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

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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 %

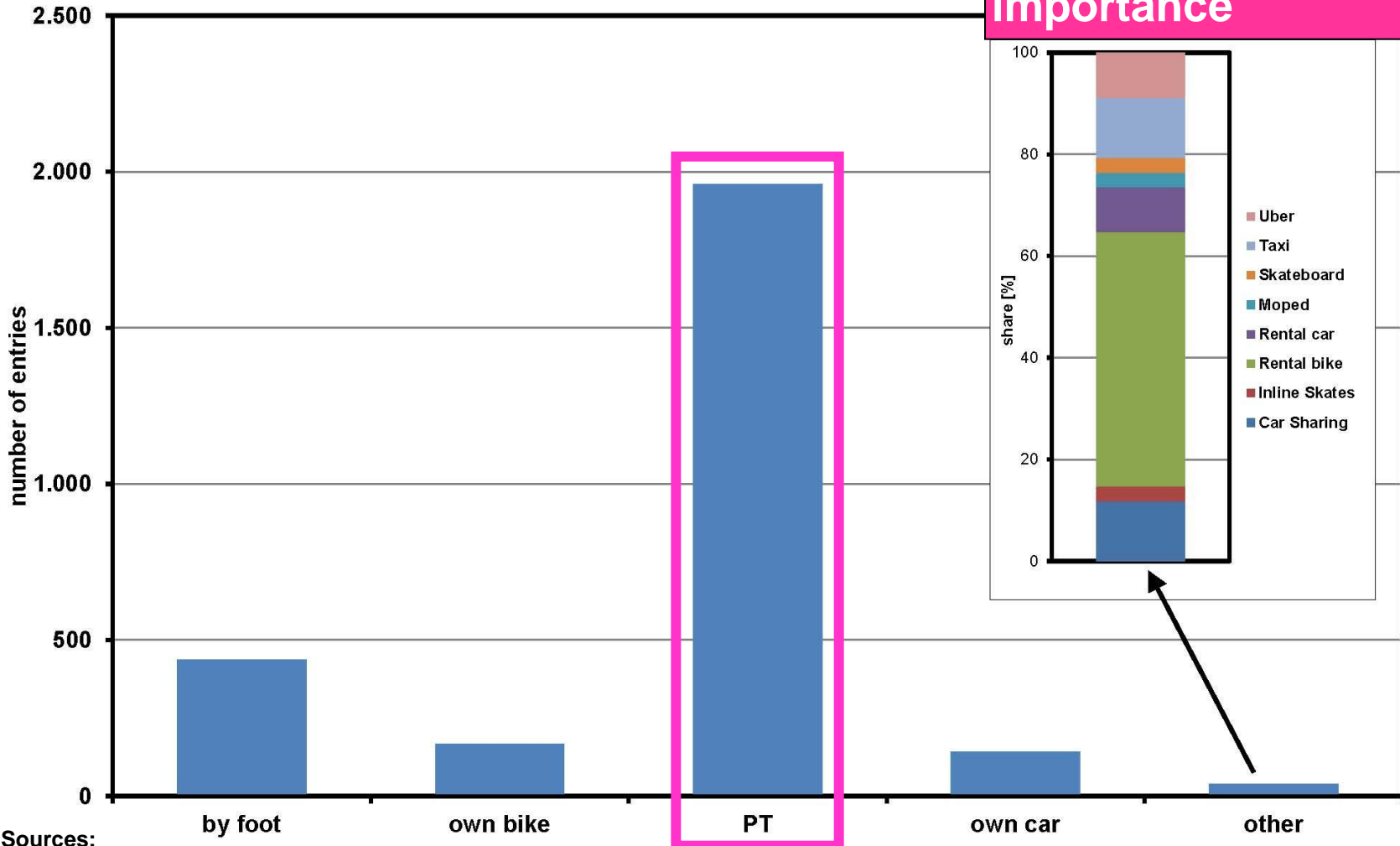
How often does CBW substitute another means of transport?

| CB substitute? (07+10/2016) | Absolute | Share [%] |
|--------------------------------|----------|------------|
| Yes | 1,248 | 92.4 |
| No | 105 | <u>7.6</u> |

Substitution of modes

CBW substitutes ...
(2016)

