

Traffic impact of flexibly rented, private parking spaces

presented at mobil.TUM 2024 on 11 April 2024 in Munich

Alexander Erath, Adrian Meyer, Sara Venuleo, Denis Jordan



INTRODUCTION

CHALLENGE

Private parking



Source: [Haus.de](https://www.haus.de)

High vacancy rates of private parking lots in (swiss) cities and agglomerations: **5%-15%**.

Private parking lots are **usually allocated to fixed users**.

Parking lots remain empty at certain times of the day e.g. during the night, if rented for business users or assigned to shopping facility.

On-street parking



Source: [Basler Zeitung](https://www.baslerzeitung.ch)

On-street parking is **too cheap**.

High demand for on-street parking.

Competition for street space: trees, cycling lanes, ...

On street parking is **not "reliable"**.

INTRODUCTION

FLEXIBLY RENTED, PRIVATE PARKING SPACES

Innovative firms such as [Parcandi](#) see a **business and sustainability case**.

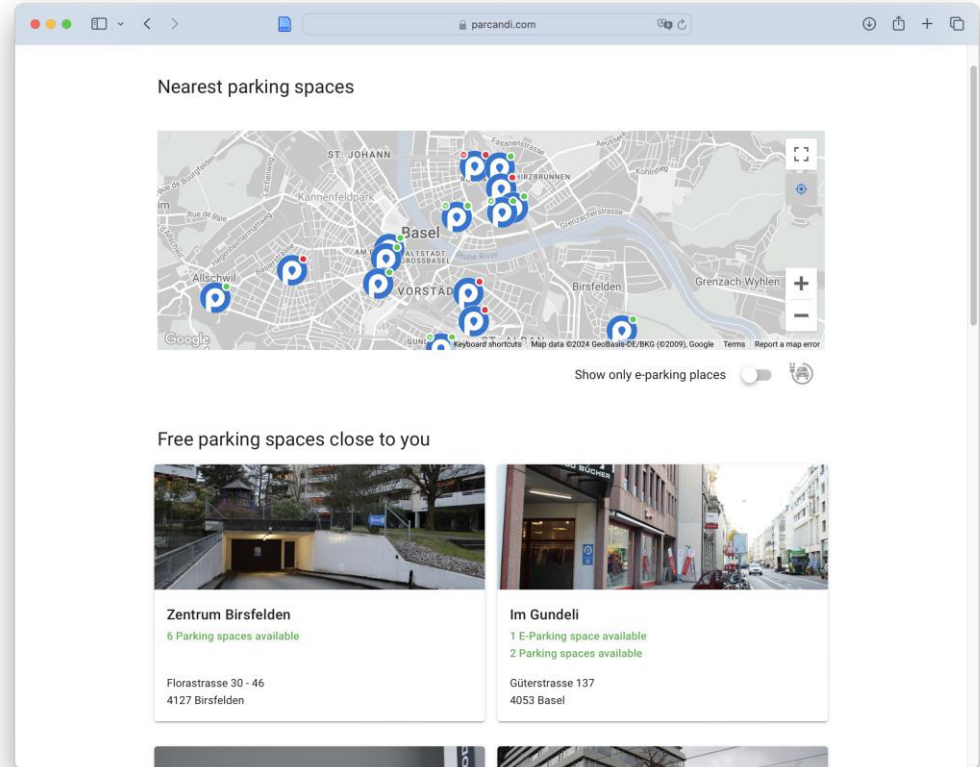
Internet of thing applications allow to grant access to parking through a smartphone app.

Parking lots are rented flexibly, e.g. from 1h up to several weeks.

Cities see the **potential to replace on-street parking** but are also **concerned about additional traffic**.



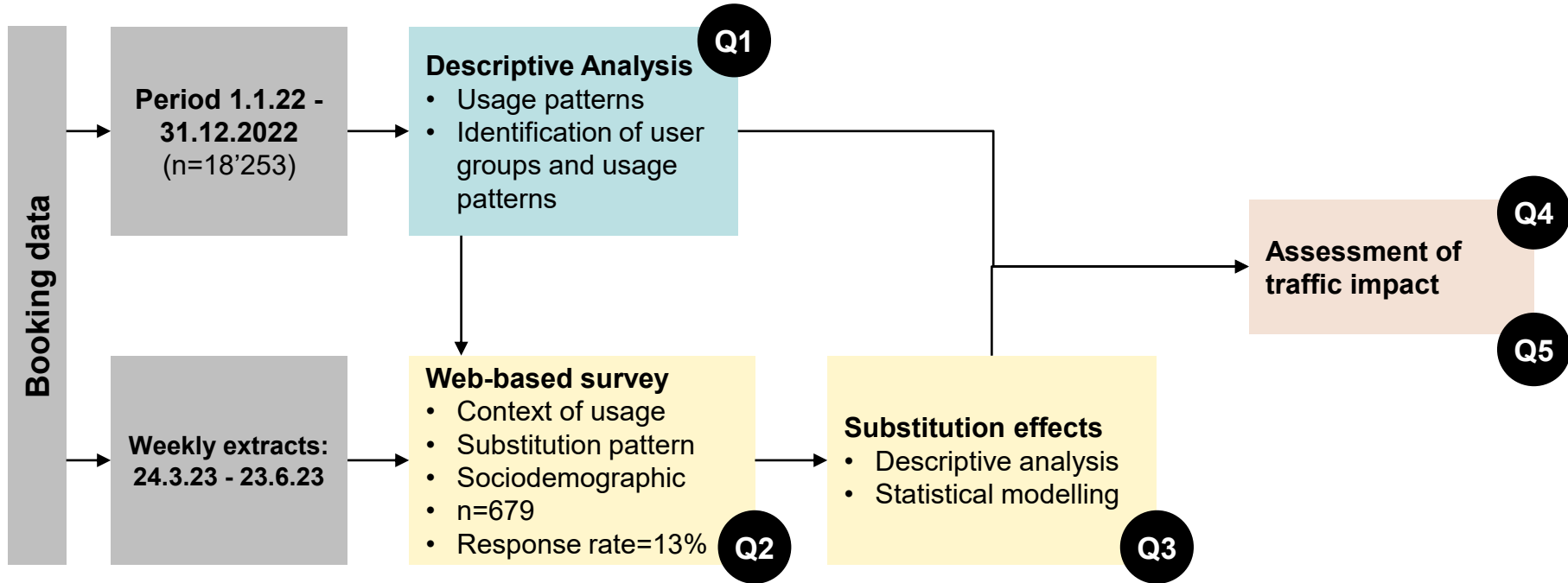
Scan to check out
the Parcandi website!



