Lower Snake River Dams Transportation Study

Washington State Transportation Commission

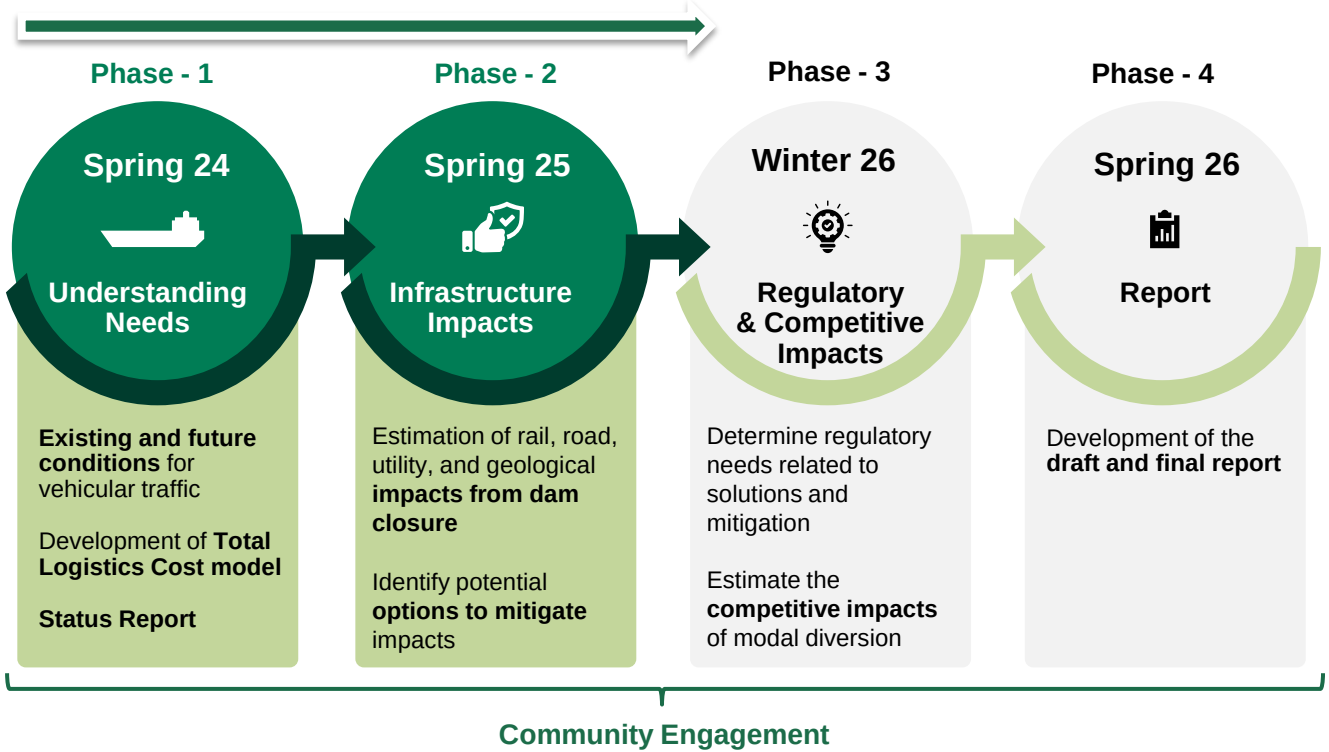
Jim Mahugh, Lower Snake River Dams Study Lead

March 24, 2026

Agenda

- **Study Status**
- **Geotech & Utilities**
- **Cargo Capacities**
- **Scenarios & Preliminary Model Outputs**
- **Community Engagement**

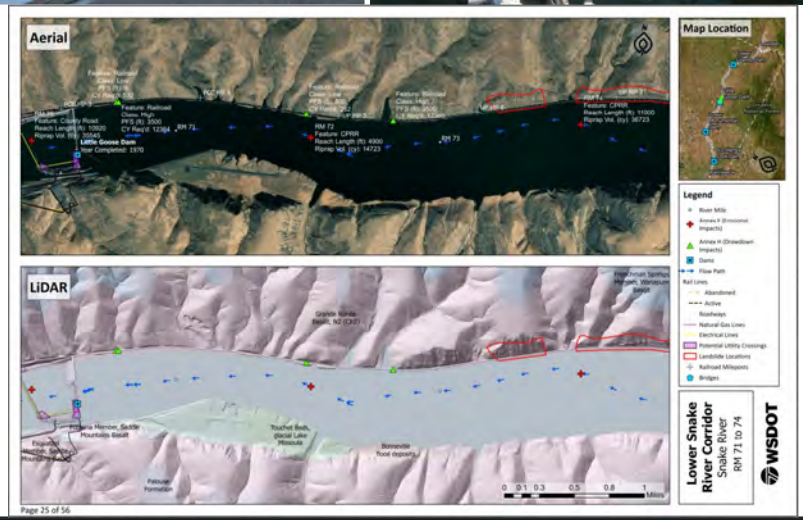
Study Status



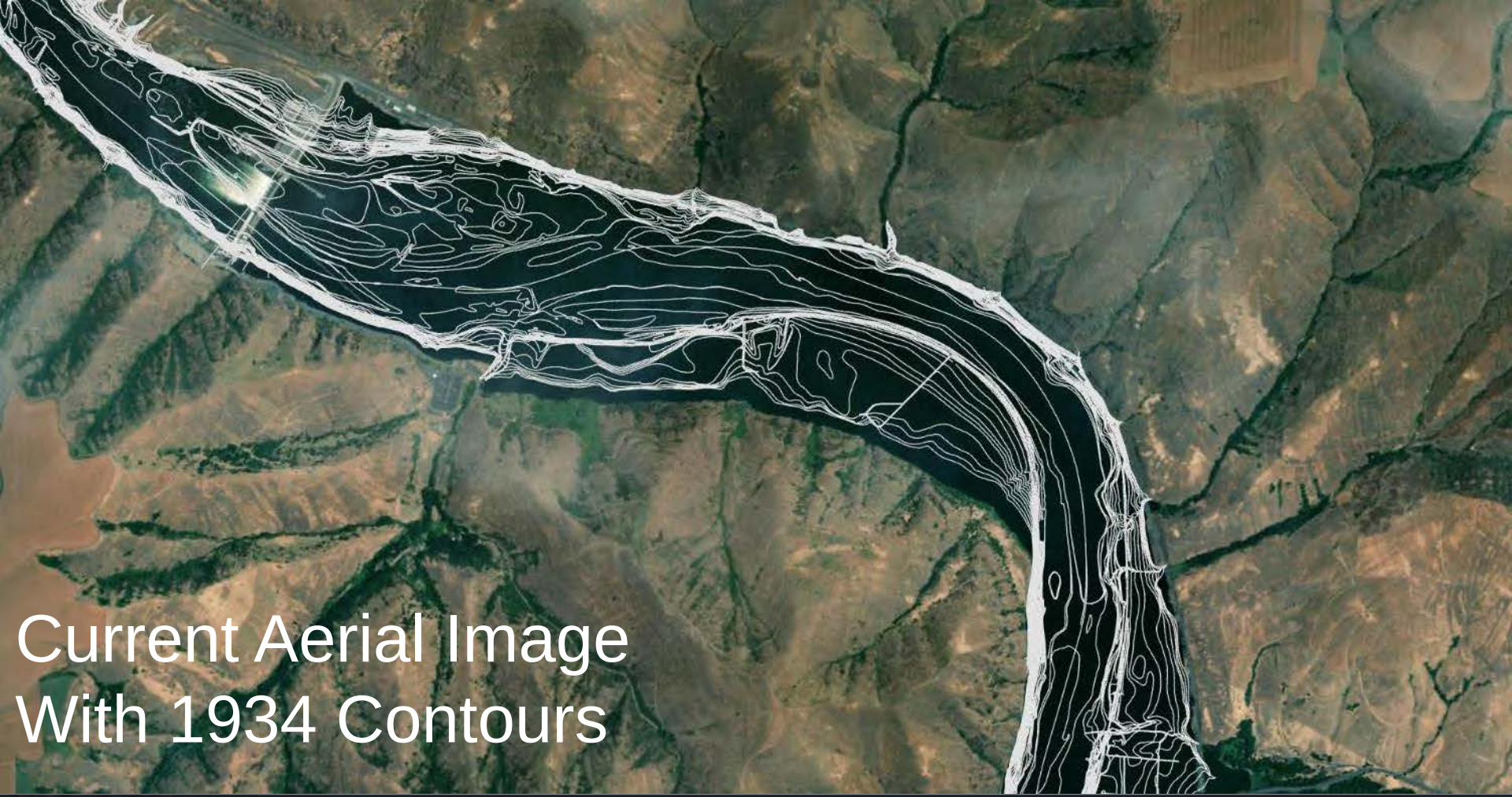
Geotech

Geological Impacts: Sources of Information

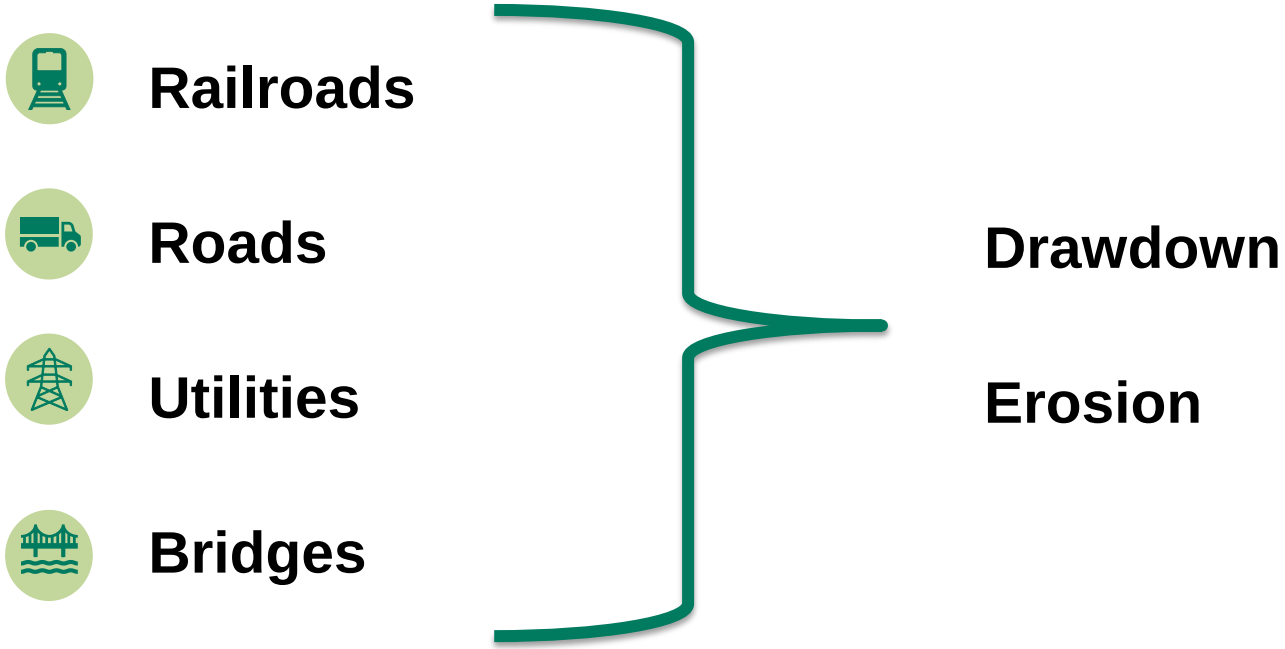
- Observations from boat of road and railroad embankments
- Observations from road of abandoned railroad and trestles
- Field data and geo-referenced photos collected using ArcGIS saved to tablets
- Combined with information from existing literature
- 1934 USACE river survey



