SUBURBAN LAND USE AND TRANSIT IN MEXICO CITY

TRANSIT & CITIES
PAST, PRESENT, FUTURE
(MARCH, 2014)

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PRESENTATION OUTLINE

OVERVIEW AND TRENDS
Suburbanization
Transit

POLICY INTERVENTIONS
Reorienting Growth
Urban Design
Transit Investments
Improving Informal Transit

MEXICO CITY METROPOLITAN AREA
SUBURBANIZATION IN MEXICO CITY

RAPID SUBURBANIZATION

Mexico City: Millions of People per Urban Ring (1950 to 2010)

Source: Mexico Population Census, INEGI
MOSTLY DENSE INFORMAL URBANIZATION

Nezahualcoyotl, Edo. Mex.  Livingston, NJ

AVERAGE ANNUAL POPULATION GROWTH RATES (2000 – 2010)
SHIFT IN SUBURBAN HOUSING PRODUCTION

View from Ecatepec Station, 15km northeast of downtown

Los Héroes de Ecatepec, 25km northeast of downtown

SUBURBAN COMMERCIAL HOUSING DEVELOPMENTS

Municipality of Ixtapaluca

• Fastest increase in gross neighborhood population density: 48 to 131 people per hectare (1990 to 2005)

• Average annual population growth rate of 12% (1990 to 2010)

• Approved eight commercial housing developments, containing 68,625 units (1992 and 2002)

• That is three-quarters of all new housing units between 1990 and 2010, and twice the number between 1990 and 2000
VEHICULAR MODE SHARE

Federal District

Outside of Federal District

Proportion of trips by car
Proportion of trips by transit


METRO EXPANSION & RIDERSHIP

System length (km)
Annual boardings (millions)
GEOGRAPHY OF METRO SERVICE AND USE

METRO FEEDER SERVICE
GEOGRAPHY OF COLECTIVO USE

IMPROVING THE SUBURBAN LAND USE AND TRANSIT CONNECTION
**MOTIVATION: CONGESTION AND SUSTAINABILITY**

<table>
<thead>
<tr>
<th></th>
<th>Federal District</th>
<th>Outside of Federal District</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Average Car Speed</strong></td>
<td>14 12.1</td>
<td>13.5 14.8</td>
</tr>
<tr>
<td><strong>Millions of weekday VKT</strong></td>
<td>15.3 14</td>
<td>10.3 17.1</td>
</tr>
</tbody>
</table>

**MOTIVATION: EQUITY AND THE ECONOMY**

<table>
<thead>
<tr>
<th></th>
<th>Federal District</th>
<th>Outside Federal District</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Average Monthly income (thousands of pesos)</strong></td>
<td>12 9</td>
<td>4.5 7.9</td>
</tr>
<tr>
<td><strong>Average expenditures per transit trip</strong></td>
<td>54 65</td>
<td>54 65</td>
</tr>
<tr>
<td><strong>Average travel time by transit</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
MOTIVATION: EQUITY AND THE ECONOMY

Work commutes only

Average expenditures per transit trip

- Federal District: 5.0
- Outside Federal District: 8.5

Average travel time by transit

- Federal District: 57
- Outside Federal District: 79

1) REORIENTING SUBURBAN GROWTH
URBAN FORM AND VKT GENERATION

VKT Elasticity Estimations

- Population density
- Jobs per hectare
- Within a kilometer of a major highway
- Within a half kilometer of transit
- Intersections per hectare