1. **Usage patterns** among different user groups?
2. **Substitution effects**: travel mode, parking location or activity participation?
3. Does the new offer lead to **more car traffic**?
4. **How many on-street parking spaces can be replaced**?
5. **Recommendations to adjust legislation** to improve urban mobility?

INTRODUCTION

DATA AND METHODS



Q1: USAGE PATTERNS AND USER GROUPS

FOUR KEY USER GROUPS

«Long term users»

Usage of any facility:
at least 5x for

> 24 h

or

At least once

5 days in a row (120h)

«Frequent & long term users»

Fullfil both
requirements»

«Frequent users»

Usage of any facility

**At least 10x
< 24h**

Occasional users

All other users

Different user groups...

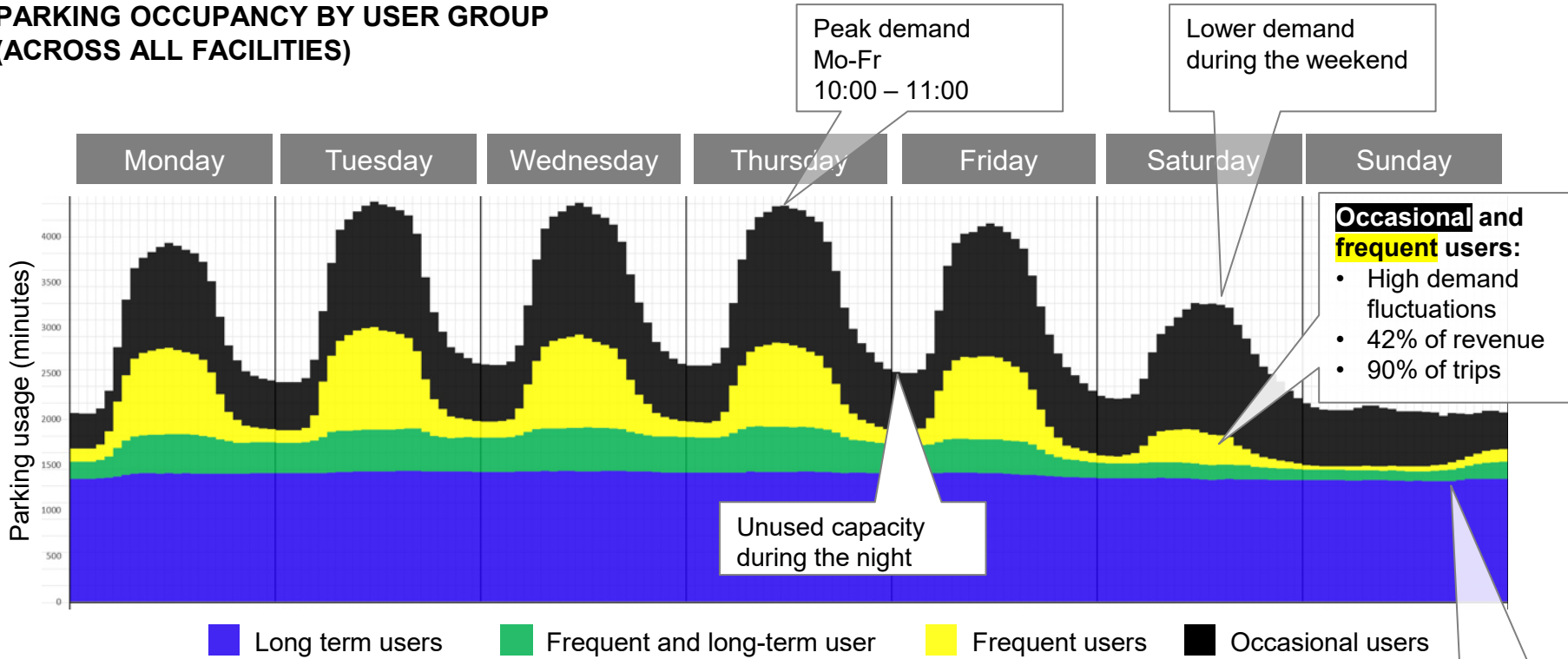
- ... conduct different activities
- ... different prevalence of substitution patterns

Therefore:

- Different options in survey instrument
- Frequent users need to respond only once.

