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Building the LAND Alternative

The LAND Alternative, developed by the LAND Steering Group and presented to the Chehalis Basin Board, is an alternative to a proposed FRE on the Chehalis River near Pe Ell. While many of the proposed actions have been considered in the past, the LAND Alternative is a comprehensive effort to address the complex issues of flooding in the Chehalis Basin. It puts forward a combination of new and extended levees; Chehalis River channel modifications; and acquisition, retrofitting, and relocation of structures; as well as restoration efforts and policy changes that together will reduce flood damage. While LAND has been developed independently of the FRE proposal, components of the LAND Alternative could potentially be implemented in concert with other proposals, depending on the outcomes of CBB decisions and with environmental review and approvals.

Some programs such as acquisition, retrofitting and relocation of structures, would likely occur under either the LAND Alternative or the FRE. The LAND Alternative assumes that acquisition, retrofitting, and relocation of structures is an integral part of the the overall flood damage reduction strategy.

Community-based flood damage reduction must be firmly rooted in values shared across the Basin—the values that tie the Basin together as a community—and lead to solutions that address all community needs. In May 2022, community leaders, public officials, non-profits, tribes, advocacy organizations, and others created a set of shared values to guide how community-based flood damage reduction can be achieved. These include:



FAMILY, CULTURE, HERITAGE

The strength of the Chehalis Basin comes from its people and the diverse heritages, cultures, and experiences they represent.



NATURAL WONDER

We value Chehalis Basin's unique environment, employment and recreation options, and a home to a wide array of animal and plant life.



ECONOMIC VITALITY

We strive to support local economies, keeping Chehalis Basin businesses robust. A thriving regional economy inspires innovation.



TRUST, RESPECT, SELF DETERMINATION

The future of the Chehalis Basin must be decided by the community itself. We recognize and respect the rights of Tribal Nations and all private property owners in the Chehalis Basin.



PUBLIC SAFETY AND RESILIENCY

Safeguarding our communities from the negative impacts of flooding is fundamental. Adequate infrastructure should ensure regional resiliency.



HEALTHY ENVIRONMENT AND HEALTHY PEOPLE

We envision a solution that prioritizes the well-being of our people and our environment.

Basin residents and businesses that are most affected by flooding often have the least ability to recover after an event. The LAND Alternative includes a framework that equitably considers potential impacts on all individuals and property owners, as well as land uses most affected by flooding during a major flood event that could occur in the late-century—in the year 2080.

The LAND Alternative Development Process

The LAND Alternative was developed using a series of shared values to frame the technical analysis and identify ways to reduce flood damage and speed recovery after an event.

The process reflects the desire for local solutions that can be applied Basin wide. It identifies a series of potential infrastructure interventions to reduce damage to existing structures, as

well as local infrastructure projects necessary to maintain emergency access in the event of both catastrophic floods and the smaller, more frequent floods common in the Basin. In addition, the LAND Alternative identifies programs and other opportunities to increase preparedness and resiliency, and acquisition, retrofitting, and relocation of structures located within the floodplain.

LAND Alternative Development Process



Determine the target level of protection



Determine the mix of infrastructure protection, structure protection, and potential relocation



Determine the extent to which the natural systems of the floodplain can be restored through environmental design

