



The Confederated Tribes  
of the Umatilla Indian Reservation

# TRANSPORTATION SYSTEM PLAN

Photo: Kittelson & Associates, Inc.

## Volume II: Technical Appendix



**FINAL**  
April 2023

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# Appendix A. Complete Project List



Table A1: Roadway System Projects

Project ID	Location/ Name	Extents	Description	Roadway Jurisdiction	Priority	Cost
R01	Kash Kash Road	Kusi Road to east of OR 331	Close existing access to OR 331 and reroute Kash Kash Road north to a new intersection with Kusi Road.	County	Medium	\$1,900,000
R02	Spilya Road	Eastern end of roadway to Kash Kash Road realignment	Extend Spilya Road east to Kash Kash Road realignment.	CTUIR	Low	\$385,000
R03	Emigrant Road	Cayuse Road to Poverty Flat Road	Widen, add shoulders, and repave Emigrant Road (County Road #937) from Cayuse Road to Poverty Flat Road.	County	Medium	\$21,800,000
R04	56th Street-Theater Road	Mission Road to US 30	Widen, add shoulders, and pave/repave 56th Street-Theater Road to help support rerouting of trucks and other regional/state traffic during I-84 closures.	County/BIA	Low	\$3,900,000
R05	North Cayuse Road	River Road to Mann Road	Widen, add shoulders, and pave North Cayuse Road (County Road #925) from River Road north to Mann Road.	County	Low	\$2,400,000
R06	Mann Road	Crawford Hollow Road to North Cayuse Road	Widen, add shoulders, and pave Mann Road (County Road #925) from Crawford Hollow Road south to North Cayuse Road.	County	Low	\$7,000,000
R07	Motanic Road	Best Road to Spring Creek Road	Widen, add shoulders, pave, and improve stormwater management on Motanic Road (County Road #1031) from Best Road south to Spring Creek Road.	County	Medium	\$10,000,000
R08	Sumac Road	Spring Creek Road to McKay Creek Road	Widen, add shoulders, pave, and improve stormwater management on Sumac Road (County Road #1050) from Spring Creek Road south to McKay Creek Road.	County	Low	\$6,000,000
R09	McKay Creek Road	Sumac Road to North Fork McKay Creek Road	Widen, add shoulders, add gravel, and improve stormwater management on McKay Creek Road (County Road #1050) from Sumac Road east to North Fork McKay Creek Road.	County	Medium	\$4,700,000
R10	Exit 216 Truck Overflow Parking	South of I-84 Exit 216	Parking lot for overflow truck parking from I-84 winter closures. Could include a shuttle service from parking lot to Arrowhead during events. The location is still to be determined based on direction from ODOT – one option is shown in the figures. There should be consideration of electrification during design and	ODOT	High	\$3,200,000

Project ID	Location/ Name	Extents	Description	Roadway Jurisdiction	Priority	Cost
			construction in preparation for future needs. Install a road camera at the I-84/OR 331 interchange to better inform winter travel coordination and truck information. Install lighting at the I-84/OR 331 interchange.			
R11	OR 331 Speed Study	UIR northern boundary to I-84	Perform a speed study along the OR 331 corridor and determine whether to modify any speed zones. Coordinate with Umatilla County to extend study north to OR 11.	ODOT	High	\$20,000
R12	Mission Road Traffic Calming	From Mustanger Lane to Parr Lane	Install speed feedback signage and other traffic calming measures.	CTUIR/ County	High	\$30,000
R13	County Road #900 (Cayuse Road and Bingham Road)	Emigrant Road to UIR eastern boundary	Perform a speed study at key intersections on the County Road #900 corridor to determine potential traffic calming or intersection safety treatments. Consider stormwater management improvements as part of any future projects.	County	Medium	\$20,000
R14	Kirkpatrick Road, vertical curve east of McKinley Lane	Intersection extents	Evaluate sight distance and install advisory signage if warranted.	County	Low	\$25,000
R15	Cayuse Road/ Cayuse River Road intersection	Intersection extents	Reconstruct northern leg to connect at a more perpendicular angle.	County	Low	\$1,200,000
R16	River Road/White Road intersection	Intersection extents	Reconstruct southern leg to connect at a more perpendicular angle.	County	Low	\$1,200,000
R17	Confederated Way	B Street to Mission Road (east intersection)	Construct flood remediation projects on Confederated Way from B Street to Mission Road (east intersection). Mitigations may include building a levy, raising the roadway, creating water retention areas, and rerouting the roadway.	BIA	High	To be determined by ongoing study
R18	Short Mile Road Traffic Calming	From Mission Road to roadway extents	Perform a speed study. Install speed feedback signage and other traffic calming measures.	CTUIR	Medium	\$30,000
R19	Riverside Avenue Traffic Calming	From UIR western boundary to roadway extents	Perform a speed study. Install speed feedback signage and other traffic calming measures.	CTUIR/ County/ Pendleton	Medium	\$30,000
R20	Iskuulpa Creek Bridge	Bridge extents	Replace the bridge, including a higher deck based on annual flooding.	CTUIR/ County	Low	\$2,100,000

