Model Application: Benefits of Closing Regional Trail Gaps

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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

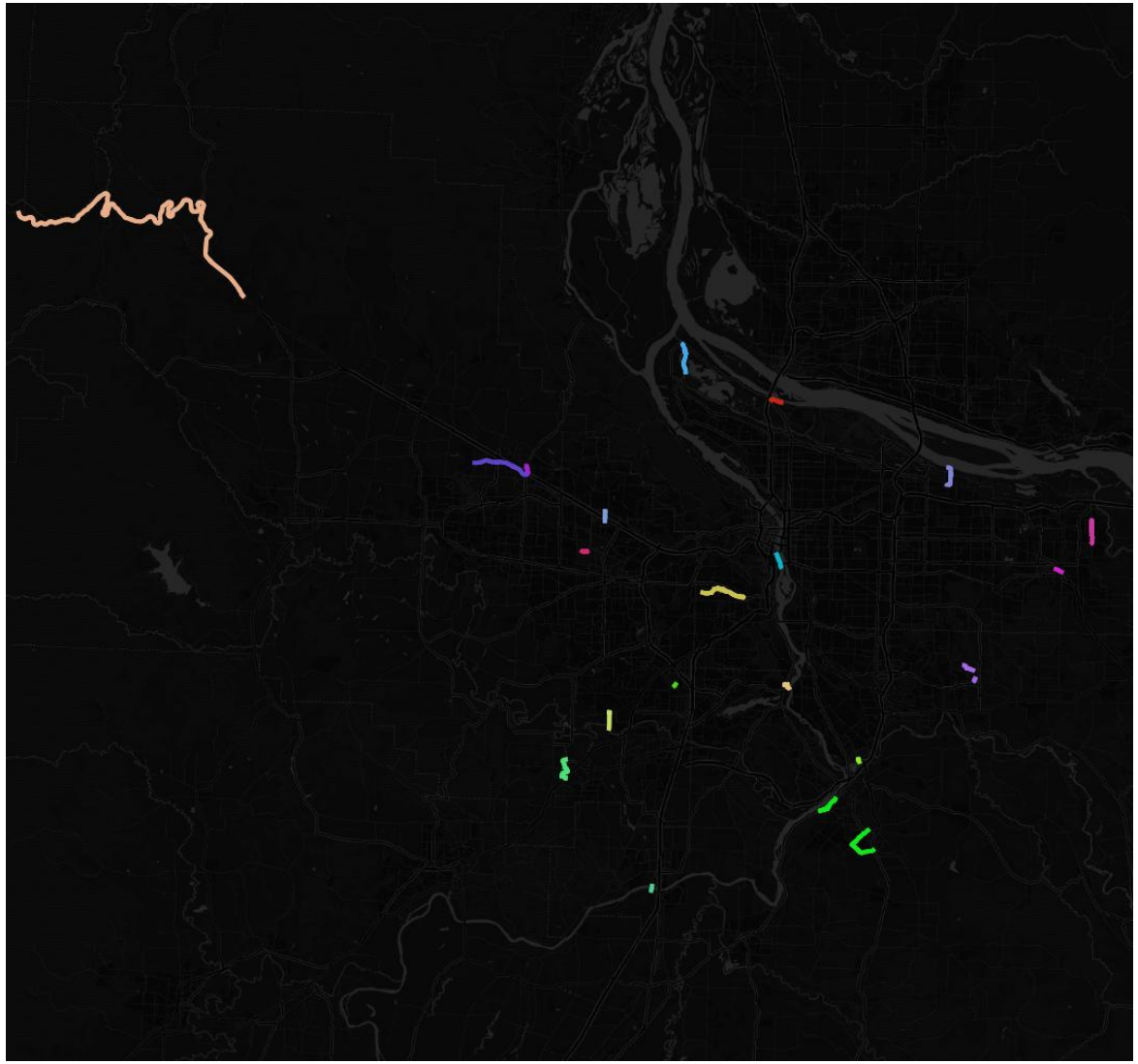
High Priority Trail Gap Benefits Estimation (2024)

