

# Using MATSim in Strategic Rail Supply Planning – Applications of SIMBA MOBI

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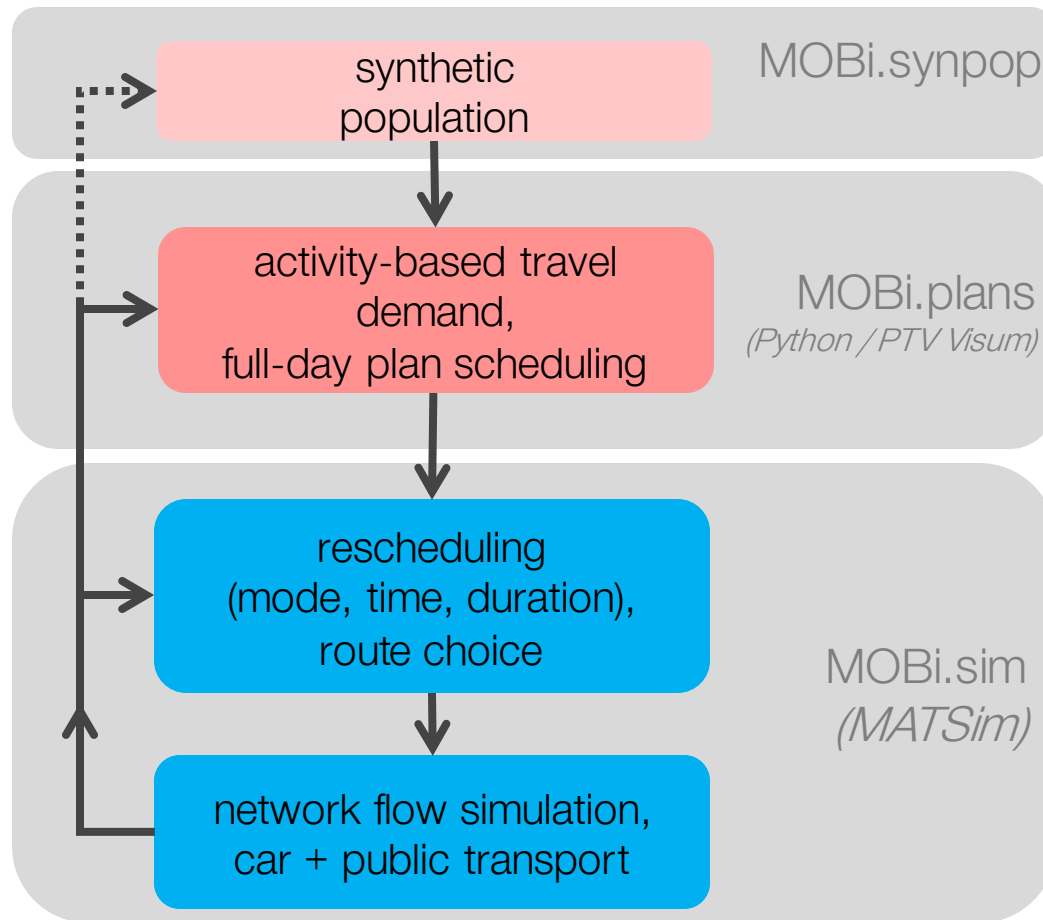
Introduction

Applications

- Access and Egress at Stations
- Dimensioning of New Railway stations
- Post-Covid Rail Demand forecast

Conclusion

# SIMBA MOBi: Agent based modelling at SBB.



- Established Modelling Environment for SBB internal case studies
- Focus on multimodal and intermodal planning
- Easy, internal assessment of new supply concepts
- Model exists for 2017, 2030, 2040 & 2050

