Is Bike Sharing Competitor, Relief or Supplement to Public Transport?

Session „Different Forms of Public Transport“
13.09.2017, Real CORP, Vienna

Ulrich Leth¹, Tadej Brezina¹, Bertram Ludwig², Christina Birett²
¹ Institut für Verkehrswissenschaften, TU Wien, 1040 Wien
² Neue Urbane Mobilität Wien, Wiener Stadtwerke, 1030 Wien
Research question specified

Interdependency between CityBike and Wiener Linien public transport

Supplement
  • Spatial: access function
  • Chronological: off-peak hours (poor PT connection)

Relief
  • Avoiding peak time in PT
    (frequent parallel CB-PT trips at peak hours)

Substitution
  • CB instead of PT, if route shorter/faster/with less transfers
Survey

Survey periods: 07 & 10/2016
37 stations
n_{TOT} = 1,389 (n_{07} = 820, n_{10} = 569)
42.3 % female; 57.7 % male
Response rate: 07: 83.5 %; 10: 75.2 %

How often does CBW substitute another means of transport?

<table>
<thead>
<tr>
<th>CB substitute? (07+10/2016)</th>
<th>Absolute</th>
<th>Share [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>1,248</td>
<td>92.4</td>
</tr>
<tr>
<td>No</td>
<td>105</td>
<td>7.6</td>
</tr>
</tbody>
</table>

Sources:
Substitution of modes

CBW substitutes ...

(2016)

Wide variety of modes … lack of quantitative importance
CityBike and trip chains

role of CB as part of a trip chain
(2016, n=1,389)

- 78%
- 21%
- 1%

- main means of transport (n=1088)
- access/egress (n=290)
- connector (n=11)
If CBW is used as the main means of transportation, then CBW serves as substitute for ...
(2016, n=1,237)

- by foot (n=273)
- own bike (n=115)
- PT (n=747)
- own car (n=68)
- other (n=34)

Sources:
Why do people choose CBW instead of other modes?

- **More fun**
- **More flexible**
- **Faster**
- **Burglar proof**
- **Exercise**
- **Eco-friendly**
- **Cheaper**

**Sources:**
- Faster
- Burglar proof
- More fun
- More flexible
- Exercise
- Eco-friendly
- Cheaper
- Variety
- Other
- Disruption other MOT
- Burglar proof
- Exercise
- More eco friendly
- More flexible
- More direct
- Cheaper
- Faster
The quantitative perspective

<table>
<thead>
<tr>
<th>data</th>
<th>trips</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw dataset 2015</td>
<td>1,005,856</td>
</tr>
<tr>
<td>Reduced by: trip duration ≤ 0 sec; stolen bikes; round trips; temporary stations; non-direct trips</td>
<td></td>
</tr>
<tr>
<td>Cleansed dataset</td>
<td>669,960</td>
</tr>
<tr>
<td>Therein: weekdays between 0500h and 2100h</td>
<td>406,597</td>
</tr>
</tbody>
</table>

Sources:
Travel time ratio CB to PT

weekday peak

CB twice as fast as PT

Travel time ratio

number

Sources:
CB twice as fast as PT
PT faster

n = 13,565
Top 10 relations

weekdays 5-21h
Relief?

CB station R. Wagner Platz

Tram line 46 disruptions

Sources:

- 29.6.2015, 14:08 – Polizeieinsatz Thaliastraße, Umleitung über Linie 2
- 27.6.2015, 11:55 – Verkehrsunfall Thaliastraße 26, Umleitung über Linie 2
- 24.6.2015, 18:59 – Verkehrsunfall Thaliastraße, Umleitung über Linie 2
- 24.6.2015, 08:56 – Rettungseinsatz Thaliastraße 79, Umleitung über Linie 2
- 15.6.2015, 12:15 – Verkehrsunfall Thaliastraße, Umleitung über Linie 2
- 5.6.2015, 19:08 – Verkehrsunfall Thaliastraße 109, Umleitung über Linie 2
- 5.6.2015, 16:34 – Verkehrsunfall Thaliastraße 49, Umleitung über Linie 2
Conclusion

- Usage patterns CB: collegiate trips, access/egress function PT
- PT axes vs. CB areal effect (“numerous lines with few stations vs. few stations with almost “unlimited“ number of lines“)
- CB strength on routes with small journey time ratio CB/PT
  → replacement of circuitous, long PT-trips
- Though: CB is (still) 1-2 dimensions too small to play a crucial role in the choice of transportation modes:
  - 1 mio. CB trips 2015 vs. 939 mio. PT passengers
  - Strongest CB relation: Praterstern ↔ Südportalstraße
    2,631 rides/year weekday peak ≤ 1 ride/hour

→ CityBike Wien is a supplement to public transport
Contact

Tadej Brezina
Research Center of Transport Planning and Traffic Engineering
Institute of Transportation; Vienna University of Technology
Gußhausstraße 30/230-1; A-1040 Wien
Tel: +43-1-58801-23127
tadej.brezina@tuwien.ac.at
www.facebook.com/FVV.TUW

Christina Birett
christina.birett@gmail.com