

Tillamook County, Oregon

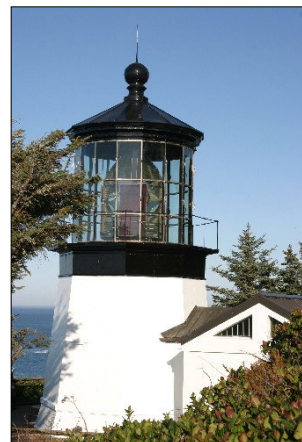
Bridge Priorities for Seismic Resiliency



November 2017

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OBJECTIVE

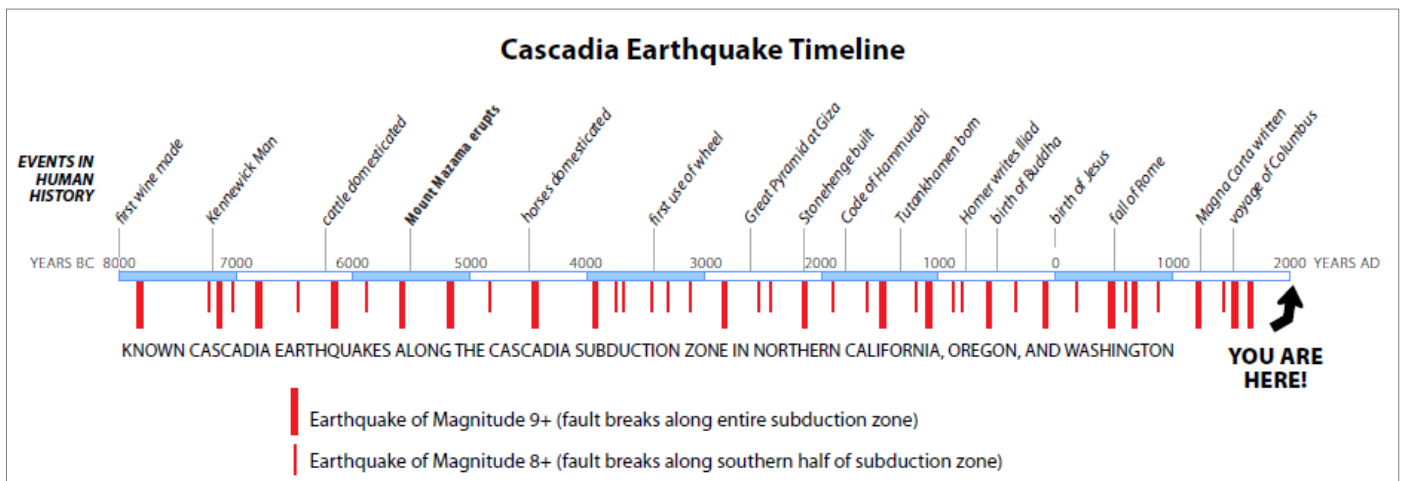
There were two objectives of the work. The first is to reevaluate and update the County's Lifeline transportation routes that were developed in 2000 during the development of the County's Transportation System Plan. The second is to review ODOT's Life Line transportation routes, the locations of vulnerable bridges and identify detour routes on County/other roads that may be more cost effective to seismically retrofit or replace.

DOGAMI has developed maps that show landslide area hazards. Many of our mapped floodplains have liquefiable soils. We did not add these layers onto the maps in this report, as they cover a large area of the County.

BACKGROUND

Over the past several years, the State of Oregon has worked to understand the potential impacts of a major earthquake in the Cascadia Subduction Zone. Such an earthquake will cause an unparalleled economic and human catastrophe for the state. A magnitude 8.0 or greater earthquake will cause widespread disruption to Oregon's transportation system. Many bridges on the Oregon coast will suffer serious damage due or irreparable destruction requiring replacement in a major seismic event because they were built before the existence of modern seismic codes. In addition, dozens of unstable slopes and pre-existing deep slides throughout the County will fail during the extended three minutes or more of shaking produced by a large Cascadia event.

Below is a graph that presents the timeline of previous Cascadia events for the past 10,000 years that was developed by the Department of Geology and Mineral Industries (DOGAMI). A Cascadia event is just as likely to happen today as 50 years from now. The duration of our current quiet period has already exceeded 75% of the quiet periods between quakes in Cascadia's history.



