departmental or program uses.
3. **Headwaters Warning and Flood Alleviation:** Evaluate opportunities for flood warning systems or flood alleviation projects on the mainstem Chehalis, South Fork Chehalis, Neuaukum, Cispus or Upper Chehalis.

4. Regional Flood Alleviation Project along I-5 in Lewis County: The project will likely consist of levee construction and implementation of flow control facilities that minimize impacts to downstream populations.
5. Regional Flood Detention Facilities: Regional floodplain detention facilities will be constructed to replace displaced system storage and to offer development of off-site mitigation opportunities.
6. Upper Cowlitz Hydrologic Data Collection/Hydrologic Model Creation and FEMA FIRM Re-Mapping: Evaluate various stream inputs to the Cispus and Cowlitz Rivers and select priority streams for data collection. Create a hydrologic and hydraulic model and initiate a request to FEMA for re-mapping.
7. Regional Stormwater Detention Facilities: Regional stormwater detention facilities will be constructed to replace system storage and to offer development of off-site mitigation opportunities.
8. Salzer Creek Backwater Control: Analyze, design and construct a flood alleviation project that eliminates or reduces backwater flooding from the Chehalis River.
9. USAEC Flood Reduction: Coordinate with USAEC on their study of using Skookumchuck dam for flood control. Create flood district boundaries.
10. China Creek Drainage Basin Plan: Develop a drainage basin plan for the China Creek basin in the Chehalis River watershed. The plan shall identify, prioritize and scope applicable projects. Project would likely include gathering hydrologic and hydraulic data, modeling China Creek, soliciting community involvement, and developing preferred project alternatives (both structural and non-structural). Deliverables would include calibrated hydrologic and hydraulic model, list of project alternatives and recommended actions, draft and final basin plan, and 30% design plan sets for prioritized structural action.
11. Berwick Creek Drainage Basin Plan: A comprehensive drainage basin plan will identify structural and non-structural actions that will minimize future peak flow increases to Berwick Creek
12. Public Assistance: Bank Stabilization Projects: The County will, to the extent that funding allows, develop a technical assistance program for bank stabilization and/or debris removal.
13. City of Toledo Wastewater Treatment Plant: Analyze, design and construct flood protection for the existing City of Toledo Wastewater Treatment Plant.
14. Isbell Road/City of Mossyrock Wellhead Flooding: Analyze, design and construct measures to protect Isbell Road and the City of Mossyrock wellhead.
15. City of Toledo Head Start Area: Analyze causes of erosion and develop protection strategies for the Cowlitz River bank I the vicinity of the City's Heard Start, which has been eroding.

Appendix 6

Chehalis Renaissance Implementation Projects

Phase 2 - Implementation projects

Project List

Following projects are being developed for implementation by the Economic Development Steering Committee in phase 2 of the Chehalis Renaissance Project based on the results of the stakeholder interviews, public workshops, open houses, and mail-out/phone-back survey.

Gateways and way-finding signage options

		<i>Timing/cost</i>
1	<u><i>Develop major Interstate-5 gateways at Chamber of Commerce Way, Main Street, 13th Street, and Larbee Road</i></u> – with monuments, signage, and landscaping to identify entry into the city for interstate travelers?	
2	<u><i>Erect “National Historic District” signage on Interstate-5</i></u> - using Main Street as the principal entry corridor to the downtown?	
3	<u><i>Design and erect a system of way-finding signs throughout the city</i></u> – to provide a consistent visual look, functional directional information, and directional routing system for residents and out-of-town customers alike?	
4	<u><i>Incorporate neighborhood names into the way-finding signage system</i></u> - to identify the historic Westside Neighborhood, State Avenue Business District, Cascade Avenue Neighborhood, and others throughout the city?	

Boulevard and parkway corridor options

		<i>Timing/cost</i>
5	<u><i>Create landscaped boulevard corridor treatments on portions of Chamber of Commerce Way, National Avenue, Main Street, Chehalis Avenue, and Market Boulevard</i></u> – to define and direct tourist and customer traffic to the Twin City Town Center, Downtown, Downtown South, Courthouse, and other destinations and attractions?	
6	<u><i>Create landscaped parkways of the rest of Market Boulevard, Cascade Avenue, Interstate Avenue, National Avenue, and other major arterials</i></u> – to create attractive roadway corridors that define the rest of the city?	
7	<u><i>Reconfigure Twin City Town Center</i></u> – to simplify traffic patterns, increase pedestrian walkways, install street trees, and otherwise enhance the development’s appearance and functionality?	

Downtown transportation options

		<i>Timing/cost</i>
8	<u><i>Keep Market Boulevard 1-way traffic through the downtown area from Park to National Avenue</i></u> – consolidating the free-turning lanes at Park and National Avenues to improve pedestrian movements and access?	

Downtown parking options

Timing/cost

9	<u>Designate Park Street between Market Boulevard and Washington Avenue one-way east with angle parking</u> – to simplify traffic flow at the intersection and increase parking capacity for the Library and City Hall?	
10	<u>Reconfigure the parallel parking on both sides of Pacific Avenue between National and Park Avenues with angle parking on the north side only</u> – to increase parking capacity, improve access to the south side of downtown stores, and calm traffic flow in this portion of the 1-way downtown couplet?	
11	<u>Reconfigure the parallel parking on Washington Avenue between Cascade and National Avenues with angle parking on the west side only</u> – to increase parking capacity for new mixed use retail developments along Washington Avenue and calm traffic flow in this portion of the one-way downtown couplet?	
12	<u>Create angle parking on Park, Prindle, Center, and North Streets, and Front, Chehalis, and Pacific Avenues</u> – to increase on-street parking capacity for new retail, office, and housing uses in this downtown/courthouse district?	
13	<u>Develop a parking deck on Washington Street adjacent to and as a joint venture with the St Helens Inn and on Chehalis Street adjacent to and as a joint venture with Lewis County</u> – to increase off-street parking capacity for new retail uses, office, and housing uses in the downtown south warehouse districts?	

Downtown streetscape options

		<i>Timing/cost</i>
14	<u>Improve the downtown streetscape on Market Boulevard from National to Park Avenue</u> – to provide a flexible space with high quality pedestrian amenities that may be closed to traffic on special occasions for Farmers' Markets and other celebrations?	
15	<u>Extend the downtown streetscape design treatment on the alleyway between Market Boulevard and Washington Avenue</u> – to provide parking access to new mixed use building developments along Washington Avenue, and new entries into the stores fronting on Market Boulevard?	
16	<u>Extend the downtown streetscape design treatments on Boistfort and Chehalis Avenues from Washington to Main</u> – to link this district with the downtown and create a pedestrian corridor between the downtown and the Courthouse complex?	
17	<u>Extend the downtown streetscape design treatments on Park Street from Front Way to Washington Street</u> – to link the downtown and Chehalis Avenue districts with the new Library and City Hall?	

