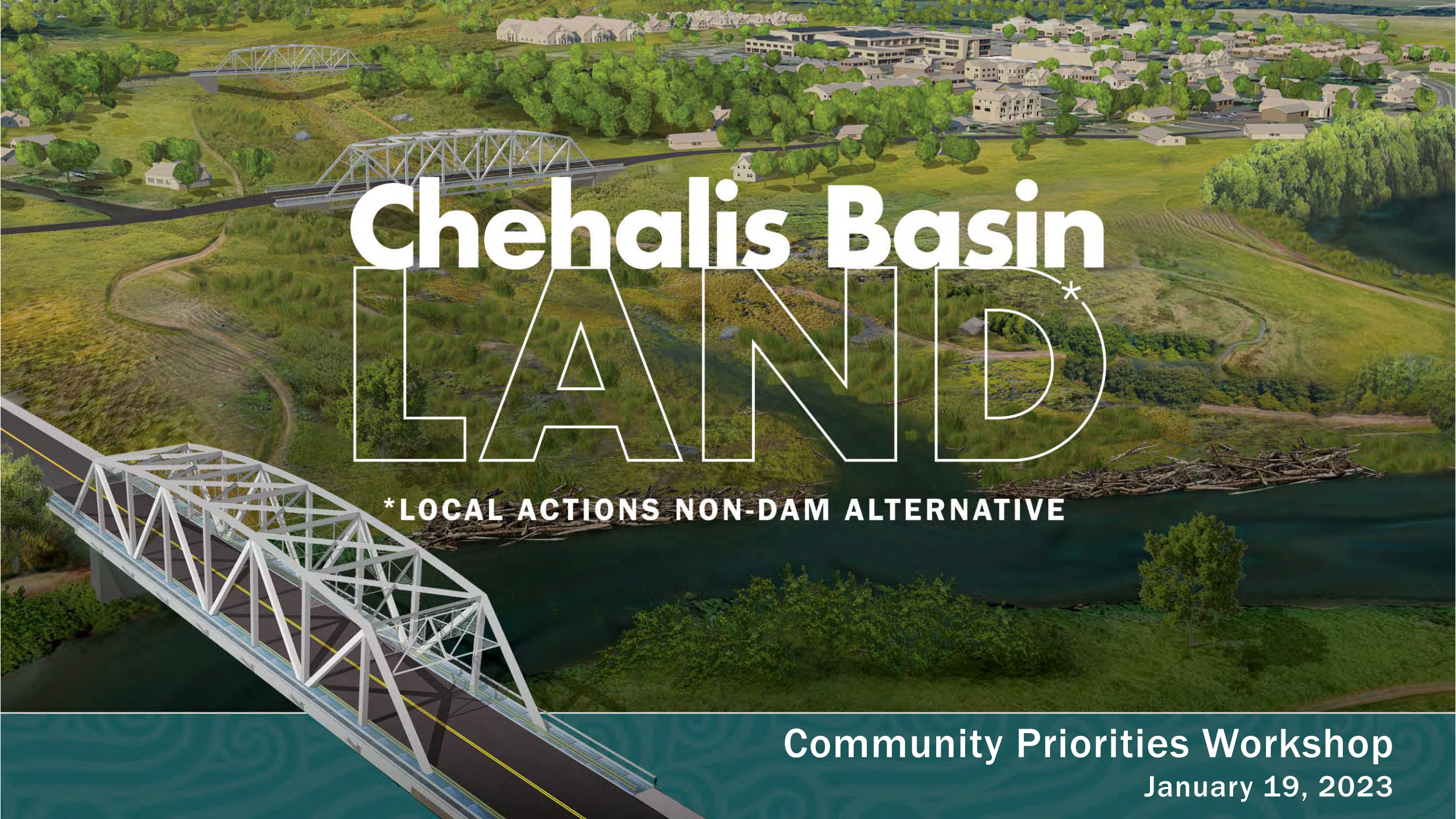


Community Priorities Workshop

January 19, 2023

WELCOME!

Chehalis Basin LAND

WELCOMING REMARKS!

Chehalis Tribal Chairman: Dustin Klatush

LAND Steering Group Co-Chairs: Todd Chaput and Glen Connelly

Office of Chehalis Basin Director: Andrea Doyle

LONG-TERM RESILIENCE & VITALITY

Large & Small Scale

- **Flood Solutions**
- **Aquatic Species Restoration**

CHEHALIS BASIN STRATEGY

HOW THE CHEHALIS BASIN STRATEGY WORKS

Collaborative governance in action

Integrated approach to flood & fish

Immediate action AND long-range planning, at many scales

CHEHALIS BASIN STRATEGY

SMART INVESTMENTS THAT ARE ALREADY WORKING

Evacuation routes and early flood **warning systems**

Flood protections for homes, businesses & critical infrastructure

Raised farm pads that safeguard farms, livestock and farm equipment

Fish passage barrier corrections opening up 100+ miles of salmon and steelhead

60+ habitat restoration projects

WORKSHOP AGENDA

I. Welcome and Introduction

II. Community-Based Flood Protection for the Communities of the Chehalis River Basin: Building the "No Dam" Alternative

III. Discussion Groups: Identifying the Advantages and Disadvantages of the Four Options

Break . . .

IV. Discussion Group Reports

V. Large Group Review of Potential Resiliency Program Elements

VI. Wrap-Up and Next Steps . . .

Close . . .

PRESENTATION OVERVIEW

Building the “No Dam” Alternative . . .

Four Options for Reducing Flood Damage Based on the Hydrologic Modeling Results

Economic Development Opportunities

Funding Sources and Project Delivery Options

Resiliency Program Elements

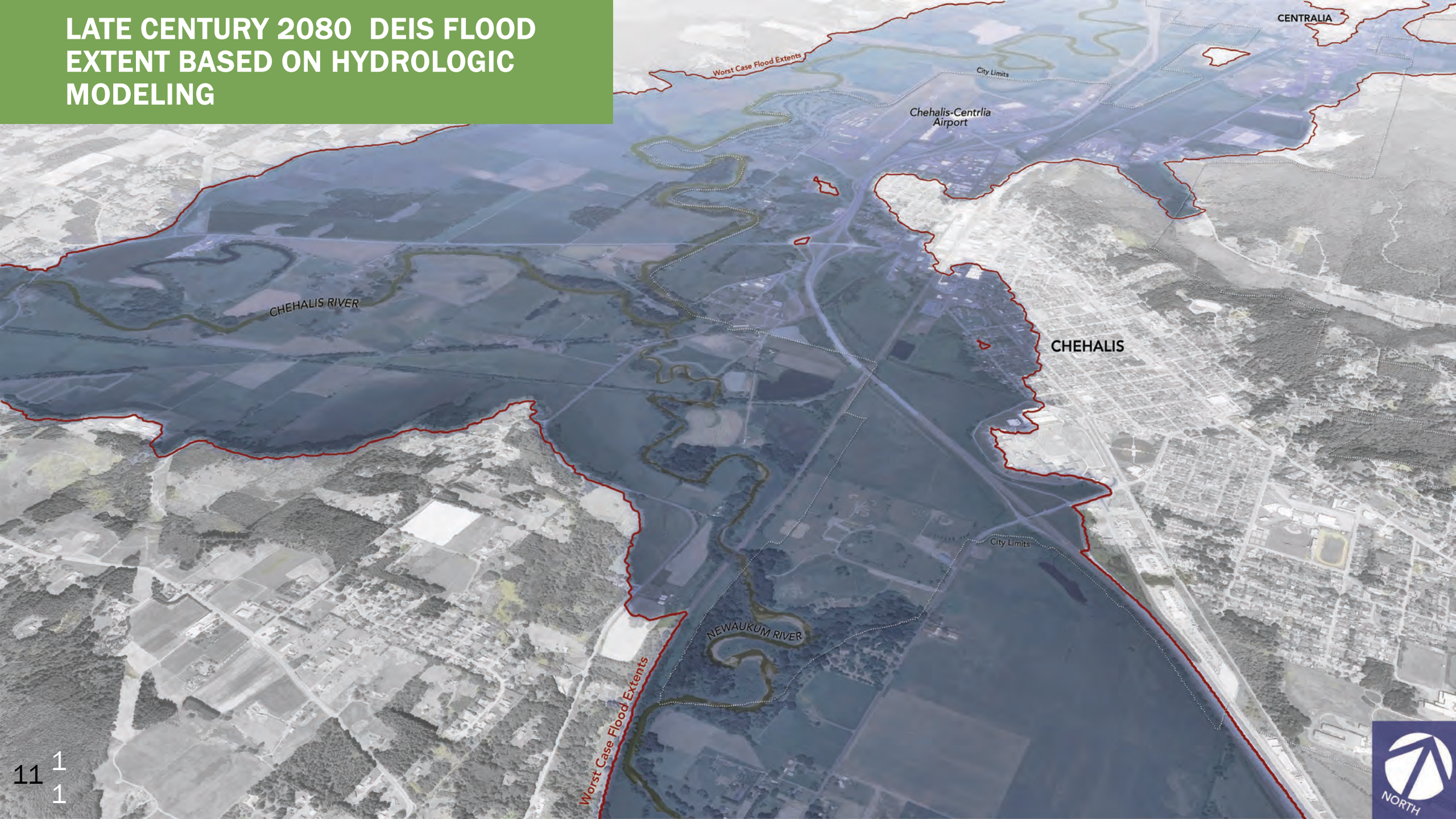
BUILDING THE "NO DAM" ALTERNATIVE

Chehalis Basin LAND

CHEHALIS BASIN TODAY

CENTRALIA
City Limits
Chehalis-Centrlia Airport
CHEHALIS
City Limits
NEWAUKUM RIVER
NORTH

LATE CENTURY 2080 DEIS FLOOD EXTENT BASED ON HYDROLOGIC MODELING



Can we reduce catastrophic flood damage in the Chehalis Basin without building a dam?

Why are we taking yet another look at this . . . . . haven't we studied this enough?

A

We have new information,
and new ideas,
to justify taking a
fresh look!

THE “NO DAM” ALTERNATIVE PLANNING PROCESS

1.
Determine the target level of protection

2.
Determine the mix of new infrastructure, flood proofing, etc.

3.
Determine how much can be achieved through floodplain restoration

4.
Identify future economic development opportunities

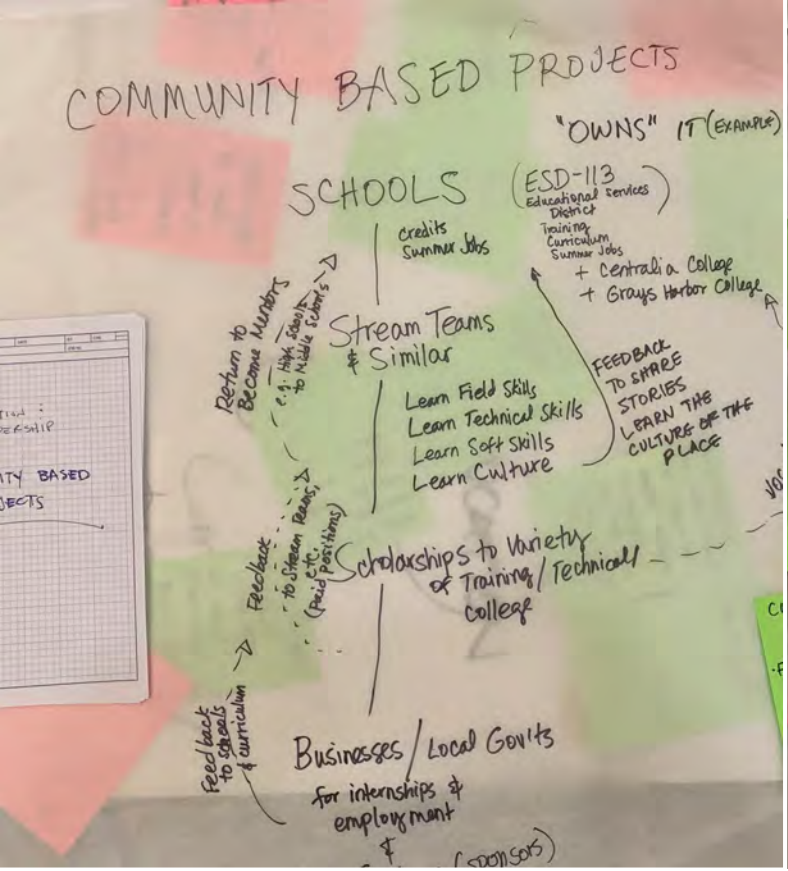
5.
Identify potential funding and project delivery methods

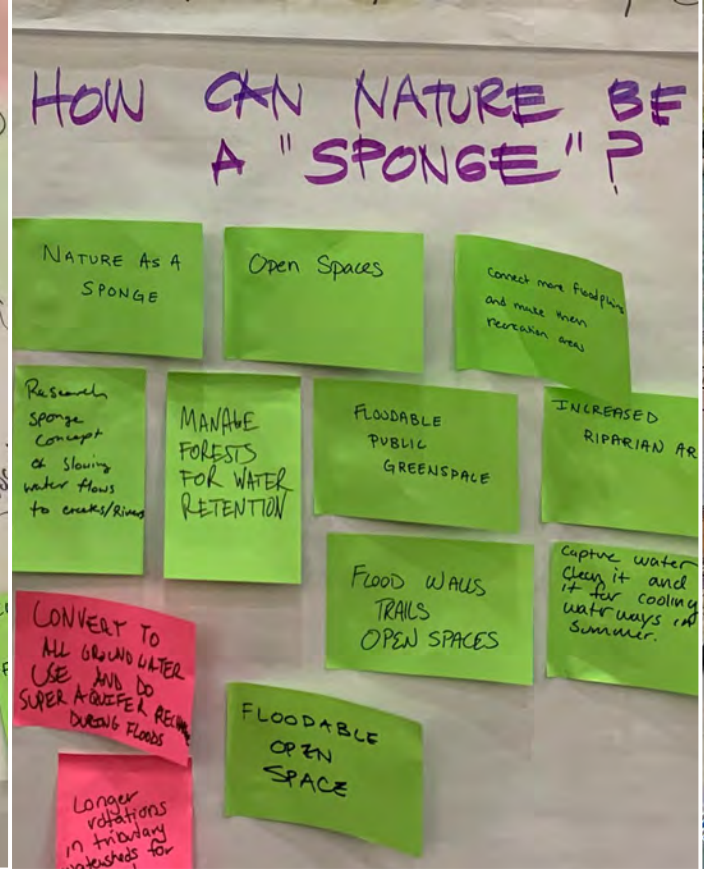
COMMUNITY VALUES PLANNING WORKSHOP

Chehalis Basin LAND

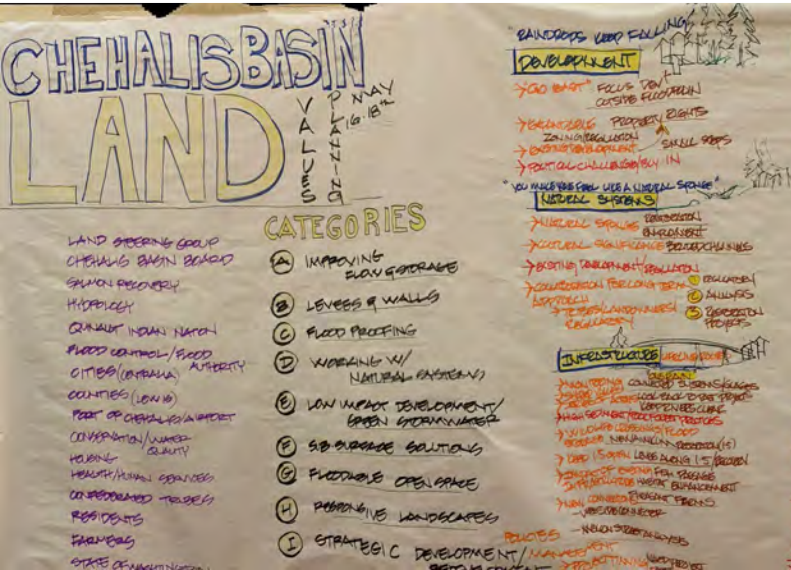
How Many Attended the Community Values Planning Workshop?