The *Oregon Highways Seismic PLUS Report* (ODOT 2014) outlined a comprehensive Program to address seismic vulnerability and mitigate structural deficiencies across the state, which would require over \$4 billion in funds over multiple decades.

Tillamook County is a rural community with a full-time population of 25,000, which doubles during the summer months. With 75 miles of scenic coastline, four bays and nine rivers, Tillamook County offers the finest deep-sea and stream fishing, charter and dory boats, clamming, crabbing, whale and bird watching, beachcombing and hiking. Our forests also furnish excellent hunting, backpacking and other recreational activities. The local economy is driven by three main industries; agricultural (dairy farming), logging and the tourism. A large Cascadia event would cause the County's economy to falter due to severe limitations in moving people and farm to market goods.

This report describes a collaborative approach with the Oregon Department of Transportation (ODOT) of prioritizing bridges on the State Highway System and County Road System for seismic retrofit or replacement to make these systems more resilient following the Cascadia event for our communities to respond and recover.

METHOD

The State Bridge Engineer and other ODOT leadership proposed working collaboratively with Tillamook County to identify potential detour routes around the State Highway System and on County Roads that may be cost effective to retrofit bridges that are seismically vulnerable. ODOT Bridge Engineering staff provided the cost estimates for State and County bridge seismic retrofits or replacements utilizing 2014 dollars. In the 2014 report, only multi-span bridges were evaluated. Single-span bridges are not considered vulnerable for this study. Any damage to a single-span bridge could be more easily repaired in the event of seismically-related damage.

Appendix 'A' presents data on Tillamook County's 37 major multi-span bridges. Appendix 'B' represents the County's retrofit/replacement priorities based on recommendations of this report.

PUBLIC OUTREACH

Tillamook County staff presented this study to the County Road Advisory Committee (CRAC) for discussion and input. We identified the locations of hospitals, schools, emergency operation centers, fire departments, law enforcement locations, airports, and other assets. ODOT presented County staff their Seismic Life Lines priorities that were developed in 2012 and presented on Figure 1. ODOT's Tier 1 Highways in our region are US-30, OR- 22, and US-101 south of Juno Hill at MP 63.5±. Based on the ODOT's plan and location of essential facilities and assets present the existing life line routes, additionally we have added roads to the County's Life Line Routes and are presented in Figures 1 – 12.

RESULTS

The results presented below start at the south end of Tillamook County traveling north, include both the County life line routes and detours around ODOT's US-101.

State Highway OR-18 is a Tier 1 route for ODOT from the north central coast (Lincoln City) to the Willamette Valley. The County has added Slab Creek Road as part of the County's life line route. Slab Creek Road is south of Neskowin and connects US-101 to OR-18 in crossing Tillamook/Lincoln County near Otis, Oregon. Slab Creek Road has 4 single span bridges and a multitude of culverts. The County

road is about 4.5 miles long, changing jurisdiction to the Siuslaw National Forest (USFS). There is one USFS bridge that needs to be assessed for seismic vulnerability and discussions between the County and USFS need to be initiated. A discussion with Lincoln County will also take place in the near future. Figure 2 represents the Slab Creek County life line route.

Proceeding north, ODOT bridge #02508A over the Little Nestucca River at MP 91.79 is seismically vulnerable with an estimated cost of \$3.5 million to retrofit. The County evaluated a detour around this ODOT bridge that includes Redburg Road, Meda Loop Road and a portion of State highway OR-130 and shown on Figure 3. The County’s estimated cost of this 2.9 miles detour is \$2.5 million with seismic retrofit cost of Bridge #04691A being about \$1 million. The cost/benefit ratio is 1.4. Discussions with ODOT bridge staff indicate it is not high enough to justify this detour.

Continuing north on US-101 from Pacific City at MP 89.77 (at Resort Drive) to Fawcett Creek on US-101 at MP71, there are no County roads that make sense to be used for a detour. The ODOT bridges on US-101 in this zone that are multi-span and seismically vulnerable are presented on Figure 4 and are included in Table ‘A’.

