Bob Ortblad is a retired Civil Engineer, MBA and CPA. He teaches a UW class on the history of infrastructure, and recently presented “Who Built Seattle” at Seattle Town Hall. He has lived on Capitol Hill for forty years.
Round Trip /Car
Martha’s Vineyard
9.2 miles

$137
100% of Operating & Capital
Round Trip /Car
Bainbridge Island
8.6 mi

$30
40% of Operating & Capital

$75
100% of Operating & Capital
Toll $9.60
Tokyo to Sapporo
1993
World’s Longest Subsea Tunnel

33.5 miles
790 feet

Seikan Tunnel
6 Miles Tunnel
Puget Sound Regional Council

+1,000,000

\{\}
1 million additional people

\{\}
850,000 additional jobs

\{\}
600,000 additional households

Graph showing population, employment, and household trends from 1970 to 2040, with an forecasted increase of +1,000,000 people by 2040.
"the ferry system is a critical link between more affordable housing on the west side of the sound and key employment centers on the east side."
City of Seattle
Affordable Housing Crisis
$820,000 median value
<table>
<thead>
<tr>
<th>City</th>
<th>Median Value</th>
<th>Percentage Off</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seattle</td>
<td>$820,000</td>
<td>-64%</td>
</tr>
<tr>
<td>Bremerton</td>
<td>$276,000</td>
<td>-62%</td>
</tr>
<tr>
<td>Port Orchard</td>
<td>$314,000</td>
<td>-57%</td>
</tr>
<tr>
<td>Silverdale</td>
<td>$359,000</td>
<td>-57%</td>
</tr>
<tr>
<td>Poulsbo</td>
<td>$391,000</td>
<td>-53%</td>
</tr>
</tbody>
</table>
Six Urban Growth Areas

Population

1  Kingston  111,000
2  Poulsbo  77 sq. miles
3  Bainbridge
4  Silverdale 77 sq. miles = 84 sq. miles
5  Bremerton
6  Port Orchard

Seattle
<table>
<thead>
<tr>
<th>Area</th>
<th>JOBS 2011-2016</th>
<th>POPULATION 2016-2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEATTLE metro area</td>
<td>229,600</td>
<td>2.3%</td>
</tr>
<tr>
<td>KITSAP COUNTY</td>
<td>5,700</td>
<td>0.7%</td>
</tr>
</tbody>
</table>

*slowest growing*
Special report: Accessibility of jobs in Puget Sound region

2017

KING, PIERCE, & SNOHOMISH

670,000 jobs within 30 minutes

Cumulative jobs accessible

300  229,000  436,000  668,000  925,000  1,117,000  1,300,000
HOUSING $1 billion JOBS $54 billion

NORTH

SOUTH

East
1891 - 1940

MADISON PARK TO KIRKLAND

LESCHI TO MEDINA

LESCHI TO MERCER ISLAND
Central Puget Sound

Riders: 55%
Vehicles: 45%

Kingston - Edmonds route
30-minute trip time

Seattle - Bainbridge route
35-minute trip time

Seattle - Bremerton route
60-minute trip time
Central Fleet - Six Ferries

Total 1,068 Cars

60% utilization

Walla Walla 188 cars
x 2 = 376

Puyallup 202 cars
x 2 = 404

Tokitae 144 cars
x 2 = 288
FOG
WIND
OUT OF SERVICE FOR REPAIRS

9.5 weeks / year / vessel
Seattle / Bainbridge Island
Crossing Time: Approximately 35 minutes

<table>
<thead>
<tr>
<th>Monday through Friday Leave Seattle</th>
<th>Saturday, Sunday &amp; Holidays Leave Seattle</th>
</tr>
</thead>
<tbody>
<tr>
<td>5:30 10:40 3:45 9:00</td>
<td>6:10 10:40</td>
</tr>
<tr>
<td>6:10 11:25 4:40 10:05</td>
<td>6:20 10:15</td>
</tr>
<tr>
<td>7:05 12:20 5:30 10:55</td>
<td>7:20 11:45</td>
</tr>
<tr>
<td>7:55 1:10 6:20 11:45</td>
<td>7:55 12:20</td>
</tr>
<tr>
<td>8:45 2:05 7:10</td>
<td>9:35 3:00</td>
</tr>
</tbody>
</table>

**Note:** Passengers must be on board two minutes before departure time.

*Every 50 Minutes x 20 hours*

*23% Delayed sailings-July 2017*
Every SECOND x 24 hours
12 million commuter hours/year
Opportunity Cost

$360 million/Year
Tunnel: 6,000 cars/hour

Six Ferries: 1,000 cars/hour

Inefficient
Via Flaminia
Ancient Roman Tunnel

30 years

2,000 years
$7.2 billion
99.4%
0.6%
5,800,000 drivers
33,000 ferry riders

10%
$506 million

27%
$7.2 billion

$4.7 Billion
2017-2019 Budget
Net of tolls

18.9 billion
2018-2040
Maintenance, Preservation, & Operations

Puget Sound Regional Council
Red Ink  $ 506,000,000
Performance Metric -46%
Fare Revenue / Operating Costs

