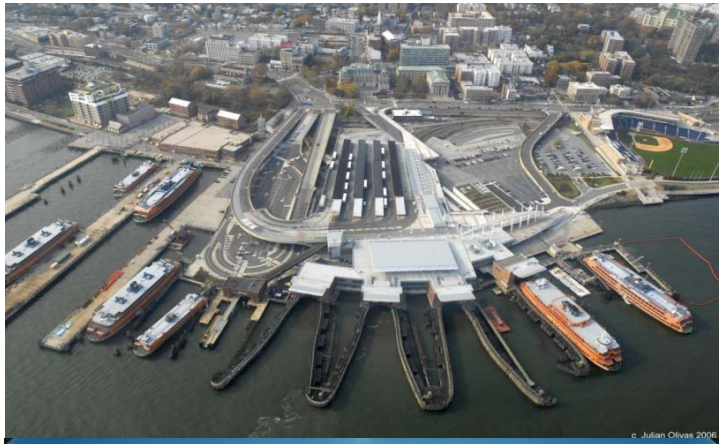
Implementation of Asset Management at Washington State Ferries

Stephanie MacLachlan
Ninth Annual Conference on Transportation Asset Management
April 17 2012
San Diego, California

kpff Consulting Engineers

Overview

A Unique Mode



kpff Consulting Engineers

Maintenance Challenges

Washington State Ferries:

The Nation's Largest Ferry System

Genesis of Asset Management at WSF

Challenges

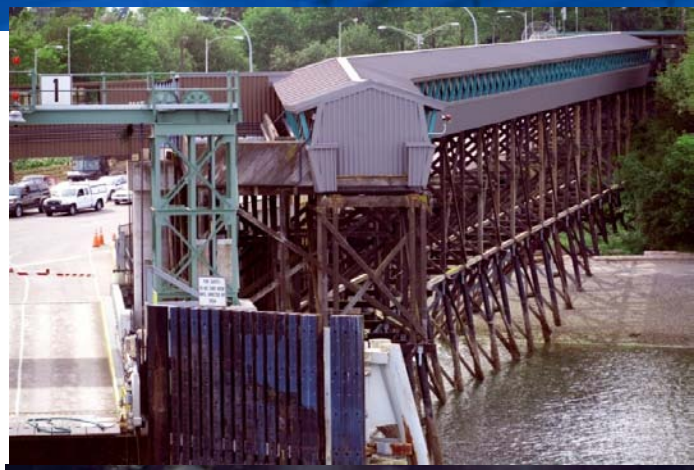
- Aging infrastructure—vessels and terminals
- Insufficient state funding
- Elasticity of fare revenue
- Governance structure

Ferry Financing Study Findings: Terminals

Positive	Negative
Excellent asset knowledge Regular inspections Performance-based maintenance reporting	Deficiencies in the Life Cycle Cost Model Not incorporating annual inspection results Asset components not disaggregated properly Preservation budget requests thought to be “gold plated”