Current Aerial Image


Current Aerial Image
With 1934 Contours

Geotech Impacts



Geological Impacts: Drawdown

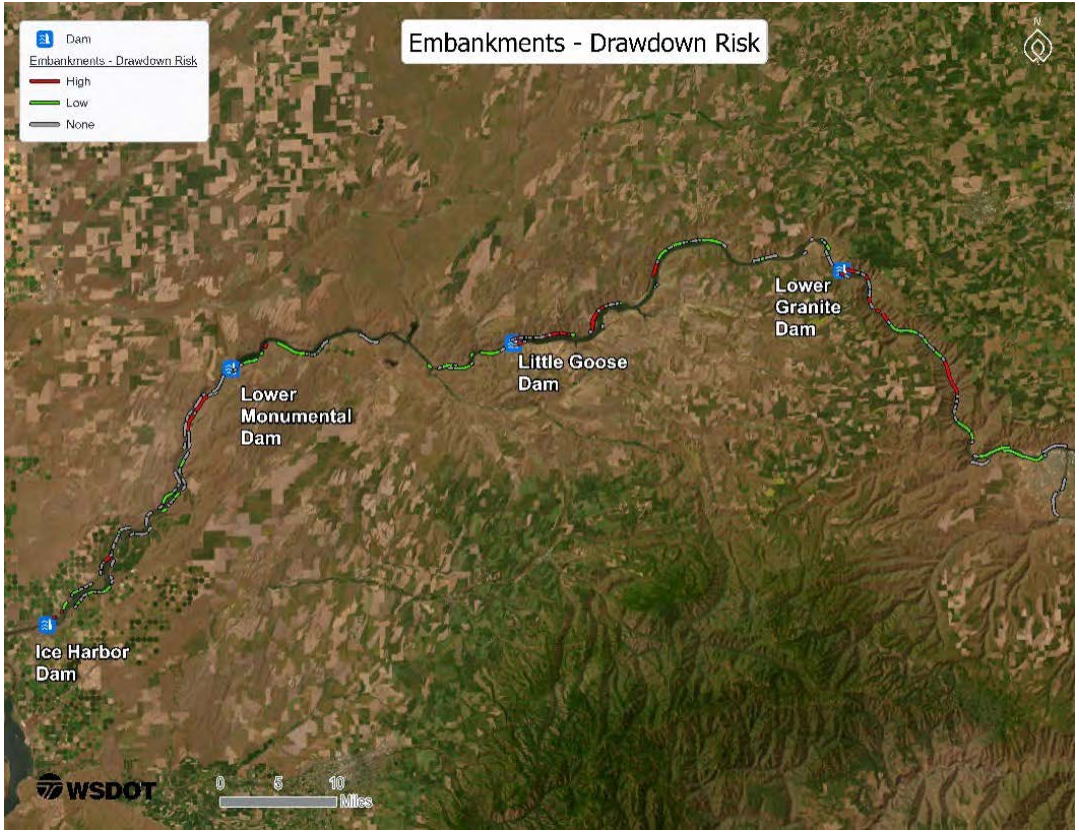
- Embankment failure risk due to the water draining from saturated soil
  - Short term impact
  - Not recurring
  - Impacted by drawdown rates

Geological Impacts: Drawdown

- Embankment failure risk due to the water draining from saturated soil
  - Short term impact
  - Not recurring
  - Impacted by drawdown rates

Geological Impacts: Drawdown

- Risk of embankment failure from drawdown is divided into three categories
  - High risk (red)
  - Low risk (green)
  - No risk (gray)
  - No color (no embankment present)
- Level of risk is correlated to the amount and cost of repair needed along the river



Roadway Impacts: Drawdown Risks

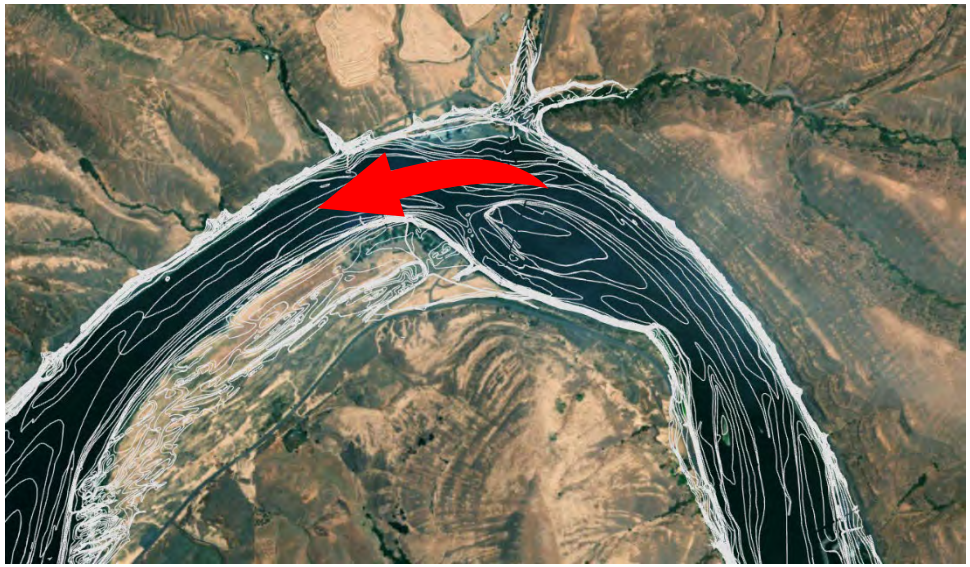
Pool	RM Start	RM End	Risk (H/L)	Estimated Failure (ft)	Road/Railroad	Miles Rebuild	Miles Resurfacing
Lower Granite Pool	133.4	137	Low	2001	US 12	0.38	3.03
	130.9	133.8	Low	1473	Wawawai Rd	0.28	2.23
	126.3	128.9	Low	1298	Wawawai Rd	0.25	1.97
	125.1	125.4	High	109	Wawawai Rd	0.02	0.17
	124.6	125	High	189	Wawawai Rd	0.04	0.29
	124.2	124.5	High	182	Wawawai Rd	0.03	0.28
	120.6	124.1	High	1762	Wawawai Rd	0.33	2.67
	119.2	120.4	Low	580	Wawawai Rd	0.11	0.88
	117.8	118.7	Low	467	Wawawai Rd	0.09	0.71
	114.4	117.4	Low	1535	Wawawai Rd	0.29	2.33
	113.5	114.3	High	405	Wawawai Rd	0.08	0.61
	113	113.2	High	72	Wawawai Rd	0.01	0.11
	111.2	112	High	395	Wawawai Rd	0.07	0.60
Little Goose Pool	104.4	105	Low	324	Lower Granite Rd	0.06	0.49
	104	104.3	Low	142	Lower Granite Rd	0.03	0.22
	85.3	85.5	Low	87	Hasting Hill Rd	0.02	0.13
	70.4	71.2	High	414	Little Goose Dam Rd	0.08	0.63
Lower Monumental Dam	67.4	69.1	Low	930	Little Goose Dam Rd	0.18	1.41
	66.5	66.6	Low	93	Riparia Rd	0.02	0.14
	64.1	65.9	Low	917	Little Goose Dam Rd	0.17	1.39
	6						0.20
Ice Harbor Pool	3						0.18

Roadway Data Sample

- Road segments to rebuild and resurface are estimated based on the drawdown risk along the river
- Similar process used for erosion impacts

Geological Impacts: Erosion

- Embankment failure risk due to water action on the banks of the river
  - Long term impact
  - Recurring
  - Needs to consider the old river channel
  - Most prevalent where the river bends



Geological Impacts: Erosion

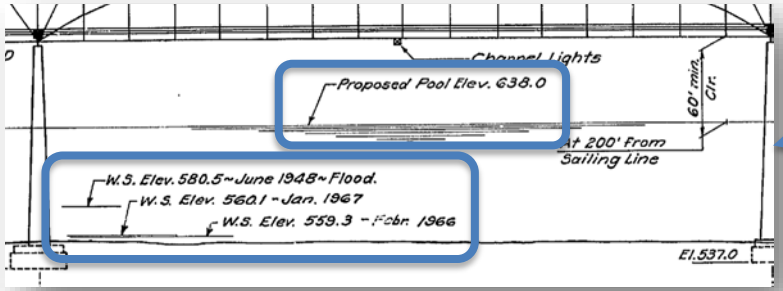
- Embankment failure risk due to water action on the banks of the river
  - Long term impact
  - Recurring
  - Needs to consider the old river channel
  - Most prevalent where the river bends

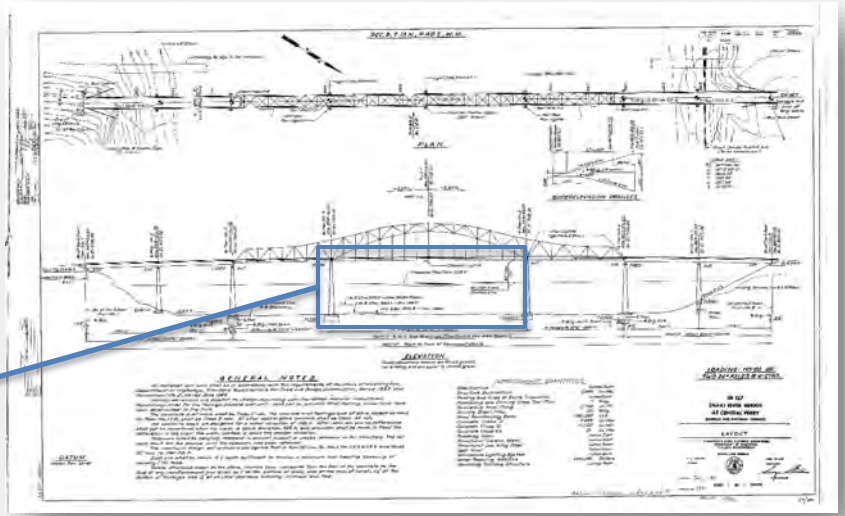
Geological Impacts: Erosion

- Longitudinal erosion along embankments
- Risk of erosion is divided into four categories
  - High risk (red)
  - Medium risk (yellow)
  - Low risk (green)
  - No risk (gray color)
  - No color (no embankment present)
- Level of risk is correlated to the amount and cost of repair

