“It makes the commute that much easier.”

Maintaining Mobility in Substantial Urban Growth Futures

mobil.TUM 2016
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Urban growth in Portland, Oregon

Conder, Lawton
TRR 1805 (2002)
Traditional model integration

Land use model

- Dwellings
- Population
- Accessibilities
- Floorspace
- Employment

Travel demand model
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**
- move
- inmigrate/outmigrate
- aging
- child is born
- leave parental household
- get married/cohabitate
- get divorced/separate
- death
- change job
- change of income
- buy or sell cars

**Dwellings**
- build new dwellings
- renovate dwelling
- dwellings deteriorate
- demolish dwelling
- price adjustment
Modeling Constraints
Traditional land-use modeling

Location choice is based on utilities

\[ u_i = \alpha \cdot \text{size}_i + \beta \cdot \text{price}_i + \gamma \cdot \text{location}_i + \ldots \]

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.