Q1: USAGE PATTERNS AND USER GROUPS

PARKING OCCUPANCY BY USER GROUP (ACROSS ALL FACILITIES)



Occasional and frequent users:

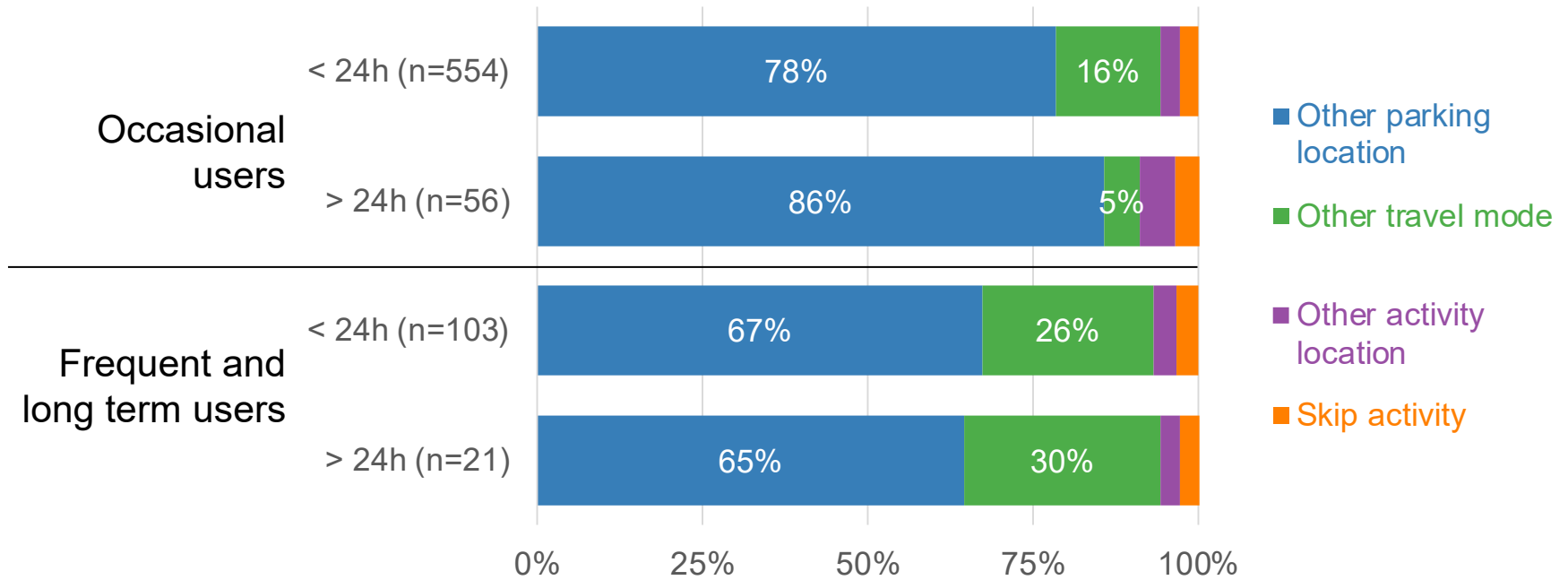
- High demand fluctuations
- 42% of revenue
- 90% of trips

Long term & frequent users:

- low demand fluctuations
- 58% of revenue

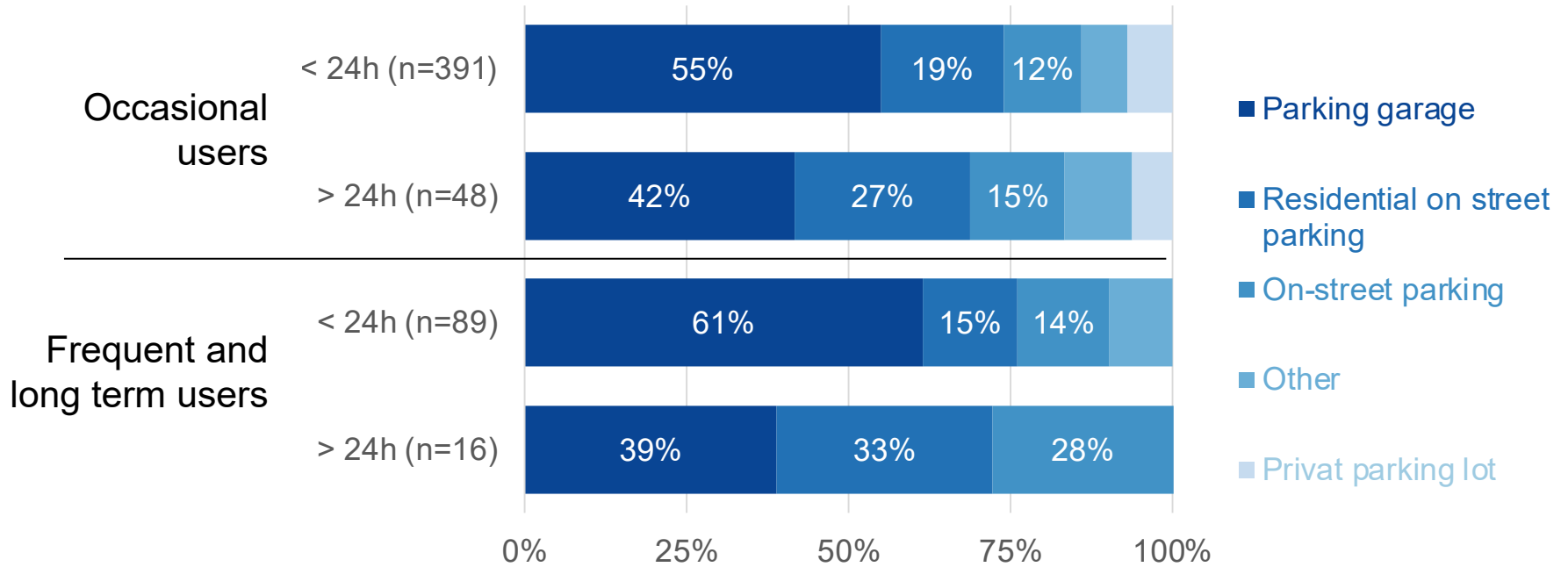
Q2: SUBSTITUTION EFFECTS

SUBSTITUTION PATTERNS



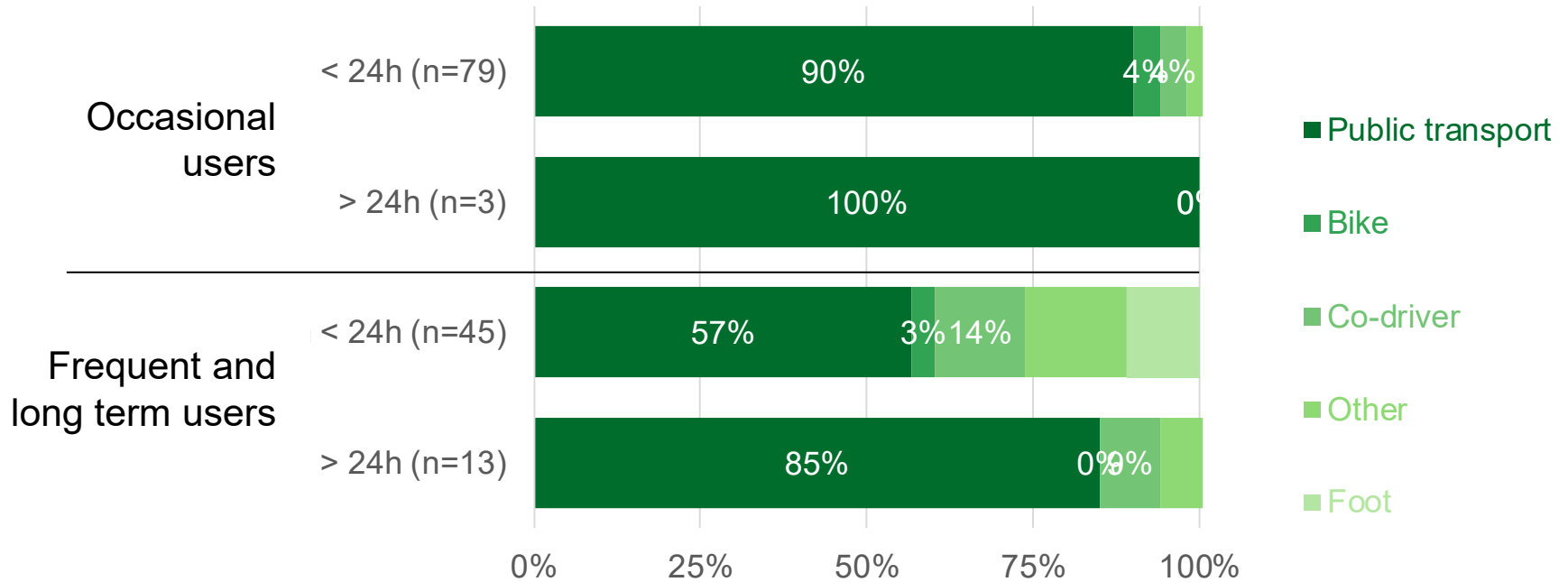
Q2: SUBSTITUTION EFFECTS

TYPE OF PARKING