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

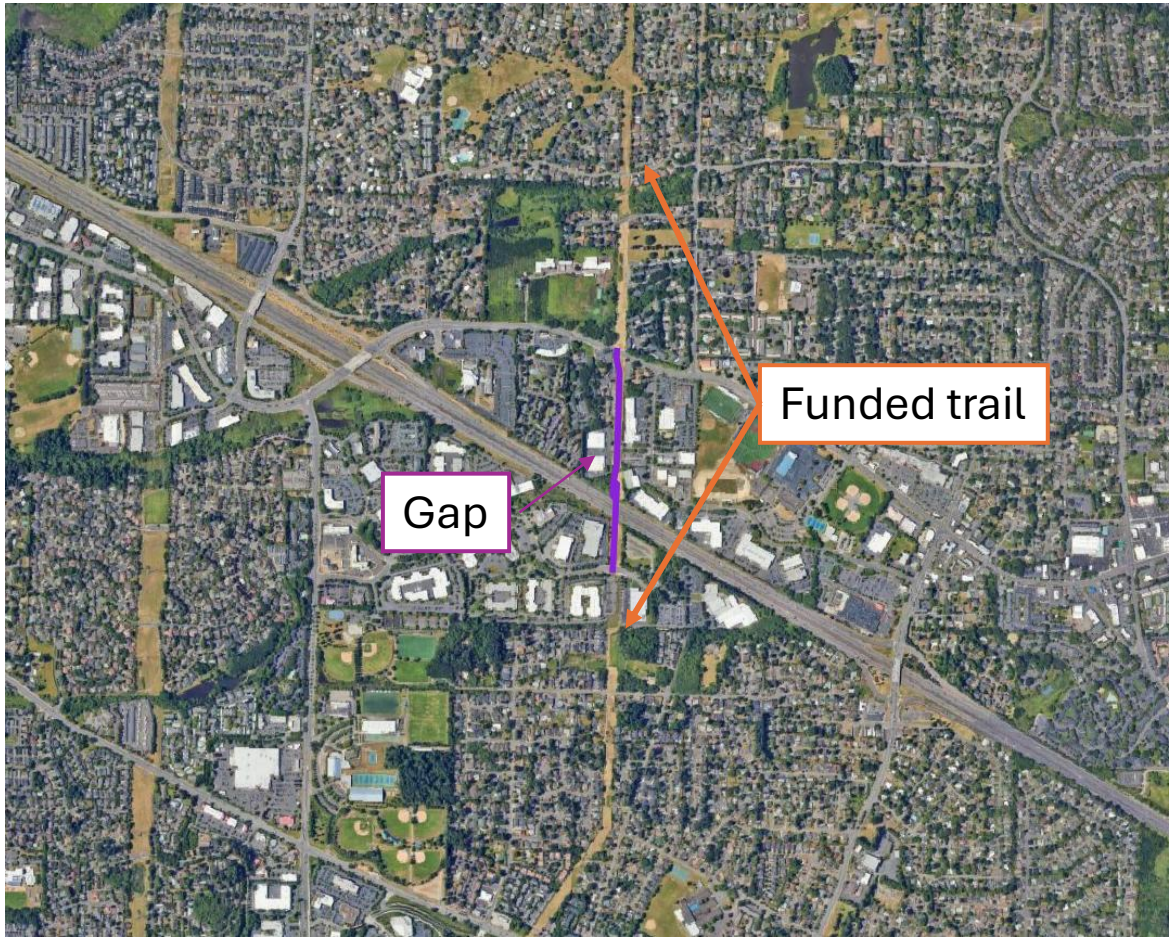
20 high priority system gap closures nominated by local agencies



