

Mobility@Chair of Urban Development

Prof. Dr. Alain Thierstein

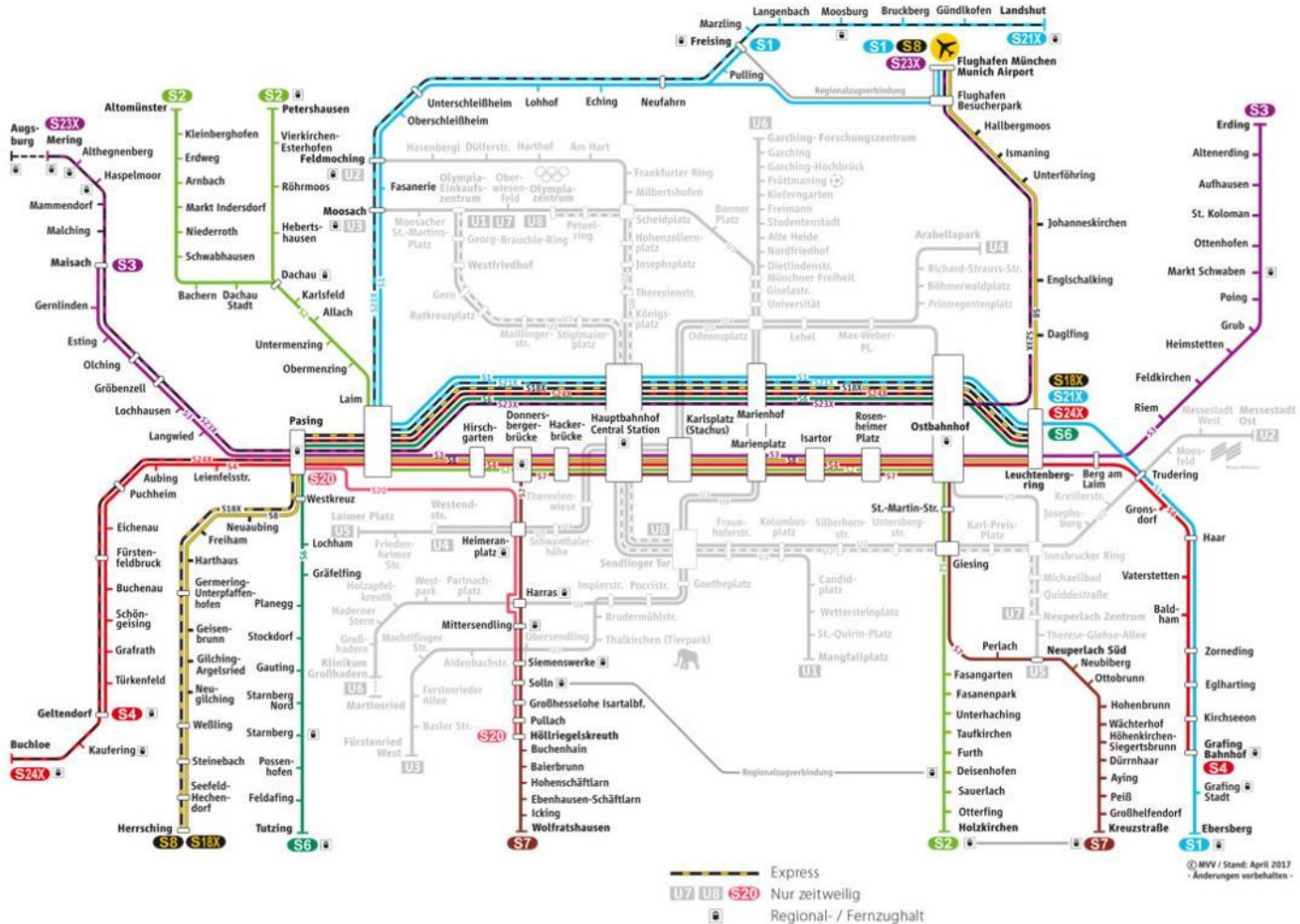
Fabian Wenner M.Sc

Mobilitätstag Mobility@TUM

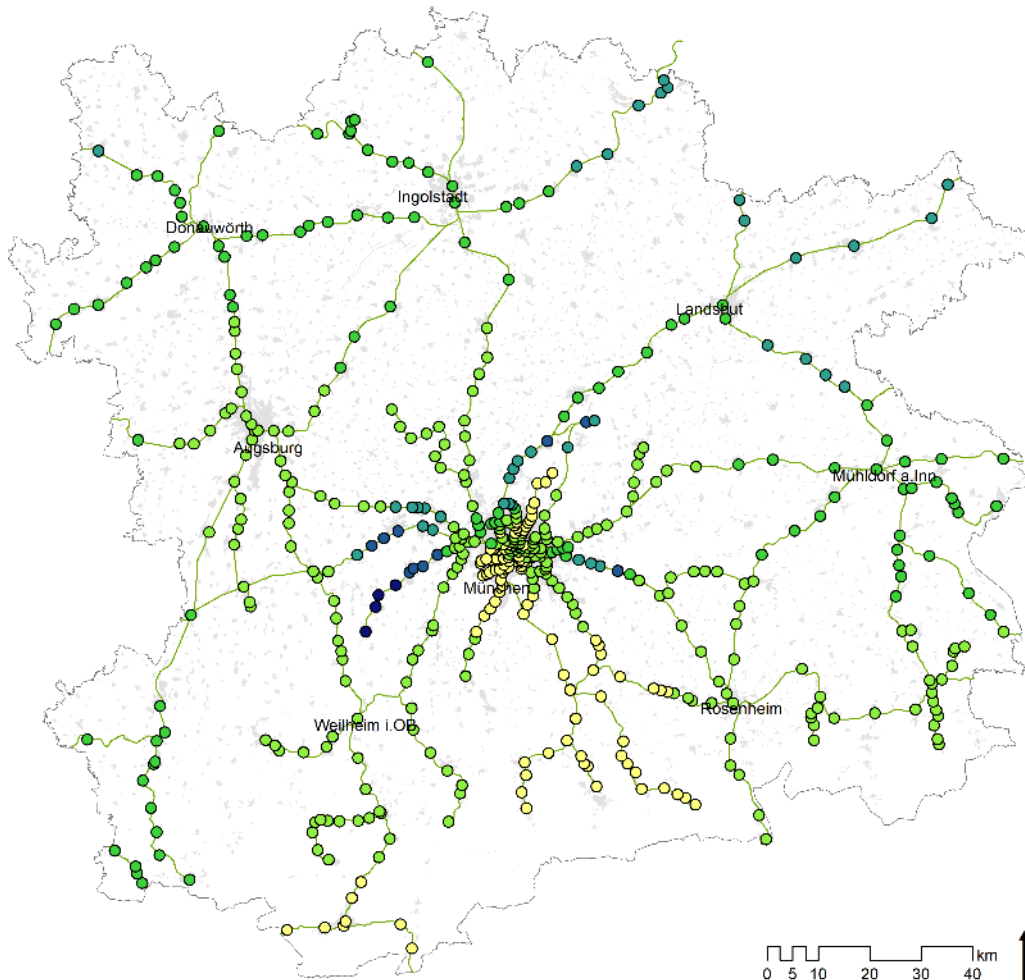
18. November 2019

Accessibility Effects of the Second S-Bahn Trunk Line (Munich)

Planned Network after Completion of Second S-Bahn Trunk Line



Change of Accessibility of Population at Railway Stations in the Metropolitan Area of Munich



After Completion of
Second S-Bahn Trunk Line

(ICE/IC, RE, RB, S, U)