TABLE ‘ A’	ODOT Bridge No. and (Crossing Feature)	US-101 Mile Point	Estimated Cost to seismically retrofit*
	04660A (Three Rivers)	MP 85.01	\$5.0 million
	00555B (Big Nestucca River)	MP 84.08	\$1.0 million
	02762 (Beaver Creek)	MP 80.32	\$5.4 million
	04654 (Beaver Creek)	MP 79.61	\$3.4 million
	*Cost Estimates in 2014 dollars	TOTAL COST =	\$14.8 million

Figure 5 presents a detour on the County Road system around three ODOT seismically vulnerable bridges. The estimated cost to retrofit ODOT bridges in this vicinity is \$11.1 million are shown in Table ‘B’.

TABLE ‘ B’	ODOT Bridge No. and (Crossing Feature)	US-101 Mile Point	Estimated Cost to seismically retrofit*
	07181 (Fawcett Creek)	MP 71.18	\$ 4.5 million
	04643A (Anderson Creek)	MP 68.67	\$ 3.0 million
	04642A (South Prairie Creek)	MP 68.45	\$ 3.6 million
	*Cost Estimates in 2014 dollars	TOTAL COST =	\$11.1 million

The County’s detour route includes the following roads; South Prairie Road to Brickyard Road and Long Prairie Road. At Long Prairie Road, you can go west to US-101 or east to OR-6.

Travelling west bound on Long Prairie Road encounters the seismically vulnerable Earl Bridge #06550 (Co#168) with an estimated cost to retrofit of \$150,000. Travelling east on Long Prairie Road is the Johnson Bridge #20306 (Co #156) which is a two-span structure built in 2007 and is not considered

seismically vulnerable. Discussions with ODOT staff indicate that the cost/benefit ratio of this detour is 7.4 and large enough to justify this detour route.

Figure 6 presents a detour route west of US-101 which will service the local hospital located on 3rd Street. This detour is located on Gienger and Tillamook River Road. There is one County seismically vulnerable bridge; Tone Bridge #17929 (Co #158) with a retrofit estimate of \$467,357. Table 'C' shows the County bridges identified.

TABLE ' C'	Detour East & West of US-101		
	County Bridge No. and (Crossing Feature)	County Mile Point	Estimated Cost to seismically retrofit*
	06550 (Mill Creek) "Earl Br" (East of US-101)	MP 1.39	\$137,131
	17929 (Trask River) "Tone Br" (West of US-101)	MP 3.35	\$467,357
*Cost Estimates in 2014 dollars	TOTAL COST =	\$604,488	

Figure 6 shows two ODOT bridges in this section; Bridge #07147 crossing the Trask River at MP 67.98 with a retrofit cost of \$6.6 million and Bridge #07224 crossing a drainage ditch at MP 66.36 with a retrofit cost estimate of \$4 million (see Table 'D'). The County detour retrofit costs west of US-101 is \$470,000 (Tone Bridge) and ODOT retrofit costs of \$10.6 million the cost benefit ratio is 22.5 and big enough to support the detour on the County road system.

TABLE ' D'	ODOT Bridge No. and (Crossing Feature)	US-101 Mile Point	Estimated Cost to seismically retrofit*
	07147 (Trask River)	MP 67.98	\$6.6 million
	07224 (Drainage Ditch)	MP 66.36	\$ 4.0 million
	*Cost Estimates in 2014 dollars	TOTAL COST =	\$10.6 million

In Table 'E' and shown in Figure 7, ODOT has identified four vulnerable bridges and one potentially vulnerable bridge on US-101 from MP 65 to MP 63.

TABLE ' E'	ODOT Bridge No. and (Crossing Feature)	US-101 Mile Point	Estimated Cost to seismically retrofit*
	01500 (Hoquarten Slough) Currently under replacement construction	MP 65.55	
	17371 (Dougherty Slough)	MP 65.12	\$ 1.28 million
	01499 (Wilson River)	MP 64.23	\$ 8.9 million
	01498 (Wilson River Slough)	MP 64.14	\$4.5 million
	00505 (US-101 over Port of Tillamook Bay [POTB] RR)	MP 63.48	\$6.8 million
	*Cost Estimates in 2014 dollars	TOTAL COST =	\$21.48 million

Table 'F' identifies the County bridges located on the two detour routes around the ODOT structures. The first detour is located on Wilson River Loop Road and Latimer Road to the east and north end of Tillamook. Along this route there are two vulnerable County bridges (Br #11340A and Br #57C23) and three potentially vulnerable County bridges (Br #18592, Br #18593, and Br #18594). The second detour is located on Boquist Road located on the west side of US-101 with one vulnerable County bridge (Br #57C60). Boquist Road is currently a dead-end road and the last road segment is vacated. This can be used as a detour with approximately 400 feet of new road, a new crossing structure and a new approach to US-101. This is the only way around if Juno Hill slides.