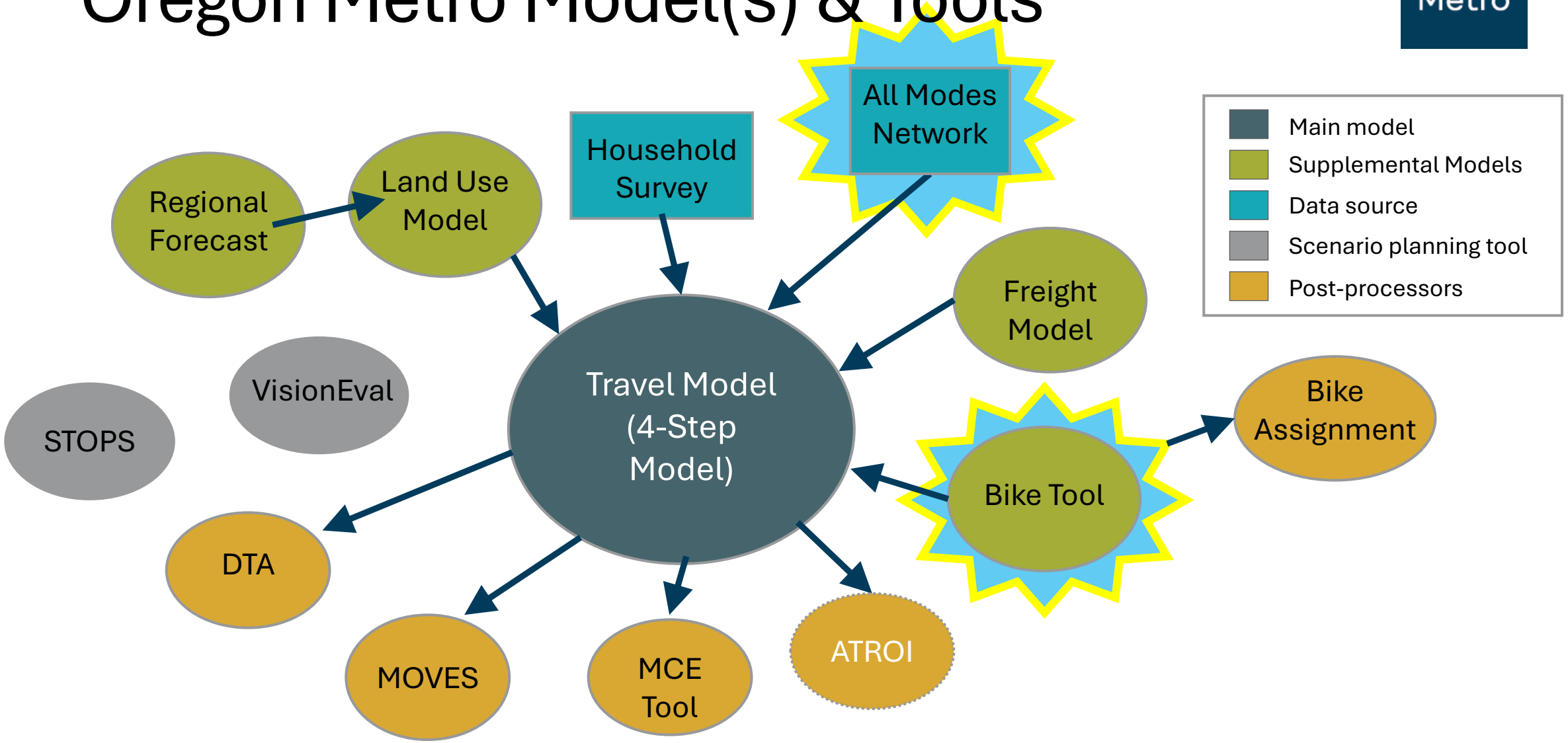
Basemap: CartoDB

Example Trail Gap