Geological Impacts: Bridges

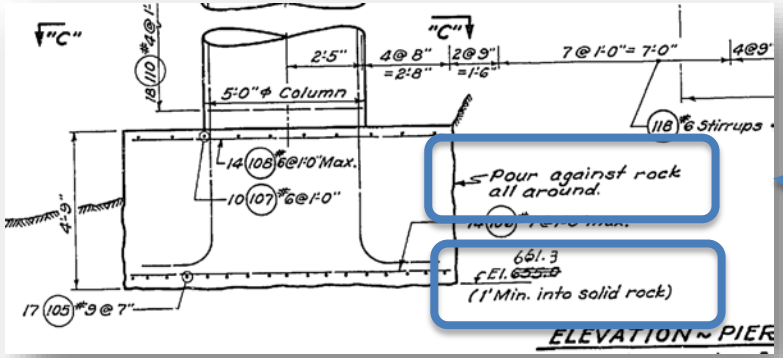
- Used original bridge drawings

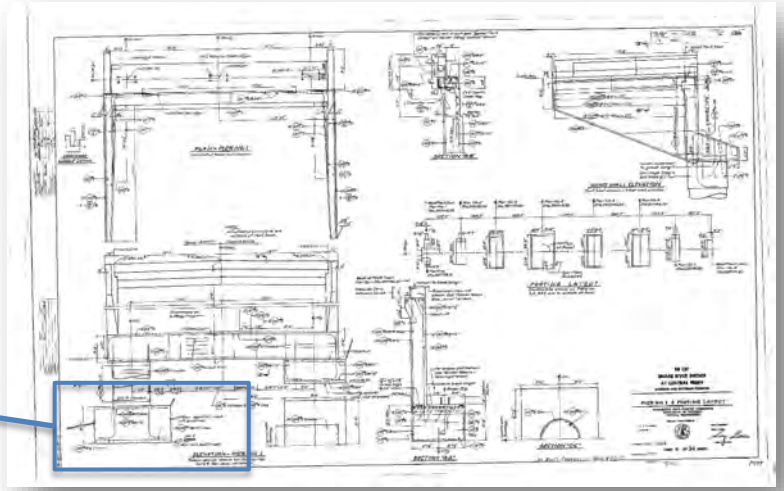




Geological Impacts: Bridges

- Used original bridge drawings





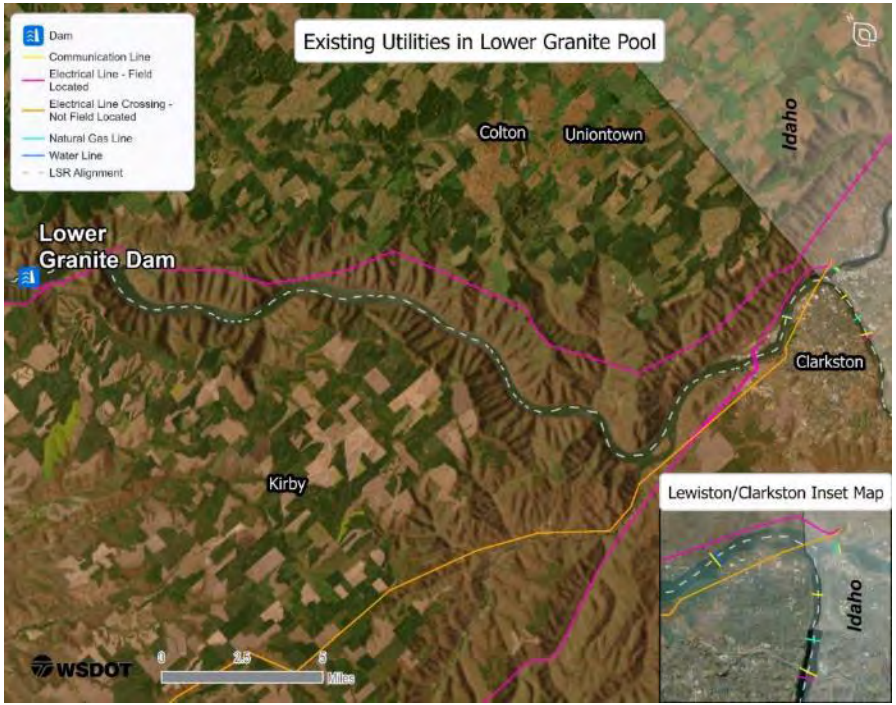
Geological Impacts: Bridges

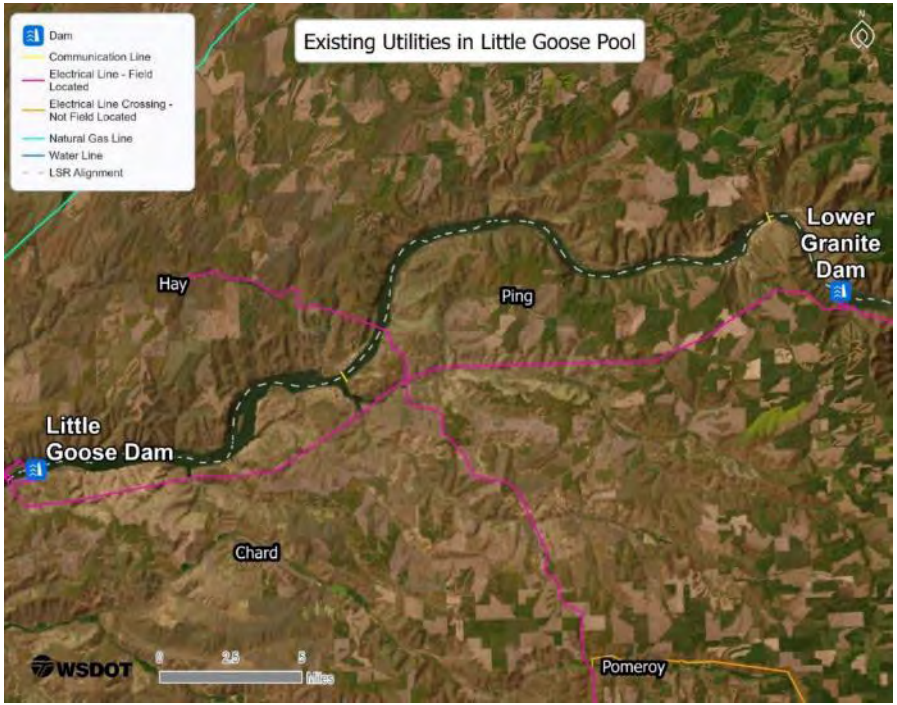
- A summary of the geotechnical study recommendations at each bridge

Bridge Name	Recommendation
Southway Bridge County/City	Post 5-year flood monitoring
SR 12 Interstate Bridge	Investigate and armor Pier 2. Monitor riverbed between Piers 2 & 3.
SR 128 Red Wolf	Riprap Piers 2, 3, 4, & 5. Additional investigation of bedrock.
SR 127 Elmer Huntley	Riprap armor Piers 2 through 7
Watco Railroad	Confirm bedrock erosion resistance or riprap Piers 3 through 6
SR 261 Lyons Ferry	Riprap armor Piers 4, 5, 7, & 8. Investigate bedrock at Pier 6.
Union Pacific Railroad	Riprap armor Piers 38 through 42. Investigate bedrock at Piers 37, 43, and 44.

Utilities

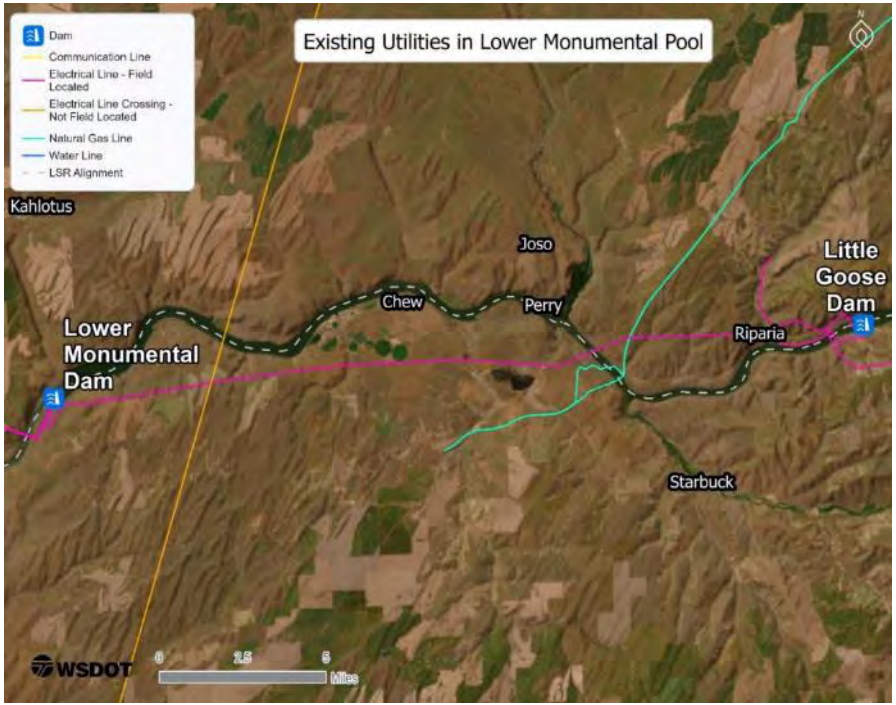
Utility Impacts: Locations of Infrastructure





Note: The orange lines are in the utilities database, but only the Pomeroy one could be found.

Utility Impacts: Locations of Infrastructure



Note: The orange lines are in the utilities database but could not be found.

Utility Impacts

Utility Crossing Type	River	River Mile	Vicinity	Estimated Scour Below Pre-Dam Channel Bottom
Water	Clearwater	0.2	Lewiston	*
Gas	Clearwater	0.1	Lewiston	9 feet
Comm	Clearwater	0.2	Lewiston	14 feet
Gas	Snake River	140.7	Southway Bridge	8 feet
Comm	Snake River	139.8	US 12 Bridge	9 feet
Gas	Snake River	61.8	Lyons Ferry	Negligible
Gas	Snake River	61.5	Lyons Ferry	Negligible

* Addressed by the *Lower Snake River Water Supply Replacement Study*

Base Scenarios

Scenarios 1 – 4: Base Year Scenarios

Scenario 1: Base year (2020) model with dams in place

- Discussed at previous TAC meeting
- Showed catchment areas for each port and rail terminal
- Examined lock volumes, pool volumes, and river volumes relative to existing data

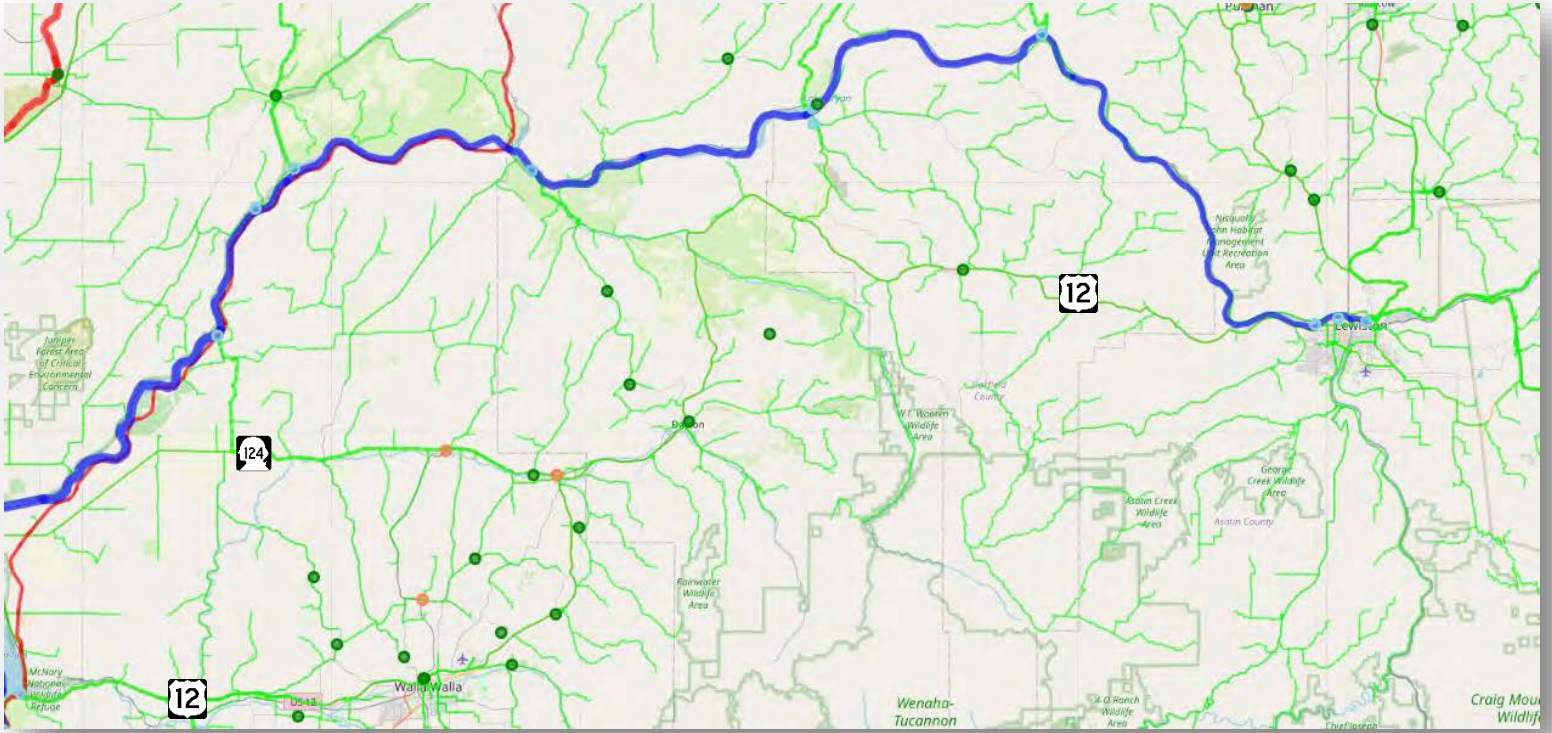
Scenario 2: Base year (2020) model with dam breaches

