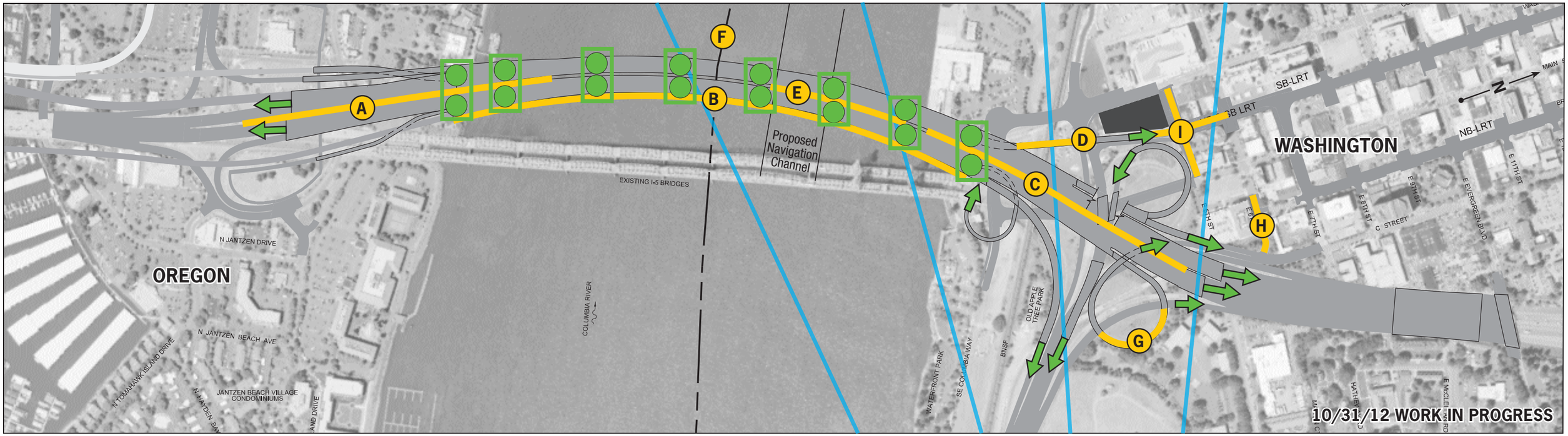
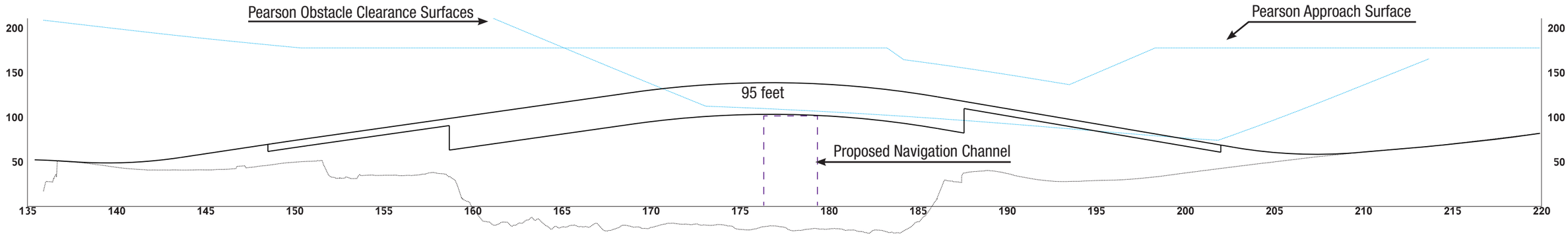
Columbia River CROSSING

Vertical clearance analysis for 100-125 feet





Cost increase

- Ramps lengthen
- Column height increases
- Column height increases and column footprint expands

Preliminary Findings

- A C Mainline grade
- B Traffic performance
- D Transit grade
- E G FAA airspace
- F Foundation sizes
- H 6th Street – I-5 South
- I Transit alignment and stations

