

AGENDA

Number	Time	Details	Presenter
1	10:00	Welcome, Introductions, and Agenda Review (5 mins) Outcome: All stakeholders meet project team and are welcome.	Thuy Tu, TTU
Outcome: All stakeholders meet project team and are welcome. Project Summary Outcomes Project Summary: Deliverables, Key Findings and Recommendations (15 mins) Outcome: Regional partners understand project process and outcomes. 2 10:05 Regional ETR Update Phase 1 Final Report and Appendices: https://rdpo.net/emergency-transportation-routes 10:20 Q&A (5 mins) Outcome: Participants can ask process or outcome questions for clarifications. 3 10:20 Demo of Regional ETR Arc GIS online viewer (10 mins)			
2	10:05	Outcome: Regional partners understand project process and outcomes. Regional ETR Update Phase 1 Final Report and Appendices: 	Laura Hanson, RDPO Thuy Tu, TTU
3	10:20		Laura Hanson, RDPO Kim Ellis, Metro Allison Pyrch, Salus
		Project Data Deep Dive	
4	10:25	 Demo of Regional ETR Arc GIS online viewer (10 mins) Outcome: Partners understand how to access and navigate the on-line viewer. Regional ETR online viewer (<u>https://arcg.is/0rWCX5)</u> 	Matthew Hampton, Metro
4	10:35	GIS Data Orientation (30 mins) Outcome: Regional partners understand what geospatial data is available, its gaps and limitations, how to use the analysis presented in the report tables and charts, and how to access the RETR route and supporting data for their own work.	Jed Roberts, FLO Allison Pyrch, Salus
6	11:05	Q&A (15 mins) Outcome: Participants can ask technical questions for clarifications.	Laura Hanson, RDPO Kim Ellis, Metro
		Close	
7	11:20	 What's Next? (10 mins) RDPO + PSU Transportation Resilience & Recovery Interim Project (2021) RDPO + Metro Regional ETR Phase 2 Project (2022-2023) Outcome: Regional partners understand ongoing initiatives to advance this work. 	Laura Hanson, RDPO Kim Ellis, Metro
8	11:30	Adjourn	Thuy Tu, TTU

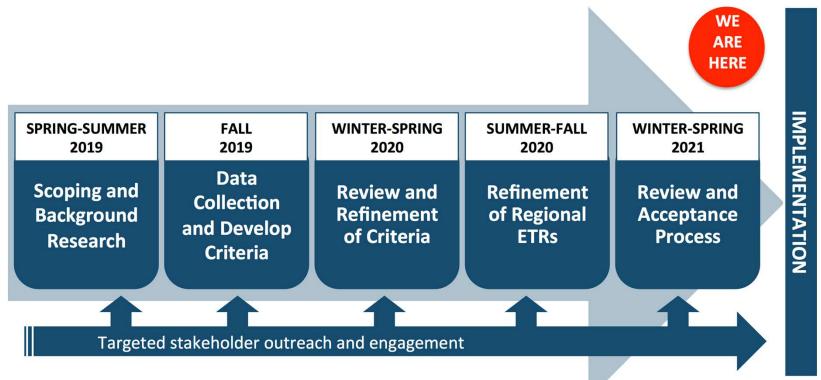


RETR Update: Project Summary Key Findings and Recommendations



Regional ETR Update Work Group 翻 Metro R SHINGTON CO. Regional Disaster Preparedness Organization Unified. Prepared. Resilient. INBIA CA Oregon ABIA Department of Transportation OREGON CLACKAMAS COUNTY Washington State CY MAN REGO **Department of Transportation** DISASTER MANAGEMENT T R I 🌀 MET RESA 9-1-1 **C-TRAN** Always Here, Always Ready! **PORT OF PORTLAND** Possibility. In every direction. Multnomah WILSONVILLE OREGON County **Emergency Management Association of** & Transportation **Oregon Counties** TRANSPORTATION RESEARCH and EDUCATION CENTER





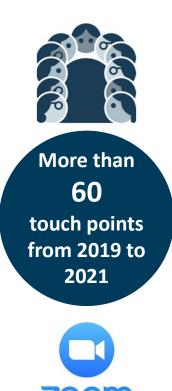
Project timeline



Stakeholder engagement | 2019 to 2021

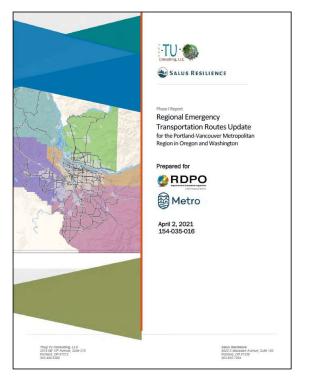
- 9 Regional ETR work group meetings
- 3 TPAC/MTAC workshops
- 1 community leaders' forum
- 17 county-level coordinating committee briefings (staff and policy)
- 8 jurisdictional specific meetings to review draft maps
- 5 REMTEC briefings
- 3 RDPO Public Works work group briefings
- 4 RDPO Steering Committee briefings
- 1 Metro Policy Advisory Committee briefing
- 3 Joint Policy Advisory Committee on Transportation briefings
- 2 Metro Council briefing
- 2 Southwest Washington Regional Transportation Council briefing
- 3 RDPO Policy Committee briefings





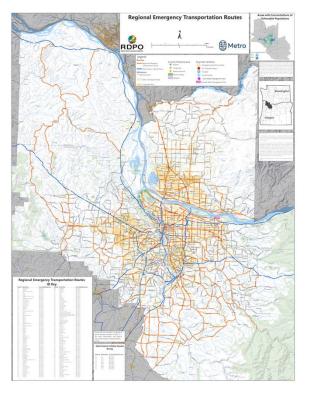
PROJECT SUMMARY OUTCOMES

FINAL PH. 1 TECHNICAL REPORT



RDPO Regional Disaster Prepared resolution Unifed Prepared. Resilter.