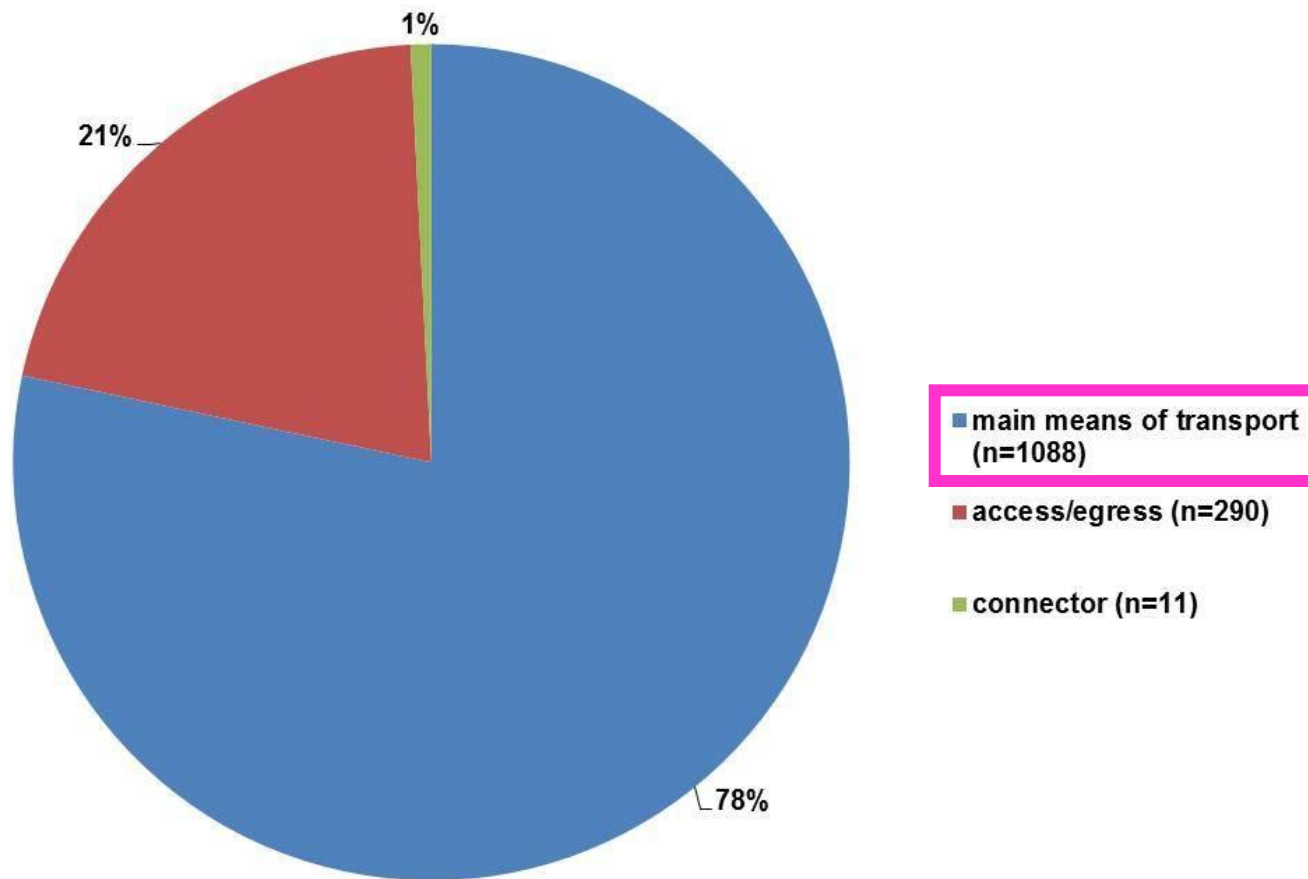
Wide variety of modes ...
lack of quantitative importance



Sources:

