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the mind of movement

MaaS and the impact of (semi-) autonomous vehicles

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PTV Group.

“Software platform for traffic planning & traffic optimalization”

Strictly private and confidential

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“MaaS is not a new app or service, it stands for a change in mobility as a whole”

Eindhovens Dagblad

- Strategic approach (human driven)
- Adding autonomous vehicles / ride sharing
- Smart cities (Operational; market orientated)

- Dutch Ministry ; 7 Maas

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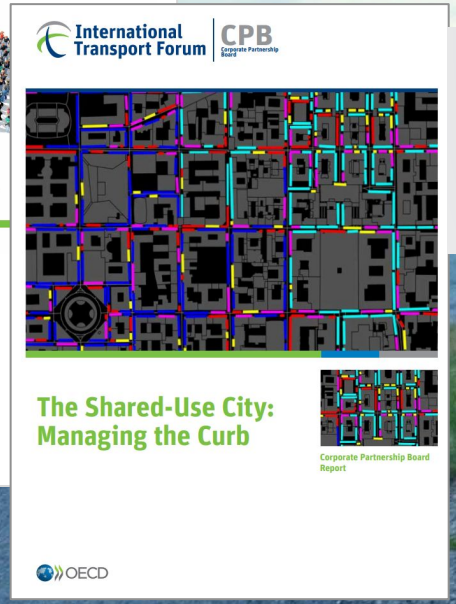
The evolving Lisbon Studies

2015: shared autonomous vehicle fleet

2016: introduced ride share. Capturing a vision

2017: Expanded to a wider region



2018: Identifying the curb as an asset to be managed

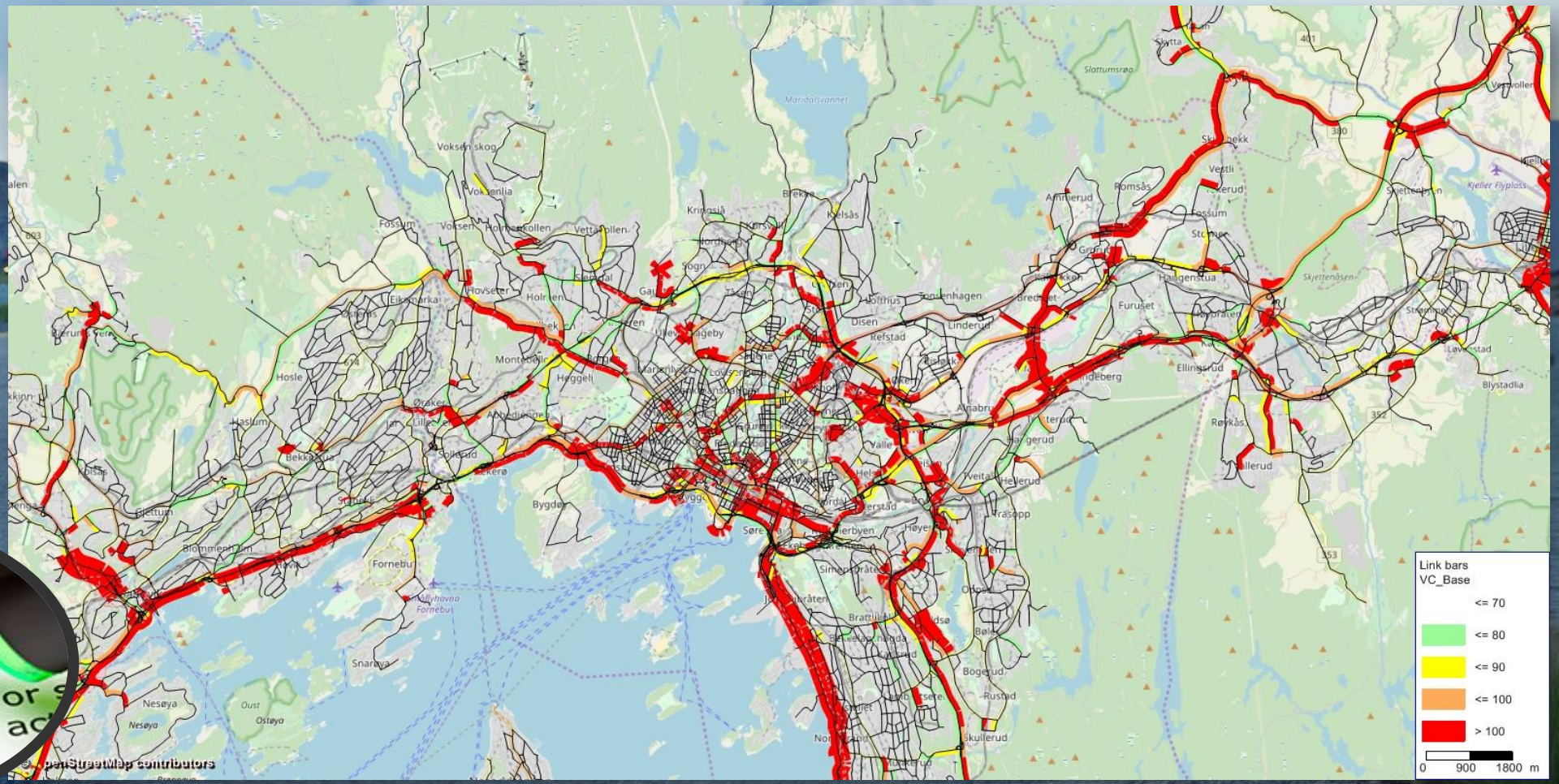
Number of vehicles and traveled kilometers.