Downtown park and plaza options

		<i>Timing/cost</i>
18	<u>Replace the abandoned gas station on the northwest corner of West Street and National Avenue with a plaza and 3-dimensional artwork</u> – to provide a visual accent for the downtown corridor on Market Boulevard and a gateway into the downtown from the Westside Neighborhood and State Avenue Business District?	

Downtown development options

		<i>Timing/cost</i>
19	<u>Issue a design/develop RFP for a new mixed use structure between the alley and Washington Avenue</u> – over the proposed parking deck to be shared with the St Helens Inn to provide first floor retail uses and upper floor housing?	
20	<u>Sponsor a rehabilitation project in the older retail and warehouse structures along Chehalis and Pacific Avenue</u> – for ground floor retail and upper floor residential uses including live/work loft spaces?	

21	<u>Issue a design/develop RFP for private redevelopment of the vacant city property on the northeast corner of Market Boulevard, National, and Washington Avenue for a signature mixed use development with ground floor retail</u> - to provide an anchor to balance the St Helens Inn landmark at the other end of the district?	
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St Helens Inn options

		Timing/cost
22	<u>As a public/private project, acquire the first 3 floors or all of the St Helens Inn and issue a design/develop RFP to completely rehabilitate and refurbish the lower retail and office floors of the building into a Class A building</u> – and once again make the St Helens’ the downtown and city landmark it once was?	
23	<u>Open up the lobby entry from Market Boulevard, improve and reopen the courtyard on the second and third floors as an interior skylight space and create new entries from the alleyway</u> – to better connect the building on all sides into the downtown?	
24	<u>As an option, consolidate city administration, finance, community development, parks, and other city offices on the 2nd-3rd floors and construct a Council Chambers or public meeting space and new entry on the Cascade Avenue side of the complex</u> – to consolidate city functions, compliment the Library and City Hall/Police/Court Building complex, and establish the city as an integral activity in the building and downtown?	
25	<u>Convert the upper story residential portions of the building</u> – into residential condominiums if necessary to make the building project more economically feasible?	

Economic development options

		Timing/cost
26	<u>Create a new Chehalis brand, logo, tagline, and promotional packaging to be shared on city, chamber, port, and EDC websites and promotional materials</u> – that incorporates the Chehalis Renaissance mission and objectives?	
27	<u>Expand and improve the city’s website capability and linkages</u> - to market and promote development, employment opportunities, and other economic actions?	
28	<u>Adopt the “Main Street” program for the downtown</u> – by implementing the façade improvement program, creating more special events and promotions, initiating an aggressive retail tenant recruitment program, and designing streetscape and public space enhancements?	
29	<u>Create a tourism promotion group as part of the economic development function above</u> – to market, promote, and attract tourist and visitors to Chehalis attractions and retail businesses?	
30	<u>Expand the central, accountable economic development function in city government to oversee implementation of the projects identified above</u> – composed of the Economic Development Committee, Chehalis Business Association, Airport, Port of Chehalis, Chamber of Commerce, Centralia Community College, and Chehalis School District, and other agencies?	
31	<u>Create a local capital investment fund (“Invest in Chehalis”)</u> – to provide monies for start-up businesses, project development and redevelopment opportunities, and special labor force development and training activities?	
32	<u>Expand local labor force training and development opportunities provided by the Community College, School District, and private resources</u> – geared to the economic and tourism marketing efforts identified above?	
33	<u>Improve local infrastructure and fiscal capabilities</u> – by completing the proposed south UGA annexation and resolving flood control plan and programs?	

34	<u>Improve city development regulations and procedures to streamline and pre-approve private development projects and actions</u> - that support the projects and policies identified above?	
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Possible Funding Sources

The following preliminary funding sources have been identified by Tom Beckwith Consulting in the Draft Action Plan, Chehalis Renaissance Project.^{iv} Beckwith Consulting Group indicates that a more detailed funding strategy and sources will be prepared within the next two months. Please refer to the City of Chehalis' Action Plan Chehalis Renaissance Project, to be published within about 2 months, for more detail on funding possibilities for this project.

- Special Federal & State appropriations
- Transportation Improvement Board
- Pedestrian, Bicycle & Safety Program
- WA State Resource & Conservation Office (RCO)
- CTED Tourism Marketing Program
- Downtown Revitalization Main Street
- Downtown Revitalization Program (DRP)
- Tourism Marketing Program Grants
- CTED Growth Management Planning Grants
- Washington State Department of Transportation
- Rural Tourism Development Program
- Department of Ecology Centennial Fund
- Transportation Improvement Board
- Federal Aid Safety Program (FAUS)
- Urban Arterial Trust Account
- Washington State Child Care Facility Fund
- Community Development Block Grant
- WA State Child Care Micro-Loan Fund
- Building for the Arts
- Commercial Services Facilities Program

Appendix 7

Action Plan Project Descriptions

Chehalis River Basin Flood Control Authority: Lewis, Thurston and Grays Harbor Counties, the Cities of Aberdeen, Montesano, Bucoda, PE Ell, Oakville, Centralia and Chehalis, and the Confederated Tribes of the Chehalis have entered into an interlocal agreement and created the Chehalis River Basin Flood Control Authority. The Chehalis River Basin Flood Control Authority is charged with the following tasks:

- Review flood hazard plans and related studies, conduct additional studies, identify, prioritize and develop potential projects
- Coordinate federal, state, local efforts to develop & implement comprehensive flood control strategy for Chehalis River Basin
- Seek federal & state funding to implement recommended flood control projects

This economic recovery strategy recommends that the Chehalis River Basin Flood Control Authority prioritize flood control projects consistent with an effective flood control strategy, and seek or support funding for these projects as determined by the Authority

Budget:

Planning: Phase I:	\$2,500,000	Funded
Planning: Phase II:	Not determined	Not Funded
Planning: Phase III:	Not Determined	Not Funded
Implementation, State:	\$47,500,000	Funded
Implementation, Federal	\$74,000,000	Not Funded

Timing:

- Phase I: June 30, 2009
- Phase II: July 1, 2009 to June 30, 2010
- Phase III: July 1, 2010 to June 30, 2011

Economic benefits: Implementation of a comprehensive flood protection and mitigation strategy will create far reaching direct and indirect benefits, including both job preservation, job creation, and extensive other economic development benefits to industrial, commercial, residential and public sectors of the Lewis County economy.

Lead Agency: Chehalis River Basin Flood Control Authority, with Lewis County as fiscal and staffing agency

Implementation of Corps of Engineers Flood Control Analysis: Funding from federal and state sources is needed for the recommendations to implement as a result the Corps of Engineers update evaluation of proposed flood control measures for the Chehalis River and its tributaries in Lewis County. These measures currently include: levee construction, adding additional storage at Skookumchuck dam, and raising building structures impacted by the levee and storage measures.

Budget: Currently the budget is \$74,000,000 based on Corps of Engineers work completed in 2004. These numbers will be updated with completion of the current update study and final design.