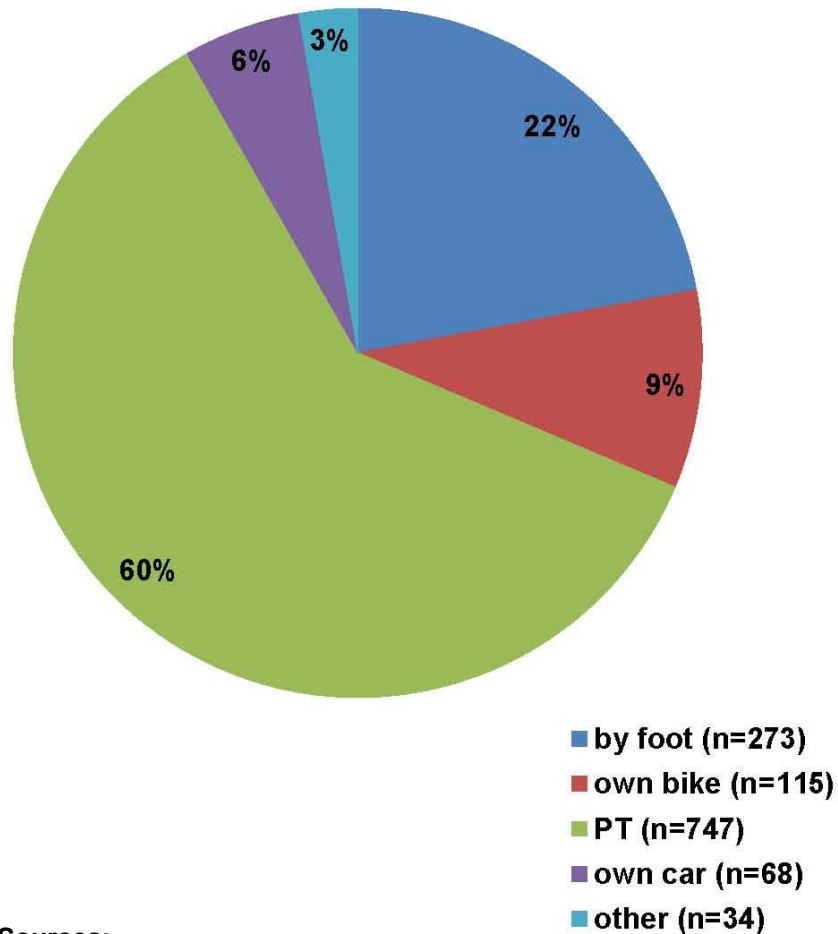
CityBike and trip chains

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

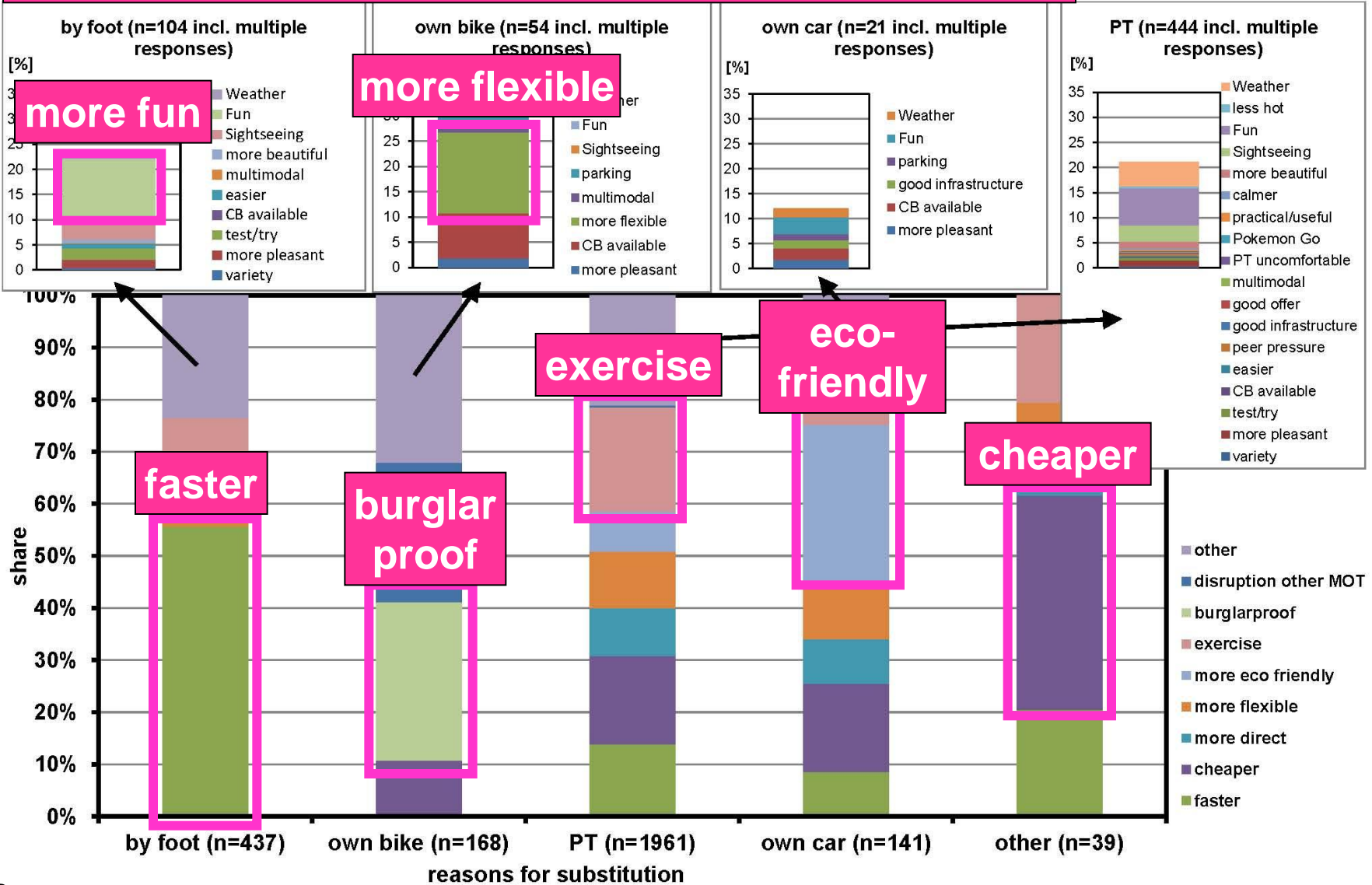


If CBW is used as **main means** of transportation, then CBW serves as substitute for ...

(2016, n=1.237)

