DISCUSSION

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WORKSHOP ON USING PAYMENT INNOVATIONS TO IMPROVE URBAN TRANSPORTATION NETWORKS
JUNE 12, 2007
Federal Reserve Bank &
CHICAGO METROPOLIS 2020
OTHER ROUTES ON NETWORK

CHOICES ON CSR-91 TEN MILE STRETCH

GENERAL LOW-TOLL LANES

EXPRESS HIGH-TOLL LANES
• If travelers care about reliability, they should be risk averse. But in the study they are treated as implicitly risk neutral. This requires further study.

• Do congestion tolls make traffic more or less reliable? Congestion is stochastic and as it increases traffic should fluctuate more. Tolls reduce congestion, improve reliability?
Significance of Study

• Shows importance of knowing distribution of income (VOT) in calculating tolls.

• Demonstrates unequal effects of congestion tolls according to income.

• Leads to insights on implementation by public vs. private operators.
How tolls will be set?

- We need to know the income distribution on the road to set tolls correctly. Otherwise tolls would only capture a small part of potential benefits.

- Is it appropriate to use an econometric model to calculate the tolls people should pay?

- If not, then how will we realize the effect of the income distribution on the tolls we set?
HOV, HOT may not be optimal

- These solutions need not be used. Uniform tolling of lanes is better from perspective of economic efficiency.

- **BUT**, private road operators would use HOV, HOT solutions to get better revenue.
<table>
<thead>
<tr>
<th>Alternative Tolling Schemes</th>
<th>REVENUE/PER.</th>
<th>SURPLUS/PER.</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOV</td>
<td>$ 0</td>
<td>$ 2.11</td>
</tr>
<tr>
<td>HOT</td>
<td>$ 0.24</td>
<td>$ 2.01</td>
</tr>
<tr>
<td>ONE-RTE.</td>
<td>$ 1.64</td>
<td>$ 0.50</td>
</tr>
<tr>
<td>TWO-RTE.</td>
<td>$ 5.35</td>
<td>$-2.36</td>
</tr>
<tr>
<td>TWO-HOT</td>
<td>$ 1.81</td>
<td>$ 0.98</td>
</tr>
<tr>
<td>2-HOT.LTD.</td>
<td>$ 1.05</td>
<td>$ 1.36</td>
</tr>
</tbody>
</table>
# Two-Route Toll Policy

(Best of Those Tried)

Sample median income = $46,250

<table>
<thead>
<tr>
<th>Type of Lane</th>
<th>Toll (One Way)</th>
<th>Travel Time (One Way)</th>
<th>Trips Per Year</th>
<th>Toll Per Year</th>
<th>Toll as Percent of Median Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Express</td>
<td>$10.14</td>
<td>11.6 min</td>
<td>500</td>
<td>$5,070</td>
<td>10.9%</td>
</tr>
<tr>
<td>General</td>
<td>$8.16</td>
<td>12.8 min</td>
<td>500</td>
<td>$4,080</td>
<td>8.8%</td>
</tr>
</tbody>
</table>

**Revenues from the Toll**

\[(5.35/\text{Person} \times 500) = 2,675\]

**Consumer Surplus from the Toll**

\[(-2.36/\text{Person} \times 500) = -1,180/\text{Person}\]
Income effects

• How will the consumer economize to partially offset the financial burden of the tolls?
How will travelers react?

Substitution effects cause:
- Choose lane type/change route
- Switch to public transit

Income effects cause:
- Switch to efficient vehicles
- Make fewer trips and shorter trips
- Reduce dwelling size or change residence location
- Move to Buffalo
QUESTIONS RAISED IN READER’S MIND THAT NEED STUDY

• Are there income effects? These are ignored in the model but above calculations suggest they are important.

• Which (and whose) taxes should be reduced when tolls are charged? We must find those taxes that are the most distorting and reduce those.
The paper covers only these...
RELU-TRAN MODEL

• JOBS MOVE TO SUBURBS
• LAND USE CHANGES SLOWLY BUT ADDS UP OVER TIME.

CHICAGO MSA 14 ZONE TEST VERSION