Kayak Metro Travel Distan	km per day	km per week	per month	per year	EV Route		
35 km per route	210	1050	4200	50400	2948400		
					2948.4		

Routes per day	
6	
Current Ridership per year	
15880	

Lrg	192 gCO2e per km		GHG	85871100			
SM/Md	117 gCO2e per km		MTCO2E	85871.1	this is from current ridership		
Bus	58.5 gCO2e per km						

Year	Ridership increase FROM BASELINE	Projected Riders per Year	GHG Avoided per Year (gCO2E)	GHG Avoided by Ridership	Ridership Cumulative	GHG Avoided by EV Route (g)	EV Replacement Cumulative	EV Cumulative MTCO2E
2025	0	15880	85871100	85871	85871	0	0	0
2026	5	16674	90164655	90165	176036	2948400	2948400	2948.4
2027	5	16674	90164655	90165	266200	2948400	5896800	5896.8
2028	5	16674	90164655	90165	356365	2948400	8845200	8845.2
2029	5	16674	90164655	90165	446530	2948400	11793600	11793.6
2030	10	17468	94458210	94458	540988	2948400	14742000	14742
2031	10	17468	94458210	94458	635446	2948400	17690400	17690.4
2032	10	17468	94458210	94458	729904	2948400	20638800	20638.8
2033	10	17468	94458210	94458	824363	2948400	23587200	23587.2
2034	10	17468	94458210	94458	918821	2948400	26535600	26535.6
2035	10	17468	94458210	94458	1013279	2948400	29484000	29484
2036	25	19850	107338875	107339	1120618	2948400	32432400	32432.4
2037	25	19850	107338875	107339	1227957	2948400	35380800	35380.8
2038	25	19850	107338875	107339	1335296	2948400	38329200	38329.2
2039	25	19850	107338875	107339	1442634	2948400	41277600	41277.6
2040	25	19850	107338875	107339	1549973	2948400	44226000	44226
2041	25	19850	107338875	107339	1657312	2948400	47174400	47174.4
2042	25	19850	107338875	107339	1764651	2948400	50122800	50122.8
2043	25	19850	107338875	107339	1871990	2948400	53071200	53071.2
2044	25	19850	107338875	107339	1979329	2948400	56019600	56019.6
2045	25	19850	107338875	107339	2086668	2948400	58968000	58968
2046	25	19850	107338875	107339	2194007	2948400	61916400	61916.4
2047	25	19850	107338875	107339	2301345	2948400	64864800	64864.8
2048	25	19850	107338875	107339	2408684	2948400	67813200	67813.2
2049	25	19850	107338875	107339	2516023	2948400	70761600	70761.6
2050	25	19850	107338875	107339	2623362	2948400	73710000	73710

Byway	Avg Traffic (per day)	Avg Projected Vh/day Reduced P0 (yrs 1-3, 0%, cars/day)	P1 (yrs 4-5, 2% reduction, cars/day, 2030)	P2 (yrs 6-10, 5% reduction cars/day)	P3 (years 11-20, 10% reduction cars/day 2050)
Mission Road	1377	0	28	69	138
Mission Road Trail System	Distance (km)	GHGs P1 Per YR (MTCO2e)	GHGs P2 Per YR (MTCO2e)	GHGs P3 (MTCO2e)	Total (MTCO2E) Over Time Period
Phase 0 Years 1-3	3.2	0			
Phase 1 Years 4&5	3.2	4970			9940
Phase 2,1 2031-2035	6.5	5125	9190		71576
Phase 3,2,1 2036-2040	6.5	4970	5125	24849	174718
Phase 3,3,2 2041-2045	9.7		12424	50474	314493
Phase 3,3,3 2046-2050	9.7			75323	376614
Cumulative 2025-2050					947341

