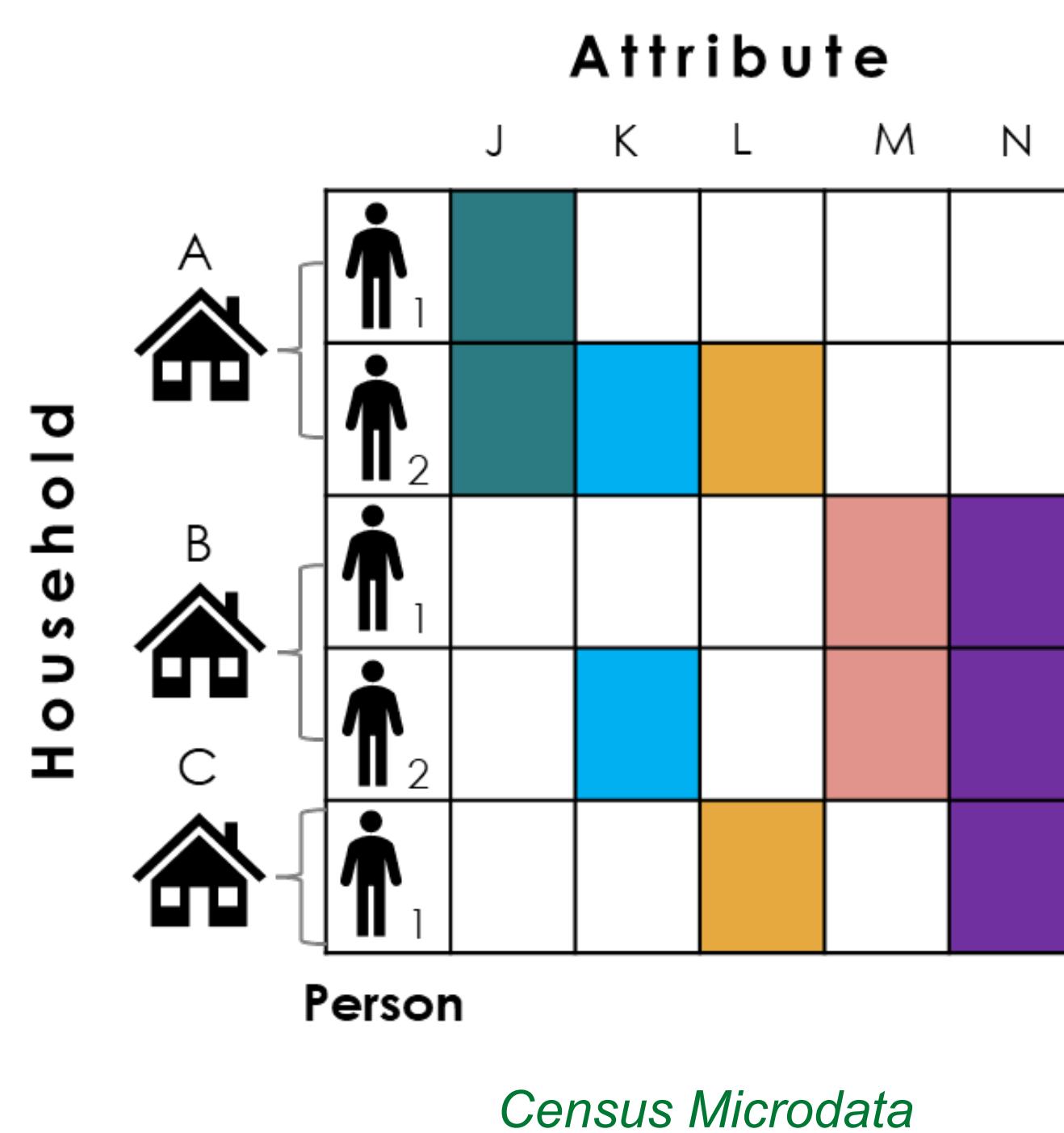


Joseph V. Tuccillo and James D. Gaboardi

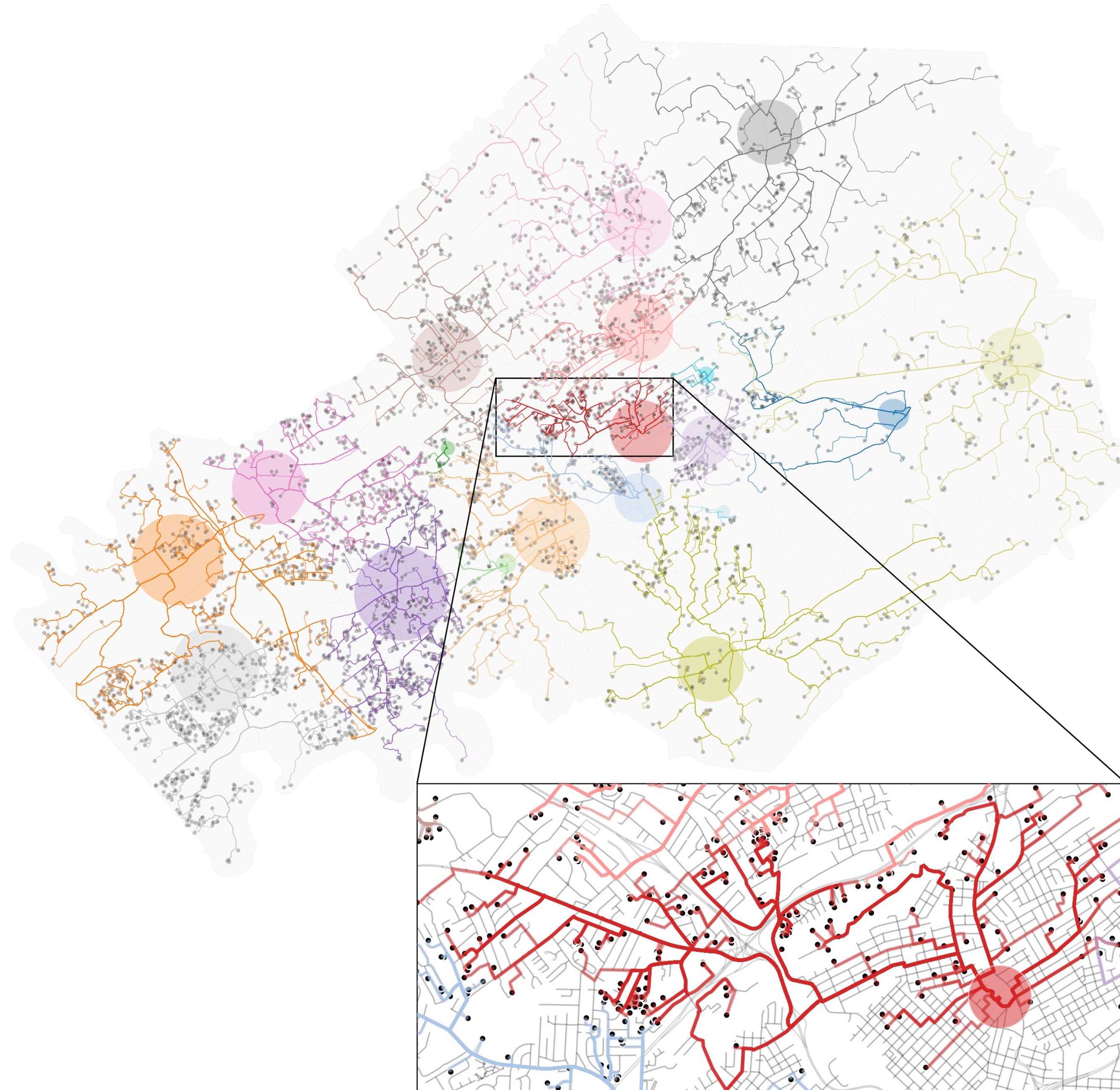
Human Geography Group, Geospatial Science and Human Security Division

## What is Likeness?

- Model **human dynamics** at scale for **human security**
- Novel insights with “**atomic**” representations of population
- Create **synthetic populations** from **public-use census microdata** that preserves respondent privacy