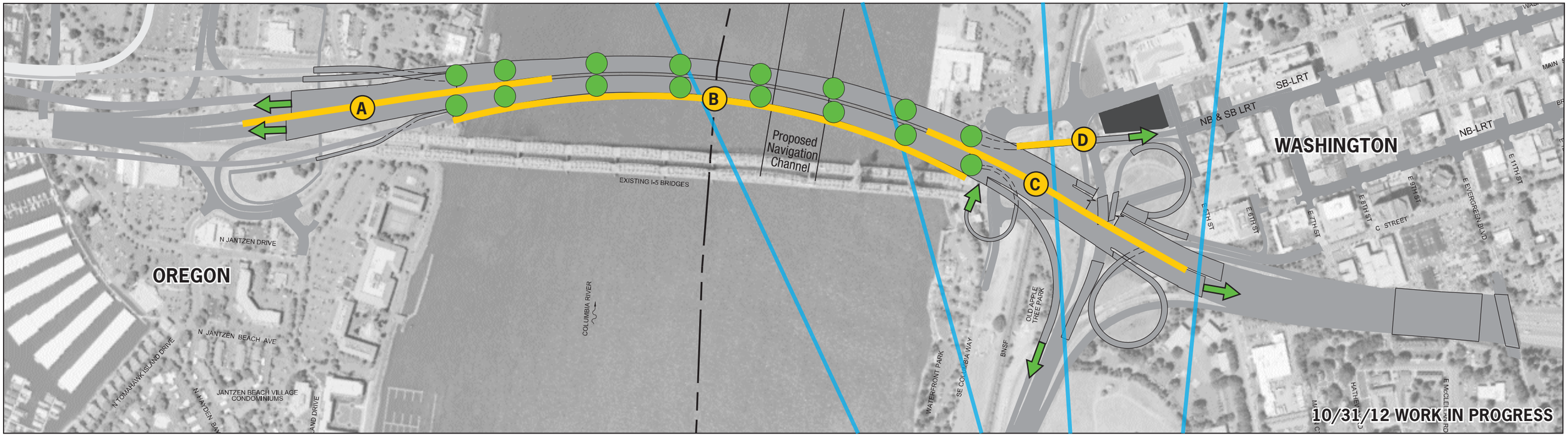
Significant challenge to maintain function

FAA airspace

Columbia River CROSSING

100 feet analysis

43 vessels/users potentially impacted*



** Based on 2011 CEVP, does not include mitigation costs.

* Potential impacts at 16 ft river stage and 10 ft air gap. Some of the vessels would pass at a lower river stage and/or with a smaller air gap. For this illustration each fabricator was represented by 1 vessel.

		Hayden Island	Main Crossing	Vancouver	TOTAL COST
Cost increase estimate over 95 feet**	60%	**$5 million**	**$2 million**	**$6 million**	**$13 million**
Highway/Transit		(A) In Oregon the mainline grade increases to 3.16% from 2.83%. This would need a design exception for a grade above 3%.	(B) More traffic analysis needed to address changes to traffic operations due to increased grades.	(C) In Washington the mainline grade increases to 3.61% from 3.40%. (D) Transit grade on Washington approach is 6% for an additional 120 feet.	

NOTE: *Estimates of impacts and costs are preliminary and may be refined following selection of a recommended bridge height.*

Cost increase

- Ramps lengthen
- Column height increases
- Column height increases and column footprint expands

Preliminary Findings

- (A) (C) **Mainline grade**
- (B) **Traffic performance**
- (D) **Transit grade**
- (E) (G) **FAA airspace**
- (F) **Foundation sizes**
- (H) **6th Street – I-5 South**
- (I) **Transit alignment and stations**

