# Model Application: Benefits of Closing Regional Trail Gaps

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Joe Broach, Oregon Metro







## Background

Metro/PSU Bike GPS Study (~2010s)

Added route quality sensitivity to regional model

Active Transportation Return on Investment Study [ATROI] (2022)

Developed retrospective benefit estimates for selection of Metro-Funded bike projects

NCHRP 08-149 Guidebook (in press) Developed range of benefit estimation techniques for bike and walk gap closures

High Priority Trail Gap Benefits Estimation (2024)

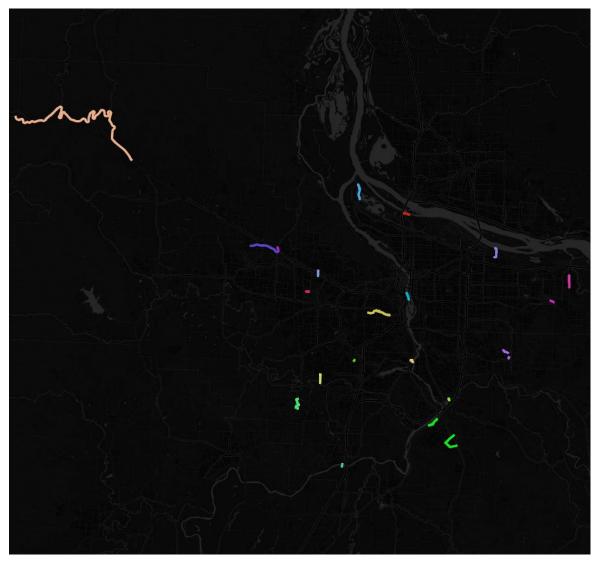
Local partners identified 20 high-priority "shovel-ready" gap filling projects in need of funding.

Wanted to equip them with sound benefit estimates for grant applications.



## Trail Gap Projects

20 high priority system gap closures nominated by local agencies

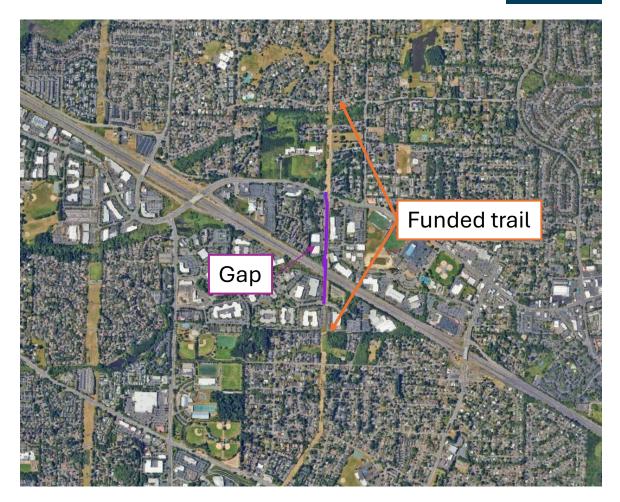


Basemap: CartoDB



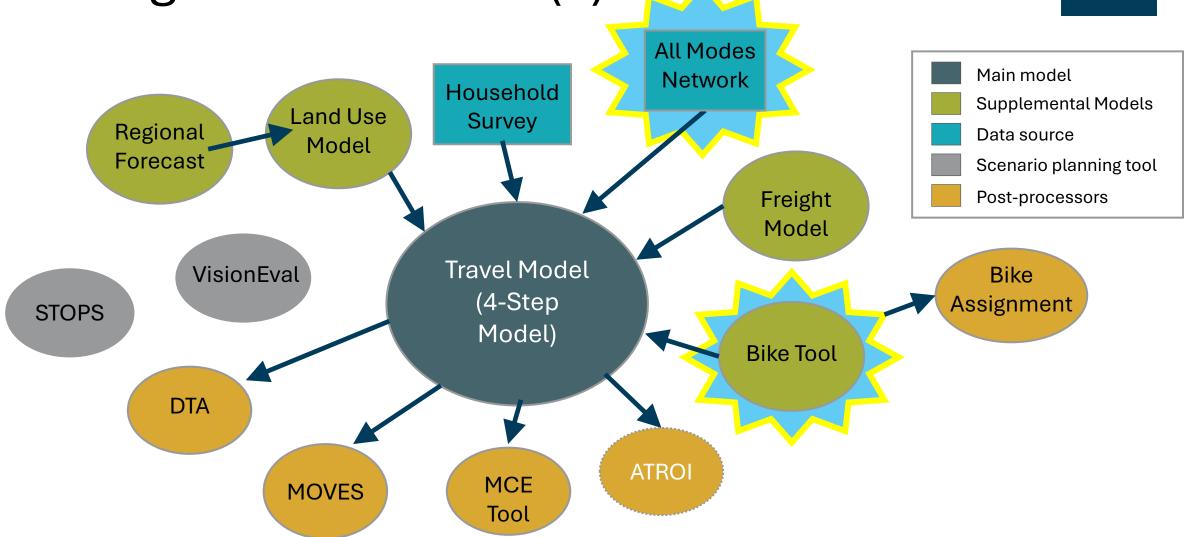
### Example Trail Gap

Westside Trail Bike/Ped Bridge would connect two in-progress trail segments near Beaverton on either side of Hwy 26.