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

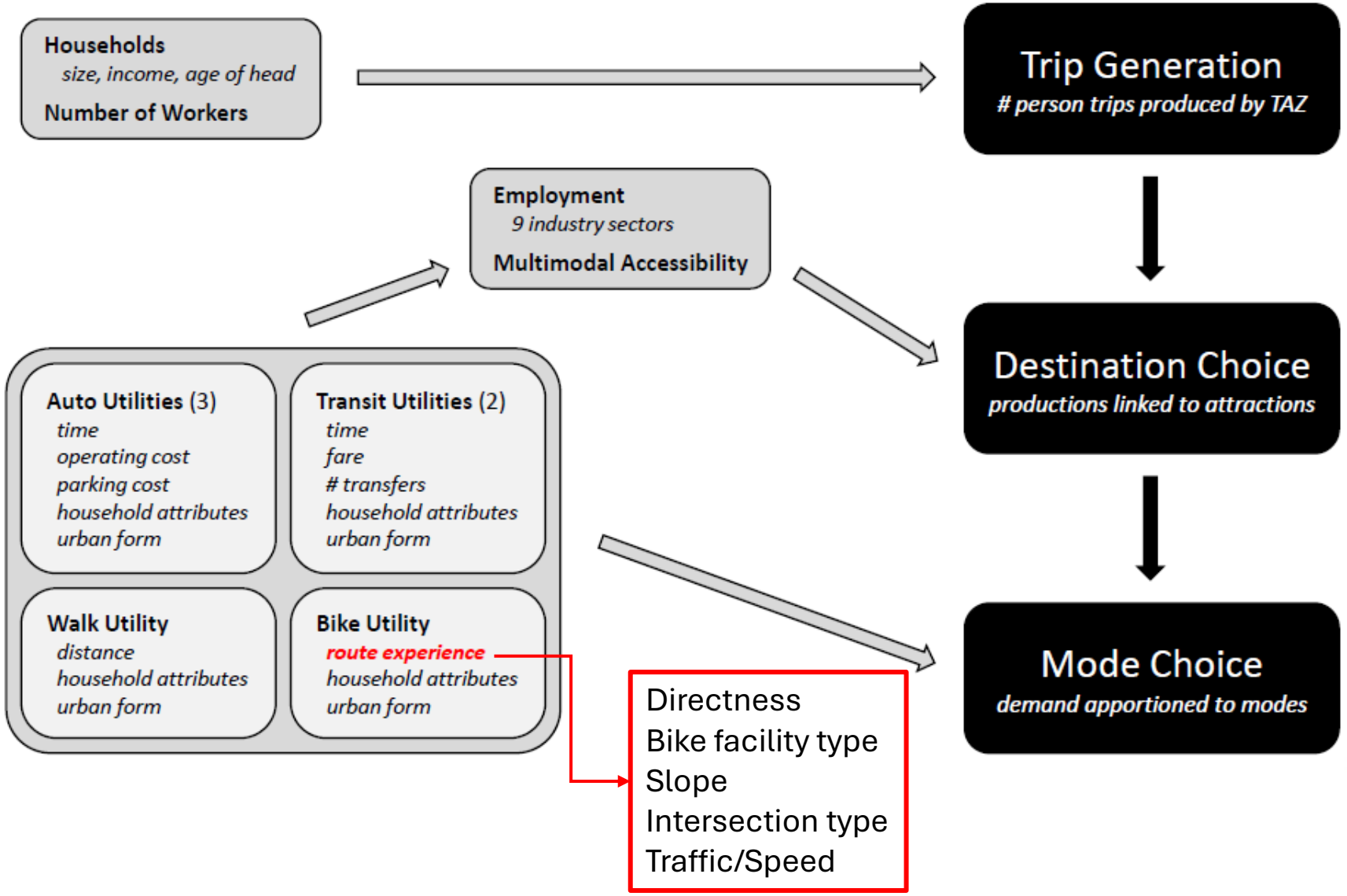


Oregon Metro Model(s) & Tools



