

Light Rail Hubs in a Multimodal Transport Environment

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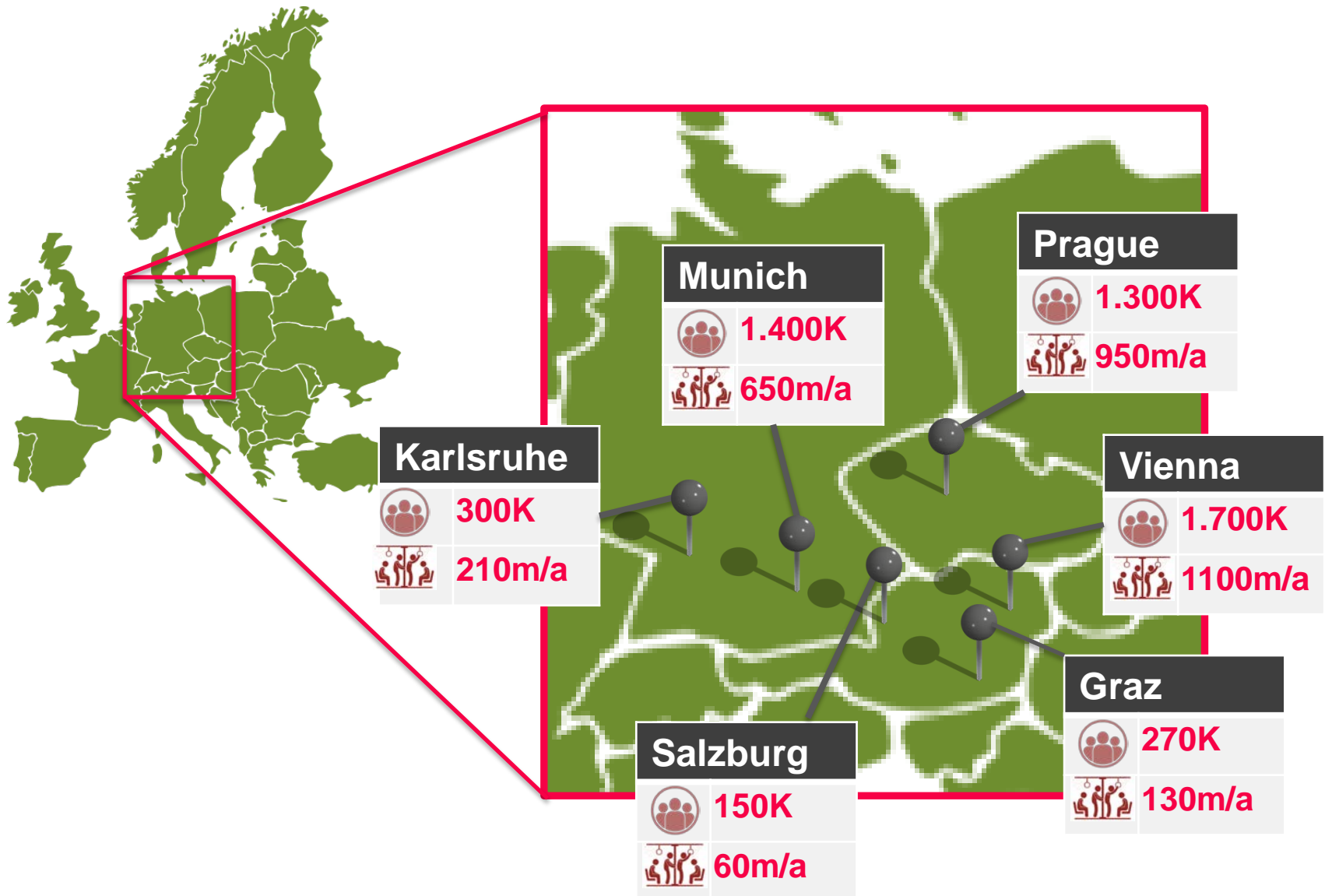


13th National Light Rail & Streetcar Conference



- Public Transport Alliance
- Joint Traffic Modeling
- Integrated design of individual and public transport
- Integrated urban development, road design and network design

- Hubs are the interfaces between light rail and other modes
- Transfers have significant impact on mode choice
- Successful hub design requires integrated design approach