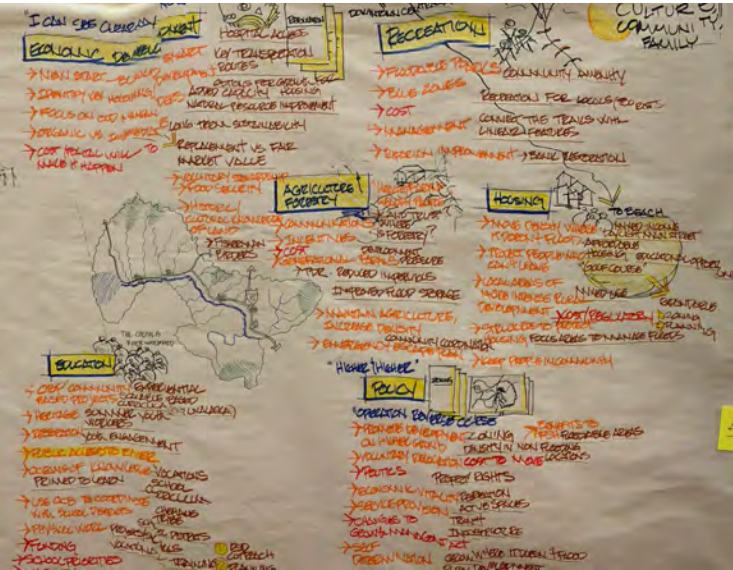

CHEHALIS BASIN
LAND
VALUES

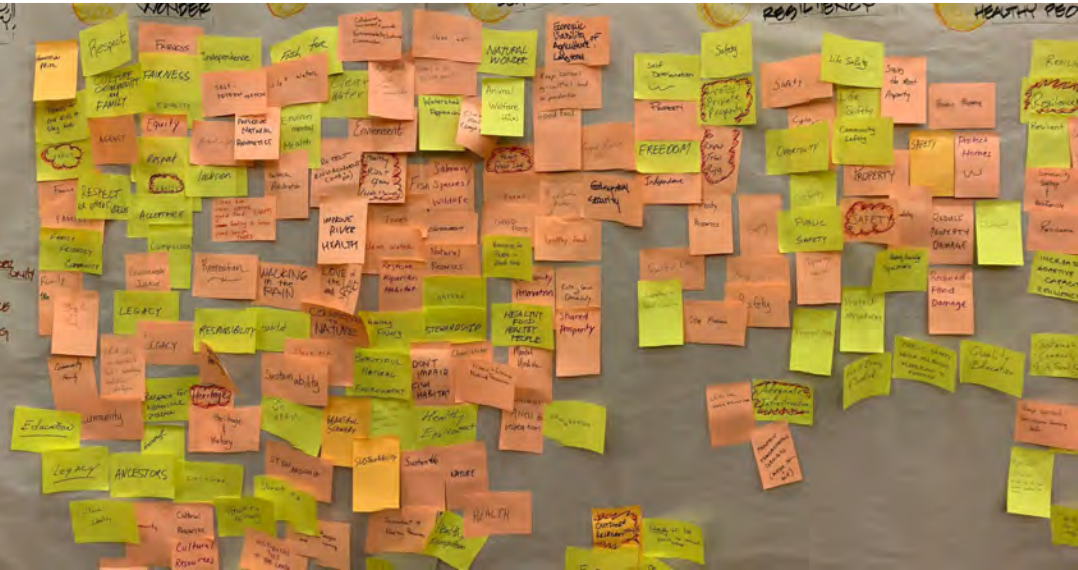

COMMUNITY BASED PROJECTS
"OWNS" IT (EXAMPLE)
SCHOOLS
(ESD-113 Educational Services District
Training
Curriculum
Summer Jobs
+ Centralia College
+ Grays Harbor College)
credits
Summer Jobs
Return to Become Mentors
Stream Teams & Similar
Learn Field Skills
Learn Technical Skills
Learn Soft Skills
Learn Culture
FEEDBACK TO SHARE STORIES
LEARN THE CULTURE OF THE PLACE
Feedback
Scholarships to Variety of Training/Technical/ college
Businesses/Local Govts
for internships & employment
Feed back to Goals & Curriculum


HOW CAN NATURE BE A "SPONGE"?
NATURE AS A SPONGE
Open Spaces
Connect more floodplains and make them recreation areas
Research sponge concept of slowing water flows to creeks/rivers
MANAGE FORESTS FOR WATER RETENTION
FLOODABLE PUBLIC GREENSPACE
INCREASED RIPARIAN AR
FLOOD WALLS TRAILS OPEN SPACES
Capture water cleans it and it for cooling waterways in summer.
CONVERT TO ALL GROUND WATER USE AND DO SUPER AQUIFER RECH DURING FLOODS
FLOODABLE OPEN SPACE
Longer rotations in triadway


MARKERS
FARM
HOME
HIGH GROUND
NATURA
UPLAND
AFFORDA
HOUSING
MANAGED


CHEHALIS BASIN LAND
CATEGORIES
A IMPROVING FLOW STORAGE
B LEVEES & WALLS
C FLOOD PROOFING
D WORKING W/ NATURAL SYSTEMS
E LOW IMPACT DEVELOPMENT/ GREEN STORMWATER
F SUB-SURFACE SOLUTIONS
G FLOODABLE OPEN SPACE
H RESTORATIVE LANDSCAPES
I STRATEGIC DEVELOPMENT/


DEVELOPMENT
ECOLOGY
RECREATION
AGRICULTURE
HOUSING
EDUCATION
POLICY
INFRASTRUCTURE



RESULTS OF THE COMMUNITY PLANNING VALUES WORKSHOP

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.

RESULTS OF THE COMMUNITY PLANNING VALUES WORKSHOP

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

Healthy Environment/Healthy People:
We envision a solution that prioritizes the well-being of our people and our environment.

GUIDING PRINCIPLES FOR THE NO-DAM ALTERNATIVE

Chehalis Basin LAND

GUIDING PRINCIPLES

1. **All properties that might be adversely affected by any of the LAND Alternative flood protection interventions will 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 will be compensated fairly,** assuming pre-disaster conditions, for voluntary relocations or property acquisition using funds that supplement public funding sources, to the extent feasible.
3. **Site selection and site planning for any designated "receiving areas" will be guided by the local communities,** applying a combination of local codes, quality design standards, and community input governing each receiving area.

GUIDING PRINCIPLES

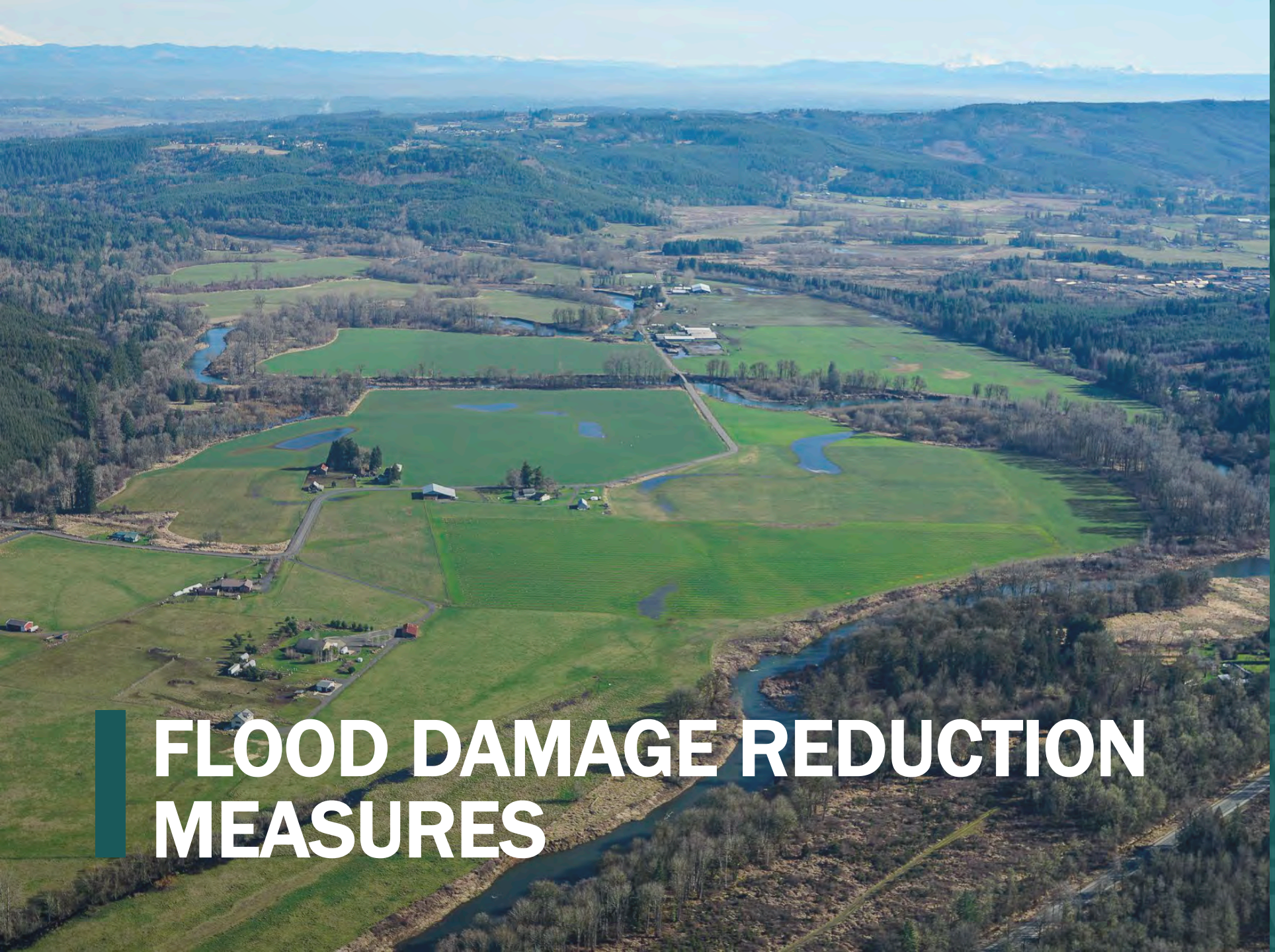
4. **To the greatest degree practicable, proposed flood protection measures will be locally led** and based on reasonable cost/benefit assumptions with consideration for all impacted property owners and tenants at all income levels.

5. **Implementation of proposed flood protection strategies and solutions will 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 will include a prioritized list of actions to reduce flood damage for property owners and tenants**. Some **in the short term (0 to 5 years), medium term (5-10 years), and long term (10+ years),** while some measures will be required throughout the entire life of the project.

GUIDING PRINCIPLES

7. **All proposed flood protection measures will be consistent with the goals of the Aquatic Species Restoration Plan (ASRP)** and will be designed to minimize impacts to 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 will 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 will be designed to support community economic vitality** throughout the Chehalis River Basin.



FLOOD DAMAGE REDUCTION MEASURES

Chehalis Basin LAND

FLOOD DAMAGE REDUCTION MEASURES

Structural Interventions:

- Dams
- Floodwalls and levees (>6 feet)
- River channel diversions

Non-Structural Interventions:

- Floodproofing, elevating, and/or relocating homes and businesses
- Floodplain storage
- Berms and floodwalls (<6 feet)
- Local land use planning and building codes
- Resiliency programs, e.g., flood warning systems, emergency preparedness plans, equipment pre-positioning, etc.

BUILDING THE “NO DAM” ALTERNATIVE

OPTION 1: ”Safe” Structures and Floodplain Management

OPTION 2: Waterflow Diversion and Improved Conveyance

OPTION 3: New and Expanded Levees

OPTION 4: All Interventions

BUILDING THE "NO DAM" ALTERNATIVE . . .

Through a Combination of Structural (S) and Non-Structural (NS) interventions

OPTION 1
Safe Structures & Floodplain Management

NS

OPTION 2
Option 1 + Waterflow Diversion and Conveyance

NS

+S

OPTION 3
Option 1 + New and Expanded Levees

NS

+S

OPTION 4
All Interventions

NS

+S

+S

	OPTION 1: Safe Structures & Floodplain Management	**OPTION 2:** Waterflow Diversion and Conveyance	**OPTION 3:** New and Expanded Levees	**OPTION 4:** All Interventions
Non-Structural Interventions				
Safe Structures				
Land Use Planning				
Econ Dev. Opportunities				
Mitigation/Restoration				
Resiliency				
Structural Interventions				
Diversion				
Improved Conveyance				
Roads and Bridges				
Levees and Floodwalls				
China Creek Daylighting				

	OPTION 1: Safe Structures & Floodplain Management	**OPTION 2:** Waterflow Diversion and Conveyance	**OPTION 3:** New and Expanded Levees	**OPTION 4:** All Interventions
Non-Structural Interventions				
Safe Structures				
Land Use Planning				
Econ Dev. Opportunities				
Mitigation/Restoration				
Resiliency				
Structural Interventions				
Diversion				
Improved Conveyance				
Roads and Bridges				
Levees and Floodwalls				
China Creek Daylighting				

	OPTION 1: Safe Structures & Floodplain Management	**OPTION 2:** Waterflow Diversion and Conveyance	**OPTION 3:** New and Expanded Levees	**OPTION 4:** All Interventions
Non-Structural Interventions				
Safe Structures				
Land Use Planning				
Econ Dev. Opportunities				
Mitigation/Restoration				
Resiliency				
Structural Interventions				
Diversion				
Improved Conveyance				
Roads and Bridges				
Levees and Floodwalls				
China Creek Daylighting				

	OPTION 1: Safe Structures & Floodplain Management	**OPTION 2:** Waterflow Diversion and Conveyance	**OPTION 3:** New and Expanded Levees	**OPTION 4:** All Interventions
Non-Structural Interventions				
Safe Structures	■	■	■	■
Land Use Planning	■	■	■	■
Econ Dev. Opportunities	■	■	■	■
Mitigation/Restoration	■	■	■	■
Resiliency	■	■	■	■
Structural Interventions				
Diversion		■		
Improved Conveyance		■		
Roads and Bridges		■	■	
Levees and Floodwalls			■	
China Creek Daylighting			■	

	OPTION 1: Safe Structures & Floodplain Management	**OPTION 2:** Waterflow Diversion and Conveyance	**OPTION 3:** New and Expanded Levees	**OPTION 4:** All Interventions
Non-Structural Interventions				
Safe Structures	■	■	■	■
Land Use Planning	■	■	■	■
Econ Dev. Opportunities	■	■	■	■
Mitigation/Restoration	■	■	■	■
Resiliency	■	■	■	■
Structural Interventions				
Diversion		■		■
Improved Conveyance		■		■
Roads and Bridges		■	■	■
Levees and Floodwalls			■	■
China Creek Daylighting			■	■

OPTION 1: SAFE STRUCTURES & FLOODPLAIN MANAGEMENT

Chehalis Basin LAND

OPTION 1: SAFE STRUCTURES & FLOODPLAIN MANAGEMENT

- Implement a “flood safe structures” program throughout the Chehalis Basin.
- Recreate natural floodplains where feasible to restore natural geomorphic river flows and increase flood water storage capacity.

THE FLOOD SAFE STRUCTURES CONTINUUM

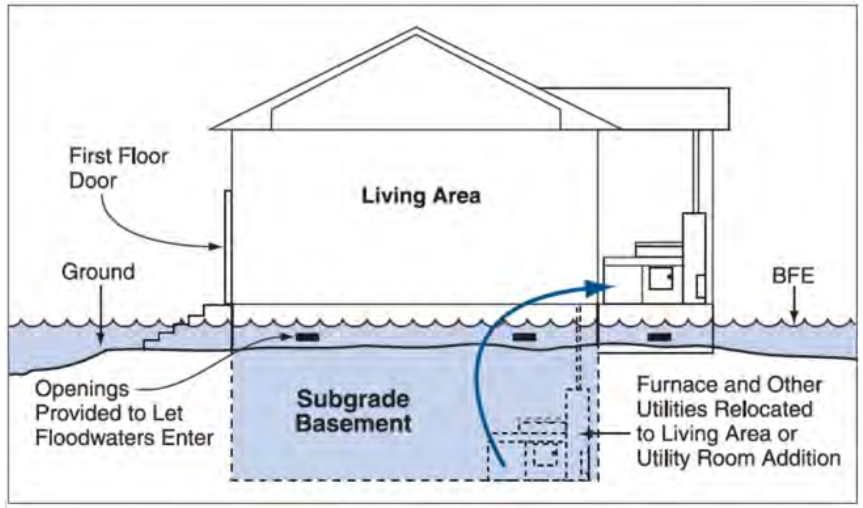
Level 1: Flood Insurance

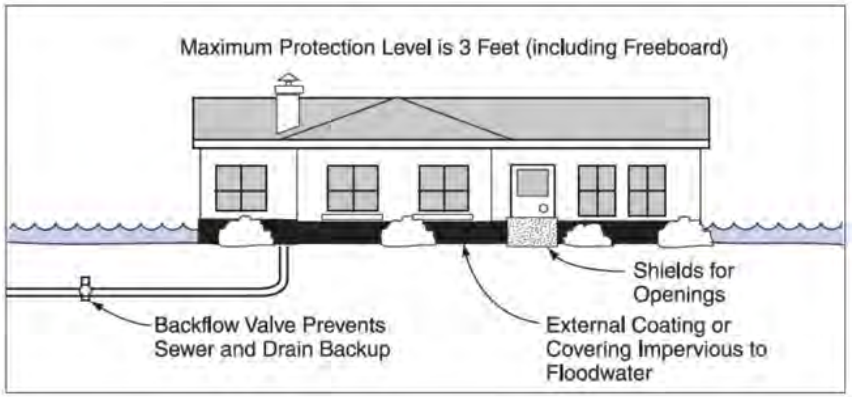
Level 2: Utility Relocation

Level 3: Floodproofing (both wet and dry)

Level 4: Structure Elevation

Level 5: Voluntary buy-out with fair compensation and relocation assistance for homeowners and tenants





OPTION 1: SAFE STRUCTURES & FLOODPLAIN MANAGEMENT

OPTION 1: SAFE STRUCTURES & FLOODPLAIN MANAGEMENT

Maximize floodplain restoration, where feasible, that also allows existing agriculture to operate.