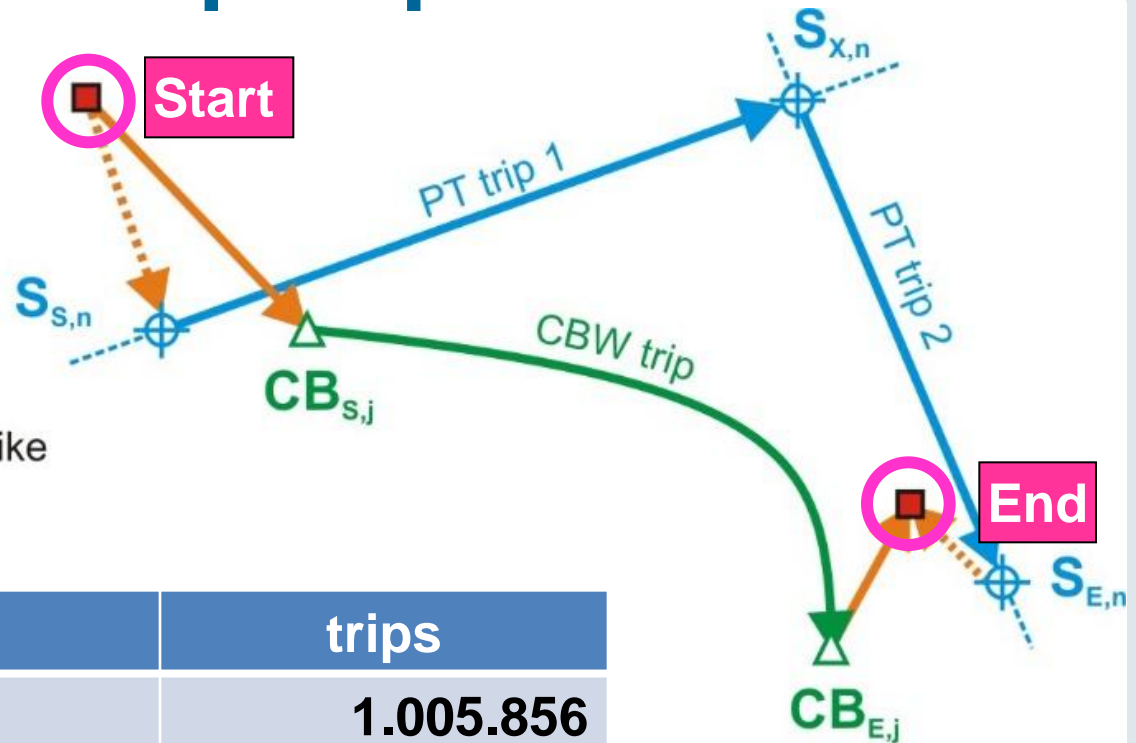


Why do people choose CBW instead of other modes?



The quantitative perspective

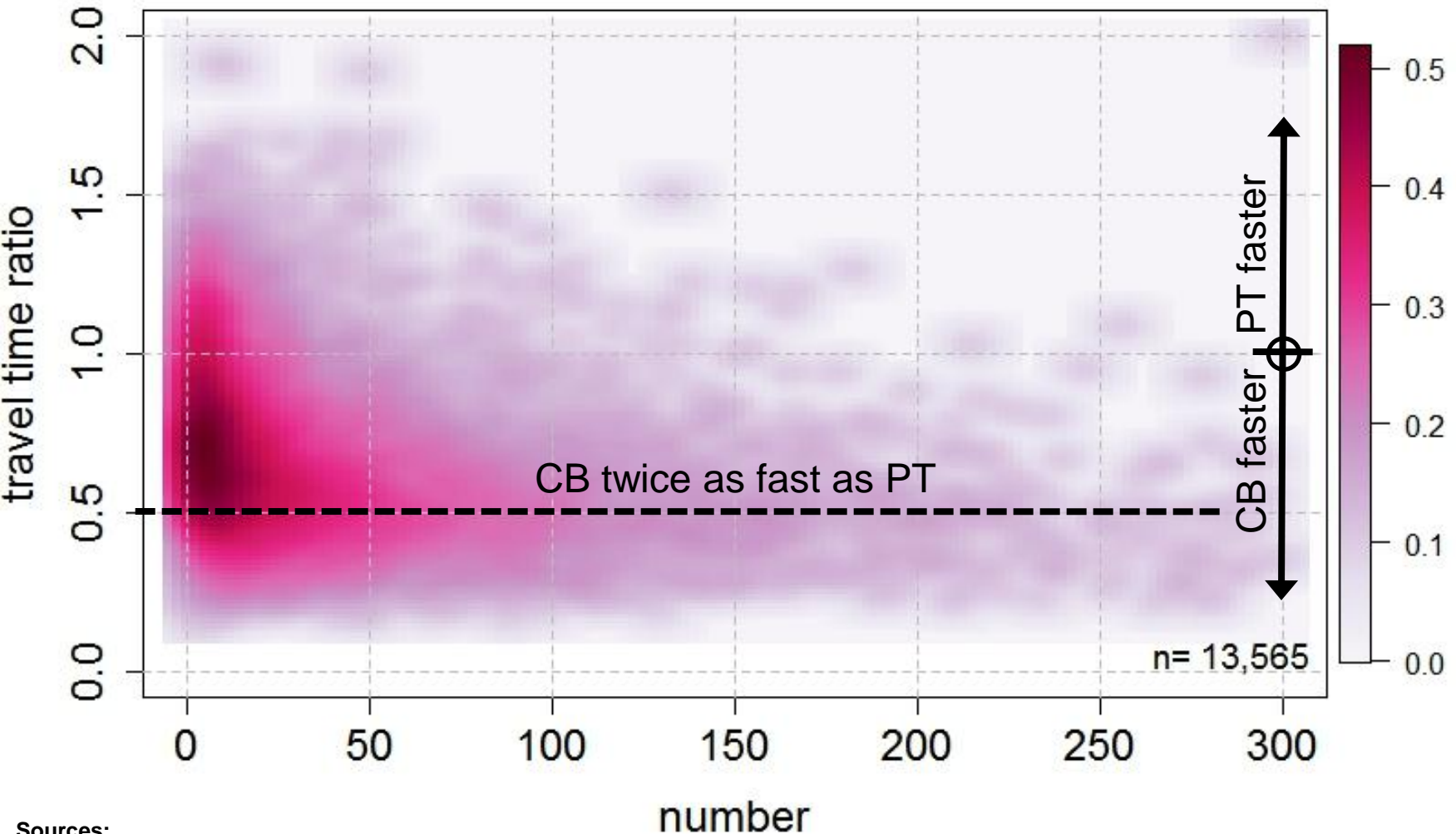
- Starting/end point of a trip
- △ CityBike station
- ⊕ Public transport stop
- CB_j Starting point(S)/end point(E) of CityBike trip j
- S_n Starting(S)/interchange(X)/End(E) stop of trip n
- ⋯ Access/egress leg to/from PT
- Access/egress leg to/from CityBike



