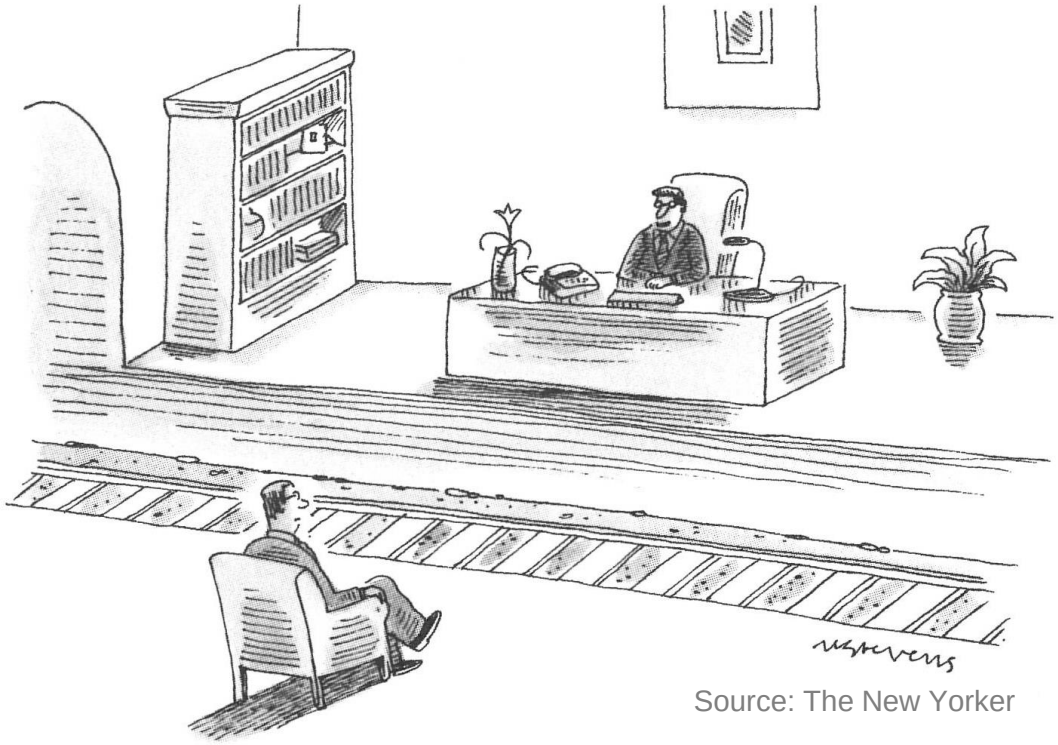


Source: The New Yorker

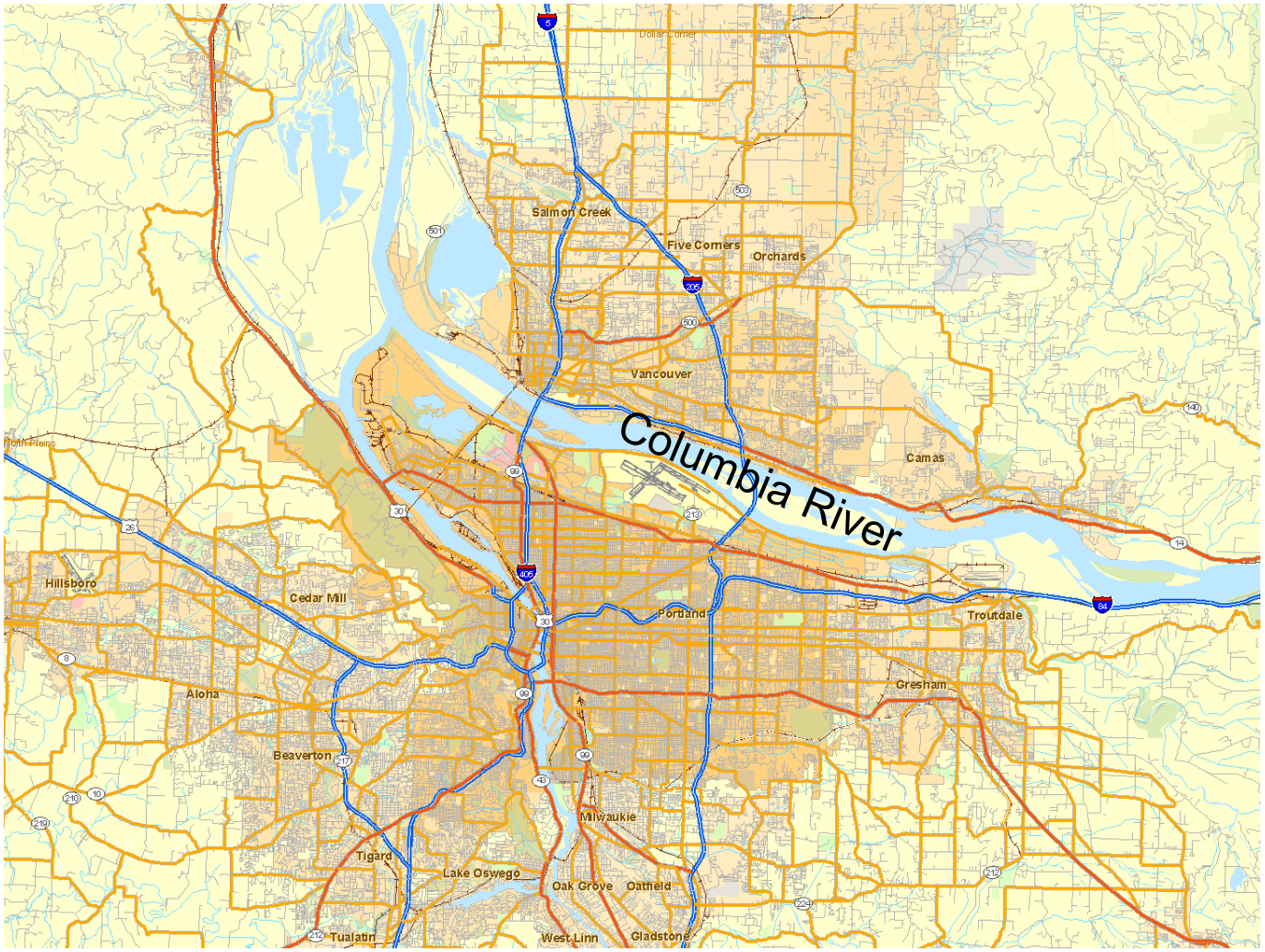
"It makes the commute that much easier."