Late Century 2080 Flood Extent

City Limits

Chehalis-Centrlia Airport

CENTRALIA

Increase access to the river using floodable parks, trails, and other open space

CHEHALIS RIVER

CHEHALIS

Improve riparian areas along rivers and streams

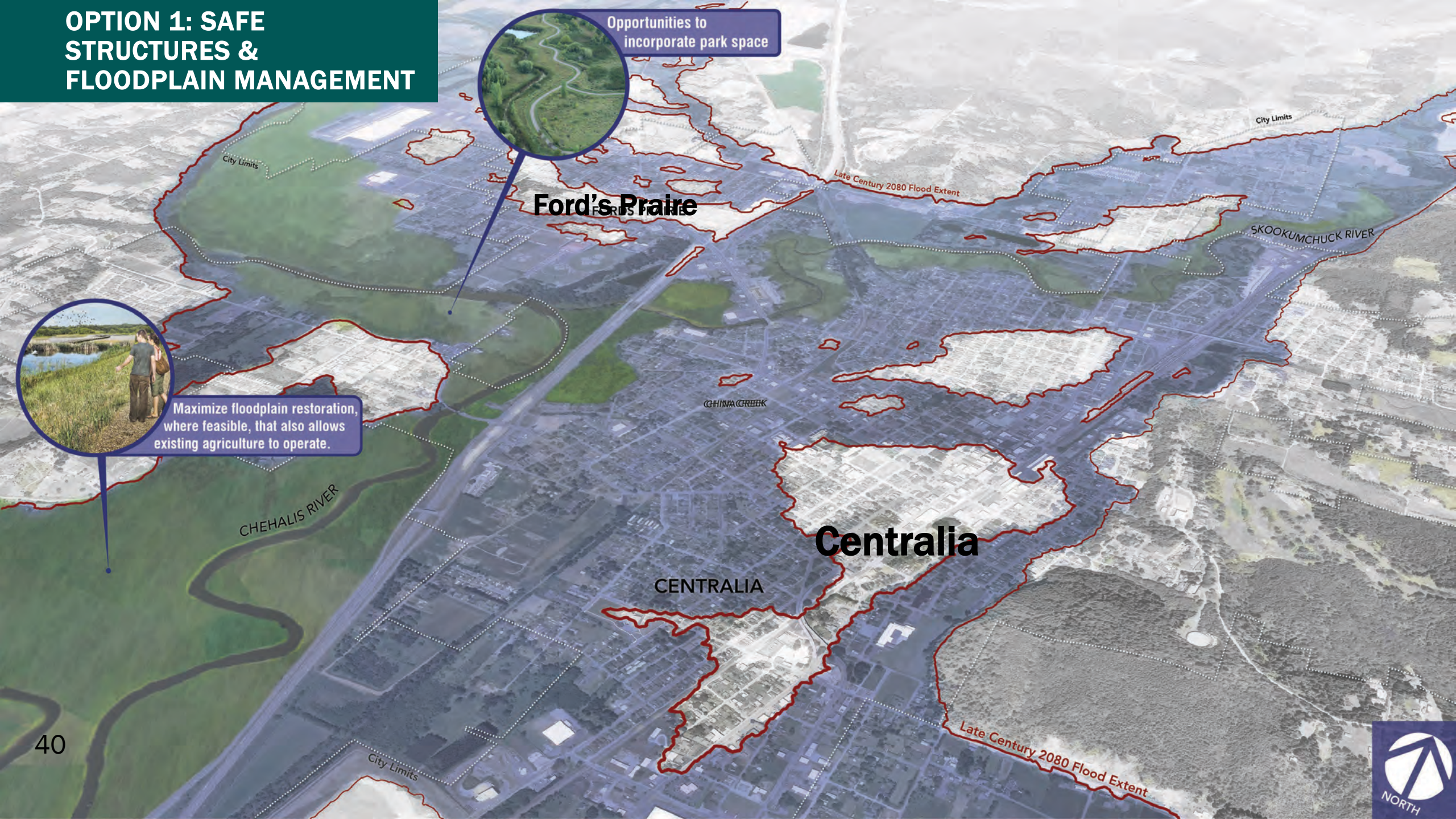
City Limits

NEWAUKUM RIVER

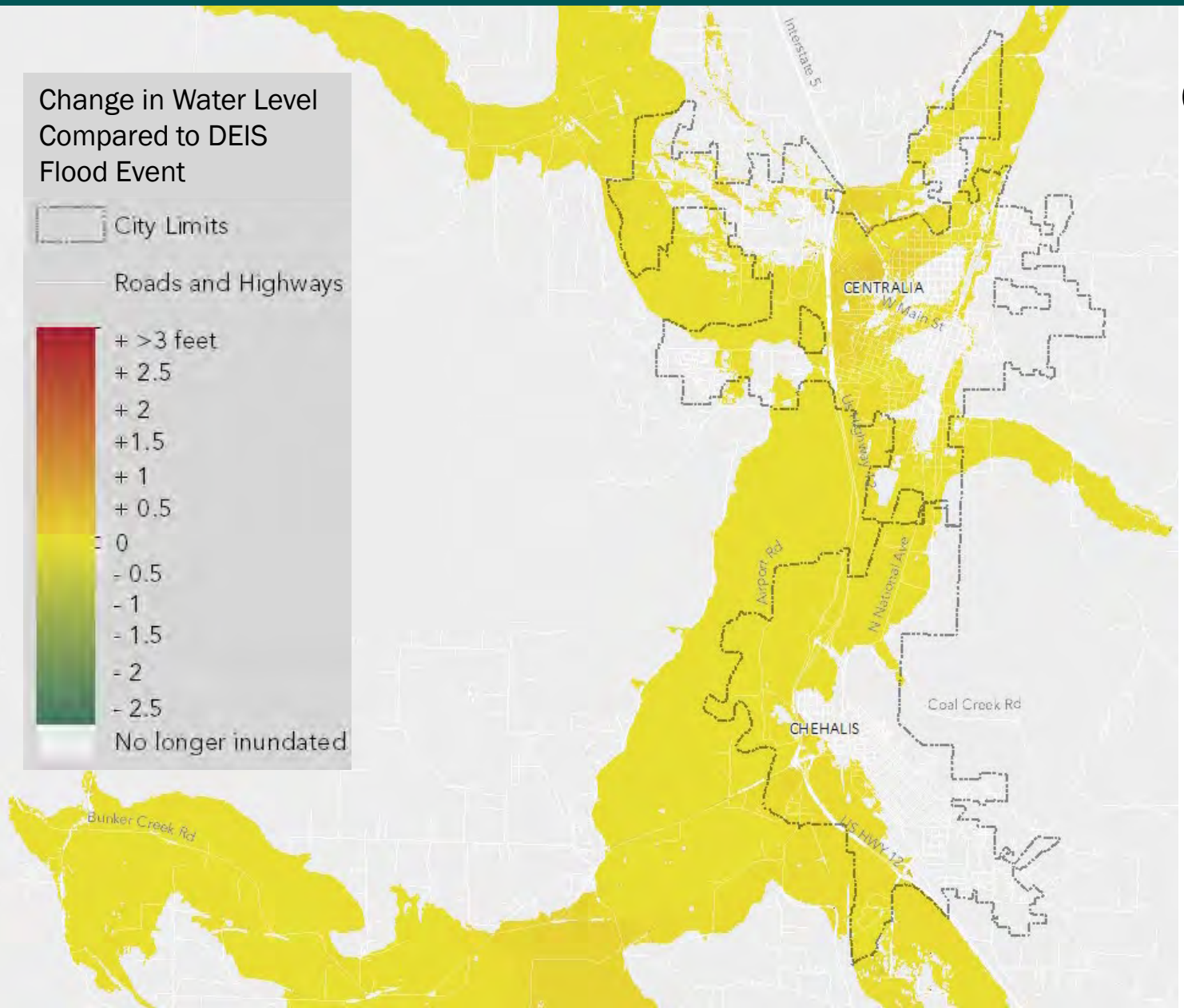
Late Century 2080 Flood Extent

NORTH

OPTION 1: SAFE STRUCTURES & FLOODPLAIN MANAGEMENT

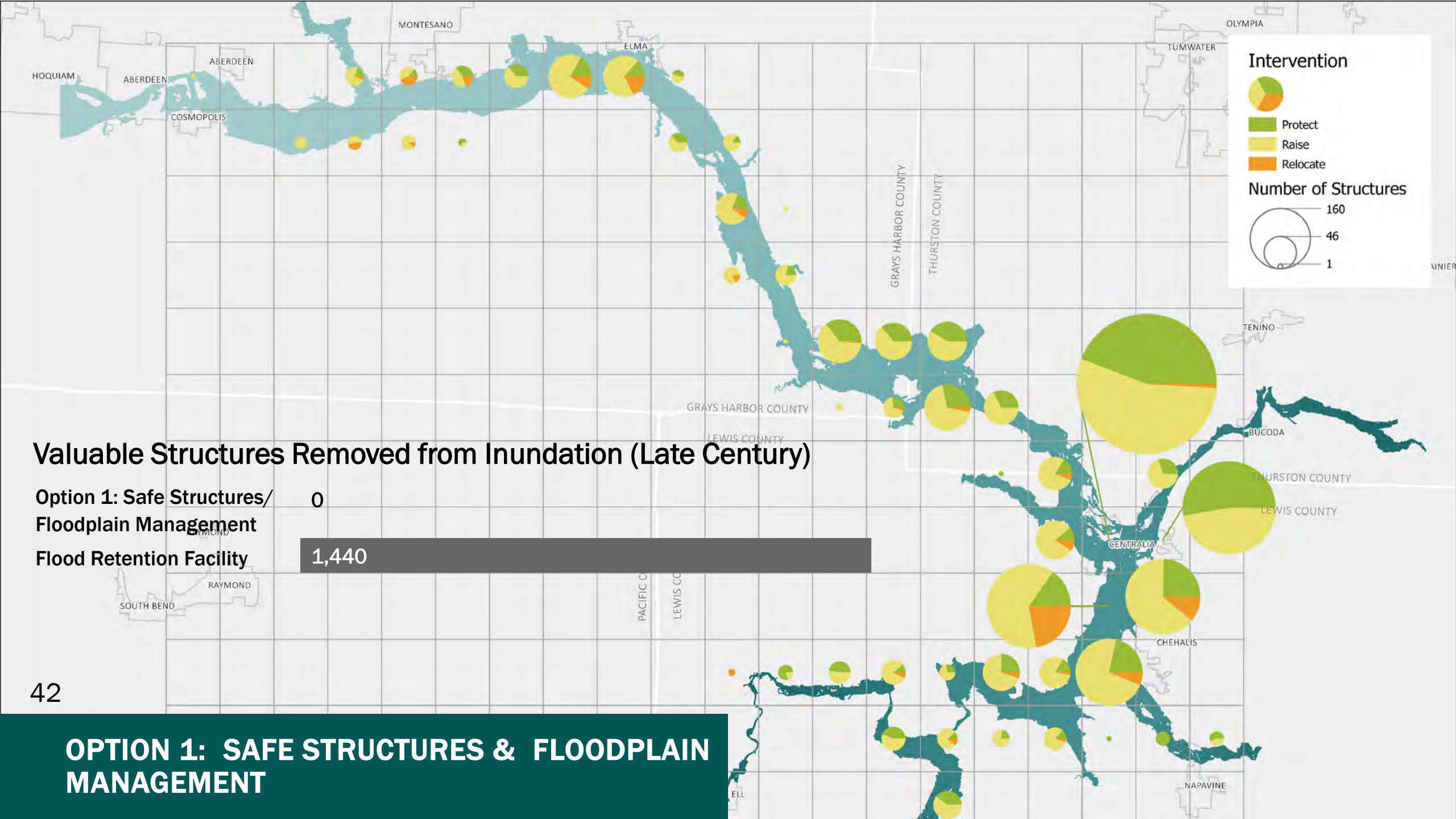


OPTION 1: DEPTH AND EXTENT OF INUNDATION



Option 1:

- No change in the level of inundation compared to the DEIS 2080 Late Century storm event

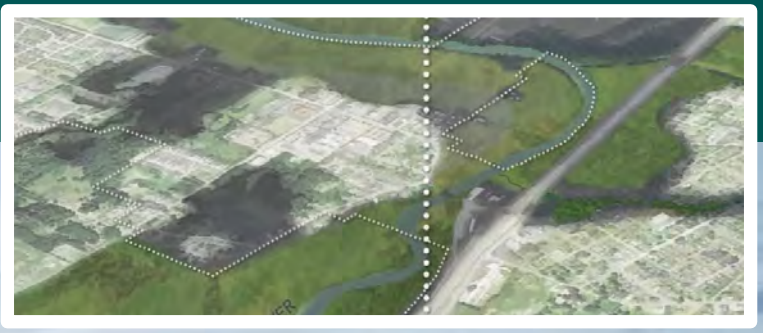


Valuable Structures Removed from Inundation (Late Century)

Option 1: Safe Structures/ Floodplain Management	0
Flood Retention Facility	1,440

OPTION 1: SAFE STRUCTURES & FLOODPLAIN MANAGEMENT

FLOODPLAIN NORTH OF HOSPITAL



FLOODPLAIN RESTORATION/MITIGATION

RESTORATION: FLOODED CONDITION

OPTION 1: SAFE STRUCTURES & FLOODPLAIN MANAGEMENT

Pros:

- Provides potential benefits to local landowners who decide to restore the floodplain on their properties using project assistance grant funding
- Supports flood relief for relatively “lite” storm events
- Provides potential overall environmental benefits
- Encourages adoption of flood-friendly land use and building codes

Cons:

- These measures by themselves do not reduce flood inundation levels for major storm events

OPTION 2: WATERFLOW DIVERSION AND IMPROVED CONVEYANCE

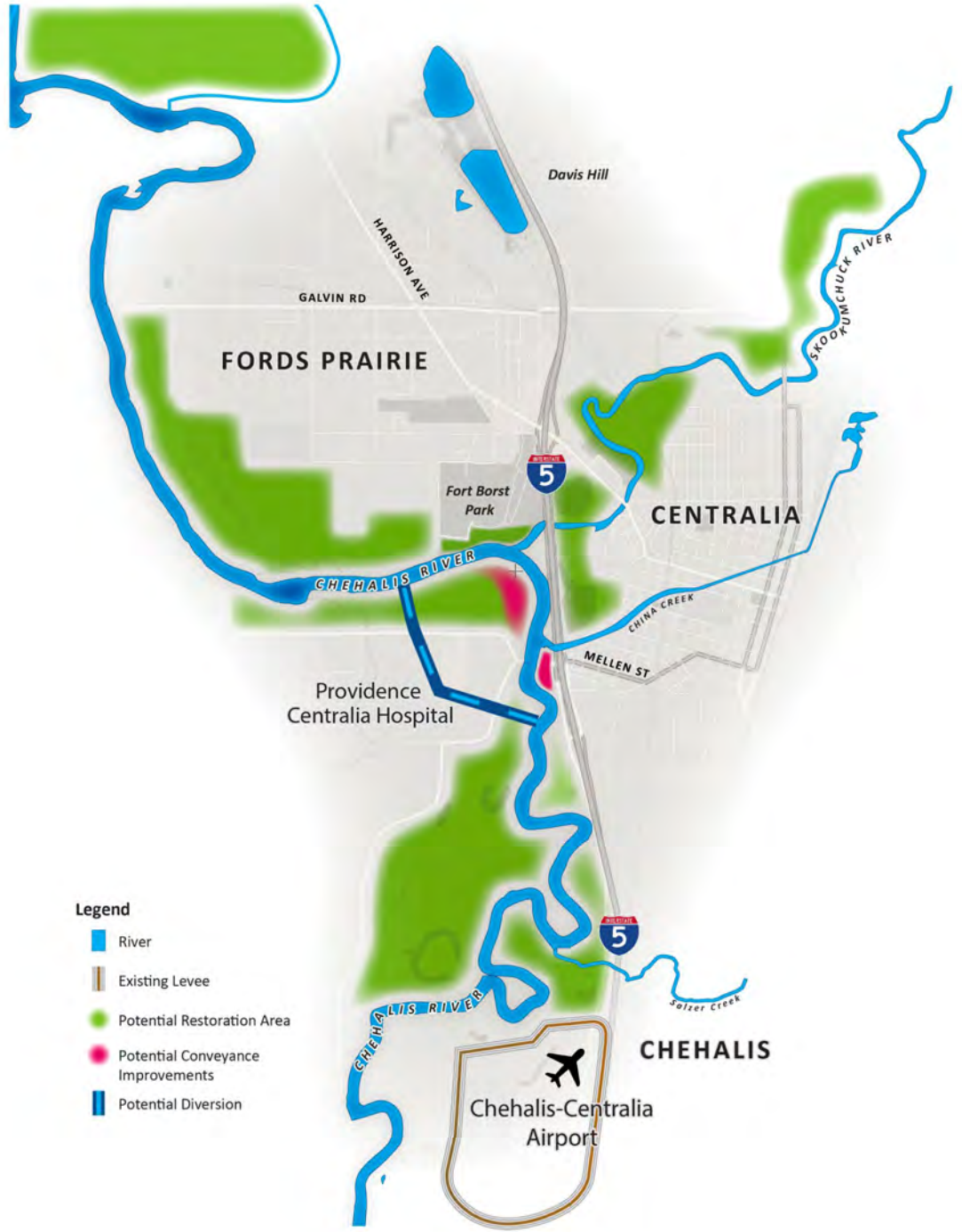
Chehalis Basin LAND

OPTION 2: WATERFLOW DIVERSION AND IMPROVED CONVEYANCE

- Construct a new 700-foot-wide, one-mile, long water diversion by excavating approximately 1.3 million cubic yards of soil west of the existing Mellen Street.
- Remove the Existing Mellen Street Bridge and reconstruct it approximately 2,000 feet to the south to connect to Military Road, west of the Chehalis River and I-5.
- Increase conveyance near the existing Mellen Street Bridge by removing approximately 1.3 million cubic yards of soil immediately upstream and for approximately 3,000 feet downstream of the existing Mellen Street Bridge.

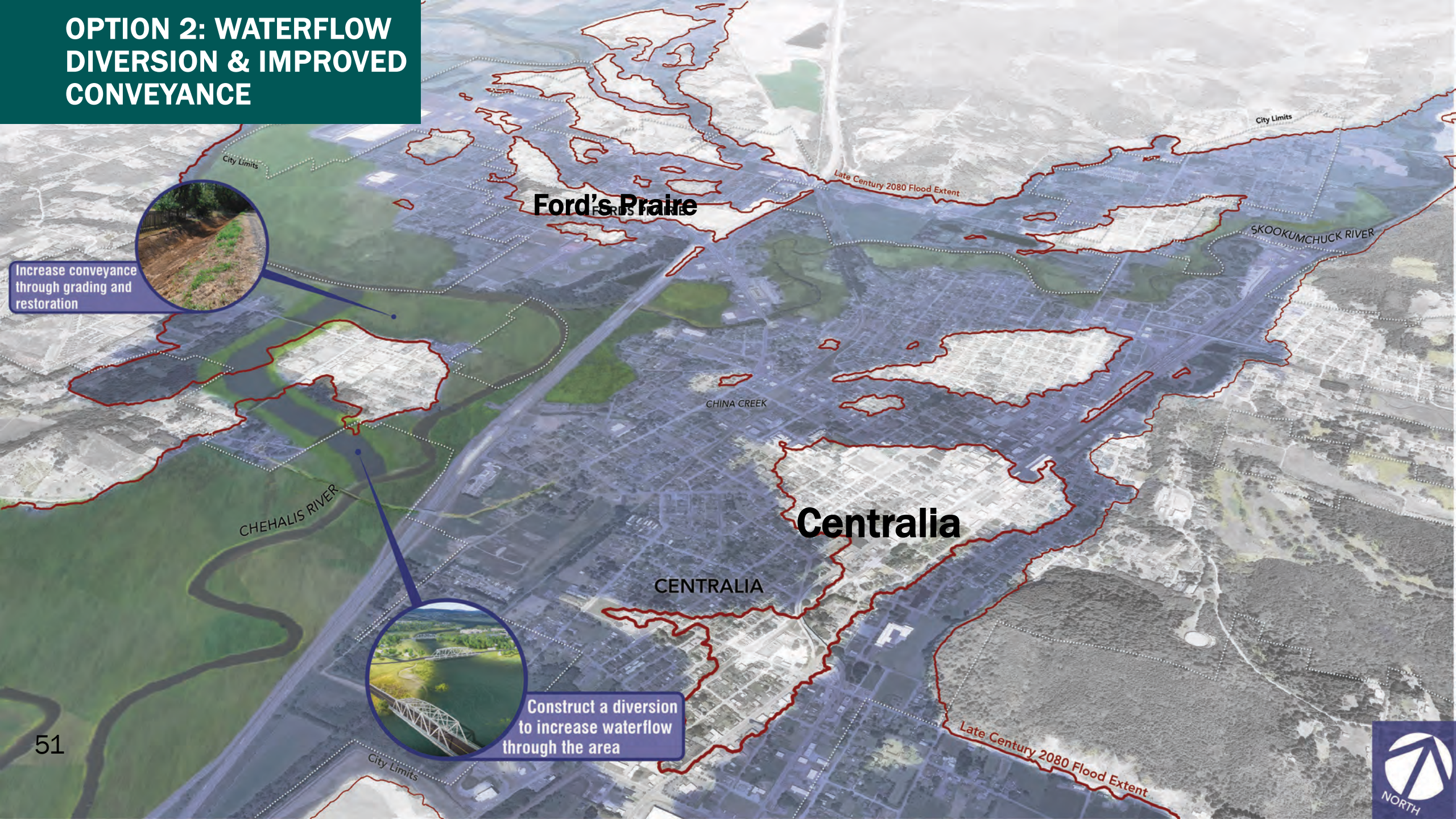
There are documented cultural resources in the vicinity of the Mellen Street Bridge that must be evaluated prior to any ground disturbance.