# Access and Egress at Stations



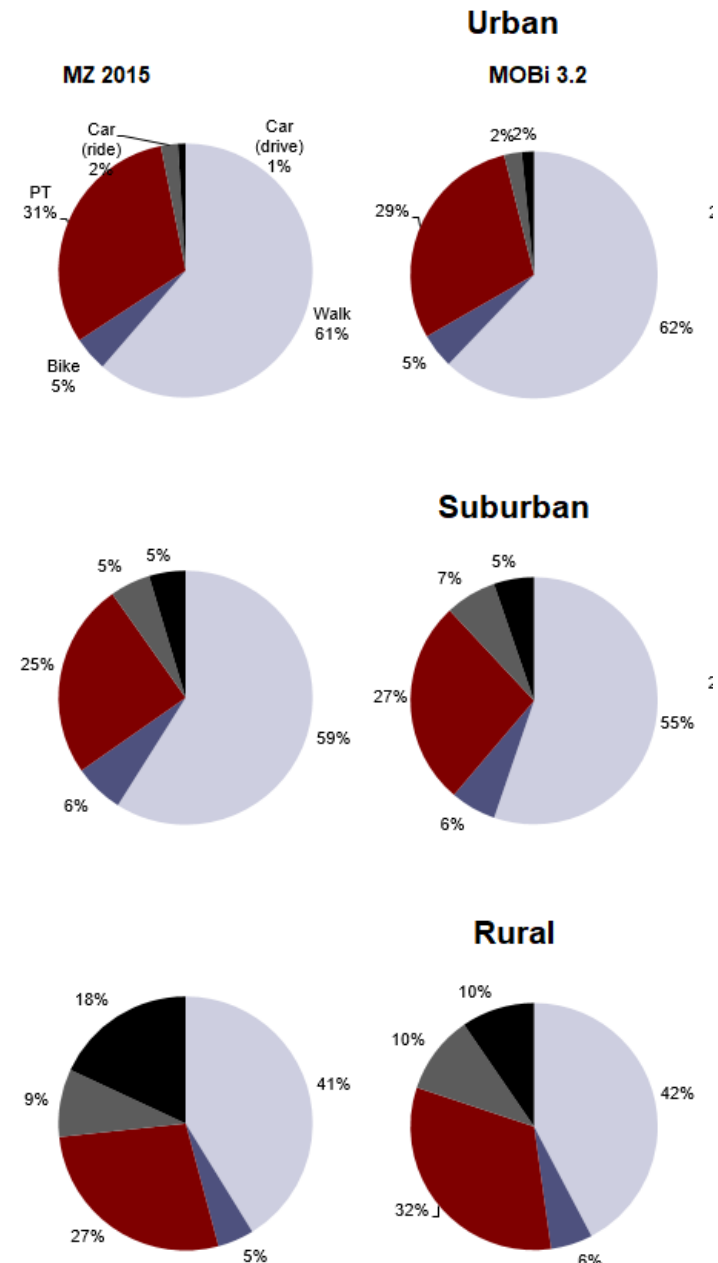
# Access and Egress at Stations

Access and egress travel at stations is important for station design and planning but depends heavily on local circumstances.

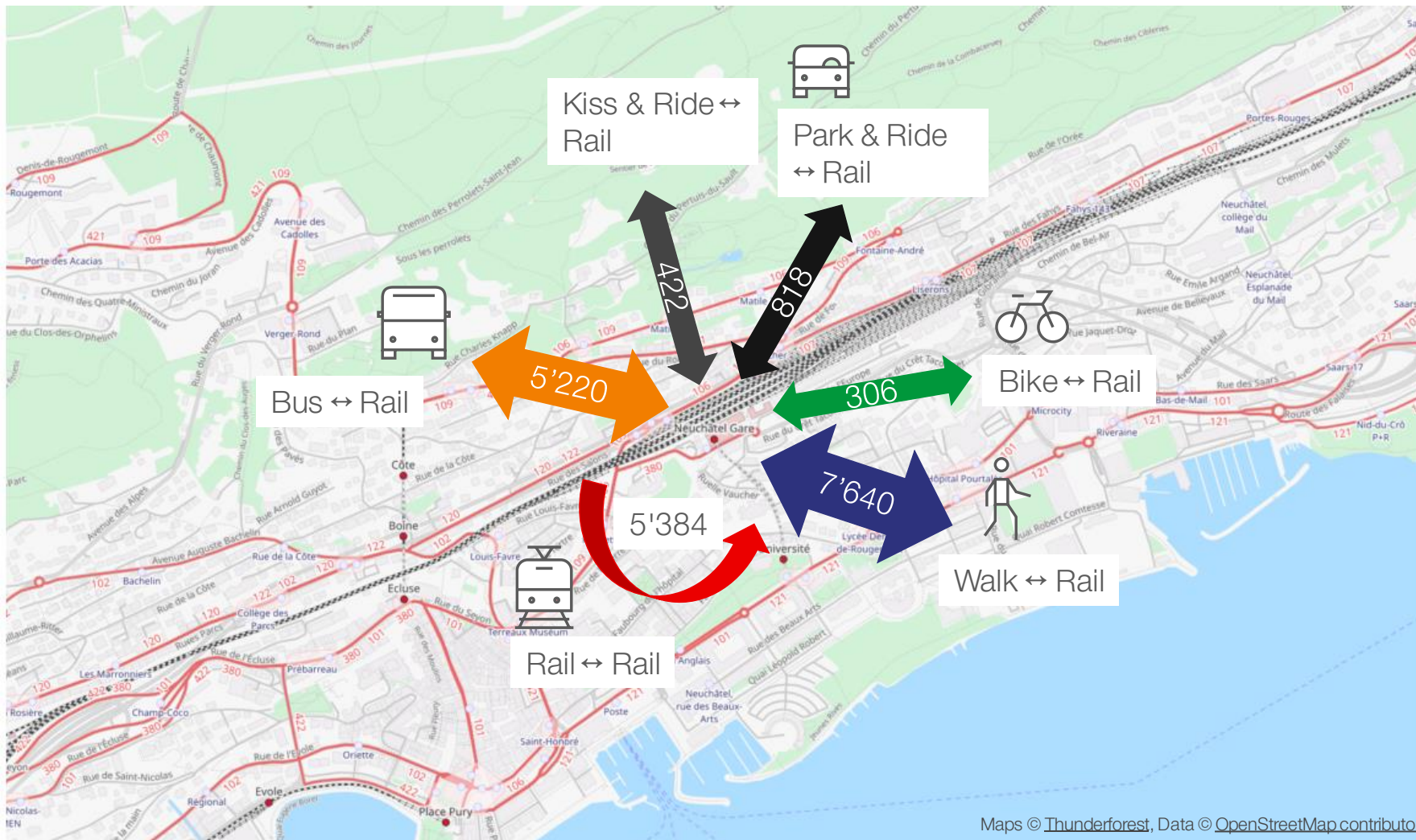
- Model output is used as one source in station planning and re-designing.
- Detailed report can be generated for any station in Switzerland