FOOD WASTE INFRASTRUCTURE UPGRADES																				
General description	build local capacity for composting and anaerobic digestion, reducing impacts by preventing landfilling of food waste and yard debris, and also by lowering transport distances																			
GHG reduction method:	oregon-specific life cycle model of solid waste, with results expressed as yearly emissions																			
Models/tools used	Oregon DEQ Waste Impact Calculator, open source at https://or-dept-environmental-quality.github.io/wic/																			
Key assumptions about measure implementation:	Capacity will be added slowly over the first 5 years of the project, aided by information from a separate pilot project																			
Key assumptions about GHG estimates:	100% adoption of composting and AD is unrealistic; tonnages have been adjusted to acknowledge this.																			
Reference case scenario:	No change in current practice of landfilling both food waste and yard debris																			
Measure-specific activity data:	Tonnages based on county data provided in Oregon DEQ's Waste Impact Calculator, adjusted for tribal territory and population																			
GHG emissions reduced, 2025-2030 (MTCO2E)	266					UIR Population						CO2e from FW Transit								
GHG emissions reduced, 2025-2050 (MTCO2E)	2,677					2,818	-2020					One way (km)	Round Trip (km)	CO2e per week	Per year	2025-2030 (g	2025-2050 (gCO2e)			
assumed units:	tons waste increased capacity											16	32	6144	294,912	1,179,648	7,077,888			
assumed quantity	500					Umatilla County Population									tns	1,180	7,078			
cost for assumed quantity ($)	$ 1,955,200					77,752	2020				Avg Lrg Car gCO2e	192								
per-unit average cost ($)	$ 3,600.00																			
						UIR Pop	3.62%													
cost/MTCO2E (2025-2030)	$ 6,755.65																			
cost/MTCO2E (2025-2050)	$ 672.41																			
parameters	all impact factors from Oregon DEQ Waste Impact Calculator, open source at https://or-dept-environmental-quality.github.io/wic/	year	BAU impact (MTCO2E)	Alternative impact (MTCO2E)	Benefit (MTCO2E)	Cumulative G	BAU food waste landfill (tons)	BAU food waste distance (miles)	BAU yard debris landfill (tons)	BAU yard debris distance (miles)	Alt food waste compost (tons)	Alt food waste compost distance (miles)	Alt food waste AD (tons)	Alt food waste AD distance (miles)	Alt yard debris compost (tons)	Alt yard debris compost distance (miles)	food waste BAU (tons)	food waste ALT (tons)	yard debris BAU (tons)	yard debris ALT (tons)
57.50	food waste AD impact (kg CO2e)	2025	-	-	-	-	-	114	-	114	-	10	-	10	-	10	-	-	-	-
21.60	food waste AD transport impact (kg CO2e)	2026	47	9.60	37	37.29	108	114	20	114	108	10	-	10	20	10	108	108	20	20
73.60	food waste composting impact (kg CO2e)	2027	49	9.92	39	76.52	108	114	30	114	81	10	27	10	30	10	108	108	30	30
21.60	food waste composting transport impact (kg CO2e)	2028	70	13.53	57	133.32	162	114	30	114	108	10	54	10	30	10	162	162	30	30
59.00	food waste IncinerationNoER impact (kg CO2e)	2029	70	13.53	57	190.13	162	114	30	114	108	10	54	10	30	10	162	162	30	30
21.60	food waste IncinerationNoER transport impact (kg CO2e)	2030	94	17.46	76	266.44	216	114	40	114	108	10	108	10	40	10	216	216	40	40
377.80	food waste landfilling impact (kg CO2e)	2031	150	29.22	121	386.97	325	114	101	114	162	10	162	10	101	10	325	325	101	101
21.60	food waste landfilling transport impact (kg CO2e)	2032	150	29.22	121	507	325	114	101	114	162	10	162	10	101	10	325	325	101	101
57.50	yard debris AD impact (kg CO2e)	2033	150	29.22	121	628	325	114	101	114	162	10	162	10	101	10	325	325	101	101
21.60	yard debris AD transport impact (kg CO2e)	2034	150	29.22	121	749	325	114	101	114	162	10	162	10	101	10	325	325	101	101
73.60	yard debris compost impact (kg CO2e)	2035	150	29.22	121	869	325	114	101	114	162	10	162	10	101	10	325	325	101	101
21.60	yard debris compost transport impact (kg CO2e)	2036	150	29.22	121	990	325	114	101	114	162	10	162	10	101	10	325	325	101	101
59.00	yard debris incinerationNoER impact (kg CO2e)	2037	150	29.22	121	1,110	325	114	101	114	162	10	162	10	101	10	325	325	101	101
21.60	yard debris incinerationNoER transport impact (kg CO2e)	2038	150	29.22	121	1,231	325	114	101	114	162	10	162	10	101	10	325	325	101	101
210.90	yard debris landfilling impact (kg CO2e)	2039	150	29.22	121	1,351	325	114	101	114	162	10	162	10	101	10	325	325	101	101
21.60	yard debris landfilling transport impact (kg CO2e)	2040	150	29.22	121	1,472	325	114	101	114	162	10	162	10	101	10	325	325	101	101
15,027	food waste county total generation (tons)	2041	150	29.22	121	1,592	325	114	101	114	162	10	162	10	101	10	325	325	101	101
3.60%	reservation proportion of county	2042	150	29.22	121	1,713	325	114	101	114	162	10	162	10	101	10	325	325	101	101
540.97	food waste generation first estimate (tons)	2043	150	29.22	121	1,833	325	114	101	114	162	10	162	10	101	10	325	325	101	101
-	food waste adjustment (tons)	2044	150	29.22	121	1,954	325	114	101	114	162	10	162	10	101	10	325	325	101	101
540.97	food waste generation revised estimate (tons)	2045	150	29.22	121	2,074.30	325	114	101	114	162	10	162	10	101	10	325	325	101	101
5,609.00	yard debris county total generation (tons)	2046	150	29.22	121	2,194.83	325	114	101	114	162	10	162	10	101	10	325	325	101	101
3.60%	reservation proportion of county	2047	150	29.22	121	2,315.35	325	114	101	114	162	10	162	10	101	10	325	325	101	101
201.92	yard debris generation first estimate (tons)	2048	150	29.22	121	2,435.88	325	114	101	114	162	10	162	10	101	10	325	325	101	101
-	yard debris adjustment (tons)	2049	150	29.22	121	2,556.40	325	114	101	114	162	10	162	10	101	10	325	325	101	101
201.92	yard debris generation revised estimate (tons)	2050	150	29.22	121	2,676.92	325	114	101	114	162	10	162	10	101	10	325	325	101	101

