



Research Stage 1 Problem Statement

Number 26-43 – “Expanding the Analytic Capability of the SEI Tool to Better Account for Distribution of Effects of Transportation Projects and Users Affected”

1. Concisely describe the **transportation issue** (including problems, improvements, or untested solutions) that Oregon needs to research.

One of ODOT’s 2024-2028 Strategic Action Plan priorities is to improve equitable outcomes. This includes ensuring that ODOT’s employees are “equipped with tools and processes that ensure decisions lead to more equitable outcomes” (SAP 14). Having access to data on communities within Oregon can help the agency identify how our projects impact the people of Oregon, and can help us define outcomes to work toward. How can we better incorporate data on community needs and impacts into ODOT’s decision-making, to ensure our agency meets the transportation needs of all Oregonians?

One way ODOT works to include social equity in its decision making process for transportation projects is through the use of the Social Equity Index (SEI) mapping tool. The SEI uses Census information at the block group level to indicate where concentrations of people who have been historically/currently underserved by Oregon’s transportation system reside. The tool has been used by different ODOT units and local agencies in various ways in an effort to include social equity in decision making.

However, two primary problems with the SEI mapping tool persist:

1. An inability of the tool to determine the diffusion of effects.
2. An inability of the tool to shed light on whether projects benefit or burden underserved communities.

More on each of these problems is described below. First, given that the tool maps demographic information, it can give decision makers some information about who lives in the vicinity of a project and who might be impacted by it. However, the tool is limited because it only tells users who lives in the area, but not who uses the roadway. For projects such as those that improve pedestrian safety, use of the current SEI map tool may be more sensible, since most pedestrian crash victims are injured relatively close--within 1.1 miles--of their home (McNeil and Roll 2021). However, for many types of projects that ODOT develops and builds, including rural highways and interstates that will impact travelers from many miles away, the use of the current tool is less sensible. This is because many projects, such as highway or major arterial road projects, affect more than just the residents nearby and can change access, mobility, safety and air quality conditions not only for people using that road but also for those living many miles away.

Another limitation of the current SEI tool is that most current uses of the tool simply determine if a project is within a block group that is historically and/or currently underserved, which doesn’t help practitioners answer the question about whether the project benefits or burdens underserved populations. For instance, a new set of ADA ramps, sidewalk infill, and high visibility mid-block rapid flashing beacons would be a clear safety and accessibility benefit to local residents. Conversely, a project that expands a roadway in an underserved neighborhood has the potential to increase traffic safety risk, emissions, and noise which would be a further burden to the community. The increased traffic flow may be a benefit for some individuals—those with access to cars, who are typically wealthier--who are now able to travel more quickly, but that increased accessibility benefit comes at the burden of the local population. Currently the tool and the way it is being applied cannot account for the difference between these benefits and burdens.

These two problem areas require further tool development so that the agency can access more accurate information to optimize transportation project decision-making.

2. What final product or information needs to be produced to enable this research to be implemented?

We propose to improve ODOT’s ability to include social equity in project decision making by expanding the analytic capability of the SEI tool to better account for distribution of effects of transportation projects and users affected. Building on the Transportation Equity Scorecard developed by the Center for Urban Transportation Research (Williams et al. 2021), this research would develop additional functionality for the SEI map that would help ODOT staff understand how a project affects communities in terms of ensuring fair access to essential services. This functionality is intended to be employed in addition to conducting community engagement (to inform community engagement or provide additional context), not in place of it. Using geospatial data and network routing algorithms, the tool would specifically help answer the questions featured in the Scorecard, presented in Table 1 below.

Directions : Select " No, Yes, or Yes, high impact". See user guide for details.		
Project ID		
	Criteria	Response
COCs	What is the concentration of COCs within a 1/4 mile of the project?	
Access to Opportunity	Does the project improve access to jobs?	
	Does the project improve access to educational facilities?	
	Does the project improve access to community services?	
Health and Environment	Does the project improve access to health care?	
	Does the project improve access to grocery stores or markets with healthy and fresh affordable food?	
	Does the project increase livability through design and/or mitigation measures?	
Safety and Emergency Evacuation	Does the project implement appropriate safety countermeasures for pedestrians and bicyclists at high-crash locations?	
	Does the project implement appropriate safety countermeasures at other (non-high crash) locations?	
	Does the project improve emergency evacuation?	
Affordability	Does the project decrease the share of household income consumed by transportation and housing?	
	Does the project reduce travel time or eliminate a barrier to/from affordable housing?	
	Does the project provide affordable transportation choices, especially in areas with a high transportation cost?	
Mobility	Does the project improve or expand bicycle or pedestrian facilities?	
	Does the project improve transit service or access, including first mile/last-mile access?	
	Does the project include special measures to improve accessibility for persons with disabilities?	
Burdens	Does the project cause cumulative, disproportionate, or other major adverse impacts?	