Advantages of using MATSim:

- Behavior for intermodal travel highly depends on vehicle availability and personal circumstances
- Intermodal Routing can be highly customized with SwissRailRaptor



# Intermodal connections at Neuchâtel

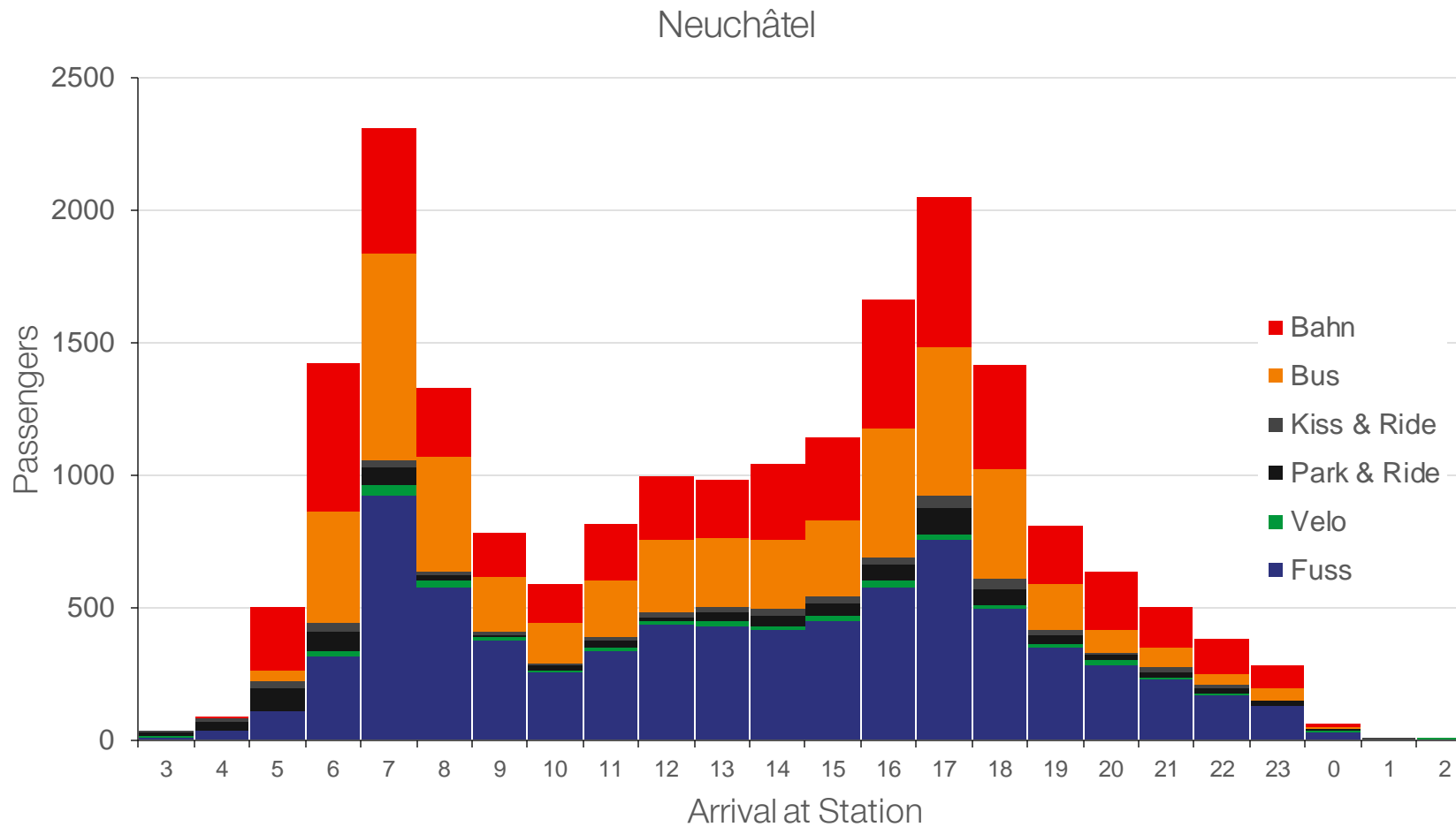


## Neuchâtel Stations:

19'808 Passengers boarding or alighting.