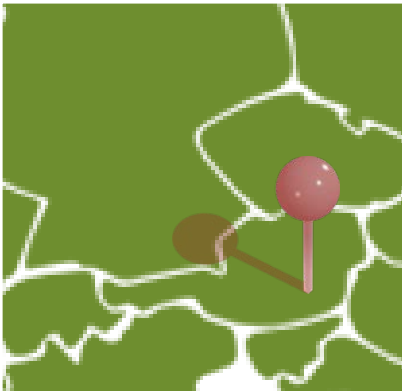


Graz

Andritz

Passengers/day

Urban	14K
Regional	-
Long-D	-



Graz

Murpark

Passengers/day

Urban	8K
Regional	1K
Long-D	-



Graz Puntigam

Passengers/day

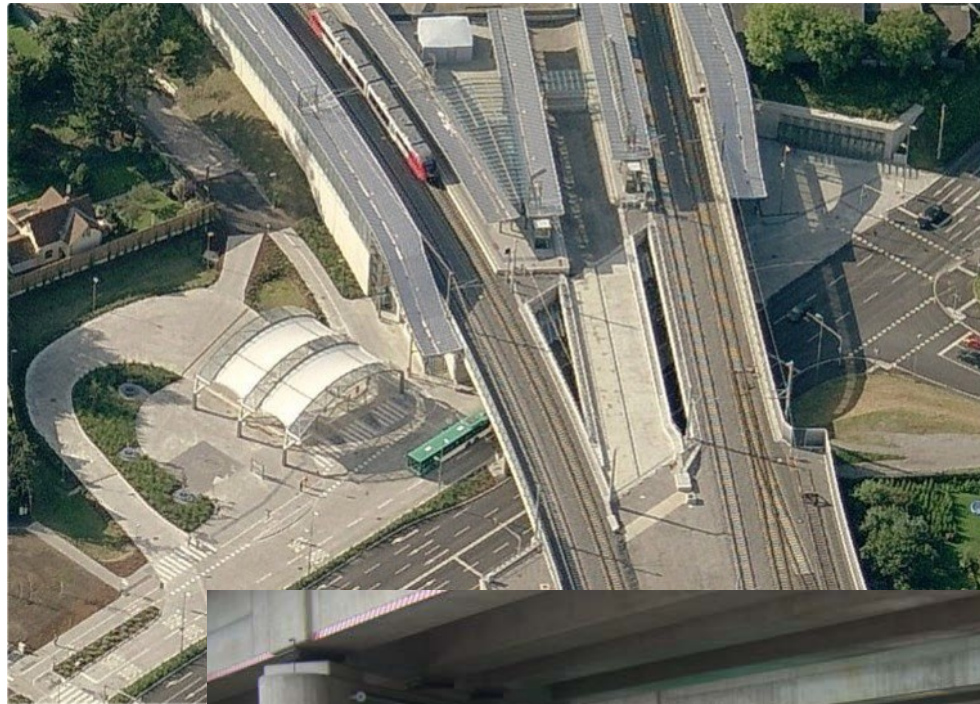
Urban	9K
Regional	-
Long-D	-



Graz Don Bosco

Passengers/day

Urban	17K
Regional	2K
Long-D	-



www.geo-illy.at

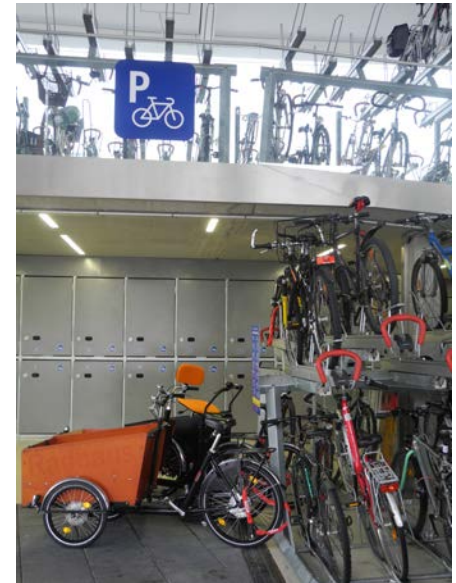
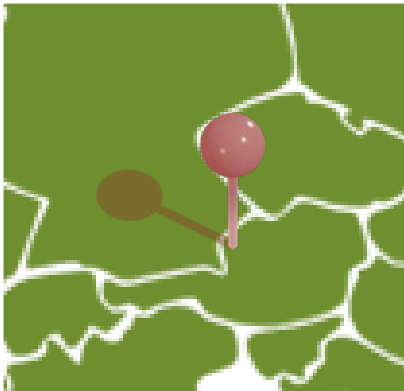


