**Developing Livability-Based Transit Performance Measures**

Marc Schlossberg, PhD *(Corresponding Investigator)*

Nico Larco

University of Oregon

Jennifer Dill, PhD

Portland State University

This project is developing GIS-based transit and livability performance metrics focusing on the integration of transit system performance, urban form surrounding each transit stop, and transit stop-based ridership data.

The following figure delineates several transit ridership factors into seven different elements, each of which plays some part in effecting existing or potential ridership. The three primary areas of focus for this study are to incorporate the three “green” or livability-based measures into an overall system/ of ridership analysis: urban form at the regional level, neighborhood level, and around each transit stop. This type of analysis gets transit agencies to look beyond how well busses or trains perform themselves, but also integrates how well transit integrates into the local urban form.

The research will examine two spatial scales (regional and neighborhood, including stop-level) with two frameworks for evaluation (coverage and accessibility). At a regional scale, performance metrics will focus on the needs of people getting to destinations (particularly jobs and commercial centers) in addition to the geographic coverage of transit. At the neighborhood level (the area surrounding each transit stop) the urban form will be investigated to determine if it supports or hinders access to and use of the transit facility. The indicators will be validated using transit use/performance data (e.g. ridership) and regression analysis. The following are some of the proposed indicators to be included in this model.

| Model | Category | Variables | Stop Level | Neighbor-hood Level | Regional level |
| --- | --- | --- | --- | --- | --- |
| Dependent Variable | Transit Ridership | Total boarding and alightings | X |  |  |
| Independent Variables | Urban Form | Stop physical quality (e.g. benches, shelter) | X |  |  |
| Parking availability | X |  |  |
| sidewalks | X | X |  |
| Bike lanes, paths |  | X |  |
| Land use mix |  | X |  |
| Population/Residential Density |  | X |  |
| Employment Density |  | X |  |
| Jobs-housing balance |  |  | X |
| Street connectivity |  | X |  |
| Distance to major destinations (e.g. downtown) |  |  | X |
| Topography |  | X | X |
| Transfer design |  |  |  |
| Demography | Age |  | X |  |
| Income |  | X |  |
| Race |  | X |  |
| Gender |  | X |  |
| Children in households |  | X |  |
| Vehicle ownership |  | X |  |
| Transit Service | Frequency (headways) | x |  |  |
| Transit type (e.g. bus, rail, streetcar) | x |  |  |
| Safety | x |  |  |
| Hours of operation | x |  |  |
| Transit travel times | x |  |  |
| Transit Cost | Fare |  |  |  |
| Other external factors | Gas price |  |  |  |
| Parking Costs |  |  |  |
| Weather |  |  |  |