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Travel demand models are absolute garbage. They have been for decades and yet we allow more good money to be sent after projects designed with bad tools. No more funds for transportation until the program requires accountability and better performance.

The Broken Algorithm That Poisoned American Transportation

For the last 70 years, American transportation planners have been using the same model to decide what to build. There's just one problem: it's often wrong.

By **Aaron Gordon**

XL Illustrated By **Xavier Lalanne-Tauzia**
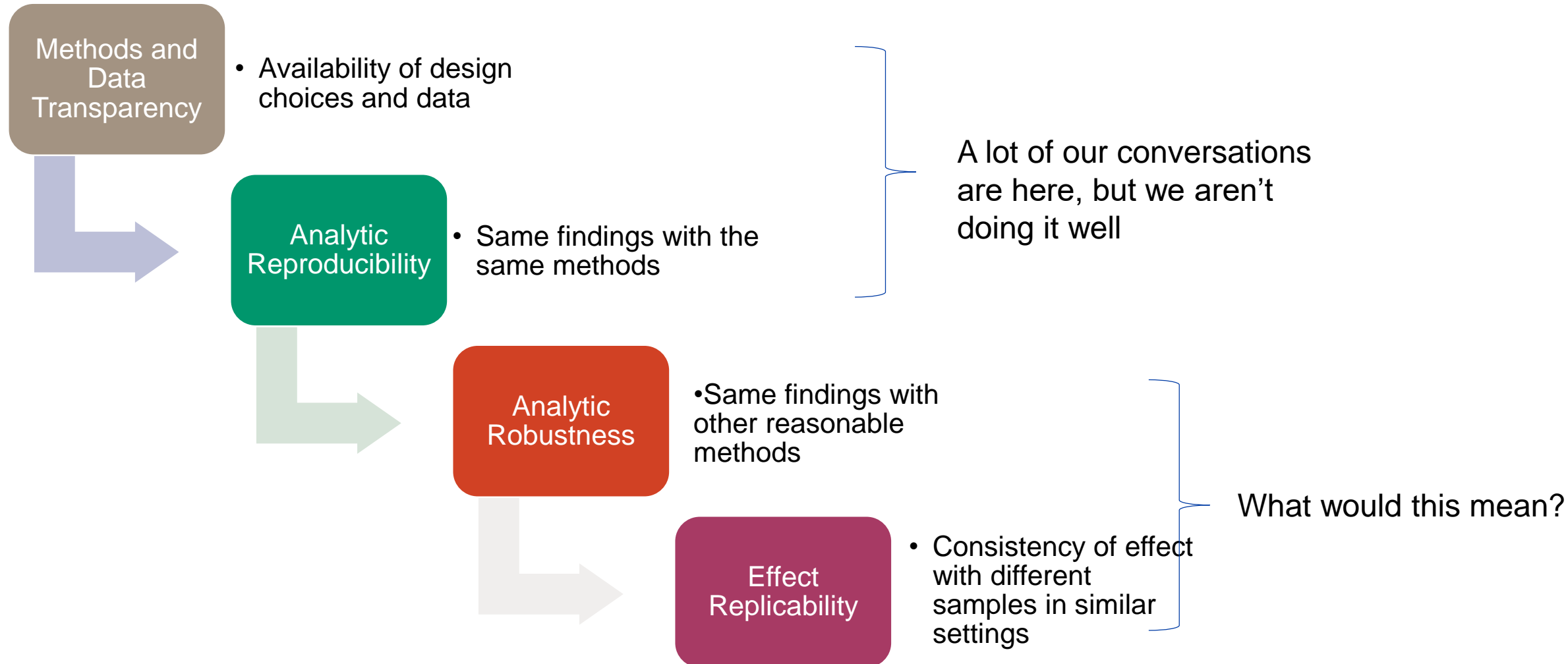
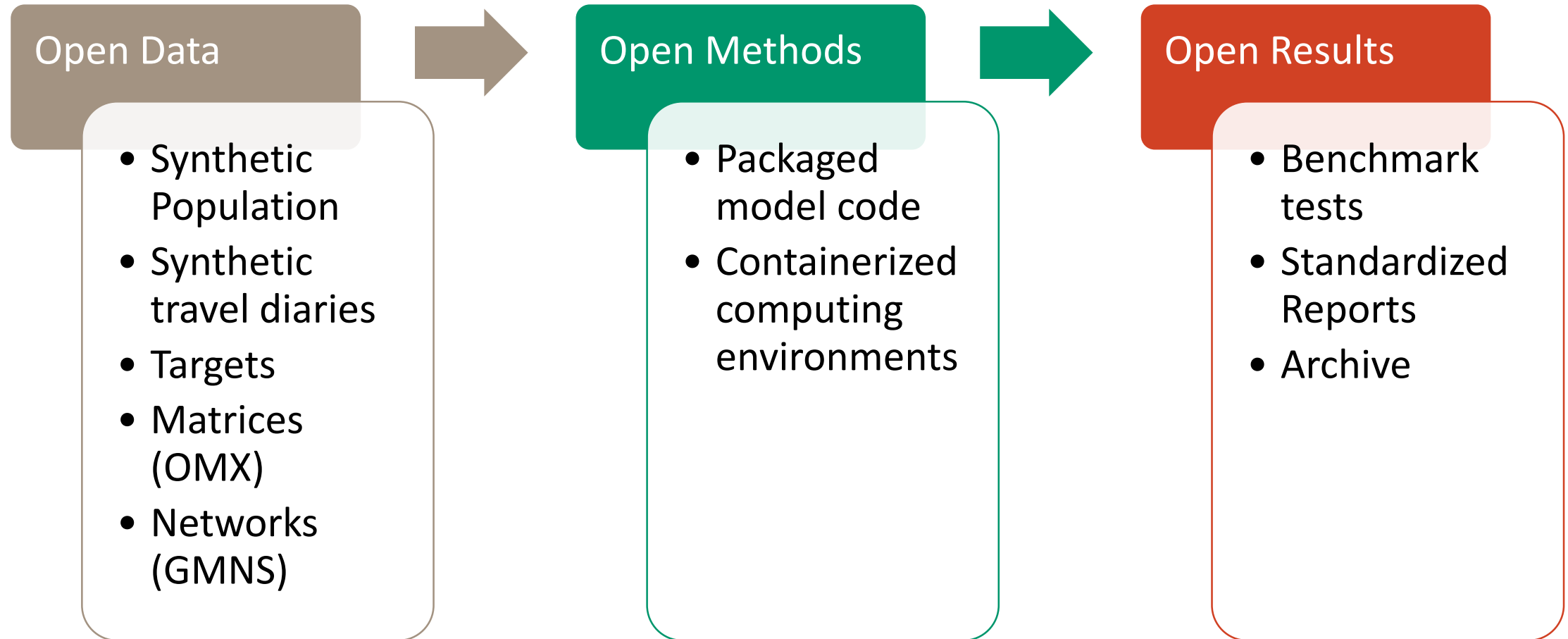August 24, 2020, 6:00am   **f** **Share**   **𝕏** **Tweet**   **👻** **Snap**