Scenario 3: Future year (2045) model with dams in place

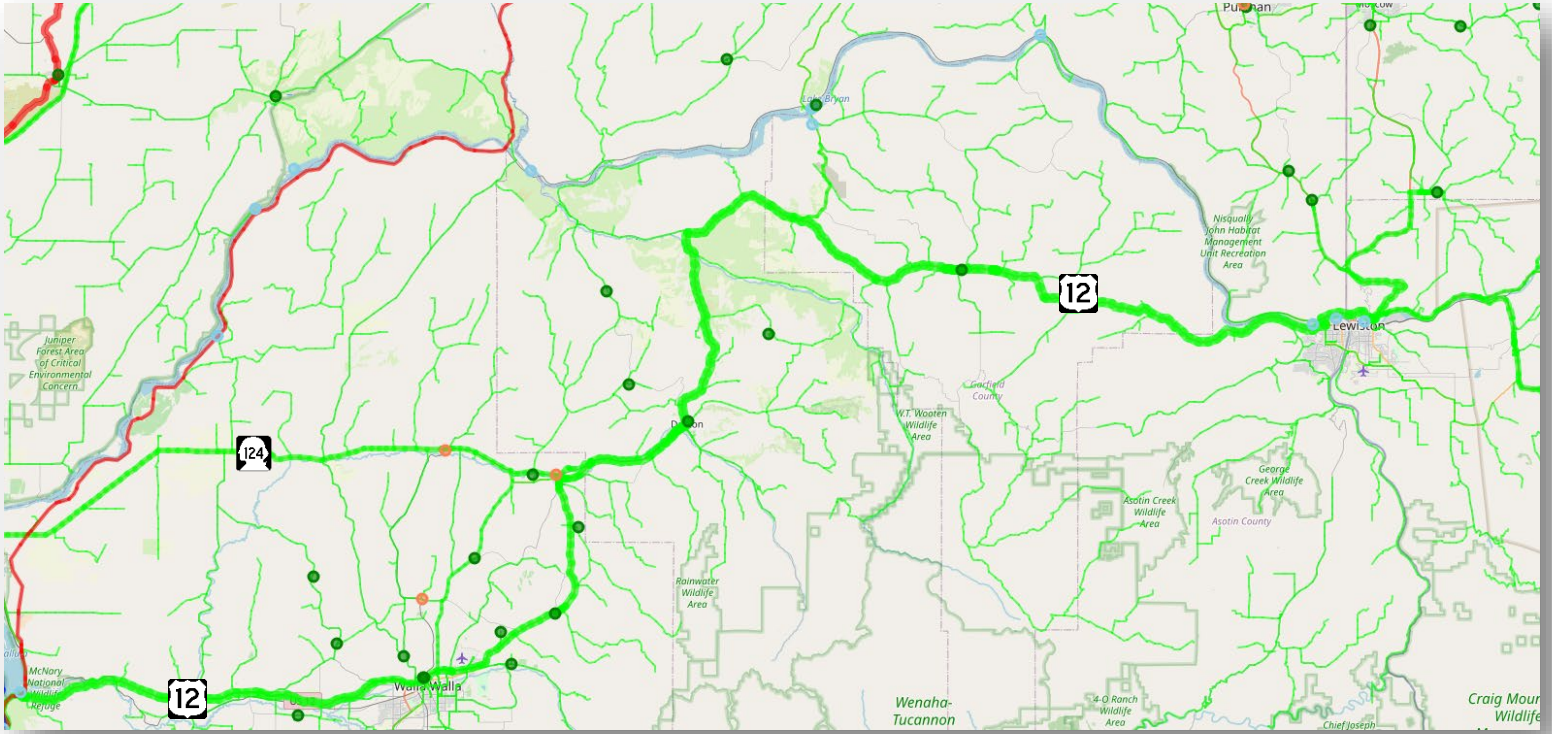
Scenario 4: Future year (2045) model with dam breaches

All Base Year Scenarios: No new infrastructure

Scenario 1: 2020 With Dams



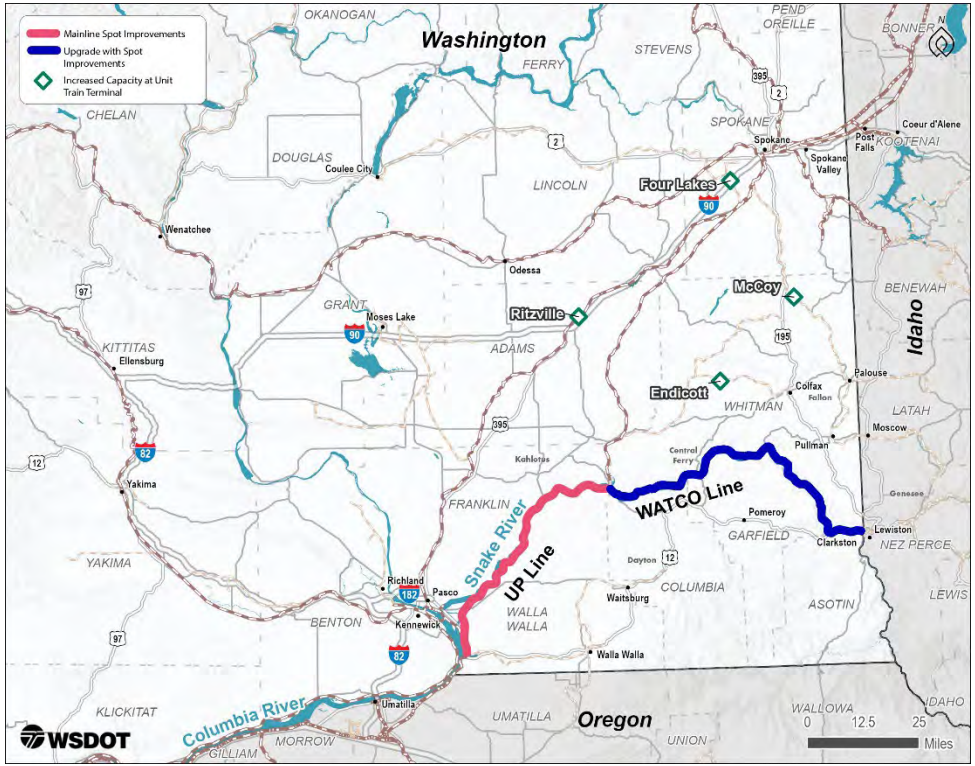
Scenario 4: 2045 Without Dams



Future Scenario Development

- Created with the Technical and Community Advisory Committees:
  - Scenario 5 – Created with farm cooperatives
  - Scenario 6 – Created with shortline rail proponents
  - Scenario 7 – Created at the request of the Technical Advisory Committee
- Scenario 8 – To be created by the study team learning from Scenarios 5 – 7
- All scenarios have trade-offs
- Goal is to get ideas of what can work, not to recommend a scenario

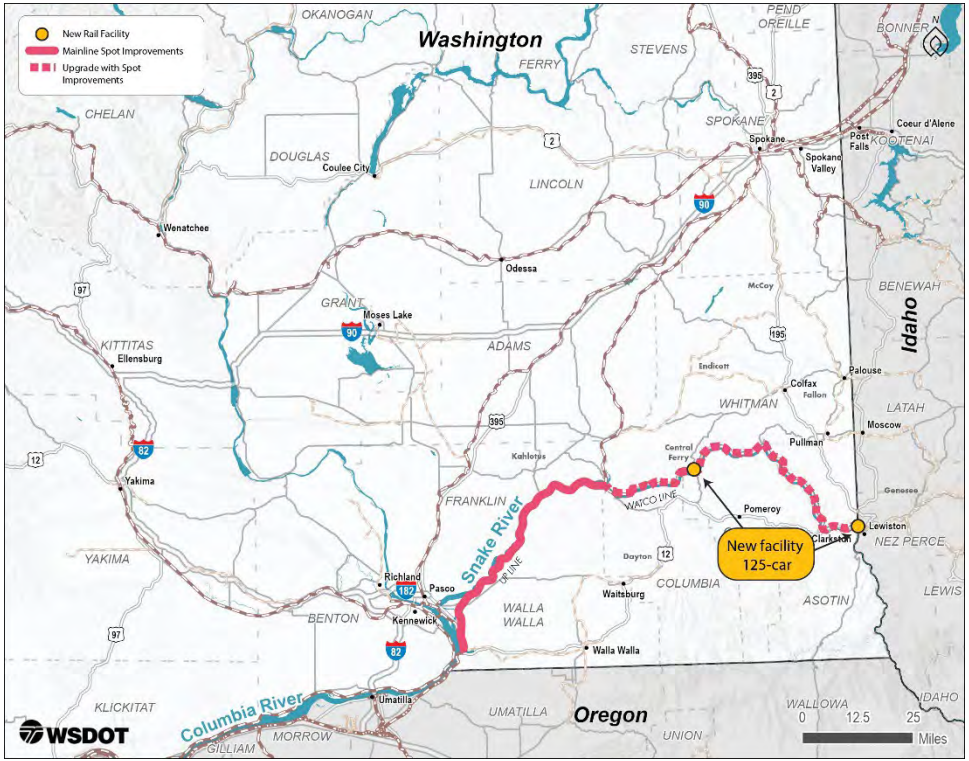
Future Baseline Rail Infrastructure Assumptions For All Scenarios



Preserve UP and WATCO Lines

Four existing rail ports can increase existing throughput

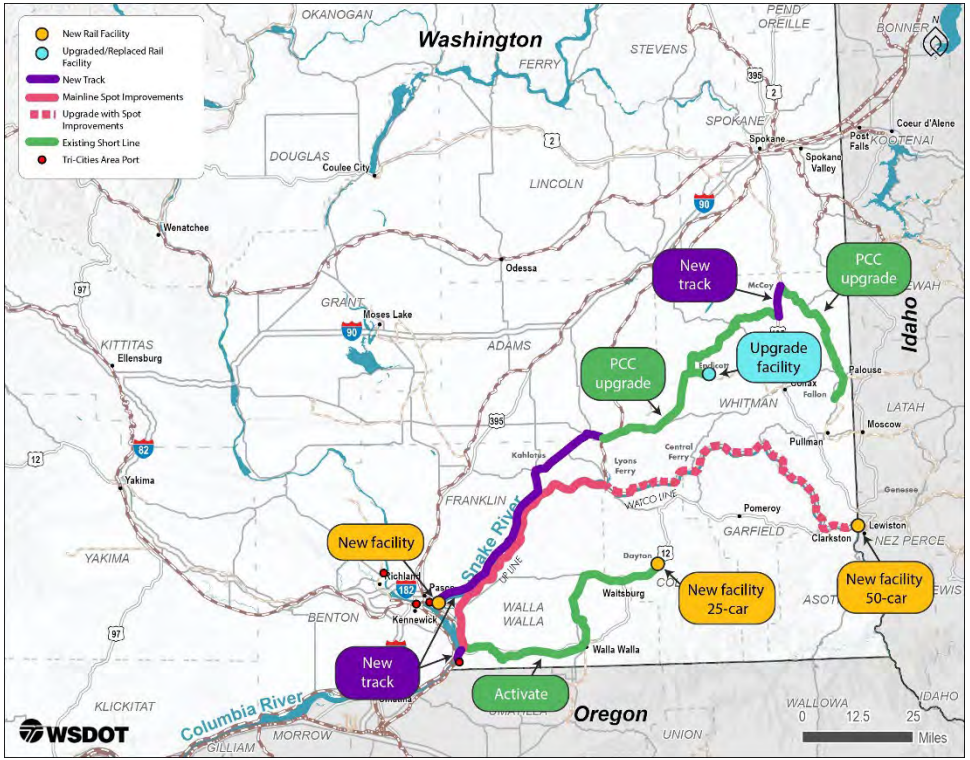
Scenario 5: Two New Unit Train Rail Terminals



