

Leveraging big data to drive decisions about the built environment

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REPLICA



INTRODUCTIONS



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Organize the world's information about the **built environment** to make it **accessible, valuable,** and **actionable.**

Our process

Replica develops a wide range of data products that can be accessed in myriad ways for all different types of users.

- 4 Applications:** Data is leveraged in a growing number of workflow-style tools to support decision-making.
- 3 Data Library and Studio:** Our various data products that be accessed and downloaded through multiple interfaces.
- 2 Data modeling:** We use raw data as inputs into our activity-based models to produce nationwide mobility and traffic data.
- 1 Raw data:** Replica integrates numerous data sources into our diverse set of raw data.



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**.



Location
Data



Consumer
& Resident Data



Built
Environment



Economic
Activity



Ground
Truth Data

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, but **maintaining privacy standards**



2

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



3

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



4

Calibrate the outputs of the model against observed “ground-truth” to improve quality



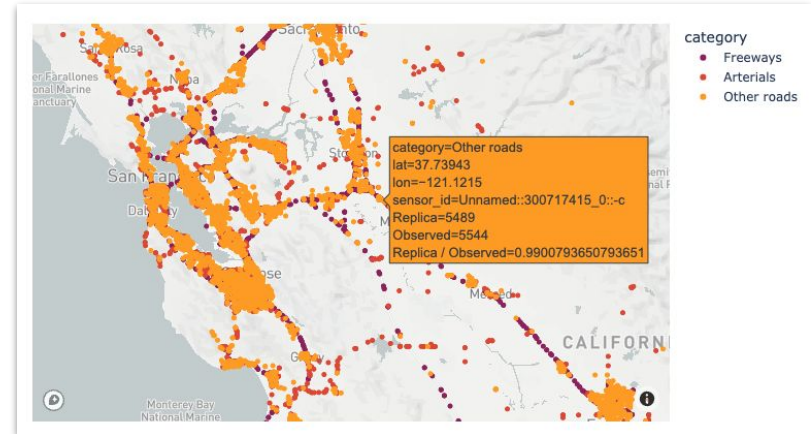
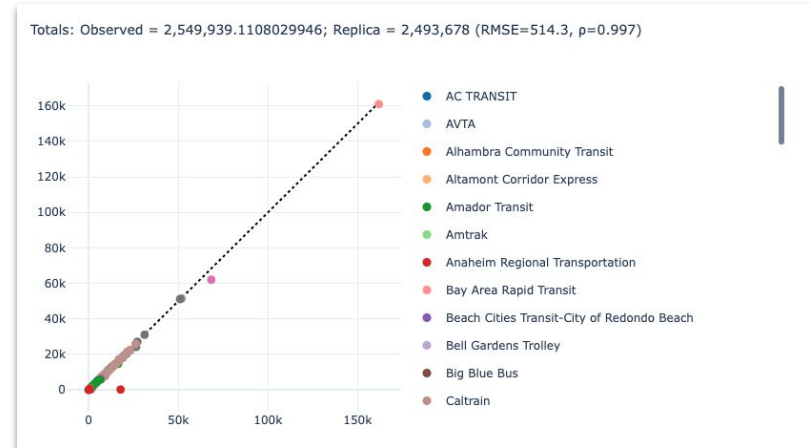
HOW IT WORKS

Calibration & Validation

Replica's models are calibrated against both Replica collected and customer-provided ground truth.

Sources include auto sensors, network volumes, transit ridership, and Uber/Lyft data.

Data comes with an associated quality report, and an extensive list of third-party validation reports can be found on our website.



The Basics

Replica sets **industry standards of transparency and calibration** across:



DATA PRODUCTS

- Seasonal Disaggregate Trips
- Weekly Mobility Data
- Seasonal Disaggregate Population
- Weekly Consumer Spend
- Weekly Consumer Spend O-D Pairs
- Annual Average Daily Traffic (AADT)
- Hourly Auto Volume Profiles
- Speed Profiles
- Turning Movement Counts (TMC)
- Land Use
- Road Infrastructure
- Transit Infrastructure