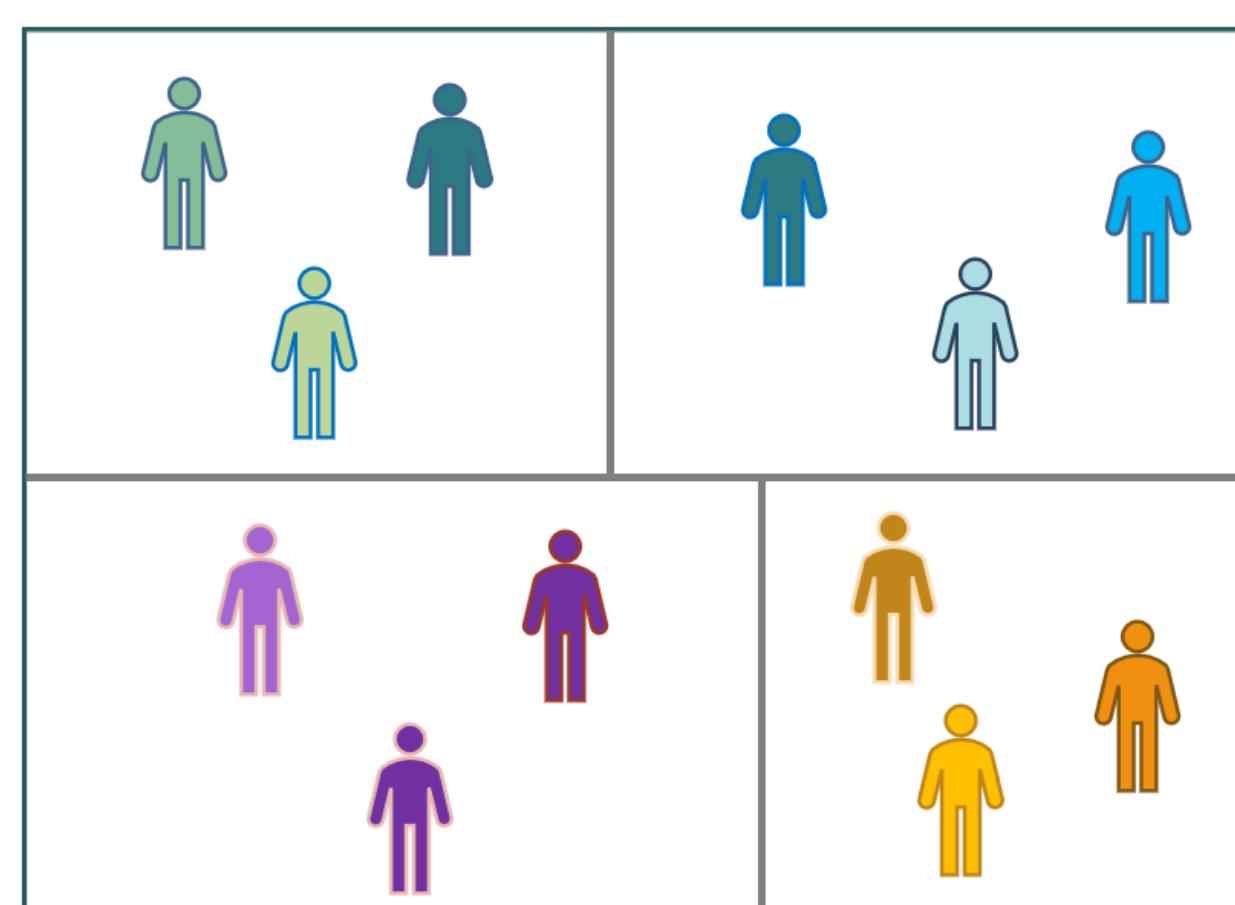


## Likeness Integrated Demonstration

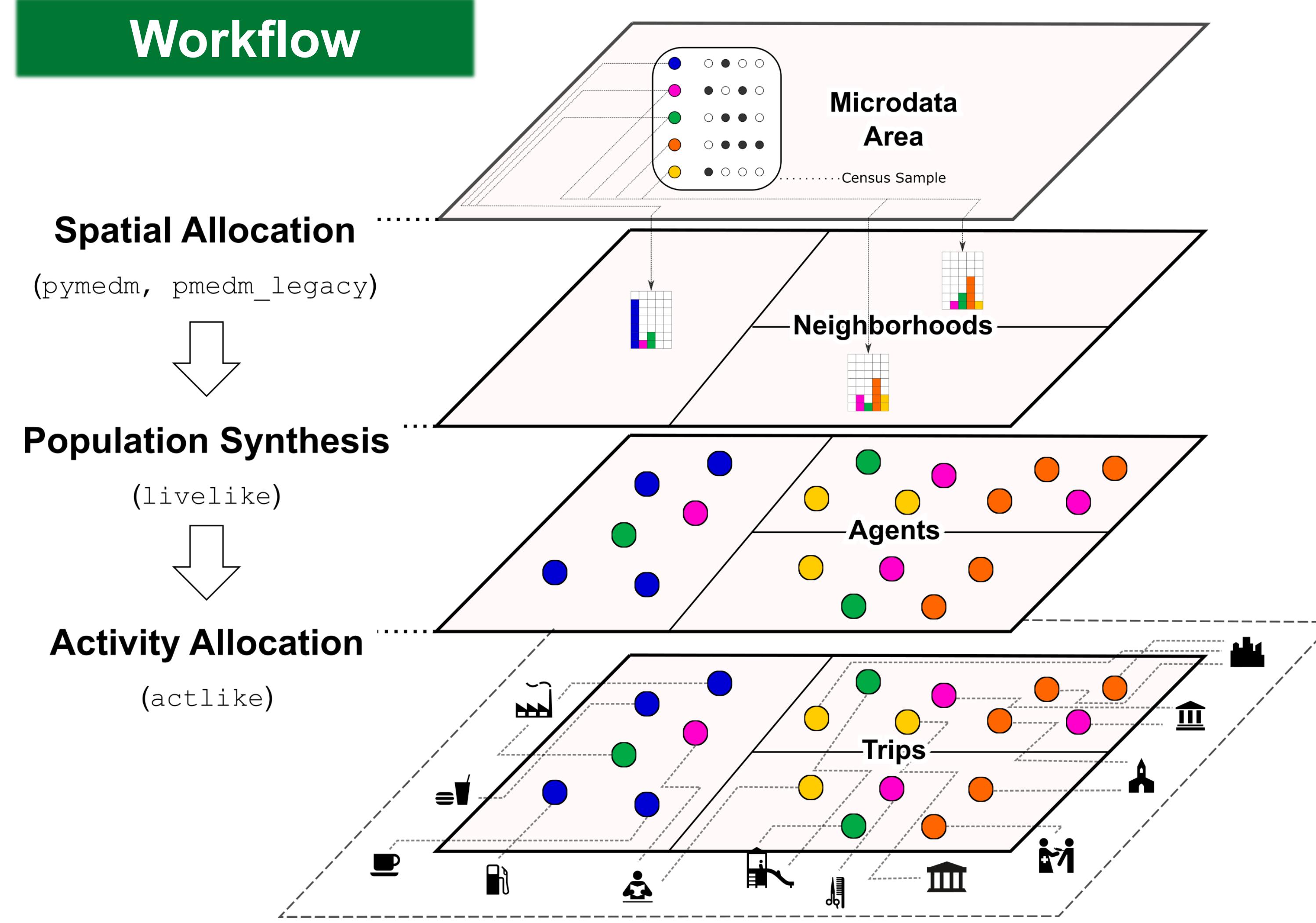


## Vivid Synthetic Populations

- Synthetic populations support spatial epidemiology, transportation, energy, & public health
- Vivid synthetic populations** → hundreds of attributes across demographics, socioeconomic status, housing, & health
  - More informed geolocation of individual profiles derived from **census microdata**
  - Deeper **individual & neighborhood characterization**