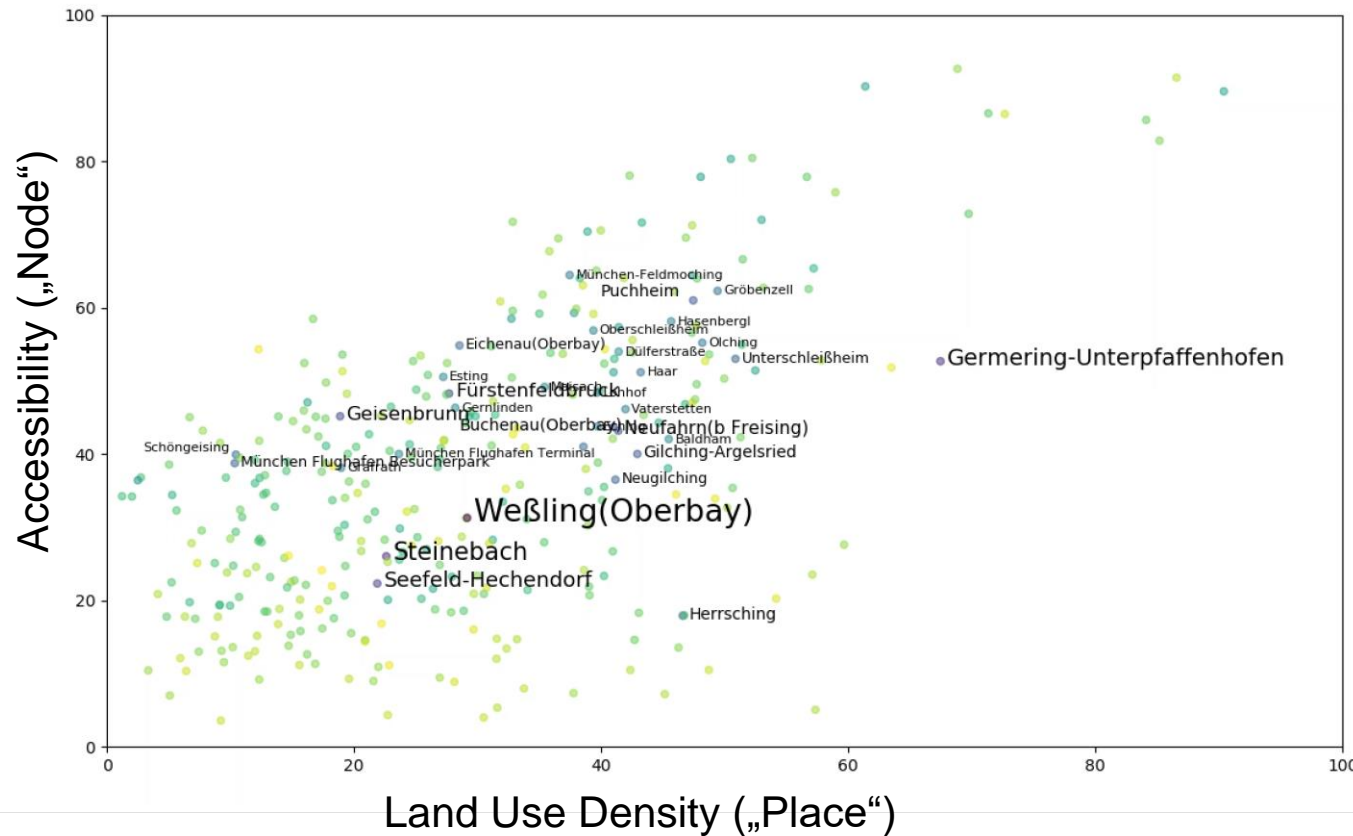
Legende

Veränderung der Gravitationserreichbarkeit

- +22% - +25%
- +25.01% - +30%
- +30.01% - +40%
- +40.01% - +60%
- +60.01% - +100%
- +100.01% - +143%

- Bahnstrecken
- Siedlungsfläche

Change of Accessibility of Population at Railway Stations in the Metropolitan Area of Munich