FINAL LARGE-SCALE MAPS



RETR ONLINE VIEWER

Regional Emergency Transportation Routes update



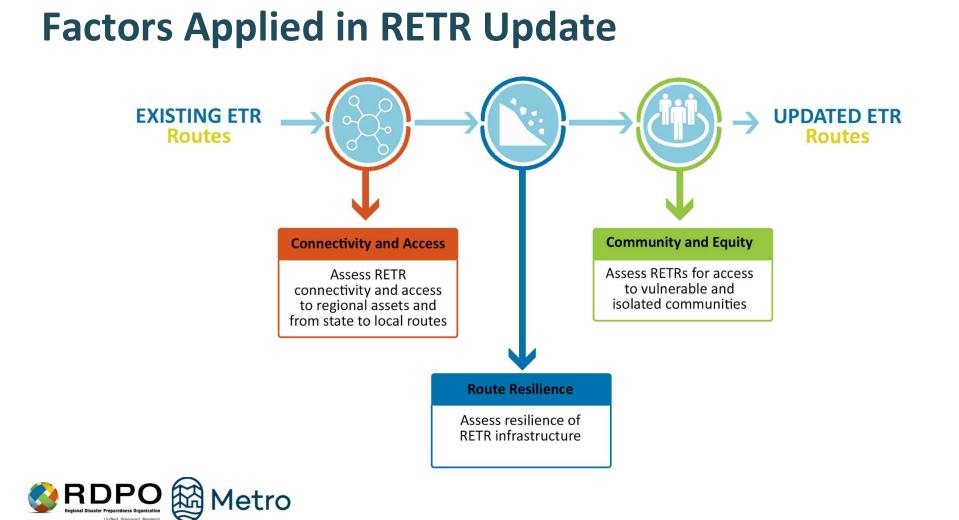
WHERE WE LANDED

A total of 1,204 miles making up 305 miles making up **195 routes** designated.

89 new routes were added.

OVER 75% of state and regional critical infrastructure and essential facilities connected by facilities connected.



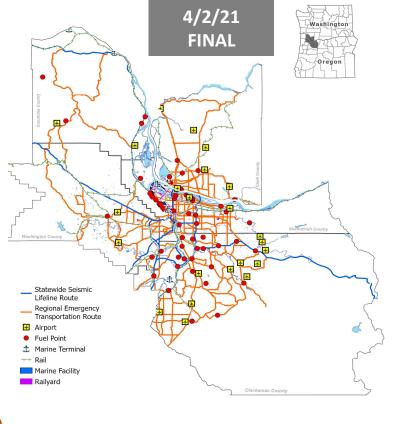


Key findings

Factor	Findings
	 adequate connectivity and access further study of critical infrastructure and essential facilities needed some areas have limited alternate routes, including areas with higher hazard vulnerability some areas rely on state routes
Connectivity and access	
	 seismic and landslide impacts will hinder connectivity and access need to seismically strengthen bridges, particularly for major river crossings more analysis needed on major earthquake, landslide, wildfire and flood impacts to transportation engineering analysis needed to propose specific retrofits
Route resilience	
Community and equity	 provides adequate connectivity and access to the region's population centers and areas with concentrations of vulnerable populations limited alternate routes and transportation services in some rural areas with concentrations of vulnerable populations more in-depth equity analysis and community-specific engagement is needed to better
	understand and address the unique needs of urban and rural communities

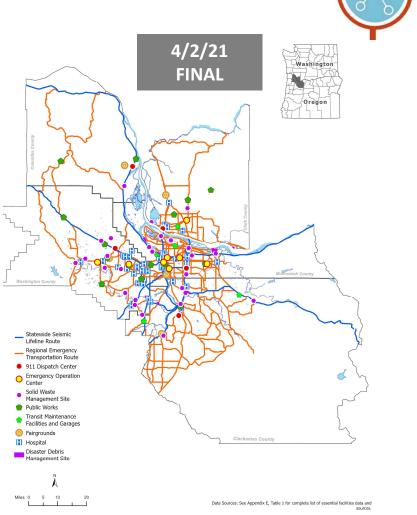


RETR Connectivity and Access Findings State/Regional critical assets





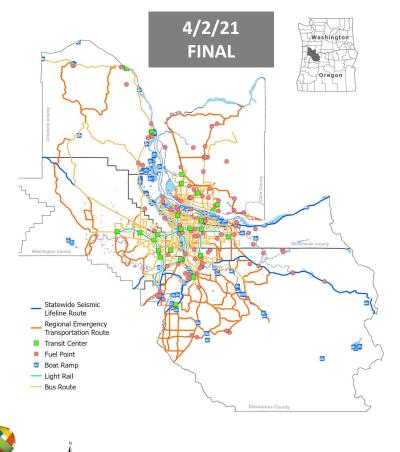
Data Sources: See Appendix E, Table 1 for complete list of critical infrastructure data and sources.

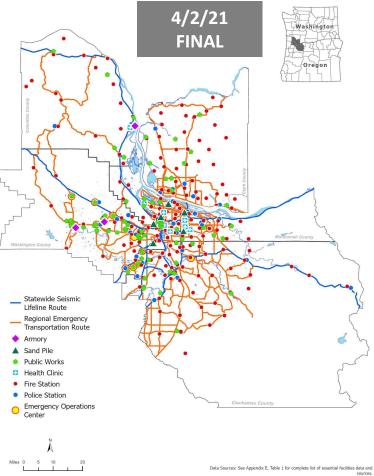


RETR Connectivity and Access Findings County/City critical assets

Data Sources: See Appendix E, Table 1 for complete list of critical infrastructure data and