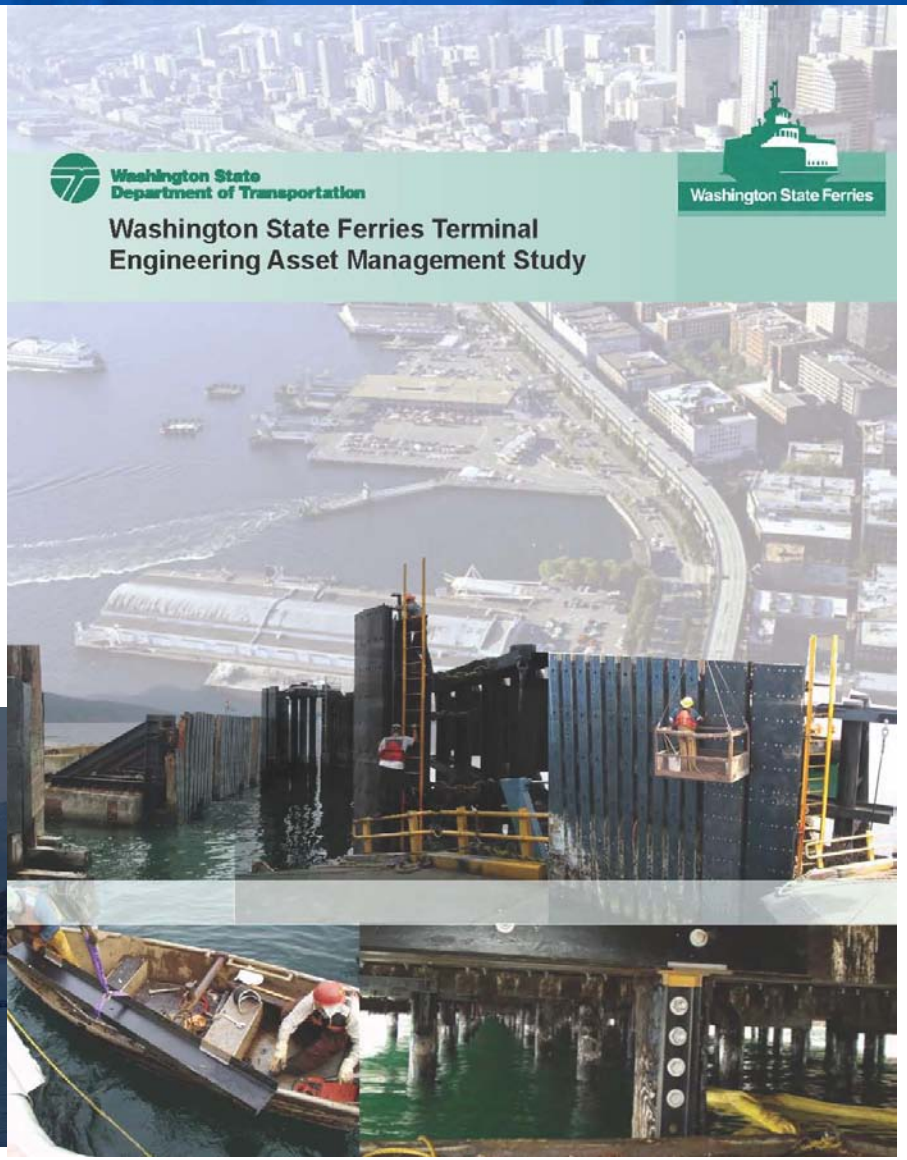
WSF Response

"We suggest that a better outcome would be for policy-makers to resolve that WSF's terminal program would benefit from a truly contemporary asset management system."