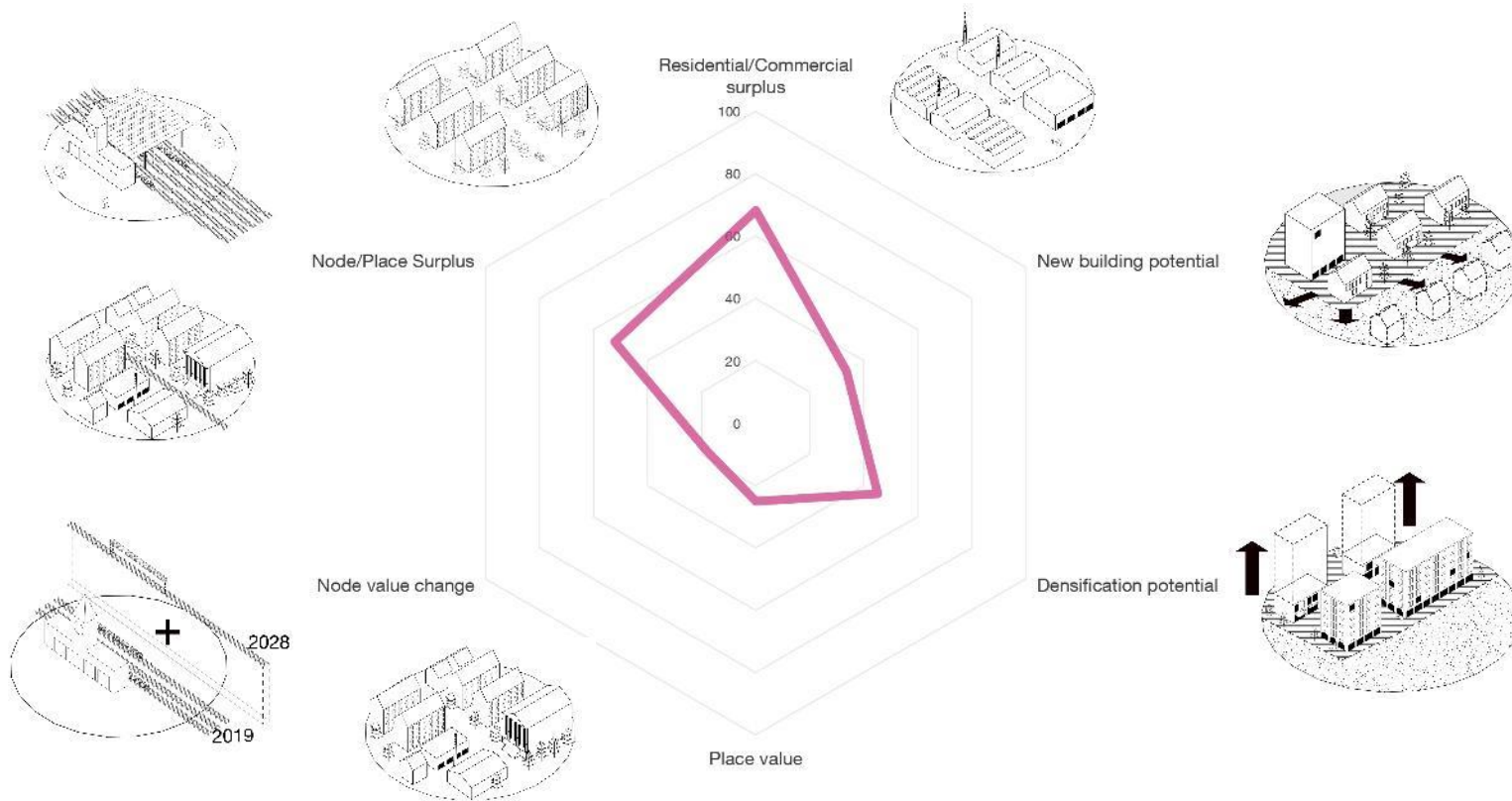


Visualisation: Student Project „Inside Out“, Khoi Anh Dang, Alessandro Pedrazzoli, Jiaqi Wang (2019)

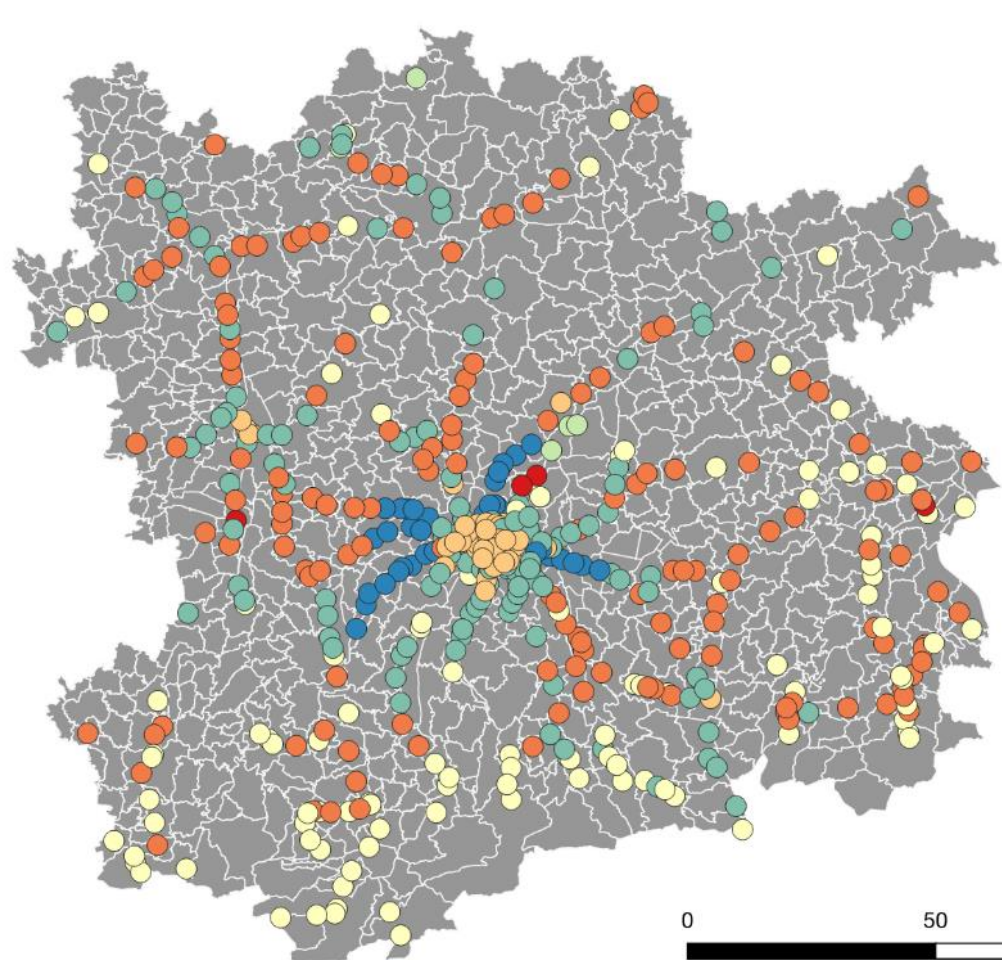
Change of Accessibility of Population at Railway Stations in the Metropolitan Area of Munich