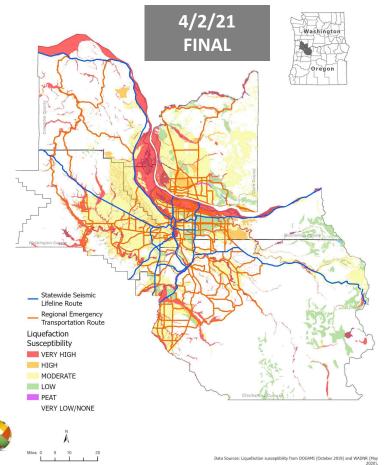


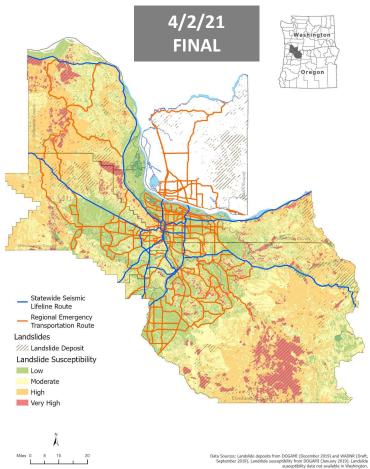




RETR Resilience Findings Liquefaction and Landslide Hazards



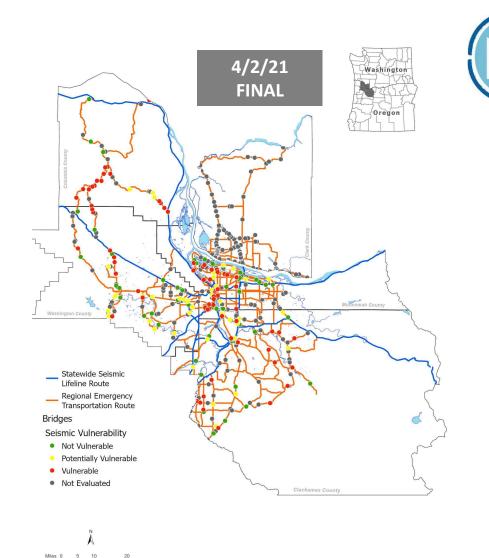




RETR Resilience Findings Vulnerable Bridges

- Vulnerable bridges greatly increase risk in region.
- Crossings of the Columbia and Willamette rivers are very vulnerable.
- Seismic and landslide impacts to roads and bridges will likely hinder connectivity and access during an emergency.

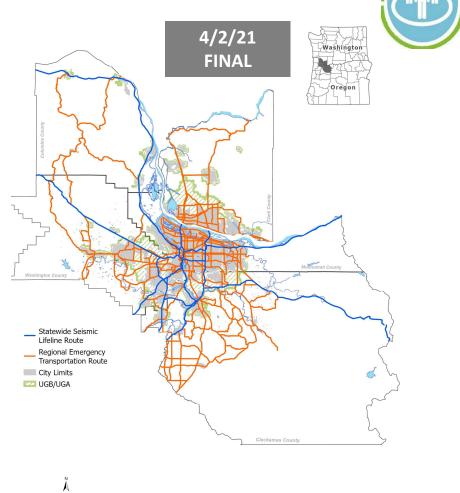




Data Sources: Bridge seismic vulnerability from ODOT (October 2019). Bridge vulnerability information not available for Clark County.

RETR Community and Equity Findings Population Centers and Growth Areas

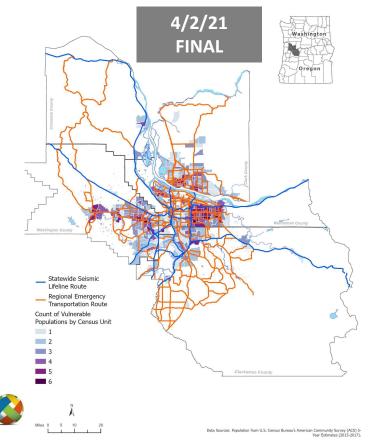
- provides adequate connectivity and access to communities
- limited alternate routes and transportation services in some rural areas with fewer travel options
- more in-depth equity analysis and community-specific engagement needed in future work

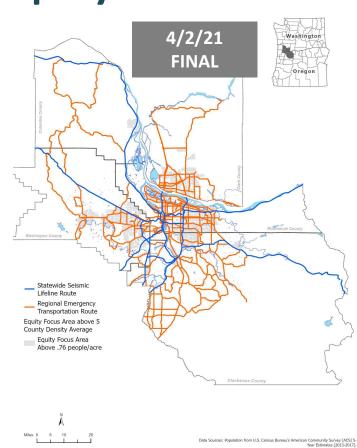




Data Sources: City limits and urban growth boundaries from Metro RLIS (October 2019)

RETR Community and Equity Findings Vulnerable Populations and Equity Focus Areas





16

Recommendations for Future Work

Recommendation	Level	Lead/Key Partner(s)
 Integrate regional ETRs into other planning and investment decision-making processes 	Regional	Various
2. Prioritize or tier the regional ETRs	Regional	RDPO & Metro*
3. Develop RETR management plans to include: RETR operations in an emergency, evaluation of specific hazard events, maintenance and coordination between jurisdictions and transition to recovery	Local with regional facilitation	Local jurisdictions with facilitation by RDPO & Metro*
4. Better address vulnerable populations	Regional	RDPO & Metro* (Social Vulnerability Tool Project)
5. Formalize the RETRs and agree to a plan for consistent updates	Regional	RDPO & Metro*
6. Integrate RETR and LETRs into evacuation planning	Local and regional	Various
7. Engineering evaluation of top priority/tier routes for seismic upgrades	Local and regional	TBD
8. Evaluate river routes	Regional/State	Ports, Coast Guard & State Resilience Office
9. Develop equity-centered public messaging for transportation in emergencies	Regional	RDPO Public Messaging Task Force
10. Evaluate bike and pedestrian options for emergency transportation	Local	Various