New terminals at Lewiston/Wilma and Central Ferry

Improve WATCO and UP rail lines between Lewiston/Wilma and Tri-Cities

Scenario 6: Shortline Rail to Tri-Cities



New shortline rail terminals

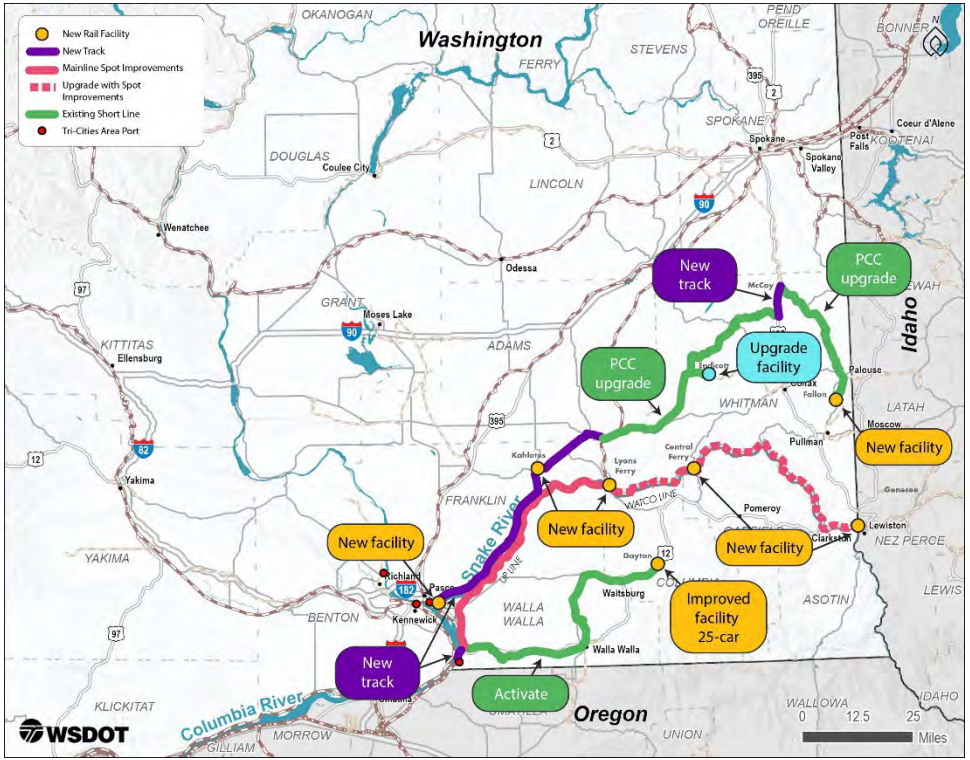
- Dayton
- Lewiston/Wilma
- Endicott upgrade

New track

- Columbia Plateau Trail
- Thornton to McCoy
- Wallula connection to Dayton

Track improvements along WATCO and UP line on river

Scenario 7: Many Solutions



New rail terminals

- Lewiston/Wilma
- Central Ferry
- Lyons Ferry
- Dayton
- Kahlotus
- Endicott upgrade

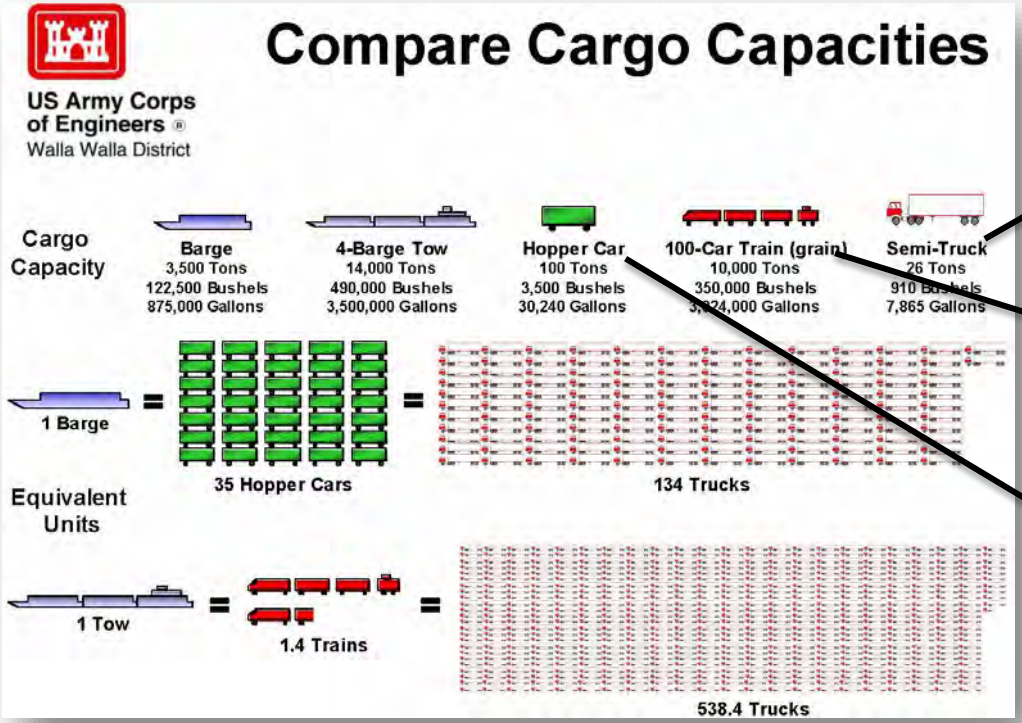
New track

- Columbia Plateau Trail
- Thornton to McCoy
- Wallula connection to Dayton

Track improvements on WATCO and UP line along river

Conversion Factors

Conversion Factors

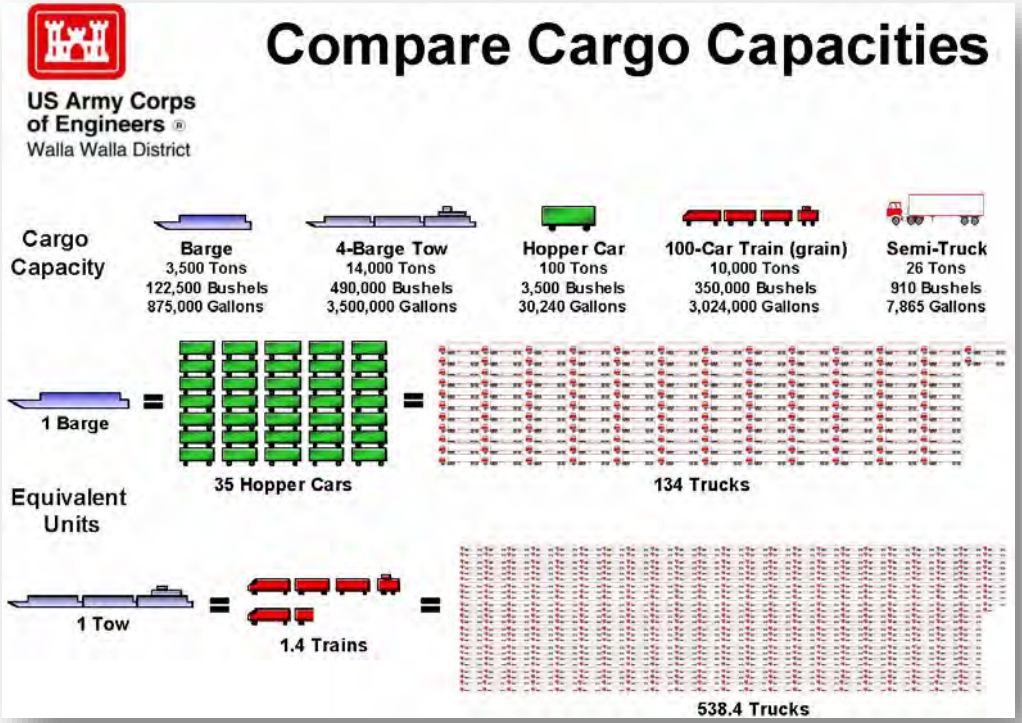


USACE = 26 tons
LSRD = 26 tons

USACE = 100 cars
LSRD = 112 cars

USACE = 100 tons
LSRD = 110 tons

Conversion Factors



Results

Trucks are unchanged

Unit-Train capacity ***up*** 23%

Means a 23% ***drop*** in trains

We are updating our model outputs to reflect these changes

Everything you see today is based upon USACE capacities

Annual Barge Volumes

Scenario 5: Annual Barges Compared to Scenario 3

WORK IN PROGRESS

Decreased barge volumes on both the Lower Snake River and the Columbia River

S1 – 2020 with dams | S3 – 2045 with dams | **S5 – New unit train terminals** | S6 – Shortline to Tri-Cities | S7 – Many solutions

Scenario 6: Annual Barges Compared to Scenario 3

WORK IN PROGRESS

Decreases in barge volumes due to LSR port closures

Increases in barge activity downstream of the Tri-Cities (compared to Scenario 5) from shortline rail delivering to the Tri-Cities

S1 – 2020 with dams | S3 – 2045 with dams | S5 – New unit train terminals | **S6 – Shortline to Tri-Cities** | S7 – Many solutions

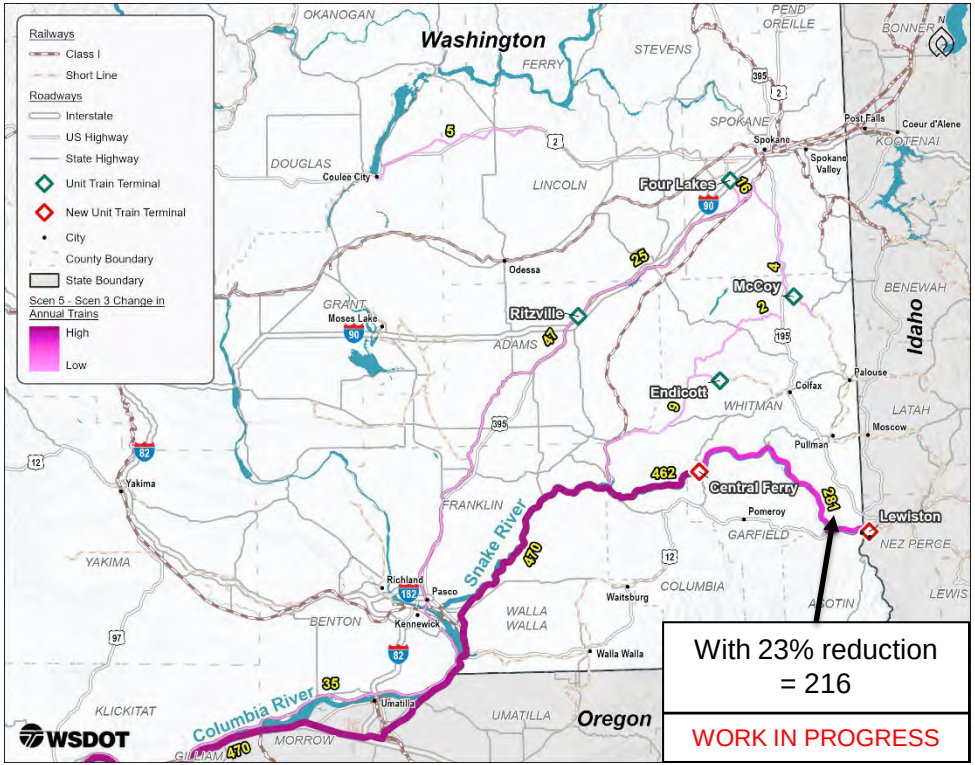
Scenario 7: Annual Barges Compared to Scenario 3