Timing: Start in 2011.

Economic benefits: Increased flood protection and mitigation from future storm and flood events in Lewis County.

Lead Agency: Chehalis River Basin Flood Control Authority, with Lewis County as fiscal and staffing agency.

Implementation of Lewis County Flood Hazard Management Plan Project Recommendations: The Lewis County Comprehensive Flood Hazard Management Plan was updated in 2008 to reflect more current information about existing streams, rivers, land uses, and regulations related to flood hazards. It identifies goals for flood hazard reduction consistent the needs of residents, businesses, and neighborhood jurisdictions; and identifies flood hazards, evaluates alternative solutions, and recommends future projects or program modifications to address these hazards.

Both flood prevention and mitigation policies and specific projects are identified for implementation in the plan. Structural and non-structural policies and projects are included. This economic development and recovery strategy recommends the implementation of the recommendations of this flood hazard management plan, as determined appropriate by Lewis County in consultation with other local jurisdictions within Lewis County.

Budget: \$21,145,000 to \$21,495,000

Timing: To be determined.

Economic benefits: Increased flood protection and mitigation from future storm and flood events in Lewis County.

Lead Agency: Lewis County and other jurisdictions as appropriate.

Headwaters Warning and Flood Alleviation Analysis: This project will establish a headwaters warning system of river and precipitation gages for river gages destroyed in the December 2007 food, as well as river systems lacking such systems in Lewis County. These river systems might include the mainstream Chehalis, South Fork Chehalis, Newaukum, Cispus, and upper Cowlitz river systems. The project will also identify, evaluate, rank flood alleviation options and develop preliminary cost estimates for flood alleviation options on these river systems. These projects are grouped together because both projects would require similar data gathering efforts.

Budget:	Flood Warning System:	\$200,000
	Warning System Implementation:	\$50,000+
	Flood Alleviation Projects:	\$350,000
		<hr/>
		\$600,000+

Timing: To be determined

Economic benefits: Ability to better predict storm and flood events in advance of their arrival and to prepare for their impacts. Potential loss of life, industrial, commercial, residential and public damages from these events will be reduced measurably by installation of this system.

Lead Agency: Lewis County with potential for partnerships with United States Geological Survey

Oregon and Washington Coast Doppler Radar: The Oregon and Washington State coastline is the largest contiguous coastal area within the continental United States which is not covered by Doppler radar to predict incoming storms and evaluate their severity and movement. Senator Patty Murray has initiated a budget appropriation to develop a Doppler system for this stretch of coastline which is not currently covered by this type of radar.

Budget: \$2,000,000

Timing: Upcoming federal budget cycle

Economic benefits: Ability to better predict storm and flood events in advance of their arrival and to prepare for their impacts. Potential loss of life, industrial, commercial, residential and public damages from these events will be reduced measurably by installation of this system.

Lead Agency: Senator Patty Murray and Senator Marie Cantwell.

Providing Industrial & Commercial Sites with Infrastructure & Environmental Compliance

Update Lewis Co. Industrial Lands Analysis: The current Lewis County Industrial Lands Analysis Update was prepared in August 2005, and will not reflect many of the sites currently being studied for possible development, or those sites which will become appropriate for development upon construction of flood control and mitigation projects being considered by the Chehalis River Basin Flood Control Authority and the Corps of Engineers. Upon completion of these efforts, this industrial lands analysis should be updated to reflect these changes.

Budget: \$100,000

Timing: To be determined

Economic benefits: More effective marketing and promotion of Lewis County industrial sites to prospective investors and companies who will bring new jobs to the area.

Lead Agency: Lewis County Economic Development Council

South Lewis Co. (Winlock) Industrial and Commercial Development Winlock's proposed industrial and commercial business development is located on 543 acres of industrial land and 106 acres of commercial land located about half way between the Seattle/Tacoma and Portland-Vancouver areas.

This project will prepare final design documents, and construct infrastructure for this development, located west and adjacent to Exit 63 on I-5. City efforts to plan for this development include:

- Winlock 2005 Comprehensive Plan, prepared with extensive citizen participation
 - Includes expansion of Winlock’s Urban Growth Boundary east to I-5
 - Approved by Lewis County and adopted by City of Winlock
 - Upheld by the Western Washington Growth Management Hearings Board
- Winlock 2005 Capital Facilities Plan
- Winlock Final Environmental Impact Statement
- New zoning and land use ordinances
- Draft general sewer plan to serve the new UGA; under review by Dept. of Ecology
- Draft updated water system plan to serve the new UGA; under review by Dept. of Ecology
- Guidelines for design and construction of water, sewer and road systems within the area and an SR-505 Sub-Area Traffic Corridor Study
- Critical area ordinance and development standards are under development
- Development of a new sewerage treatment facility on line in September 2008

Budget: \$27,338,000

Timing: To be determined

Economic benefits: 2,334 jobs to be created

Lead Agency: City of Winlock

TransAlta Industrial Site Master Plan Implementation: A market analysis, site plan and preliminary infrastructure plan and costs are currently being carried out, with completion of this work in April 2009. There are 5 sites that are identified for the analysis for critical intensive industrial area with a minimum of 100 acres within the 1,000 acres available at the site. The Washington State Legislature has approved streamlined permitting for the site.

Budget: To be determined

Timeline: April 2009.

Economic benefits: Number of jobs and businesses to be determined

Lead Agency: Lewis County Economic Development Council

Port of Centralia Industrial Park Infrastructure Improvements: This project involves improvements to road, water, sewer, gas, telephone, fiber, street fronts and minor rail extensions at the Port of Centralia Industrial Park.

Budget: \$15,000,000

Timeline: Multiple phases over seven years.

Economic benefits: Number of new industries to the industrial site and number of new jobs generated by those industries.

Lead Agency: Port of Centralia

Harrison St. Sewer Extension Project: This project will result in the construction of a new 36-inch diameter gravity sewer interceptor from the existing Kuper Road pump station south approximately 1.5 miles to the intersection of Harrison Avenue/ Reynolds Road. The area where this project is located falls within a designated critical aquifer area that currently can only be served by septic system because sewer is not available. This limits the density and kind of development along this corridor. This project is a portion of a larger project that would provide sanitary sewer to the entire Ford's Prairie area. Of the 1067 acres in the Fords Prairie project area over half are zoned industrial/light industrial and commercial, most of which are located along the Harrison Avenue route served by this project.

Budget: Harrison Avenue Project: \$11,000,000
Fords Prairie Area: \$33,000,000

Timing: 2 year project, depending on funding availability

Economic benefits: Harrison Avenue runs parallel to I-5 and is the only local route between Centralia and Grand Mound. The 4.8 mile stretch from the intersection with Galvin/Reynolds roads has great potential for light industrial and commercial development that would add to the local job market in Centralia and Lewis County. This project will service an area which protects the critical aquifer serving as the water source for the entire city of Centralia.