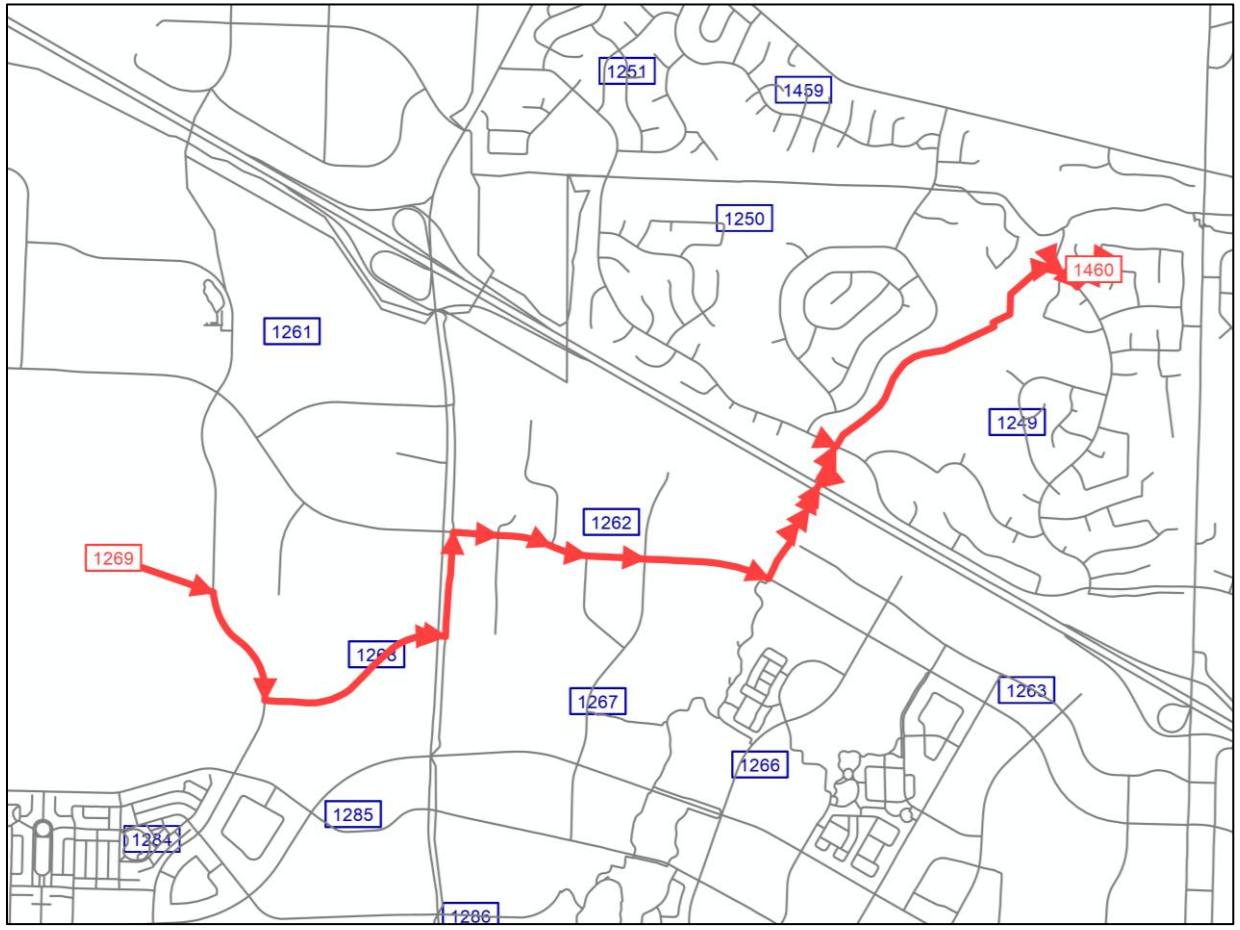
Modified from Metro's "Modeling 101" Series