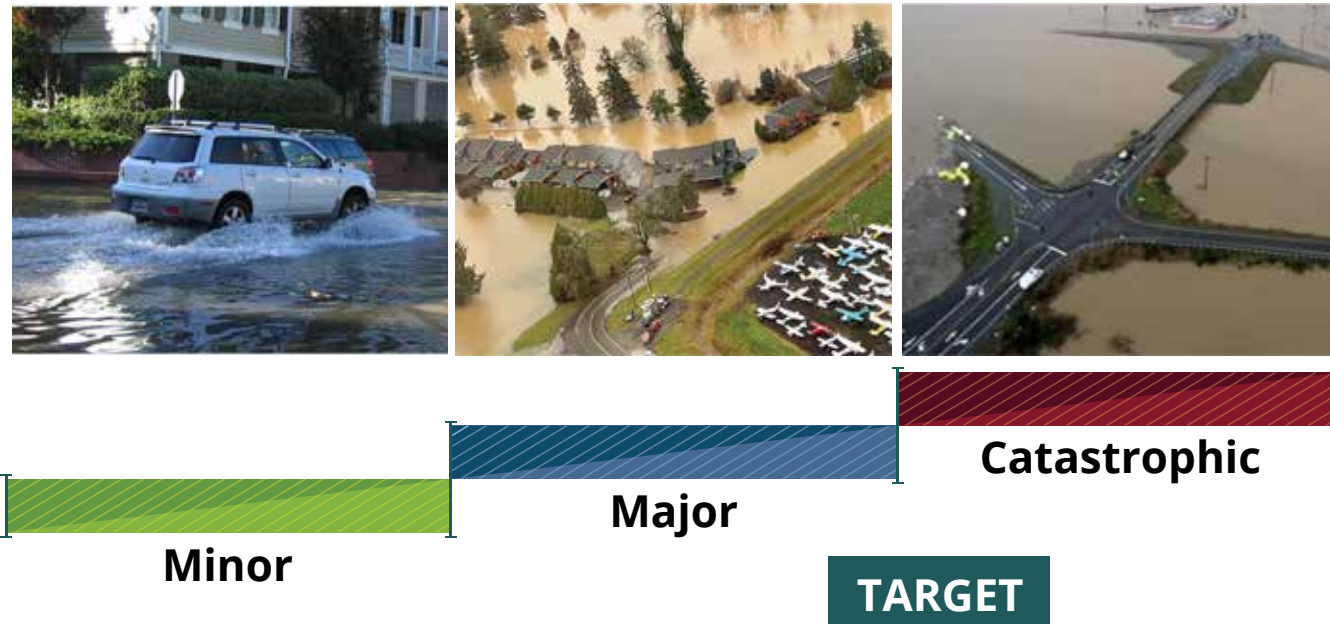


Determine the number and extent of resiliency elements and programs



Determine funding, project management entity, and implementation

Targeted Flood Damage Reduction Levels



MINOR EVENTS

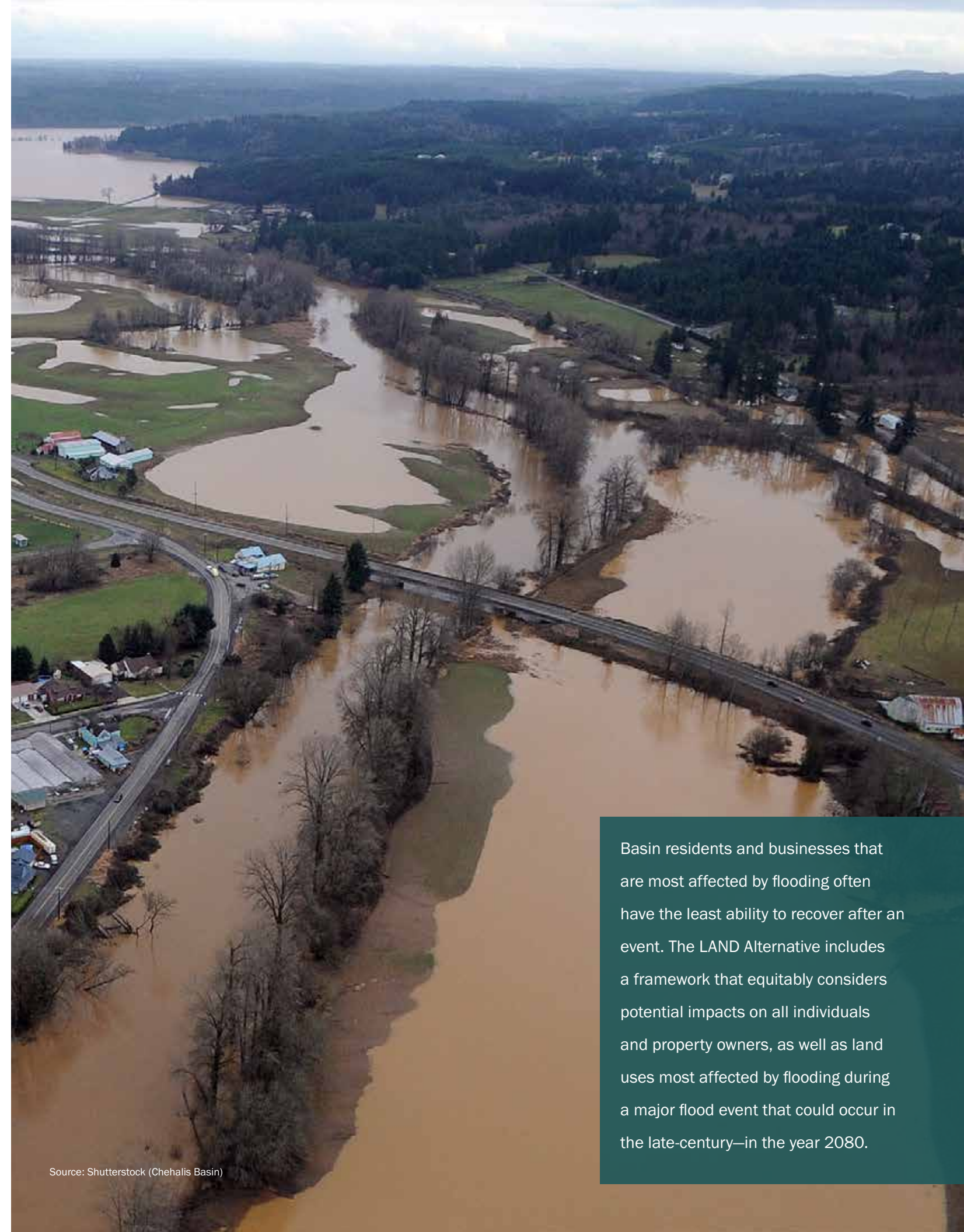
More frequent events that typically happen every few years. These events may have some localized damage to areas within the floodplain, damage roadways, and other infrastructure, but are not life threatening

MAJOR EVENTS

Major events typically happen less regularly, but cause significantly more damage in the Chehalis Basin. Major events are categorized as approximately 10-year events where there is more than 38,800 cfs at the Grand Mound gauge. Example events include the 2009 and 2022 floods.

CATASTROPHIC EVENTS

Catastrophic events are larger and more severe than 10-year events where floodwaters reach more than approximately 75,000 cfs at the Grand Mound gauge. These types of events affect many areas in the Basin with deep floodwaters for a prolonged period of time and that have a significant impact on structures and infrastructure. Examples of catastrophic floods include the 1996 and 2007 floods.



Basin residents and businesses that are most affected by flooding often have the least ability to recover after an event. The LAND Alternative includes a framework that equitably considers potential impacts on all individuals and property owners, as well as land uses most affected by flooding during a major flood event that could occur in the late-century—in the year 2080.

Source: Shutterstock (Chehalis Basin)

Guiding Principles

The LAND development process uses an equity framework in how it considers potential impacts on all individuals, property owners, and land uses most affected by flooding. Equity is embedded in the process, from early development of the potential project elements described in this document to existing and future analysis to develop implementation recommendations.

Based on input from community leaders, non-profits, Tribes, advocacy organizations, and a community online survey, the LAND Steering Group developed a set of Guiding Principles that provided direction for how any potential implementation measures are developed and could be administered—whether infrastructure and restoration, programs, or a combination of options.



1. All properties that might be adversely affected by any of the LAND Alternative flood protection interventions would be **mitigated at little or no cost** to the affected property owner within the legal requirements allowed for these types of actions.



2. Property owners and tenants would be **compensated fairly**, assuming pre-disaster conditions, for voluntary relocations or property acquisition using funds to supplement public funding sources, to the extent feasible.