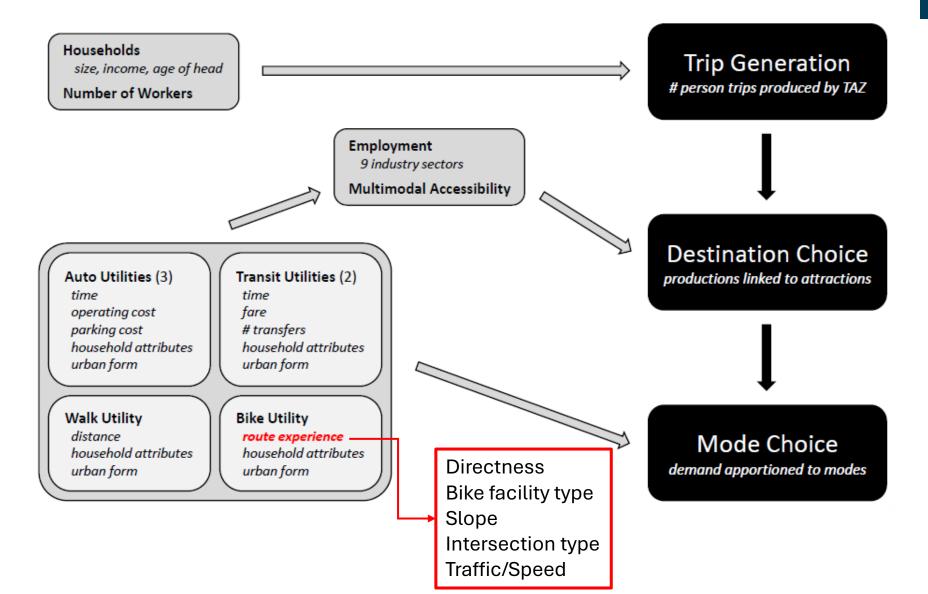


Oregon Metro Model(s) & Tools



## Current Bike Model Integration

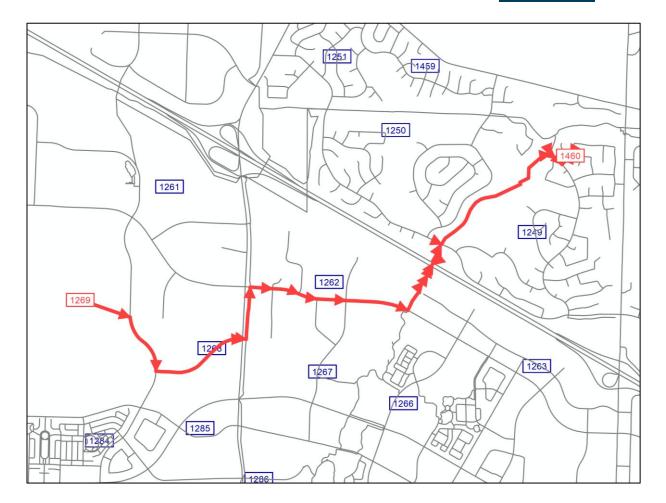




## Bike Utility Calculation



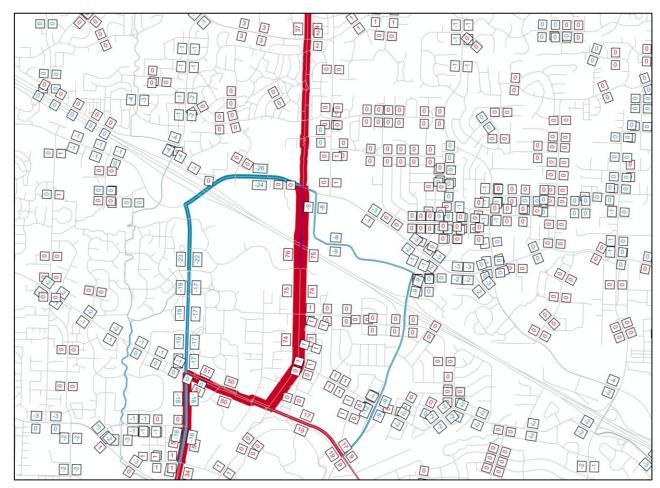
- Visum + Python Scripts
- Approximate single "best," least-cost bike route approximated between zone pairs (2000+ TAZs)
  - Simplified Cost = f(distance, bike facility type, traffic, turns)
- Calculate full utilities along approximate best routes
  - Separate commute and non-commute utilities
  - Full utility adds: slope, intersections, and bridge-specific bike facilities