Project ID	Location/ Name	Extents	Description	Roadway Jurisdiction	Priority	Cost
R21 <sup>3,4</sup>	OR 331/ Mission Road	Intersection extents	Install safety and traffic operations improvements. Future traffic control could include a single lane roundabout, traffic signal, or other alternative configuration. <sup>1</sup>	ODOT/ County/ CTUIR	Development-Driven	
R22 <sup>3</sup>	Mission Road/Timíne Way	Intersection extents	Install an eastbound right-turn lane and/or a westbound left-turn lane when warranted. OR Construct a single lane roundabout. OR Install a traffic signal, with necessary turn lanes, when warranted.	ODOT/ CTUIR	Development-Driven	
R23 <sup>3,4</sup>	OR 331/ Wildhorse Boulevard	Intersection extents	Install safety and traffic operations improvements. Future traffic control could include a single lane roundabout, traffic signal, or other alternative configuration.	ODOT/ CTUIR	Development-Driven	
R24 <sup>3,4</sup>	OR 331/ Spilya Road	Intersection extents	Install safety and traffic operations improvements. Future traffic control could include a single lane roundabout, traffic signal, or other alternative configuration. <sup>1</sup> Consider options to modify access at Kusi Road and/or Arrowhead Travel Plaza depending on the future traffic control selected.	ODOT/ CTUIR	Development-Driven	
R25 <sup>3,4</sup>	OR 331/I-84 Eastbound Ramps	Intersection extents	Install safety and traffic operations improvements. Future traffic control could include a single lane roundabout, traffic signal, or other alternative configuration. <sup>1</sup> Consider whether to install exclusive left- and right-turn lanes on the off ramp approach depending on the future traffic control selected.	ODOT	Development-Driven	
R26 <sup>3</sup>	OR 331/I-84 Westbound Ramps	Intersection extents	Install safety and traffic operations improvements. Future traffic control could include a traffic signal, single lane roundabout, or other alternative configuration. <sup>1</sup> Consider whether to install exclusive left- and right-turn lanes on the off ramp approach and an exclusive right-turn lane on the north approach depending on the future traffic control selected.	ODOT	Development-Driven	



Project ID	Location/ Name	Extents	Description	Roadway Jurisdiction	Priority	Cost
<b>Total High Priority Cost</b>						<b>\$3,250,000</b>
<b>Total Medium Priority Cost</b>						<b>\$38,480,000</b>
<b>Total Low Priority Cost</b>						<b>\$24,210,000</b>
<b>Total Cost</b>						<b>\$65,940,000</b>

Note: The cost estimates presented do not include costs associated with right-of-way acquisition due to its high variability depending on location, parcel sizes, and other characteristics. The cost estimates also reflect the full cost of the projects, including costs likely to be funded by others, such as ODOT or private developers.

<sup>1</sup>Depending on the reconfiguration of the intersection, consider incorporating bus pull-outs into the project design.

<sup>2</sup>This project may be completed in conjunction with future replacement of the Exit 216 I-84 overpass.

<sup>3</sup>Project will require coordination with ODOT and approval from the State or Regional Traffic Engineer. Further evaluation may be required to determine the most appropriate form of traffic control.

<sup>4</sup>Planning concept potentially reduces vehicle-carrying capacity of the highway; further evaluation of the project design will be required at the time of implementation to ensure compliance with ORS 366.215.

