Land Use
Transport
Access, and
Value

David Levinson
RP Braun/CTS Chair, University of Minnesota
Access = Land Use x Transport

\[ Accessibility_i = \sum_j (Opportunities_j \ast f(Cij)) \]
We can make this as simple or complicated as we like.
Which opportunities?
Which cost \((C_{ij})\)?
Which function $(f)$
We don’t need to decide arbitrarily

The market tells us
The only reason to locate anywhere in particular is:

- to possess resources (mining, farming, etc.)
- to be near something(s)
- to be far from something(s)
Since few of us own mines, especially in the city
The value of land is determined by its proximity to everyone and everything else.
Access creates Value
We measure that value by looking at the price of land.
Price per \(m^2\) = \(f(\text{Access, Quality, Structures})\)

Structures = \(f(\text{Price})\)
Hedonic models let us decompose this

e.g. Each additional job within 20 minutes adds $0.25 to price of a single family home on average in the Twin Cities (all else equal).

- additional job = Opportunity$_j$
- within 20 minutes = f(C$_{ij}$)
Cities are positive feedback loops in space.
Figure 4: Transportation and the Montgomery County Growth Management System
Transportation and Land Use are Interdependent Shapers of Urban Form
In London

Rail causes (precedes and is positively and statistically related to) suburban residential development. Induced Demand

Development causes (precedes and is positively and statistically related to) rail infrastructure. Induced Supply
In Minnesota

Transportation creates access.

Access creates value.

Landowners receive value.

Insufficient funds for capital investment in transportation.

Landowners receive less value.
Value can be used to fund Transport
Twin Cities Streetcars
Closing the feedback loop in Minnesota

Transportation creates access.

Access creates value.

Landowners receive value.

Fraction of value is captured by infrastructure funding organizations to fund transportation.

Landowners receive more value.
## Models of Provision

<table>
<thead>
<tr>
<th></th>
<th>Government built</th>
<th>Developer Built</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Publicly Funded</strong></td>
<td>Traditional “free roads”, gas tax</td>
<td>“free roads” with shadow tolls, gas tax</td>
</tr>
<tr>
<td><strong>Developer Funded</strong></td>
<td>Impact fees, special assessment, exactions, proffers land value tax</td>
<td>Road clubs, joint development</td>
</tr>
<tr>
<td><strong>User Funded</strong></td>
<td>Toll roads</td>
<td>Private toll roads (PPP)</td>
</tr>
</tbody>
</table>
Questions?

Planning for Place and Plexus

dlevinson@umn.edu

The Transportation Experience

Access to Destinations

nexus.umn.edu