TABLE ' F'	County Bridge No. and (Crossing Feature)	County Mile Point	Estimated Cost to seismically retrofit*
	18592 (Wilson River O'Flow)	MP 0.82	\$862,631
	18593 (Wilson River O'Flow)	MP 0.69	\$959,518
	57C60 (Wilson River O'Flow)	MP 0.65	\$800,000
	18594 (Unnamed Creek)	MP 0.59	\$254,643
	11340A (Dougherty Slough)	MP 0.50	\$578,338
	57C23 (Wilson River)	MP 0.07	\$702,658
	*Cost Estimates in 2014 dollars	TOTAL COST =	\$3.358 million

Continuing north on US-101, ODOT has six more vulnerable bridges listed in Table 'G'.

TABLE ' G'	ODOT Bridge No. and (Crossing Feature)	US-101 Mile Point	Estimated Cost to seismically retrofit*
	07424 (Kilchis River & Possetti Rd)	MP 62.94	\$2.906 million (rehab)
	07456 (Neilson Slough)	MP 62.84	\$0.355 million (rehab)
	07425 (Stasek Slough)	MP 62.67	\$2.424 million
	07426 (Hathaway Slough)	MP 62.40	\$0.705 million
	07480 (Tidal Slough & Cattle pass)	MP 62.25	\$0.211 million
	07481 (Tidal Slough {Vaughn Cr})	MP 62.07	\$0.163 million
	*Cost Estimates in 2014 dollars	TOTAL COST =	\$6.764 million

The primary detour route around these six bridges is Alderbrook Road located east of US-101 at MP 63.16 and MP 61.21 shown on Figure 8. The County has a single vulnerable structure (Br #00455A) located on the detour route (see Table 'H') providing a cost benefit ratio of 17.

TABLE H	County Bridge No. and (Crossing Feature)	County Mile Point	Estimated Cost to seismically retrofit*
	00455A (Kilchis River)	MP 2.44	\$403,870
	*Cost Estimates in 2014 dollars	TOTAL COST =	\$403,870

The next ODOT vulnerable structure is Br 08828 (US-101 over POTB RR) at MP 59.32 located just north of Bay City. The detour route utilizes a number of County roads and City of Bay City streets connecting back to US-101 at MP 57.52 shown on Figure 9.

Figures 10 and 11 and Table 'I' below, outline the remaining vulnerable and potentially vulnerable ODOT bridges located on US-101 in Tillamook County.

TABLE ' I'	ODOT Bridge No. and (Crossing Feature)	US-101 Mile Point	Estimated Cost to seismically retrofit*
	01226A (Miami River) (potentially vulnerable)	MP 56.99	\$0.728 million
	02349 (Lake Lytle Outlet)	MP 49.23	\$5.6 million (reconst)
	01051A (US-101 over POTB RR) at Wheeler	MP 46.60	\$1.455 million
	00714A (Gallagher Slough)	MP 46.45	\$1.455 Million
	00574F (Nehalem River)	MP 45.68	\$6.262 million
	*Cost Estimates in 2014 dollars	TOTAL COST =	\$15.500 million

The detour around these bridges is also designated County lifeline for the communities of Manzanita, Nehalem, and Wheeler. From south to north, the route utilizes Miami-Foley Road, a short section of OR-53 and McDonald Dike Road. The County has two bridges identified as vulnerable: (Br #57C01 (East Foley Creek) with an estimated replacement cost of \$3.0 million and Br #01362A (Nehalem River "Lommen" Bridge) which is currently being replaced utilizing a base isolation foundation for the new structure. Bridge #01226A (Miami River) on US-101 is very important to the residents of Tillamook County because it is the only crossing of the Miami River to access Miami-Foley Road lifeline route.

Two bridges located on the Necanicum Highway (OR-53), Br #01217 (Nehalem River) and Br #01371A (Mohler Overflow) are both considered vulnerable (see Table 'J'). However, they are currently not listed for retrofit or replacement funding. Both are very important for the evacuation for residents of Manzanita, Nehalem, and Wheeler.