This article appears in VICE Magazine's Algorithms issue, *which investigates the rules that govern our society, and what happens when they're broken.*

Elements of Credibility

Methods and Data Transparency
- Availability of design choices and data

Analytic Reproducibility
- Same findings with the same methods

A lot of our conversations are here, but we aren't doing it well

Analytic Robustness
- Same findings with other reasonable methods

Effect Replicability
- Consistency of effect with different samples in similar settings

What would this mean?

LeBel EP, McCarthy RJ, Earp BD, Elson M, Vanpaemel W. A Unified Framework to Quantify the Credibility of Scientific Findings. *Advances in Methods and Practices in Psychological Science*. 2018;1(3):389-402.

Credibility in Applied Travel Models

Open Data

- Synthetic Population
- Synthetic travel diaries
- Targets
- Matrices (OMX)
- Networks (GMNS)

Open Methods

- Packaged model code
- Containerized computing environments

Open Results

- Benchmark tests
- Standardized Reports
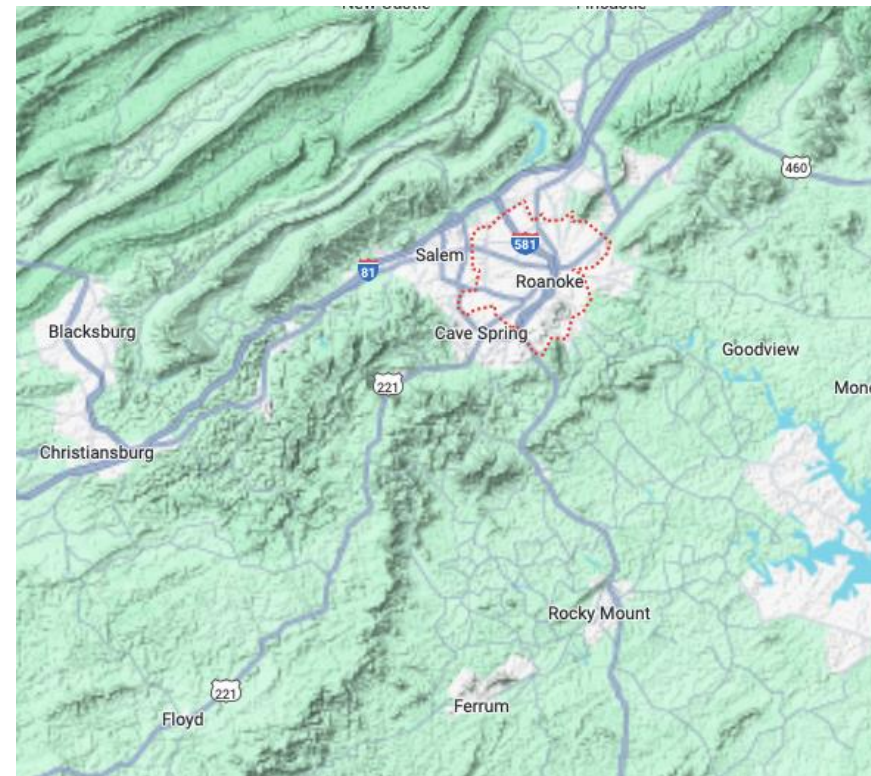- Archive