Maintaining Mobility in Substantial Urban Growth Futures

mobil.TUM 2016

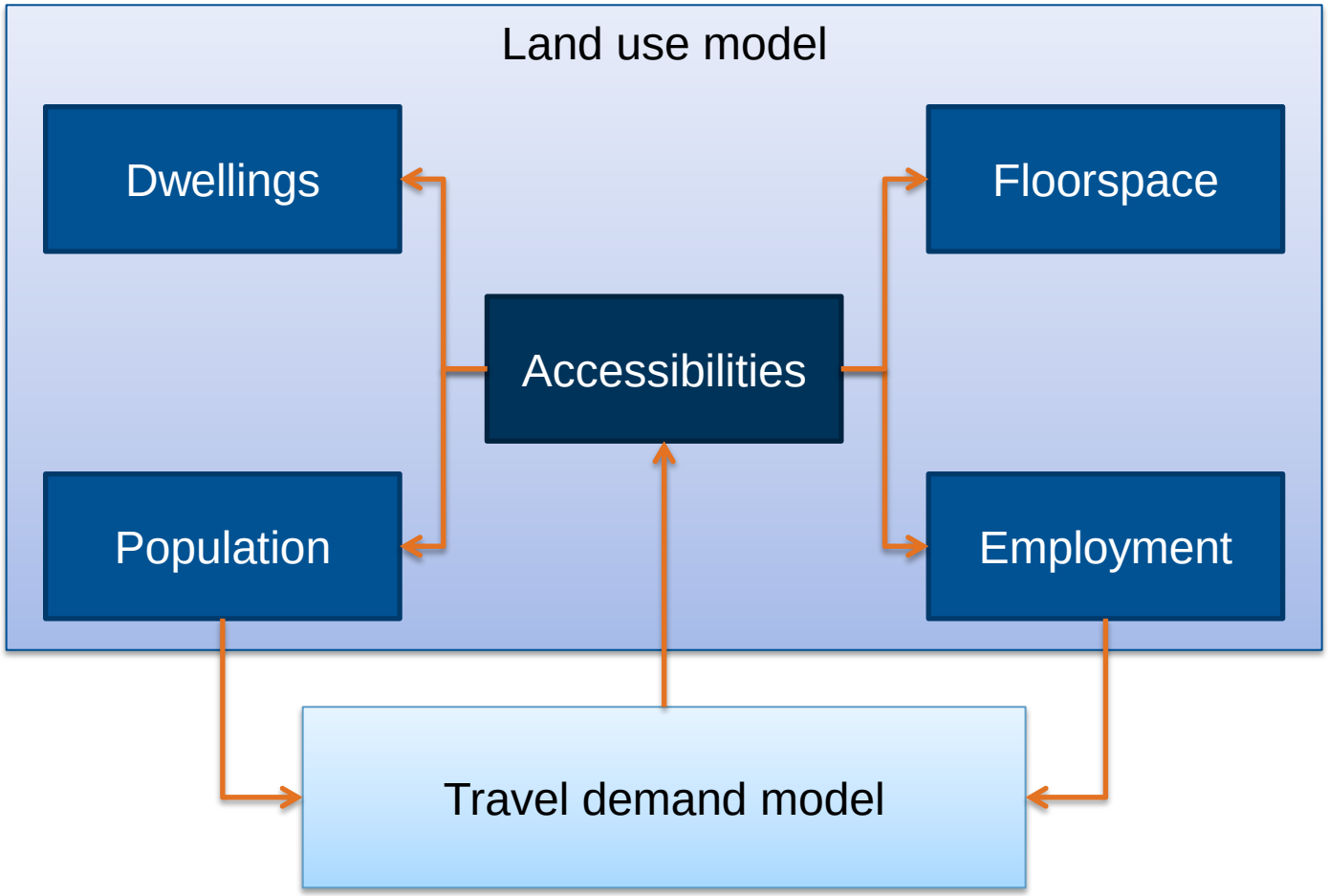
Rolf Moeckel (TU Munich), Kai Nagel (TU Berlin)