1963 120%
2017 74%

INSANITY
“From a business perspective Washington State Ferries (WSF) is an unsightly mess.” May 2012

“Lawmakers act on KING 5 investigation into ferry system spending spree”   May 2017
Terminal Upgrade
$350,000,000
102,000 tons CO2

DANGER
DIESEL FUEL
9 million gal/year
Particulate Matter: 125 tons
Nitrogen Oxides: 2,000 tons
120 DECIBELS

CAVITATION
EXECUTIVE ORDER 18-02
SOUTHERN RESIDENT KILLER WHALE
RECOVERY AND TASK FORCE
Slow 17 knots to 10 knots -40% Service
Low Cavitation & Quiet
6 Miles
118 Fathoms – 708 feet

-5% 6 Miles -5%

118 Fathoms – 708 feet

-800ft/3miles= -5%
Elliott Ave  7 lanes

9 min
2.9 miles
41 acres

Expedia

12,500 employees by 2030
3,300 parking spaces
0.75 miles
West Point, Sewer Tunnel  1912.

Two Miles
4 miles
SEVERN TUNNEL

1886  4.4 Miles
Shanghai – Yangtze River

20 months
twin tunnels
4.6 mile
50 ft. dia.
three lanes

2008
Hvalfjord Tunnel    3.6 Miles    Depth 541 Feet
5.2 population million

35 subsea tunnels

100 miles
The blue line marks where the tunnel passes below sea level.

- 4.8 miles
- 942 ft. below sea level
- $95 million
- $20 million/mile
Eysturoy Tunnel
2017-2021

Construction
$180 million

7 miles
5% grade
614 ft. deep
miles  tubes  $million/mile

Hvalfjord  $33
Eiksund  $20
Eysturoy  $26
Bainbridge  $33.3
Bainbridge  $66.6

Population
0.34 million
5.23 million
0.05 million
7.29 million

Hvalfjord 3.6 x 1 x $33 = $120 million
Eiksund  4.8 x 1 x $20 = $95 million
Eysturoy  7 x 1 x $26 = $180 million
Bainbridge  6.0 x 2 x $33.3 = $400 million
Bainbridge  6.0 x 2 x $66.6 = $800 million
Puget Sound
20,000 years under
3,000 feet of ice
3,000 feet of ice

3,500 feet of Glacial Till

Bed Rock
Caissons are embedded in very dense glacial soils -60 ft.
Tunnels are less vulnerable to earthquakes
$400/CY 
X 2 million CY 
$800 million

3 Years
41 Barge loads
2 million CY
200-300 loads
Seattle tunnel dirt for Mats Mats
33 miles
$1,000,000,000

CREDIT = Six Ferries
Maintenance, Preservation, & Operations Expenditure Estimates ($2018 Constant)

TOTAL: $105.2 BILLION

- Cities and Counties: $34.0 B
- State Highways: $18.9 B
- Sound Transit: $19.2 B
- Local Transit: $25.8 B

State Ferries: $7.2 billion

Tunnel Saving: 50%

Savings: $3.6 billion
Opportunity Cost
$360 million/Year
X 20 years
$7.2 billion
State

Public-Private

Counties

Design, Build, Own, Operate and Transfer
<table>
<thead>
<tr>
<th></th>
<th>Annual Tolls</th>
<th>Cost</th>
<th>toll/cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bridge</td>
<td>45,000 cars/day $5/car</td>
<td>$79 million</td>
<td>10%</td>
</tr>
<tr>
<td>Tunnel</td>
<td>30,000 cars/day $15/car</td>
<td>$164 million</td>
<td>21%</td>
</tr>
</tbody>
</table>
Open 1940 - Paid 1949
Public-Private

Design, Build, Own, Operate and Transfer
Ferry Frustration
202 cars/ 50 minutes
57% Just Crossing Ferry Convoy
Highway Projects

1. WSDOT – SR 305 Winslow Ferry to Poulsbo (2023)
Bridge: 3,000 feet
Tunnel: 6 miles
Parkway: 2.9 miles
15 minutes
10.0 miles
30 min Seattle

Kitsap Transit
Kitsap County to Metropolitan Seattle

• Providing access to affordable housing

• Access to Jobs for Kitsap residents
Environment

• Free acres of waterfront parking lots for Parks & Development
• Reduce Air Pollution
• Reduce noise to protect Orcas
Money

Next 20 years

• Save $7.2 billion in opportunity costs and millions of commuter hours

• Save $3.6 billion in ferry operations and new construction

• Increase tolls revenues by $1.6 billion
Homer Hadley proposes a concrete floating bridge
October 1, 1921
PORTAL TO THE OLYMPICS

Electric & Autonomous