3. Site selection and site planning for any designated “receiving areas” would be **guided by a combination of local codes, quality design standards, and community input** governing each receiving area.



4. To the greatest degree practicable, proposed flood protection measures would be **locally led and based on reasonable cost/benefit assumptions** with consideration for all impacted property owners and tenants at all income levels.



5. Implementation of proposed flood protection strategies and solutions would be **at the discretion of individual property owners**, except where Basin-wide flood protection measures are required for the success of the project as a whole.



6. The LAND Alternative would include a **prioritized list of actions to reduce flood damage** for property owners and tenants in the short term (0-5 years), medium term (5-10 years), and long term (10+ years). Some measures will be required throughout the entire life of the project.



7. All proposed flood protection measures will be consistent with the goals of the Aquatic Species Restoration Plan (ASRP) and would be **designed to minimize impacts on aquatic and semi-aquatic species**, while maintaining and supporting the revitalization of the salmon fishery in the Chehalis Basin.



8. All proposed flood protection measures would be **designed using currently available, peer-reviewed ecological and biological science**, to reduce potential harmful impacts, and to restore and revitalize the natural systems of the watershed, where feasible.



9. The LAND Alternative would be **designed to support community economic vitality** throughout the Chehalis River Basin.

Options Considered

Prior to developing recommendations (see Chapter 4) the LAND Steering Group developed and evaluated possible options that expanded upon one another to test each one's ability to meet the criteria given to the LAND Steering Group by the Board. The LAND Steering Group considered nonstructural options—i.e., those that focus on restoration and programs—and structural

interventions such as levees and floodwalls, among other major infrastructure projects. The options were organized in an ascending scale, from the least amount of structural interventions (Option 1) to options that include all structural interventions, programs, and policies (Option 4) to reduce flood damage. A brief description of each option is included below.



OPTION 1: SAFE STRUCTURES AND FLOODPLAIN MANAGEMENT



OPTION 2: IMPROVE CHEHALIS RIVER WATERFLOW AND CONVEYANCE



OPTION 3: NEW AND EXPANDED LEVEES



OPTION 4: ALL INTERVENTIONS

OPTION 1: SAFE STRUCTURES AND FLOODPLAIN MANAGEMENT

Option 1 focused on non-structural interventions and would address flooded structures through voluntary protection, raising, and/or relocation.

Restoration and Floodplain Management

A critical component of the LAND Alternative is providing improved hydrologic conveyance, reducing water velocities, filtering debris, absorbing flood waters, increasing flood storage, raising groundwater tables, and creating critical habitats for salmon and other terrestrial and aquatic species. Improved habitat restoration also offers recreation and education opportunities. While restoration throughout the floodplain can have major benefits for the natural environment, floodplain restoration alone would not reduce impacts to structures during catastrophic flooding for communities within the upper Chehalis Basin; however, it could provide benefits for minor flooding occurring every few years.

Floodplain restoration under this option would focus on reducing flood damage for smaller, but more frequent flood events with small interventions such as berms, logjams, and other projects to increase the capacity of the floodplain to store water during smaller events. Floodplain restoration would also include removing and replacing of undersized culverts and reconnecting off channel floodplain and side channels. This option assumes coordination and alignment with the Aquatic Species Restoration Plan. Restoration and other nonstructural elements of this option would be in addition to what is identified in the Aquatic Species Restoration Plan.

Safe Structures

This option would implement a voluntary Safe Structures program scaled to the need within the Basin. Safe Structures would evaluate vulnerable structures within the floodplain to determine an appropriate method to address the potential damage to a structure in the event of a flood. Structures would be evaluated, scored, and grouped by level of risk and resulting action(s) needed to reduce damage from flooding. These levels include:

Level 1: Flood Insurance. Encourage flood insurance through private insurance or through the National Flood Insurance Program to property owners, renters, and businesses.

Level 2: Utility Relocation. Elevate utilities, including furnaces, air conditioners, appliances, electrical and plumbing systems above the flood elevation.