Salzburg

Main station

Passengers/day

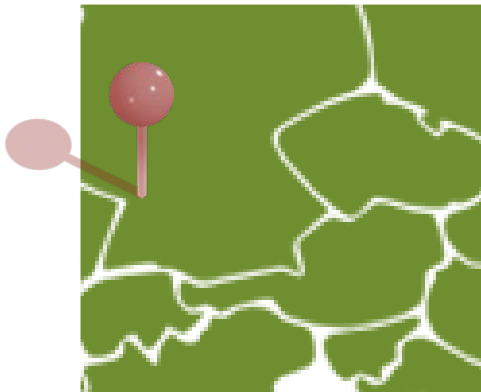
Urban	11K
Regional	14K
Long-D	-



Karlsruhe Zündhütle

Passengers/day

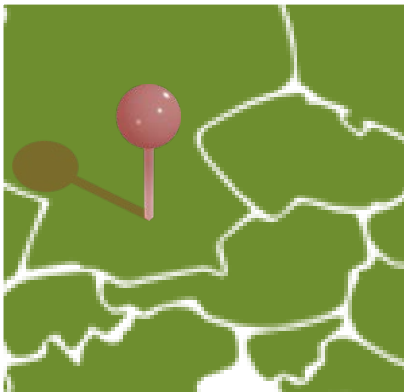
Urban	1K
Regional	10K
Long-D	-



Munich Pasing

Passengers/day

Urban	21K
Regional	11K
Long-D	9K

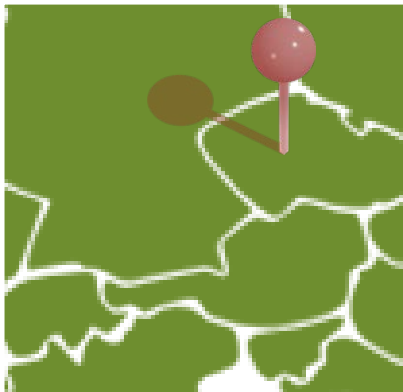


Prague

Hradčanská

Passengers/day

Urban	55K
Regional	5K
Long-D	-



www.kaupunkliikenne.net/Praha/index.html



Hubs

**14 hubs
In 6 cities**

Features

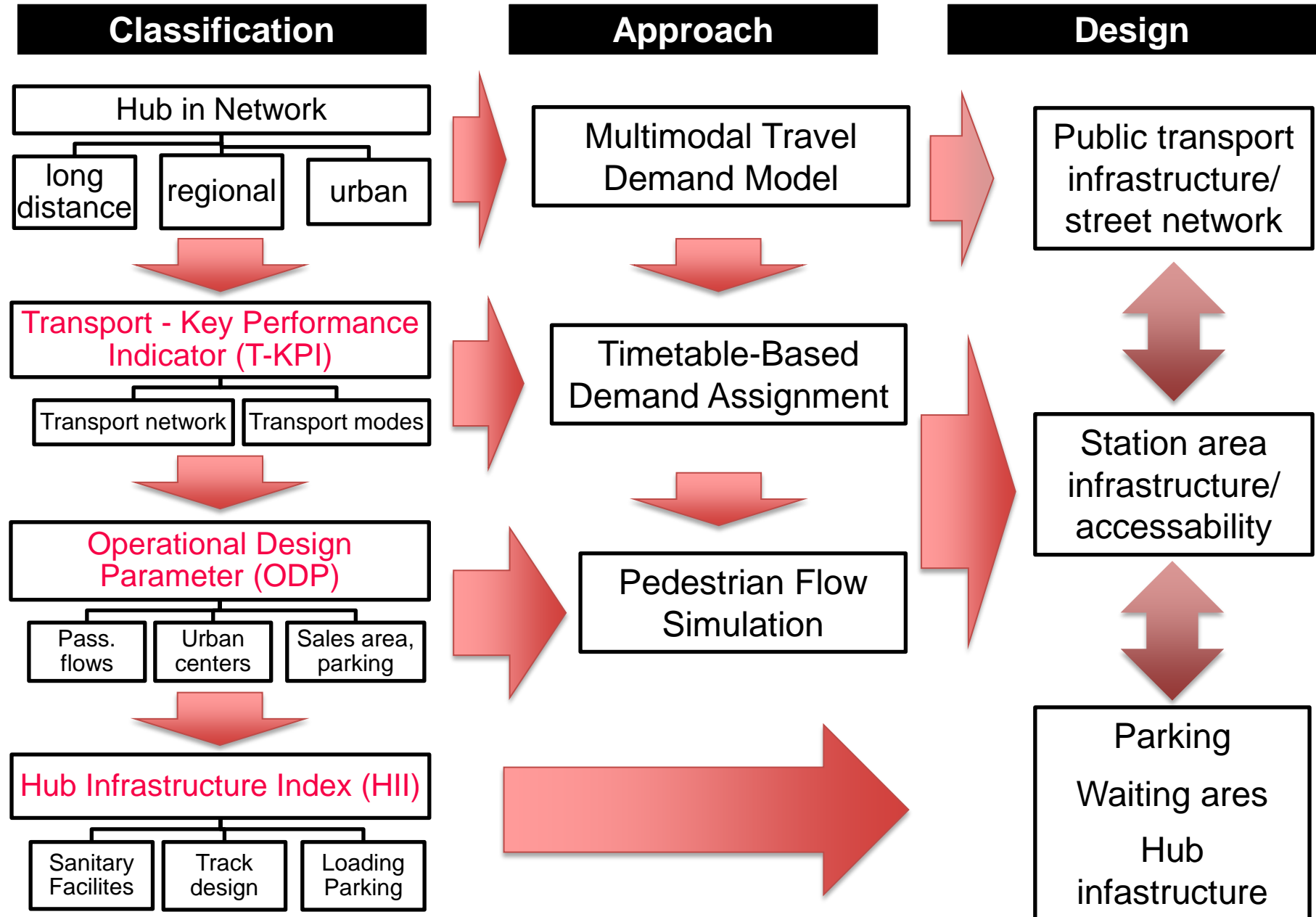
T-KPI (Transport Key Performance Index)