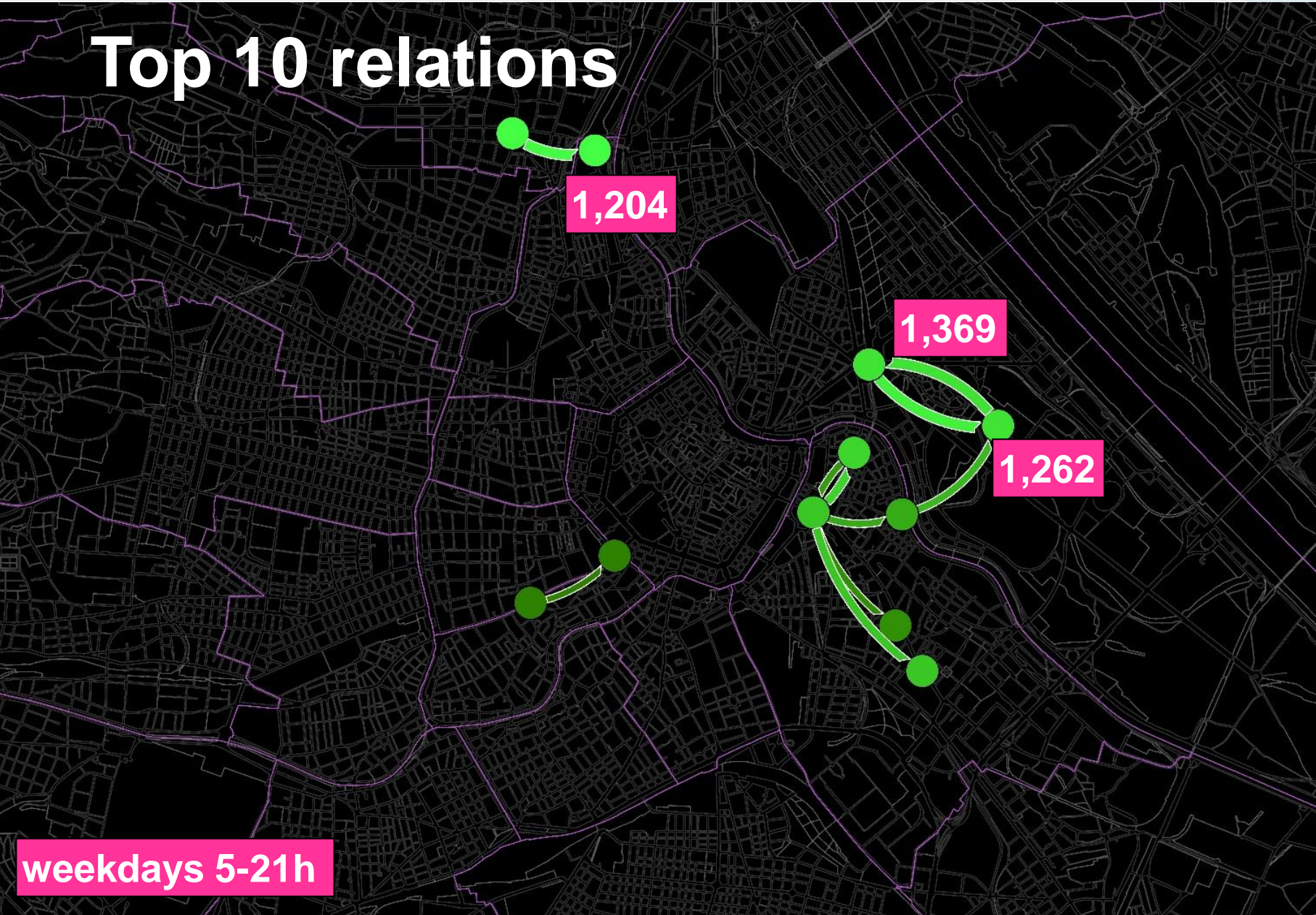
| data | trips |
|---|------------------|
| Raw dataset 2015 | 1.005.856 |
| Reduced by: trip duration ≤ 0 sec; stolen bikes; round trips; temporary stations; non-direct trips | |
| Cleansed dataset | 669.960 |
| Therein: weekdays between 0500h and 2100h | 406.597 |