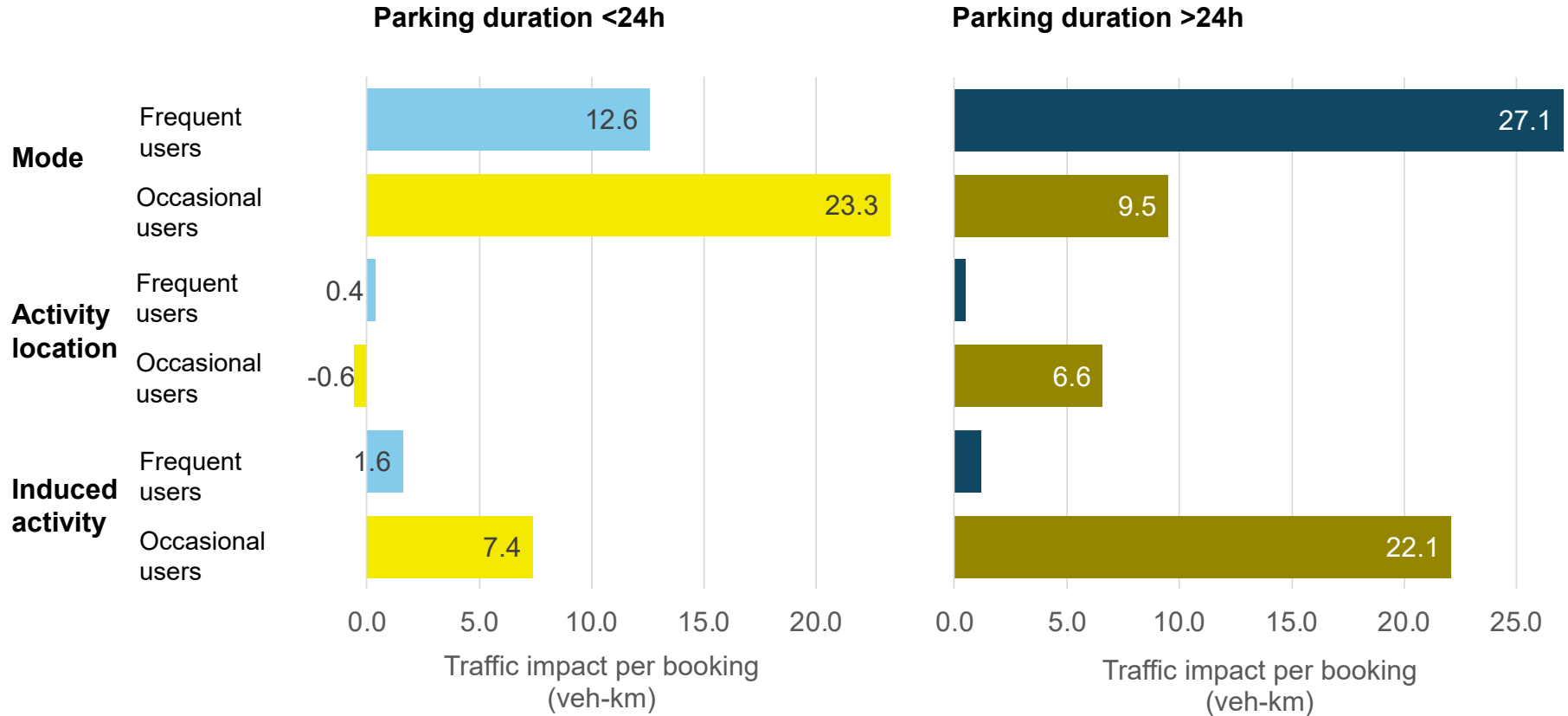
Q2: SUBSTITUTION EFFECTS

TRAVEL MODE



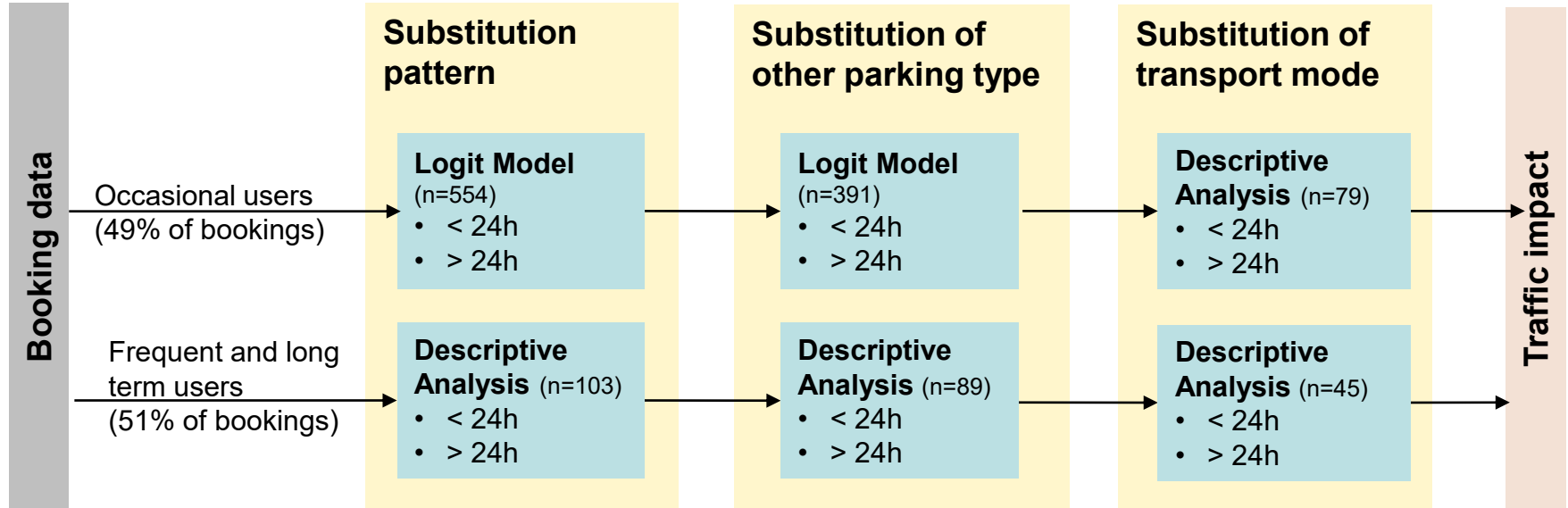
Q3: HOW MUCH MORE TRAFFIC?

TRAFFIC IMPACT PER BOOKING



Q3: HOW MUCH MORE TRAFFIC?