9'186 (46 %) use other modes than walk to connect to or from the station

# Diurnal Variation



## Neuchâtel Station:

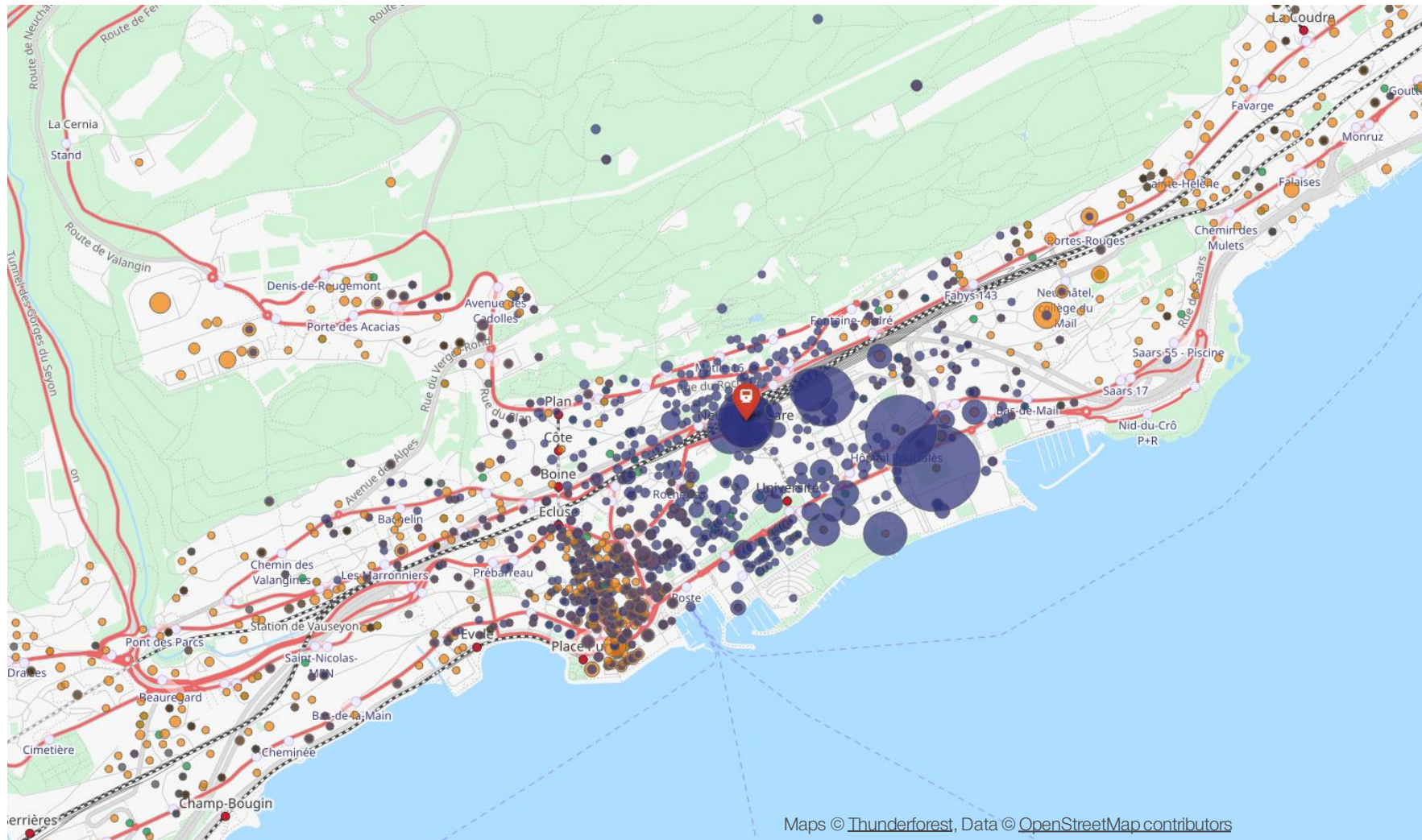
Total passengers morning peak:  
(06:00-09:00): 5'052 Rail  
passengers

Total passengers afternoon peak:  
(16:00-19:00): 5126 Rail  
passengers

Die Grafik enthält alle Reisen, welche im Bahnhof in einen Zug ein-, oder aussteigen oder zwischen zwei Zügen umsteigen (einfach gezählt).

# Origins and destinations of railway passengers

## Neuchâtel Station



Maps © Thunderforest, Data © OpenStreetMap contributors

Quelle: SIMBA MOBi (DWW)  
Bevölkerungsdaten: 2017  
öV-Angebot: 2020





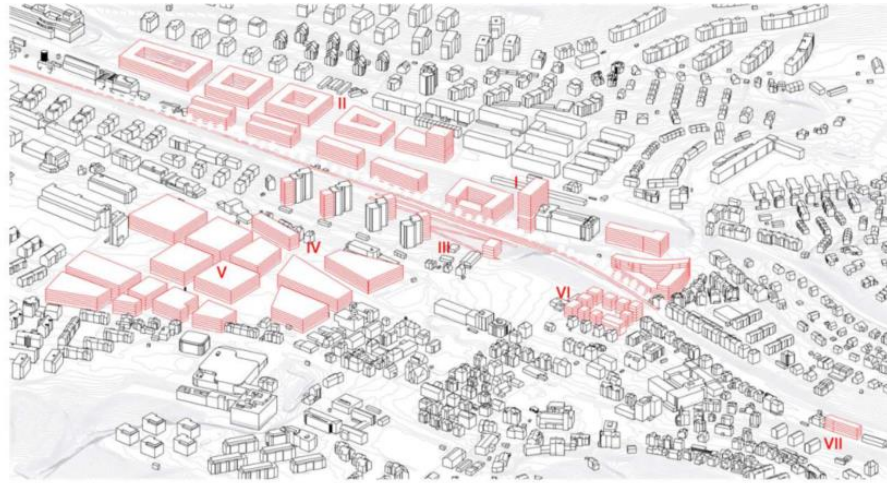
# Dimensioning of new Railway Stations



## Dimensioning of new Railway Stations

- Over the next decades, several dozens of new stations are expected to be opened in Switzerland
- Mostly along existing lines
- In many cases, stations are built to better connect newly developed areas with thousands of new workplaces or houses
- SIMBA MOBi allows adding these new locations and estimate the impact on the overall transport system