Table 1: the Transportation Equity Scorecard Tool developed by the Center for Urban Transportation Research (Williams et al. 2021).

Using the latest Census and Longitudinal Employment and Household Dynamics (LEHD) data and a routable network with basic impedance functions, the additional functionality would make answering the above questions easy through the use of a web-based application that pulls the necessary population and network data together. In addition to making answering the above questions easy, this tool would ensure that these questions are being answered using consistent methods and data.

Currently the typical process used by ODOT staff to include social equity involves answering the first question in Table 1. Improving our analytic capability to answer the remaining questions with ease and consistency will advance ODOT’s mission of reducing burdens to populations that are underserved by the existing transportation system.

3. (Optional) Are there any individuals in Oregon who will be instrumental to the success of implementing any solution that is identified by this research? If so, please list them below.

Name	Title	Email	Phone
Josh Roll	Research Coordinator	Josh.F.ROLL@odot.oregon.gov	(971) 701-0271
Anisha Datta	Equity Data Manager	Anisha.DATTA@odot.oregon.gov	(971) 453-2624
Matt Bagwell	Research Coordinator	Matt.T.BAGWELL@odot.oregon.gov	503.983.1062

4. Decision making lenses

Please complete the following three sections. Your answers to these questions will be applied on a programmatic basis to support agency decisions. Answering yes to the questions below is not required. Resolving a narrowly focused technical research problem may meet agency needs without answering yes to any of the following questions. The ODOT Research Section will seek a balanced portfolio some projects will answer yes to one of the three categories below (e.g. climate, equity, and/ or safety) and other projects in a different category.

We are looking for an overall program balance and no one project is expected to balance all categories. Generally, a research problem statement is expected to be able to answer yes with clear and verifiable information in only one of the three categories below, some projects may be able to answer yes in two or even three categories. Some projects (i.e. needs focused on specific elements of infrastructure design), may have no yes answers but may still be high value research need.

Climate

Oregon recognizes the climate crisis and makes systemic changes to reduce emissions caused by travel. Every mile driven in Oregon is powered by a clean source of fuel. We seek research that supports construction and maintenance operations are carbon neutral and investments in mobility that support travel by low and no emission modes. While every research project may not result in a reduction in emissions, transportation investments overall support emission reductions to achieve state goals. Oregon envisions a transportation system that is resilient in the face of seismic and climate events and impacts to the degradation of the natural environment are reduced. Our vision includes a transportation infrastructure is built in a way that avoids impacts on key habitat and results in better environmental conditions for wildlife and native vegetation. For definitions and details please review the equity vision, goals, and objectives of the [ODOT Strategic Action Plan](#) and [Oregon Transportation Plan](#).

4f. Will addressing the **transportation issue** identified as a need in Question 1 develop, or validate methods for the estimation, measurement, or monitoring of transportation generated greenhouse gasses (GHG)?

Yes

No

Unsure

4g. If climate or GHG is not the focus of this **transportation issue** identified in this problem statement, will the research apply a GHG analysis to transportation infrastructure, planning, operations, maintenance, or materials?

Yes

No

Unsure

4h. Will the addressing the **transportation issue** include development or testing of construction practices, methods, or materials to establish potential reductions in greenhouse gas emissions?

Yes

No

Unsure

4i. Will the solving the **transportation issue** in question 1 study or support the reduction of vehicle miles traveled and single occupancy vehicle travel or support transition to electric vehicles (or other types of zero emission vehicles) or low-carbon alternative fuels?

Yes

No

Unsure

4j. Will the solving the **transportation issue** in question 1 lead to work that will support, measure, monitor, transportation system resilience in response to expected climate events, effects, or natural disasters in general?

Yes

No

Unsure

4k. Will the solving the **transportation issue** in question 1 lead to work that may result in better environmental conditions for wildlife and native vegetation ?

Yes

No

Unsure

4l. If you answered yes to any of the climate questions above or can provide alternative details related to climate, please provide additional information:

Climate will not be the focus of this research. However, identifying equitable outcomes includes considering how climate-related issues--greenhouse gas emissions, temperature increases, etc.--may disproportionately impact Oregonians who are historically/currently underserved by our transportation system. By incorporating demographic information from ACS data, the updated tool can help to identify communities or areas that may be disproportionately affected by, or more vulnerable to, climate events, effects, and natural disasters.