METHODOLOGY TO APPLY FINDINGS TO COMPLETE BOOKING DATA

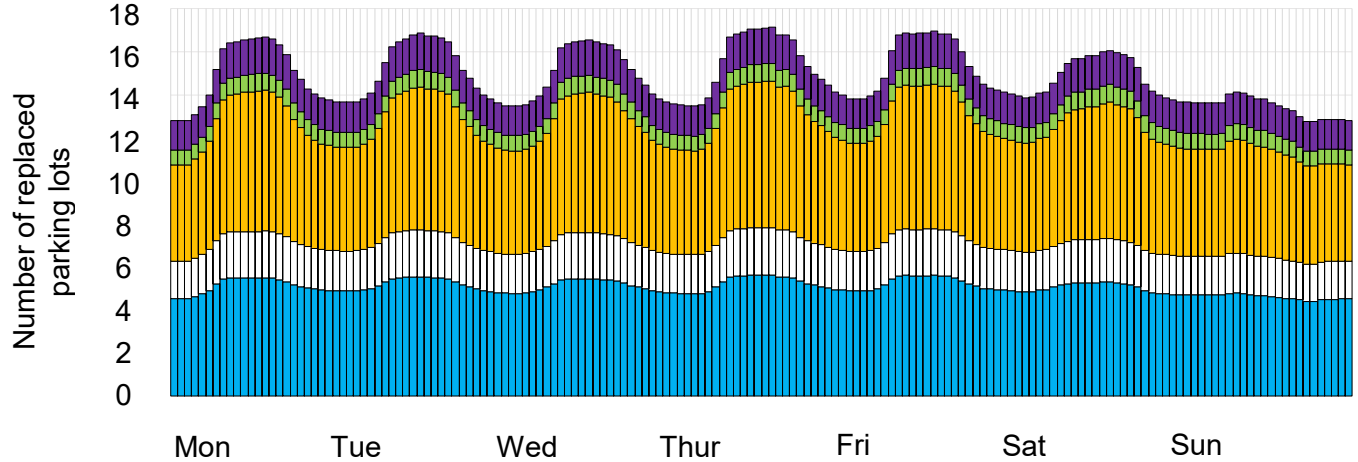


Q4: HOW MANY PARKING LOTS CAN BE REPLACED

POTENTIAL FOR REPLACEMENT OF EXISTING PARKING LOTS

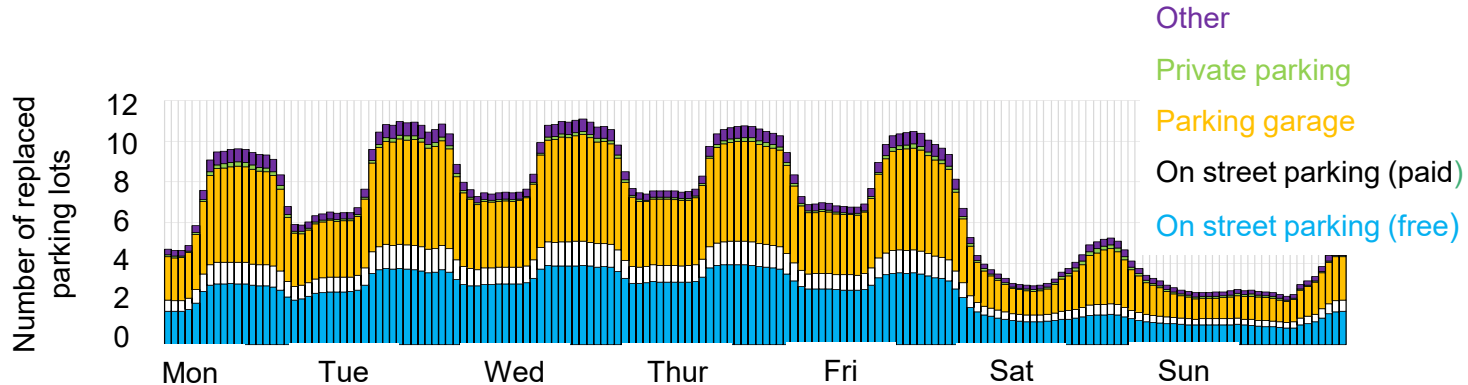
Im Gundeli

- 34 parking lots
- Close to main railway station
- Dense, mixed-used environment



Picassoplatz

- 26 parking lots
- Central business district



CONCLUSION

Key insights

Flexibly rented private parking lots...

... create **opportunities to reduce demand for on street parking demand.**

... **lead to increased car demand** if no compensatory measure are implemented.

... **require smart pricing models** to optimise usage during the night.

... **work best in mixed use neighbourhoods** where parking demand of different use groups complement each other.

... have a limited impact with regards to parking search traffic

Policy recommendations

Revise legislation to...

... **make flexible utilisation** of private parking lots **the default.**

... **reduce on-street parking by default** if private lots are flexibly rented.

... **price residential parking dependent** on local **demand and supply** in a socially just manner.

... **establish Public-Private Partnerships** aimed at effectively managing private parking lots in alignment with democratically defined objectives.

TRAFFIC IMPACT OF FLEXIBLY RENTED, PRIVATE PARKING SPACES

QUESTIONS AND CONTACT



Project report

(only available in german)



Scan for
[project report](#)