Given the option, once wheat gets on rail, it will stay on rail

S1 – 2020 with dams | S3 – 2045 with dams | S5 – New unit train terminals | S6 – Shortline to Tri-Cities | **S7 – Many solutions**

Annual Train Volumes

Scenario 5: Change in Annual Trains Compared to Scenario 3



Large train volumes increase alongside the Lower Snake River

- Lower increases on the BNSF/UP mainlines

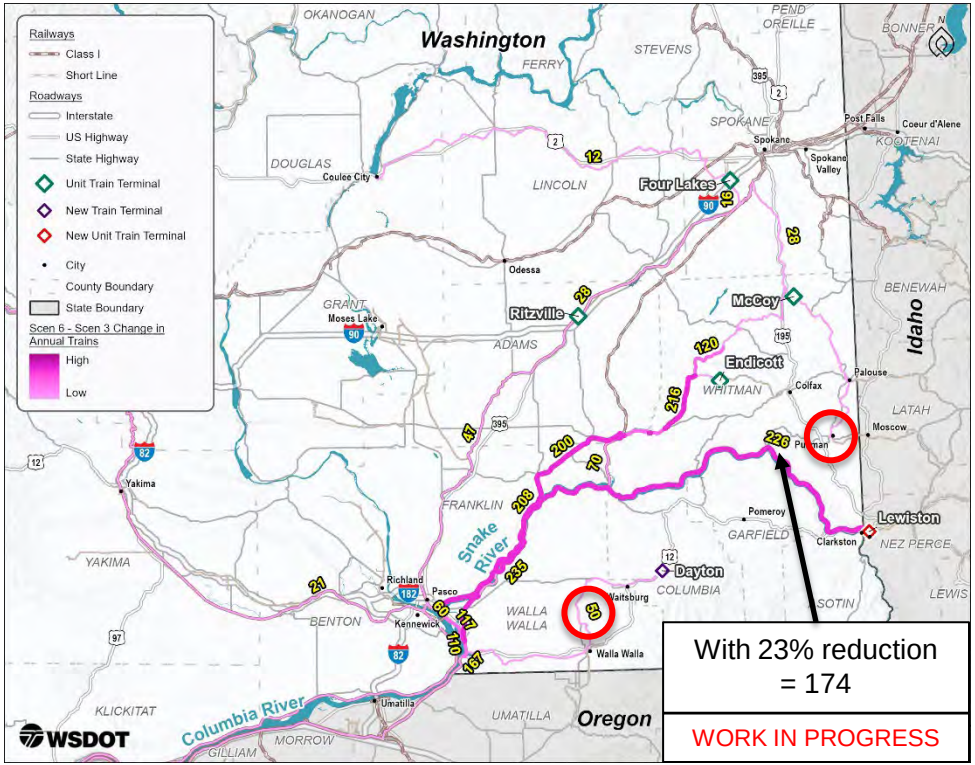
Lower than expected growth at Endicott rail terminal

- Indicates model capacity needs adjustment

Numbers will go down ≈ 23%

S1 – 2020 with dams | S3 – 2045 with dams | **S5 – New unit train terminals** | S6 – Shortline to Tri-Cities | S7 – Many solutions

Scenario 6: Change in Annual Trains Compared to Scenario 3



Train volumes increase on shortlines into Tri-Cities

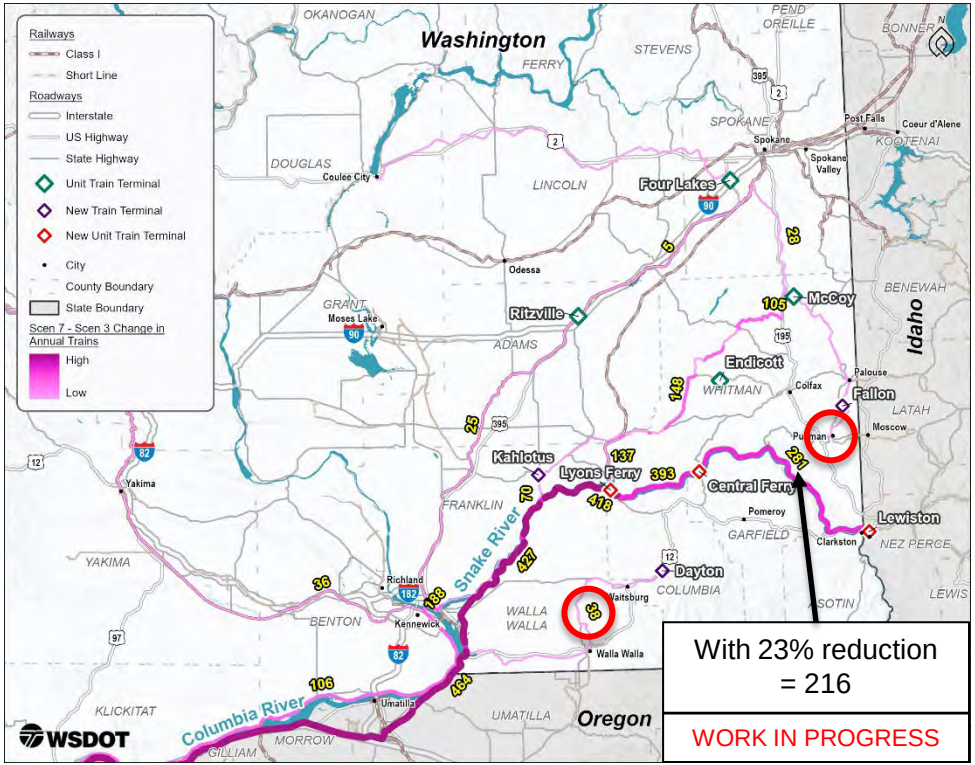
UP/BNSF mainline increases volumes as well

Numbers will go down ≈ 23%

○ Model Error

S1 – 2020 with dams | S3 – 2045 with dams | S5 – New unit train terminals | **S6 – Shortline to Tri-Cities** | S7 – Many solutions

Scenario 7: Change in Annual Trains Compared to Scenario 3



Some volumes attracted to each of the solutions

Further analysis can be used to determine the relative effectiveness of each solution

Numbers will go down ≈ 23%

○ Model Error

S1 – 2020 with dams → S3 – 2045 with dams → S5 – New unit train terminals → S6 – Shortline to Tri-Cities → **S7 – Many solutions**

Trucks

Peak Daily Trucks vs. Pavement Strength

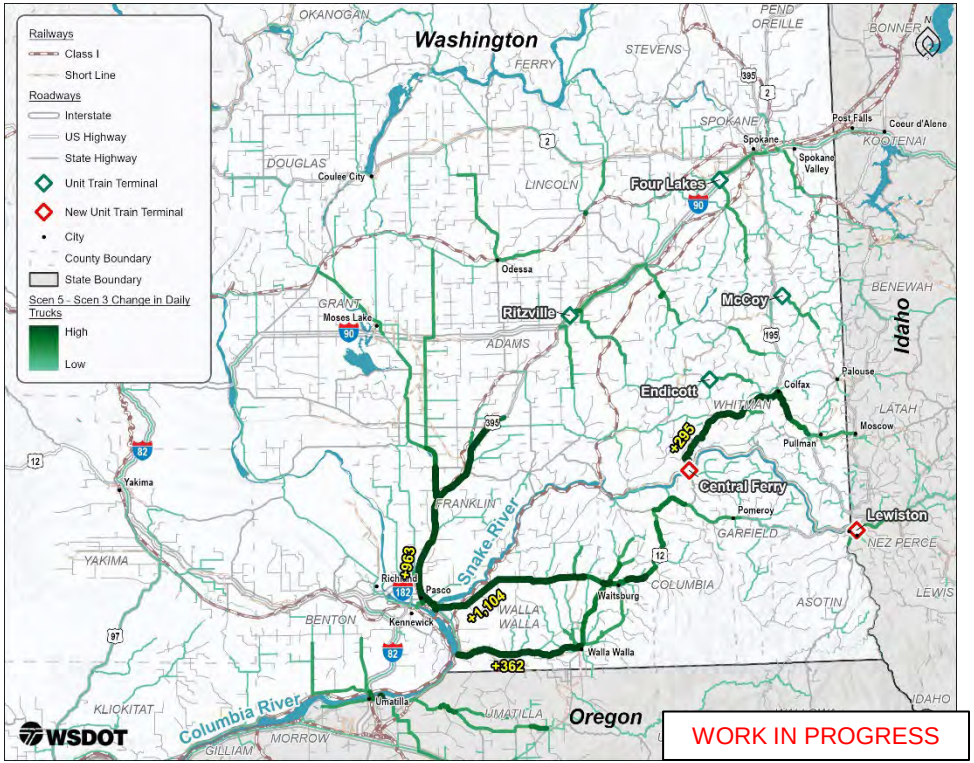
Peak Daily Trucks

- Tough to accurately calculate
- Don’t know what is stored on the farm
- Based on:
  - % wheat moved during harvest
  - Peak harvest is 21-28 days
  - 26 tons/truck ≈ 850 bushels
- Tough to calculate first-mile routes

Pavement Strength

- More reliable procedure
- Uses ESALs (Equivalent Single Axle Loads)
- ESALs calculated from annual trucks
- Annual truck tonnage is a direct output of the model
- Tough to calculate first-mile route

Scenario 5: Peak Daily Trucks Compared to Scenario 3



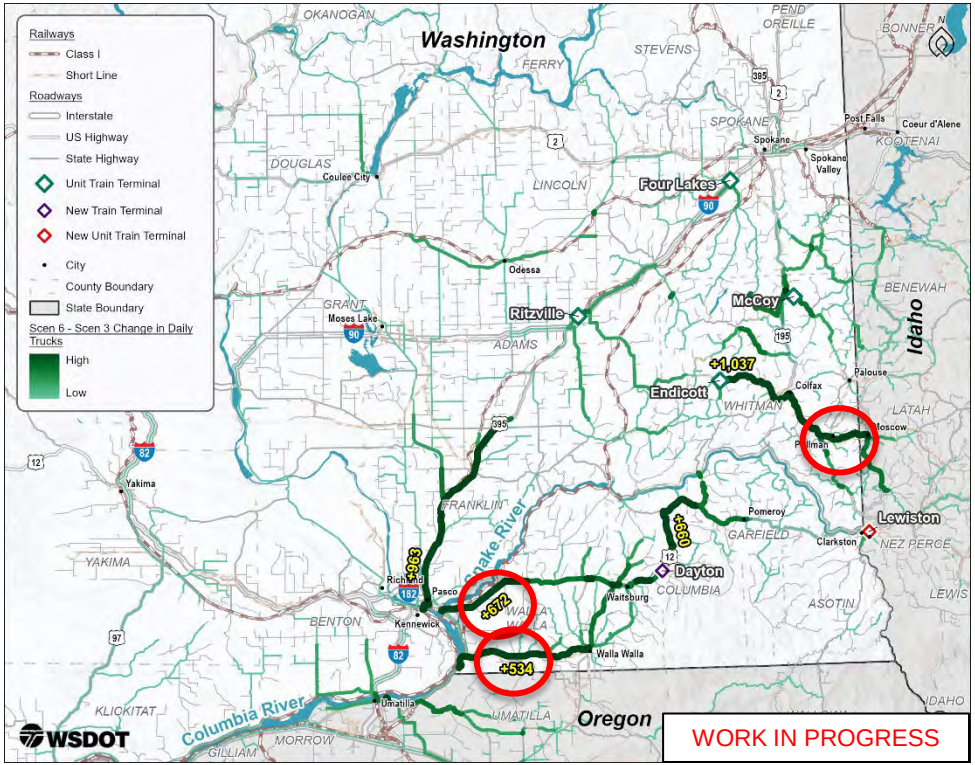
Truck volumes increase to both existing and new rail terminals