Urban growth in Portland, Oregon



Conder, Lawton
TRR 1805 (2002)

Traditional model integration



SILO Model Concept

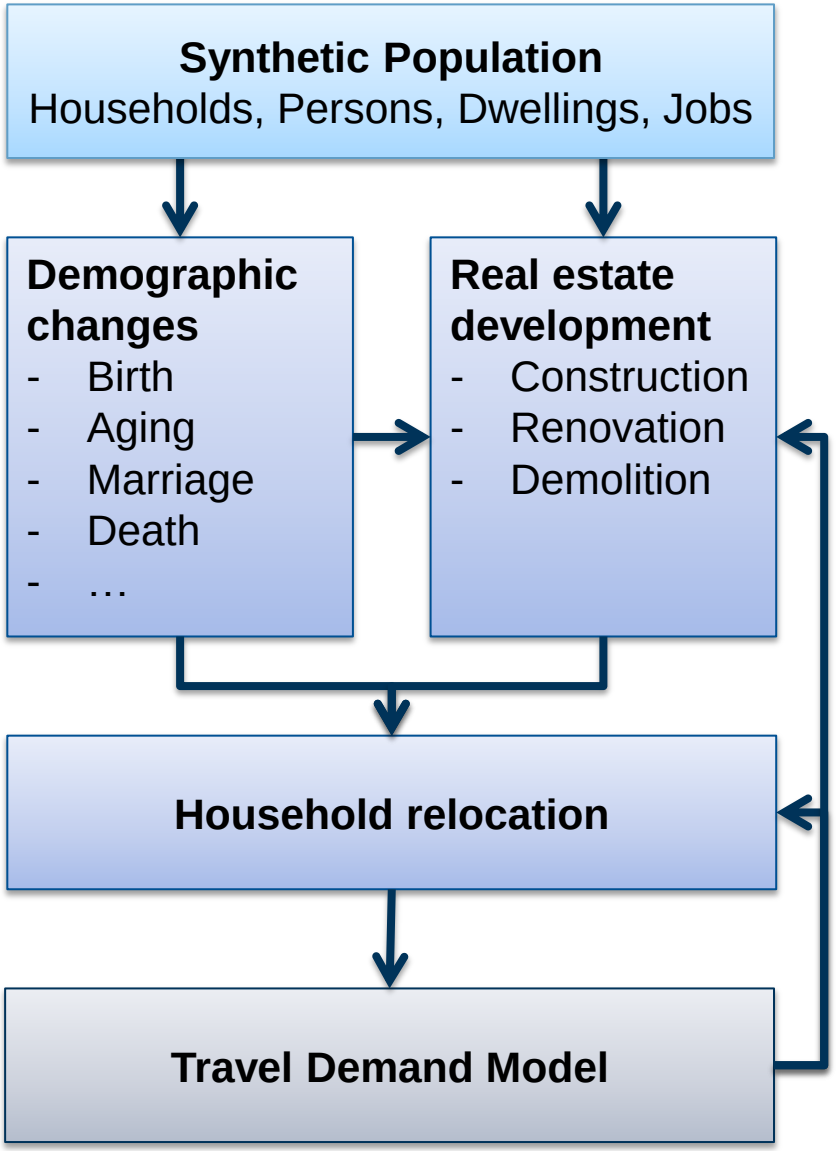
Microscopic land-use model

Fully integrated with travel demand model

Three implementations

- Minneapolis/St. Paul
- Maryland
- Munich, Germany

Open source: www.silo.zone



Events simulated in SILO

	Population	*Dwellings*
spatial	• move • inmigrate/outmigrate	• build new dwellings
aspatial	• aging • child is born • leave parental household • get married/cohabitate • get divorced/separate • death • change job • change of income • buy or sell cars	• renovate dwelling • dwellings deteriorate • demolish dwelling • price adjustment