Equity

Equity can have many dimensions and impacts relating to communities, and transportation. It is important that problem statement proposals clearly explain in what capacities are equity dimensions or impacts being examined within problem statements. It is a goal of the OTP to “Improve access to safe and affordable transportation for all, recognizing the unmet mobility needs of people who have been systemically excluded and underserved. Create an equitable and transparent engagement and communications decision-making structure that builds public trust”. Proposed research may have the intent of studying elements of this goal or apply analysis to specific transportation topics to ensure the resulting research recommendations is consistent with our equity goals. For definitions and details please review the equity vision, goals, and objectives of the [ODOT Strategic Action Plan](#) and [Oregon Transportation Plan](#).

4a Is the **transportation issue** identified as a need in Question 1 specifically focused on transportation equity?

Yes

No

Unsure

4b If the **transportation issue** is not focused on transportation equity, will the primary topic be assessed for equity benefits or impacts within the research project?

Yes

No

Unsure

4c Is the implementation of potential findings from this research likely to directly involve participation from an identified group that would benefit from an equitable process or outcome?

Yes

No

Unsure

4d Is the intended final product or information expected to support ODOT's equity efforts (Including but not limited to supporting one of the equity related objectives of the [ODOT's Strategic Action Plan](#) or [Oregon Transportation Plan](#)) ?

Yes

No

Unsure

4e If you answered yes to any of the equity questions above or can provide alternative details related to equity, please provide additional information:

The SEI map tool's primary focus is on equity. This research will enable ODOT staff to better identify community needs and gaps in service. This aligns with our agency's Strategic Action Plan goal of advancing equitable outcomes. Moreover, assessing these equity metric areas will robustly evaluate a greater dimension of considerations related to project planning, policy, and decision making that impact historically and currently underserved transportation user groups.

Safety

Research outcomes may include interventions and countermeasures to prevent or reduce the frequency of crashes or other causes of transportation-related injury or death; or may include measures to reduce severity of injury (including prevention of death) after a crash or other injurious event. For definitions and details please review the equity vision, goals, and objectives of the [ODOT Strategic Action Plan](#), [Oregon Transportation Safety Action Plan](#) and [Oregon Transportation Plan](#).

4m. Will solving the **transportation issue** in question 1 support improving **safety culture** for either transportation workers or the traveling public?

Yes

No

Unsure

4n. Will the solving the **transportation issue** support improving safety through **healthy and livable communities**?

Yes

No

Unsure

4o. Will solving the **transportation issue** support improving safety through using **best available technologies**?

Yes

No

Unsure

4p. Will solving the **transportation issue** support improving safety through **communication and collaboration**?

Yes

No

Unsure

4q. Will the solving the **transportation issue** support improving safety through **investing strategically**?

Yes

No

Unsure

4r. If you answered yes to any of the safety questions above or can provide alternative details related to safety, please provide additional information:

This project will help improve the safety culture of the traveling public by identifying areas and communities historically and currently underserved by transportation planning efforts, which can help ODOT invest strategically in improvements that will positively impact these communities. Furthermore, this project will help support more healthy and livable communities by providing users with initial information on the benefits and burdens of transportation projects to the communities they are located in, which enables ODOT staff to consider these when moving forward with community engagement and project plans.

5. Other comments:

Works Cited

Roll, J., & McNeil, N. (2021). *Understanding Pedestrian Injuries and Social Equity* (Report No. FHWA-OR-RD-22-05). Oregon Department of Transportation, Research Section. Prepared for the Oregon Department of Transportation and Federal Highway Administration.

Williams, K. M., Boyd, T., Keita, Y., & Kramer, J. (2021). *Transportation Equity Toolkit: Transportation Equity Needs Assessment & Project Prioritization* (Final Report No. CUTR-2021-04; Project No. CTEDD No. 72016-00). USF Center for Urban Transportation Research. Prepared for the Center for Transportation, Equity, Decisions, and Dollars (CTEDD).

6. Corresponding Submitter's Contact Information:

Name:	Anisha Datta
Title:	Equity Data Manager
Affiliation:	ODOT Office of Equity and Civil Rights (OECR)
Telephone:	(971) 453-2624
Email:	Anisha.datta@odot.oregon.gov

This form is not a grant application or contract document.