

# Intermodal Urban Mobility – The Case of Berlin

## Context

Cities are growing and the demand for flexible mobility solutions is rising, supported by increased use of ICT, sharing services etc. In this context, intermodal mobility is likely to play a key role for a flexible and situation-related urban mobility.

## Aim

Based on the dataset "Mobility in Cities – SrV 2008 Berlin", we compare intermodal and monomodal travel behavior to explain the influence of socio-demographic, socio-economic and land-use characteristics on intermodal urban mobility.

## Definition



**Intermodality:** The use of more than one mode of transport on a single trip.

How many trips are intermodal in Berlin? – A question of definition:

**Many! 24.7%** – Walking and different public transport modes count as single modes.



**Few! 1.8%** – No walking, and public transport modes count as one mode.



**Medium! 9.4%** – No walking, but different public transport modes count as single modes.

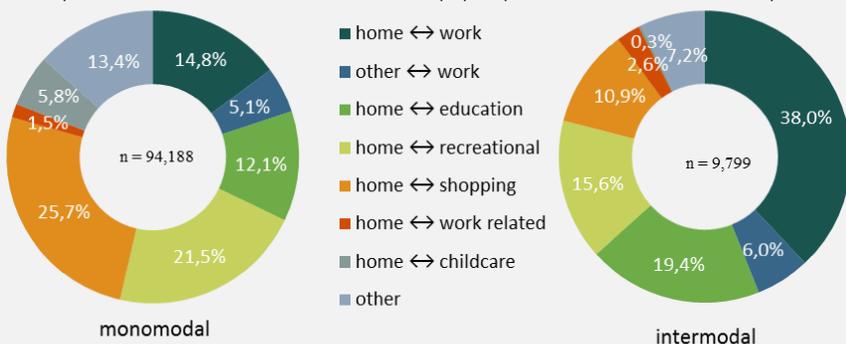


## Descriptive analysis for intermodal trips and persons

Persons with intermodal trips tend to

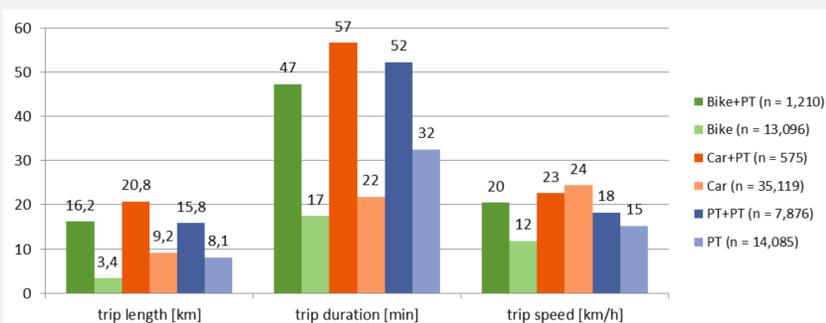
- be relatively young
- be more likely female
- have a higher education
- live in bigger households
- have less often access to a car, but more often public transit passes

Trips to work are the dominant trip purpose on intermodal trips.



Source: Authors' own analyses based on "Mobility in Cities – SrV 2008", sample Berlin, Senatsverwaltung für Stadtentwicklung und Umwelt Berlin, Abteilung Verkehr.

Intermodal trips are longer in distance and time.



Source: Authors' own analyses based on "Mobility in Cities – SrV 2008", sample Berlin, Senatsverwaltung für Stadtentwicklung und Umwelt Berlin, Abteilung Verkehr.

## Conclusions

Public transport plays a central role concerning intermodal urban mobility. Therefore, it is necessary to improve the connection to other transport modes at public transport stations. Since specific population groups (young women with higher education living in bigger households) are more likely to combine different transport modes, it is useful to explore their mobility needs to facilitate intermodal travel behavior.

## Binary logistic regressions for intermodal vs. monomodal bike and car use considering all trips

| Explanatory variables  | Bike+PT vs. Bike | Car+PT vs. Car |
|--|------------------|----------------|
| <i>Person related variables</i>  |                  |                |
| Age in years   | –                | –              |
| Gender: male   | –                | –              |
| In education   | +                | –              |
| In employment  | –                | –              |
| Highest school graduation: university-entrance diploma (Abitur)  | +                | +              |
| Highest professional education: college or university  | +                | –              |
| Car availability: unrestricted   | –                | –              |
| Public transport ticket ownership: high commitment   | +                | +              |
| <i>Household related variables</i>   |                  |                |
| Number of household persons  | –                | –              |
| Monthly household net income   | +                | +              |
| <i>Variables describing the trip</i>   |                  |                |
| Main trip purpose: home $\leftrightarrow$ work as referential category                                       | +                | +              |
| home $\leftrightarrow$ childcare   | –                | –              |
| home $\leftrightarrow$ education   | +                | +              |
| home $\leftrightarrow$ work related  | +                | +              |
| home $\leftrightarrow$ shopping  | –                | +              |
| home $\leftrightarrow$ recreational  | –                | +              |
| other $\leftrightarrow$ work   | +                | +              |
| other  | –                | +              |
| Trip length [km]   | +                | +              |
| Trip duration [min]  | –                | +              |
| Trip speed [km/h]  | –                | –              |
| <i>Variables describing the home place (on the level of the statistical areas or boroughs, respectively)</i> |                  |                |
| Share of foreign nationals   | +                | +              |
| Number of employees per inhabitant   | +                | +              |
| Rate of unemployment with respect to all employed persons  | –                | +              |
| Density (per km <sup>2</sup> ) of various facilities:  |                  |                |
| Educational institutions   | +                | +              |
| Health care institutions   | –                | –              |
| Shopping opportunities   | +                | +              |
| Share (per km <sup>2</sup> ) of various land use types:  |                  |                |
| Areas with high-density residential use  | –                | –              |
| Areas with low-density residential use   | +                | –              |
| Areas for commercial and industrial purposes   | –                | –              |
| Areas for transportation   | –                | –              |
| Areas for public service and special-use   | –                | –              |
| Share (per km) of various way types of the roadnetwork (based on OSM):                                       |                  |                |
| Motorways  | +                | +              |
| Through roads  | +                | +              |
| Side roads   | +                | +              |
| Cycle way  | –                | –              |
| Foot way   | +                | +              |
| Average distance [km] to the next stop for various means of transport (normalised by number of households):  |                  |                |
| Regional means of transport (regional and urban railway)   | –                | –              |
| Local means of transport (subway, tramway, bus and ferry)  | +                | +              |
| Home place located in the inner city of Berlin   | –                | +              |
| <i>Further variables</i>   |                  |                |
| Constant   | –                | –              |
| Number of observations   | 13965            | 34801          |
| R-Quadrat  | 0,558            | 0,391          |
| Adjusted R-Quadrat   | 0,549            | 0,379          |

bold: level of significance  $\leq 0.10$