Current Bike Model Integration



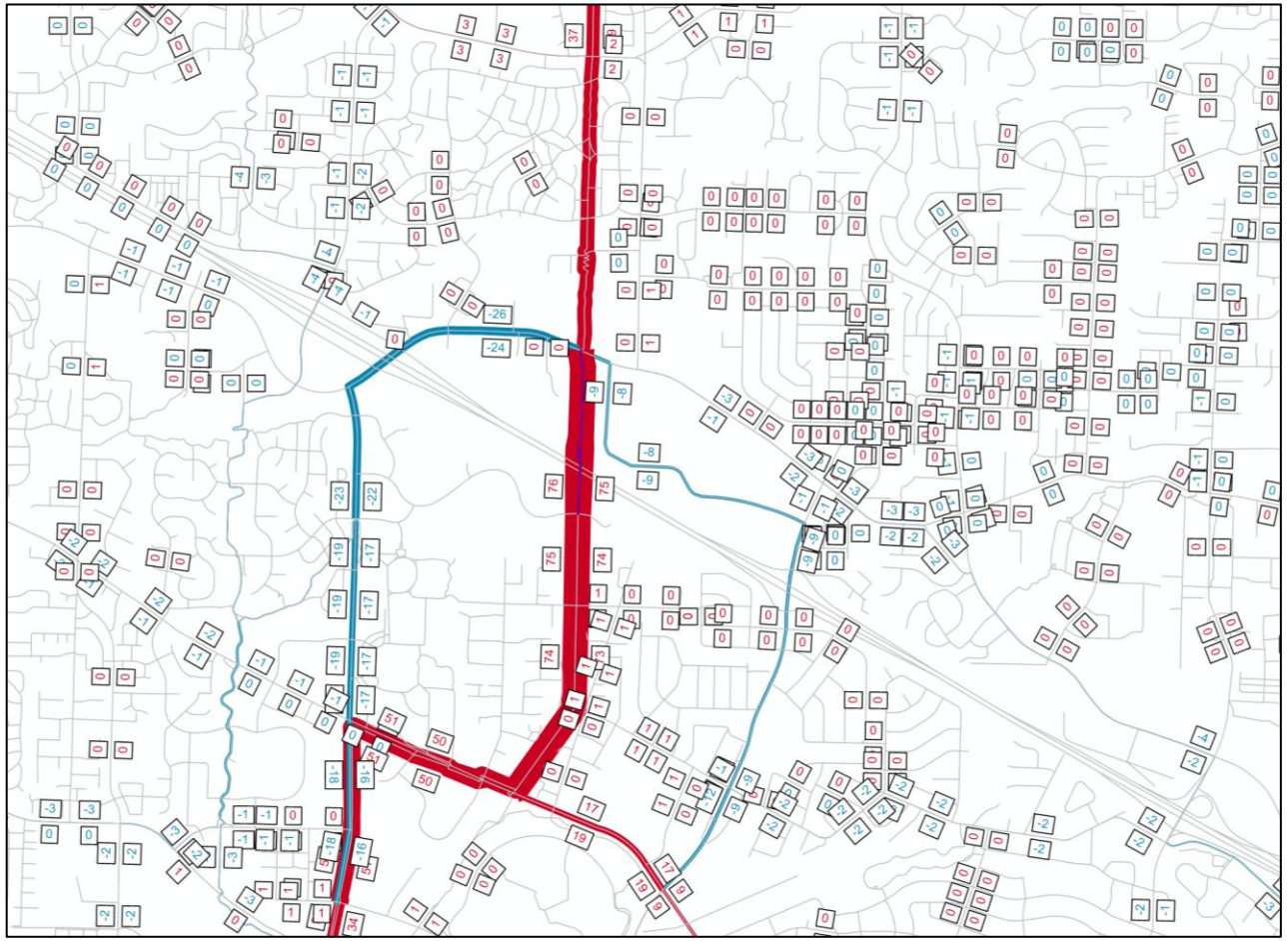
Bike Utility Calculation

- 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**