* Part of Phase 2

GIS Data Orientation

June 2, 2021



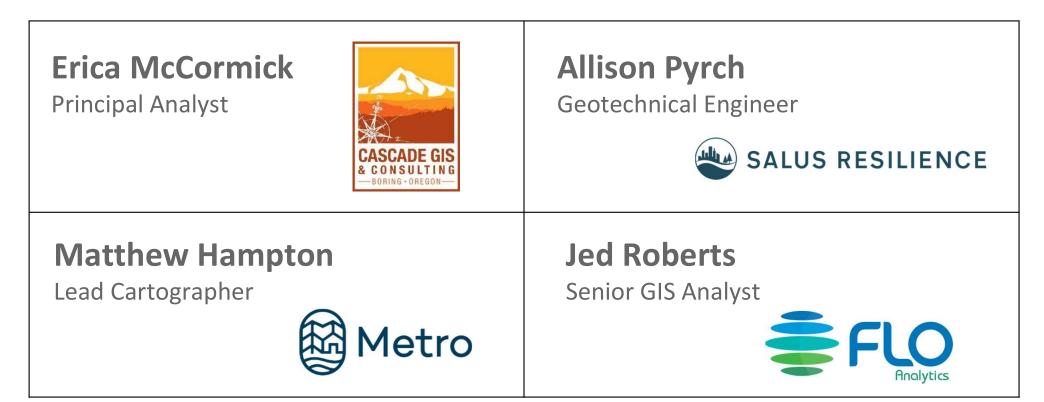








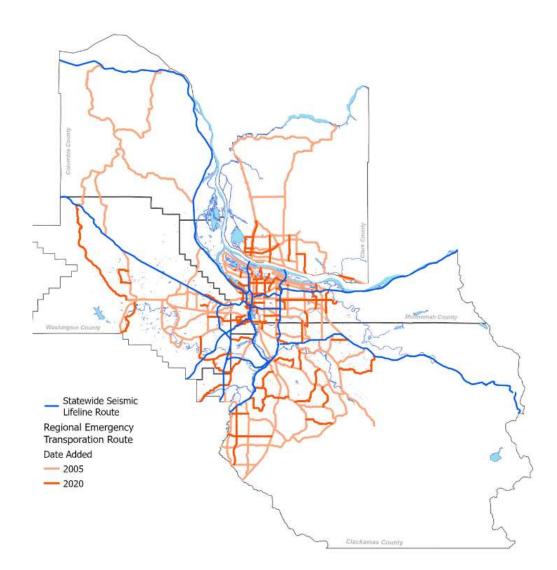
GIS & Data Team





Route Layer Overview

- Primary layer representing Regional Emergency Transportation Routes and Oregon Statewide Seismic Lifeline Routes
- Secondary layers used for analyses
 - Proximity to essential facilities + critical infrastructure
 - Exposure to geohazards (flooding, earthquake liquefaction, landslide susceptibility, bridge resilience)
 - Service to vulnerable populations (BIPOC, low income, limited English proficiency, and others)
- Tertiary layers used for reference
 - Helped inform designation of routes





Attribute Overview

Route ID

- Unique segment identifier
- Naming convention is (S/R)-#-XXX-00-RouteName
- **S/R** = State or Regional
- **#** = route tiering system TBD
- **XXX** = 3-digit route number (even runs east/west, odd runs north/south
- **00** = Segment number for routes with multiple ("00" only has one segment)



Route Name	Route From	Route To	Year Designated			
Unique name	Name of	Name of	Either 2005 (legacy) or 2020 (current project)			
comprised of road	intersecting	intersecting				
names	road at start	road at end				

Route Type

- Primary is preferred for connectivity
- Alternate is designated as backup for resilience considerations

How to Get the Route Layer

The shapefile with metadata is available for download from the Metro RLIS Discovery Home:

http://rlisdiscovery.oregonmetro.gov/

All other project information and links: https://rdpo.net/emergency-transportation-routes



Demo of Regional ETR Online Viewer





Project Team: RDPO, Metro

June 2, 2021

Thuy Tu Consulting, LLC, Salus Resilience, Cascade GIS & Consulting, FLO Analytics







Route connectivity/access Community/equity

Regional Emergency Transportation Routes (ETRs) Update

Route resilience

The information contained in this ArcGIS viewer is to assist agencies as they review data related to updating the designated regional emergency transportation routes for the five-county Portland-Vancouver metropolitan area, which includes Clackamas, Columbia, Multnomah and Washington counties in Oregon and Clark County in Washington. The last update occurred in 2006.

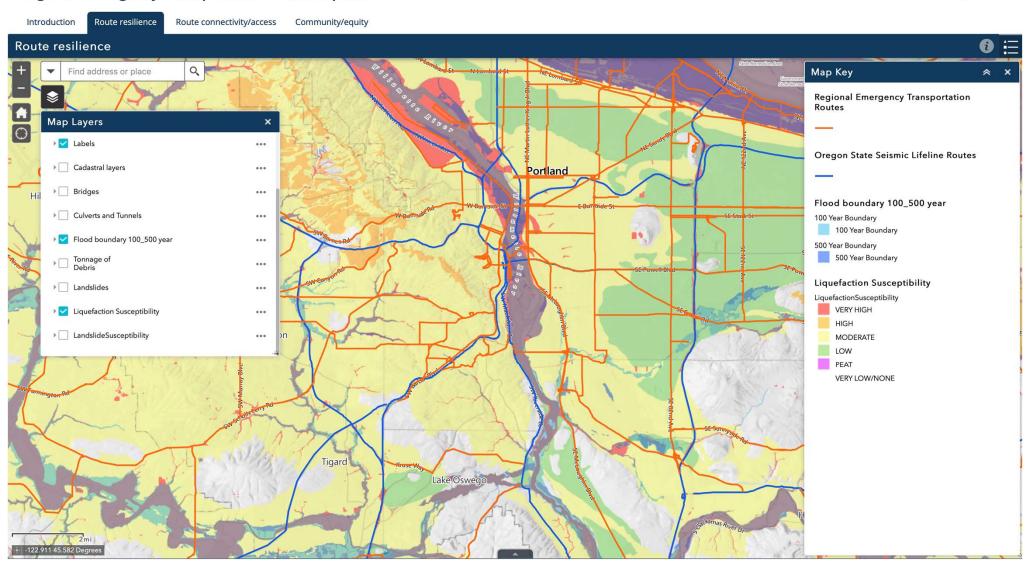
Find more information about the Regional Emergency Transportation Routes update at <u>rdpo.net/emergency-transportation-routes</u>.