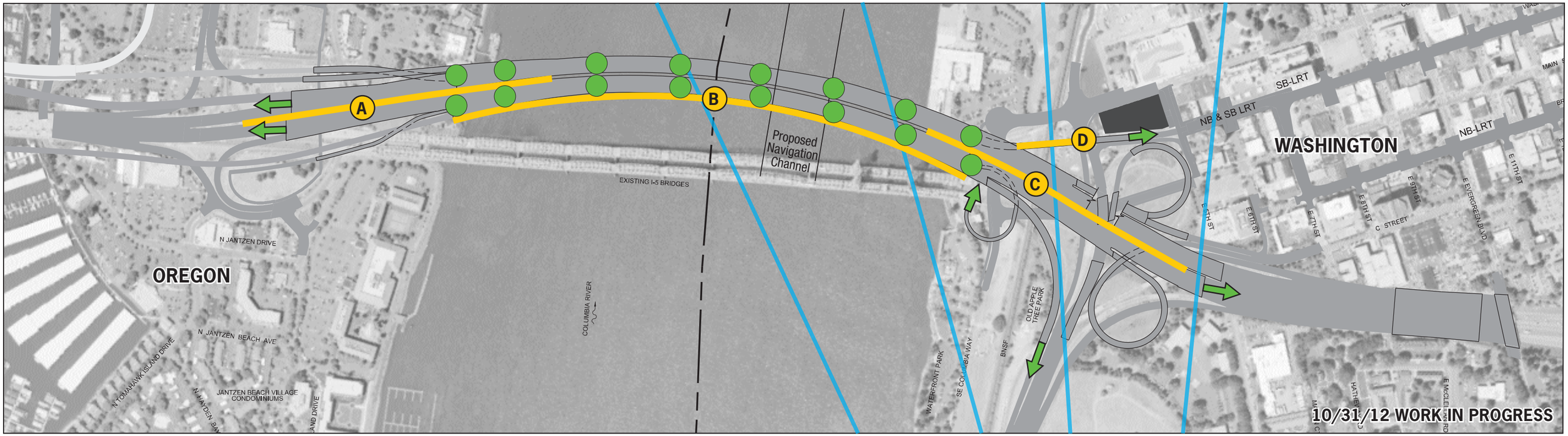
Significant challenge to maintain function

FAA airspace

Columbia River CROSSING

105 feet analysis

27 vessels/users potentially impacted*



** Based on 2011 CEVP, does not include mitigation costs.

* Potential impacts at 16 ft river stage and 10 ft air gap. Some of the vessels would pass at a lower river stage and/or with a smaller air gap. For this illustration each fabricator was represented by 1 vessel.

		Hayden Island	Main Crossing	Vancouver	TOTAL COST
Cost increase estimate over 95 feet**	60%	**$9 million**	**$3 million**	**$10 million**	**$22 million**
Highway/Transit		(A) In Oregon the mainline grade increases to 3.48% from 2.83%. This would need a design exception for a grade above 3%.	(B) More traffic analysis needed to address changes to traffic operations due to increased grades.	(C) In Washington the mainline grade increases to 3.81% from 3.40%. (D) Transit grade on Washington approach is 6% for an additional 120 feet.	

NOTE: *Estimates of impacts and costs are preliminary and may be refined following selection of a recommended bridge height.*

Cost increase

- Ramps lengthen
- Column height increases
- Column height increases and column footprint expands

Preliminary Findings

- (A) (C) **Mainline grade**
- (B) **Traffic performance**
- (D) **Transit grade**
- (E) (G) **FAA airspace**
- (F) **Foundation sizes**
- (H) **6th Street – I-5 South**
- (I) **Transit alignment and stations**