OPTION 2: WATERFLOW DIVERSION AND IMPROVED CONVEYANCE

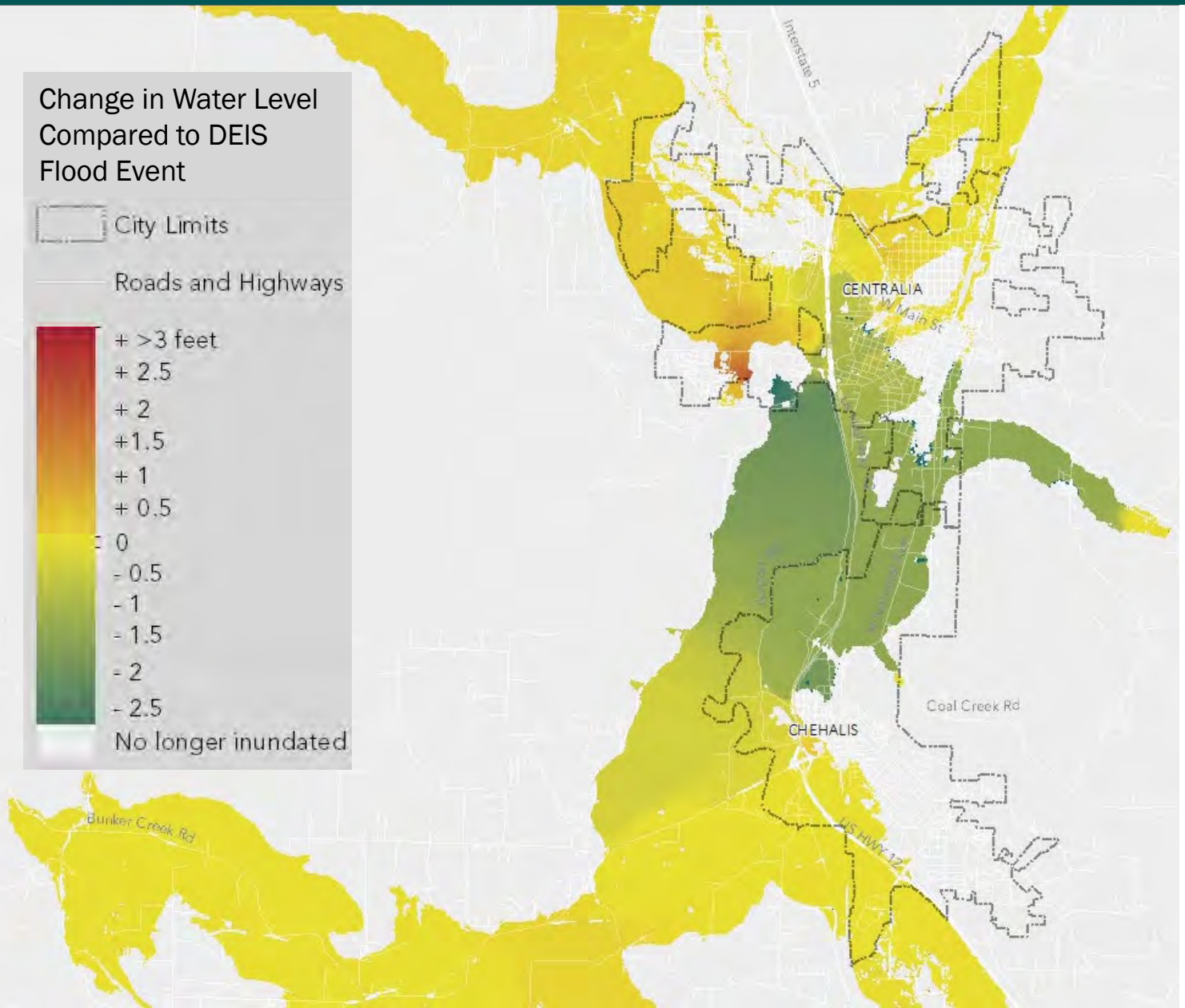


OPTION 2: WATERFLOW DIVERSION AND IMPROVED CONVEYANCE

OPTION 2: WATERFLOW DIVERSION & IMPROVED CONVEYANCE

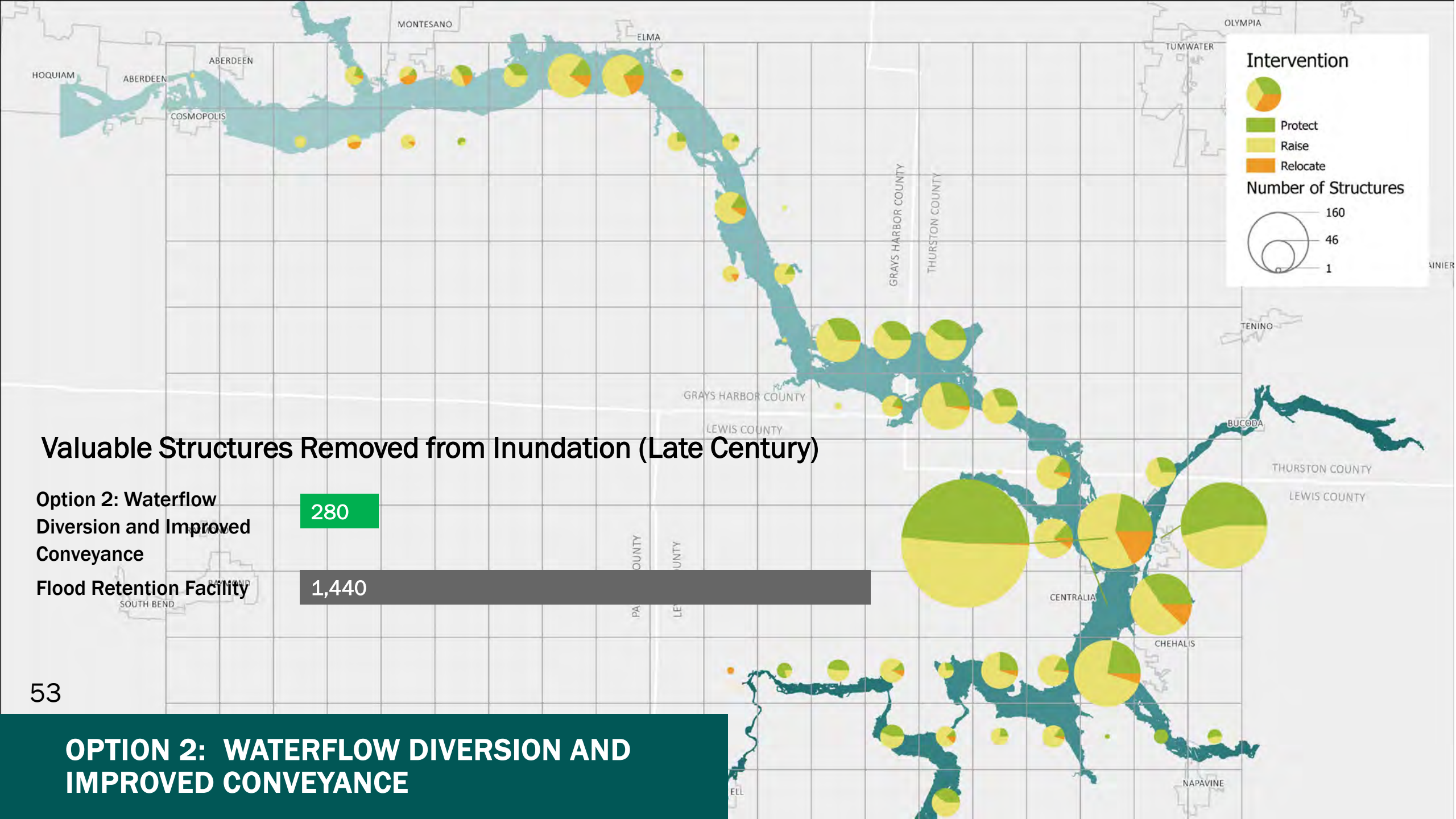


OPTION 2: DEPTH AND EXTENT OF INUNDATION



Option 2:

- Reduces flooding extents and lowered water surface elevation (WSE) for:
  - Skookumchuck River
  - China and Salzer Creeks
  - Chehalis River upstream of Mellen Street
  - Minor improvements for the Newaukum River
- Increased WSE by tenths of feet on the Chehalis River downstream of Mellen Street Bridge

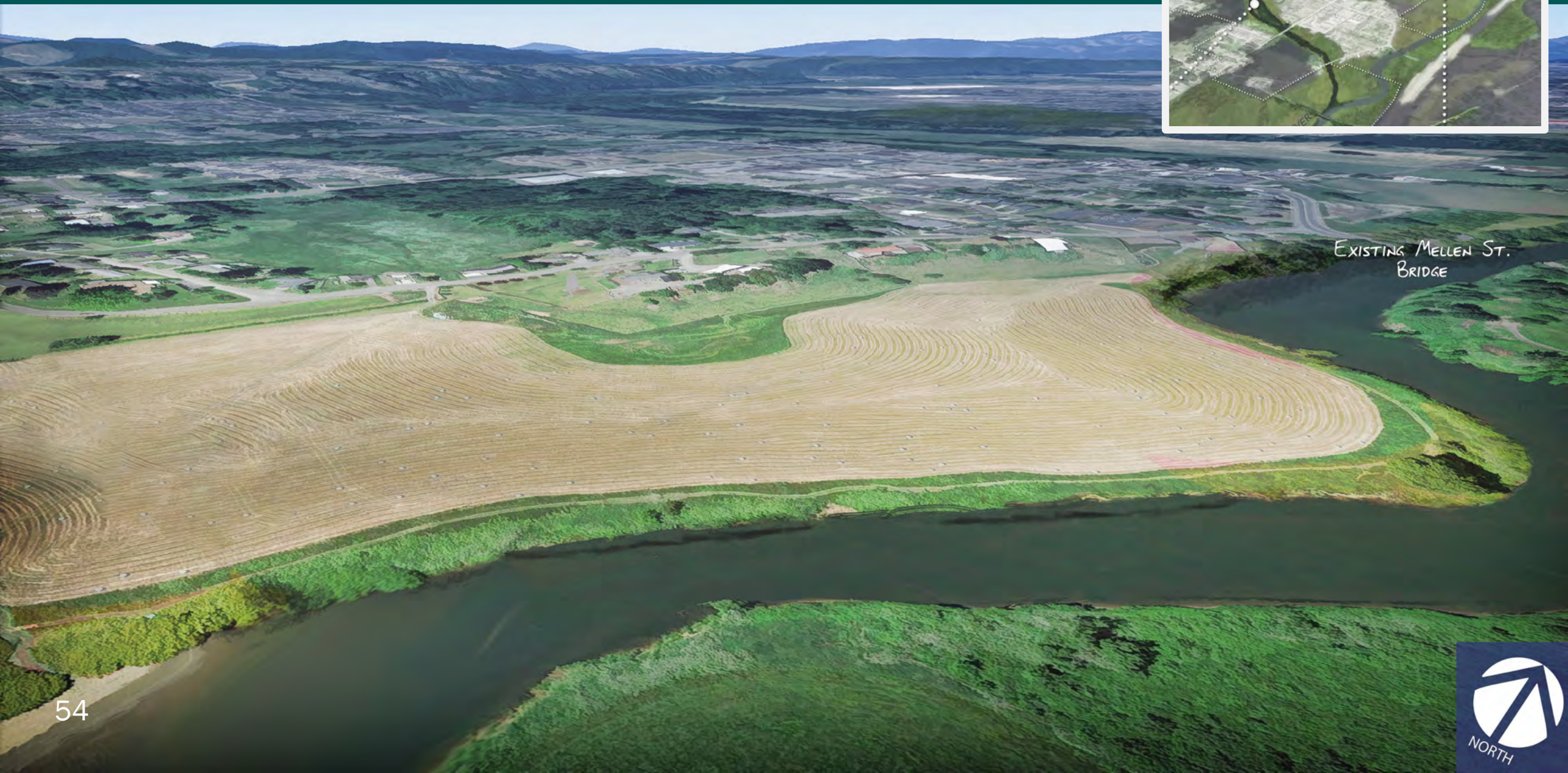


Valuable Structures Removed from Inundation (Late Century)

Option 2: Waterflow Diversion and Improved Conveyance	280
Flood Retention Facility	1,440

OPTION 2: WATERFLOW DIVERSION AND IMPROVED CONVEYANCE

MELLEN STREET-TODAY



MELLEN STREET DIVERSION

MELLEN STREET DIVERSION

DIVERSION-DOWNSTREAM

DIVERSION AND CONVEYANCE-DURING EVENT (OPTION 2)

DIVERSION AND CONVEYANCE-DURING EVENT (WITH LEVEE)

DIVERSION EXAMPLES – VEGETATED WIDE CHANNEL – THORNTON CREEK - SEATTLE

DIVERSION EXAMPLES – NAPA RIVER

Source: San Francisco Chronicle

PLACEMAKING – CITY OF NAPA, NAPA VALLEY

Source: SFGate

MAKING ROOM FOR RIVERS – THE NETHERLANDS

Image Credit: H+N+S

MAKING ROOM FOR RIVERS – THE NETHERLANDS

Image Credit: Johan-Roerink

CEDAR RIVER – CEDAR RAPIDS, IOWA

OPTION 2: WATERFLOW DIVERSION & IMPROVED CONVEYANCE

Pros:

- Reduces impacts to structures
- Results in fewer construction-related impacts compared to levees
- Provides significant economic development benefits
- Reduces impacts during catastrophic flood events
- Encourages adoption of flood-friendly land use and building codes

Cons:

- Documented cultural resources in the vicinity of the Mellen Street Bridge must be evaluated prior to any ground disturbance.
- Provides less flood damage reduction compared to the levee concept (Option 3)
- Complex permitting, land acquisition and additional transportation costs
- Balancing cut and fill requirements (2.6M cubic yards of material)

OPTION 3: NEW AND EXPANDED LEVEES/FLOODWALLS

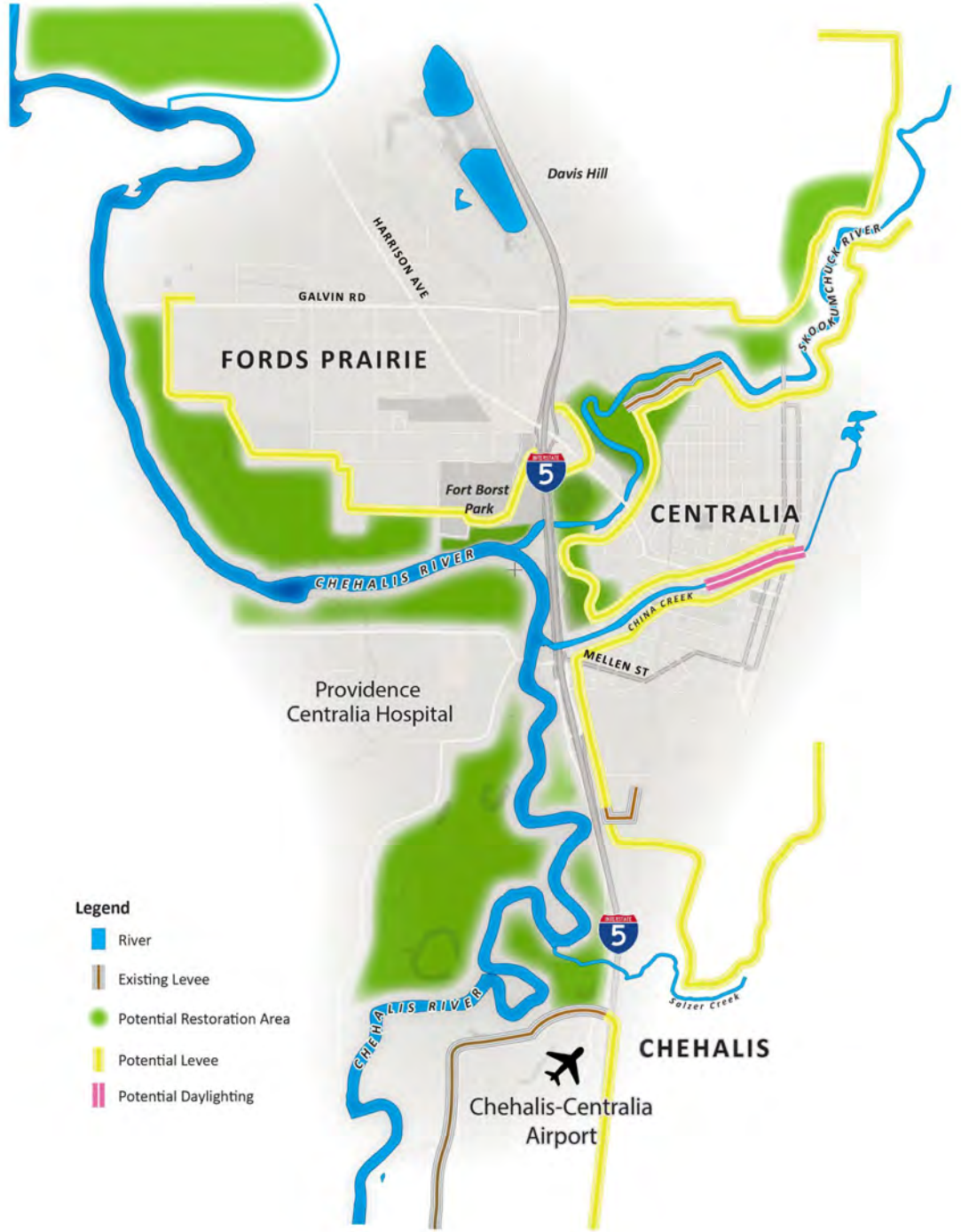
Chehalis Basin LAND

OPTION 3: NEW AND EXPANDED LEVEES/FLOODWALLS

Construct approximately 20.4 miles of new levees or expanded levees:

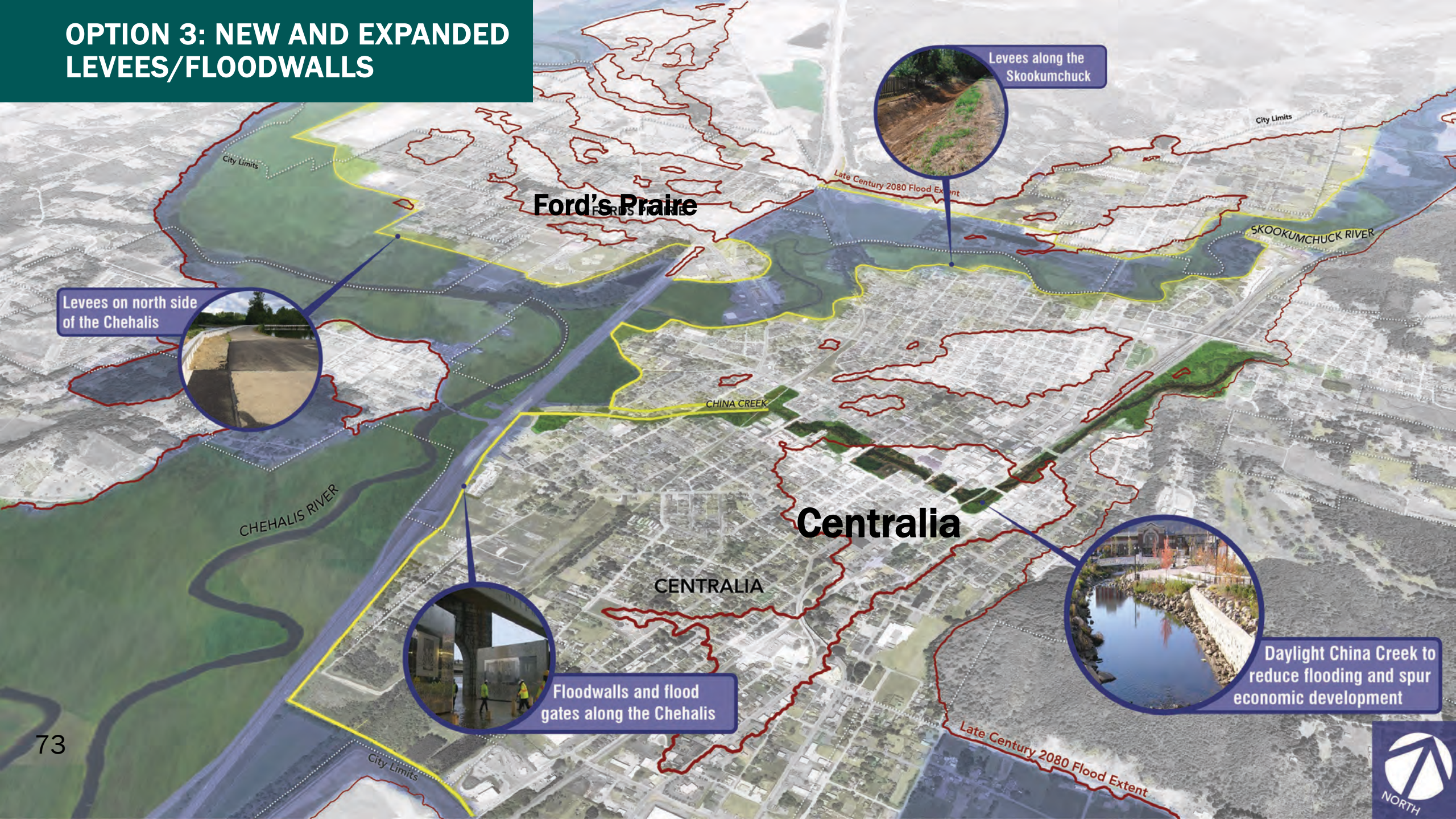
- New levee on the north bank of the Chehalis River from north of Fort Borst Park downstream to Galvin Road (2.7 miles)
- New levee on the east side of I-5 from China Creek south to Salzer Creek (3.3 miles)
- New and expanded levees on the north and south sides of the Skookum chuck River (6.6 miles)
- Expanded levee around the Chehalis-Centralia Airport (4.3 miles)
- New levee on the north bank of the Newaukum River east of I-5 near (1.2 miles)
- New levees on the north and south sides of China Creek from I-5 to the railroad tracks (2.3 miles)

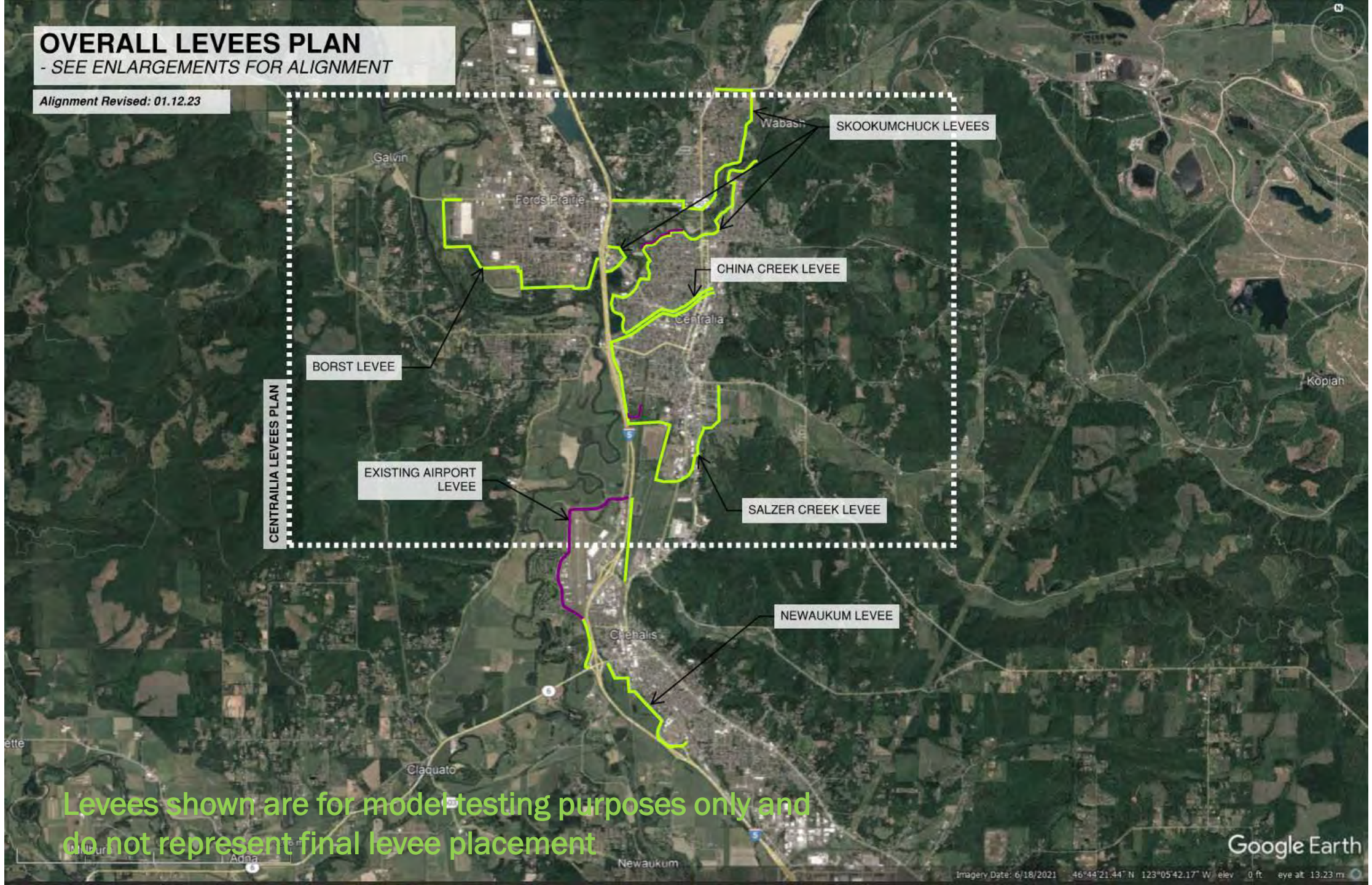
OPTION 3: NEW AND EXPANDED LEVEES/FLOODWALLS

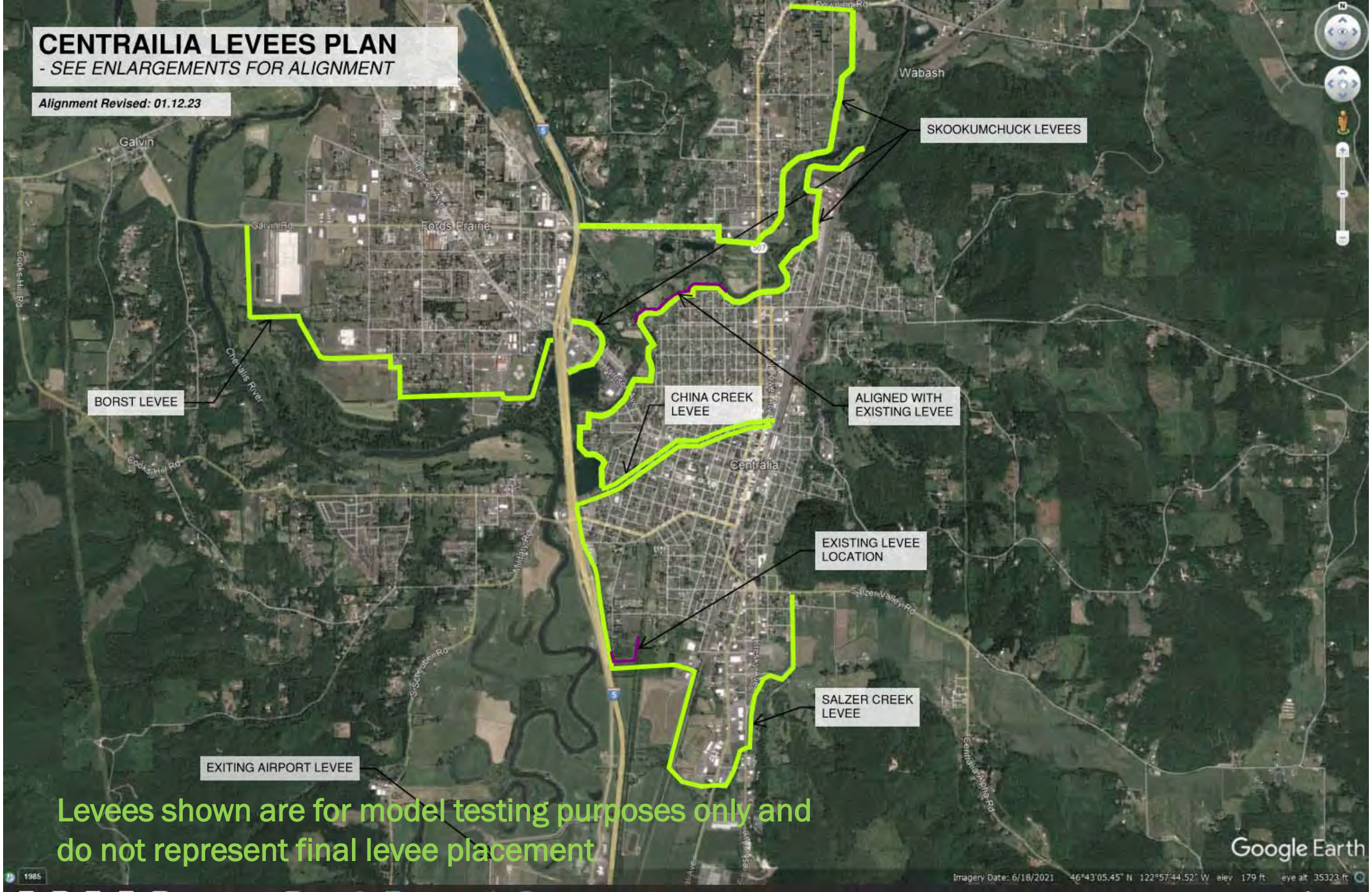


OPTION 3: NEW AND EXPANDED LEVEES/FLOODWALLS

OPTION 3: NEW AND EXPANDED LEVEES/FLOODWALLS




OVERALL LEVEES PLAN
- SEE ENLARGEMENTS FOR ALIGNMENT
Alignment Revised: 01.12.23
CENTRAILIA LEVEES PLAN
SKOOKUMCHUCK LEVEES
CHINA CREEK LEVEE
BORST LEVEE
EXISTING AIRPORT LEVEE
SALZER CREEK LEVEE
NEWAUKUM LEVEE
Galvin
Fords Prairie
Centralia
Kopiah
Chehalis
Claquato
Newaukum
Levees shown are for model testing purposes only and do not represent final levee placement
Google Earth


CENTRAILIA LEVEES PLAN
- SEE ENLARGEMENTS FOR ALIGNMENT
Alignment Revised: 01.12.23
SKOOKUMCHUCK LEVEES
BORST LEVEE
CHINA CREEK LEVEE
ALIGNED WITH EXISTING LEVEE
EXISTING LEVEE LOCATION
SALZER CREEK LEVEE
EXITING AIRPORT LEVEE
Levees shown are for model testing purposes only and do not represent final levee placement
Galvin
Fords Prairie
Wabash
Centralia
Chehalis River
Google Earth


BORST LEVEE
Alignment Revised: 01.12.23
SKOOKUMCHUCK LEVEES
CHINA CREEK LEVEE
Levees shown are for model testing purposes only and
do not represent final levee placement
Chehalis River
Fords Prairie
Galvin Rd
Russell Rd
Borst Ave
Mt Vista Rd
Mayberry Rd
Hayes Lake
Plummer Lake
W Main St
Lewis St
Google Earth

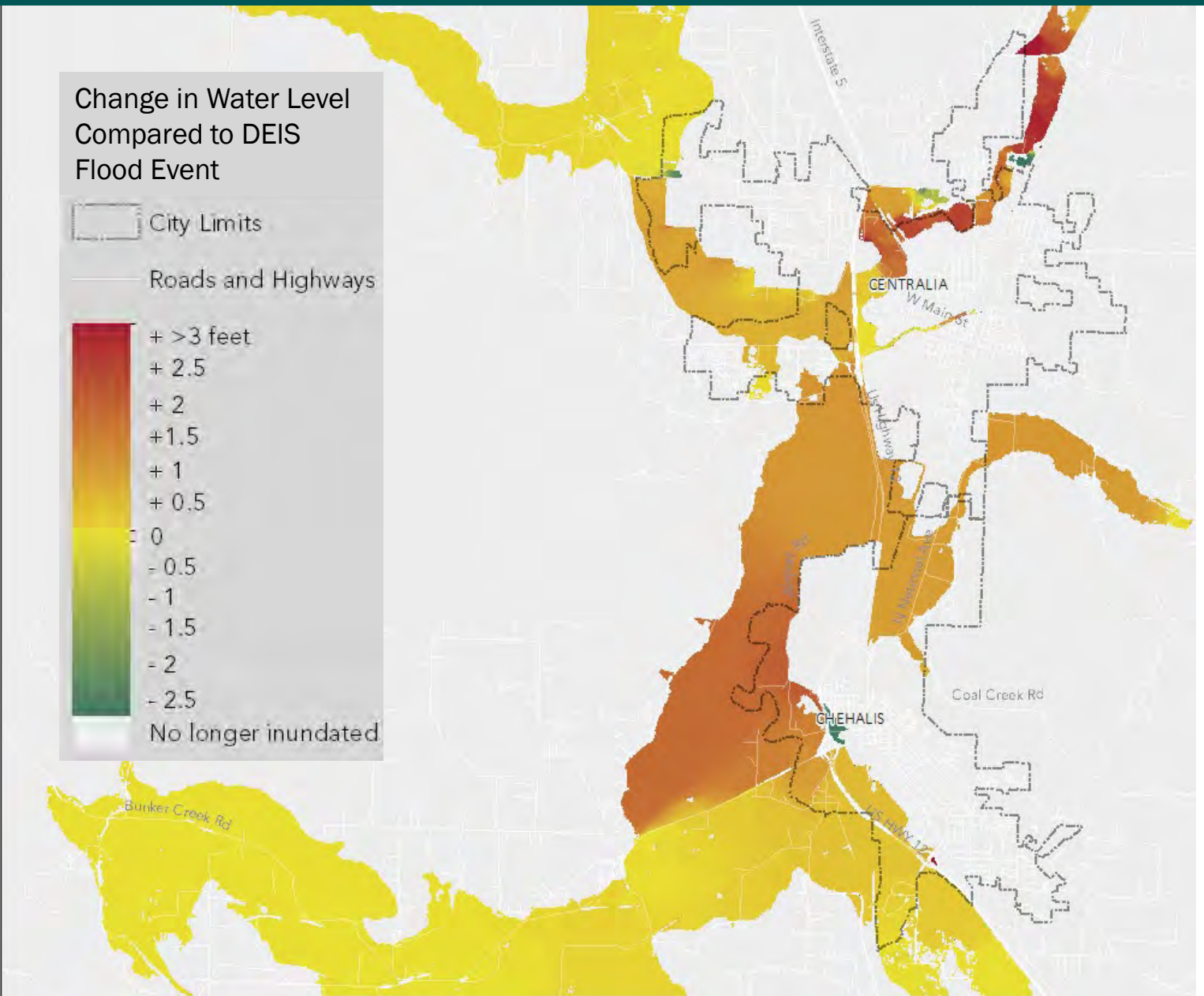

CHINA CREEK LEVEE
Alignment Revised: 01.12.23
SEE SKOOKUMCHUCK LEVEES ENLARGEMENT FOR THIS SEGMENT
SEE SALZER CREEK LEVEE ENLARGEMENT FOR THIS SEGMENT
Levees shown are for model testing purposes only and do not represent final levee placement
Google Earth


