Regional Architectures: Institutions of the Metropolis

Day 4
11.953

Content

• Wrap-up from Last Lecture…
  – The “Future” of Travel Demand Modeling
  – Integrated LUT Models
• Regional Architectures
  – Governing Systems
  – Metropolitan Dynamics
  – Realms of Relevance
  – Challenges of Different Disciplines
  – Practical Possibilities for Moving Forward

Travel Demand Modeling - Promise

• Technology advances
  – Computing power, GIS
• Theoretical advances
  – Direct-demand models
  – Integrated transport-use models
  – Transport-Emissions modeling
  – Activity modeling and Microsimulation (TRANSIMS)
• Practical advances
  – Mode consideration
  – Lower-cost data collection methods
“Integrated” Urban (LUT) Models

- Attempt to replace the typical approach to land use forecasting (i.e., “professional judgment”, Trend-Delphi) with more robust representations of land use development
- Attempt to capture the natural relationship/feedback between land use and transportation
- First models date to 1960s (i.e., Lowry)

Land Use-Transport Models
General Schematic

- Land Use
  - Land Uses (Activities)
  - Prices
  - Land, Floor Space
- Spatial Distribution
- Transportation
  - Travel
  - Time Costs
  - Demand
- Transportation System
  - Demand

“Integrated” Urban Models

- Probably 12-15 “operational” integrated urban models around the world
- In the US, the 3 best known are ITLUP (DRAM/EMPAL), MEPLAN, TRANUS
  - Operational, commercially available, history of use, applied in US
  - DRAM/EMPAL: spatial interaction (Lowry-based)
  - MEPLAN/TRANUS: spatial input/output

Source: Miller et al., 1999.
“Integrated” Urban Models

- Other notable models:
  - MUSSA (U. de Chile): academic research, prototypical application, discrete choice
  - UrbanSim (U. of Washington): academic research, prototypical application, discrete choice/microsimulation, open source

Source: Miller et al., 1999.

Integrated LUT Models: General Observations

- All fall short of ideal
  - Excessive spatial aggregation
  - static equilibrium
  - aggregate household representation
  - lack of endogenous processes (demographics, auto ownership)
  - reliance on 4-step travel models
  - data intensive

Source: Miller et al., 1999.

Integrated LUT Models: General Observations

- Still, strengths and solid basis for evolution
  - Microeconomic formulations of land market
  - framework for dealing with land use-transport interaction
  - integration with “off-the-shelf” computing capabilities (i.e., GIS, disaggregated databases)
- New generation of models needed
  - Disaggregate, dynamic, non-equilibrium

Source: Miller et al., 1999.
Implications for Us

• We all use Models, both normative and positive
• Models can be powerful
• Models can be abused
• Know your models
  – Strengths and weaknesses
• Question your models
  – Assumptions
• Recognize that all modeling is an art

Regional Architectures

Relevant Dimensions

• Degree of Bureaucratic Centralization
• Degree of Territorial Consolidation
• Degree of Bureaucratic Professionalism
• Degree of Bureaucratic Autonomy
  – From political process
Influencing Factors

1. Governance Systems
2. Metropolitan Dynamics
3. Metropolitan Responsibilities
4. Conflicting Disciplines
5. Conflicting Interests
   - Public over Private
   - Local over Regional

“Caricatures” of Governing Systems

<table>
<thead>
<tr>
<th></th>
<th>Deconcentration (Local Admin)</th>
<th>Devolution (Local Govt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Origin/ Legitimacy</td>
<td>Arms of Central Government</td>
<td>Semi-autonomous</td>
</tr>
<tr>
<td>Broad Powers</td>
<td>Delegated powers</td>
<td>Elective powers</td>
</tr>
<tr>
<td>Oversight</td>
<td>Central Ministry control</td>
<td>Some oversight (some linked to $)</td>
</tr>
<tr>
<td>Decision-making autonomy</td>
<td>Directed by center</td>
<td>Elected local council</td>
</tr>
<tr>
<td>Revenue Mechanisms</td>
<td>Share of national taxes, some local</td>
<td>Grants, local taxes/ fees</td>
</tr>
</tbody>
</table>

Smoke, 1999.

The “caricatures” in practice

- Most places display a mixture of deconcentration and devolution
- Results can be confusing
  - Who has responsibility?
- Most metropolitan governments function at the “second tier”
  - through voluntary coordination among municipalities (e.g., typical US approach) or
  - through a political and institutional restructuring, with direct elections empowering metropolitan political authority (e.g., Toronto, Ontario).
Mexico City Metro Area: Number of Local Jurisdictions

<table>
<thead>
<tr>
<th>Year</th>
<th>DF</th>
<th>EM</th>
</tr>
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<tbody>
<tr>
<td>1950</td>
<td></td>
<td></td>
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<tr>
<td>1950-1960</td>
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<td>1960-1970</td>
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<td>1970-1980</td>
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<td>1980-1990</td>
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“Caricatures” of Conflicting Disciplines?