Truck volume increases to Endicott rail terminal are lower than expected

- Likely due to the throughput capacity being lower than needed

S1 – 2020 with dams | S3 – 2045 with dams | **S5 – New unit train terminals** | S6 – Shortline to Tri-Cities | S7 – Many solutions

Scenario 6: Peak Daily Trucks Compared to Scenario 3

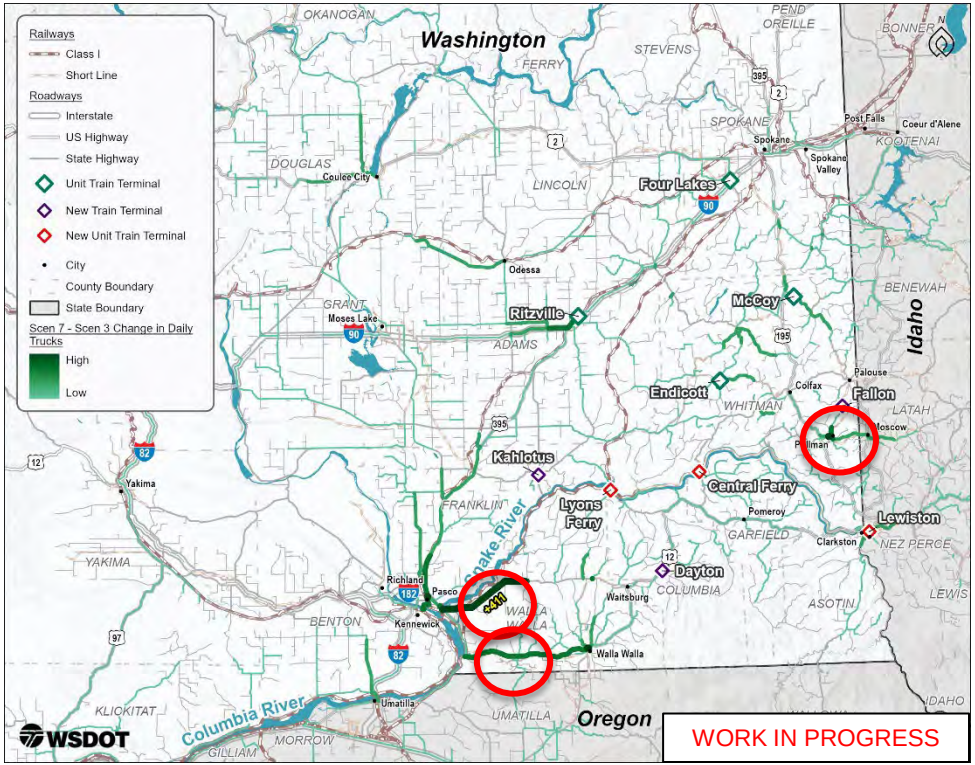


Increase in truck volumes to unit train terminals, shortline terminals, river ports and storage facilities, as expected

○ Model Error

S1 – 2020 with dams | S3 – 2045 with dams | S5 – New unit train terminals | **S6 – Shortline to Tri-Cities** | S7 – Many solutions

Scenario 7: Peak Daily Trucks Compared to Scenario 3



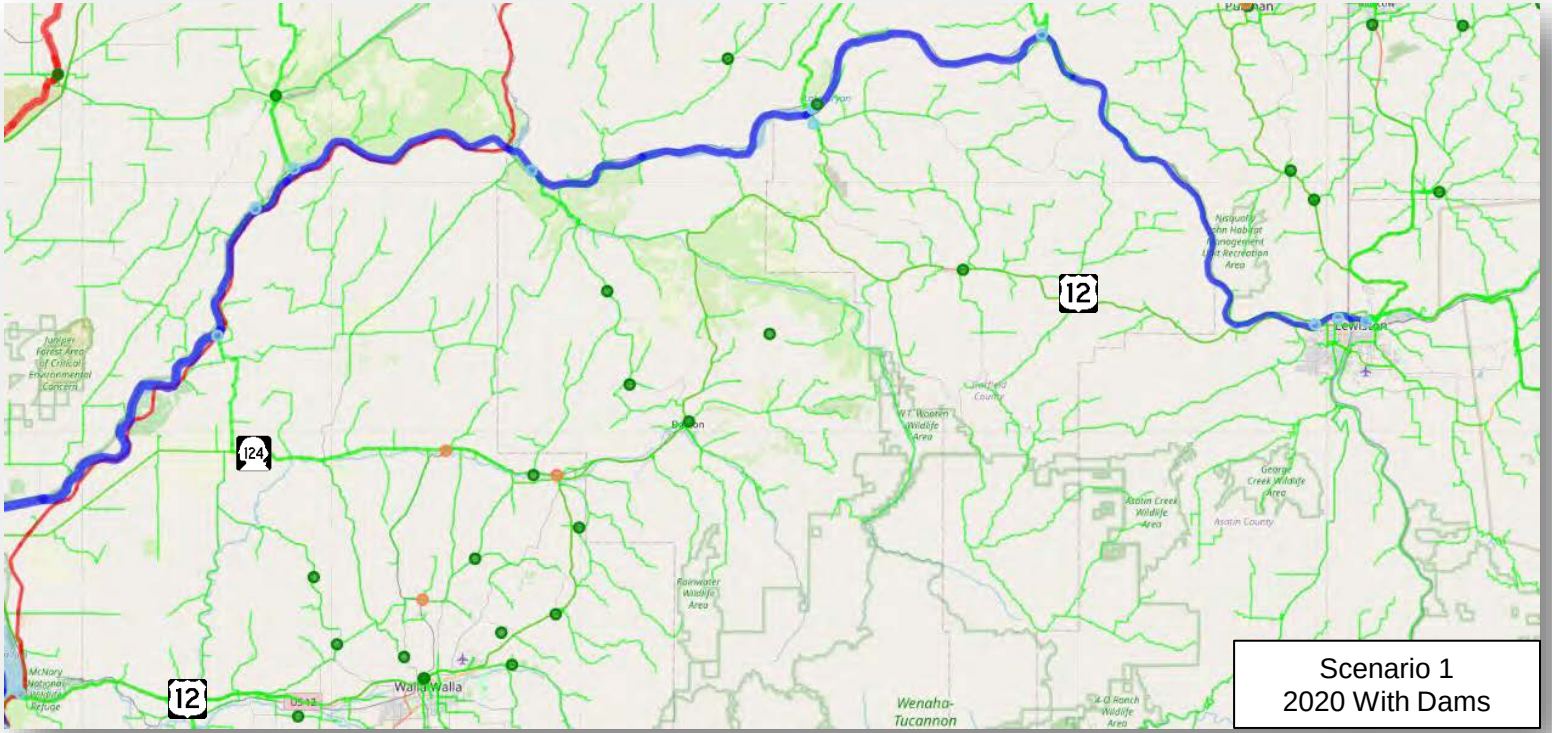
Least amount of truck impacts of all scenarios

Truck volume increases remain in the Tri-Cities area

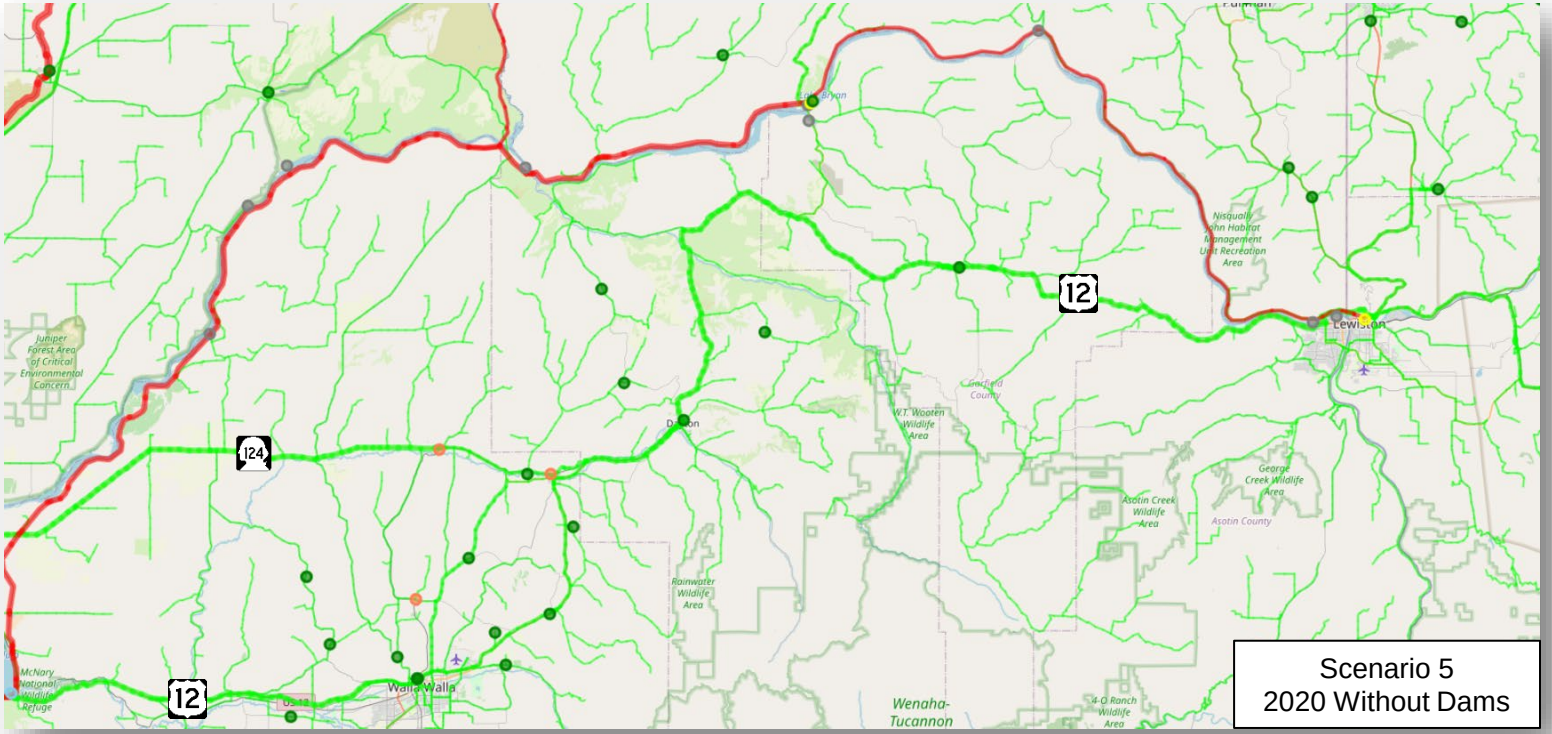
Model Error

S1 – 2020 with dams | S3 – 2045 with dams | S5 – New unit train terminals | S6 – Shortline to Tri-Cities | **S7 – Many solutions**