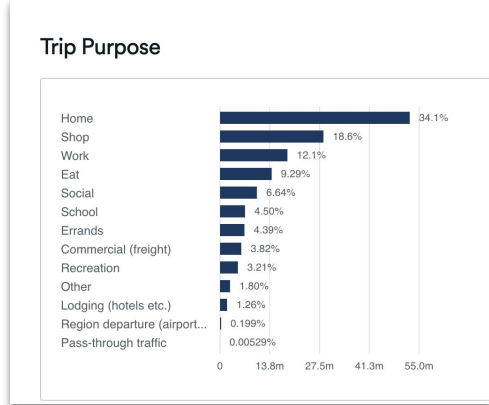
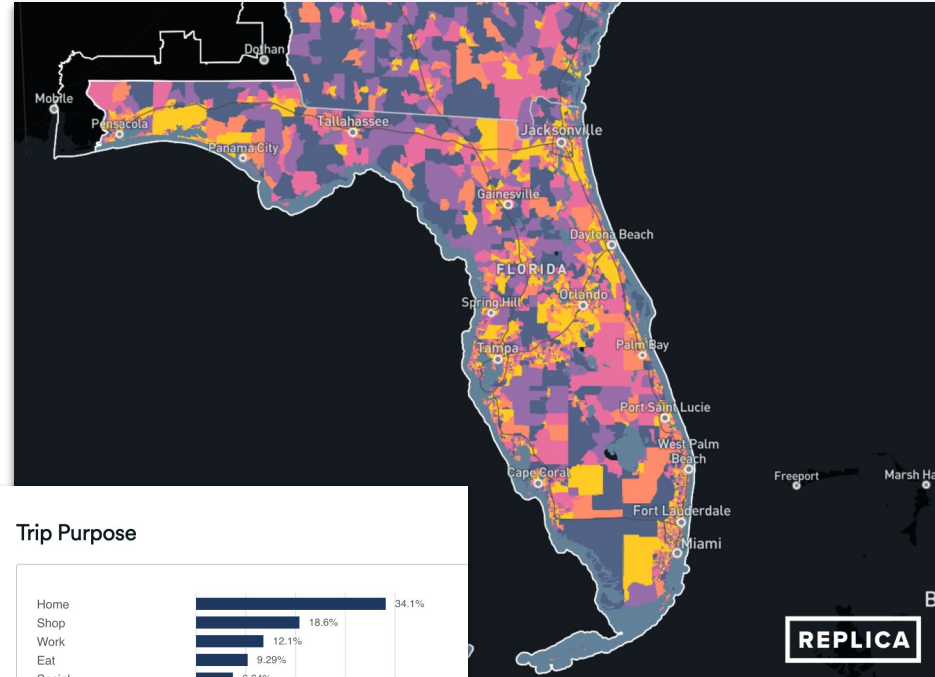


METRICS AND INSIGHTS

- O-D Flows
- Travel Time Reliability
- Network Link Volumes
- Peak Hours of Travel
- Mode Split
- Residential VMT
- Average Trip Times/Distance
- Accessibility of Land Uses
- Vulnerable Demographics
- Commercial Freight Trips

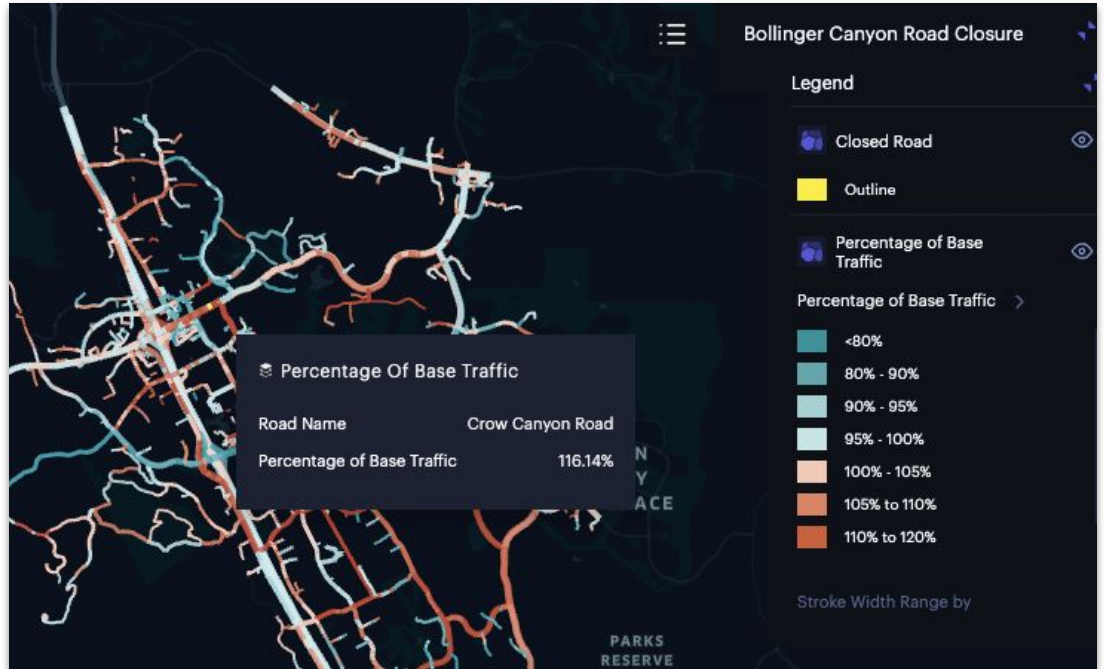
Places Studies

- High-fidelity, disaggregate activity-based travel model, with data outputs at the network-link level.
- Use Places to :
 - Generate Origin-Destination Matrices for specific trip modes, purposes, and travel demographics
 - Prioritize locations for active transportation infrastructure to achieve Vision Zero
 - Create EV charging implementation plans based on EV trip behavior and VMT
 - Monitor commute modes and travel times



Road Closure Scenarios

- **Simulate traffic patterns** with custom road closures to understand the impact on travel behavior and the network.
- Use the tool to :
 - Identify Traffic Diversion Patterns
 - Estimate Impacts on Daily Travel
 - Understand Socio-Economic Impacts
 - Assess Environmental Impact (like changes in VMT)
- Enables rapid, efficient, and iterative forecast planning.



Q & A



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