Nr	Name	Change	Rank 2019	Rank 2028
1	Weßling(Oberbay)	+143.00%	317	114
2	Steinebach	+141.32%	359	189
3	Seefeld-Hechendorf	+139.96%	388	246
4	Herrsching	+138.51%	430	312
5	Germering-Unterpfaffenhofen	+79.94%	149	47
...				
338	München Hbf	+26.67%	1	1
...				
512	Furth(b Deisenhofen)	+22.00%	131	169

Cluster Analysis of Station Characteristics (Example: München-Langwied)



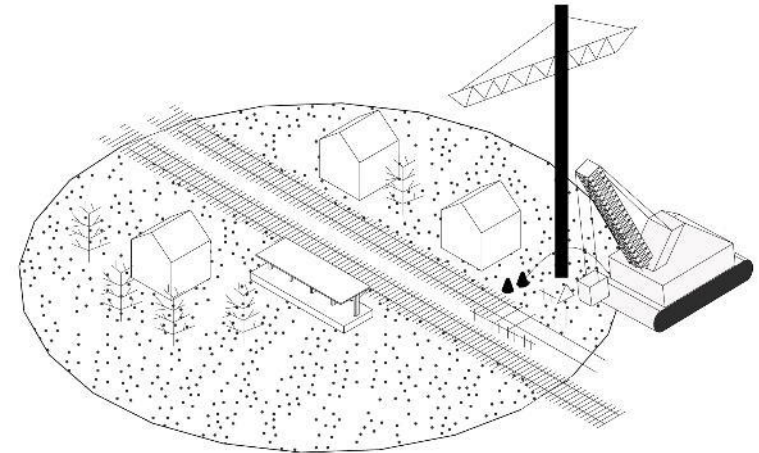
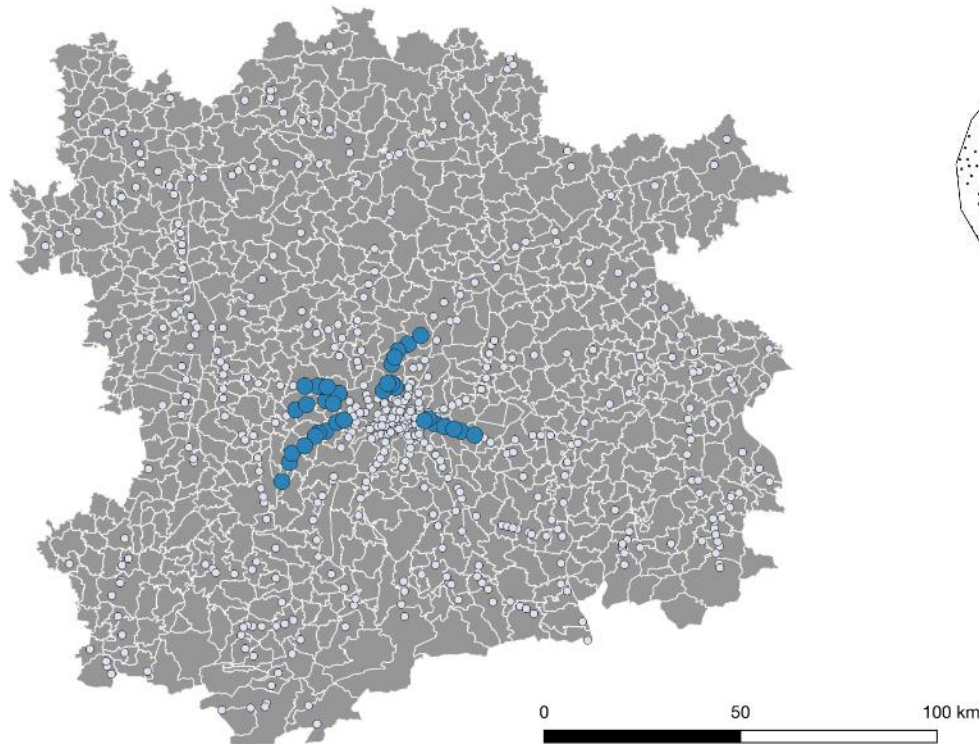
Spatial Distribution of Clusters