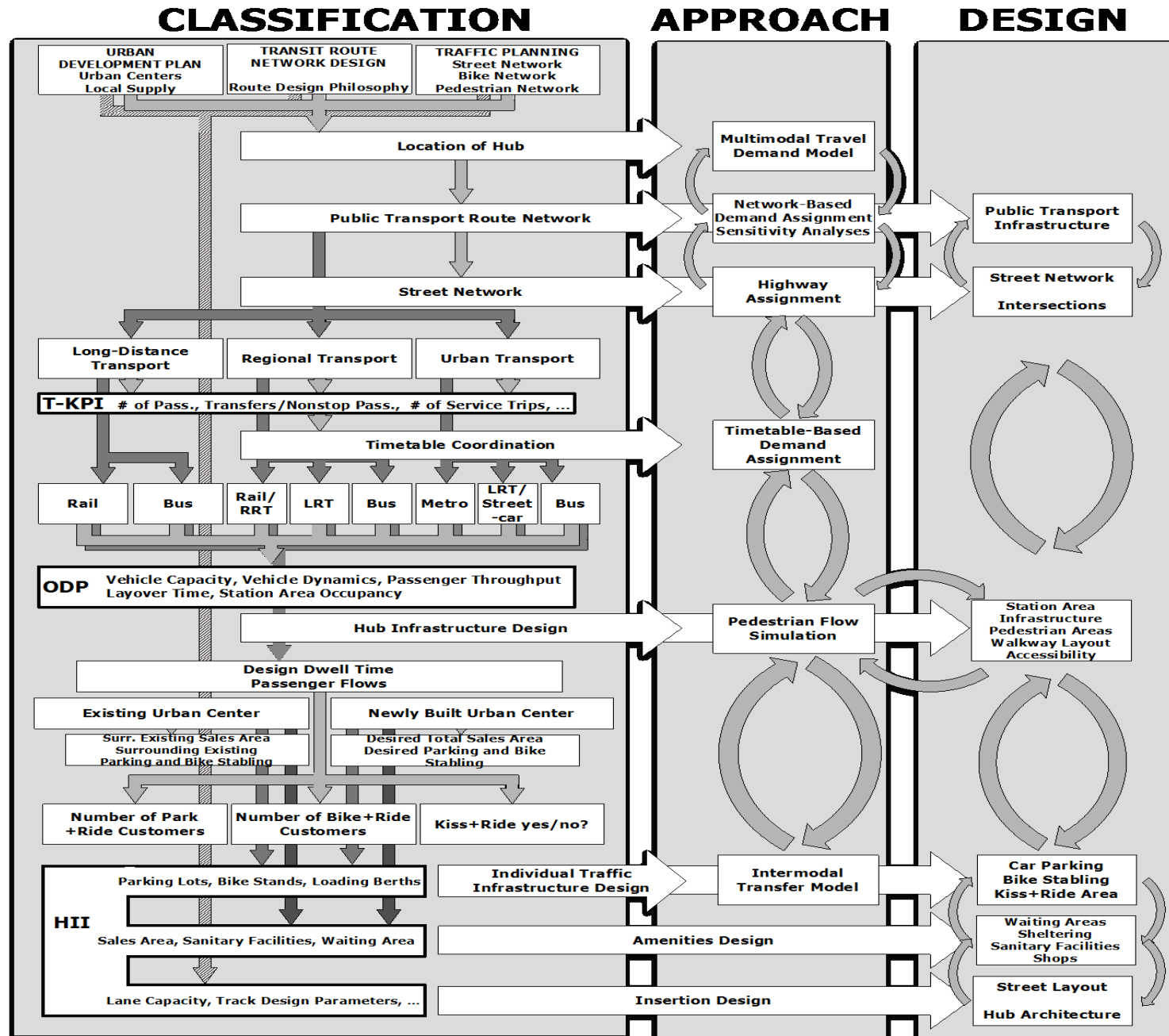
Total Area Hub [km²]	4	8	4	5	3	32	2	11	12	1	25	13	15	15
# of Passengers/Day:														
- Long-distance	-	-	-	-	-	-	-	N/A	N/A	N/A	9k	N/A	-	-
- Regional	-	2k	1	-	1k	-	5k	-	-	-	11k	-	5k	2k
- Urban	14k	17k	8k	9k	10k	11k	5k	-	-	-	21k	-	55k	70k
# of Trips/Day	282	272	148	731	565	23	291	221	200	122	287	886	2104	2514
Pass. Capacity/Day	520k	100k	10k	73k	33k	11k	5k	11k	8k	11k	150k	150k	278k	411k
pass capacity ratio														
longdist. : regional:urban	0:0:1	0:1:2	1:9:19	0:1:2	0:1:31	0:4:3	0:1:1	1:11:20	0:0:1	0:0:1	1:3:6	0:0:1	0:1:12	0:1:29
Ratio of Transfers/Nonstop passengers	7.4:1	1:4.3	8.3:1	10.4:1	10.4:1	10.4:1	10.4:1	1:0	3:1	0:1	1:1	2:1	1:2	1:2

HII (Hub Infrastructure Index)

Walkway layout		max	max	max	max	max	max	max	max	max	max	max	max	max
- Distance btw. different modes [m]		250	500	250	200	150	200	250	550	400	250	650	550	
- Location of service facilities [m]		max	max	max	max	max	max	max	max	max	max	max	max	
Percentage of handicapped accessible berths [%]	100	100	100	100	100	100	100	100	100	100	100	100	100	
Stopover function [Yes/No]	Y	N	N	N	N	Y	N	N	Y	N	Y	N	Y	Y
Sales area														
- # of stores	<10	-	>10	-	-	<10	-	-	-	<5	>10	<5	<5	<5