Initial Approach

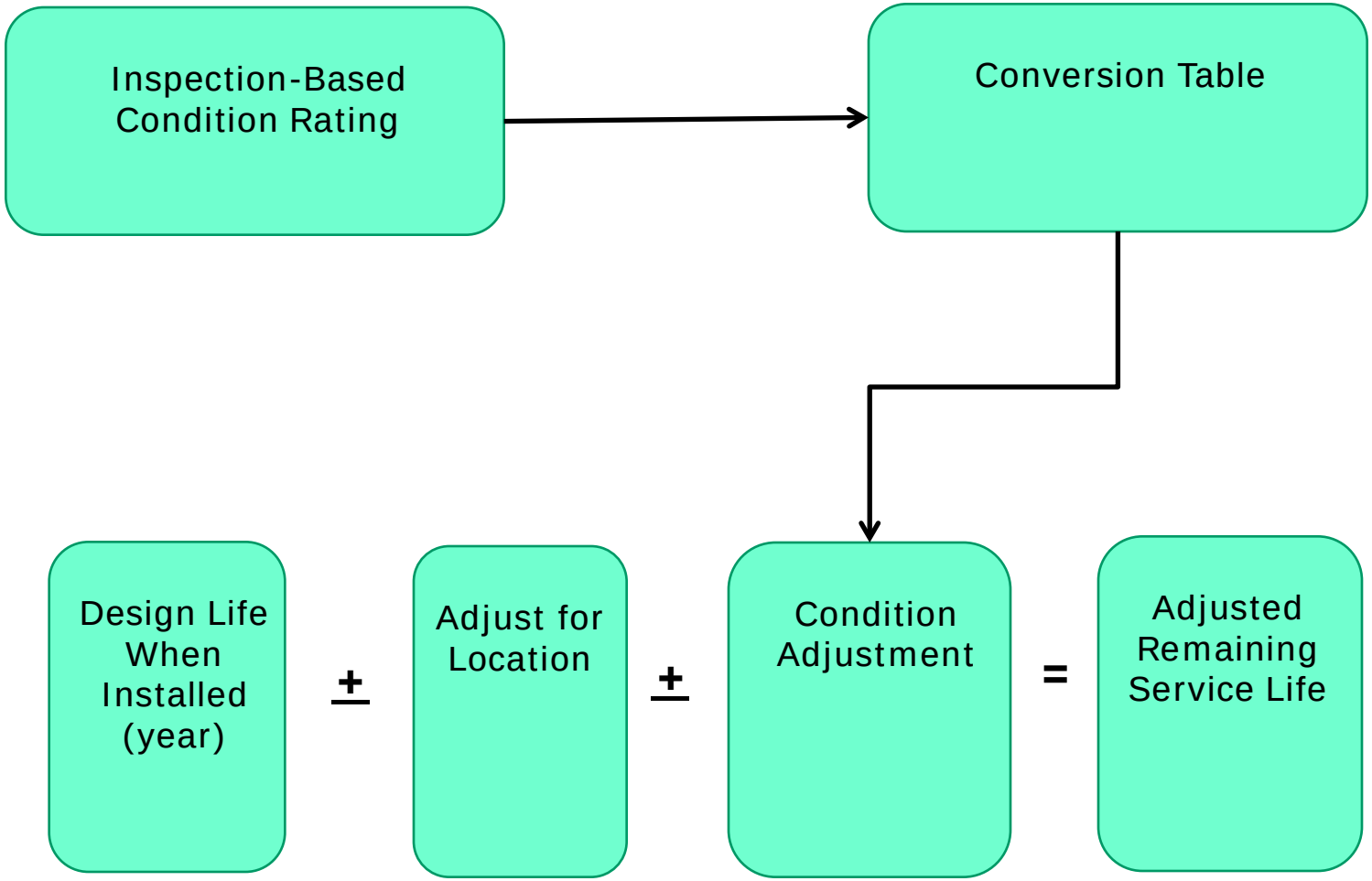
- Improve the LCCM
- Incorporate Risk



Conversion Table—Inspection-Based Condition Ratings to RSL

	Starting RSL Estimate					
Condition Rating	RSL = 20+	RSL = 10-20	RSL = 5-10	RSL = 0-5	RSL = 0 to 5 years past	RSL = < 5 years past
90-100	No Change	No Change	Add 5-10	Add 10	Add 5-10	Plus 5-10 on inspections
80-90	No Change	No Change	Add 5-10	Plus	Add 2-10	Plus 5 on inspections
70-80	Subtract 5	No Change	No Change	Add 2-5	Add 2-5	Plus 2-5 on inspections
60-70	Subtract 10	Subtract 5	No Change	No Change	Positive	Plus 2 on inspections
50-60	Less than 15 years	Less than 10 years	No Change	No Change	Positive	0 years
30-50	Less than 5 years	Less than 5 years	Reduce to under 5 years	Reduce to under 3 years	0 years	0 years
0-30	Less than 2 years	Less than 2 years	0 years	0 years	0 years	0 years

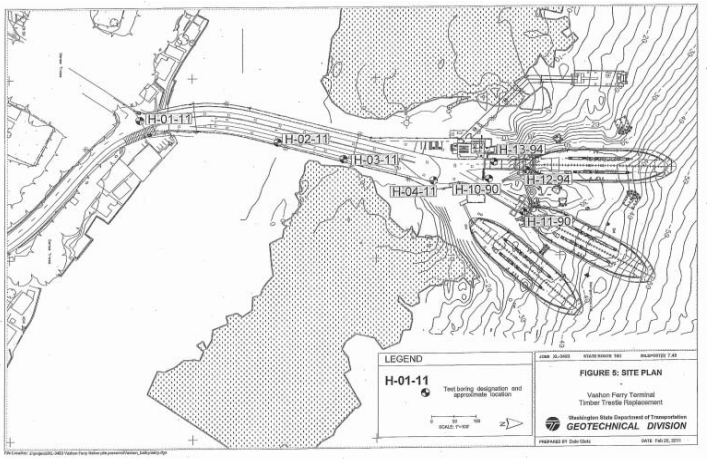
Remaining Service Life with LCCM Improvements



Incorporating Risk Into Preservation Programming

Assessing the cost/benefit of seismic retrofit options short of replacement for WSF's14 timber trestles

- Mode and likelihood of asset failure
  - Current condition
  - Seismic considerations
  - Capital costs of various options