- Commercial Places
- Rural Areas
- Inner-City Situations
- Boundary Places
- Transit Hubs
- Suburban Places
- Stations in Transition

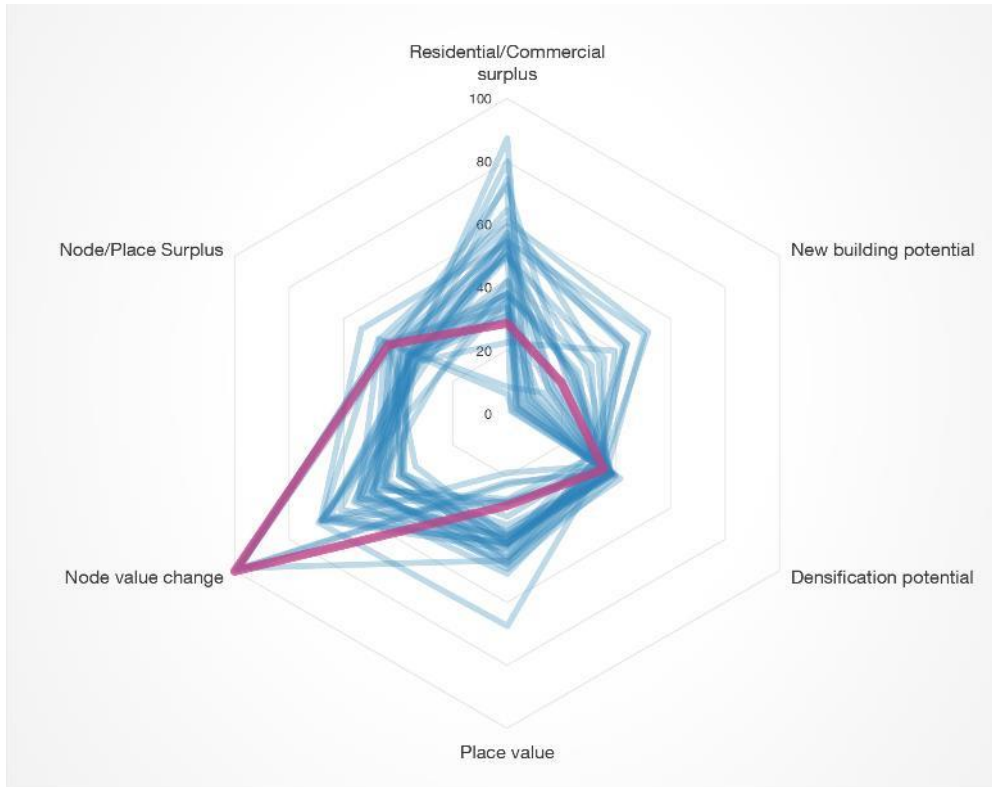
- K-means cluster analysis to identify structures and similarities between stations
- Total of 7 clusters with different size (4 to 145)

Stations in Transition



- Number of stations: 35
- Stations with the highest node value change due to the 2nd Stammstrecke
- Node surplus, expected to increase

Stations in Transition: Weßling(Oberbay)



Stations in Transition: Weßling(Oberbay)



- Stop for the new express S-Bahn trains, travel times to Munich to drastically decrease
- Proposal: Prepare for the upcoming accessibility change by adequate policies to support dense, diverse, sustainable urban development