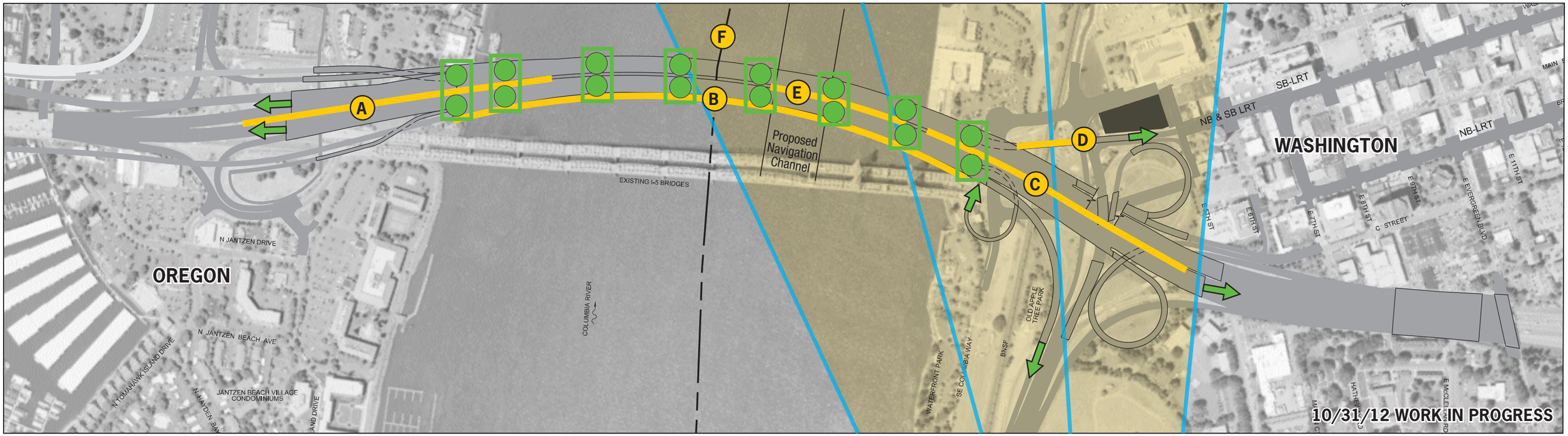
Significant challenge to maintain function

FAA airspace

Columbia River CROSSING

110 feet analysis

20 vessels/users potentially impacted*



** Based on 2011 CEVP, does not include mitigation costs.

* Potential impacts at 16 ft river stage and 10 ft air gap. Some of the vessels would pass at a lower river stage and/or with a smaller air gap. For this illustration each fabricator was represented by 1 vessel.

		Hayden Island	Main Crossing	Vancouver	TOTAL COST
Cost increase estimate over 95 feet**	60%	**$9 million**	**$17 million**	**$10 million**	**$36 million**
Highway/Transit		(A) In Oregon the mainline grade increases to 3.73% from 2.83%. This would need a design exception for a grade above 3%.	(B) More traffic analysis needed to address changes to traffic operations due to increased grades. (E) Top of roadway deck at centerline is 29' below FAA surface. (F) Foundation sizes may increase, however, they are still consistent with FEIS.	(C) In Washington the mainline grade increases to 3.99% from 3.40%. (D) Transit grade on Washington approach is 6% for an additional 130 feet.	

NOTE: *Estimates of impacts and costs are preliminary and may be refined following selection of a recommended bridge height.*

Cost increase

- Ramps lengthen
- Column height increases
- Column height increases and column footprint expands

Preliminary Findings

- (A) (C) **Mainline grade**
- (B) **Traffic performance**
- (D) **Transit grade**
- (E) (G) **FAA airspace**
- (F) **Foundation sizes**
- (H) **6th Street – I-5 South**
- (I) **Transit alignment and stations**