TABLE ' J'	County and ODOT Bridge No. and (Crossing Feature)	County Mile Point	Estimated Cost to seismically retrofit*
	57C01 (East Foley Creek)	MP 10.13	\$3.00 million (replace)
	1362A (Nehalem River) "Lommen"	MP 11.57	Under Construction
	01217 (Nehalem River) on Necanicum Hwy	MP 17.76	No costs listed
	01371A (Mohler O'flow) on Necanicum Hwy	MP 17.93	No costs listed
	*Cost Estimates in 2014 dollars	TOTAL COST =	

Going back to the south end of the County there are two bridges that do not have any direct link to detour routes with US-101. However, Figure 12 presents the County's lifeline routes out of the communities of Pacific City and Woods to US-101. Two vulnerable County bridges are located on

these routes. Ferry Street Bridge #01372A (Co #256) and the Pacific Avenue Bridge #11366A (Co#257) with seismic retrofit cost estimates of \$755,000 and \$1,762,000 respectively. This gives citizens in the Pacific City, Woods vacationers of this area access to Resort Drive and to US-101.

RECOMMENDATIONS

County Lifeline Bridge retrofit priorities ...

Tillamook County proposes the following bridge bundles for future funding potential.

The County has identified a potential bundle shown on Figure 3 consisting of three culvert upgrades, one bridge retrofit, and an overlay along the Meda Loop Road bypass around the Little Nestucca River Bridge on US-101. The estimated cost to address culvert upgrades and one bridge retrofit is along the detour route is \$2.496 million. The retrofit cost to the ODOT structure is estimated at \$3.5 million. The calculated benefit cost ratio of ODOT improvements to County improvements is $\$3.5\text{M}/\$2.496\text{M} = 1.40$ which does not reflect the anticipated benefit of improvements.

- **Bundle #1** – The first bundle shows the comparison between the County Road detour along South Prairie Road to Long Prairie Road then east and north to Trask River Road to OR-6 versus three vulnerable bridges located on US-101 Br #07181 (Fawcett Creek) at MP 71.18, Br #04643A (Anderson Creek) at MP 68.67, and Br 04642A (South Prairie Creek) at MP 68.45). The reconstruction cost for these three bridges equals \$11.1 million. The County detour consists of a retrofit to Br #06550 (Earl Bridge) crossing Mill Creek with an estimated cost of \$137,132.

The calculated benefit cost ratio of ODOT improves to County improvements is $\$11.1\text{M}/\$137,132 = 80.94$.

- **Bundle #2** – The second bundle is a County detour around the south end of the City of Tillamook beginning at the intersection of Gienger Road and US-101 (MP 68.18) then north along Tillamook River Road to the Intersection of 12th Street and US-101 at MP 66.25. Identified improvements to this detour include the retrofit of County Br #17929 with an estimated cost of \$467,357. The detour bypasses two vulnerable bridges along US-101, Br #07147 (Trask River) at MP 67.98, and Br #07224 (Drainage Ditch) at MP 66.36. The combined reconstruction cost for these two structures is \$10.63 million.

The calculated benefit cost ratio of ODOT improves to County improvements is $\$10.63\text{M}/\$467,357 = 22.74$.

- **Bundle #3 – Recommendation:** As an area of concern to the residents of north Tillamook County, we would like to make a case for improvements to the detour and lifeline route of Miami-Foley Road that serves the communities of Manzanita, Nehalem, Wheeler, and the residents living within the surrounding unincorporated area. The combined permanent residency population of these three communities and surrounding area is greater than 2,500 or approximately 10 percent of the total county population. However, with the summer

tourism season, the population is estimated to grow in excess of 10,000. Improvements to Br #01226A (Miami River) at MP 59.66 just south of Garibaldi, Br #01217 (Nehalem River) and Br #1371A (Mohler Overflow) on Hwy OR-53 is necessary to provide a safe and viable egress route. Additional cost information is needed to capture the retrofit or replacement costs to calculate a benefit cost.

Additionally, the County would like to include the need for retrofit support for the two seismically vulnerable bridges crossing the Big Nestucca River (Br #01372A [Ferry St] and Br #11336A [Pacific Avenue]) serving residents living in the Pacific City and Woods areas in south Tillamook County. There are approximately 980 full time residents living in this area of the County. With the many recreational opportunities available for public use at the Bob Straub State Park and Cape Kiwanda State Natural Area, these communities see a tremendous population increase throughout the summer season.