# Moving and re-dimensioning St. Gallen Bruggen Station



Nutzungsdichte: Variante A

Entwicklungsgebiet	Einwohner/Arbeitsplätze neu	
	Einwohner [EW]	Arbeitsplätze [AP]
I	1'350	540
II	1'500	300
III	175	0
IV	118	377
V	716	2'101
VI	200	0
VII	63	0
<b>I-VII</b>	<b>4'059</b>	<b>3'318</b>

**7'377**



## New developments in the area

- 4000 new inhabitants are placed in the area around the new station
- They receive a daily plan that fits to their demographics and home location
- 3000 new work places are allocated in the area to agents

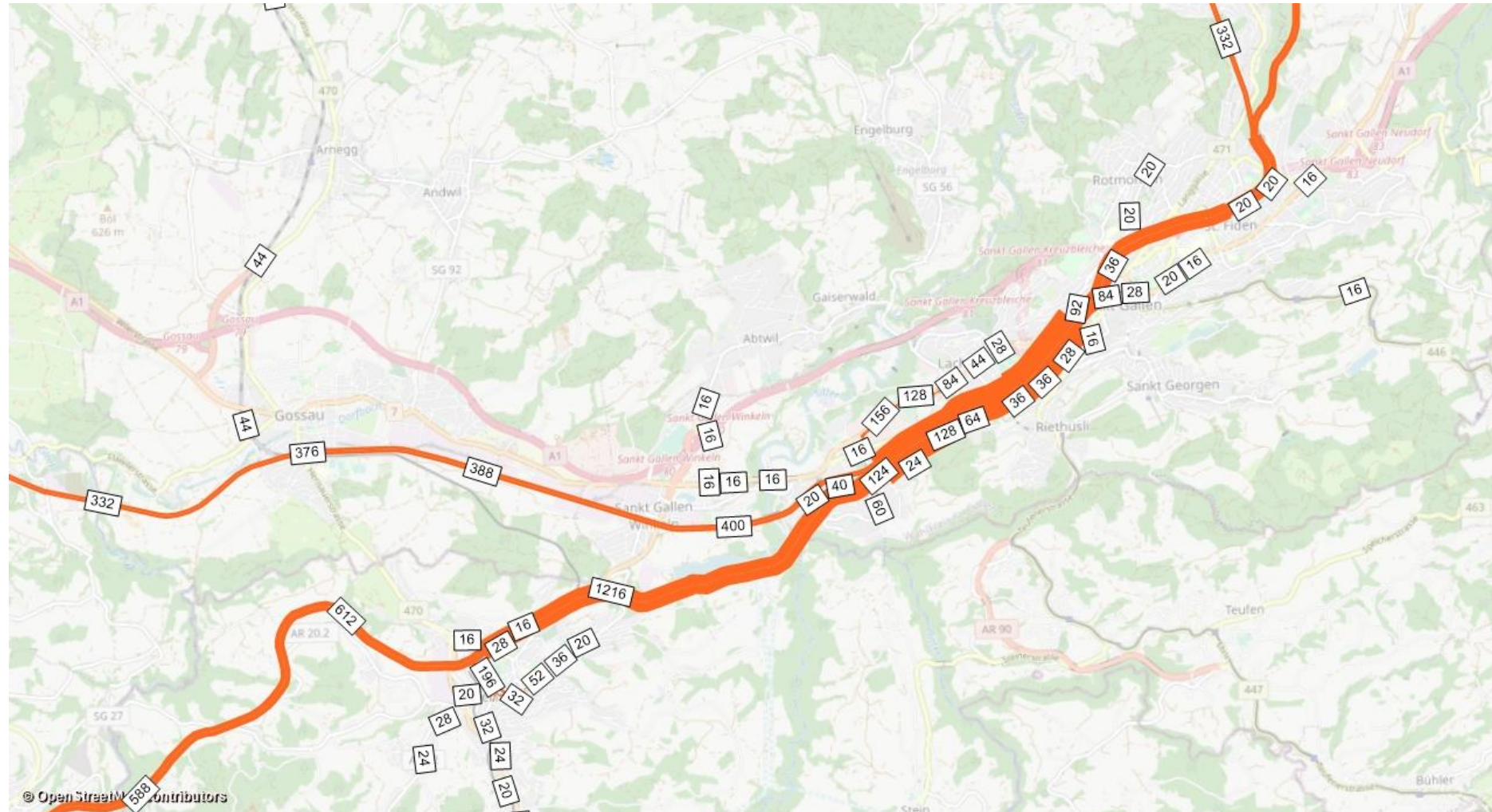




# Passenger Development

	Bruggen	Haggen	Total
Basecase	1'500	2'800	4'300
New Station & New Developments	2'400	3'400	5'800