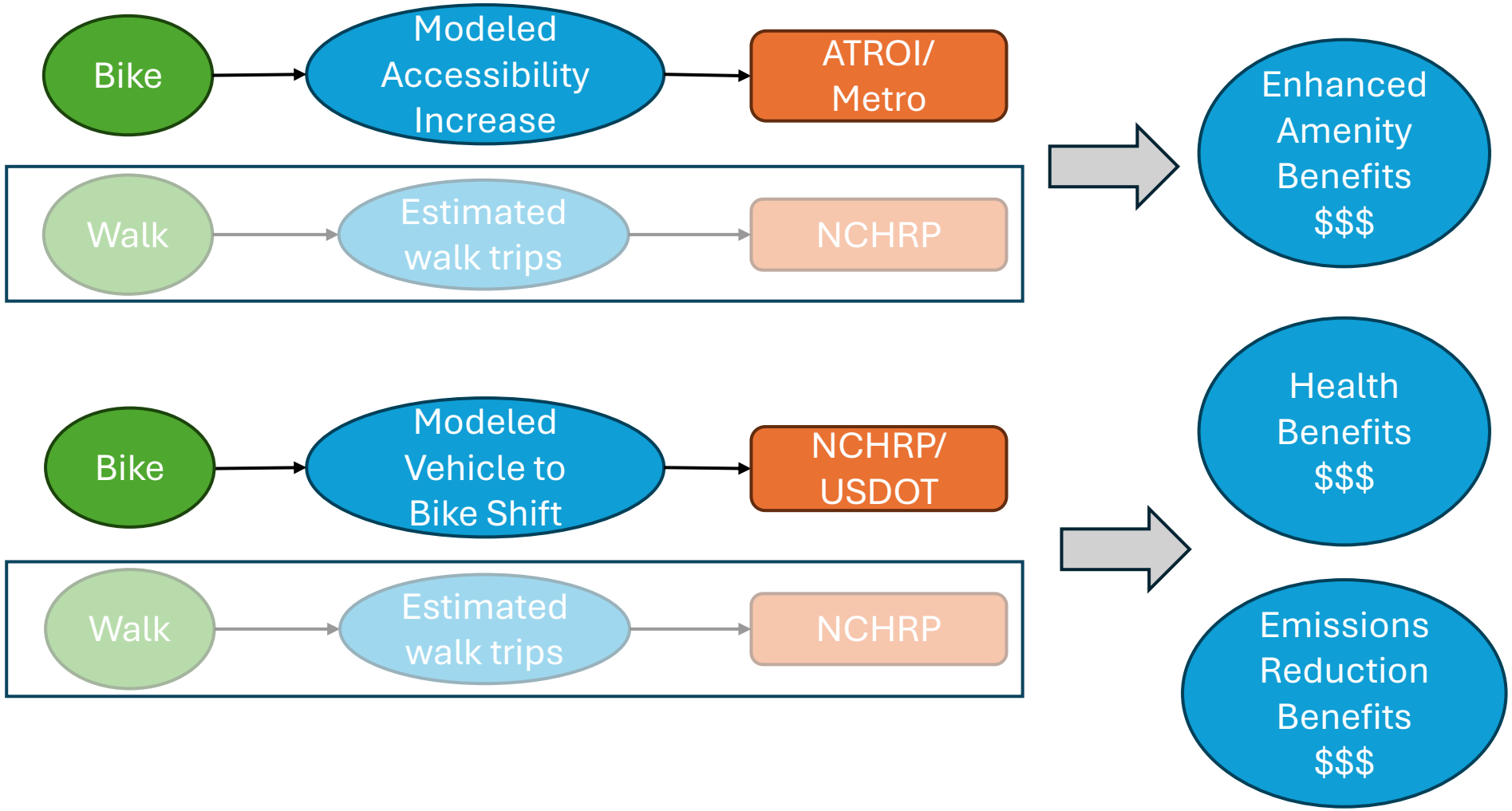
Bike Model representation

- 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.