Contact

alexander.erath@fhnw.ch

<https://www.fhnw.ch/verkehr-und-mobilitaet>

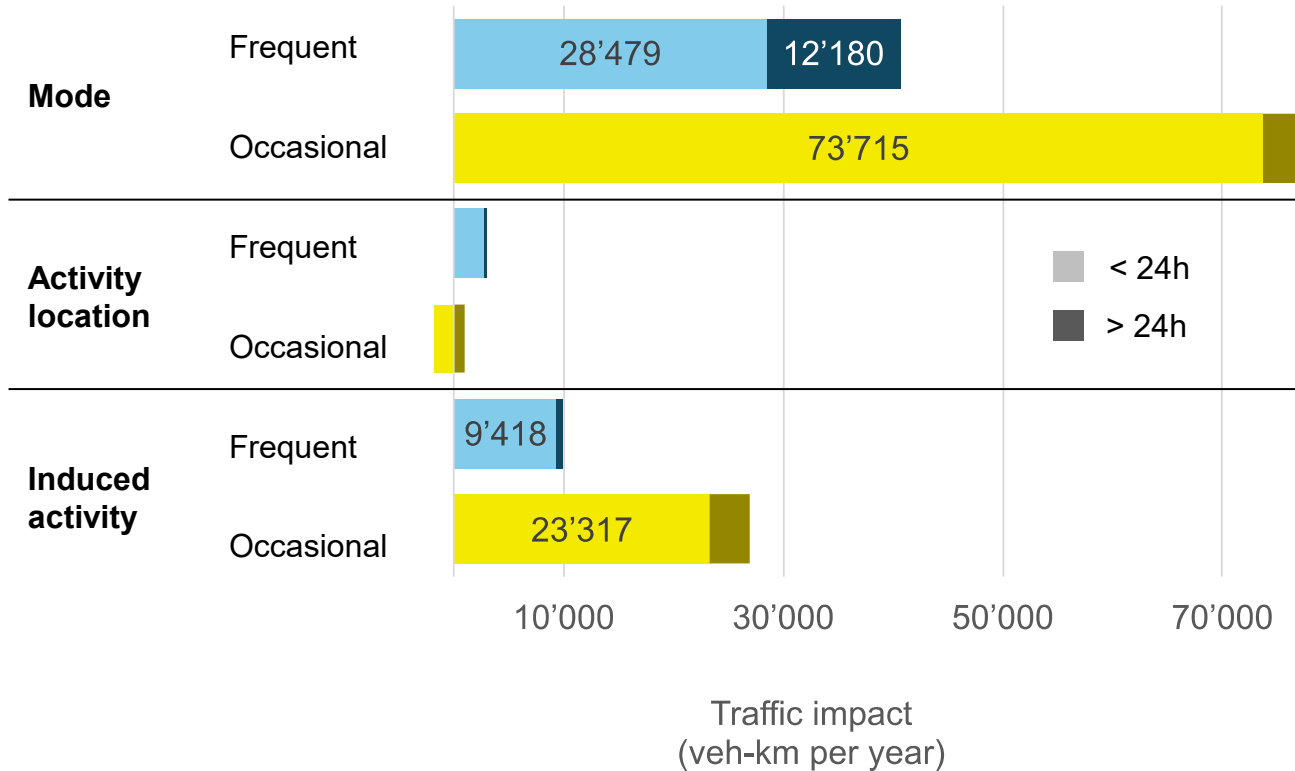


TRAFFIC IMPACT OF FLEXIBLY RENTED, PRIVATE PARKING SPACES

APPENDIX

Q3: HOW MUCH MORE TRAFFIC?

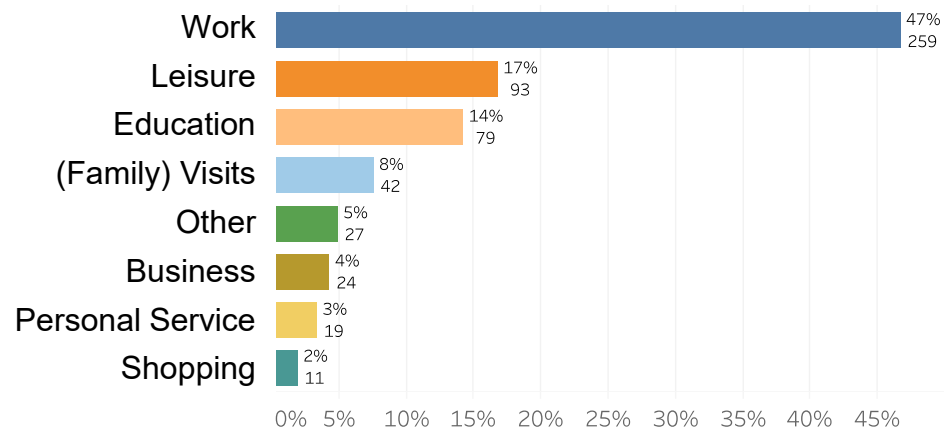
TRAFFIC IMPACT ACROSS ALL 34 FACILITIES AND 483 PARKING LOTS DURING 1 YEAR



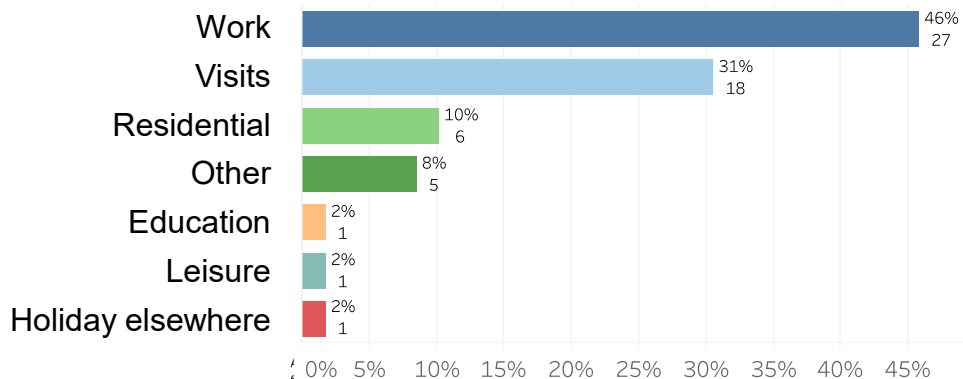
Q1: USAGE PATTERNS AND USER GROUPS

ACTIVITIES WHILE PARKING: OCCASIONAL USERS

Parking duration < 24h (n=554)