Lead Agency: City of Centralia

Long Road Renewal Project Redevelopment Plan: Prepare a redevelopment plan for the Long Road area which includes a site plan, infrastructure plan, environmental analysis and preliminary cost estimates. Long Road is an area of the city devastated by flooding in 1996 and in 2007. The City of Centralia recognized that this area as one that experiences flooding. A recent comprehensive plan update designated this area commercial because of its location relative to I-5 and because of resident concern regarding the potential for future flooding.

The project would extend Ellsbury Street along I-5 and reconnect it to Long Road and South Street, possibly using it as a levee, allowing for better access and future planned improvements. The project would include moving and improving infrastructure to attract new business to locate in the area, creating new jobs within the city.

Budget: \$125,000

Timing: To be determined

Economic benefits: Creation of highway commercial business and jobs

Lead Agency: City of Centralia

Skookumchuck Bridge Intermodal Access Redevelopment Project: Development of a new bridge over the Skookumchuck River in north Centralia addresses three major issues:

- About 70 acres of industrially zoned property will become available for industrial and commercial development and job creation within the City of Centralia.
- A new bridge over the Skookumchuck will ensure that industrial traffic, including trucks hauling refuse will no longer use Central, but instead will have a new way to access the Intermodal yard where the refuse is loaded on trains destined for Eastern Washington.
- Diversion of industrial traffic from Central Boulevard will save maintenance funds.

Economic benefits: Industrial and commercial job creation Diversion of industrial traffic away from residential neighborhoods \$2,000,000/year savings due to reduced maintenance of Central Boulevard.

Cost: \$5,800,000 to \$6,800,000.

Timing: Three to five years

Implementation of South Lewis County Subarea Plan: The South Lewis County Subarea Plan, also known as the South Lewis County Watershed Plan & Economic Development Demonstration Project, is a partnership between Lewis County, the Washington State Department of Ecology and the Washington Department of Fish and Wildlife. Its purpose is to develop an economic development strategy for the South Lewis County area which provides protection for significant environmental characteristics within the study area, including watershed and habitat protection. Upon the completion of the planning phase, this project would implement the capital improvement and policy recommendations of this strategy based on the characterization of the watershed, local habitat, an economic forecast, and land use assumptions, and developed by a broad based local stakeholder group. This project is coordinated with two other studies which are currently being carried out and described later in this strategy:

- I-5/SR 505 Corridor Interchange Plan
- South Lewis County Airport Upgrade Study for the Toledo-Winlock Ed Carlson Memorial Field Airport

Budget: \$950,000
\$725,000 from Legislature
\$225,000 from Lewis County General Fund

Timeline: June 2009

Economic benefits: Creation of family wage jobs (employment numbers, increase in median income for South Lewis County subarea)

Lead Agency: Lewis County

Centralia Sewer Force Main Relocation: During the December 2007 flooding, erosion of the Chehalis River adjacent to the main Centralia sewer force main collapsed the bank of the Chehalis River and exposed a bend in the force main. This required an emergency repair to protect the force main. The repair provided a temporary fix. The long-term solution is to move the force main several hundred feet to the east close to I-5. Relocation of this line is critical to protect the line from further erosion and collapse, but this project has not been funded by the Federal Emergency Management Agency because

the damage is still potential and eminent, not actual. The City of Centralia has appealed FEMA's decision not to fund the project, and is awaiting a decision on this question.

This project would relocate this sewer force main away from the area adjacent to the Chehalis River, and would insure that the line does not rupture and spill raw sewage into the river. The concept calls for installation of approximately 1400 linear feet of pipeline and a new access road from 80 to 200 feet east of the current location.

Cost: \$2,500,000

Timing: Immediate: two years from design to completing construction.

Economic benefits: A force main failure would lead to the loss of Centralia's functional sewer system in major commercial and residential areas of the city, pollution of the Chehalis River downstream of the break including the inner portions of Grays Harbor, possible closure of shellfish production areas at Grays Harbor, loss of recreational opportunities in the Chehalis River downstream of the break, the cost of an emergency by-pass, fines and penalties, and potential long-term damage to the public's perception about the City of Centralia

Lead Agency: City of Centralia

Packwood-East Lewis Co. Waster-water Treatment System: Refine existing feasibility study for the Packwood sewer system by expanding service area to provide regional infrastructure framework for economic development in East Lewis County. Select preferred service area scenario to develop and construct wastewater treatment plant.

Budget: \$6,213,600

Timeline: August 2009

Economic benefits: New investment, increased economic activity, businesses, tourism, direct and indirect job creation for region.

Lead Agency: Lewis County

Toledo Wastewater Treatment Plant Upgrade: The original system was put in place in 1963 with upgrades to the treatment plant in 1986. In the draft Toledo Wastewater Treatment facility plan developed by Gray & Osborne, Inc., the number one option is to upgrade the plant to a modern facility. The current facility is inadequate for projected growth as determined by the state DOE.

Budget: \$8,906,000

Timeline: 2009-2011

Economic benefits: The upgraded facility will serve new businesses and industry resulting from the South Lewis County Area Plan with a potential to serve out to the Toledo Airport.

Lead Agency: City of Toledo

Toledo Water Tower & Water Rights: The current water system exceeds water rights capacity during peak flows in the high use times (summer). A new 250,000 gallon water tower would improve the capacity of the system to reflect correct pump times and not exceed the current water rights. This has been identified in the draft Toledo Water Comprehensive Plan. Toledo has had applications for additional water rights since 1996. These additional water rights would put Toledo in compliance during peak times.

Budget: \$916,000
Timeline: 2008-2013

Economic benefits: A new water tower could potentially service to the Toledo Airport and serve 1000 + residences and some businesses. With additional water rights, this project will serve many businesses.

Lead Agency: City of Toledo

Toledo Area Water & Sewer Extension: Building a booster pump station with force mains and a tower for water (above project), construction of an 8 inch sewer main, and construction of a 1,209 foot collector road with 5 foot sidewalks on both sides for two new developments. One development is for 28 low income houses for the Cowlitz Tribe.

Budget: \$2,640,000
Timeline: 2008-2010

Economic benefits: This would open up development to 28 low income houses and 44 higher income houses. The development of water and sewer would also be available for a total of 250 new residences.

Lead Agency: City of Toledo and Cowlitz Tribe

Programmatic Wetlands Mitigation Project: This project proposes to create approximately 40 acres of Category II wetlands comprised of forested, scrub-shrub, emergent, and wet prairie wetlands buffered by a 100 foot buffer to compensate in advance for future impacts to 24.32 acres of Category IV PCC wetlands at a 0.8 to 1 ratio, and for impacts to 15.16 acres of Category IV PCC wetlands at a 0.5 to 1 ratio. Approximately 12.97 acres of additional advance mitigation will be available at the proposed mitigation site. To establish a large contiguous area of high quality wetlands that will achieve higher functions and values than provided by the impacted Category IV wetlands; the proposed mitigation site is located on approximately 66 acres of valley bottomland bordered to the east by Stearns Creek and to the south by an unnamed tributary of Stearns Creek.