Regional Emergency Transportation Routes (RETR) Update

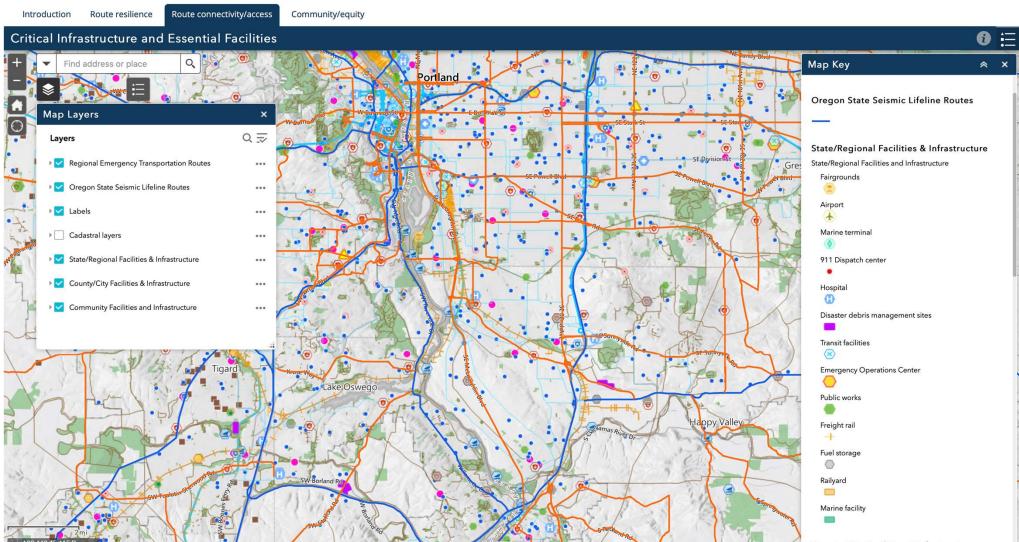
Review and Refinements of Regional ETRs





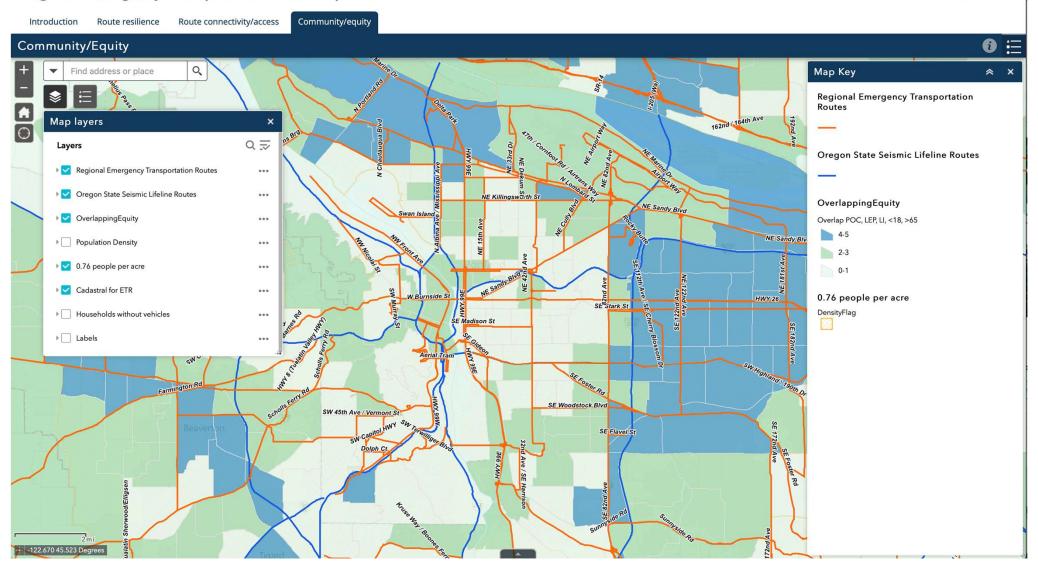


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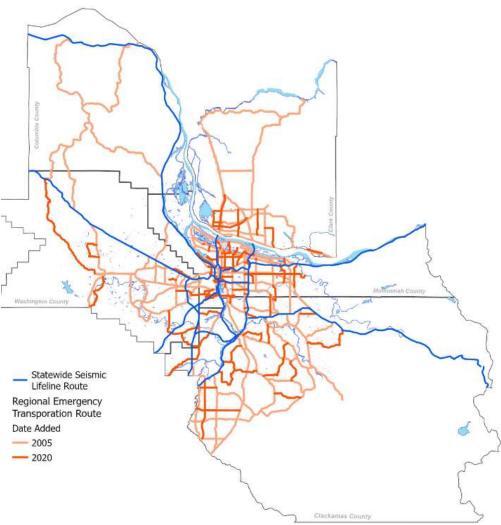
County/City Facilities & Infrastructure



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Data Collection: Routes

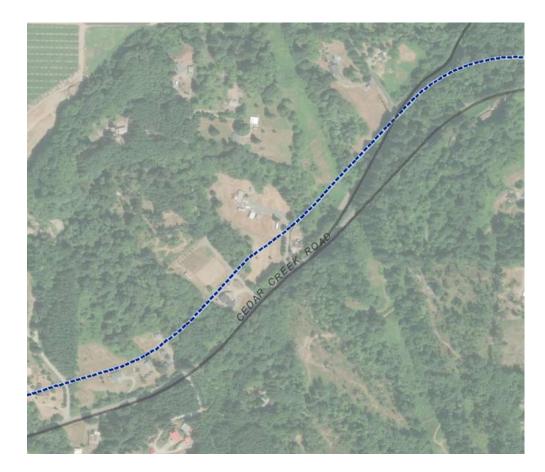
- Starting point: existing layers for routes designated in 1996 and 2005
 - 122 segments
- Additional routes identified during stakeholder review process
 - 69 segments added for total of 191





