BRT SYSTEMS and SOCIAL INCLUSION

Impact on access to jobs and housing in the Lima metropolitan area

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Low income populations tend to live in the peripheries

Low quality and lack of infrastructure

– Expensive commute
– Lack of access to affordable and efficient transportation

Reduced access to jobs and other economic opportunities
Project Goals

Reduce travel time

Reduce emissions and accidents

Improve low income population mobility
Study Objectives

Estimate the impact of Lima’s BRT on:
1. Accessibility
2. Jobs
3. Housing property values

Among the lowest income groups that live under the system’s influence
Previous Study Summary

Low income populations have less coverage than the middle class
- 46% of the population is middle class
- 32% is low income
- Only 4% is population living in extreme poverty

Use BRT to travel to downtown (72%) and work commutes (12 pp increase)

It is more affordable for trips from the periphery to downtown (14% v. 15% of monthly income)
Lima’s system is not affordable for poor when taking into account forgone trips.

Affordability threshold = 10-20% of income
POTENTIAL ACCESSIBILITY ANALYSIS

The sum of accessible opportunities in each area is based on trip cost

\[ A_i^m = \sum_j O_j e^{-(\beta_i^m \cdot c_{ij})} \]

Costs (time & money)

Jobs

The sum of accessible opportunities in each area is based on trip cost
Treatment: 14,012 personas
Control: 30,514 personas

July 2010 trunk
Jan 2011 Feeders

Difference – in - Difference
Jobs Variables Analyzed

- Job status
- Formal employment
- Working hours
- Subemployment
- Earnings
- Employer company size
- Type of contract
Percentage of Jobs in Lima within BRT influence

- **Trunk stations**: 22%
- **North feeder**: 24%
- **South feeder**: 14%

- 500 meters:
  - Trunk stations: 5%
  - North feeder: 2%
  - South feeder: 2%

- 1000 meters - 500 meters:
  - Trunk stations: 2%
  - North feeder: 3%
  - South feeder: 2%

- 1500 meters - 500 meters:
  - Trunk stations: 2%
  - North feeder: 2%
  - South feeder: 2%
## Accessibility ratio 2011/2004

<table>
<thead>
<tr>
<th>Income level</th>
<th>Treatment</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Income</td>
<td>0.80</td>
<td>0.68</td>
</tr>
<tr>
<td>Low Income</td>
<td>0.80</td>
<td>0.85</td>
</tr>
</tbody>
</table>

(Metropolitan area only)

<table>
<thead>
<tr>
<th>Income level</th>
<th>Treatment</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>High income</td>
<td>1.10</td>
<td>0.87</td>
</tr>
<tr>
<td>Low income</td>
<td>1.21</td>
<td>0.91</td>
</tr>
</tbody>
</table>
Summary of Job Impacts of Households Living within 500 meters of BRT Corridor

Percentage points

- Increase formal employment: +6.9 **
- Sub-employment*: -8.0 (10% level)
- Increase formal contract*: +6.1
- Small businesses employment: -5.6**

No impact on employment, hours, or tenure

*truck corridor area only
** after 2011