UrbanSim DRCOG

How does a region develop over time?

UrbanSim represents how the regional real estate market is predicted to respond to a set of regulatory land use constraints and demand for new space, consistent with a regional forecast of population and employment.

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950,000 parcels of data

-Buildings

-People

-Regulatory Environment

-Constraints

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$$\frac{\partial}{\partial a}\ln f_{a,\sigma^2}(\xi_1) = \frac{(\xi_1 - a)}{\sigma^2}$$

$$\int_{\mathbb{R}_n} T(x)\cdot\frac{\partial}{\partial\theta} f(x,\theta)dx = \mathrm{M}\left(T(\xi)\cdot\frac{\partial}{\partial\theta}\ln L(\xi,\theta)\right)$$

$$\int_{\mathbb{R}_n} T(x)\cdot\left(\frac{\partial}{\partial\theta}\ln L(x,\theta)\right)\cdot f(x,\theta)dx = \int_{\mathbb{R}_n} T(x)\cdot\left(\frac{\frac{\partial}{\partial\theta}f(x,\theta)}{f(x,\theta)}\right)$$

$$\frac{\partial}{\partial\theta}\mathrm{M}T(\xi) = \frac{\partial}{\partial\theta}\int T(x)f(x,\theta)dx = \int_{\mathbb{R}_n}\frac{\partial}{\partial\theta}T(x)f(x,\theta)dx$$

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UrbanSim Theory

-UrbanSim combines urban economics, land use and real estate development theory into a series of models that can simulate individual choices.

-Discrete Choice models

-Pro-Forma models

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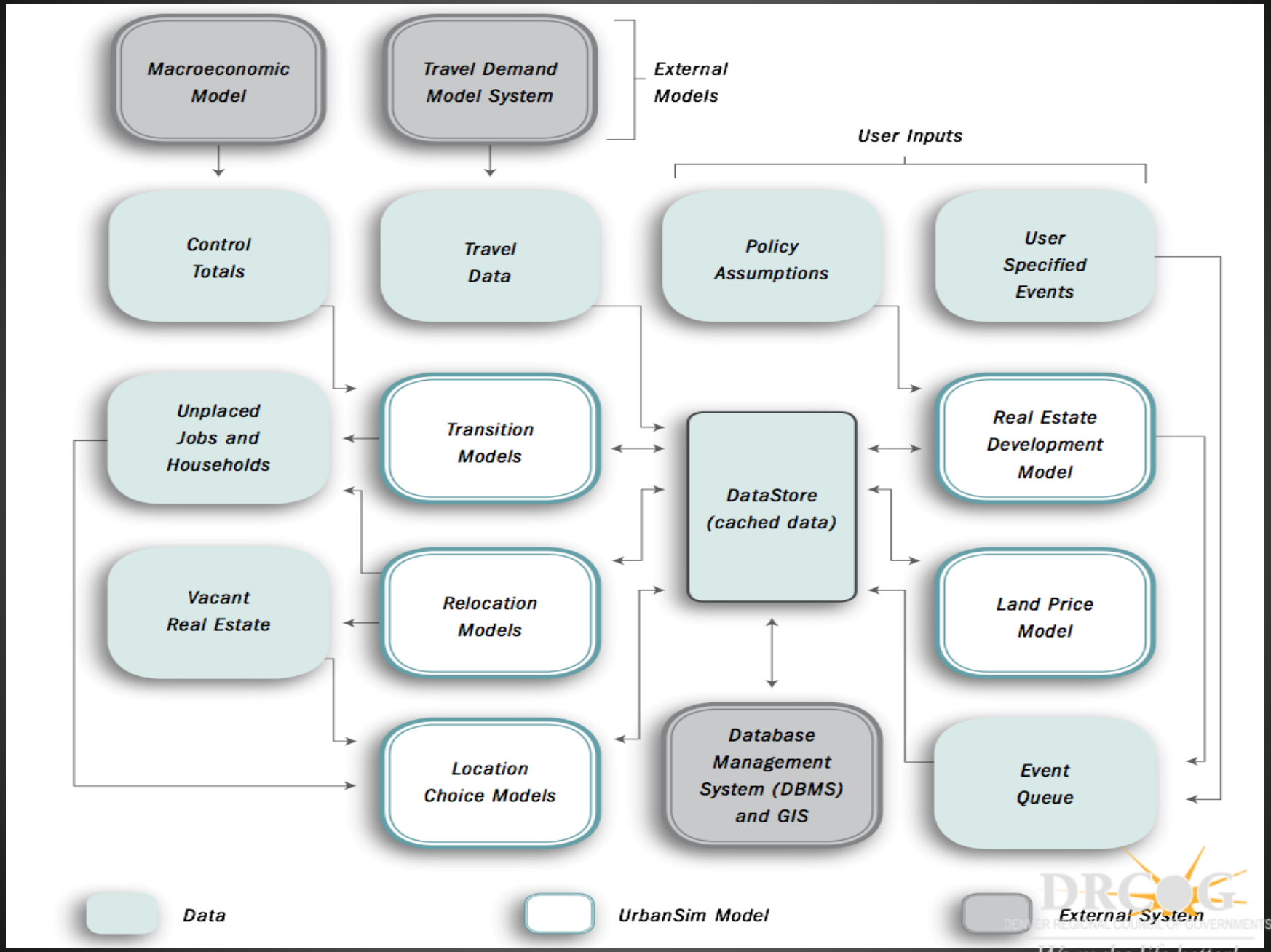

There are 3 economic agents in the UrbanSim model

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UrbanSim models the choices that households make

-Rent or own?

-Single family home, multifamily, apartment?

-Location choice within the region

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UrbanSim models choices of businesses in the region

-Where will new employees locate?

-Which existing businesses will choose to relocate within the region?

-Where will those businesses locate?

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Real estate developer's choices are modeled

-Supply/demand interactions produce price signals

-Every parcel in the region is sampled as a viable alternative

-Land prices, zoning and existing buildings help determine where the NPV will lead a developer to build

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UNION STATION
TRAVEL by TRAIN
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UrbanSim can account for future scheduled developments

-UrbanSim will build known, future projects as specified

-Involvement by member governments is a crucial step in the modeling process

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UNION STATION
UNION STATION
TheRide
108
RTD
FREE MallRide
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Interacts with Focus travel model

- UrbanSim and Focus can exchange information to reflect changes to the regional transportation plan over the forecast horizon

- Scenarios can be run to test various alternative transportation plans

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What if?

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Scenario analysis

- Transportation

- Subsidies, impact fees, financing

- TOD & Urban Centers

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Questions?

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