SALZER CREEK LEVEE
Alignment Revised: 01.12.23
SEE CHINA CREEK LEVEE ENLARGEMENT FOR THIS SEGMENT
EXISTING LEVEE LOCATION
EXITING AIRPORT LEVEE
Levees shown are for model testing purposes only and do not represent final levee placement
Chehalis River
Salzer Valley Rd
Meller St
Airport Rd
S Scheuber Rd
Google E


SKOOKUMCHUCK LEVEES
Alignment Revised: 01.12.23
POTENTIAL ALTERNATE ALIGNMENT
ALIGN WITH EXISITNG LEVEE
SEE CHINA CREEK LEVEE ENLARGEMENT
SEE BORST LEVEE ENLARGEMENT
Levees shown are for model testing purposes only and do not represent final levee placement
Google Earth

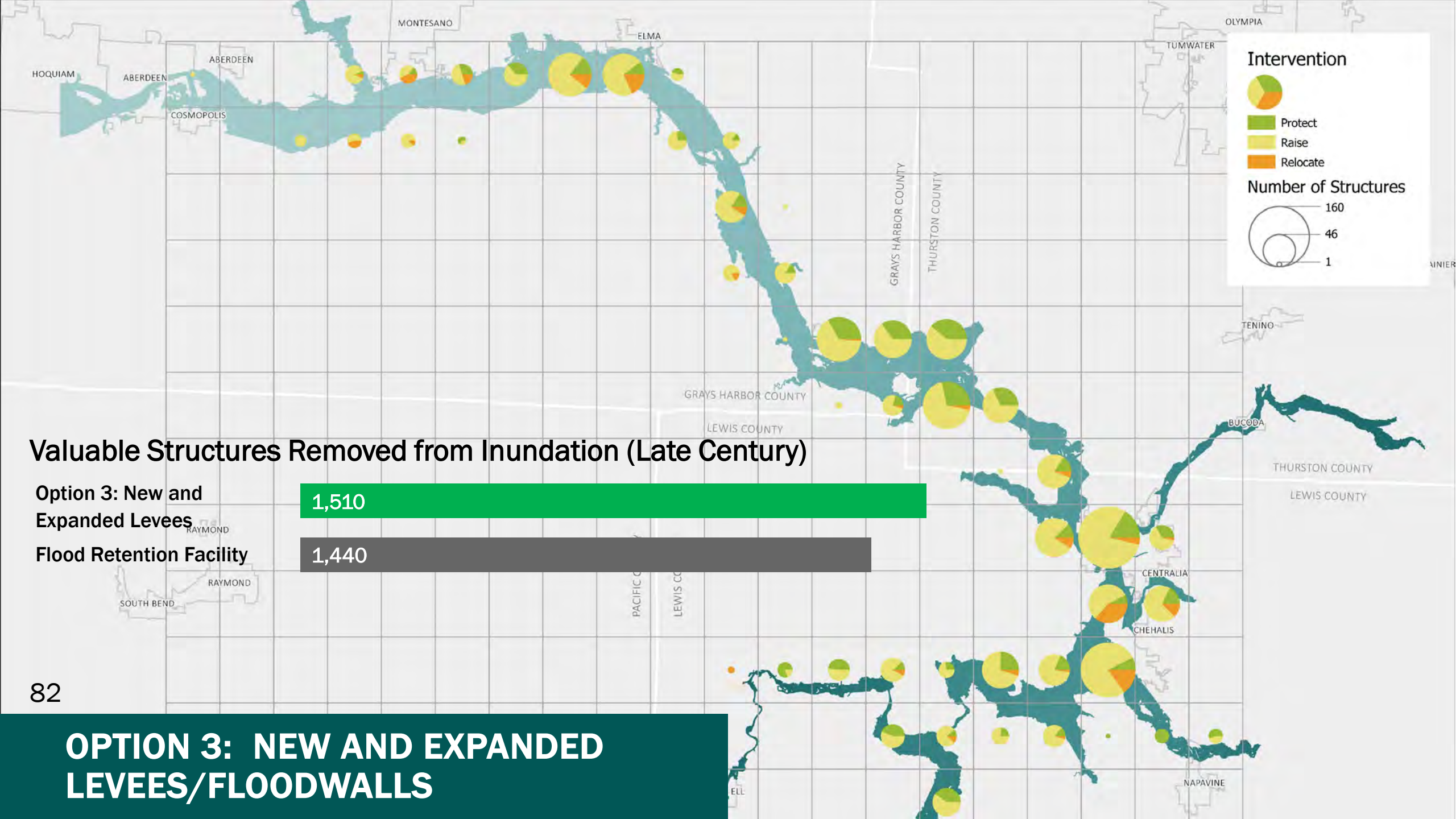

NEWAUKUM LEVEE
Alignment Revised: 01.12.23
Levees shown are for model testing purposes only and
do not represent final levee placement
Google Earth

OPTION 3: DEPTH AND EXTENT OF INUNDATION



Option 3:

- Significantly reduces flooding extents on the landward side of levees
- Increases water level riverward of levees on Skookumchuck, Salzer, Newaukum (less significant) and Chehalis (more significant) upstream of Mellen Street



Valuable Structures Removed from Inundation (Late Century)

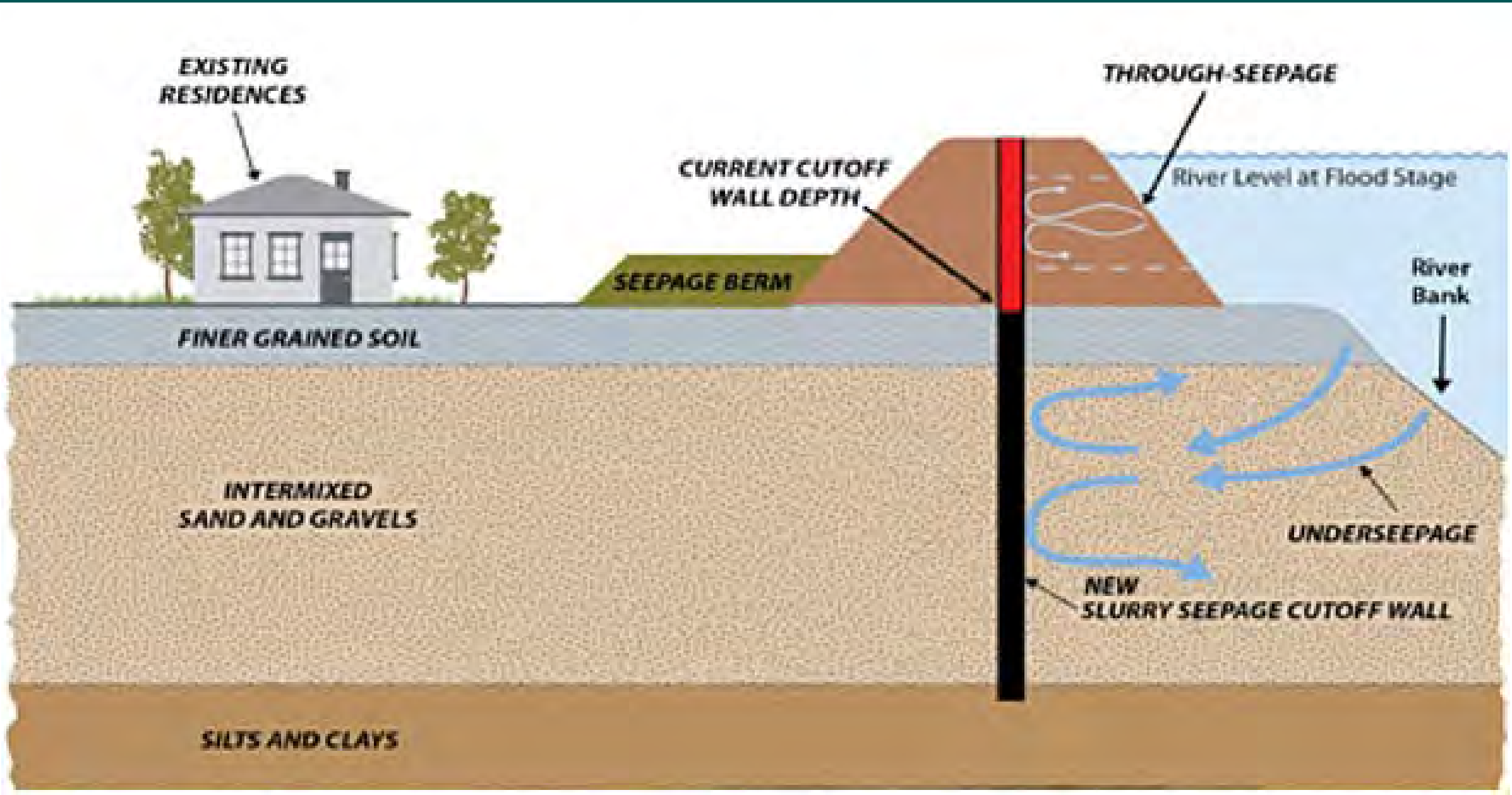
Option 3: New and Expanded Levees	1,510
Flood Retention Facility	1,440

OPTION 3: NEW AND EXPANDED LEVEES/FLOODWALLS

LEVEE - WALL

Source: Mario Tama Getty Images

LEVEE SECTION



LEVEE – LANDFORM

Source: US Army Corps of Engineers Seattle District

LEVEE - AMENITY

Source: Reveal News

LEVEE - AMENITY

Source: Luzerne County Levee Trail

LEVEE - INFRASTRUCTURE

Source: Reveal News

FLOOD WALL, MOUNT VERNON

Source: Seattle Times

FLOOD WALL, MOUNT VERNON

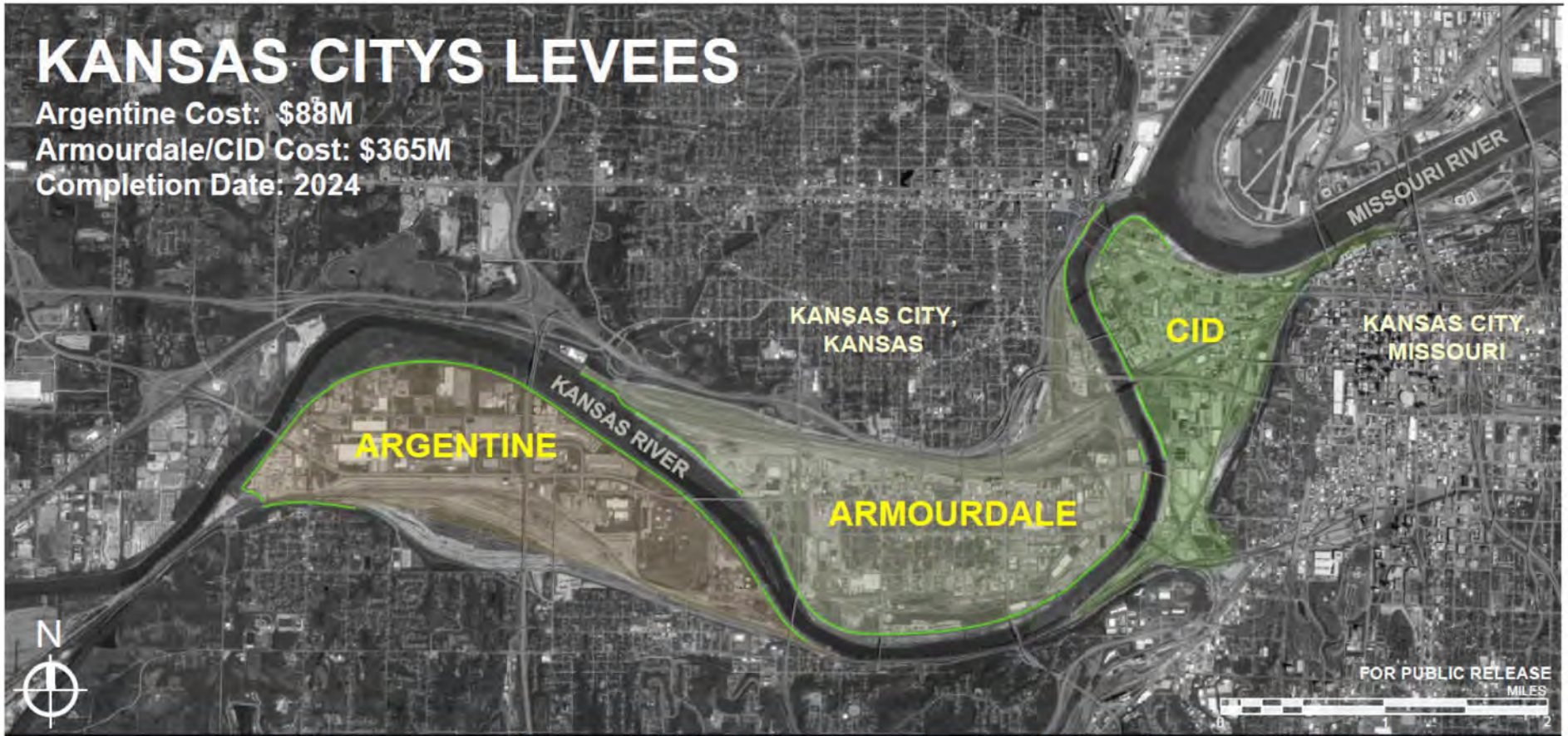
Source: King 5 News

DOWNTOWN MOUNT VERNON

Source: Mt Vernon Parks Foundation

KANSAS CITYS LEVEES

Argentine Cost: $88M
Armourdale/CID Cost: $365M
Completion Date: 2024



ARGENTINE LEVEE UNIT	
PROJECT FEATURES	**IMPROVEMENTS**
Constructed: 1951	Improved performance reliability
Total Miles: 5.48 mi.	Five feet of levee and floodwall raise
Embankment: 5.21 mi	Installation of ~50 relief wells
Floodwall: 0.27 mi	Stability improvement measures
Closure Structures: 2	Two closure structure replacements
Population at Risk: 10,700	Replace two pump stations
Structures at Risk: 723	Repair one pump station
Property Value: $3.05B	Utility Relocations
Leveed Area: 3.09 sq. mi.	Modifying drainage structures

ARMOURDALE LEVEE UNIT	
PROJECT FEATURES	**IMPROVEMENTS**
Constructed: 1951	Improved performance reliability
Total Miles: 6.58 mi.	Four feet of levee and floodwall raise
Embankment: 5.30 mi	Installation of ~75 relief wells
Floodwall: 1.28 mi	Stability improvement measures
Closure Structures: 5	Modifying or replacing closure structures
Population at Risk: 6,700	Modifying seven pump stations
Structures at Risk: 1,468	Abandoning two pump stations
Property Value: $3.06B	Utility Relocations
Leveed Area: 3.08 sq. mi.	Modifying drainage structures

CENTRAL INDUSTRIAL DISTRICT LEVEE UNIT	
PROJECT FEATURES	**IMPROVEMENTS**
Constructed: 1950	Improved performance reliability
Total Miles: 4.83 mi.	Four feet of levee and floodwall raise. Adding 600 feet of floodwall
Embankment: 1.84 mi	Installation of ~75 relief wells
Floodwall: 2.99 mi	Stability improvement measures
Closure Structures: 11	Modifying or replacing closure structures
Population at Risk: 7,494	Modifying five pump stations
Structures at Risk: 526	Abandoning two pump stations
Property Value: $3.36B	Utility Relocations
Leveed Area: 1.48 sq. mi.	Modifying drainage structures

