What to Expect

01 Replica Overview

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Our Mission

Organize the world’s information about the built environment to make it accessible, valuable, and actionable.
What makes Replica different?

- **Depth: Mobility & demographic data**
  - Trips: O/D pairs, Start time, Mode split, Purpose, Distance, Duration, Transit routes, and more
  - Trip takers: Household income, Race and ethnicity, Age, Employment status, Private auto availability, Working from home, and more

- **Breadth of data**
  - Land use, including parcel-level
  - Economic spend
  - Additional datasets:
    - AADT
    - Turning Movement Counts
    - Parking
High-fidelity activity-based travel models, representing specific regions during specific seasons, with data outputs down to the network link level.
Nationwide activity-based model, with near-real time data at the census-tract level covering mobility, consumer spend, land use, and COVID-19 cases.
How it Works

Raw Data Layer

We leverage a diverse set of third-party source data to create our models.

This composite approach is both a risk-mitigation strategy and aligned with our objective to show a holistic view of the built environment.

Mobile Location Data

Consumer & Resident Data

Built Environment

Economic Activity

Ground Truth Data
How it Works

The Pipeline

Replica generates its data by running computationally intensive, large-scale simulations.

These simulations allow us to deliver granular data outputs that match behavior in aggregate, but don't compromise the privacy (or surface the actual movements) of any one individual.

1. Create a **synthetic population** matching the characteristics of a given region

2. Train a number of **behavior models** specific to that region

3. Run **simulations** of those models applied to the synthetic population to create a “replica” of transportation and economic patterns

4. Calibrate the outputs of the model against observed “ground-truth” to improve quality
# Leveraging Replica

## Transportation Equity Planning

<table>
<thead>
<tr>
<th>Trip Filters</th>
<th>Origin</th>
<th>Destination</th>
<th>Mode</th>
<th>Network Links</th>
<th>Transit Route</th>
<th>Duration</th>
<th>Distance</th>
<th>Purpose</th>
<th>Start Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>People Filters</td>
<td>Household Income</td>
<td>Race and Ethnicity</td>
<td>Age</td>
<td>Home Location</td>
<td>Work / School Location</td>
<td>Employment Status</td>
<td>Work From Home Status</td>
<td>Private Auto Availability</td>
<td></td>
</tr>
</tbody>
</table>
How do disconnected communities reach the city?
What infrastructure do disadvantaged communities rely on most?
Where do low-income commuters rely on transit?
What can I learn about inequities in white vs. nonwhite transit riders?

**Nonwhite Transit Commuters**
- **Household Income**
  - Under $0: 4.83%
  - $0-$15k: 3.87%
  - $15k-$25k: 17%
  - $25k-$50k: 12.2%
  - $50k-$75k: 10.1%
  - $75k-$100k: 12.7%
  - $100k-$150k: 13.2%
  - $150k-$200k: 22.8%
  - Over $200k: 20.6%

- **Private Auto Availability**
  - Two vehicles: 41.3%
  - Three or more vehicles: 57.2%
  - One vehicle: 11.1%
  - No vehicles: 37.2%
  - No data: 0.3%

**White Transit Commuters**
- **Household Income**
  - Under $0: 23.0%
  - $0-$15k: 14.8%
  - $15k-$25k: 11.0%
  - $25k-$50k: 23.3%
  - $50k-$75k: 21.0%
  - $75k-$100k: 7.02%
  - $100k-$150k: 8.1%
  - $150k-$200k: 7.28%
  - Over $200k: 7.28%

- **Private Auto Availability**
  - No vehicles: 53.1%
  - Three or more vehicles: 15.3%
  - One vehicle: 19.2%
  - Two vehicles: 10.1%
  - No data: 6.87%
How should I target community outreach to capture feedback from those most impacted by a policy intervention?
Presenter: Hailey Vaughn, Community Account Manager at Replica
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