+ ODP Operation Design Parameter

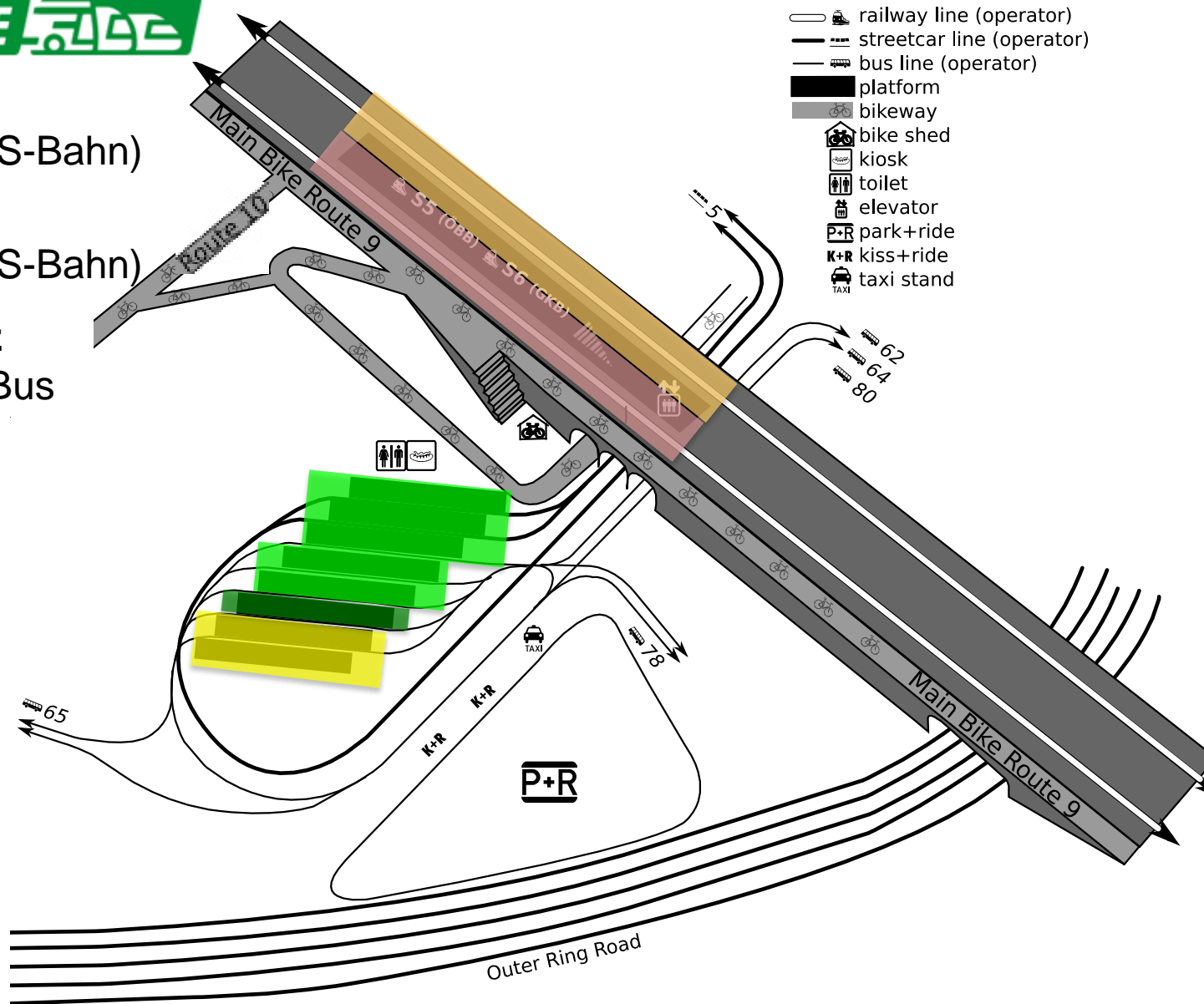




Public Transport Alliances

VERBUND LINIE 

-  **ÖBB**
Heavy Rail (S-Bahn)
-  **GKB**
Heavy Rail (S-Bahn)
-  **Holdig Graz**
Streetcar + Bus
-  **Grüner Bus**
Bus
-  **Watzke**
Bus