## Bike Model representation

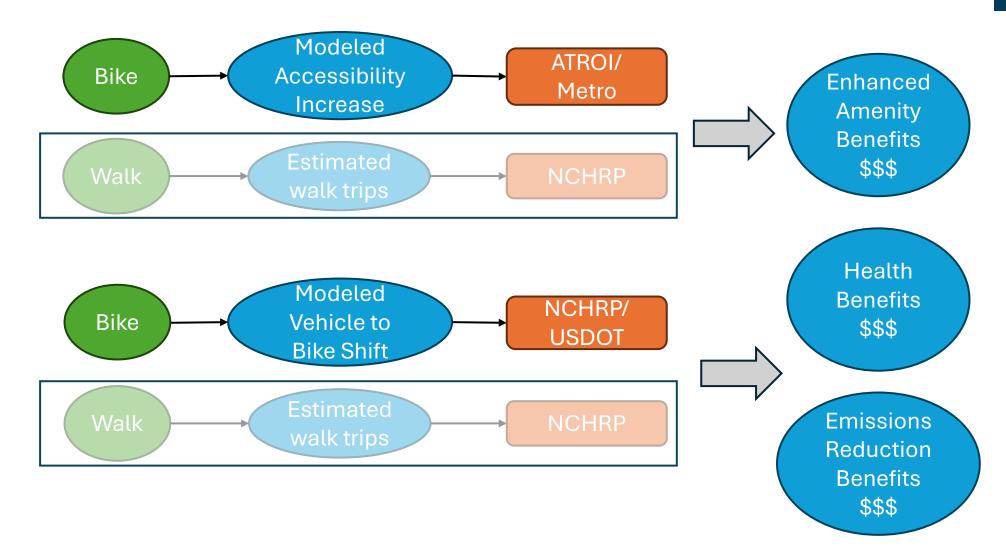
- Generate new "best" bike routes with trail gaps filled.
- Routes shift when gap closure creates a better route.
- New routes (and their calculated utilities) feed into updated Destination and Mode Choice.
- In other words, trips may shift destination and/or mode based on more attractive available routes.



Numbers indicate increase (red) or decrease (blue) in thousands of zone pairs connected by each link



### Benefit estimation





- Outcomes and monetized benefits estimated for 20 trail gap projects.
- Results will help local agencies compete for grant funding to complete high priority projects.
- Under consideration for MTIP CMAQ reporting needs to replace outdated method.



Metro

the Bonneville Power Administration and Portland General Electric, as well as the Oregon Dept. of Transportation (ODOT) and Washington County, Other permits and coordination will be required from Oregon Dept. of Environmental Quality, Oregon Dept. of State Lands, and the U.S. Army Corps of Engineers.

#### Estimated Annual Project Outcomes and Impact When Project is Complete

- Trail users: 399,000
- · Tons of greenhouse gases reduced: 40
- VMT<sup>2</sup> reduction: 175,000
- Enhanced amenities benefits<sup>3</sup>: \$299,000
- Emission benefits: \$11,000
- Health benefits: \$294,000
- Total emissions, amenities, and health benefits: \$604,000

#### Major Opportunities & Constraints

The project will serve areas of higher concentrations of people of color and lower average household incomes that the region overall. It will provide low- and no-cost transportation options within an ODOT-identified transportation-disadvantaged

area, in addition to providing a safe, offstreet, dedicated pedestrian and bicycle alternative to existing nearby U.S. 26

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Planning & Development Manager g.keck@thprd.org

September 202



calculated using output from the Metro trave

from the forthcomin NCHRP 08-149 Repor

Values are in 2022 dollars

2 - Vehicle Miles Traveler

benefits include reductions in travel costs and quality

3 - Enhanced amenit





#### Advantages (vs. standalone tool)

- Network effects
- Competing modes
- Complementary and competing projects already coded
- Direct VMT reduction & user benefit estimation

#### Limitations

- ➤ Not currently practical to run for all 20 projects individually
  - Benefits apportioned where projects overlapped
- > Size of zones can hide local effects
- Recreational biking not captured
  - > Also missing: induced travel
- ➤ Updated travel survey and AcitivitySim development should improve bike model
  - Newer facility types captured
  - Bicyclist user typology will help us add meaningful distribution of benefits