Test Environment Criteria

- Should be a real city, not a contrived network
  - Highway counts
  - Transit ridership
- Small
- Isolated from larger metro areas
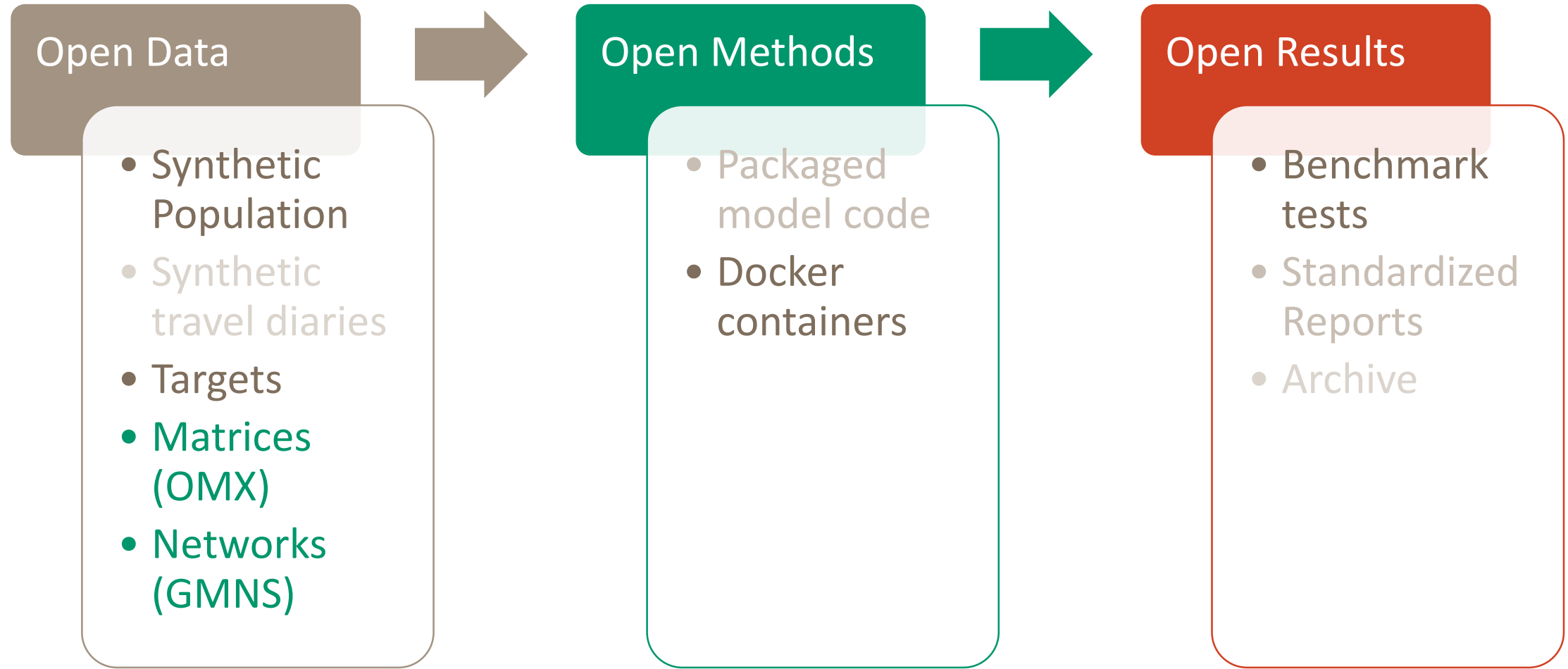- Something interesting

Test Environments

Logan, Utah

Roanoke, Virginia

Credibility in Travel Models

Open Data

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- Networks (GMNS)

Open Methods

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- Docker containers

Open Results

- Benchmark tests
- Standardized Reports
- Archive

Variables

Survey
- Utah HHTS or US NHTS
- Or PSRC?
- + freight and external matrices

Household Model
- ActivitySim
- Trip-based (trippy?)
- MITO
- Transport Foundry
- Marlin's thing
- More…

Assignment
- MATSim
- Aequilibrae (Static)

Tests

- Add a specified development
- Widen a specific road
- Eliminate a specific road
- Increase transit frequency

Base Reports

- Error on counts and transit ridership
- Annotated run time

Test Reports

- Change in VMT
- Change in transit route ridership
- Change in volumes on specific roads