Modeling Constraints

Traditional land-use modeling

Location choice is based on utilities

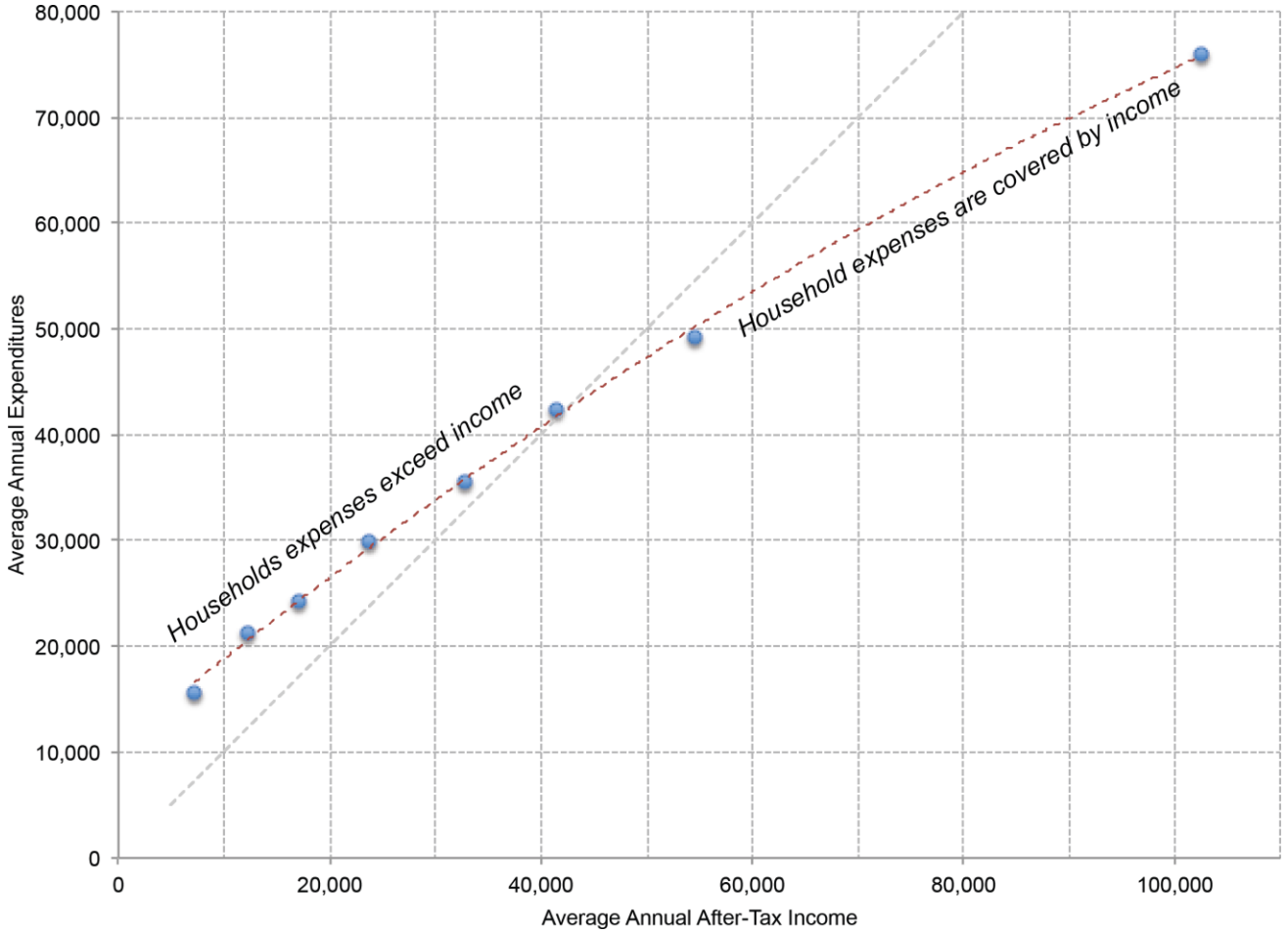
$$u_i = \alpha \cdot size_i + \beta \cdot price_i + \gamma \cdot location_i + \ldots$$