Heavy Rail



Streetcar



Bus



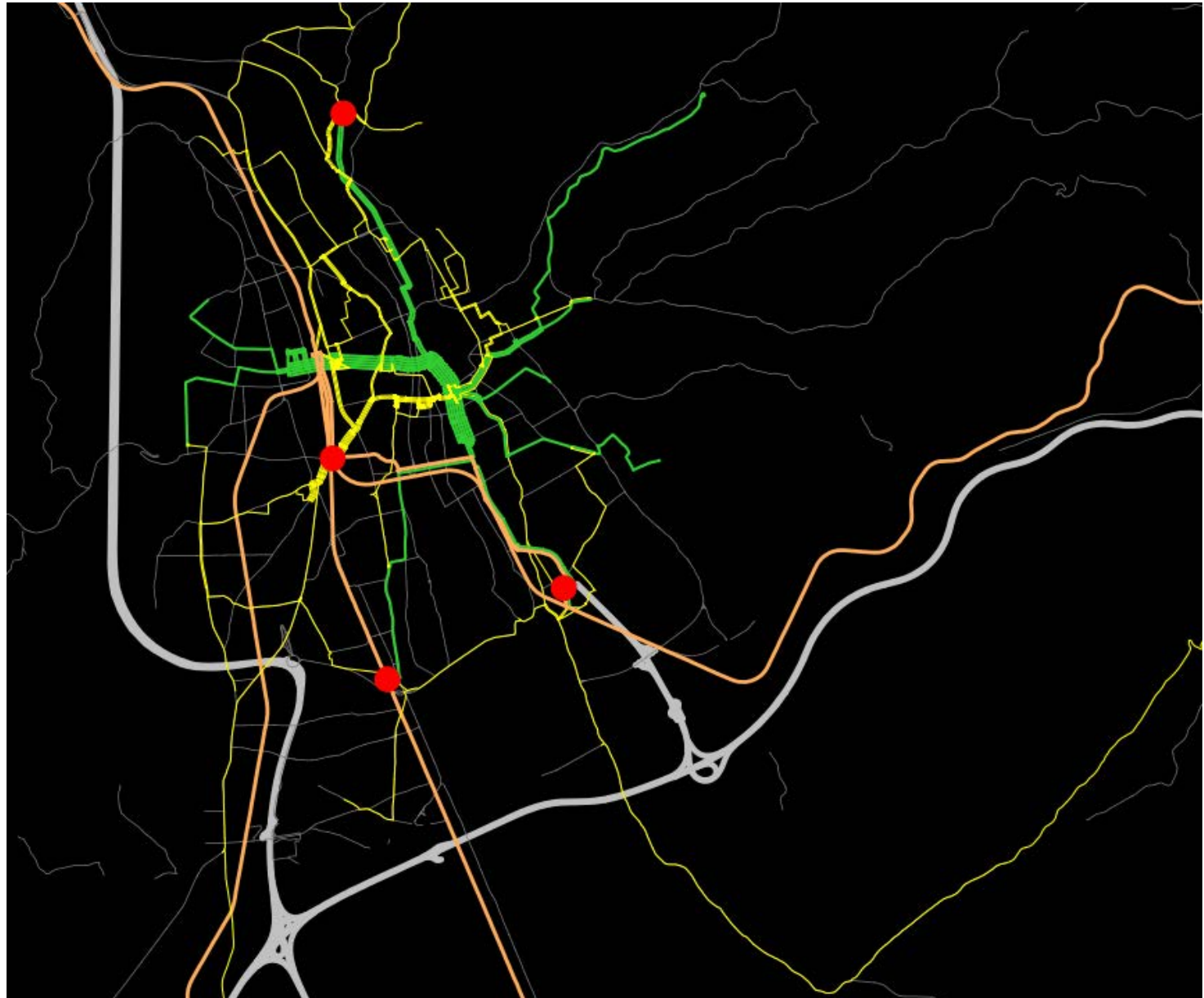
Highway

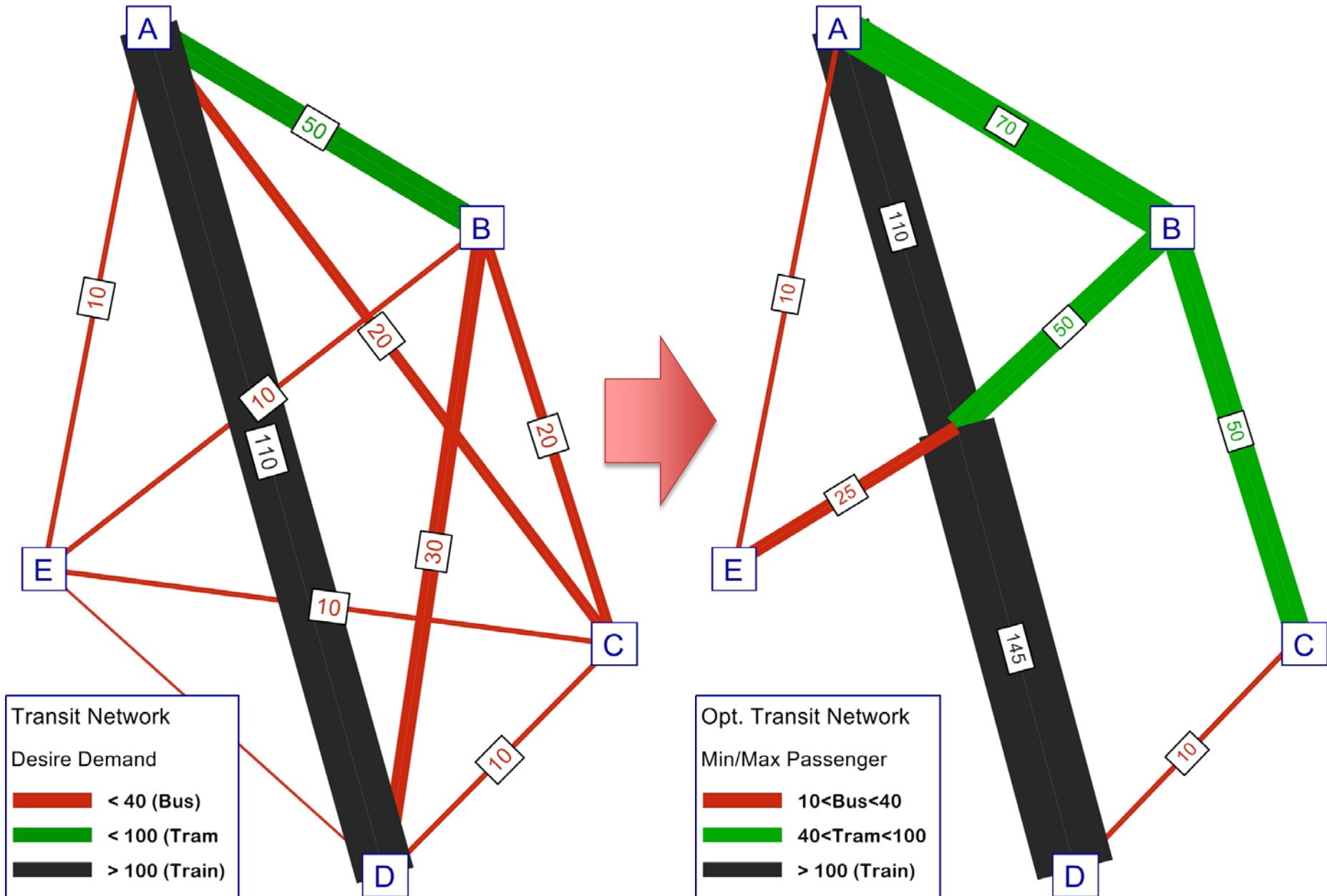


Streets



Multimodal
Hub