Appendix 'A' is information pulled from national bridge inventory data provided by ODOT representing 37 major multi-span bridges in Tillamook County. There were two cost options considered for this report. Option "A" identified values based upon a unit cost. Option "B" identified values based upon a minimum cost. In some cases, the retrofit cost is the same as the minimum cost for the work described. Therefore, Option "B" was chosen for this report.

Appendix 'B' represents the County bridge priorities located on the lifeline routes and listed in Tables outlined in the report.

Appendix 'A' – Tillamook County Bridge Data

Generated: 03/25/2016

Bridge ID	Carries (Roadway)	Crosses (Waterway)	Material Main	Design Main	Based on Unit Cost	RETRO FIT COST (\$)	
						Using Min. Bridge Cost	
06550	LONG PRAIRIE RD	MILL CREEK	2 Concrete Continuous	02 Stringer/Girder	\$137,131.65	\$600,000.00	
11280	FOSS RD	SALMONBERRY RIVER	7 Wood or Timber	02 Stringer/Girder	\$394,800.84	\$450,000.00	
017433	BLAINE RD	NESTUCCA RIVER	5 Prestressed Concrete	02 Stringer/Girder	NOT	VULNERABLE	
18027	BAYS CREEK RD	BAYS CREEK	2 Concrete Continuous	02 Stringer/Girder	\$68,624.13	\$450,000.00	
18538	BEWLEY CREEK RD	TILLAMOOK RIVER	5 Prestressed Concrete	01 Slab	\$180,286.46	\$300,000.00	
18592	WILSON RIVER LOOP	O'FLOW BRIDGE	2 Concrete Continuous	01 Slab	\$862,631.78	\$862,631.78	
18593	WILSON RIVER LOOP	O'FLOW BRIDGE	2 Concrete Continuous	01 Slab	\$959,517.55	\$959,517.55	
18594	WILSON RIVER LOOP	O'FLOW BRIDGE	2 Concrete Continuous	01 Slab	\$254,643.36	\$300,000.00	
20276	BLAINE RD	NESTUCCA RIVER	6 P/S Conc Continuous	02 Stringer/Girder	NOT	VULNERABLE	
20306	LONG PRAIRIE RD	TRASK RIVER	5 Prestressed Concrete	02 Stringer/Girder	NOT	VUNERABLE	
20999	KILCHIS RIVER RD	KILCHIS RIVER	3 Steel	02 Stringer/Girder	\$147,403.69	\$600,000.00	
00455A	ALDERBROOK LOOP	KILCHIS RIVER	5 Prestressed Concrete	04 Tee Beam	\$403,870.22	\$450,000.00	
01580A	BLAINE RD	NESTUCCA RIVER	5 Prestressed Concrete	02 Stringer/Girder	\$409,342.36	\$450,000.00	
01594A	TILLAMOOK RIVER RD	TILLAMOOK RIVER	5 Prestressed Concrete	05 Multiple Box Beam	\$509,074.02	\$509,074.02	
11279A	NEHALEM RIVER RD	NEHALEM RIVER	5 Prestressed Concrete	02 Stringer/Girder	\$563,251.58	\$563,251.59	
11315A	WOODS CLOVERDALE	NESTUCCA RIVER	5 Prestressed Concrete	02 Stringer/Girder	\$798,525.05	\$798,525.05	
11366A	PACIFIC AVE	NESTUCCA RIVER	5 Prestressed Concrete	06 Single/Spread Box	\$1,762,019.32	\$1,762,019.32	
17929	TILLAMOOK RIVER RD	TRASK RIVER	5 Prestressed Concrete	05 Multiple Box Beam	\$467,356.94	\$467,356.94	
57C20	CURL RD 3037	KILCHIS RIVER	7 Wood or Timber	02 Stringer/Girder	\$180,168.24	\$600,000.00	
57C23	WILSON RIVER LOOP	WILSON RIVER	5 Prestressed Concrete	22 Channel Beam	\$702,658.14	\$702,658.14	
57C33	WYSS RD	TRASK RIVER	7 Wood or Timber	02 Stringer/Girder	\$111,789.27	\$3,000,000.00	
57C51	LEARNED RD	SLOUGH	7 Wood or Timber	02 Stringer/Girder	\$170,794.87	\$600,000.00	
00633A	N. F. NEHALEM RD	NORTH FORK NEHALEM RIVER	5 Prestressed Concrete	02 Stringer/Girder	\$391,232.89	\$450,000.00	
01362A	MIAMI-FOLEY RD	NEHALEM RIVER	2 Concrete Continuous	03 Girder-Floorbeam	\$1,487,344.59	\$8,581,173.13	
01372A	FERRY ST	NESTUCCA RIVER	6 P/S Conc Continuous	01 Slab	\$755,508.65	\$755,508.65	
11272A	MCDONALD DIKE RD	NORTH FORK NEHALEM RIVER	5 Prestressed Concrete	02 Stringer/Girder	\$650,387.40	\$650,387.40	
11340A	WILSON RIVER LOOP	DOUGHERTY SLOUGH	2 Concrete Continuous	02 Stringer/Girder	\$578,338.39	\$800,000.00	
11377A	BLAINE RD	NESTUCCA RIVER	5 Prestressed Concrete	02 Stringer/Girder	\$1,148,763.13	\$1,148,763.13	
11449A	TRASK RIVER RD	TRASK RIVER (NORTH FORK)	5 Prestressed Concrete	04 Tee Beam	\$293,313.00	\$300,000.00	
57C01	MIAMI-FOLEY RD	EAST FOLEY CREEK	5 Prestressed Concrete	01 Slab	\$182,521.55	\$3,000,000.00	
57C10	N. FK. NEHALEM RVR	COAL CREEK	5 Prestressed Concrete	01 Slab	\$178,960.28	\$600,000.00	
57C12	MOSS CREEK RD	MIAMI RIVER	5 Prestressed Concrete	01 Slab	\$212,719.88	\$600,000.00	
57C14	SOUTH LOMMEN RD	FOLEY CREEK	7 Wood or Timber	02 Stringer/Girder	\$117,466.59	\$600,000.00	
57C22	GOODSPEED RD	HALL SLOUGH	7 Wood or Timber	02 Stringer/Girder	\$176,670.55	\$600,000.00	
57C42	WHALEN ISLAND RD	SAND LAKE	7 Wood or Timber	02 Stringer/Girder	\$150,685.27	\$3,000,000.00	
57C59	NEW MIAMI RIVER RD	MIAMI RIVER	5 Prestressed Concrete	01 Slab	\$195,900.04	\$3,000,000.00	
57C60	BOQUIST RD	O'FLOW WILSON RIVER	2 Concrete Continuous	02 Stringer/Girder	\$267,916.32	\$800,000.00	
37 Major Bridges					\$15,871,617.99	\$39,310,867.00	