# Where do people travel to from the new stations?





# Goal: prediction of future rail demand.



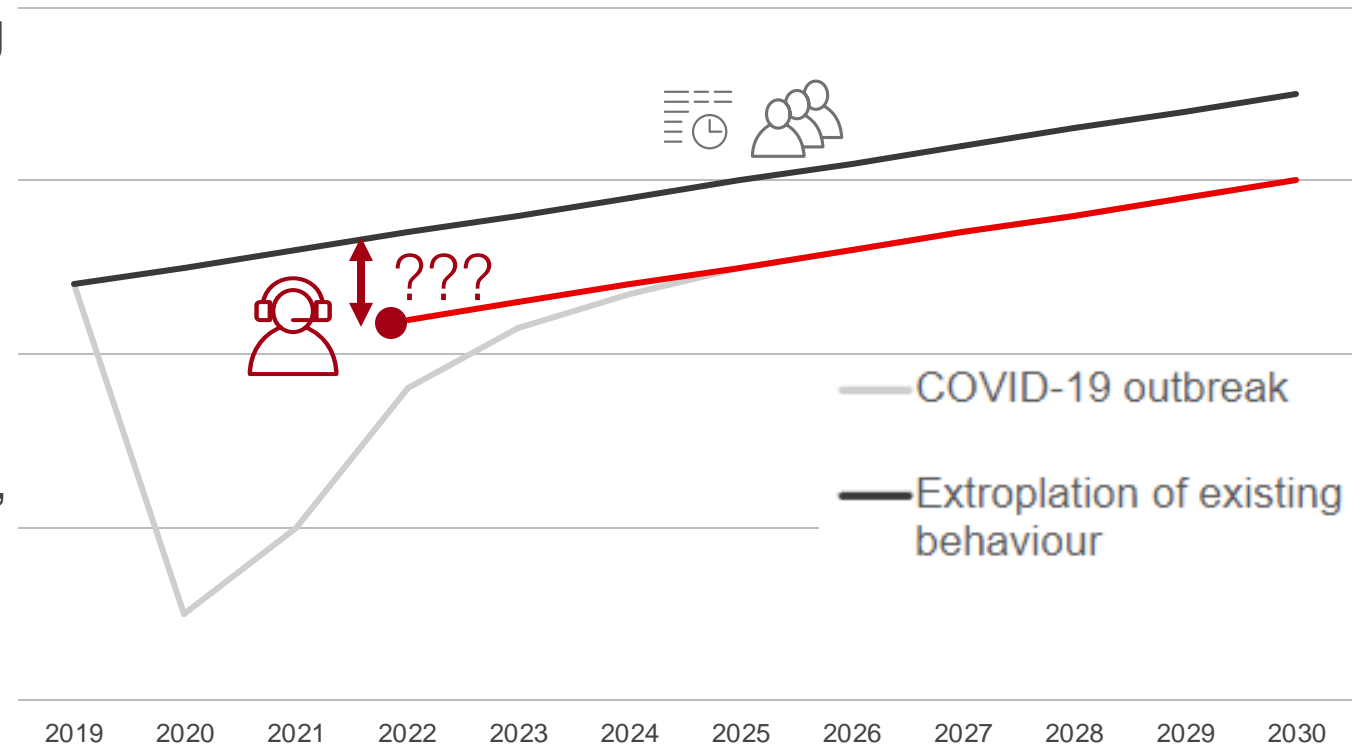
Adjustment of planning process



SIMBA



Changes in population, rail service

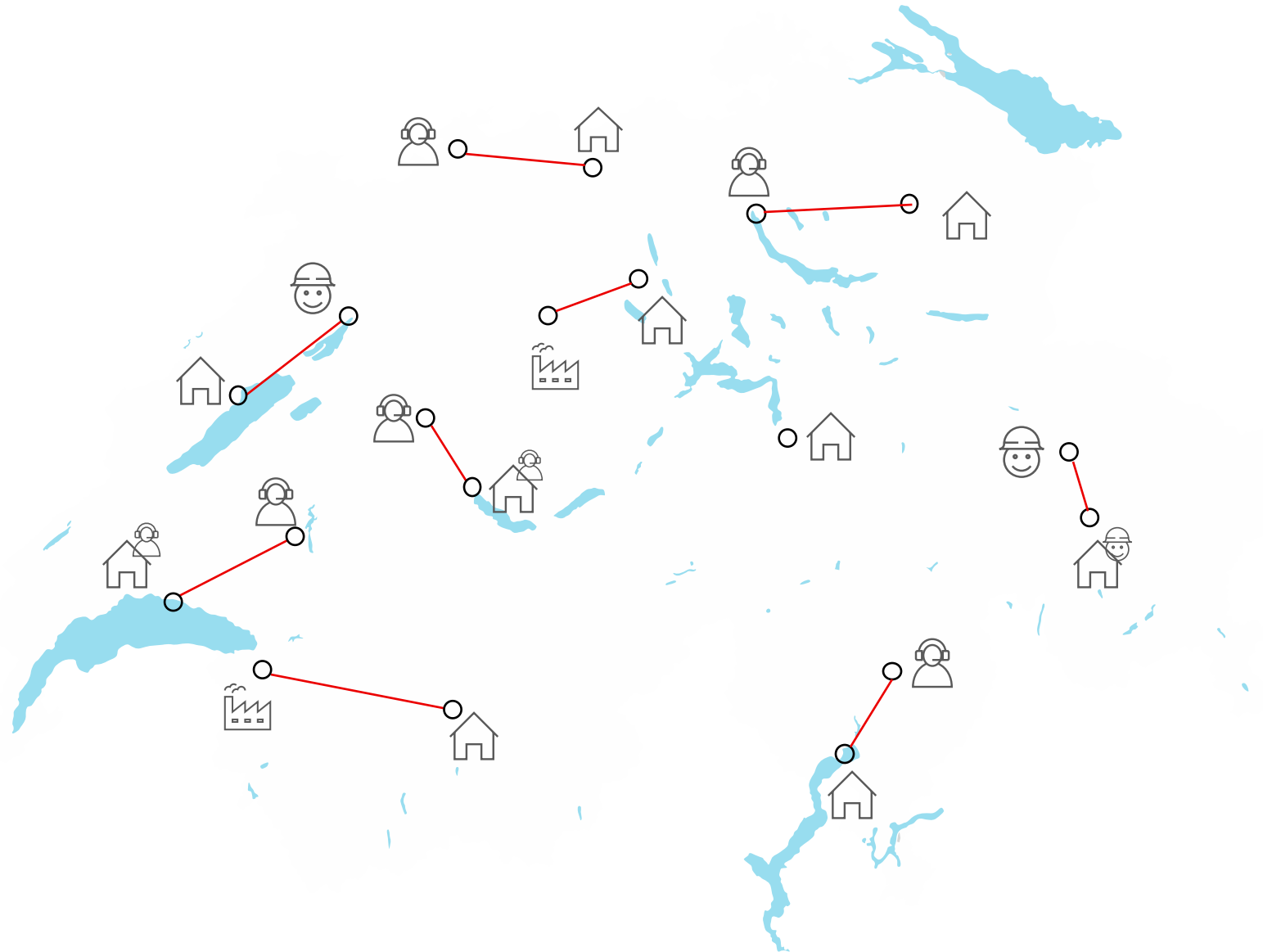




# Methodology: prediction of working from home.

## Basis: Synthetic population.

- Persons with household location and socio-demographic attributes.
- Workplace for all employed persons.