Integrated design of individual and public transport

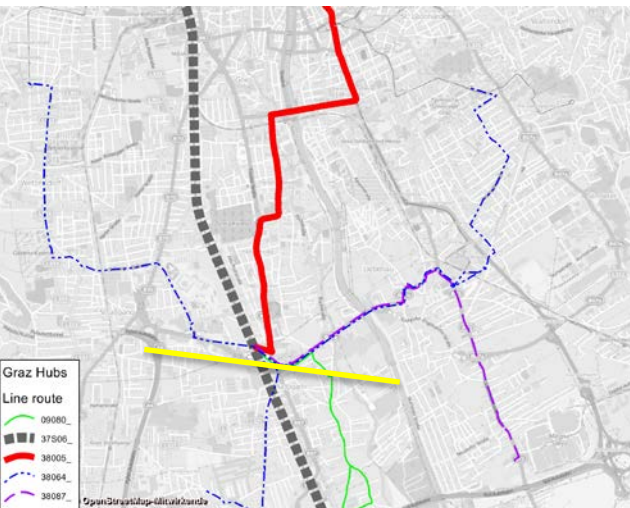
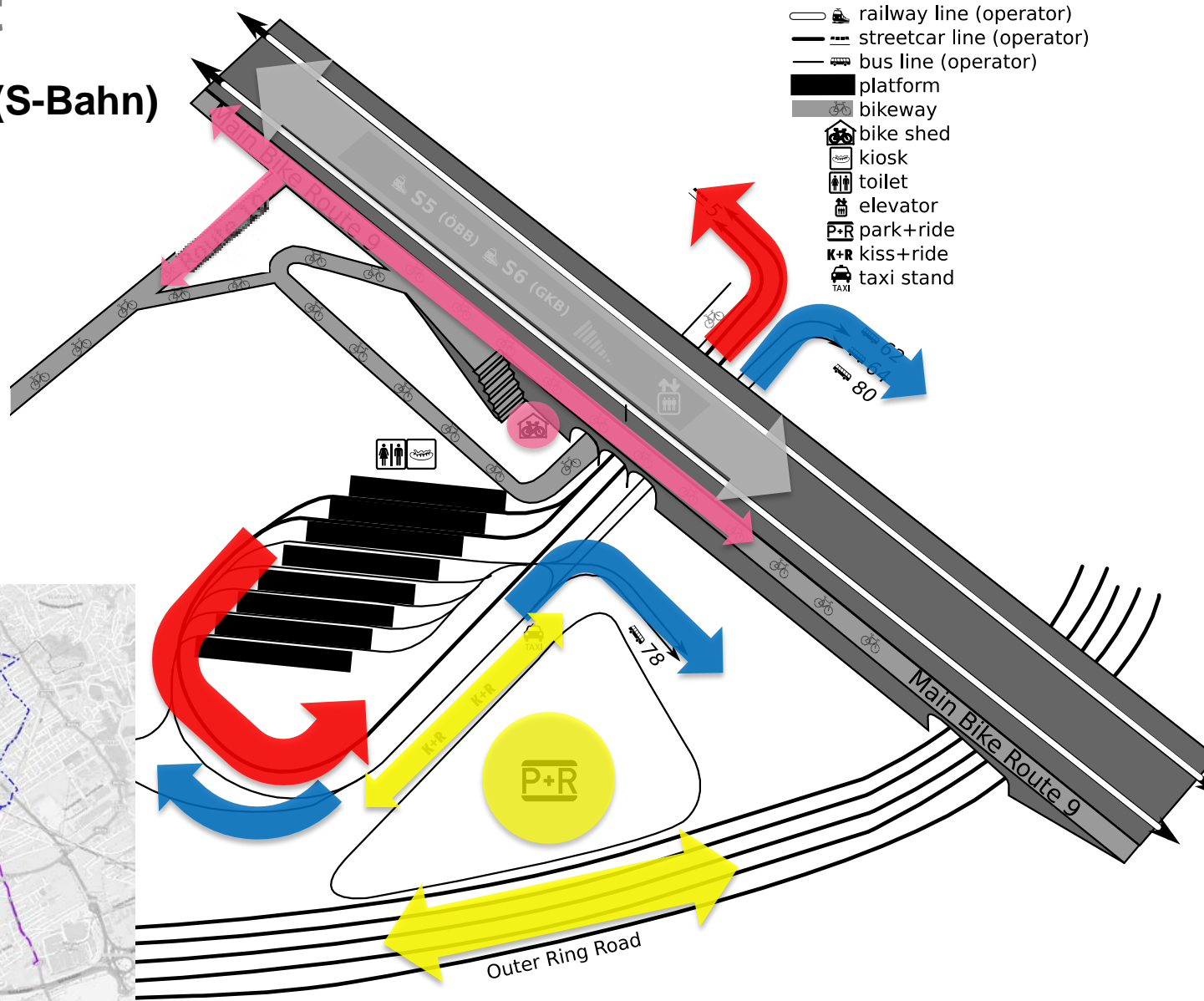
Heavy Rail (S-Bahn)