Budget: \$1,550,000
Timeline: To be completed by 2009

Economic benefits: The project will address industrial growth for the next 20 years in a manner which prevents traditional piecemeal development at the Port of Chehalis. Industrial property at the Port will be attractive to private enterprise due to the creation of a higher degree of development certainty. This will result in approximately 750 additional family wage jobs in Lewis County.

Lead Agency: Port of Chehalis and Department of Ecology

Development Planning & Marketing

Marketing Program for Industrial & Commercial Development: Prepare simple marketing brochure and promote the flood planning and implementation actions being carried out by local, state and federal agencies & private sector as a part of ongoing economic development marketing efforts for Lewis County.

Budget: \$10,000

Timeline: June 2009 to September 2009

Economic benefits: Numbers of contacts with prospective businesses which include the marketing brochure as a part of the contact information.

Lead Agency: Lewis County Economic Development Council

Cowlitz Lewis Economic Development District Operating Funds: The Cowlitz Wahkiakum Council of Governments, in cooperation with the Cowlitz and Lewis County Economic Development Councils, are partners in an effort to further the diversification of the region's economy. The COG and the Cowlitz and Lewis County Boards of Commissioners have entered into an interlocal agreement to establish a two-county economic development district. A district designation from the federal Economic Development Administration (EDA) was approved in July, 1998. The EDD received financial assistance from EDA to develop the diversification strategy, primarily with the production of the Cowlitz-Lewis Comprehensive Economic Development Strategies and plan updates, and the funding of numerous diversification actions of the two economic development councils. Continued assistance from EDA is essential in order to fully carry out the strategies and administer the economic development district.

Budget: \$110,000 (\$55,000 federal, \$55,000 local)

Timeline: 2013

Economic benefits: Planning strategies include the development of a regional data center, cluster analysis and labor market analysis, among other projects.

Lead Agency: Cowlitz-Wahkiakum Council of Governments

Tourism & Community Revitalization

Chehalis Renaissance Implementation: A study to develop a community vision and strategy, and implementation projects for the City of Chehalis— a road map for the future. The goal of this program is to have a working plan that guides the city’s economic development, transportation, tourism, environmental, land use, parks and recreation, public facilities and design efforts over the next 25 years.

Phase one of the Renaissance implementation will focus on the enhancement and revitalization of the city's historic downtown (old town), signage and city entrances. Areas of action for the downtown include real estate development, beautification, traffic flow, parking, business retention and recruitment and marketing.

This strategy will supplement the city’s comprehensive plan and when completed and adopted by the City Council, will guide investment decisions over the next 25 years. Approximately 34 projects have been identified in the Chehalis Renaissance process for consideration (See Appendix 5: Chehalis Renaissance Implementation Projects)

Budget: \$5-7 million

Timeline: To be determined

Economic benefits: Increase in tourism, revenue, additional businesses into downtown business area and retention of businesses in area.

Lead Agency: City of Chehalis

Morton Scenic Byway & Downtown Revitalization: Downtown revitalization, including a tourist information center, relocation and renovation of Morton train depot, Roxy Theatre renovation, and gateway corridor improvements on SR 7. Planning is in progress.

Budget: Total: \$3,000,000-\$4,000,000
Received: \$385,000 for a tourism information center
\$700,000 for Roxy Theater and Morton train depot renovation

Timeline: To be determined

Economic benefits: Increased collection of local retail sales tax and lodging tax are the main indicators of more tourism activity. Increased business activity, new businesses, and attendance at events are also indicators of increased tourism.

Lead Agencies: City of Morton, Cowlitz Valley Historical Society, Mountain Valley Arts Council, White Pass Scenic Byway Committee

Pe Ell Tourism Destination Project: This project will develop a trailhead horse & hiking park at the trail junction of the Chehalis to coast hiking and horse trail. Conceptual design has been completed by the WA State Department of Parks and Recreation, and final design and construction will be carried out as soon as funding is made available.

Budget: \$500,000

Timeline: To be determined

Economic Benefits: Increased commercial sales in Pe Ell downtown resulting from use of the trailhead by hikers and riders.

Lead Agencies: Pe Ell and WA State Department of Parks and Recreation

Lewis Co. Community Trails Project: Development and construction of an integrated, regional network of trails to increase multi modal transportation systems, recreational opportunities, and community health. This project represents partnerships between local and state government, stakeholders, and a non-profit (501(c) (3) entities. The Willapa Trail is the first segment currently under construction. This segment of rails to trails project runs through unincorporated areas of Lewis County from Hillberger Road to Adna. Future trails are planned to connect Centralia and Chehalis and the Willapa Trail segment. The Willapa Hills Trail has been adopted in the transportation work program for fiscal year 2009 by the Southwest Washington Regional Transportation Planning Organization (SWRTPO).

Budget: Current fundraising efforts total over \$300,000; Other segments to be determined

Timeline: Three years for Willapa Trails segment Other segments to be determined

Economic benefits: Number of visitors using trails and increased trail use.

Lead Agency: Willapa Trail: Washington State Parks Dept Lead Agency status will change by segment to reflect changing jurisdictional authority.

Interstate & Arterial Roads & Bridges

I-5 Lewis Co. Centralia North Interchange The Washington State Dept. of Transportation is currently working on an analysis of a new interchange north of Centralia. The Interstate 5 widening project will stimulate an assessment of current land uses and future economic development that will be assessed in areas around the Mellen, Chamber and Harrison Interchanges. The project will decrease congestion in Centralia linked to freight mobility concerns. The Centralia North County Interchange will provide access to the Port of Centralia and the proposed Industrial Land Bank at the TransAlta site.

Budget: \$1.2 million for Interchange Justification Report and NEPA \$40-\$60 million for construction

Timeline: To be determined

Economic benefits: Increased industrial transportation efficiency to Port of Centralia Industrial areas and the TransAlta site, once it is developed.

Lead Agency: Lewis County in partnership with WSDOT

I-5 Improvements to Flood Prone Section between Exits 76 & 81: Develop concepts, feasibility analysis, finalize design and construct I-5 improvements where freeway flooded in 1996, 2007 and 2009. Possible alternatives include:

- Assuming consensus is achieved regarding construction of adequate flood control measures, widen interstate and rebuild interchanges
- Assuming consensus is not achieved regarding adequate flood control measures , raise freeway above flood levels & rebuild interchanges

Budget: To be determined

Timeline: To be determined

Economic benefits: Increased traffic efficiency along I-5 and avoidance of future closing due to flood events

Lead Agency: Washington State Department of Transportation

I-5: Mellen Street to Blakeslee Junction: This project will widen approximately 3 mi. of I-5 between Mellen St. Interchange (exit 81) & Blakeslee RR Junction bridge . One lane will be added in each direction. Improvements will also be made at the Mellen Street and Harrison Avenue Interchanges.