In reality, most choices are made under constraints

- Price of dwelling
- Travel costs
- Parking availability

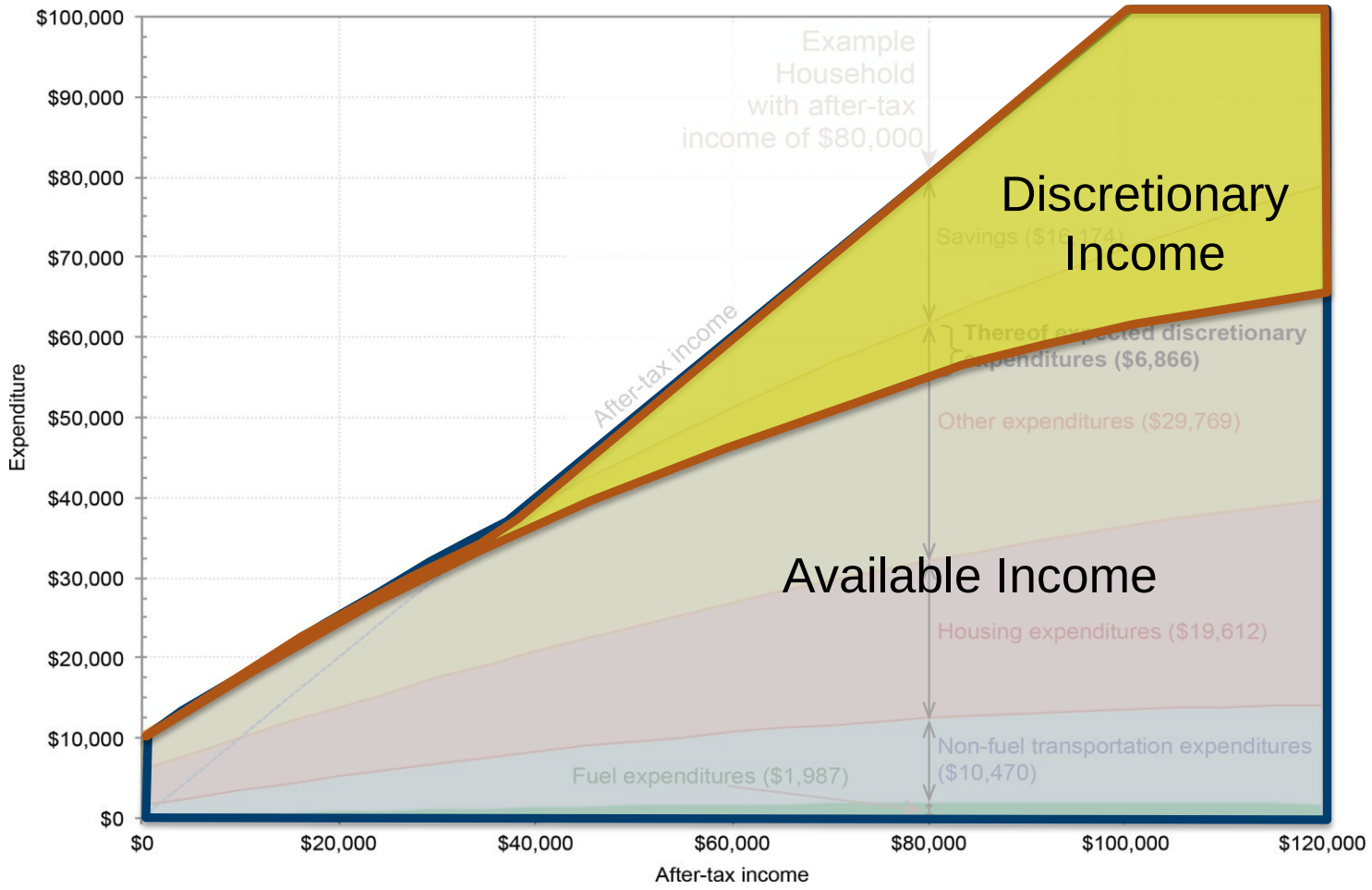
Modeling human behavior is less about maximizing utilities, but satisfying needs.