US Army Corps of Engineers ®
Kansas City District

Partnerships

KAW VALLEY DRAINAGE DISTRICT

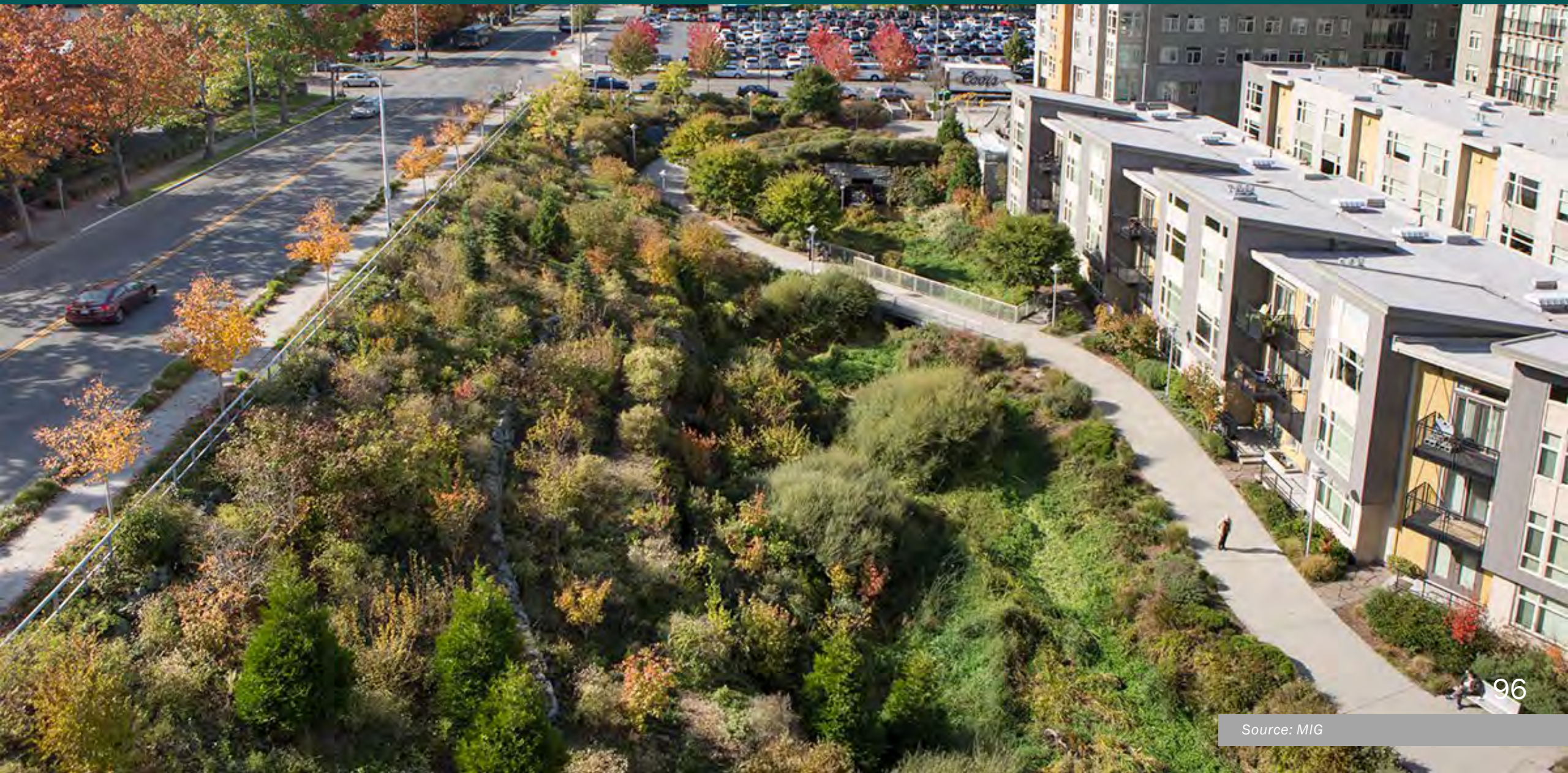
UNIFIED GOVERNMENT • Wyandotte County • Kansas City, Kansas •

KANSAS CITY MISSOURI

DAYLIGHTING: FRY CREEK FLOOD REDUCTION PLAN

Source: City of Aberdeen

STREAM DAYLIGHTING – THORNTON CREEK, SEATTLE



Source: MIG

CREEK DAYLIGHTING – RENO NEVADA

Source: Anthony22 at English Wikipedia

CHINA CREEK DAYLIGHTING

CHINA CREEK DAYLIGHTING

CHINA CREEK DAYLIGHTING

OPTION 3: NEW AND EXPANDED LEVEES/FLOODWALLS

Pros:

- Provides greatest flood damage reduction to structures
- Economic development benefits (construction etc. and land removed from the floodplain)
- Encourages adoption of flood-friendly land use and building codes

Cons:

- Highest construction-related impacts of the concepts
- Potential visual and community connectivity impacts
- Complexity of permitting, land acquisition and additional access infrastructure cost
- Increases river heights in some locations
- Constrains river to limited areas

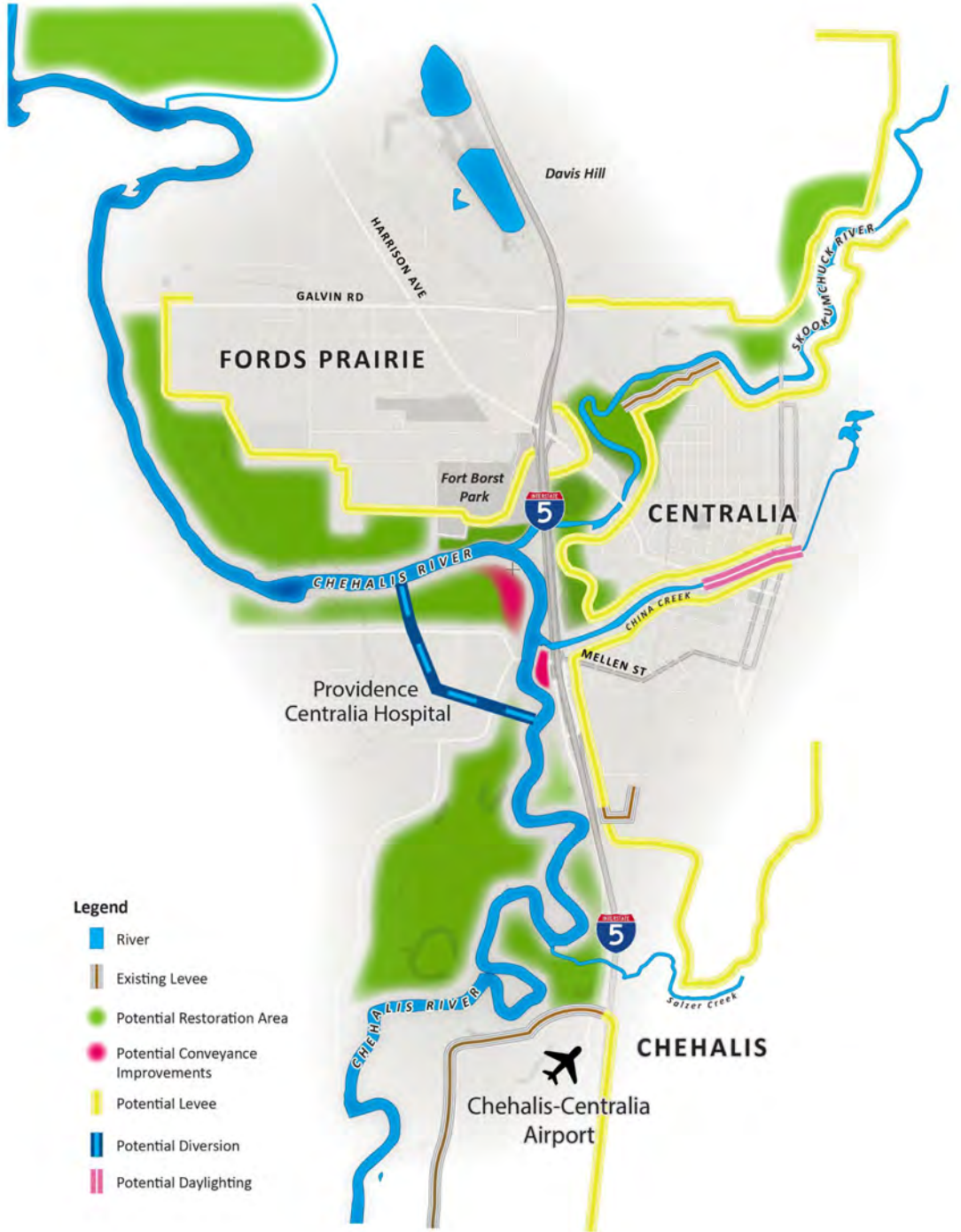
OPTION 4: ALL INTERVENTIONS

Chehalis Basin LAND

OPTION 4: ALL INTERVENTIONS

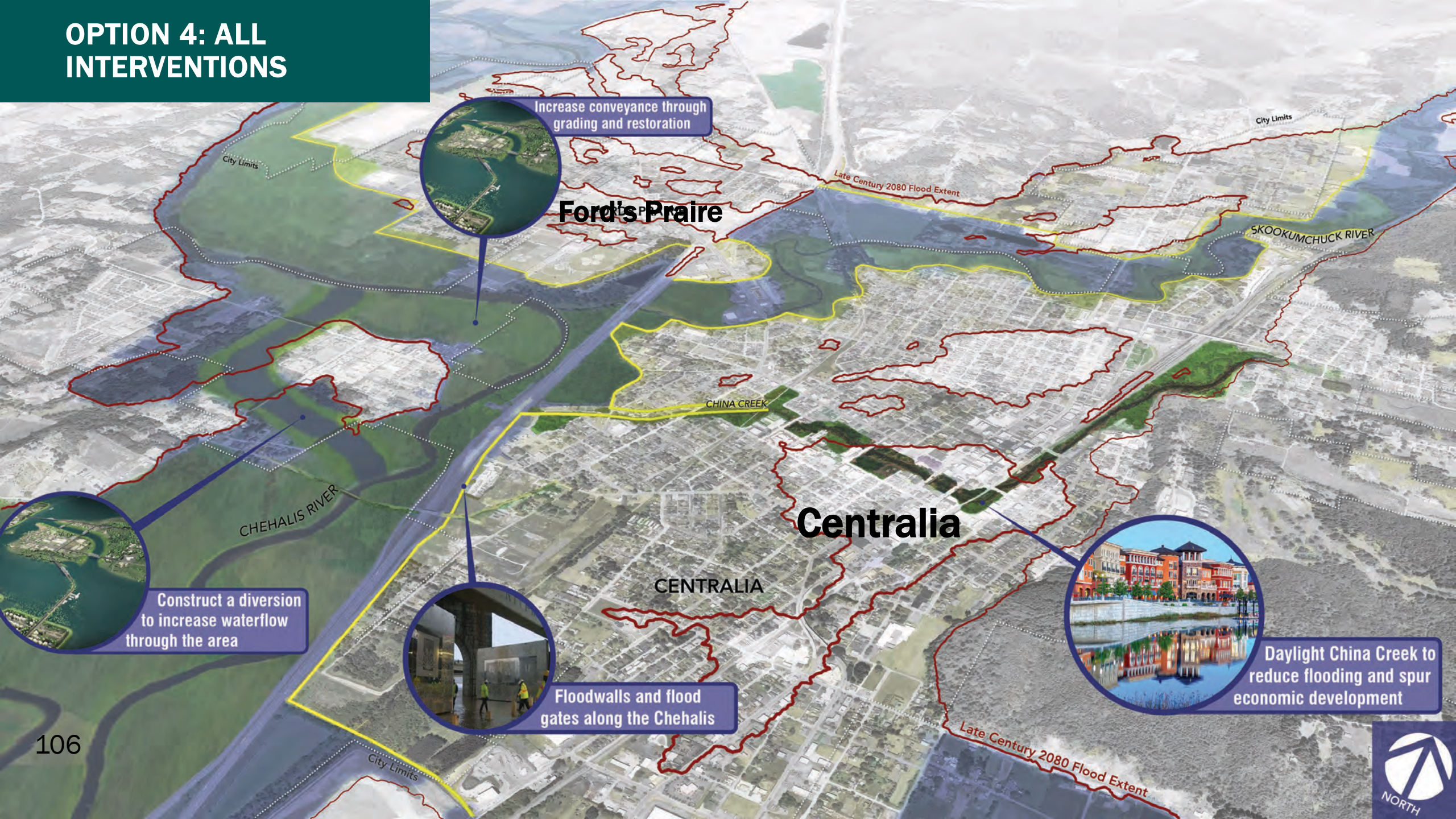
- Includes all interventions previously described

OPTION 4: ALL INTERVENTIONS

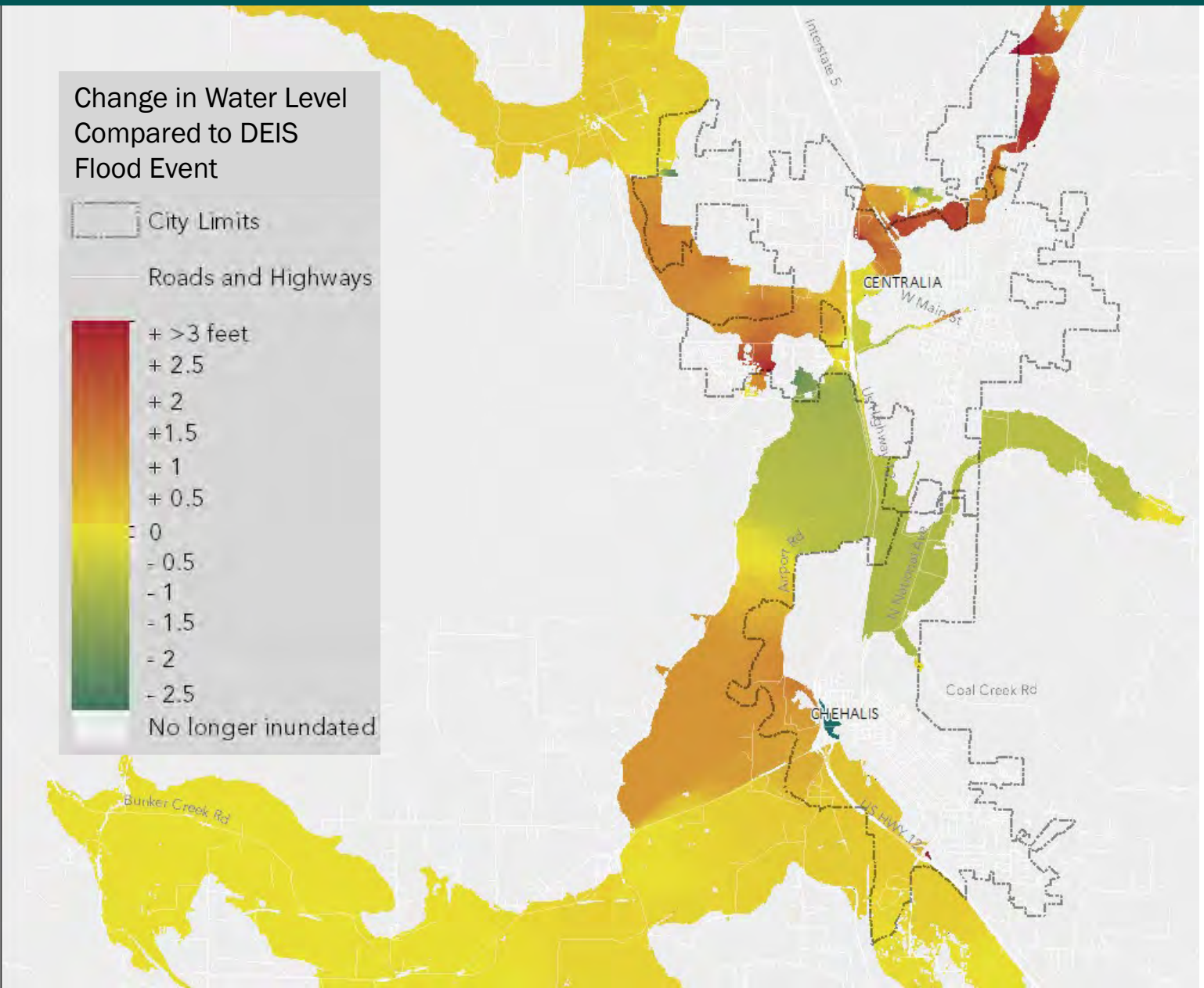


OPTION 4: ALL INTERVENTIONS

OPTION 4: ALL INTERVENTIONS

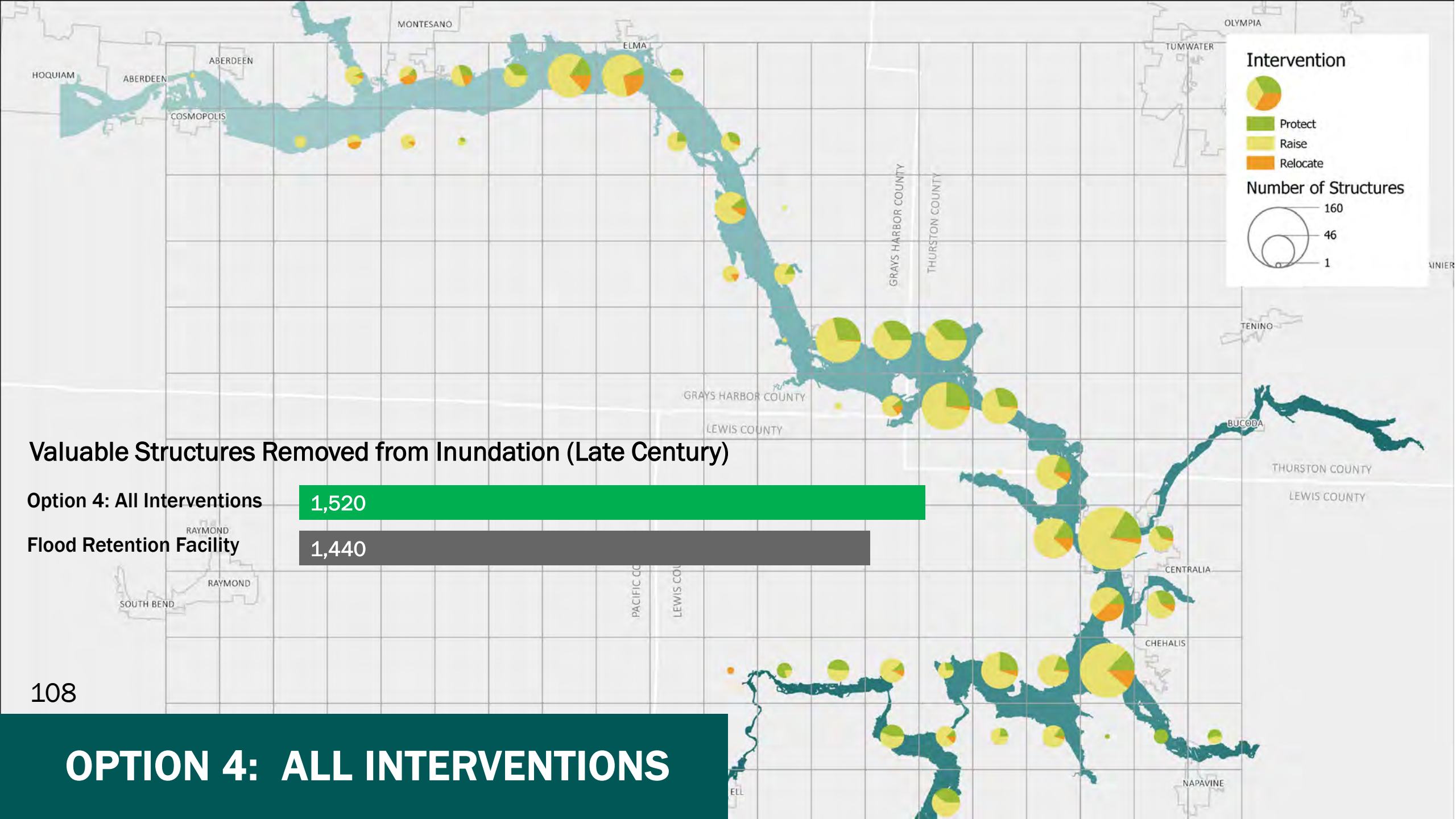


OPTION 4: DEPTH AND EXTENT OF INUNDATION



Option 4:

- Significantly reduces flooding extents with lower height levees (i.e., landward of levees)
- Increases water level (riverward of levees) on Skookumchuck and Newaukum (less significant) and Chehalis downstream of Mellen St.
- Lowers water surface elevation on Chehalis upstream of Mellen Street and for Salzer (riverward of levees)



Valuable Structures Removed from Inundation (Late Century)

Option 4: All Interventions	1,520
Flood Retention Facility	1,440

OPTION 4: ALL INTERVENTIONS

FLOODPLAIN RESTORATION/MITIGATION

RESTORATION: FLOODED CONDITION

OPTION 4: ALL INTERVENTIONS

Pros:

- Potentially reduces size of levees with conveyance and diversion
- Highest economic development benefits of the concepts, particularly for (construction etc.).
- Reduces impacts during catastrophic flood events
- Encourages adoption of flood-friendly land use and building codes

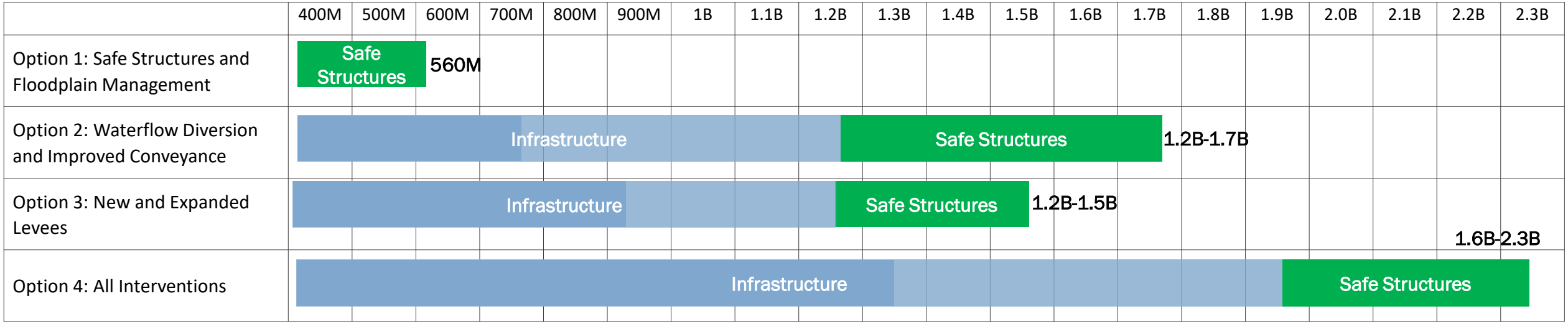
Cons:

- Documented cultural resources in the vicinity of the Mellen Street Bridge
- Highest assumed number of structures displaced by construction
- Does not provide more flood damage reduction than Levees and Floodwalls
- Potential visual and community connectivity impacts
- Complexity of permitting, land acquisition and additional access infrastructure cost

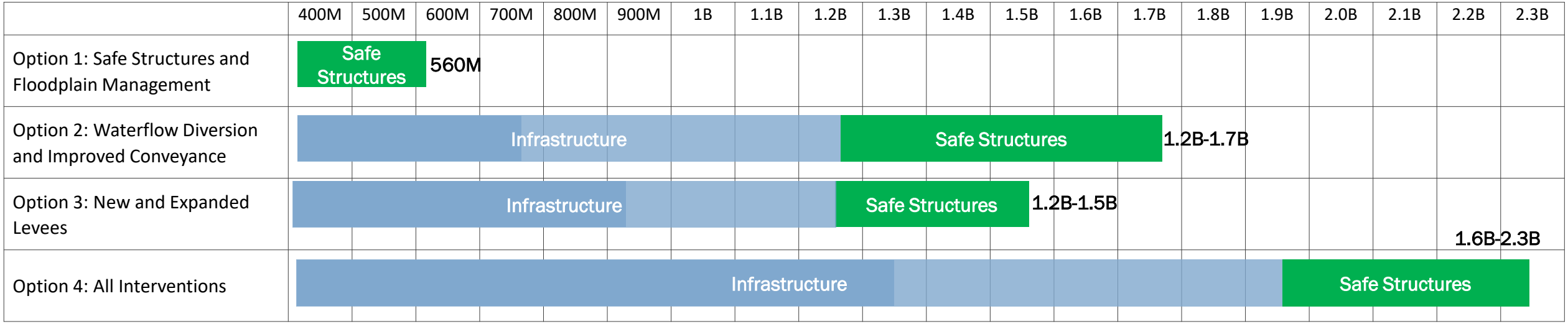
PRELIMINARY COST ESTIMATES

Chehalis Basin LAND

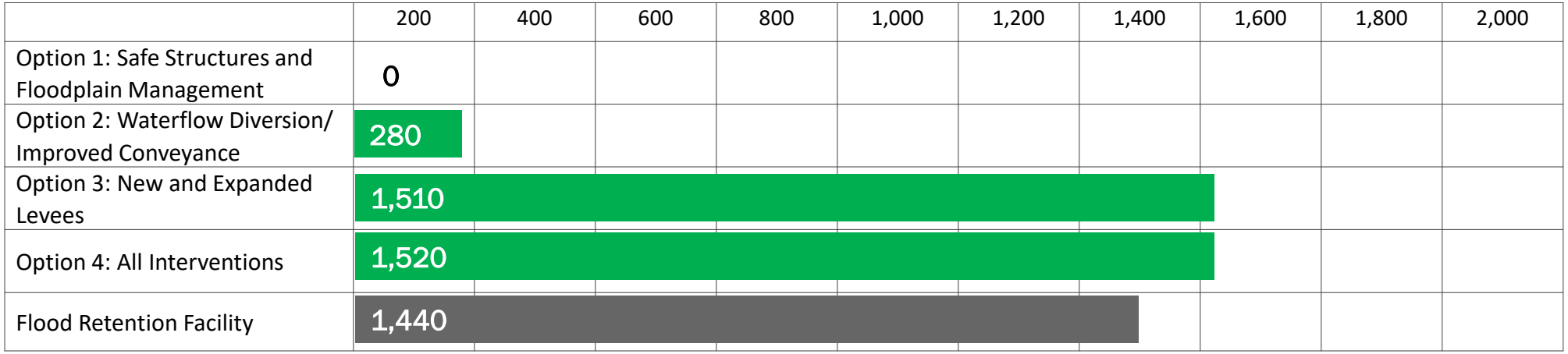
PRELIMINARY COST ESTIMATES



PRELIMINARY COST ESTIMATES



Valuable Structures Removed from Inundation (Late Century):



ECONOMIC DEVELOPMENT OPPORTUNITIES

Chehalis Basin LAND

ECONOMIC DEVELOPMENT BENEFITS AND OPPORTUNITIES

Avoided Flood Damages

Investments in safe structures as well as infrastructure and community investment help avoid costs generated by flood damage to both public and private structures. In 2022, flood damage costs recorded to date exceed $12.4 million, including more than $6.4 million in damages reported by individuals and businesses.

Avoided Local Transportation Disruptions

Avoided costs associated with delays and closures within the local transportation system include:

- ✓ Lost wages and business activity due to closures
- ✓ Costs of increased time and mileage associated with detour routes
- ✓ Costs to travelers associated with abandoned trips

ECONOMIC DEVELOPMENT BENEFITS AND OPPORTUNITIES

Infrastructure and Construction Benefits

Direct spending generates multiplier effects in the local economy:

- ✓ Floodplain restoration and levee construction including design, engineering, construction, etc.
- ✓ Maintenance and operations of the flood damage reduction system structures
- ✓ Safe Structures program including floodproofing and elevating structures, etc.
- ✓ Economic activity through business-to-business and supply chain transactions (indirect impact) as well as spending of worker wages (induced).

ECONOMIC DEVELOPMENT BENEFITS AND OPPORTUNITIES

Creation of New Agriculture, Recreation and Open Space, and Habitat

- ✓ **Expanded Agricultural Opportunities**
  - ✓ Reclaimed land in fertile floodplain adjacent zones

- ✓ **Expanded Recreation, Open Space and Habitat Opportunities**
  - ✓ Fishing, boating, and river recreation
  - ✓ New and expanded urban open and green spaces in sending areas for Safe Structures program
  - ✓ Levee-top recreation paths
  - ✓ New and expanded habitat for local wildlife

ECONOMIC DEVELOPMENT BENEFITS AND OPPORTUNITIES

Opportunity to Update Land Use and Building Codes

- ✓ So as not to make the flooding problem worse

- ✓ Applying innovative land use planning, development standards, and building codes

ECONOMIC DEVELOPMENT BENEFITS AND OPPORTUNITIES

New Economic Development in "Receiving Areas"

- ✓ **Mix of Uses**
  - ✓ Planning for receiving areas that encourages a healthy mix of land uses can create additional opportunities for new and expanded community serving businesses and services

- ✓ **Increased Density While Preserving Rural Character**
  - ✓ Retail follows rooftops - if density is increased incrementally to accommodate relocation plus planned growth, the increased local buying power can support more retail activity or stronger sales for local businesses

- ✓ **Enhanced Quality of Life**
  - ✓ Successful mixed-use, walkable neighborhoods enhance perceptions of quality of life and can attract new talent, entrepreneurship, and business activity

ECONOMIC DEVELOPMENT BENEFITS AND OPPORTUNITIES


Highlands
OPEN

DISCUSSION GROUPS . . .

Chehalis Basin LAND

DISCUSSION GROUPS . . .

1. Discuss the advantages and disadvantages of the Four Options

2. Select your preferred option and provide a rationale for your selection

3. Use the comment card provided to write out your individual thoughts

4. Work with your group to prepare a summary of your group's discussion for presentation to the large group

BREAK . . . AND ADJOURN TO THE DISCUSSION GROUPS . . .

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DISCUSSION GROUP REPORTS

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RESILIENCY PROGRAM ELEMENTS

Chehalis Basin LAND

RESILIENCY PROGRAM ELEMENTS

Connect to Ment-A-Meter

For each option, log in your selection for each program element:

5 Current Program Is Sufficient

4 Current Program Could Be Strengthened or Expanded

3 Worth Considering

2 Not Necessary

1 Don’t know/No Opinion

Updating the Early Warning System

Key Considerations:

- Top of the line, advanced, integrated, and well coordinated system.
- Includes evacuation routes and nearest community resilience hub locations.
- Accessible interface for citizens with cell phone alerts.
- Keep a phone tree for quick calls to friends and families if needed

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Swift Water Rescue Teams

(trained personnel and rescue equipment)

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Expanding Farm Evacuation Plans

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Providing Safe Transport and Refuge for Livestock

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Updating Evacuation Plans and Route Guidance

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Pre-Positioning of Supplies

(e.g., medicines, sandbags etc.)

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Pre-Positioning of Equipment

Expanding Utility Capacity to Handle Peak Events

Power, water, septic, communications uplinks.

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Creating Places for Continuity of Business Operations

40% of small businesses fail post major disasters.

Provide work-stations, shareable desks, and meeting space to keep business moving

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Providing Pre-Disaster Training Classes

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POTENTIAL FUNDING SOURCES

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FUNDING SOURCES OVERVIEW

The Bipartisan Infrastructure Bill includes five new programs and 13 updated programs with potential funding sources.

FUNDING SOURCES OVERVIEW

Flood Mitigation Assistance Grants

- ✓ The existing program has expanded to include projects that reduce or eliminate the risk of repetitive flood damage to buildings insured by the National Flood Insurance Program (NFIP)

- ✓ This program targets local flood protection measures, retrofits, acquisitions, relocations, etc.

FUNDING SOURCES OVERVIEW

Building Resilient Infrastructure & Communities

FEMA will provide financial assistance for:

- ✓ Capability and Capacity-Building
- ✓ Mitigation Projects
- ✓ Management Costs

FUNDING SOURCES OVERVIEW

Watershed and Flood Prevention Grants (WFPO)

The WFPO program originally required flood prevention and protection as a function of all projects but has since been amended to include other water quality and water resources purposes.

FUNDING SOURCES OVERVIEW

National Coastal Resilience Fund

Under the Bipartisan Infrastructure Law, the National Coastal Resilience Fund will have significantly increased annual investments from NOAA.

The program is focused on projects to restore, increase, and strengthen natural infrastructure on landscapes to help absorb the impacts of storms and floods, risk reduction, and disaster recovery.

FUNDING SOURCES OVERVIEW

Additional sources:

- ✓ Clean Water State Revolving Fund
- ✓ Community Development Block Grants
- ✓ Rebuilding American Infrastructure Sustainably and Equitably (RAISE)
- ✓ Department of Interior Grants

FUNDING SOURCES OVERVIEW

Some level of local participation in project funding will most likely be required:

- ✓ Local sales tax measure ?
- ✓ Local bond measure ?
- ✓ Other . . . ?

PROJECT DELIVERY OPTIONS

Chehalis Basin LAND

PROJECT DELIVERY OPTIONS FOR MAINTAINING LOCAL CONTROL

- **Existing Joint Powers Agency (JPA)**
  An existing JPA could assume responsibility for acquiring funding, project construction, operations and maintenance of the flood management system

- **Existing Public Agency (such as Lewis County)**
  An existing public agency could perform all the roles described above

- **Single Purpose Construction Management Authority**
  A single purpose organization could be established for the sole purpose of constructing and delivering the project; it would then dissolve and transfer project ownership to an existing public entity to operate and maintain the flood management system

EXAMPLE JOINT POWERS AUTHORITY (JPA)

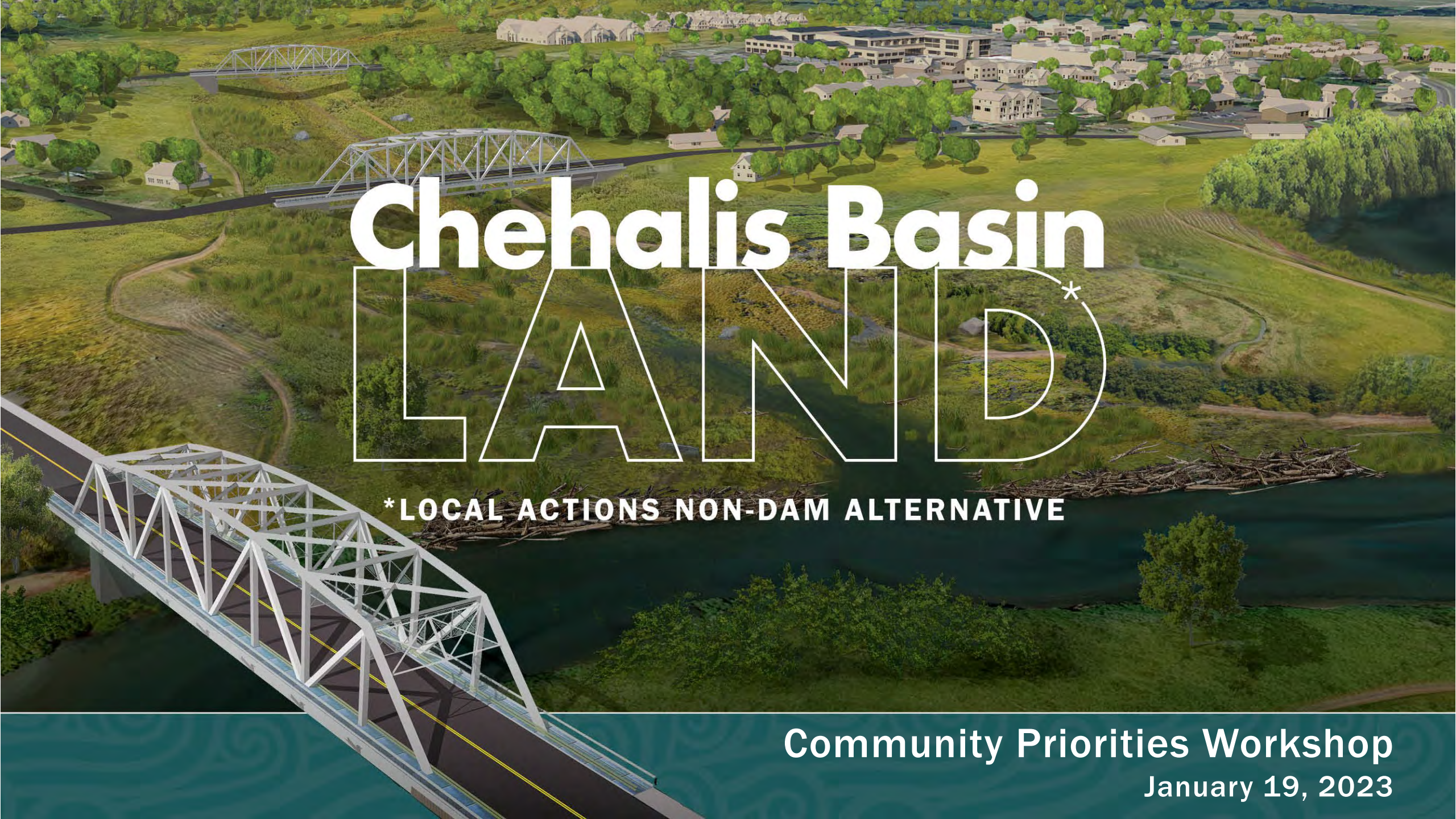
The Three Rivers Levee Improvement Authority, a joint powers agency, was established in May 2004 by the County of Yuba and Reclamation District 784 to finance and construct levee improvements in south Yuba County.

The Authority's mission is to provide 200-year flood protection for south Yuba County.

NEXT STEPS . . .

UPCOMING EVENTS . . .

- ✓ Refinement of the “No Dam” Alternative Based on Community Feedback
- ✓ Additional Technical Work and Refinements
- ✓ Broad Community Outreach
- ✓ Preparation of Project Summary Report
- ✓ Steering Group Recommendation to the OCB by the End of Q1 2023



Community Priorities Workshop

January 19, 2023