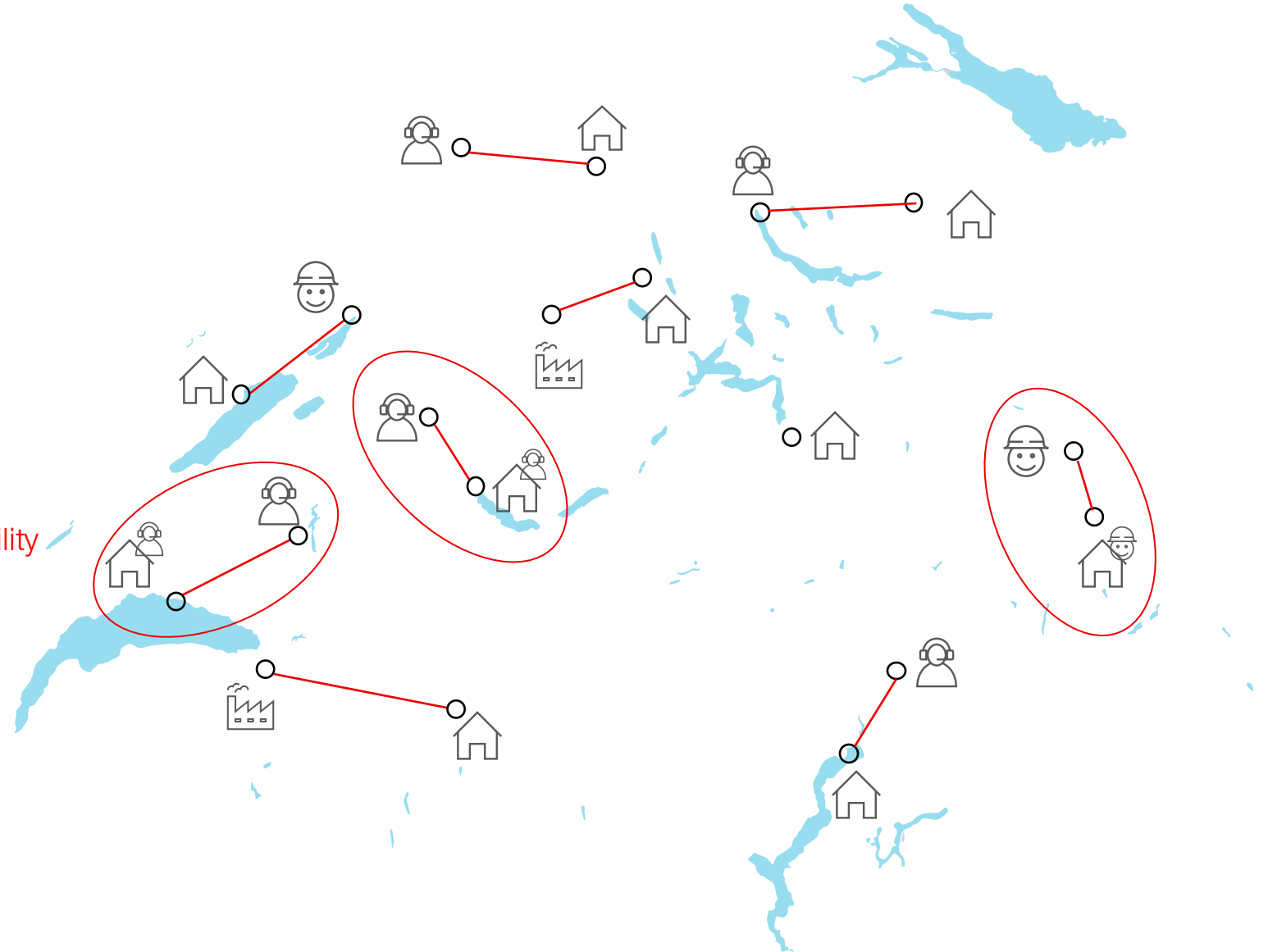
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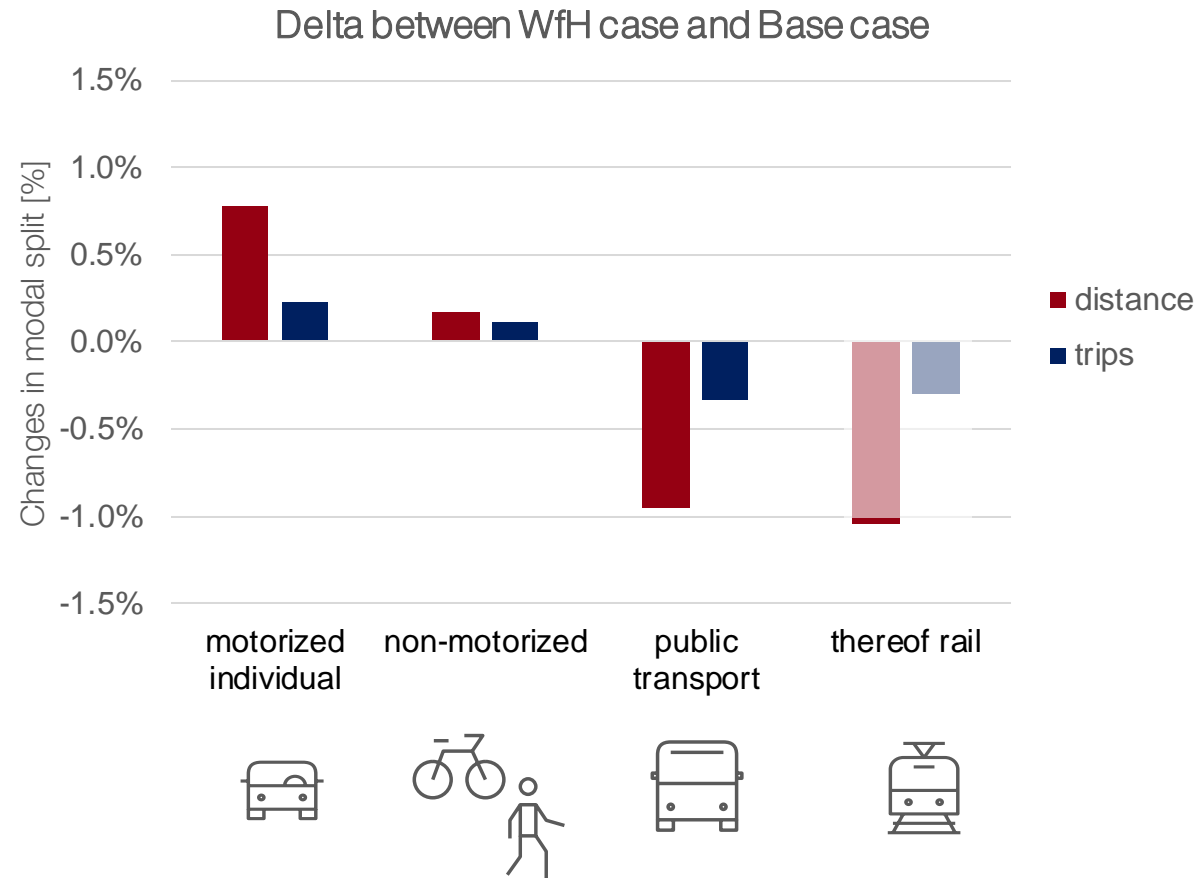
- Persons with household location and socio-demographic attributes.
- Workplace for all employed persons.

## Challenges.

- Which persons?
- How many persons?
- Re-scheduling of daily mobility choices
- Network simulation



# Case study – modal split



Small modal split changes with a big impact:  
Total distance travelled in trains drops by **8.3%**

# Case study – rail demand



# Conclusion

- **SIMBA MOBi offers fast answers** to many different planning questions
- The model allows us to evaluate mobility from a holistic perspective
- Most applications are and will always remain public transport related



Thank you for your attention.

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We are hiring:  
Deadline: June 6

<https://jobs.sbb.ch/v2/offene-stellen/expert-in-simulation-raum-und-mobilitaet/38a28b60-b098-41cf-a5af-6306e3abf3c2>