Pulp and Pellet Mill							
Year	Mill Average (tns of wood)	% Capacity	En Tons of Dry Wood processed	Dry Wood processed MT	Carbon from Wood (MT)	MTCO2E	Cumulative values (metric tons of Carbon)
2025	18000	0	0	0	0	0	
2026	18000	0.2	3600	3240	1620	5940.54	
2027	18000	0.5	9000	8100	4050	14851.35	
2028	18000	0.8	14400	12960	6480	23762.16	
2029	18000	1	18000	16200	8100	29702.7	74256.75
2030	18000	1	18000	16200	8100	29702.7	
2031	18000	1.2	21600	19440	9720	35643.24	
2032	18000	1.2	21600	19440	9720	35643.24	
2033	18000	1.5	27000	24300	12150	44554.05	
2034	18000	1.5	27000	24300	12150	44554.05	
2035	18000	1.5	27000	24300	12150	44554.05	
2036	18000	1.5	27000	24300	12150	44554.05	
2037	18000	1.8	32400	29160	14580	53464.86	
2038	18000	1.8	32400	29160	14580	53464.86	
2039	18000	1.8	32400	29160	14580	53464.86	
2040	18000	2	36000	32400	16200	59405.4	
2041	18000	2	36000	32400	16200	59405.4	
2042	18000	2	36000	32400	16200	59405.4	
2043	18000	2	36000	32400	16200	59405.4	
2044	18000	2	36000	32400	16200	59405.4	
2045	18000	2	36000	32400	16200	59405.4	
2046	18000	2	36000	32400	16200	59405.4	
2047	18000	2	36000	32400	16200	59405.4	
2048	18000	2	36000	32400	16200	59405.4	
2049	18000	2	36000	32400	16200	59405.4	
2050	18000	2	36000	32400	16200	59405.4	1167316.11

Biochar Demo trailer

Year	Processing Capacity (cubic yards)	Hours per day	Days per year	Cubic Yards Wood processed	Convert to Tons Wood Processed	Carbon Saved in Biochar (50%)	Cumulative	Per hour ($1.5 per hour)	Cost
1	5	4	40	800	216	108		240	55000
2	10	4	60	2400	648	324		360	
3	15	6	80	7200	1944	972		720	
4	20	6	100	12000	3240	1620		900	
5	20	6	100	12000	3240	1620	4644	900	
6	20	6	100	12000	3240	1620		900	
7	20	6	120	14400	3888	1944		1080	
8	20	6	120	14400	3888	1944		1080	
9	20	6	120	14400	3888	1944		1080	staff
10	20	6	150	18000	4860	2430		1350	1,174,500
11	20	6	150	18000	4860	2430		1350	
12	20	6	150	18000	4860	2430		1350	
13	20	6	150	18000	4860	2430		1350	operations total
14	20	6	150	18000	4860	2430		1350	1,258,360
15	20	6	150	18000	4860	2430		1350	
16	20	6	150	18000	4860	2430		1350	
17	20	6	150	18000	4860	2430		1350	
18	20	6	150	18000	4860	2430		1350	
19	20	6	150	18000	4860	2430		1350	
20	20	6	150	18000	4860	2430		1350	
21	20	6	150	18000	4860	2430		1350	Operation Cost
22	20	6	150	18000	4860	2430		1350	
23	20	6	150	18000	4860	2430		1350	
24	20	6	150	18000	4860	2430		1350	
25	20	6	150	18000	4860	2430	50976	1350	28860