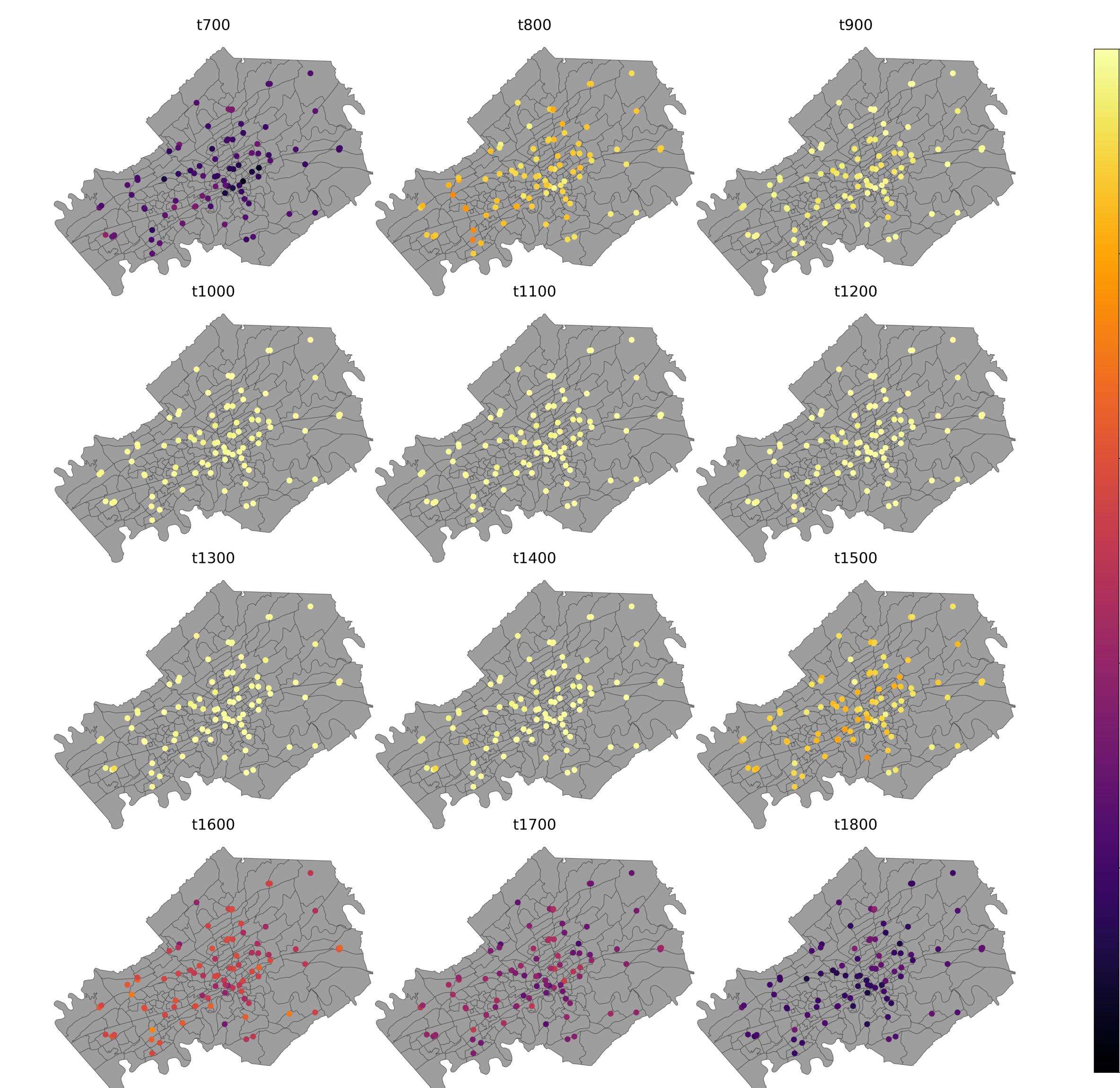


## Workflow



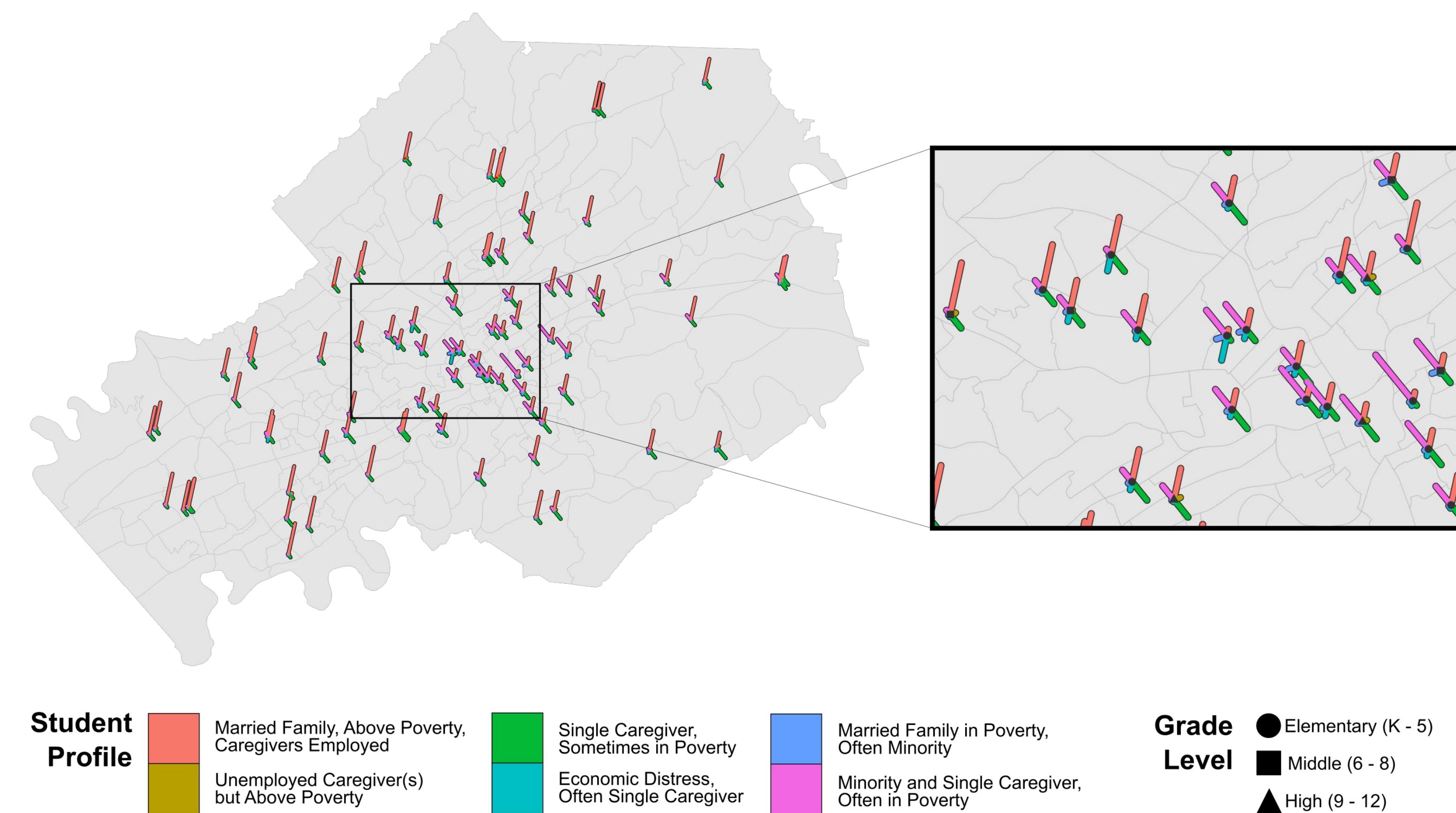
## Worker Commutes & Occupancy Estimates

K-12 Educators | True Network Time | Arrival Time vs. Hours Worked



## Student Composition & Social Contact Networks

K-12 Students by Grade | True Network Distance | 6 Student Profiles



## Validation & Diagnostics

Are relative facility sizes preserved?

K12	R <sup>2</sup>	Type	Mean
Students	Between-Destination	CCA	0.9973
	Within-Destination	CCA	0.9896
Educators	OLS Linear Regression		0.9983

Coefficients of Determination (R<sup>2</sup>) for 30 Likeness simulations

## Recommended Resources

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- Tuccillo, J.V. & Gaboardi, J.D. (2022, June). Connecting Vivid Population Data to Human Dynamics. *Distilling Diversity by Tapping High-Resolution Population and Survey Data*. DOI: 10.5281/zenodo.6607533.
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