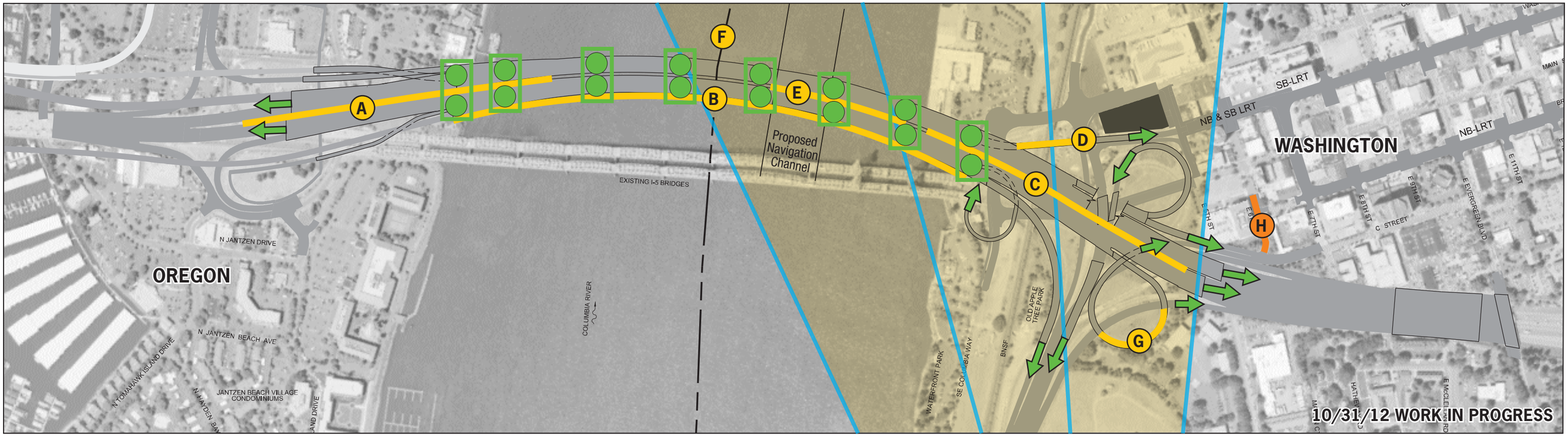
Significant challenge to maintain function

FAA airspace

Columbia River CROSSING

115 feet analysis

13 vessels/users potentially impacted*



** Based on 2011 CEVP, does not include mitigation costs.

* Potential impacts at 16 ft river stage and 10 ft air gap. Some of the vessels would pass at a lower river stage and/or with a smaller air gap. For this illustration each fabricator was represented by 1 vessel.

		Hayden Island	Main Crossing	Vancouver	TOTAL COST
Cost increase estimate over 95 feet**	60%	**$18 million**	**$19 million**	**$54 million**	**$91 million**
Highway/Transit		(A) In Oregon the mainline grade increases to 3.99% from 2.83%. This would need a design exception for a grade above 3%.	(B) More traffic analysis needed to address changes to traffic operations due to increased grades. (E) Top of roadway deck at centerline is 22' below FAA surface. (F) Foundation sizes may increase, however, they are still consistent with FEIS.	(C) In Washington the mainline grade increases to 3.99% from 3.40%. (D) Transit grade on Washington approach is 6% for an additional 300 feet. (H) 6th St. to I-5 South becomes challenging. (G) Top of roadway deck at 5N-C St. is 30' below FAA surface.	

NOTE: *Estimates of impacts and costs are preliminary and may be refined following selection of a recommended bridge height.*

Cost increase

- Ramps lengthen
- Column height increases
- Column height increases and column footprint expands

Preliminary Findings

- (A) (C) **Mainline grade**
- (B) **Traffic performance**
- (D) **Transit grade**
- (E) (G) **FAA airspace**
- (F) **Foundation sizes**
- (H) **6th Street – I-5 South**
- (I) **Transit alignment and stations**