CHALLENGES

VKT Elasticity Estimations

- Kilometers to downtown
- Car accessibility
- Destination diversity
CHALLENGES

Growth has slowed
Projected to increase from 20 million to 21 million by 2025

Land prices much higher in central locations

2) IMPROVING URBAN DESIGN
CAR USE IN NEW SUBURBAN DEVELOPMENTS

Municipality of Ixtapaluca

Households in Ixtapaluca and Tecamac

<table>
<thead>
<tr>
<th></th>
<th>Traditional Development Mean</th>
<th>Commercial Housing Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cars per household</td>
<td>0.39</td>
<td>0.61</td>
</tr>
<tr>
<td>Average daily VKT</td>
<td>6.0</td>
<td>15.6</td>
</tr>
<tr>
<td>Monthly income (in pesos)</td>
<td>$7,431</td>
<td>$8,678</td>
</tr>
<tr>
<td>People per hectare in Census Tract</td>
<td>107</td>
<td>204</td>
</tr>
</tbody>
</table>

Average household in commercial development has 64% higher odds of owning a car after controlling for income and other household attributes.

LIMITED ROAD NETWORKS
POOR TRANSIT CONNECTIONS

WIDER STREETS AND UBIQUITOUS PARKING
3) EXPANDING HIGH CAPACITY TRANSIT INTO THE SUBURBS

LINE B INVESTMENT

Two phases in 1999 and 2000

24 Kilometers (15 miles)

Into neighborhood with 85 people per gross acre

$1.3 billion USD
LINE B INVESTMENT

BEFORE AND AFTER LAND USE AND TRAVEL BEHAVIOR MEASURES AT SIX GEOGRAPHIC SCALES
SUMMARY OF FINDINGS

- Primary influence of Line B has been localized around stations with some spillover in Ecatepec.
- Faster, less expensive public transit (2 pesos and 1.5 minutes saved per trip) compared to 1 peso and 3 minute increase in the rest of the state.
- Increased mode share coming from Colectivos. Limited to no impact on car travel or road speeds.
- Localized increase in residential density.

HOUSEHOLD LOCATION OF LINE B USERS
NON-HOME DESTINATIONS OF LINE B USERS

4) IMPROVING EXISTING SUBURBAN TRANSIT
**INCREASE IN SUBURB-TO-SUBURB TRAVEL**

Geography of trip patterns

<table>
<thead>
<tr>
<th></th>
<th>1994</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal to Federal</td>
<td>0.55</td>
<td>0.47</td>
</tr>
<tr>
<td>State to State</td>
<td>0.22</td>
<td>0.30</td>
</tr>
<tr>
<td>State to Federal</td>
<td>0.20</td>
<td>0.19</td>
</tr>
<tr>
<td>Federal to State</td>
<td></td>
<td>0.03</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.03</td>
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**PERCENT OF DAILY TRIPS TO THE URBAN CENTER**

<table>
<thead>
<tr>
<th></th>
<th>All trips</th>
<th>Journey-to-work trips</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Millions of trips</td>
<td>Millions of trips</td>
</tr>
<tr>
<td>1994</td>
<td>5.3</td>
<td>2.0</td>
</tr>
<tr>
<td>2007</td>
<td>4.3</td>
<td>2.0</td>
</tr>
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GEOGRAPHY OF RECENT JOB GROWTH

EMBRACING INFORMAL TRANSIT
THANK YOU
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VISUALIZATION OF TRAVEL BY ECATEPEC RESIDENTS
<table>
<thead>
<tr>
<th>Metrobus</th>
<th>Length (km)</th>
<th>Daily passengers</th>
<th>Passengers per km</th>
<th>Opening</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metrobus 1</td>
<td>30</td>
<td>440,000</td>
<td>14,667</td>
<td>2005</td>
</tr>
<tr>
<td>Metrobus 2</td>
<td>20</td>
<td>170,000</td>
<td>8,500</td>
<td>2009</td>
</tr>
<tr>
<td>Metrobus 3</td>
<td>17</td>
<td>140,000</td>
<td>8,235</td>
<td>2011</td>
</tr>
<tr>
<td>Metrobus 4</td>
<td>28</td>
<td>50,000</td>
<td>1,786</td>
<td>2012</td>
</tr>
</tbody>
</table>
RECENT PROTESTS AGAINST FARE INCREASE

Source: http://www.chinadaily.com.cn/photo/2013-12/13/content_17173352.htm