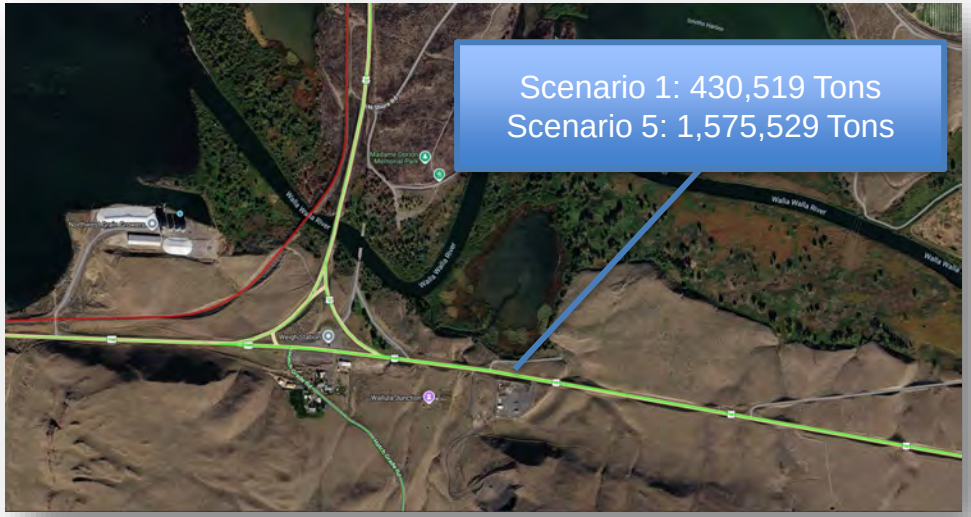
Pavement Strength



Pavement Strength



Scenario 5: Pavement Strength

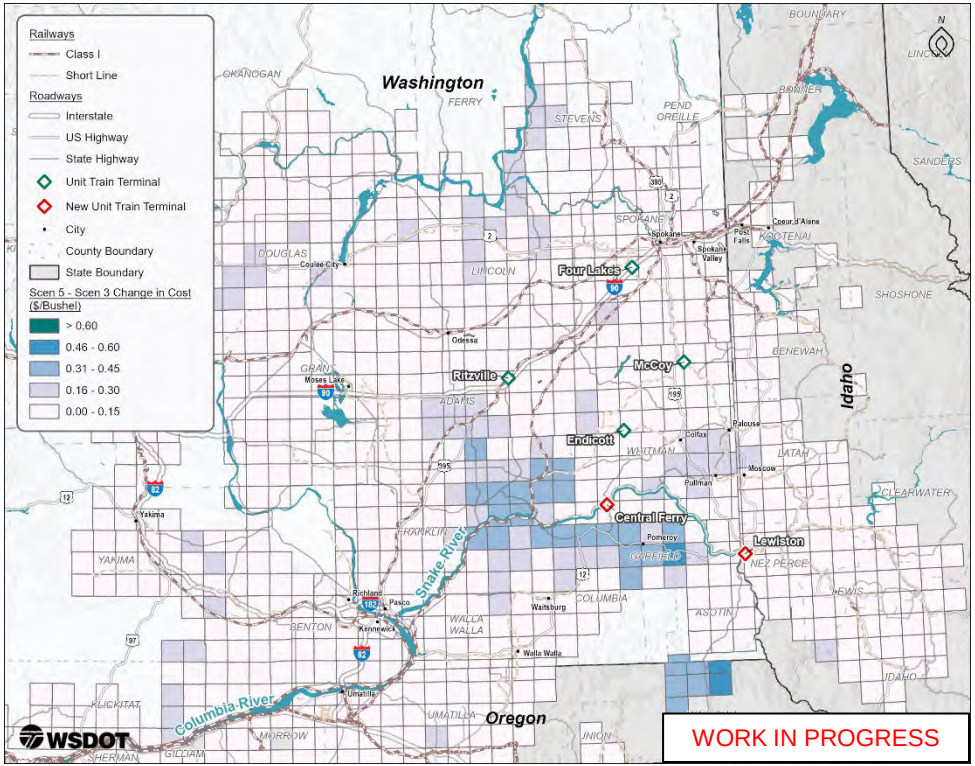


Pavement Strength

- Using:
  - Increased tons from model
  - WSDOT Pavement Policy
- Determine:
  - Does increase results in additional asphalt depth?
- Preliminary results:
  - US 12 overlay from Lewiston to Walla Walla
  - SR 124 overlay

Change in Transportation Shipping Costs

Scenario 5: Transportation Shipping Costs Compared to Scenario 3



Preliminary total transportation *shipping* costs of $273 million annually

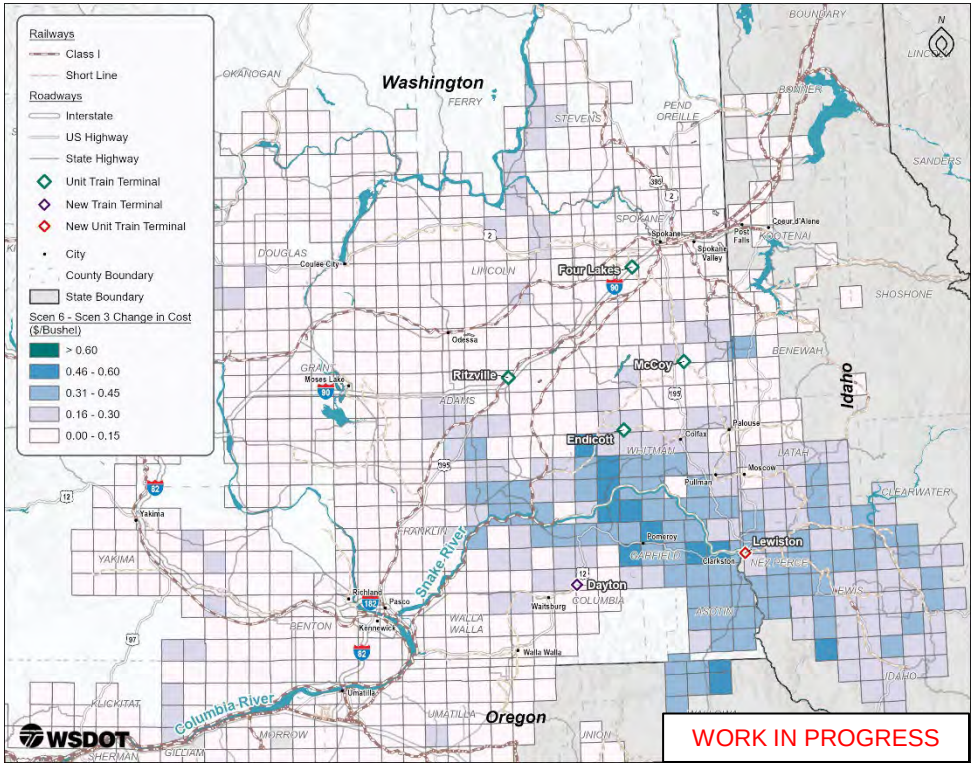
- **Increase of $17 million** compared to Scenario 3

Increased costs for some shippers located close to the LSR due to higher relative rail costs versus barge

Infrastructure cost to be determined

S1 – 2020 with dams | S3 – 2045 with dams | **S5 – New unit train terminals** | S6 – Shortline to Tri-Cities | S7 – Many solutions

Scenario 6: Transportation Shipping Costs Compared to Scenario 3



Preliminary total transportation *shipping* costs of $290 million annually

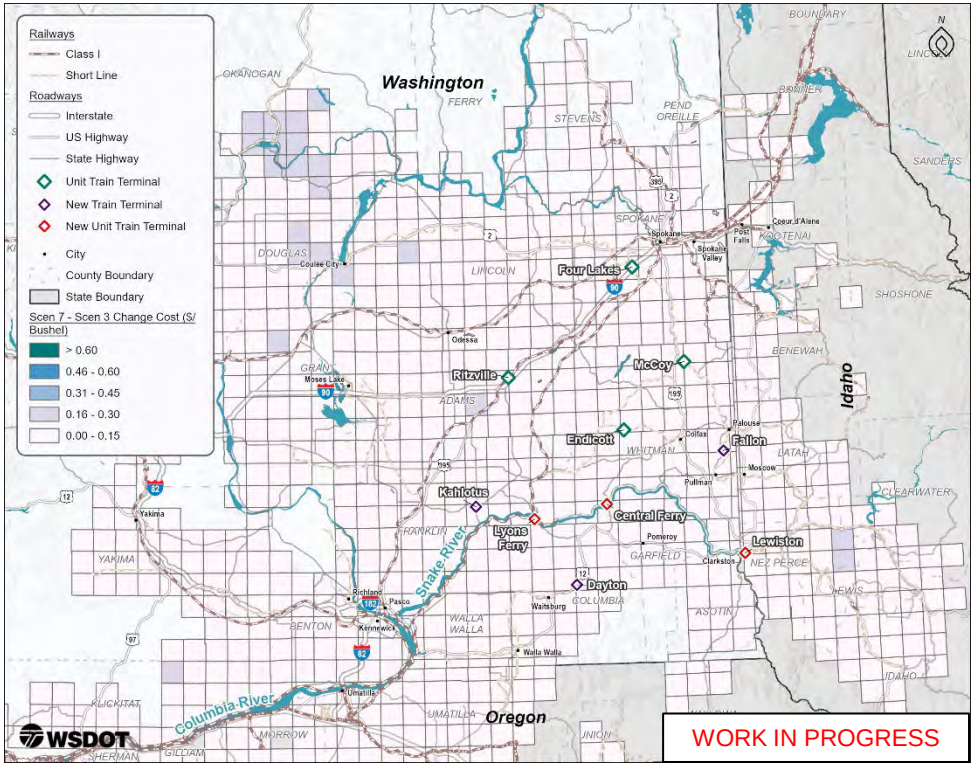
- **Increase of $33 million** compared to Scenario 3
- Higher than Scenario 5

Increased costs are experienced by shippers located along the LSR due to higher relative rail costs, particularly at Lewiston/Wilma and Central Ferry areas

Infrastructure cost to be determined

S1 – 2020 with dams | S3 – 2045 with dams | S5 – New unit train terminals | **S6 – Shortline to Tri-Cities** | S7 – Many solutions

Scenario 7: Transportation Shipping Costs Compared to Scenario 3



Preliminary total transportation *shipping* costs of $265 million annually

- **Increase of $8 million** compared to Scenario 3
- Lower increases than Scenarios 5 and 6

Infrastructure cost to be determined

S1 – 2020 with dams | S3 – 2045 with dams | S5 – New unit train terminals | S6 – Shortline to Tri-Cities | **S7 – Many solutions**

Engagement

Stakeholder Engagement

- Technical Advisory Group
- Community Advisory Group
- Update Meetings
  - WSDOT Executives
  - FHWA
  - Six Sovereigns
  - US Army Corps of Engineers

Public Engagement: Online

- Advertised via
  - GovDelivery: 469 subscribers
  - Postcards: 19,000+ mailed to Snake River zip codes
  - Social Media: Facebook, Instagram & X
  - Media Release: Radio, TV, Print
- Open House
  - Nov/Dec 2024
    - 2,276 attendees and 11 paper copies
  - Jan/Feb 2026
    - 1,326 attendees (23 questions) and 10 paper copies

Public Engagement: In-Person

- Advertised via
  - GovDelivery: 469 subscribers
  - Postcards: 19,000+ mailed to Snake River zip codes
  - Social Media: Facebook, Instagram & X
  - Media Release: Radio, TV, Print
- June 2025
  - Colfax: 34
  - Clarkston: 48
  - Pasco: 44

Next Steps

Next Steps

- Determine capacity enhancements needed for rail and port modes
- Develop capital costs
- Regulatory and Competitiveness Reports
- Engagement
  - In-Person Open House – Late Summer 2026

Questions?

For additional information on the
Lower Snake River Dams Transportation Study,
please contact:

Jim Mahugh, Lower Snake River Dams Study Lead
Jim.Mahugh@wsdot.wa.gov