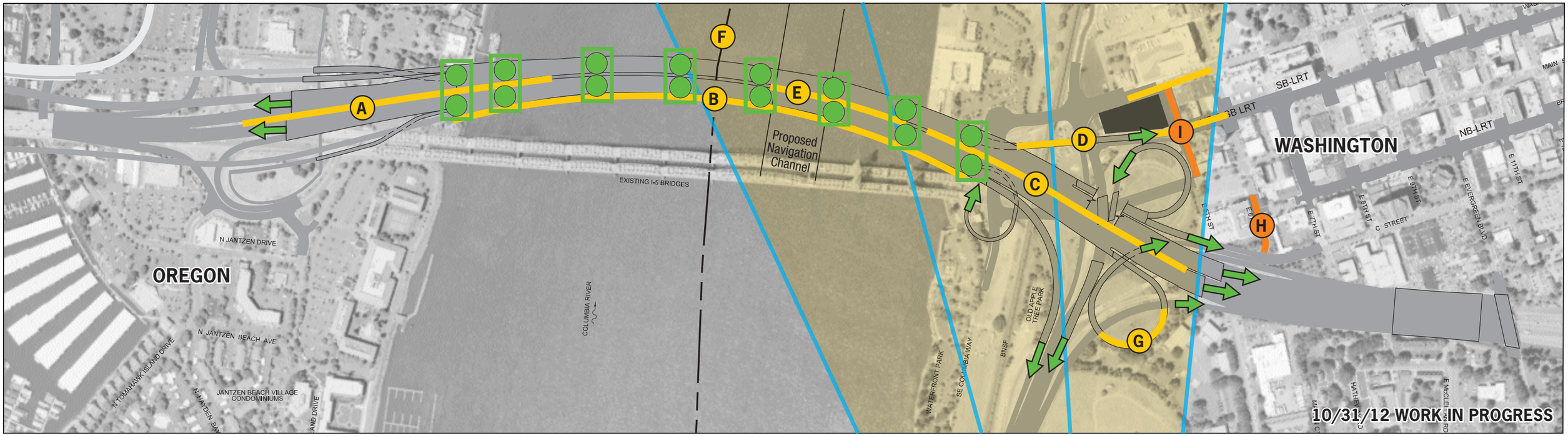
Significant challenge to maintain function

FAA airspace

Columbia River CROSSING

120 feet analysis

9 vessels/users potentially impacted*



** Based on 2011 CEVP, does not include mitigation costs.

* Potential impacts at 16 ft river stage and 10 ft air gap. Some of the vessels would pass at a lower river stage and/or with a smaller air gap. For this illustration each fabricator was represented by 1 vessel.

		Hayden Island	Main Crossing	Vancouver	TOTAL COST
Cost increase estimate over 95 feet**	60%	**$18 million**	**$93 million**	**$65 million**	**$176 million**
Highway/Transit		(A) In Oregon the mainline grade increases to 3.99% from 2.83%. This would need a design exception for a grade above 3%.	(B) More traffic analysis needed to address changes to traffic operations due to increased grades. (E) Top of roadway deck at centerline is 17' below FAA surface. (F) Foundation sizes may increase, however, they are still consistent with FEIS.	(C) In Washington the mainline grade increases to 4% from 3.40%. (H) 6th St. to I-5 South may be closed. (G) Top of roadway deck at 5N-C St. is 25' below FAA surface. (D) Transit grade on Washington approach is 6% for an additional 470 feet. (I) 6th St. Station platform grade raised resulting in 6'-8' over existing grade closing 5th St. Impacts to businesses on Washington between 5th and 6th St. Access to and from Park & Ride limited to Columbia St. Intersection at 6th and Washington requires modification. Challenging to maintain circulation in and out of parking structure.	

NOTE: *Estimates of impacts and costs are preliminary and may be refined following selection of a recommended bridge height.*

Cost increase

- Ramps lengthen
- Column height increases
- Column height increases and column footprint expands

Preliminary Findings

- (A) (C) Mainline grade
- (B) Traffic performance
- (D) Transit grade
- (E) (G) FAA airspace
- (F) Foundation sizes
- (H) 6th Street – I-5 South
- (I) Transit alignment and stations

