Is The Current Urban Transport Model Broken?

Jeffrey Gutman
Senior Fellow
Brookings Institution
Key Points

• Social equity is missing from sustainable urban transport dialogue.
• There is a lack of a common definition/measure of urban access across disciplines.
• Addressing urban access faces serious practical challenges in implementation.
Defining Urban Transport Access
Quality of Mobility

• Reflects the quality of the transport network in terms of the level of congestion, average speeds, and other measures related to the flow of traffic.

• Measure typically used in the economic and technical appraisal of transport investments.
Access to Transport

• Reflects the physical accessibility of the transport network such as the average distance between a household and a road or a transit station.

• A typical measure is the percentage of households within 15 walking minutes of a bus stop or transit station.
Access to Opportunities

• Directed at measuring how well connected are individuals to employment, services, or commerce.

• Simplest form can be represented by the number of jobs or schools or clinics are within a given radius of a specific household.

• What is distinctive about this broader concept of urban accessibility is that it encompasses both changes in mobility as well as changes to land use.

• Recognizes that mobility is not sufficient alone. Besides building more infrastructure, access can be improved by facilitating the location of a school or clinic closer to a neighborhood, or housing closer to employment.
Measuring Access
Quantitative Approach

- **Isochronic Measures**: A measure expressed as a cumulative count of opportunities (e.g., employment, schools, hospitals, etc.) reachable within a threshold of travel time or distance or generalized cost (combined travel time and cost).

\[ A_{im} = \sum (E_j) \text{ within } T_{ijm} \]

Where; \( A \) = Accessibility Index; \( E \) = opportunity mass (e.g., number of jobs or workers) \( T \) = generalized cost or travel time; \( i \) = location of households or firms; \( j \) = desired destination of opportunities (e.g., zone of employment, retail businesses or public amenities), mode of travel (car, bus, walk, truck, etc.); and \( a \) = estimated impedance coefficient which reflects travelers’ or firm’s perception of increase in time or cost or distance of travel. Usually people perceive longer trips less favorably.
## Rank of Accessibility by Metropolitan Area

### 2010 vs 2015

<table>
<thead>
<tr>
<th>Rank</th>
<th>Metropolitan Area</th>
<th>2010 Rank</th>
<th>Metropolitan Area</th>
<th>2015 Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>New York</td>
<td>1</td>
<td>Los Angeles</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Los Angeles</td>
<td>2</td>
<td>San Francisco</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Chicago</td>
<td>3</td>
<td>New York</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>Dallas</td>
<td>4</td>
<td>Chicago</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>San Jose</td>
<td>5</td>
<td>Dallas</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>San Francisco</td>
<td>6</td>
<td>San Jose</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>Washington</td>
<td>7</td>
<td>San Francisco</td>
<td>7</td>
</tr>
<tr>
<td>8</td>
<td>Washington</td>
<td>8</td>
<td>Houston</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td>Boston</td>
<td>9</td>
<td>Boston</td>
<td>9</td>
</tr>
<tr>
<td>10</td>
<td>Houston</td>
<td>10</td>
<td>Philadelphia</td>
<td>10</td>
</tr>
<tr>
<td>11</td>
<td>Miami</td>
<td>11</td>
<td>Miami</td>
<td>11</td>
</tr>
<tr>
<td>12</td>
<td>Minneapolis</td>
<td>12</td>
<td>Minneapolis</td>
<td>12</td>
</tr>
<tr>
<td>13</td>
<td>Phoenix</td>
<td>13</td>
<td>Phoenix</td>
<td>13</td>
</tr>
<tr>
<td>14</td>
<td>Detroit</td>
<td>14</td>
<td>Detroit</td>
<td>14</td>
</tr>
<tr>
<td>15</td>
<td>Denver</td>
<td>15</td>
<td>Denver</td>
<td>15</td>
</tr>
<tr>
<td>16</td>
<td>Baltimore</td>
<td>16</td>
<td>Baltimore</td>
<td>16</td>
</tr>
<tr>
<td>17</td>
<td>San Diego</td>
<td>17</td>
<td>San Diego</td>
<td>17</td>
</tr>
<tr>
<td>18</td>
<td>Kansas City</td>
<td>18</td>
<td>Las Vegas</td>
<td>18</td>
</tr>
<tr>
<td>19</td>
<td>Atlanta</td>
<td>19</td>
<td>Atlanta (28 in 2010)</td>
<td>19</td>
</tr>
<tr>
<td>20</td>
<td>Seattle</td>
<td>20</td>
<td>Seattle</td>
<td>20</td>
</tr>
<tr>
<td>21</td>
<td>Salt Lake City</td>
<td>21</td>
<td>Salt Lake City (27 in 2010)</td>
<td>21</td>
</tr>
<tr>
<td>22</td>
<td>Milwaukee</td>
<td>22</td>
<td>Milwaukee</td>
<td>22</td>
</tr>
<tr>
<td>23</td>
<td>Orlando</td>
<td>23</td>
<td>Orlando</td>
<td>23</td>
</tr>
<tr>
<td>24</td>
<td>Columbus</td>
<td>24</td>
<td>Columbus</td>
<td>24</td>
</tr>
<tr>
<td>25</td>
<td>Portland</td>
<td>25</td>
<td>Portland (31 in 2010)</td>
<td>25</td>
</tr>
</tbody>
</table>

Source: “Access Across America” by David Levinson. Note: Weighted Average is an average of accessibility rankings, giving a higher weight to closer jobs.
Accessibility & CBA
Cost Benefit Analysis Basics

- **Benefits**
  - Vehicle Operating Cost Savings
  - Travel Time Savings
  - Safety Improvement
  - Polluting Emissions Reduction

- **Costs**
  - Initial Investment Costs
  - Operating and Maintenance Costs
Multi-Criteria Analysis

- MCA presents the performance level of each project alternative in achieving a number of pre-set objectives.