Level 3: Flood-Proofing. Modify structures using wet or dry methods. Wet flood-proofing means water is allowed to enter the impacted area such as a crawl space to equalize the hydrostatic pressure. Dry flood-proofing means the walls are made watertight, and all openings closed so water that reaches the building does not get inside. The building itself becomes the barrier to the passage of floodwaters.

Level 4: Structure Elevation. All damage-prone parts of the building are elevated above the flood protection level on a foundation intended to resist flood damage.

Level 5a: Voluntary Acquisition. Property is purchased under a voluntary program and demolished, creating open space that preserves the natural function of the floodplain. Property owners and tenants will be compensated fairly, assuming pre-disaster conditions, for voluntary relocations or property acquisition. (Guiding Principle #2).

Level 5b: Voluntary Relocation. Acquisition/ Demolition & Relocation. Same as Level 5a, with relocation assistance. Options include physically moving a residential structure to a new location outside of a floodplain or identifying potential receiving areas for relocation outside of the floodplain. Financial incentives may be provided to housing developers, reducing housing costs to closely resemble buy-out costs.

The history of voluntary relocation in the Basin is limited. In 2023, the City of Centralia identified seven properties that have been purchased, that have repeatedly flooded. The Chehalis Basin Flood Hazard Mitigation Report (2012) identified 173 properties as elevated since 1996; 19 of which were repetitive loss properties. The program would also include assistance for renters who might be displaced, at the local, state and federal level.

OPTION 2: IMPROVE CHEHALIS RIVER WATERFLOW AND CONVEYANCE

Option 2 built upon Option 1 by including a new approximately 700-foot-wide diversion west of the Mellen Street Bridge to reduce peak flood elevations by providing another path for flood waters. The existing Mellen Street Bridge would be removed and relocated to the south. A significant amount of soil immediately upstream and about 3,000 feet downstream of the Mellen Street Bridge would also be removed to increase conveyance opportunities so floodwaters could move through this constricted area.

The size of the diversion channel would be determined through engineering and modeling refinements. The Mellen Street Bridge relocation could occur in advance of the diversion and conveyance projects.

OPTION 3: NEW AND EXPANDED LEVEES

Option 3 included the floodplain restoration and Safe Structures components of Option 1. This option would also construct approximately 22.1 miles of new or expanded levees, including potential pump stations:

1. New ring levee in Adna around the new high school and commercial area (1.7 miles)
2. New levee on the east bank of the Newaukum and Chehalis Rivers east of I-5 (1.2 miles)
3. New and expanded levees on the north and south sides of the Skookumchuck River (6.6 miles)
4. New levee on the north bank of the Chehalis River from north of Fort Borst Park downstream to Galvin Road (2.7 miles)
5. New levees on the north and south sides of China Creek from I-5 to the railroad tracks (2.3 miles)
6. New levee on the east side of I-5 from China Creek to Salzer Creek (3.3 miles)
7. Expanded levee around the Chehalis-Centralia Airport (4.3 miles)

Levees would likely be phased and also combined with road and bridge projects.

OPTION 4: ALL INTERVENTIONS

Option 4 included all interventions described in Options 1 through 3.

OTHER CONSIDERATIONS: EMERGENCY ACCESS AND RESILIENCY

In addition to the options described above, the LAND Steering Group evaluated emergency access during an event and potential resiliency measures to speed recovery after a flood. Those recommendations have been included in the recommended LAND Alternative, described in Chapter 4.

Community Feedback and Steering Group Recommendations

The LAND Steering Group reviewed feedback from the Community Priorities Workshop in January 2023, information gathered through the community briefings and technical analysis to determine the key elements to carry forward in the LAND Alternative. In March 2023, the LAND Steering Group reached consensus (with all nine members in agreement) to move forward with what was originally called “Option Four: All Interventions,” as presented and discussed in the Community Prioritization Workshop in January 2023. The LAND Alternative was presented to the Chehalis Basin Board in April 2023. The Land Alternative is Described in Chapter 4.