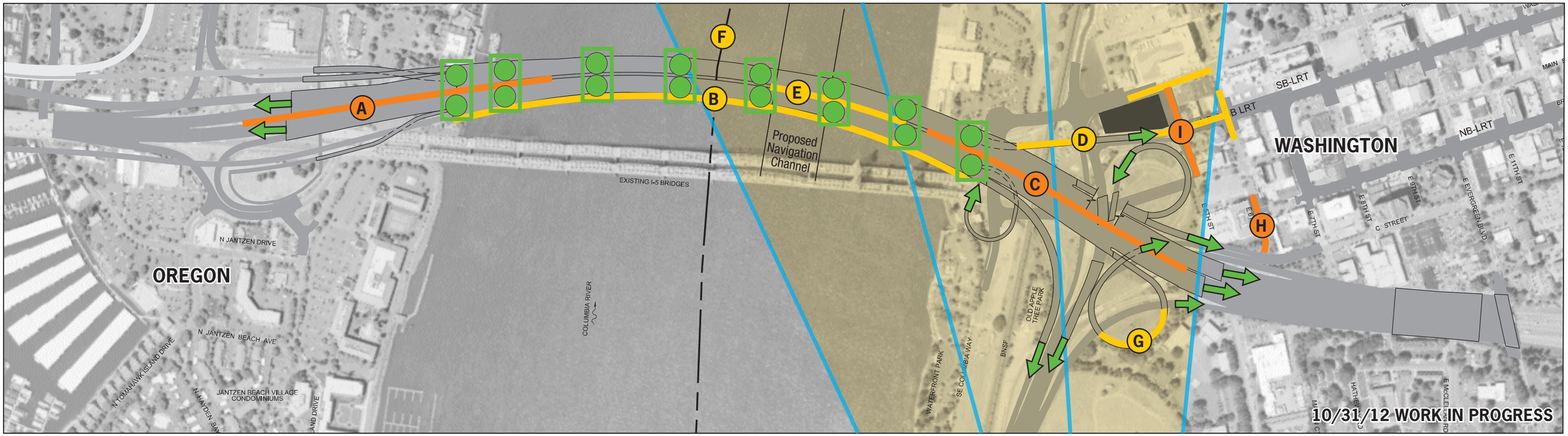
Significant challenge to maintain function

FAA airspace

Columbia River CROSSING

125 feet analysis

8 vessels/users potentially impacted*



** Based on 2011 CEVP, does not include mitigation costs.

* Potential impacts at 16 ft river stage and 10 ft air gap. Some of the vessels would pass at a lower river stage and/or with a smaller air gap. For this illustration each fabricator was represented by 1 vessel.

		Hayden Island	Main Crossing	Vancouver	TOTAL COST
Cost increase estimate over 95 feet**	60%	**$24 million**	**$94 million**	**$53 million**	**$171 million**
Highway/Transit		(A) In Oregon the mainline grade increases to 5% from 2.83%. This would need a design exception for a grade above 3%.	(B) More traffic analysis needed to address changes to traffic operations due to increased grades. (E) Top of roadway deck at centerline is 12' below FAA surface. (F) Foundation sizes may increase, however, they are still consistent with FEIS.	(C) In Washington the mainline grade increases to 5% from 3.40%. (H) 6th St. to I-5 South may be closed. (G) Top of roadway deck at 5N-C St. is 41' below FAA surface. (D) Transit grade on Washington approach is 6% for an additional 470 feet. (I) 6th St. Station platform grade raised resulting in 7'-9' over existing grade closing 5th St. Impacts to businesses on Washington between 5th and 6th St. Access to and from Park & Ride limited to Columbia St. Intersection at 6th and Washington requires modification. Challenging to maintain circulation in and out of parking structure.	

NOTE: *Estimates of impacts and costs are preliminary and may be refined following selection of a recommended bridge height.*

Cost increase

- Ramps lengthen
- Column height increases
- Column height increases and column footprint expands

Preliminary Findings

- (A) (C) Mainline grade
- (B) Traffic performance
- (D) Transit grade
- (E) (G) FAA airspace
- (F) Foundation sizes
- (H) 6th Street – I-5 South
- (I) Transit alignment and stations

Significant challenge to maintain function

FAA airspace