Budget: \$133,000,000

Timing: Construction underway

Economic Benefit: Improved connectivity along I-5 and between Centralia and Chehalis as well as improved access to the proposed Centralia Long Street Industrial and Commercial Area.

Lead Agency: WSDOT

Implementation of I-5—SR-505 Corridor Interchange Plan: Develop a plan for SR-505 as part of the corridor study of the I-5 widening and improvement project to Exit 63. The plan will consider transportation and capital improvements for SR-505.

Budget: \$650,000

Timeline: February 2009

Economic benefits: Increased road capacity and safety for industrial, commercial and general traffic related to:

- Winlock Industrial and Commercial Park development
- South Lewis County Area Subplan and South Lewis County Airport Plan, recommendations, which will identify
 - Possible industrial and commercial land for development
 - potential cargo and general airport services at the Toledo Airport

Lead Agency: Lewis County

SR-7 - Lewis County Roadside Safety Improvements: This project will make safety improvements to reduce severity of accidents to various locations throughout the SR-7 Corridor from US-12 to the Lewis/ Pierce county line.

Three phase Route Development Plan to identify transportation safety, congestion, mobility improvement opportunities and other roadside issue to guides WSDOT investments in the corridor over 20 years. Phase I from Morton to the Lewis-Pierce County line is complete. Phases II and II from Lewis Pierce County line north to Tacoma is pending funding.

Budget: \$1,700,000

Timing: Phase-I: Completed Phases II & III: To be determined

Economic benefits: Increased safety and efficiency of tourist and general traffic along SR 7, a major transportation corridor for access to East Lewis County tourism activities and the Mt. Rainier National Park.

Lead Agency: WSDOT

SR-6 - South Fork Chehalis River Bridge Replacement: Replace existing narrow South Fork Chehalis River Bridge (22') on SR 6, 15 miles west of Chehalis in Lewis County with a new, wider bridge.

Budget: \$6,700,000

Timing: May 2008 to summer 2009

Economic benefits: Improved forest industry and general traffic flow and safety

Lead Agency: WSDOT

SR 6-Rock Creek (6/103) Bridge Replacement: Pe Ell East: replace the existing bridge with a new bridge designed to current standards at Lewis SR 6/Rock Creek (6/103)

Budget: \$6,000,000

Timing: 2012

Economic benefits: Improved forest industry and general traffic flow and safety

Lead Agency: WSDOT

SR 6/Rock Creek (6/102) bridge replacement: Pe Ell east: replace the existing bridge with a new bridge designed to current standards at Lewis SR 6/Rock Creek (6/102).

Budget: \$5,700,000

Timing: 2008

Economic benefits: Improved forest industry and general traffic flow and safety

Lead Agency: Washington State Department of Transportation

Repairs to Forest Service Road 23: Make repairs to and reopen Forest Service Road 23 east of Mt. St. Helens, connecting Randall in Lewis Co. to Swift Reservoir in Cowlitz County. Forest Road 23 was closed due to flooding, erosion and slides during the October and November 2006 storm, which created severe impacts in east Lewis and Cowlitz counties. This road is the major north-south transportation corridor for tourist and visitor traffic to and from east Lewis County and Mt. Rainier National Park and eastern Cowlitz County and the Mt. St. Helens National Monument and reservoirs in eastern Cowlitz and Skamania counties. Closure of this road created significant impacts to commercial and tourism related businesses in both Lewis and Cowlitz counties.

Budget: Unknown

Timing: Unknown

Economic benefits: Traffic access for commercial and tourism related businesses in eastern Lewis and Cowlitz counties.

Lead Agency: U. S. Forest Service, Gifford Pinchot National Forest

Rail Transportation

Curtis Industrial Park Rail Line and Bridge Repairs: Repair to the 10.3 miles of rail line between Port of Chehalis and the Curtis Industrial Park to pre-disaster condition. Significant portions of this line were damaged during the December 2007 flood. A total of 4, 443 track feet of embankment was completely washed out or damaged. A total of 2,496 track feet of ballast was contaminated with silt and 523 cross ties needed to be repaired or replaced for re-use. Eight culverts were washed out, and over 17,667 track feet of the roadbed experienced some degree of ballast erosion. In addition, several wood railroad bridges are in need of repair due to age and use which has caused deterioration on these bridges.

Budget: Rail Line Repairs: \$1,273,307 \$159,163 not funded Rail Bridget Repairs \$240,000 not funded.

Economic benefits: Trains will be able to travel from the port facilities and the mainline in Chehalis to the Port's Curtis Industrial Park safely and efficiently.

Lead Agency: Port of Chehalis

Port of Chehalis Truck to Rail Reload Facility: Construction of intermodal rail reload facility for transfer of products from truck to rail, to attract a private company to locate within Port of Chehalis Industrial Park. About one third of this project is for port infrastructure development: an access road, utility extensions, rail spur extensions and design energy. The port sees this development as a job creation catalyst for the port's industrial park because inquiries from existing business show that many businesses would consider rail shipping if it were available. Additionally, close proximity to a rail reload facility is an incentive for some industries to locate at the port. It should be noted that recent dramatic rises in petroleum fuels has increased truck freight costs for some shippers to a point where rail shipping is becoming their only affordable option.

Budget: Total cost:\$4,500,000; Design engineering & construction:\$1, 500,000

Timing: 2008-2009

Economic benefits: New industrial jobs from new company, and increased marketability of Port of Chehalis locations for business attraction and expansion.

Lead Agency: Port of Chehalis

Tacoma RMDRR Morton Phase II Line Repairs: This project placed thousands of new rail ties and tons of ballast to stabilize the aging track bed and prepare the line between Tacoma and Morton to carry more freight cars. The rail line was in poor condition and nearly impossible to use after it was severely damaged in a 1996 flood.

Budget: \$3,180,000

Timing: Construction was completed in June 2005

Economic Benefit: Assure safe freight rail transport between Tacoma and Morton.

Lead Agency: Washington State Department of Transportation; State Marine and Rail Office; Office of Freight Strategy and Policy

Morton Rail & Downtown Tourism Development Project: This project continues railroad rehabilitation work accomplished by the Tacoma RMDRR Morton Line Repairs – Phase 2 project and provides for the restoration work on the Morton Depot. Rehabilitation will enable the rail line to transport more goods and people safely, and enable the depot to serve as a destination for passenger excursion service. The rail line will serve both freight and passenger excursion service. The rehabilitated depot, which was moved from its original location closer to the center of town, will become part of a new tourist facility. Rail line work will be done in conformance to American Railway Engineering Maintenance-of-Way Association (AREMA) and BNSF Railway track standards to help ensure the safe operation of trains. Construction work on the rail line was scheduled for completion in October 2007, but the rail line and the Nisqually Valley Bridge were damaged during a storm that occurred in November of 2006. The rail line rehabilitation design work has begun. The historic depot was moved to its new location and the rehabilitation work is almost complete.