<table>
<thead>
<tr>
<th></th>
<th>Land Use</th>
<th>Transport</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objectives</td>
<td>Complex, Variable</td>
<td>Simpler and more Stable</td>
</tr>
<tr>
<td>Planning Techniques</td>
<td>Design Criteria</td>
<td>Standardized forecast tech.</td>
</tr>
<tr>
<td>Level of Government</td>
<td>Mostly Local</td>
<td>Higher-up</td>
</tr>
<tr>
<td>Horizons of Reliable Predictions</td>
<td>Shorter</td>
<td>Longer</td>
</tr>
</tbody>
</table>

Modified from Gakenheimer, 2005.
“Caricatures” of Conflicting Disciplines?

<table>
<thead>
<tr>
<th></th>
<th>Land Use</th>
<th>Transport</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementation Units</td>
<td>Small, Incremental</td>
<td>Large, indivisible</td>
</tr>
<tr>
<td>Implementation Budget</td>
<td>Private, Incremental</td>
<td>Public, unitary</td>
</tr>
<tr>
<td>Implementation Prospects</td>
<td>Lower</td>
<td>Higher</td>
</tr>
<tr>
<td>Perspective</td>
<td>Normative</td>
<td>Positive</td>
</tr>
</tbody>
</table>

Modified from Gakenheimer, 2005.

What Metropolitanism in Land Use?

- Role of typical regional “organization” (in US)
  - Source of population, economic and other relevant data and projections
  - Forums for coordinating local government plans
  - Occasionally with powers to enforce planning and implementation
  - Typically created by state governments
  - Organized as “councils” of local governments
  - May produce metro-level (broad brush) land use plans
    - Typically patched together from local plans (remember who the members typically are…)

Challenges to the Metro Land Use Agencies

- Advisory role
- Generally “behind the times”
  - That is, unable to keep up with local government plans and Metropolitan spatial evolution
- Decisions held “hostage” to local government interests
- Ultimately, the individual takes precedent over the region…
What Metropolitanism in Transport?

• In some sense, the inverse of land use
• At local government level
  – Local capital improvement plans, in practice often fall short of needs
  – Developers have important influence
  – Need to turn to higher levels of government for resources
    • State, Federal

Metropolitan Transportation Agencies

• In US: MPO
  – Empowered by Federal (since 1962) law to coordinate state and local actions
  – Generally, no implementing power
• States still play a large role
• In the end suffer from same problems as their land use counterparts
• Lack of funding is chronic concern…

LUT Interaction Leverage Points in Metropolis

1. MPO forecasts for region (demographic, economic, transport, etc.) crucial mechanism for coordination
   – Local governments, however, prefer their “own destiny”
   – Forecasts often reflect the local plans (thus, not really forecasts)
   – LUT “chicken and egg”
     • Local governments plan land uses on expected transportation initiatives.
LUT Interaction Leverage Points in Metropolis (cont)

2. Local and Regional Plan “synthesis”
   – Offers metropolitan agencies chance to provide framework for local plans.
   – Again, local governments, however, prefer their “own destiny”…
   – Again, plans often reflect the local plans (thus, not really regional plans)
   – MPO has slightly stronger influence
     • Due to its responsibilities in the transport planning process

LUT Interaction Leverage Points in Metropolis (cont)

3. Feedback
   – Possibility for regional agencies to feed regional analysis results back to local jurisdictions
   – Challenged by staffing, time and resource shortfalls
   – Again, rarely any real incentive for local governments to modify their plans
   – Local governments may not even know of neighboring jurisdictions’ plans

Does a “solution” to metropolitan governance exist?

Of course not…
• We can hope for incremental improvements
• Challenges rest in balancing planning, provision, enforcement
  – Among local, regional, national

Remember, we need to:
• Account for some variation in constituent preferences (i.e. “Tiebout” sorting); and
• aim to prevent inefficient competition across municipalities; and
• control for “spillovers” (such as traffic).
Towards a “Regional Architecture” for LUT Metropolitan Governance

• Effectiveness requires:
  – strong political legitimacy (through direct elections);
  – autonomy from higher and lower levels of governments (financial and human resources);
  – Relevant territorial coverage

Lefèvre (1998)

Towards a “Regional Architecture” for LUT Metropolitan Governance

   and

2. Defining a Metropolitan Constituency

Towards a “Regional Architecture” for LUT Metropolitan Governance

3. Improving knowledge of regional models
   • What works institutionally Porter (1991)
   • What works analytically
     Sacramento Model “test bed”
     • TRANUS, MEPLAN,
     SACMET/ITLUP
     UrbanSIM
Towards a “Regional Architecture” for LUT Metropolitan Governance

4. Improving Programmatic and Regulatory Techniques
   a. Incentives “from above”
   b. Public Finance Reforms...
      • To eliminate competition for investment
      • To more equitably distribute costs of economic growth and public infrastructure investments
      • To counteract poverty concentration

E.g.:
   • Twin Cities (Minneapolis-St. Paul, MN): ~ 20% of locally-collected taxes transferred to regional tax pool for redistribution
   • Denver (CO), Pittsburgh (PA): Regional Asset Districts, suburbs contribute to center-city infrastructure