**Table A2: Pedestrian System Projects**

Project ID	Location/ Name	Extents	Description	Roadway Jurisdiction	Priority	Near a School	Cost
<b>P01</b>	Mission Road	East of Huckleberry Street to Cedar Street	Install six-foot sidewalks along the north side of Mission Road from east of Huckleberry Street to Cedar Street. Consider incorporating bus pull-outs into the project design.	County	High	X	\$1,500,000
<b>P02</b>	Mission Road	Confederated Way (western intersection) to Confederated Way (eastern intersection)	Complete the sidewalk network along the south side of Mission Road from Confederated Way (western intersection) to Confederated Way (eastern intersection). Consider incorporating bus pull-outs into the project design.	County	High	X	\$680,000
<b>P03</b>	Mission Road	OR 331 to Confederated Way (western intersection)	Widen sidewalks to six feet on the south side of Mission Road from OR 331 to Confederated Way (western intersection) and address the existing mailbox obstructions. Consider incorporating bus pull-outs into the project design.	County	High	X	\$490,000
<b>P04</b>	Confederated Way	East of Whirlwind Drive to Mission Road (east intersection)	Complete the sidewalk network along the north side of Confederated Way from east of Whirlwind Drive to Mission Road (east intersection).	BIA	High	X	\$435,000
<b>P05</b>	Cedar Street	Short Mile Road to Mission Road	Widen sidewalks to six feet wide on both sides of Cedar Street from Short Mile Road to Mission Road.	BIA	Medium	X	\$580,000

Project ID	Location/ Name	Extents	Description	Roadway Jurisdiction	Priority	Near a School	Cost
P06	Multi-use Path to Pendleton (Phase I)	Purchase Lane to OR 331	Construct a multi-use path on the south side of Mission Road from Purchase Lane to OR 331. This project is the first phase of a larger multi-use path connection to the City of Pendleton. Further study is needed to determine the ultimate alignment.	CTUIR	High	X	\$775,000
P07	Multi-use Path to Pendleton (Phase II)	UIR western boundary to Purchase Lane	Construct the second phase of the multi-use path to Pendleton, connecting at Purchase Lane. West of Purchase Lane, the alignment of the multi-use path connection may occur in the area between Mission Road and the south bank of the Umatilla River.  Further study is needed to determine the ultimate alignment. If possible, connect to the Pendleton Riverwalk or the Riverside neighborhood. Include benches, lighting, and safety amenities (such as emergency call boxes and security cameras).	CTUIR/ County/ Pendleton	High	X	\$3,500,000
P08	Short Mile Road Multi-use Path	Mission Road to Cayuse Bridge	Construct a multi-use path along Short Mile Road to Sampson Lane adjacent to the Union Pacific Railroad maintenance road to River Road to North Cayuse Road Bridge.	CTUIR	Medium		\$3,900,000
P09 <sup>1</sup>	OR 331 Multi-use Path (Phase I)	Mission Road to Arrowhead Travel Plaza driveway	Construct a multi-use path along one or both sides of OR 331 from Mission Road to Arrowhead Travel Plaza driveway.	CTUIR	High		\$1,900,000
P10 <sup>1</sup>	OR 331 Multi-use Path (Phase II)	Kirkpatrick Road to Mission Road	Construct a multi-use path along one or both sides of OR 331 from Kirkpatrick Road to Mission Road, depending on feasible options for crossing the Umatilla River Bridge. River access could potentially be included as part of this project.	CTUIR	High	X	\$2,900,000
P11	South Market Road Multi-use Path	Arrowhead Travel Plaza driveway to Tutuilla Church Road	Construct a multi-use path along one or both sides of OR 331-South Market Road from Arrowhead Travel Plaza driveway to Tutuilla Church Road. The Exit 216 overpass may need to be replaced to fit the desired facilities.	CTUIR	Medium		\$3,900,000



Project ID	Location/ Name	Extents	Description	Roadway Jurisdiction	Priority	Near a School	Cost
P12	Wildhorse Boulevard Multi-use Path	OR 331 to the Tamástslíkt Trail	Construct a multi-use path along Wildhorse Boulevard, along the north side of the median or within the median.	CTUIR	Medium		\$675,000
P13	Parr Lane Multi-use Path	Umatilla River to Mission Road	Construct a multi-use path in the vicinity of Parr Lane and extending to the Umatilla River.	CTUIR	Low		\$305,000
P14	East-West Multi-use Path	OR 331 to Mission Road	Construct a multi-use path along the top of the bluff connecting OR 331 to Mission Road, intersecting the Tamástslíkt Trail. Include lighting, benches, and security cameras or call boxes. Coordinate with Project P19 – OR 331/Timíne Way pedestrian crossing and Project P23 - Mission Road/Cedar Street pedestrian crossing.	CTUIR	High	X	\$1,600,000
P15	Tamástslíkt Trail Lighting	Confederated Way to Tamástslíkt Cultural Institute	Install lighting and security cameras to existing multi-use path system.	CTUIR	High		\$530,000
P16	Timíne Way Multi-use Path Lighting	Mission Road to OR 331	Install lighting and security cameras to existing multi-use path system.	CTUIR	Medium	X	\$320,000
P17	July Ground Multi-use Path System Lighting	n/a	Install lighting and security cameras to existing multi-use path system.	CTUIR	Medium	X	\$480,000
P18	Mission Road Lighting	Short Mile Road to Cedar Street	Install pedestrian-scale lighting.	County	High		\$195,000
P19 <sup>1</sup>	OR 331/ Timíne Way	n/a	Install an enhanced pedestrian crossing. Treatment may include signalization or a pedestrian hybrid beacon (if warranted), rectangular rapid flashing beacons (RRFBs), or a grade separated undercrossing of OR 331. Coordinate with Project P14 – East-West Multi-use Path.	ODOT	High	X	\$2,000,000
P20	Mission Road Mid-block Crossing	n/a	Install enhanced pedestrian crossing treatments at the existing mid-block crossing on Mission Road east of Short Mile Road. Treatment may include raised crosswalk, rectangular rapid flashing beacons (RRFBs), high visibility crosswalk markings, and/or curb extensions.	County	High	X	\$105,000