Household expenditures



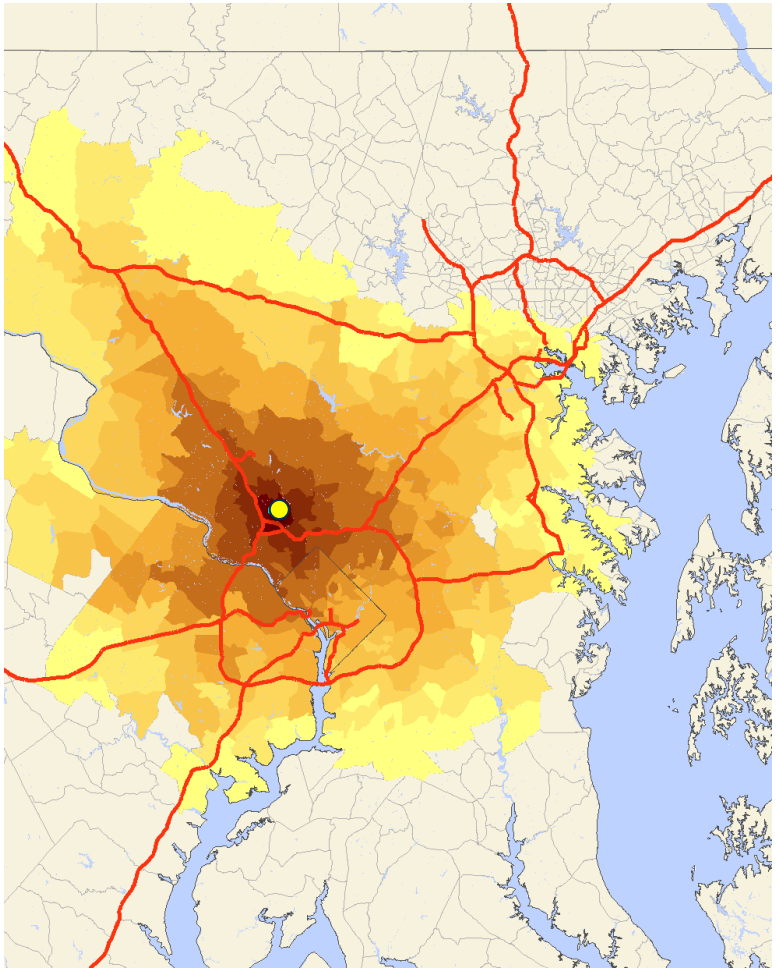
Source: BLS Consumer Expenditure Survey

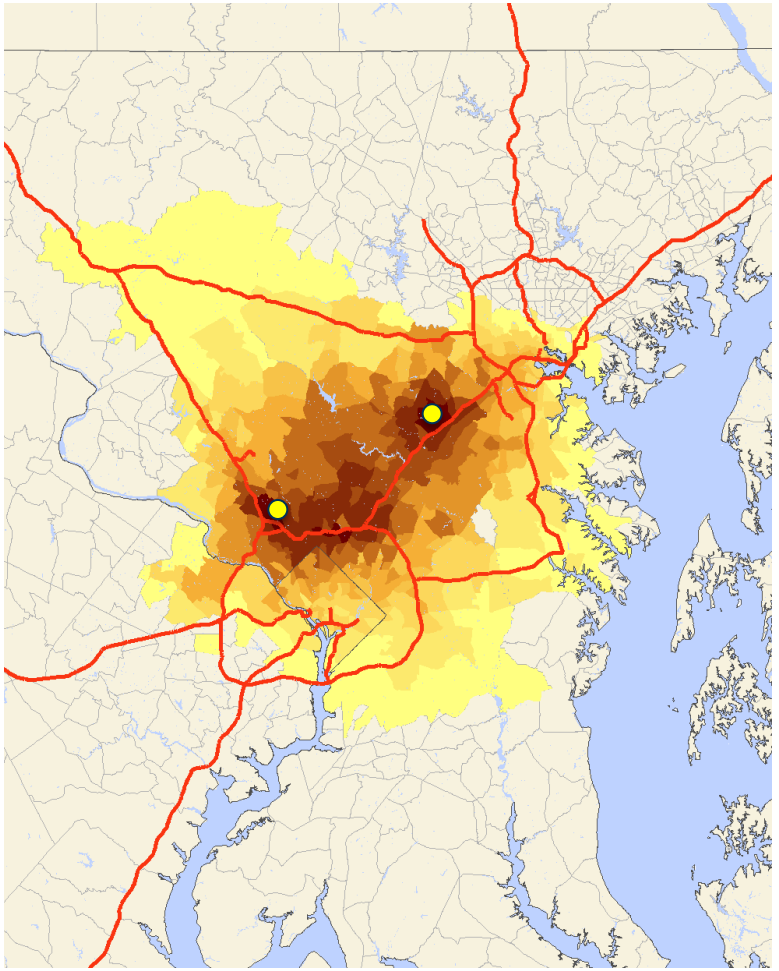
Household expenditures



Source: Own estimation based on U.S. BLS Consumer Expenditure Survey

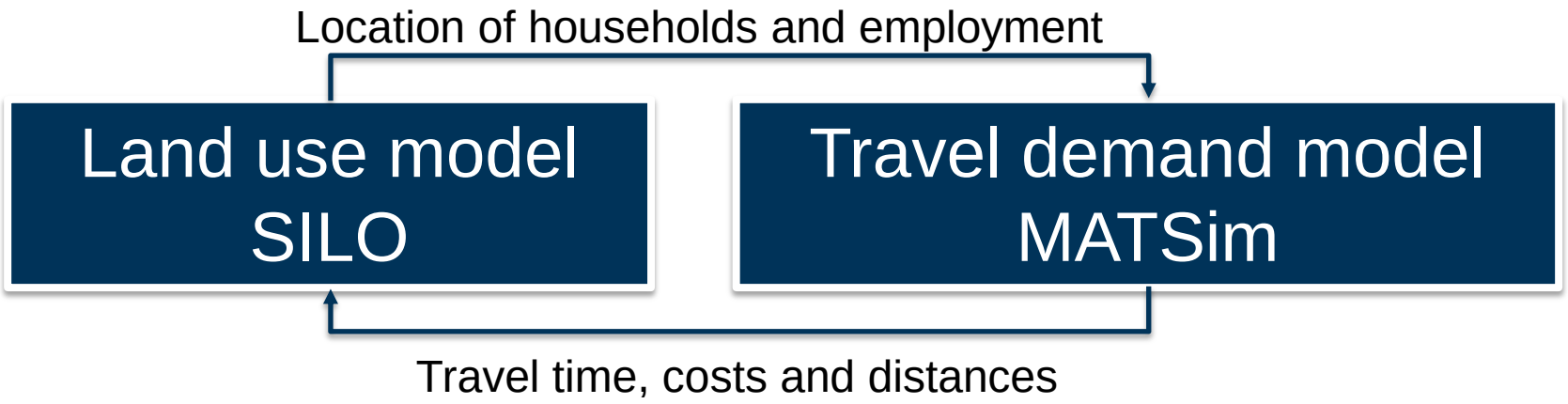