Tree Species Years 1-6	% Forest Composition	Weight Dry (En Tns per year)	Weight Dry (MT)	Carbon (MT)	CO2 (MTCO2E)
Fir, Grand (*grandis*)	0.15	2700	2449.4	1224.7	4491.0
Larch, Western (*occidentalis*)	0.05	900	816.5	408.2	1497.0
Pine, Lodgepole (*contorta*)	0.01	180	163.3	81.6	299.4
Pine, Ponderosa (*ponderosa*)	0.3	5400	4898.8	2449.4	8981.9
Douglas-fir, Coastal (*menziesii*)	0.5	9000	8164.7	4082.3	14969.9
Spruce, Engelmann (Picea engelma	0.01	180	163.3	81.6	299.4
		18360			30538.6

At 100% capacity

Tree Species Years 2032-2050	% Forest Composition	Pounds per cubic foot	Pounds per Cubic Yards	Pounds of Green Wood per species per day	Pounds Green Wood per year	Tns Green Wood per year	En Tns Dry Wood per year	MT Carbon per year	CO2 (MTCO2E)
Fir, Grand (*grandis*)	0.15	47	1269.0	15228.0	2558304.0	1279.2	639.6	575.6	2110.8
Larch, Western (*occidentalis*)	0.05	56	1512.0	6048.0	1016064.0	508.0	254.0	228.6	838.3
Pine, Lodgepole (*contorta*)	0.01	43	1161.0	928.8	156038.4	78.0	39.0	35.1	128.7
Pine, Ponderosa (*ponderosa*)	0.3	46	1242.0	29808.0	5007744.0	2503.9	1251.9	1126.7	4131.8
Douglas-fir, Coastal (*menziesii*)	0.5	49	1323.0	52920.0	8890560.0	4445.3	2222.6	2000.4	7335.4
Spruce, Engelmann (Picea engelma	0.01	44	1188.0	950.4	159667.2	79.8	39.9	35.9	131.7
									14676.7

At 100% capacity

Tree Species Years 2025-2031	% Forest Composition	Pounds per cubic foot	Pounds per Cubic Yards	Pounds of Green Wood per species per day	Pounds Green Wood per year	Tns Green Wood per year	En Tns Dry Wood per year	MT Carbon per year	CO2 (MTCO2E)
Fir, Grand (*grandis*)	0.1	47	1269.0	10152.0	1705536.0	852.8	426.4	383.7	1407.2
Larch, Western (*occidentalis*)	0.05	56	1512.0	6048.0	1016064.0	508.0	254.0	228.6	838.3
Pine, Lodgepole (*contorta*)	0	43	1161.0	0.0	0.0	0.0	0.0	0.0	0.0
Pine, Ponderosa (*ponderosa*)	0.4	46	1242.0	39744.0	6676992.0	3338.5	1669.2	1502.3	5509.0
Douglas-fir, Coastal (*menziesii*)	0.45	49	1323.0	47628.0	8001504.0	4000.8	2000.4	1800.3	6601.8
Spruce, Engelmann (Picea engelma	0	44	1188.0	0.0	0.0	0.0	0.0	0.0	0.0
									14356.4

Year	% Capacity	MT CO2E per year	
2025	0	0.0	
2026	0.2	2871.3	
2027	0.3	4306.9	
2028	0.5	7178.2	
2029	0.7	10049.5	
2030	0.85	12202.9	36608.8
2031	1	14356.4	
2032	1	14676.7	
2033	1	14676.7	
2034	1	14676.7	
2035	1	14676.7	
2036	1	14676.7	
2037	1	14676.7	
2038	1	14676.7	
2039	1	14676.7	
2040	1	14676.7	
2041	1	14676.7	
2042	1	14676.7	
2043	1	14676.7	
2044	1	14676.7	
2045	1	14676.7	
2046	1	14676.7	
2047	1	14676.7	
2048	1	14676.7	
2049	1	14676.7	
2050	1	14676.7	329823.3