Budget: \$ 1,904,000

Timing: Completion October 2008

Economic Benefit: Assure safe tourist passenger and freight rail service to Morton. Contribute to the revitalization of downtown Morton.

Lead Agency: Washington State Department of Transportation: State Marine and Rail Office; Office of Freight Strategy and Policy

Blakeslee Junction Connection & Track Alignment: Improve connection in Centralia between BNSF Railway and Puget Sound and Pacific Railroad (PSAP) so that train speeds can be increased at the

junction. This project will build a new connection between Tacoma Rail and PSAP at Blakeslee Junction. In addition, the tracks in the junction between PSAP and BNSF Railway in Centralia will be aligned. WSDOT facilitated discussions between several local community interest groups and four railroads, ultimately reaching consensus outcome for this project.

Budget: This is a multi-phased project. Only Phase 1A & 1B are partially funded;
Phase 1A: \$7.4 million
Phase 1B: \$1.5 million
Phase 1B: \$3.9 million
Total Phases I A & B funding from all sources - \$12.8 million

Timing: Project Partially Funded: Timing to be determined

- Phase 1A and 1B will:
 - Reconfigure the curve in Centralia
 - Replace jointed track between Centralia and Blakeslee Junction
 - Reconfigure the connection at Blakeslee Junction between Tacoma Rail and Puget Sound & Pacific Railroad
 - Resignal Napavine Hill
 - Remove tracks from Centralia and replace elsewhere in the Tacoma Rail system
- Phase 2 will add an additional rail line on the BNSF Railway network at Centralia.
- Phase 3 will add additional storage capacity to the Puget Sound & Pacific line at Blakeslee Junction
- Phase 4 will add a storage track on the Puget Sound & Pacific line at Hoquiam
- Phase 5 will make a new connection between Puget Sound & Pacific and Tacoma Rail at Grand Mound

Economic Benefits:

- Improved train speeds through Centralia
- Reduced congestion on city streets
- Less rail congestion for trains through Centralia
- Increased capacity for Burlington Northern through Centralia
- Alternative access point for Tacoma Rail to the BNSF Main line at Blakeslee Junction.

Lead Agency: Washington State Department of Transportation; State Rail and Marine Office

Chehalis Junction High Speed Crossover: Construct high speed crossover switching for separated passenger and freight lines at Chehalis.

Budget: \$3,900,000

Timeline: 2013

Economic Benefits: Improvements will provide greater safety and efficiency for higher speed passenger trains through the Centralia-Chehalis area.

Lead Agency: Washington State Department of Transportation; State Rail and Marine Office

Air Transportation

South Lewis County Airport Project: Conduct a feasibility study as Phase I to upgrade existing Toledo-Winlock Ed Carlson Memorial Field Airport to a Regional Airport for general aviation and air cargo. As part of this effort, evaluate airport expansion for air cargo from SeaTac and Portland International Airport.

Budget: \$100,000

Timeline: September 2009

Economic benefits: WSDOT estimates that the airport currently contributes 765 jobs, \$1,357,966 in labor earnings and \$4,967,287 in economic activity. By upgrading the airport, measurements would include employment, payroll and sales output as well as the increase in the number of flights and the addition of corporate flights.

Lead Agency: Lewis County

Transit

Transit Center: Design and construct a new central transit facility at the Port of Chehalis to handle administration, maintenance and storage functions for Twin Transit, a public transportation benefit area special district operating in Centralia, Chehalis and Lewis County. Overall, ridership is increasing throughout Twin Transit's service area, particularly during peak operating hours. This includes ridership to and from significant commercial areas in the Centralia Chehalis urban area and to the Port of Chehalis Industrial Park area in south Chehalis. In the future ridership is expected to continue to rise due to increasing gasoline prices in the United States. There is also need for new connectivity to several within Lewis County including:

- The two destination resorts operated by the Confederated Tribes of the Chehalis in Grand Mound.
- Projected industrial development and ridership to the growing south Lewis County areas of Winlock and Toledo, including the Toledo airport.
- The Port of Centralia's two industrial park areas
- The Pe Ell area

At the present time existing facilities cannot handle needed expansion and with only an operating reserve of approximately one year, Twin Transit does not have the financial capacity to expand their central facility. Funding for a new transit center would allow expansion of para-transit services for the disabled throughout the entire area projected for service by Twin Transit. With grant funding for the new transit center, Twin Transit would be able to expand the rolling stock with annual operating revenues.

Budget: \$3,000,000

Timeline: To be determined

Economic benefits: Improved general and para-transit services to serve commercial and industrial labor force ridership, as well as general ridership, to targeted non-serviced areas of the transit district.

Lead Agency: Twin Transit

Financial & Technical Assistance to Businesses

McBride Court Commercial/industrial incubator project: Construction of three commercial/industrial buildings for business incubator for lease to new firms. An engineering analysis is currently being prepared. These facilities will allow the Port of Chehalis to address the multiple inquiries each year from companies wanting to locate and create jobs in Lewis County.

Budget: To be determined

Timeline: To be determined

Economic benefits: About 50 new commercial and/or industrial jobs to be determined with completion of engineering analysis.

Lead Agency: Port of Chehalis

Small Business Assistance Program: Three year technical assistance program for small businesses recovery, expansion and start-up in Lewis Co. in response to flood impacts in county. Technical assistance will include, but not necessarily be limited to:

- Market analysis and strategy development
- Special retail products consulting to assist recovering and start-up businesses
- Assistance in accounting and finance
- Business plan development and preparation of loan applications

Budget: \$300,000 for 3 years; \$100,000 per year

Timing: June 2009

Economic Benefit: Preservation of existing business and jobs and creation of new business and jobs from new or expanding businesses.

Lead Agency: Small Business Development Center

Operating Capital Loan Program: Apply for funds to establish an operating capital loan assistance program for businesses impacted by the recent flood, or businesses wishing to expand their operations in the aftermath of the flood.

Budget: \$1,000,000

Timing: June 2009

Economic Benefit: Preservation of existing business and jobs and creation of new business and jobs from new or expanding businesses.

Lead Agency: Lending Network

Workforce Training

Workforce Training Center(s): Prepare a feasibility study to look at vocational training centers in Lewis County as well as in conjunction with Cowlitz County. The training centers would provide actual skills for jobs in specific areas of trade for regional employment. This project will be phased:

Phase I: Feasibility Study; Phase II: Center Planning and Funding and Phase III: Project Construction

Budget: Feasibility: \$150,000 Skagit County is completing a similar project for approximately \$26 million

Timeline: To be determined in the feasibility study

Economic Benefit: To be measured by the number of employees and employers served through the center, new and retained businesses in the region and trades taught at the centers.