Project ID	Location/ Name	Extents	Description	Roadway Jurisdiction	Priority	Near a School	Cost
P21 <sup>1</sup>	OR 331/ Kusi Road	n/a	Install an enhanced pedestrian crossing. Treatment may include pedestrian hybrid beacon (if warranted), rectangular rapid flashing beacons (RRFBs), raised median island, high visibility crosswalk markings, and curb extensions.	ODOT	High		\$105,000
P22	Mission Road/ Confederated Way (east intersection)	n/a	Install an enhanced pedestrian crossing. Treatment may include raised crosswalk, rectangular rapid flashing beacons (RRFBs), high visibility crosswalk markings, and curb extensions.	County	High	X	\$105,000
P23	Mission Road/ Cedar Street	n/a	Install an enhanced pedestrian crossing. Treatment may include raised crosswalk, rectangular rapid flashing beacons (RRFBs), high visibility crosswalk markings, and curb extensions. Coordinate with Project P14 - East-West Multi-use Path.	County	High	X	\$105,000
P24	Riverside Avenue	From UIR western boundary to roadway extents	Install sidewalk and lighting along one side of Riverside Avenue. Cost shown is for the roadway segment within the UIR. Coordinate with planned project in City of Pendleton TSP, if possible.	CTUIR/ County/ Pendleton	High		\$540,000
<b>Total High Priority Cost</b>							<b>\$17,465,000</b>
<b>Total Medium Priority Cost</b>							<b>\$9,855,000</b>
<b>Total Low Priority Cost</b>							<b>\$305,000</b>
<b>Total Cost</b>							<b>\$27,625,000</b>

Note: The cost estimates presented do not include costs associated with right-of-way acquisition due to its high variability depending on location, parcel sizes, and other characteristics. The cost estimates also reflect the full cost of the projects, including costs likely to be funded by others, such as ODOT or private developers.

<sup>1</sup>Project will require coordination with ODOT and approval from the State or Regional Traffic Engineer.

**Table A3: Bicycle System Projects**

Project ID	Location/ Name	Extents	Description	Roadway Jurisdiction	Priority	Near a School	Cost
B01	Mission Road	OR 331 to Cayuse Road	Widen Mission Road and install buffered or separated/ raised bicycle lanes along both sides of the roadway	County	High	X	\$4,200,000