	BASE	1A	1B	2A	2B	3A	3B
	PRIVATE CARS 2020	FROM PRIVATE CAR TO CAR SHARING	FROM PRIVATE CAR TO SHARED TAXI	FROM PRIVATE CAR, BUS AND TRAM TO CAR SHARING	FROM PRIVATE CAR, BUS AND TRAM TO SHARED TAXI	FROM BUS AND TRAM TO TAXIBUS: FROM PRIVATE CAR TO CAR SHARING	FROM BUS AND TRAM TO TAXIBUS: FROM PRIVATE CAR TO SHARED TAXI
PERSON TRIPS	401,000	401,000	401,000	611,000	611,000	611,000	611,000
FLEET SIZE	352,000	33,000	26,000	55,000	40,000	49,000	42,000
FLEET SIZE COMPARED TO BASE (PCT. OF BASE)	-	9%	7%	16%	11%	14%	12%
VEHICLE KM (MILLION)	4.4	5.5	3.7	8.6	5.7	7.3	5.5
PCT. CHANGES IN VEHICLE KM COMPARED TO BASE	-	+26%	-14%	+97%	+31%	+67%	+27%

Public Transport under presure.

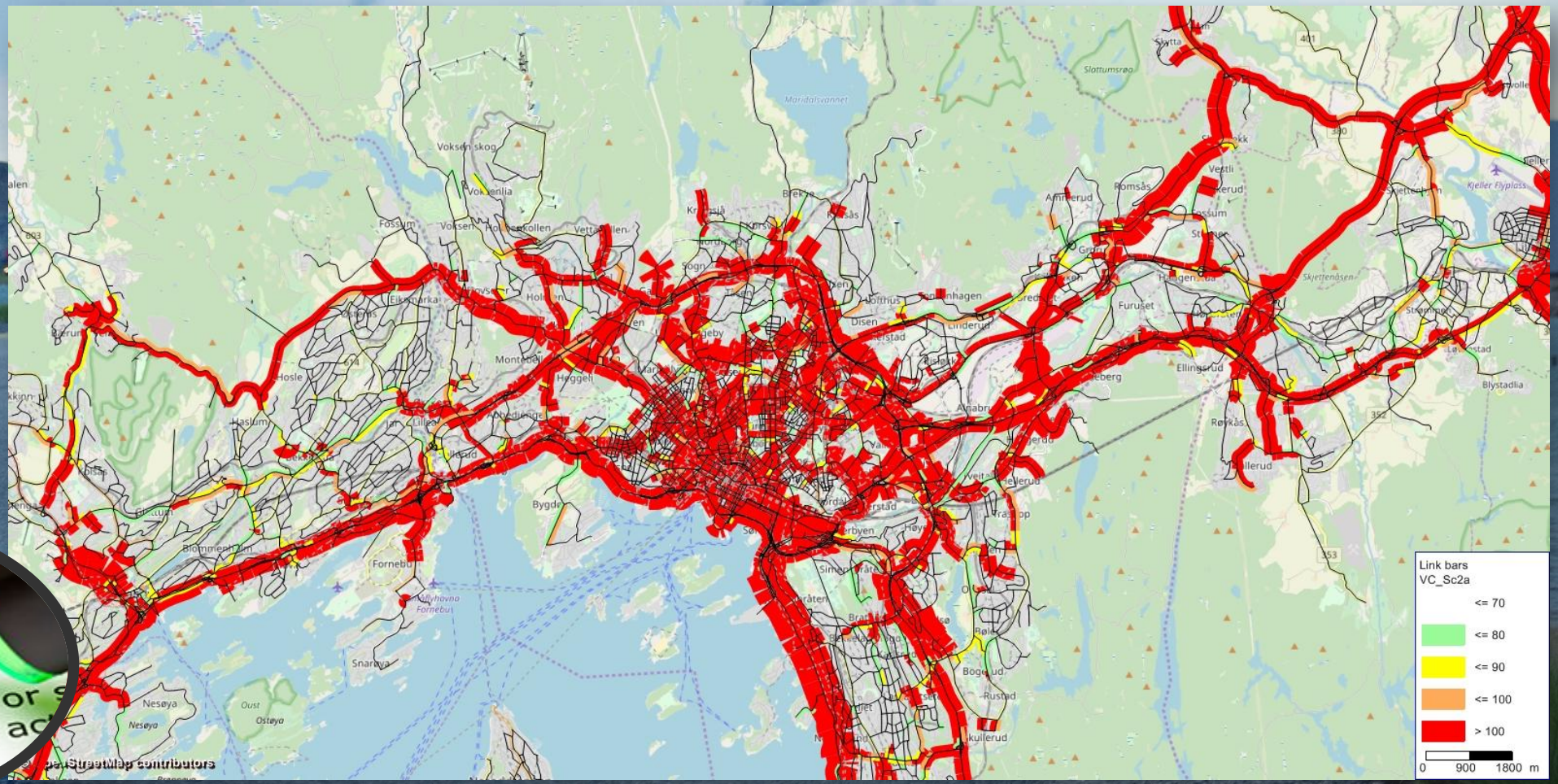
	BASIS	1A	1B	2A	2B	3A	3B	3	BASIS
	PRIVATE CARS 2020	FROM PRIVATE CAR TO CAR SHARING	FROM PRIVATE CAR TO SHARED TAXI	FROM PRIVATE CAR, BUS AND TRAM TO CAR SHARING	FROM PRIVATE CAR, BUS AND TRAM TO SHARED TAXI	FROM BUS AND TRAM TO TAXIBUS: FROM PRIVATE CAR TO CAR SHARING	FROM BUS AND TRAM TO TAXIBUS: FROM PRIVATE CAR TO SHARED TAXI	FROM TRAM AND BUS TO TAXIBUS	PUBLIC PASSEN-GERS IN BUS/TRAM 2020
AVERAGE TRIP DISTANCE [KM]	11.7	11.4	12.6	11.4	12.6	11.9	12.7	12.9	13.3
AVARAGE TRIP TIME – TOTAL	12.3	18.3	20.5	18.3	20.7	19.2	20.7	21.0	31.6
AVERAGE WAITTIME [MIN]	0.0	4.1	2.9	4.0	2.8	3.6	2.8	2.6	5.7
AVERAGE TRIP DURATION [MIN]*	12.3	14.1	17.7	14.3	17.9	15.6	17.9	18.3	25.9
AVERAGE DETOUR TIME (RIDE) [MIN]	-	2.0	5.5	2.0	5.6	3.3	5.6	5.7	-

Current traffic and congestion



PTV VISUM

Future traffic and congestion



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Level of automation.

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Current status of automation.

2017 The new A8 is the world's first production automobile to have been developed specially for conditional automated driving at level 3 according to the applicable international standards.

Audi

2019 BMW research vehicles have been testing highly automated driving on public roads for several years now, with the goal of reaching the consumer market in 2021.