Lead Agency: Lewis County with Cities of Chehalis and Centralia.

Support to Upper Chehalis Agricultural Area

Upper Chehalis Basin Fire District Planning & Development: To develop a detailed funding proposal for possible legislative funding to address flood and earthquake impacts to Upper Chehalis fire districts. This proposal should be submitted during the January 12-April 26 2009 legislative session. This proposal would include: 1) identification of optimum new substation and station locations out of the floodplain and providing more efficient response times to underserved areas within the districts, 2) relocation of stations and substations, 3) inventory of facilities and equipment needed, 4) description and detailed cost estimates to relocate and redevelop fire stations and substations for Fire Districts 6, 13, and 16 at suitable sites outside flood plain, and to replace damaged and/or destroyed equipment, and 5) redevelopment of a station and replacement of equipment for the Fire District 11 station and equipment destroyed in the earthquake.

Budget: Phase I: Develop Funding Proposal: Local sponsor in-kind contribution and Phase II: Project Implementation: About \$6,000,000

Timing: Phase I: Develop Funding Proposal: July-December 2008 and Phase II: Request to Legislature: Jan 12-April 26, 2009

Economic benefits: Higher efficiency of operation and decreased response time from fire stations and substations. Lower insurance rates for businesses and homeowners due to decreased response times. Fire stations and substations not susceptible to damage and closure due to flooding.

Lead Agency: Lewis County, in cooperation with Fire Districts 6, 11, 13, and 16

Boistfort Valley Water System: Currently, the unincorporated area of Boistfort, impacted by the December, 2007 flood, has been unable to receive a clean water test from its residential water supply. The county is looking into water options for the area.

Budget: \$1.5 million

Timeline: 2011

Economic benefits: Adequate water supply for current and projected residents that meets state standards for clean public water at a usage rate that is feasible for rate payers, construction of water source and operation and maintenance of plant.

Lead Agency: Lewis County

Endnotes

- 1 Letter from Governor Christine Gregoire to the President of the United States, December 6, 2007
- 2 KIRO TV, December 9, 2007, <http://www.kirotv.com/news/14805723/detail.html>
- 3 Interviews with Cowlitz County Emergency Management and Public Works Directors, March 4, May 5, 2008.
- 4 Source: Wikimedia, http://commons.wikimedia.org/wiki/Image:Map_of_Washington_highlighting_Lewis_County.svg.
- 5 Source: Lewis County Historical Museum, <http://208.106.253.36/Tour/tabid/82/Default.aspx>.
- 6 Cowlitz Lewis Comprehensive Economic Development Strategy, Cowlitz Wahkiakum Council of Governments, 2008, pages 1-37.
- 7 The Flood of 2007: Disaster and Survival on the Chehalis River, The Chronicle, Centralia, WA, 2008.
- 8 Unpublished and undated working document in Lewis County, Emergency Management Dept. files, recorded May 31, 1996; The Chronicle, Centralia, WA, February 14, May 2, 1996; Lewis County officials quoted in 5 County Flood Economic Recovery Strategy, Cowlitz Wahkiakum Council of Governments, 1996.
- 9 Email Source: United States Geological Survey, Chehalis River Basin, Chehalis River Basin Land Trust, Centralia, WA, <http://wa.water.usgs.gov/realtime/htmls/chehalis.html>, <http://www.chehalislandtrust.org/galvin.htm> from WA State Department of Emergency Management, August 18, 2008.
- 11 Outline Physical Conditions, unpublished document, Patricia L. Olson, Ph.D., L.G.H., Shorelands and Environmental Assistance, WA State Department of Ecology, 1-15-2008, page 1.
- 12 December 1-4, 2007 Storm Events Summary, prepared for Weyerhaeuser Western Timberlands, Maryanne Reiter, Hydrologist, Weyerhaeuser Company, February 8, 2008; also The Storm King: Some Historical Weather Events in the Pacific Northwest, Wolf Read <http://www.ocs.oregonstate.edu/index.html>.
- 13 December 1-4, 2007 Storm Events Summary, op. cit, (pp. 17-18).
- 14 Intense rainfall leads to record flooding around the state, Office of the Washington State Climatologist, <http://www.climate.washington.edu/events/dec2007floods>
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- 16 December 1-4, 2007 Storm Events Summary, op. cit, (pp. 15-16).
- 17 Northwest Cable News: 'Freak of nature' may have fueled Lewis County floods, http://www.nwcn.com/topstories/stories/NW_120707WX_why_chehalis_flooded_KS.79a5c646.html
- 18 USGS Press release of February 5, 2008: New Peak Flow Record for the Chehalis Flood, <http://wa.water.usgs.gov/news/2008/news.chehalis.newpeak.htm>
- 19 December 1-4, 2007 Storm Events Summary, op. cit
- 20 King 5 News: Scientists say a "500-year storm" caused Dec. flooding http://www.nwcn.com/sharedcontent/northwest/environment/stories/NW_020608WAB_flood_500_year_KS.988ab4e4.html
- 21 "The Flood: One Year Later," The Chronicle, November 26, 2008.
- 22 Source: Fire Districts 6, 11, 13, and 16; Lewis County Building Department, July 2008.
- Note 1: This is an estimate of the funding needed to relocate out of the floodplain, and then restore vehicles and equipment lost or damaged by as a result of the flood of 2007, for Fire Districts 6, 11, and 13. Estimates of damages to Fire District 11 from the 2003 earthquake are also included in this figure. This estimate was provided by the Lewis County Building Department, July 9, 2008.
- 23 [i] "Disaster Aid Helps Washington Communities Rebuild Flood Damaged Property," August 18, 2008; <http://www.fema.gov/news/newsrelease.fema?id=45463>; email from John Vollmer, WA State Emergency Services, 8/18/2008; WA State Department of Transportation email and spreadsheet, 12/4/2008; WA State Department of Transportation email and spreadsheet, 12/4/2008; National Flood Insurance Agency email dated 11/24/2008.
- 23 Federal Flood Insurance Agency memo dated 11/24/2008.
- 25 Twin Cities Business Sector Flood Impacts Survey Preliminary Results, Governor's Recovery Task Force Briefing., Institute for Global and Community Resilience, Huxley College of the Environment, Western Washington University, March 31, 2008.
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- 29 Lewis County Conservation District, *ibid*.
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- 36 Interviews with Department of Natural Resources, 3/13/08; with Port Blakeley Lumber Co., 6/26/08; and Washington Farm Forestry Association, 6/24/08.
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- 41 Interlocal Agreement Between the State of Washington Office of Financial Management and Lewis County, Acting as the Lead Agency for the Chehalis River Basin Flood Control Authority, executed 6-9-2008 and 6-13-2008.
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- 45 Bureau of Reclamation Meeting Minutes, August 3, 2008, Chehalis, WA.
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- 49 Lewis County Comprehensive Flood Hazard Management Plan, *ibid*, chapter 2: policies.
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