Horizontal Control

- Route geometry is coincident with authoritative street layers
 - Metro RLIS Streets: Multnomah, Clackamas, and Washington counties
 - Columbia County GIS: County road layer
 - Clark County GIS: County road layer





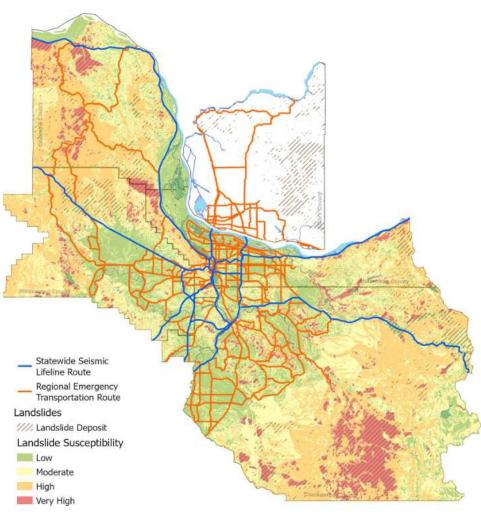
Data Collection: Facilities & Infrastructure

Category	Critical Infrastructure	Essential Facilities
State / Regional	 Airports Marine port terminals Rail yards Power, water transmission lines, fuel points of distribution (PODs) Transit emergency operations centers (EOCs), bus barns, and maintenance facilities 	 Regional hospitals State, regional and county EOCs State and regional PODs State and county public works facilities and equipment stores Regional debris management sites Transfer stations Fairgrounds
City / County	 Local lifeline facilities, such as local water transmission infrastructure Local river connections (boat ramps) Transit hubs and transit centers 	 Health clinics and local hospitals and health care facilities Police and fire stations City EOCs County and city PODs City and utility public works facilities Designated debris management sites Local transit centers
Community / Neighborhood	 Lifeline distribution systems Isolated lifeline distribution infrastructure 	 Schools Community centers Shelters Community PODs
RDPO Reginal Disseter Progradedees Organization Underd. Prograd. Resident	Metro	3

Data Collection: Natural Hazards

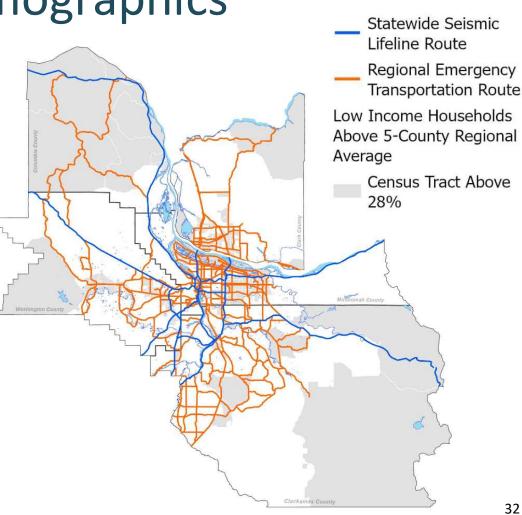
- FEMA: flood hazards
- Oregon Department of Geology and Mineral Industries (DOGAMI): earthquake liquefaction, landslide susceptibility, landslide deposits and scarps
- Washington Department of Natural Resources (WADNR): earthquake liquefaction (unpublished), landslide deposits (unpublished)





Data Collection: Demographics

- U.S. American Community Survey (ACS) five-year estimates for 2013-2017, by tract
- U.S. Census block groups





Assessment: Connectivity

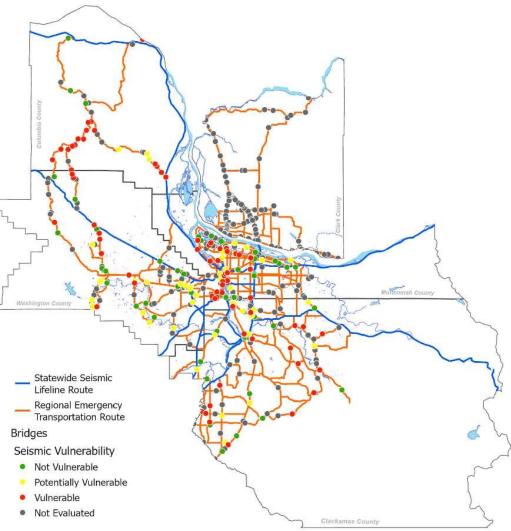
Critical infrastructure and essential facilities tested for proximity of < 1/4 mile from a RETR or SSLR

Category	Туре	CI/EF	Percent Within 1/4 Mile of RETR/SSLR
State/Regional	CI	Airports	48
State/Regional	CI	Fuel Points	86
State/Regional	CI	Marine Facilities	75
State/Regional	CI	Marine Terminals	50
State/Regional	CI	Public Works	76
State/Regional	CI	Public Works	69
State/Regional	CI	Rail	59
State/Regional	CI	Railyards	95
State/Regional	CI	Transit Facilities	79
State/Regional	EF	911 Dispatch Centers	67
State/Regional	EF	DDMS	86
State/Regional	EF	Hospitals	95
State/Regional	EF	Solid Waste Management	63
City/County	CI	Boat Ramps	7
City/County	CI	Bus Lines	100
City/County	CI	Fuel Points	60
City/County	CI	Light Rail	96
City/County	CI	Light Rail	96
City/County	CI	Transit Centers	92
City/County	EF	Armories	67
City/County	EF	EOC	17
City/County	EF	Fire	35
City/County	EF	Health Care Clinics	91
City/County	EF	Police	61
City/County	EF	Public Works	58
City/County	EF	Sand Piles	100
Community/Neighborhood	CI	Trails	46
Community/Neighborhood	EF	Community Centers	58
Community/Neighborhood	EF	Parks	53
Community/Neighborhood	EF	Schools	58