Commuting time and housing search





Future Development

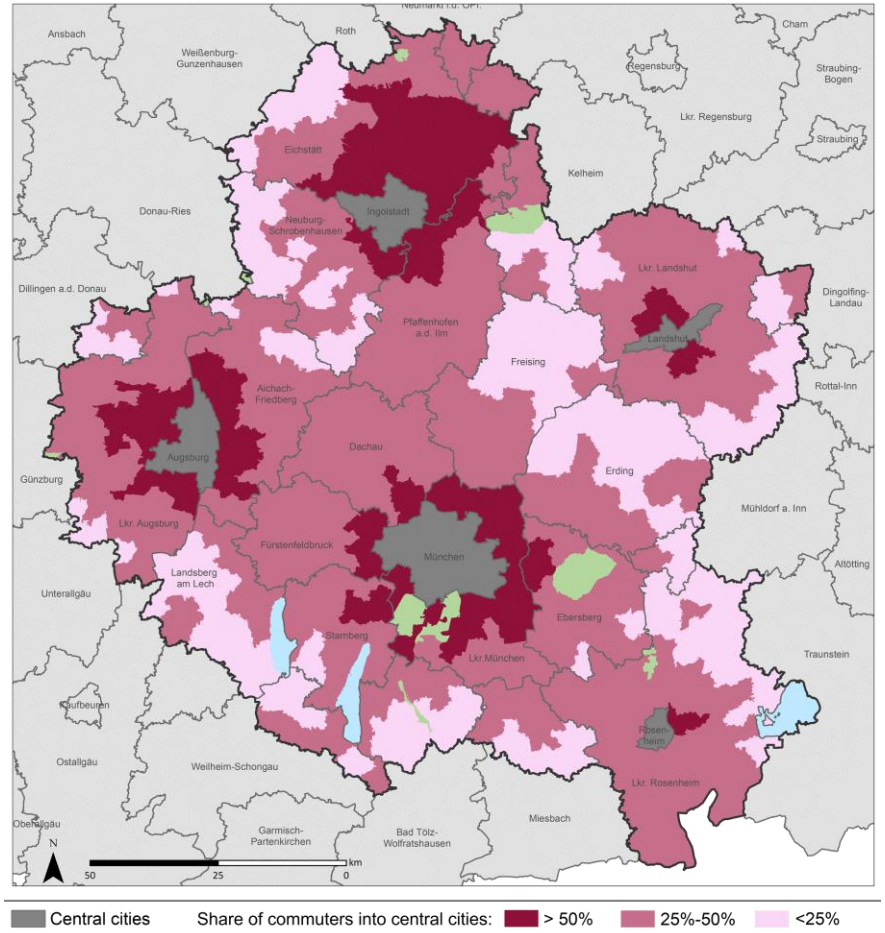
Integrated LUT Model



Idea

- Microscopic model integration
- Households will evaluate individual commute time, instead of aggregate accessibilities
- Additional attributes will be available for every traveler in MATSim