- The attainment of objectives can be measured in a number of ways, such as a measured quantity, qualitative assessment, or rating.
  
  » A score, typically in a scale between 0 and 100, is assigned to each impact (or criteria) of a project.

  » The overall performance of a project is estimated by multiplying each impact score by a relative weight given to that impact and then summing over all impacts.

- The main advantage of MCA methods is their ability to incorporate impacts (or criteria) which cannot easily be expressed in monetary value (e.g., environmental and socio-economic impacts, bicycle and walk accessibility constraints).
Access in Lima

- The east – west metro line 2 of Lima city will connect its poorest districts in the east to the western concentration of jobs, services and amenities.

- In the 13 districts of the direct area of influence, 32% of the population can be characterized as either poor or vulnerable facing severe accessibility constraints to jobs and services.

- On average users of the proposed corridor will experience 34% gain in travel time without significant increase in travel cost.

- Using a 60 minute one way travel time radius to define potential employment opportunities for the average household, implications are measured for the different districts with a number of targeted districts showing as much as a 25% increase in job employment opportunities compared to the without project scenario.

-World Bank Analysis
Access in Lima
Land Use Challenges to Accessibility
Making Room for a Planet of Cities

• As world population doubles in 43 years, urban land cover will double in 19 years

• Developing countries urban population will double from 2000 – 2030 while built up area will triple

-Angel et al
Average Built-Up Area Densities in Three World Regions
Density Differences

- Dhaka, Bangladesh
  - 555 persons per hectare
- Hong Kong
  - 555 persons per hectare
- Takoma, Washington
  - 15.7 persons per hectare
Implications for density decline in metropolitan America

- Between 2000 and 2012, the number of jobs within the typical commute distance for residents in a major metro area fell by 7 percent.

- As employment suburbanized, the number of jobs near both the typical city and suburban resident fell.

- As poor and minority residents shifted toward suburbs in the 2000s, their proximity to jobs fell more than for non-poor and white residents.

- Residents of high-poverty and majority-minority neighborhoods experienced particularly pronounced declines in job proximity.

- Kneebone & Holmes
Change in Number of Jobs Near the Typical Large-Metro Resident, by Race, Ethnicity, and Poverty Status, 2000 and 2012
Cars Remain King and Barrier to Economic Opportunity in the US

- 2013 Census numbers show 6.3 million workers don’t have a private vehicle at their home. That’s equal to about 4.5% of all workers, compared to 4.2% in 2007

- Yet, zero-vehicle workers still drive
  - Over 20% drive alone to work—meaning they find a private car to borrow
  - Another 12% commute via carpool
  - Both rates jumped between 2007 and 2013, defying national trends toward less driving
  - This paints a discouraging picture about transportation access across the country for a segment of commuters who must expend extra effort to simply get to work.

-Tomer & Kane
“We need to prepare for the sustainable growth and expansion of cities in rapidly urbanizing countries rather than seek to constrict and contain them.”

-Angel et al
Are We Chasing Our Tail?
The Issue of Gentrification
What is gentrification?

• “Gentrification is a pattern of neighborhood change in which a previously low-income neighborhood experiences reinvestment and revitalization, accompanied by increasing home values and/or rents.”

-Pollack et al
Elements in defining impact of gentrification

• Whether “poor” households are involuntarily subjected to the costs of moving through displacement at higher rates

• Whether poor households spend more on housing

• Where increased housing costs are offset by increases in household income

• Whether the poor receive more or better quality housing in exchange for higher payments

• Whether the poor become more satisfied with public services or neighborhoods in urban areas marked by gentrification

• Whether the forces underlying gentrification can be attributed to changes in the preferences of the wealthy households or to shifts in the income distribution

-Vigdor
Effects of Transit on Neighborhood Change

• Socioeconomic change in 42 neighborhoods in 12 metropolitan areas first served by rail transit between 1990 and 2000

• Comparing changes in transit neighborhoods versus changes in the broader metropolitan area

• Measure: % of neighborhoods with higher change for each variable

Median Household Income Change in Transit Rich Neighborhoods
Total Housing Units Change in Transit Rich Neighborhoods
Non-Hispanic White Population Growth Change in Transit Rich Neighborhoods
Median Gross Rent Change in Transit Rich Neighborhoods
In-Migration Change in Transit Rich Neighborhoods
Is this our choice?

“Either make the transit investment and accept loss of neighborhood diversity as collateral damage, or avoid transit expansion projects serving diverse, lower-income neighborhoods and leave those residents with poor public transit or none at all.”

-Pollack et al
Breaking the Cycle of Unintended Consequences in Transit-Rich Neighborhoods
Going Forward
Key Elements for Implementation

- Developing Clear Definition and Measures of Accessibility
- Applying an Accessibility Lens on Urban Transport and Land Policies including evaluation of funding and financing instruments
- Facilitating Inter-Disciplinary Approaches/Coordination
- Pursuing New Models for Horizontal/Cross Municipal Governance
Fiscal and Financial Affairs

Urban Planning

Transportation
Horizontal governance challenges

- Growing acceptance that local governments must recognize the network economies of transport and have organized entities that manage or oversee transport across municipalities.

- However not much support for joining finance instruments and tax authority to fund such investments and services.

- Nor is there much desire to delegate land use control to other entities outside the municipality or for requiring transportation and budgeting departments to make land use decisions in concert with the urban land department.

- Without a cross-municipal or metropolitan approach that includes funding and land use, there is a crucial governance gap in promoting accessibility.
THANK YOU!