Developing a regional bike model

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Association of Metropolitan Planning Organizations
Annual Conference
October 22, 2013
Why develop a bike model?

• Growth in biking

• Response to challenges
  – greenhouse gases, public health, fuel costs, livability

• Electeds and planners want to know impact of future bike projects
New data create opportunity

• PSU research on bike route choice

• Metro partners with PSU though Oregon Transportation Research Education Consortium
Goal of OTREC project

• Build on PSU bike route research to create a path finding algorithm
  – Improve ability for Metro to model bicycle travel behavior
  – Inform planning and funding decisions
PSU Data – Participants’ home locations
Bike facility example - Bicycle lane
Bike facility example - Off-street trail
Bike facility example - Bicycle boulevard
PSU data - Recorded bike travel
How did the previous regional travel model address bikes?

• Estimated bike trips between TAZs on basis of:
  – Trip distance
  – Land use density/mix within ½ mile
• No assignment of bike trips to a network
• New bike facility (i.e. bicycle lane, bicycle boulevard, off street trail) had no impact on mode choice or route choice
Steps to develop model...

**PSU/Metro**

1. Brainstorm potential attributes to use

**PSU**

2. Develop Bicycle Pathfinding Algorithm
...Steps to develop model

Metro

3. Populate GIS Network with attributes
4. Index zones to intersections
5. Generate intersection to intersection disutilities (zone to zone)
6. Re-estimate demand model
...Steps to develop model

7. Calibrate/validate

Portland Bike Count locations
What affects attractiveness of bicycling?

- **Facility type**: % of route on off-street paths, bike boulevards, bike lanes
- **Slope**: % of route on links with slope > 2%
- **Turns, traffic signals, stop signs** per mile
- **Traffic volumes** of on-street travel and opposing links at left turns
- **Bridge** facility type
- **Distance**
- **Commute or non-commute** trip

Metro | People places. Open spaces.
Basic facts about bike model

• Temporal Basis
  – Average weekday
  – Spring/fall conditions

• Trip Purposes
  – Commute vs non-commute
  – Non-utilitarian, exercise-only trips excluded

• Network
  – 4-county bi-state region
  – Denser than auto model – includes all streets, trails, etc.
  – TAZs as basis for origins and destinations
Application of model - Sullivan’s Gulch Trail
Sullivan’s Gulch Trail - Access points
Sullivan’s Gulch Trail
2010 Base Scenario Volumes – without trail
Sullivan’s Gulch Trail
2010 Scenario Volumes – with trail
Sullivan’s Gulch Trail

Volume Difference from 2010 Base
Sullivan’s Gulch Trail
Where are cyclists going to/from?
Sullivan’s Gulch Trail

New Riders - productions

TAZ rank

highest
Sullivan’s Gulch Trail
New Riders - attractions
Projects using bike model

To date...

• Regional Active Transportation Plan
• Regional Southwest Corridor Plan
• Local road diet analysis

In future...

• Regional Transportation Plan
• Regional Flexible Fund Allocations
Lessons learned...

1. Shows rough estimate of demand
   - less useful for estimating mode share at very specific locations or precise numbers of users on specific route

2. Does not capture all factors that could influence future bicycle mode share
   - increased social cache of bicycling
   - encouragement & education programs
...Lessons learned

3. Bicycle lanes all treated equally, regardless of auto volumes/speeds

4. Make future scenarios as distinct as possible
Questions?