What Happens to Travel Behaviour When Parking is Removed?

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What does the literature tell us?

- Change in parking availability can influence modal choice (Cairns et al., 2010, Chatterjee et al., 2016, Petrunoff et al., 2015 – hospital site)
- More use of stated preference than natural experiments: focus on cost and elasticities (Rye et al., 2006, Kelly and Clinch, 2006, Hensher and King, 2001)
- Campus studies: cost and availability of parking influence decisions to drive (Riggs, 2014, Whalen et al. 2013: both used cross-sectional data)
- Aggregate studies of parking capacity and land use (Weinberger, 2012, Melia, 2014) or hypothetical modelling (McCahill and Garrick, 2014): gradual change over time
So Broadly:

• Parking cost and availability does make a difference. Parking restraint at a destination reduces driving to *that destination*

BUT:

• No evaluations of how parking restraint at a destination affects:
  – Travel for other purposes
  – Car ownership
  – Licence holding
Expansion – planning conditions constrain parking
Needed: a Superhuman Travel Planner

Steve Ward
UWE’s first travel planner 2006 - 14
Early Changes

- £1m investment in tendered bus services
- 2008: £79 charge for staff parking permit
- 75p daily student charge
- Smaller improvements for cycling
The Big Change: 2013

- All undergraduates in **Exclusion Zone** starting after Sept. ineligible to park on campus (few exceptions)
- Student parking permits £119 or £3 per day
- Staff permits 0.3% then 0.45% of salary
- £5 per day for visitors
Methodology

• Two matched cohorts of 3rd year modules: 2015 (last year with permits) and 2016. 927 responses
• In-lecture surveys: close to 100% response (but limitations on range of questions).
• Anonymous: care to avoid response biases
• Separate observations of overspill parking
An unexpected finding:
(by survey wave)

+2.4%
But, By Start Date
(before or after September 2013)

- 9.2%
Why?
Characteristics of the 2 Waves

- Started after 9/13
- Parking permit
- Female
- Over 26
- Exclusion Zone
- Full licence holder
- Car in term

- 2015
- 2016
But, By Start Date (before or after September 2013)

- Parking permit
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Before
After

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
Gender Difference for First Time (% driving to campus today)

- 2015:
  - Female: 28.5%
  - Male: 31.2%

- 2016:
  - Female: 24.8%
  - Male: 36.1%
# Binary Logistic Regression Odds Ratios

<table>
<thead>
<tr>
<th>Independent Variables:</th>
<th>After Sept 13</th>
<th>2016 Wave</th>
<th>Exclusion Zone</th>
<th>On Campus</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent variables:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drive to campus today</td>
<td>0.502**</td>
<td>1.519*</td>
<td>0.135**</td>
<td>0.000</td>
</tr>
<tr>
<td>Public Transport today</td>
<td>1.767**</td>
<td>0.653*</td>
<td>2.976**</td>
<td>0.075**</td>
</tr>
<tr>
<td>Normally drive to campus</td>
<td>0.508**</td>
<td>1.749**</td>
<td>0.136**</td>
<td>0.000</td>
</tr>
<tr>
<td>Last trip: driven</td>
<td>0.640*</td>
<td>1.610*</td>
<td>0.237**</td>
<td>0.055**</td>
</tr>
<tr>
<td>Car available in term</td>
<td>0.410**</td>
<td>1.733**</td>
<td>0.238**</td>
<td>0.098**</td>
</tr>
<tr>
<td>Car available in holidays</td>
<td>0.377**</td>
<td>1.679**</td>
<td>0.312**</td>
<td>0.527*</td>
</tr>
<tr>
<td>Licence-holding</td>
<td>0.655*</td>
<td>1.292</td>
<td>0.455**</td>
<td>0.532*</td>
</tr>
</tbody>
</table>

* Significant at 95% confidence level, ** 99% confidence level

(age and gender, also included; age was insignificant in all cases, gender was insignificant in most cases)
Where Did the Drivers Park?

- Some enforcement problems on campus

Overspill parking survey estimates:
- 108 on streets
- 70 in retail car park
Other Explanations for More Driving in 2016

- 8% fall in price of unleaded petrol (national evidence of modal shift towards driving, away from buses)
- On-campus parking now more convenient for students able to use it (including 12 who parked illegally on campus)
- Has the policy freed up road space for others to take their place?
Conclusions

• Policy broadly seems to have worked (though national environment unhelpful)
• Restraint at the destination also reduces:
  – Car ownership
  – Licence-holding
  – Driving for other purposes
• Previous policies had already reduced driving amongst Bristol-based students, so impact not as large as expected
• Overspill parking small compared to modal shift
• Gender difference: males more likely to park off campus and to break parking rules
• ‘Sticks’ are needed to make ‘carrots’ effective
References