40 Years of Rail Accessibility Change in German Regions

High-Speed Rail in Europe

High-Speed Rail in Europe

Status

- In Service
- Under Construction

Status

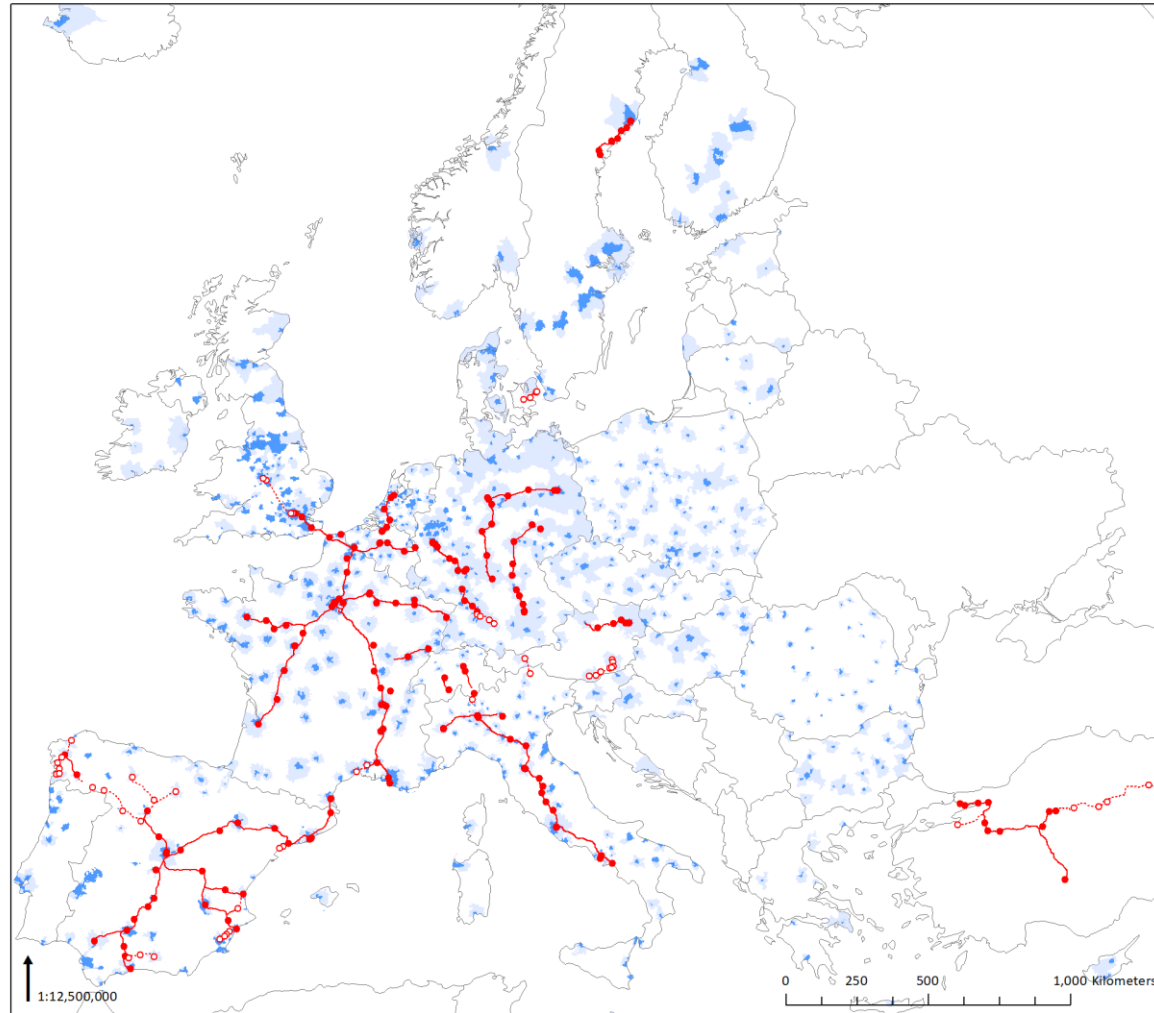
- In Service
- ⋯ Under Construction

EU Functional Urban Areas

- Core Cities
- Functional Urban Areas

Borders

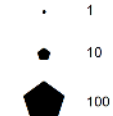
- National borders



Regional Accessibility by Rail in Germany

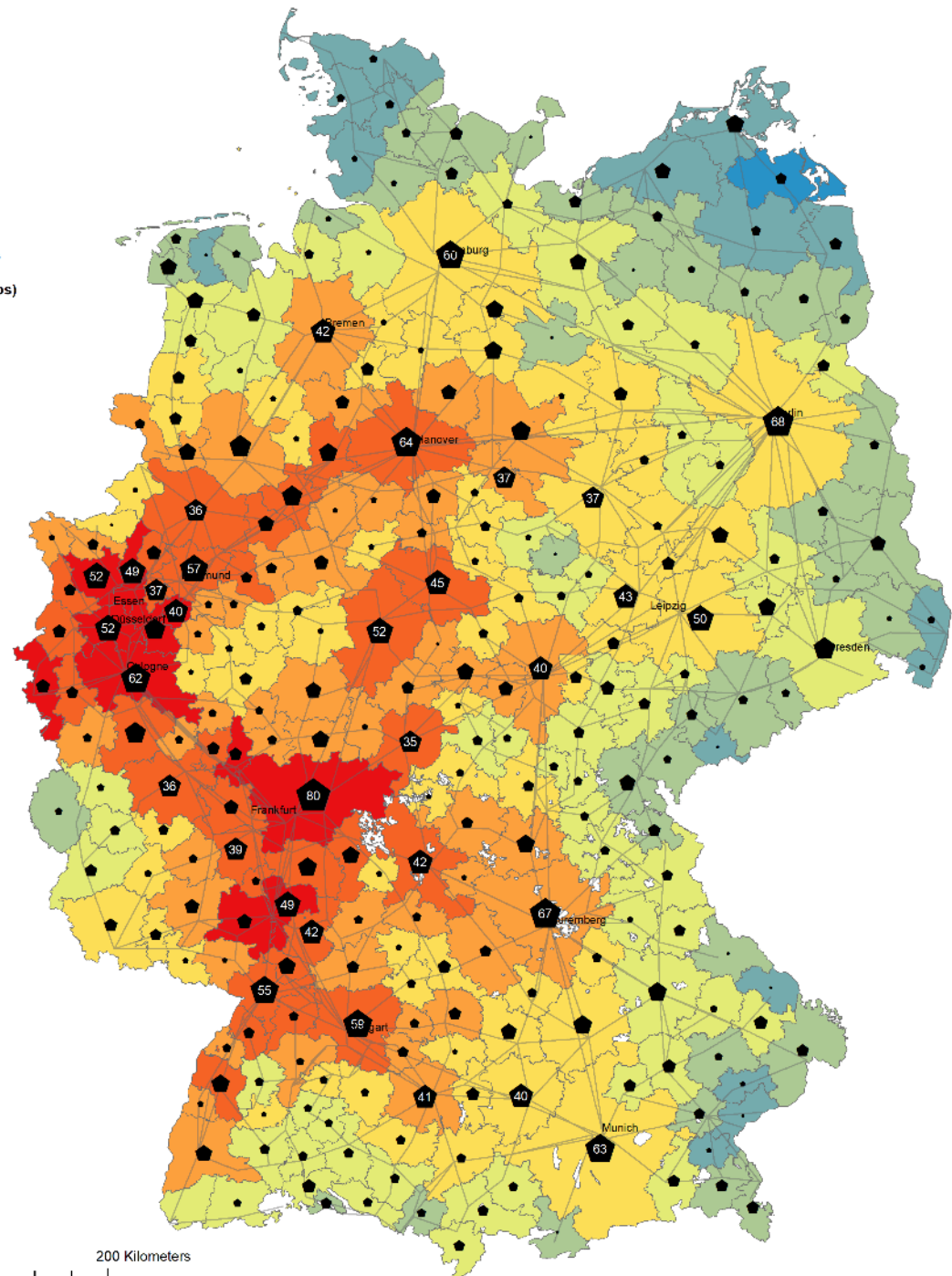
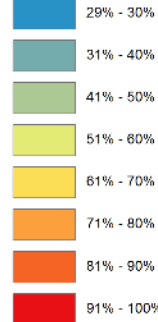
Legend

Number of Directly
Connected Regions 2020



— Railway Connections

Accessibility (Business Trips)
2020, Cologne = 100%



Rail Accessibility Change in German Regions 1990-2020

Legend

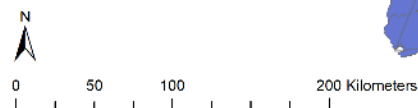
Change of Number of Directly
Connected Regions 1990-
2020

- ▼ -30 - -15
- ▼ -14 - -5
- 4 - -5
- △ 6 - 15
- △ 16 - 20

— Railway Connections

Change of Accessibility
(Business Trips) 1990-2020

- +19% - +25%
- +26% - +50%
- +51% - +75%
- +76% - +100%
- +101% - +150%
- +151% - +200%
- +201% - +285%



Thank You for Your Attention

Fabian Wenner M.Sc.
f.wenner@tum.de
+49 89 289 22142
www.ar.tum.de/re