Assessment: Resilience

- Calculation of % route exposure to:
 - Earthquake liquefaction (very high, high, and moderate hazard)
 - Landslide susceptibility (very high, high, and moderate hazard)
 - Flood hazard (100-year, 500-year)
- Count of bridges per route determined by ODOT to be not vulnerable, potentially vulnerable, or vulnerable to seismic damage



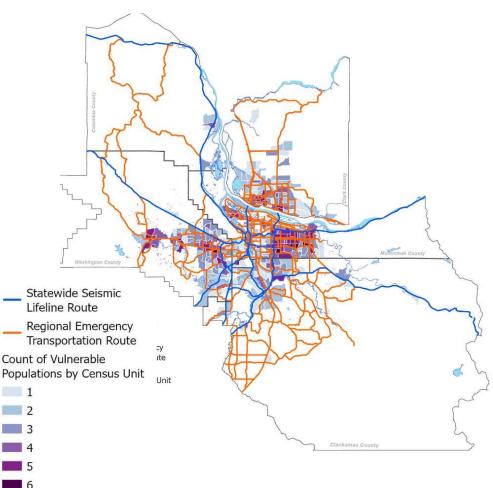


Assessment: Community & Equity

Tested for connectivity to Census tracts that exceed the five-county regional average for:

- Number of people of color
- Number of people under the age of 18
- Number of people over the age of 65
- Number of people with limited English proficiency
- Number of people with income equal to or less than the 200% of the Federal Poverty Level (2016)
- Number of households with no vehicle





Gaps and Limitations: Unavailable Data

- Landslide susceptibility for Clark County (only a small portion of the county is covered by 2018 mapping)
- Road characteristics (e.g., number of lanes, access management, pavement width, signaled intersections)
- Seismic vulnerability provided by ODOT, not available for some local Oregon bridges, all Clark County bridges, and all on/off ramps
- Equivalent of designated Statewide Seismic Lifeline Routes in Clark County
- Churches in Multnomah, Clackamas, and Washington counties
- Sandpiles outside of Portland



Gaps and Limitations: Attributes and Analysis

- Resilience analysis is based on simple exposure (i.e., intersection) with hazards and does not account for proximate hazards (e.g., downslope of landslide deposits).
- Route ownership and road characteristics were not available consistently throughout the study area. Additional coordination with transportation agencies in future phases of work is needed to provide or confirm these aspects of the Regional ETRs.
- Community and equity analyses relies on U.S. Census American Community Survey estimates, known to have large margins of error in rural Census tracts.
- Public works facilities were not defined consistently through the study area.
 Additional review and refinement of this dataset is needed during future phases of work to ensure consistency and completeness.
- Regional ETRs and SSLRs are not routed for GIS network analysis.



Large Format Maps

PDFs available for download from the RDPO project webpage:

https://rdpo.net/emergency-transportation-routes





Tabular Products

- Summary Tables of GIS data in Excel Format with Evaluation of Risk
- Includes only Routes with Hazard for each Category
- GIS results summarized per route

Table 6.1 - ETR IDs for RETRS and SSLRs

				Tier	Version	route	Route Length	County	Owner
BJECTID	ETR_ID_2020	From	То	Ther	Yelalon	Touto	(miles)	obuilty	OWNER
1	R-X-100-00-MonteCristo	HWY 213	Meridian Rd		2005	Primary	4.7	Clackamas	Clackamas County
2	R-X-101-01-Timber_GalesCreek	HWY 26	HWY 47		2005	Primary	10.2	Washington	ODOT
2	R-X-101-01-Timber_GalesCreek	HWY 26	HWY 47		2005	Primary	10.2	Columbia	ODOT
3	R-X-101-02-Timber_GalesCreek	HWY 26 (Sunset HWY)	HWY 8 (Tualatin Valley HWY)		2020	Alternate	22.5	Washington	Unknown
4	R-X-102-00-Highway211	Marion Co Line	HWY 26		2005	Primary	42.3	Clackamas	ODOT
5	R-X-103-00-Greenville_KansasCity_Kemper	HWY 47	HWY 47		2020	Alternate	6.0	Washington	Unknown
6	R-X-104-00-Barnards	HWY 213	Marion Co Line		2020	Primary	7.9	Clackamas	Unknown
7	R-X-105-00-Highway47	Yamhill Co Line	HWY 30		2005	Primary	60.1	Washington	ODOT
7	R-X-105-00-I lighway47	Yamhill Co Line	LIWY 30		2005	Primary	60.1	Columbia	ODOT
8	R-X-106-00-Macksburg	HWY 211	HWY 170 (Marquam Canby HWY)		2005	Primary	8.6	Clackamas	Clackamas County
9	R-X-107-00-FernHill_SpringHill_Gaston	HWY 47	HWY 47		2020	Alternate	7.4	Washington	Unknown
10	R-X-108-00-LoneElder	S Meridian Rd	HWY 170		2020	Primary	2.9	Clackamas	Unknown
11	R-X-109-00-Apirary	HWY 30	HWY 47	1	2005	Primary	20.7	Columbia	Columbia County
12	R-X-110-00-Carus_Mulino	HWY 99E	Beavercreek Rd		2020	Alternate	11.9	Clackamas	Unknown
13	R-X-111-00-Highway219	HWY 8	HWY 210		2005	Primary	10.1	Washington	ODOT
14	R-X-112-00-Wilsonville	1-5	Clackamas Co Line		2020	Primary	5.9	Clackamas	Unknown
15	R-X-113-00-River	Scholls Ferry Rd	HWY 8 (Tualatin Valley HWY)		2005	Primary	8.2	Washington	Washington County
16	R-X-114-00-Unger	Beavercreek Rd	HWY 211		2020	Alternate	5.2	Clackamas	Unknown
17	R-X-115-01-Brookwood	HWY 26	Shute Rd		2005	Primary	2.2	Washington	Washington County
	R-X-115-02-Brookwood	Cornell Rd	Shute Rd		2005	Primary	2.9	Washington	Washington County
19	R-X-116-00-UpperHighland	HWY 211	Beavercreek Rd		2005	Primary	8.2	Clackamas	Clackamas County
	R-X-117-01-CorneliusPass	HWY 8	Multnomah Co Line		2005	Primary	7.1	Washington	Washington County
20	R-X-117-01-CorneliusPass	HWY 8	Multnomah Co Line		2005	Primary	7.1	Multnomah	Multnomah County