Travel time ratio CB to PT

weekday peak



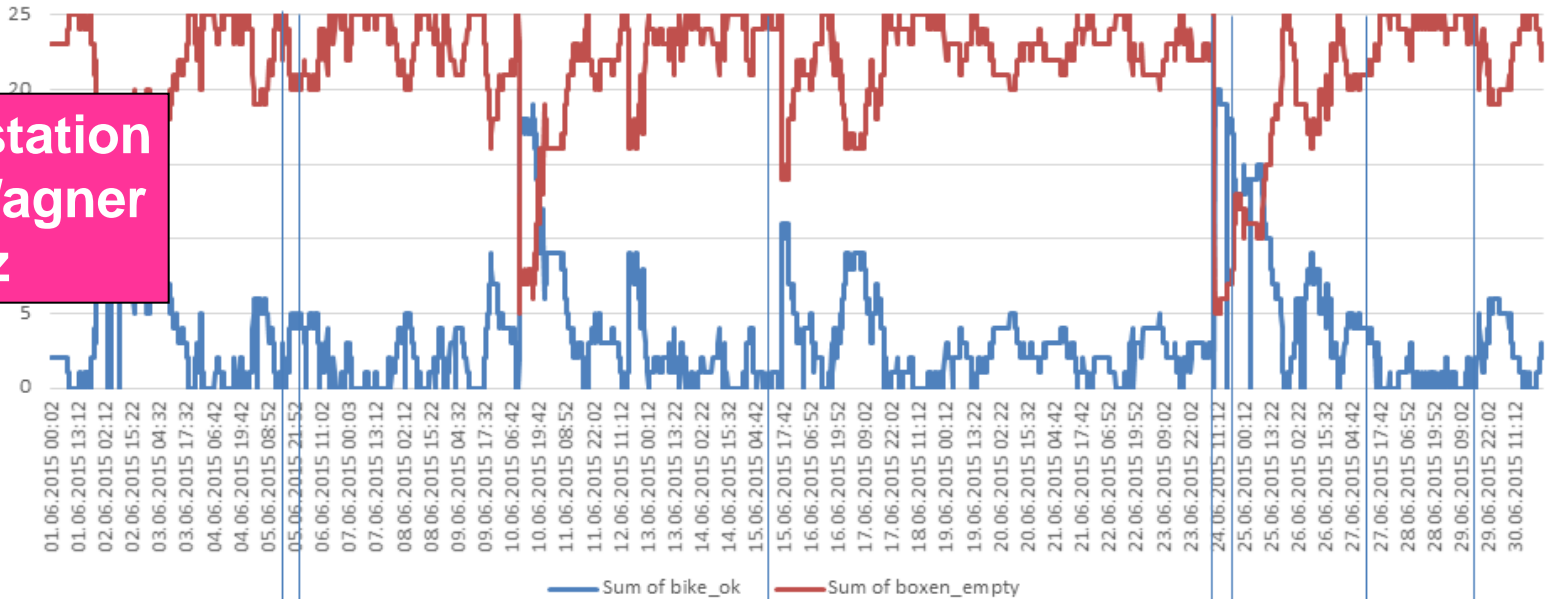
Top 10 relations



weekdays 5-21h

Relief?

CB station
R. Wagner
Platz



Tram line 46
disruptions

- 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 \leq 1 ride/hour
- CityBike Wien is a supplement to public transport

Contact

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