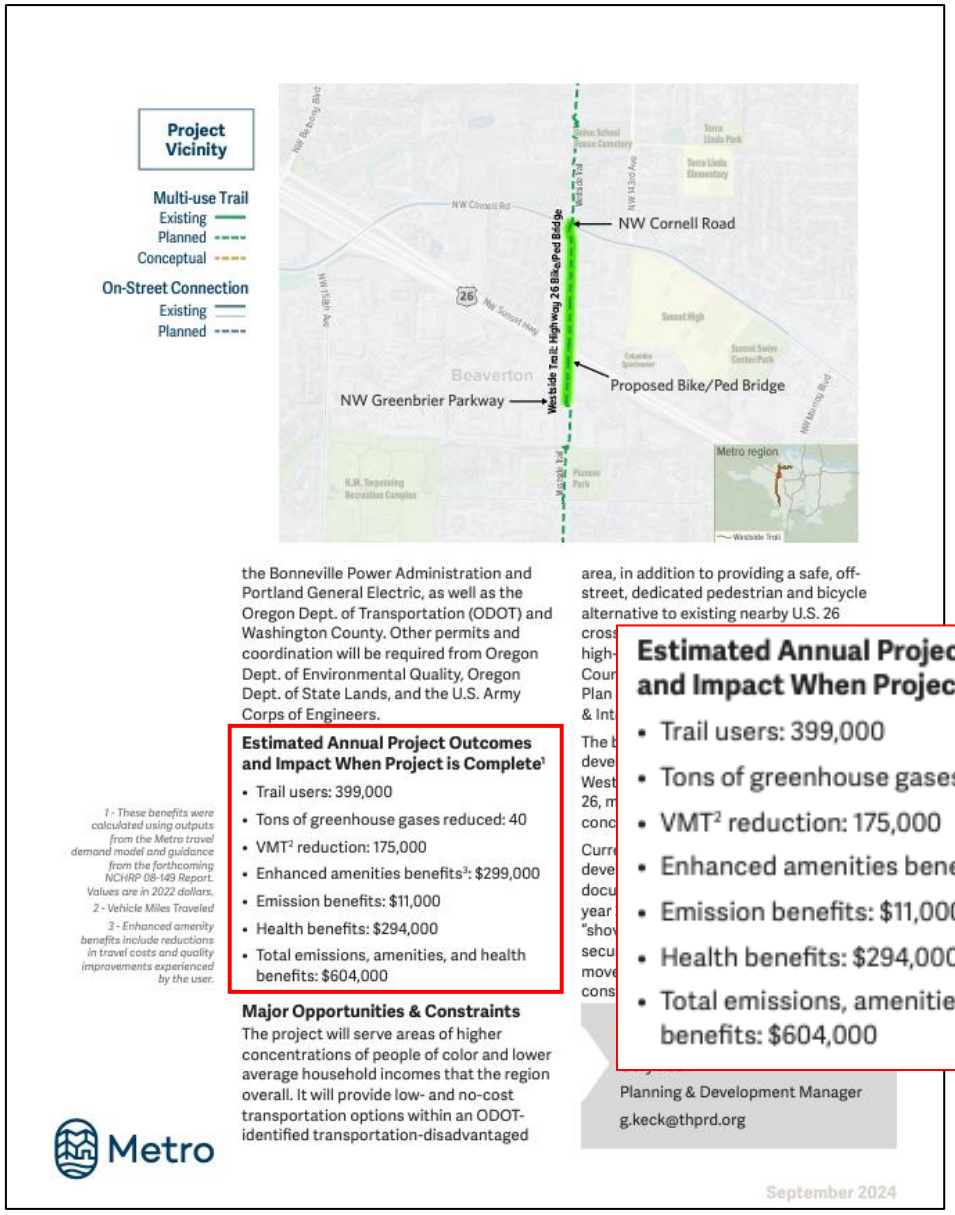
Numbers indicate increase (red) or decrease (blue) in thousands of zone pairs connected by each link

Benefit estimation



Results

- 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.



Estimated Annual Project Outcomes and Impact When Project is Complete[1]

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

https://www.oregonmetro.gov/regional-trails-and-greenways-system

Advantages/Limitations

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


Thank You!
Questions?
Metro