Tabular Products

Table 6.4 Bridge Vulnerabilities on RETRs and SSLRs

ETR_ID_2020	ROUTENAME	Not Evaluated	Not Vulnerable	Potentially Vulnerable	Vulnerable
R-X-100-00-MonteCristo	S Monte Cristo Rd	1	0	2	0
R-X-101-01-Timber_GalesCreek	Timber / Vernonia Rd	1	1	0	4
R-X-101-02-Timber_GalesCreek	Timber / Gales Creek Rd	6	1	0	1
R-X-102-00-Highway211	HWY 211	14	2	1	4
R-X-103-00-Greenville_KansasCity_Kemper	Greenville / Kansas City / Kemper Rd	1	0	1	0
R-X-104-00-Barnards	S Barnards Rd	1	0	0	3
R-X-105-00-Highway47	HWY 47	18	8	9	17
R-X-107-00-FernHill_SpringHill_Gaston	Fern Hill / Spring Hill Rd / Gaston Rd	1	1	1	1
R-X-108-00-LoneElder	S Lone Elder Rd	1	0	0	0
R-X-109-00-Apirary	Apiary Rd	2	1	0	0
R-X-110-00-Carus_Mulino	S Carus Rd / Mulino Rd	2	0	0	0
R-X-111-00-Highway219	HWY 219 (Hillsboro HWY)	1	1	3	1
R-X-113-00-River	River Rd	1	1	0	0
R-X-117-01-CorneliusPass	Cornelius Pass Rd	5	1	0	0
R-X-118-00-NewEra_Penman	S New Era Rd / Penman Rd	3	0	0	0
R-X-119-00-185th	NW 185th Ave	2	0	0	0
R-X-120-02-SchollsFerry	Scholls Ferry Rd	5	1	2	0
R-X-121-00-RoyRogers_TualatinSherwood	SW Roy Rogers / Tualatin Sherwood Rd	4	0	1	0
R-X-122-00-Redland	Redland Rd	0	2	0	3
DV (OD OD)					-



Tabular Products

Table 6.5 RETRs with Significant Landslide Risk

ETR_ID_2020	Route From	Route To	Mapped La	ndslide Hazard S	Risk	Percent Hazard Above	
EIR_ID_2020	Route From	Roue 18	Very High	High	Moderate	RISK	Moderate
R-X-100-00-MonteCristo	HWY 213	Meridian Rd			43	Moderate	43
R-X-101-01-Timber_GalesCreek	HWY 26	HWY 47		53	23	High	76
R-X-101-02-Timber_GalesCreek	HWY 26 (Sunset HWY)	HWY 8 (Tualatin Valley HWY)		46	24	High	70
R-X-102-00-Highway211	Marion Co Line	HWY 26		11	27	Moderate	38
R-X-103-00-Greenville_KansasCity_Kemper	HWY 47	HWY 47			10		10
R-X-104-00-Barnards	HWY 213	Marion Co Line			12		12
R-X-105-00-Highway47	Yamhill Co Line	HWY 30	5	64	12	High	81
R-X-106-00-Macksburg	HWY 211	HWY 170 (Marquam Canby HWY)			15		15
R-X-107-00-FernHill_SpringHill_Gaston	HWY 47	HWY 47		16	35	Moderate	51
R-X-108-00-LoneElder	S Meridian Rd	HWY 170			11		11
R-X-109-00-Apirary	HWY 30	HWY 47		36	36	High	72
R-X-110-00-Carus_Mulino	HWY 99E	Beavercreek Rd			25		25
R-X-111-00-Highway219	HWY 8	HWY 210		5	22		27
R-X-112-00-Wilsonville	I-5	Clackamas Co Line		19	26	Moderate	45
R-X-113-00-River	Scholls Ferry Rd	HWY 8 (Tualatin Valley HWY)			27	Moderate	27
R-X-114-00-Unger	Beavercreek Rd	HWY 211			30	Moderate	30
R-X-115-01-Brookwood	HWY 26	Shute Rd			20		20
R-X-115-02-Brookwood	Cornell Rd	Shute Rd			24		24
R-X-116-00-UpperHighland	HWY 211	Beavercreek Rd			32	Moderate	32
R-X-117-01-CorneliusPass	HWY 8	Multnomah Co Line			31	Moderate	31



How to Access All Project Files

See the project web page: https://rdpo.net/emergency-transportation-routes

Email project managers: Laura Hanson, RDPO laura.hanson@portlandoregon.gov

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Wrap Up & Next Steps

June 2, 2021



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RETR Update Phase 2 – Tiering and Operationalization of Routes

- Tiering Methodology and Prioritization Framework
 - Develop and apply a GIS-based tiering methodology for comparing the different RETR segments
 - Designate which routes should be evaluated, cleared and opened first, next and last, in a catastrophic scenario

Operationalization Guidelines and Agreement(s)

 Establish facility owner and operator roles and responsibilities and related coordination activities



Next Steps

- Phase 1 Close-Out TODAY
- Summer–Fall 2021 Enhance facilities data + SVT project
 - TREC workshops on
 - Transportation Resilience and Recovery
 - Phase 2 of the RETR Update project



Fall 2021

2022-2023

THANK YOU!

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