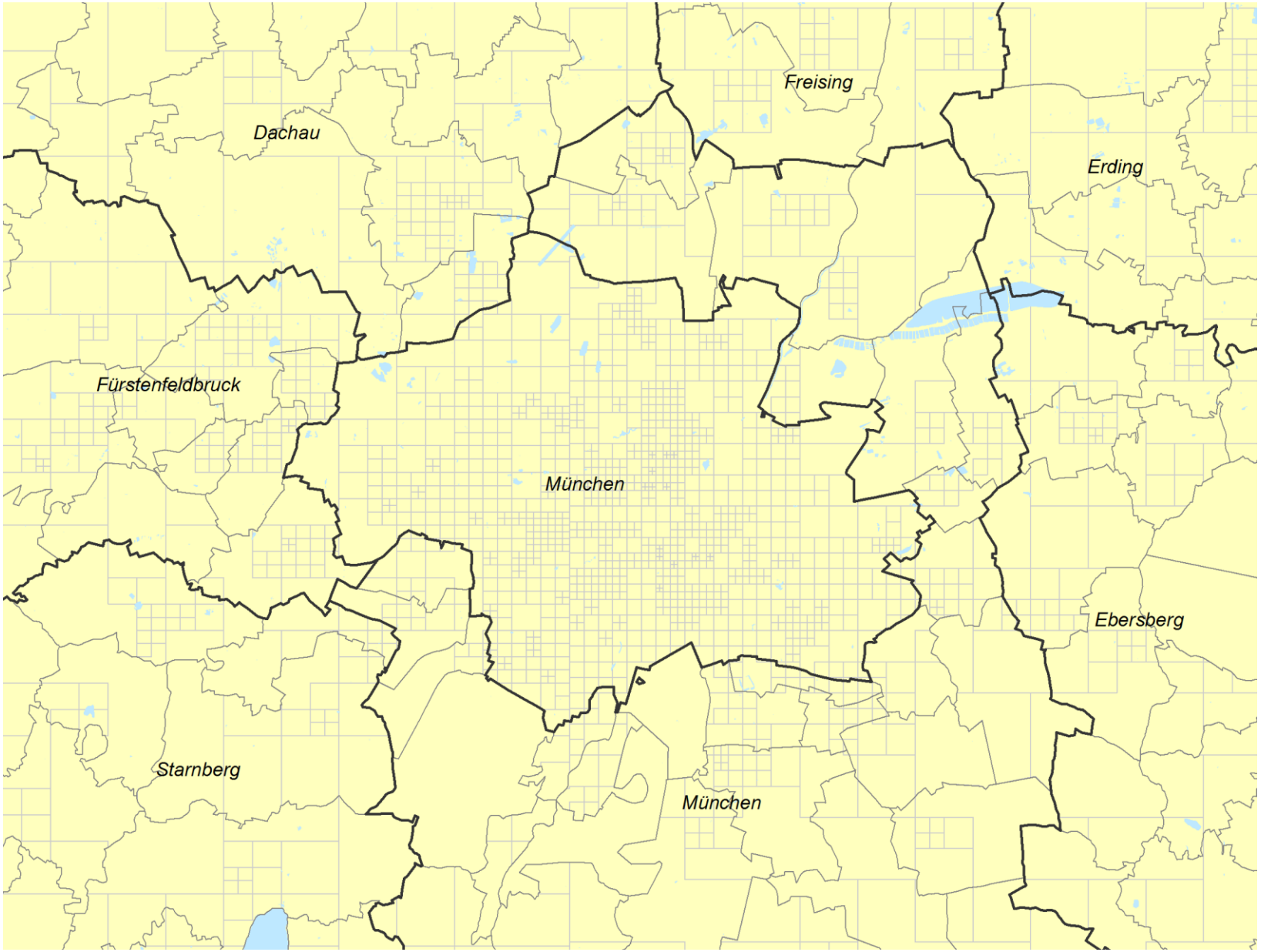
Munich Study Area



- Five central cities (Augsburg, Ingolstadt, Landshut, Munich and Rosenheim) and their suburbs
- Population: 4.5 million people living in 2.1 million households
- Region grows much faster than infrastructure investments

Raster cells for Munich Metropolitan Area

Raster cells for Munich Metropolitan Area



Final Remarks

Integration of land-use and transportation yields to more realistic model sensitivities.

Representation of constraints is crucial, particularly under high-congestion or high-costs scenarios.

Microscopic model integration is expected to provide more realistic individual utilities and constraints.