Preservation Prioritization Using Asset Management Principles

Terminal	Terminal Inventory ID	At EOL	Category	Condition Rating	Seismic Rating	Failure Probability Index based on condition only	Failure Probability Index, including seismic	Ridership	Consequence of Failure	Approximate Replacement Cost ($ thousands)	Priority Index
Eagle Harbor	EH-4-1	1	Trestle and Bulkheads	#N/A	1	#N/A	#N/A	0	#N/A	$14,151	**#N/A**
Mukilteo	MU-3-1	1	Vehicle Transfer Span Slip 1	72	2	7.98	39.88	70,000	2,791,372	$7,600	**367.29**
Seattle	SE-1-3	1	Dolphin Slip 3	42	na	33.23	33.23	6,240	207,367	$680	**304.95**
Mukilteo	MU-4-1	1	Trestle and Bulkheads	80	4	3.88	11.63	42,000	488,291	$2,107	**231.75**
Mukilteo	MU-1-1	1	Dolphin Slip 1	48	NA	26.68	26.68	42,000	1,120,372	$6,220	**180.12**
Edmonds	ED-2-1	1	Wingwalls Slip 1	66	NA	11.37	11.37	38,896	442,113	$3,140	**140.80**
Keystone	KE-2-1	1	Wingwalls Slip 1	42	NA	34.03	34.03	10,416	354,433	$3,768	**94.06**
Seattle	SE-3-3	1	Vehicle Transfer Span Slip 3	63	1	13.46	80.76	5,280	426,398	$7,600	**56.11**
Orcas	OR-3-1	1	Vehicle Transfer Span Slip 1	74	3	6.83	27.30	15,961	435,768	$9,880	**44.11**
Keystone	KE-3-1	1	Vehicle Transfer Span Slip 1	81	1	3.69	22.15	13,020	288,426	$8,448	**34.14**
Fauntleroy	FA-4-1	1	Trestle and Bulkheads	79	4	4.54	13.63	27,937	380,706	$11,554	**32.95**
Bainbridge	BA-5-1	1	Overhead Loading System	82	4	3.36	10.08	29,280	295,073	$11,750	**25.11**
Lopez	LO-2-1	1	Wingwalls Slip 1	62	NA	14.44	14.44	6,465	93,353	$4,082	**22.87**
Orcas	OR-4-1	1	Trestle and Bulkheads	84	5	2.56	2.56	9,577	24,486	$1,409	**17.38**
Vashon	VA-4-1	1	Trestle and Bulkheads	76	4	5.76	17.27	16,982	293,222	$17,612	**16.65**
Orcas	OR-1-1	1	Dolphin Slip 1	55	NA	20.35	20.35	9,577	194,873	$13,520	**14.41**
Seattle	SE-5-3	1	Overhead Loading System Slip 3	81	1	3.64	21.81	7,200	157,044	$11,373	**13.81**
Shaw	SH-1-1	1	Dolphin Slip 1	11	NA	78.42	78.42	458	35,944	$2,860	**12.57**
Southworth	SO-4-1	1	Trestle and Bulkheads	83	4	2.94	8.81	8,897	78,384	$7,000	**11.20**
Edmonds	ED-1-1	1	Dolphin Slip 1	85	NA	2.26	2.26	29,172	65,856	$6,400	**10.29**
Pt. Townsend	PT-2-1	1	Wingwalls Slip 1	54	NA	21.01	21.01	1,829	38,419	$3,768	**10.20**
Kingston	KI-4-1	1	Trestle and Bulkheads	90	2	0.95	4.76	19,536	93,039	$10,725	**8.68**
Pt. Townsend	PT-3-1	1	Vehicle Transfer Span Slip 1	74	1	6.70	40.22	1,829	73,550	$9,120	**8.06**
Pt. Defiance	PD-4-1	1	Trestle and Bulkheads	90	4	1.07	3.20	3,312	10,607	$1,681	**6.31**
Tahlequah	TA-4-1	1	Trestle and Bulkheads	85	NA	2.13	2.13	7,200	15,366	$2,994	**5.13**
Friday Harbor	FH-4-1	1	Trestle and Bulkheads	84	5	2.65	2.65	11,791	31,261	$6,342	**4.93**

Take Aways

- Asset management has come to marine infrastructure.
- Expect to hear more as port commissions and transit boards pressure operators to be more transparent in funding requests.
- Scarcity heightens need for accountability.



THANK YOU