Would be a

Appendix 'B'

TILLAMOOK COUNTY BRIDGE RETROFIT/REPLACEMENT PRIORITIES								
Priority	Bridge ID	Year Built	MP	Roadway	Crossing	Sufficiency Rating	Work Type	County Retrofit Costs (Based on unit cost)
1	57C23	1974	0.07	Wilson River Loop	Wilson River	68	Retrofit	\$702,658
2	18594	2000	0.59	Wilson River Loop	Creek	94	Retrofit	\$254,643
3	18593	2000	0.69	Wilson River Loop	Overflow Br	92	Retrofit	\$959,518
4	18592	2000	0.82	Wilson River Loop	Overflow Br	94	Retrofit	\$862,632
5	11340A	1952	0.50	Wilson River Loop	Dougherty Slough	84	Retrofit	\$578,338
6	00455A	1989	2.44	Alderbrook Loop	Kilchis River	97	Retrofit	\$403,870
7	1372A	1986	12.81	Ferry Street	Nestucca River	78	Retrofit	\$755,509
8	11366A	1973	0.12	Pacific Avenue	Nestucca River	83	Retrofit	\$1,762,019
9	57C01	1971	10.12	Miami-Foley Road	East Foley Creek	65	Replace	\$3,000,000
10	11272A	1992	1.14	McDonald Dike Road	N. Fk. Nehalem River	97	Retrofit	\$650,387
11	11315A	1986	0.01	Woods-Cloverdale	Nestucca River	98	Retrofit	\$798,525
*Cost Estimates in 2014 dollars						Total Retrofit Costs		10,728,099