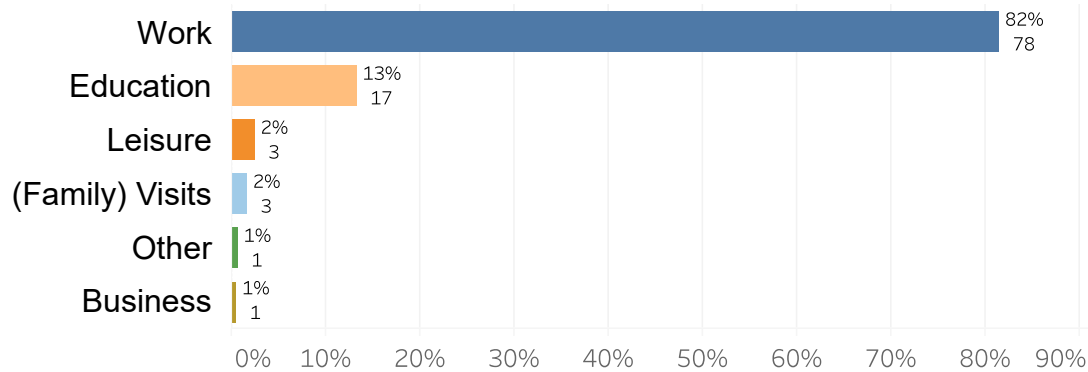
Parking duration > 24h (n=59)



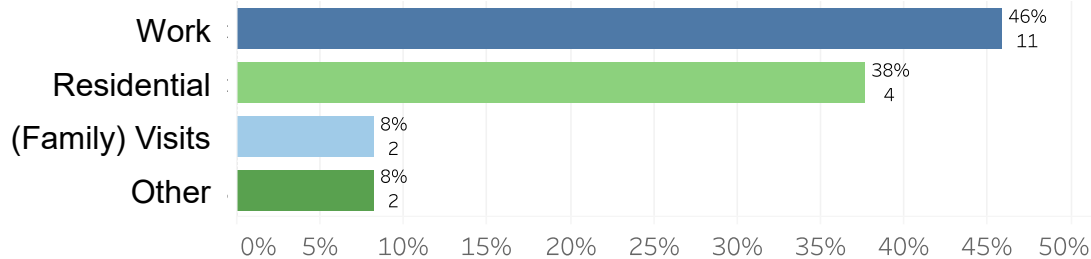
Q1: USAGE PATTERNS AND USER GROUPS

ACTIVITIES WHILE PARKING: FREQUENT AND LONG TERM USERS

Parking duration < 24h (n=103)



Parking duration > 24h (n=15)



Q2: INFLUENCE ON MODE CHOICE

SURVEY INSTRUMENT

Occasional users



English

What would you have done, if no parking space had been available from Parcandi

- Used another means of transport
- Carried out the activity(ies) in another location
- Used another parking space
- Not carried out the activity

Frequent and long-term users



English

What would you do if the Parcandi offer did not exist?

Indicate the frequency per behaviour (100 = exclusively, 0 = never). The sum must add up to 100.

Use another parking space	70
Use another means of transport	10
Carry out the activity in a different location	10
Do not carry out the activity	10
Total	100

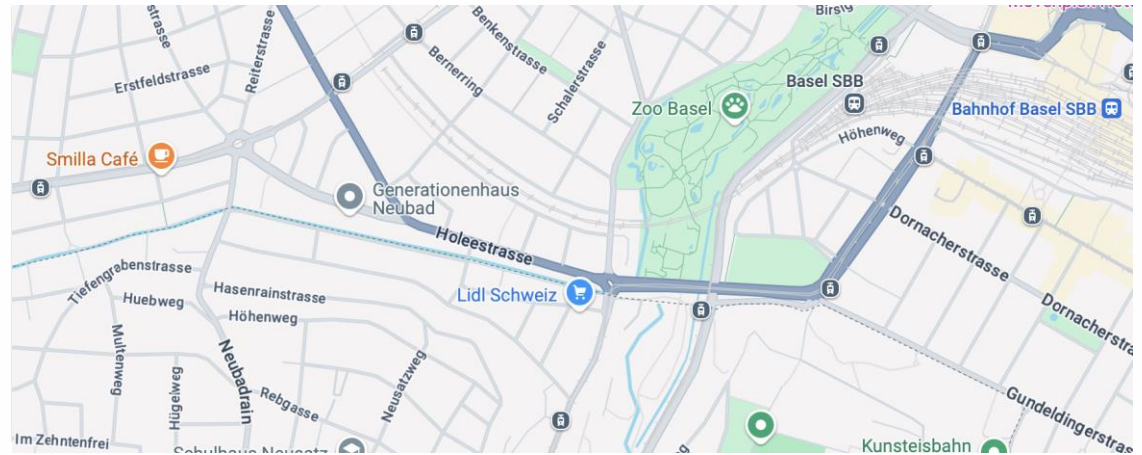
Q2: INFLUENCE ON MODE CHOICE SURVEY INSTRUMENT

GoogleMaps interface to pick location of activity before and after parking usage

Where did you go after using the Parcandi car park?

To do this, enter the street, street number and municipality or a place name in the text field and then move the marker on the map if necessary.

Geben Sie einen Standort ein.



Q2: INFLUENCE ON MODE CHOICE

SURVEY INSTRUMENT

Map interface