Project ID	Location/ Name	Extents	Description	Roadway Jurisdiction	Priority	Near a School	Cost
			from OR 331 to Cayuse Road. Consider incorporating bus pull-outs into the project design.				
<b>B02</b>	Kirkpatrick Road	OR 331 to McKinley Lane	Widen Kirkpatrick Road and install shoulder bikeways on both sides of the roadway from OR 331 to McKinley Lane.	County	Medium	X	\$2,400,000
<b>B03</b>	Cayuse Road	Emigrant Road to River Road	Widen Cayuse Road and install shoulder bikeways on both sides of the roadway from Emigrant Road to River Road.	County	Medium		\$6,800,000
<b>B04</b>	Confederated Way	Full roadway extents	Install shared roadway signage and/or striping (sharrows).	BIA	Medium	X	\$30,000
<b>B05</b>	Whirlwind Drive	Mission Road to Confederated Way	Install shared roadway signage and/or striping (sharrows).	BIA	Medium	X	\$5,000
<b>B06</b>	Cedar Street	Short Mile Road to Mission Road	Install shared roadway signage and/or striping (sharrows).	BIA	Medium	X	\$35,000
<b>B07</b>	Kusi Road	Full roadway extents	Install shared roadway signage and/or striping (sharrows).	CTUIR	Low		\$25,000
<b>B08</b>	Spilya Road	Full roadway extents	Install shared roadway signage and/or striping (sharrows).	CTUIR	Low		\$30,000
<b>B09</b>	Coyote Road	Full roadway extents	Install shared roadway signage and/or striping (sharrows).	CTUIR	Low		\$20,000
<b>B10</b>	Arrowhead Road	Full roadway extents	Install shared roadway signage and/or striping (sharrows).	CTUIR	Low		\$15,000
<b>B11<sup>1</sup></b>	Bicycle Fix-it Stations	Within UIR boundaries	Evaluate where bicycle fix-it stations would be beneficial to install within the UIR, such as trailheads, community hubs, or the school.	CTUIR	High		\$10,000 per station
<b>Total High Priority Cost</b>							<b>\$4,200,000</b>
<b>Total Medium Priority Cost</b>							<b>\$9,270,000</b>
<b>Total Low Priority Cost</b>							<b>\$90,000</b>
<b>Total Cost</b>							<b>\$13,560,000</b>

<sup>1</sup>Project not shown on the project map.

**Table A4: Transit System Projects**

Project ID	Location/Name	Description	Priority	Cost
T01 <sup>1</sup>	Park-and-ride Locations	Coordinate with regional transit providers for park-and-ride locations that help facilitate the use of transit by community members and maximize regional connectivity.	High	TBD, depends on partnerships available
T02	Bus Stop Enhancements	Evaluate transit stops for additional amenity needs, such as shelters, lighting, and signage.	High	One-time cost: \$324,000 (\$18,000/stop for 18 bus stops)
T03	OR 331 Transit Hub	Consolidate bus stops at Arrowhead Travel Plaza, Cayuse Holdings, and the Wildhorse Resort & Casino campus into one pair of transit hubs on OR 331 north of Spilya Road, reducing need for transit vehicles to turn to and from OR 331. Coordinate with Project T04 - Wildhorse Campus Shuttle. If a roundabout is constructed on OR 331 based on development-driven projects, a single transit hub on one side of OR 331 may be appropriate.	High	One-time cost: \$400,000
T04	Wildhorse Campus Shuttle	Partner with adjacent businesses to purchase one shuttle bus to transport people from Arrowhead Travel Plaza, Cayuse Holdings, and the Wildhorse Resort & Casino campus to the OR 331 Transit Hub. Coordinate with Project T03 - OR 331 Transit Hub.	High	One-time cost: \$175,000 Annual operating cost: \$195,000
T05	Kayak Transit Hub Expansion	Install public restrooms for passengers at the Kayak Transit Hub.	Low	One-time cost: \$500,000
T06 <sup>1</sup>	Electric Vehicle and Shuttle Pilot	Acquire two six-passenger electric vehicles, install charging facilities, and begin electric vehicle service for the Metro and campus shuttle routes.	Medium	One-time cost: \$130,000 Annual operating cost: \$195,000
T07 <sup>1</sup>	More frequent transit service	Explore adding more trips per day on the highest ridership routes including Hopper, Whistler, Metro, HART, Arrow, and Rocket.	Low	Annual operating cost: \$150,000
T08 <sup>1</sup>	Extended hours of service	Explore additional hours of service to serve the morning and evening shifts at Wildhorse Resort & Casino.	Medium	Annual operating cost: \$75,000
T09 <sup>1</sup>	Extended Coverage Study	Conduct a study to understand the need for extended coverage for transit services to reach residential area near Riverside Avenue, Pendleton Airport, and Walla Walla Airport. Coordinate with surrounding jurisdictions and transit agencies who already provide services to these areas, specifically the City of Pendleton. Coordinate with local health and fitness facilities when locating new bus stops.	Medium	One-time cost: \$50,000
<b>Total High Priority Cost</b>				<b>One-time cost: \$899,000 Annual operating cost: \$195,000</b>

Project ID	Location/Name	Description	Priority	Cost
			<b>Total Medium Priority Cost</b>	<b>One-time cost: \$180,000</b> <b>Annual operating cost: \$270,000</b>
			<b>Total Low Priority Cost</b>	<b>One-time cost: \$500,000</b> <b>Annual operating cost: \$150,000</b>
			<b>Total Cost</b>	<b>One-time cost: \$1,579,000</b> <b>Annual operating cost: \$615,000</b>

1 Project not shown on the project map.