Streetcar

Bus

Bike

Car



Andritz



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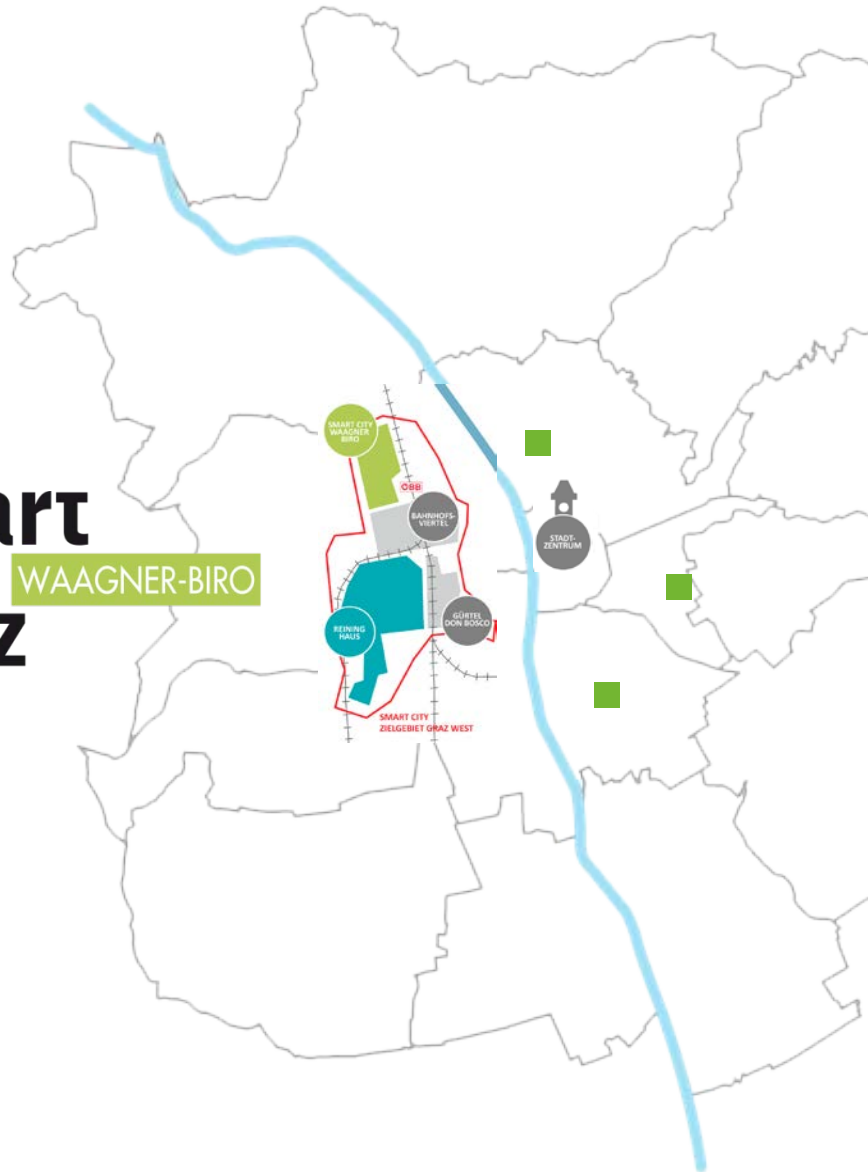
Karlsruhe – Zündhütte



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- Joint Traffic Modeling
- Integrated design of individual and public transport
- Integrated urban development, road design and network design

**smart
city
graz** WAAGNER-BIRO



Thank you for your attention!



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