Volkswagen says the Buzz Cargo previews technologies due for the mid-2020s in the form of its I.D. Pilot automated driving assist system, which falls under SAE Level 4 autonomy

CoEXist

Automation level will increase gradually. With differentiation per "road type".

Modification of existing travel demand models to include characteristics and impacts of highly automated vehicles

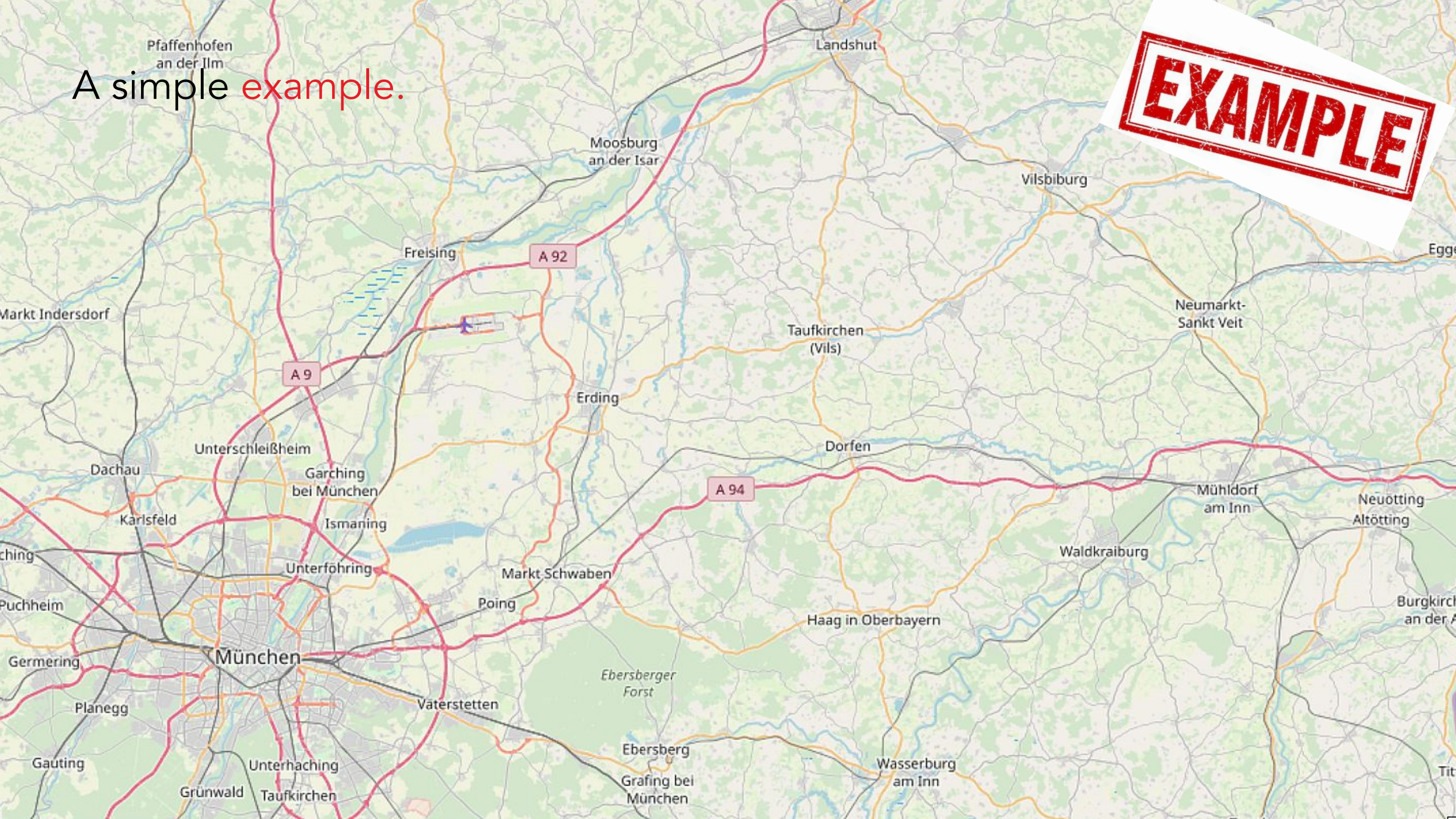
These projects have received funding from the European Union

One of the topics: perception of travel time

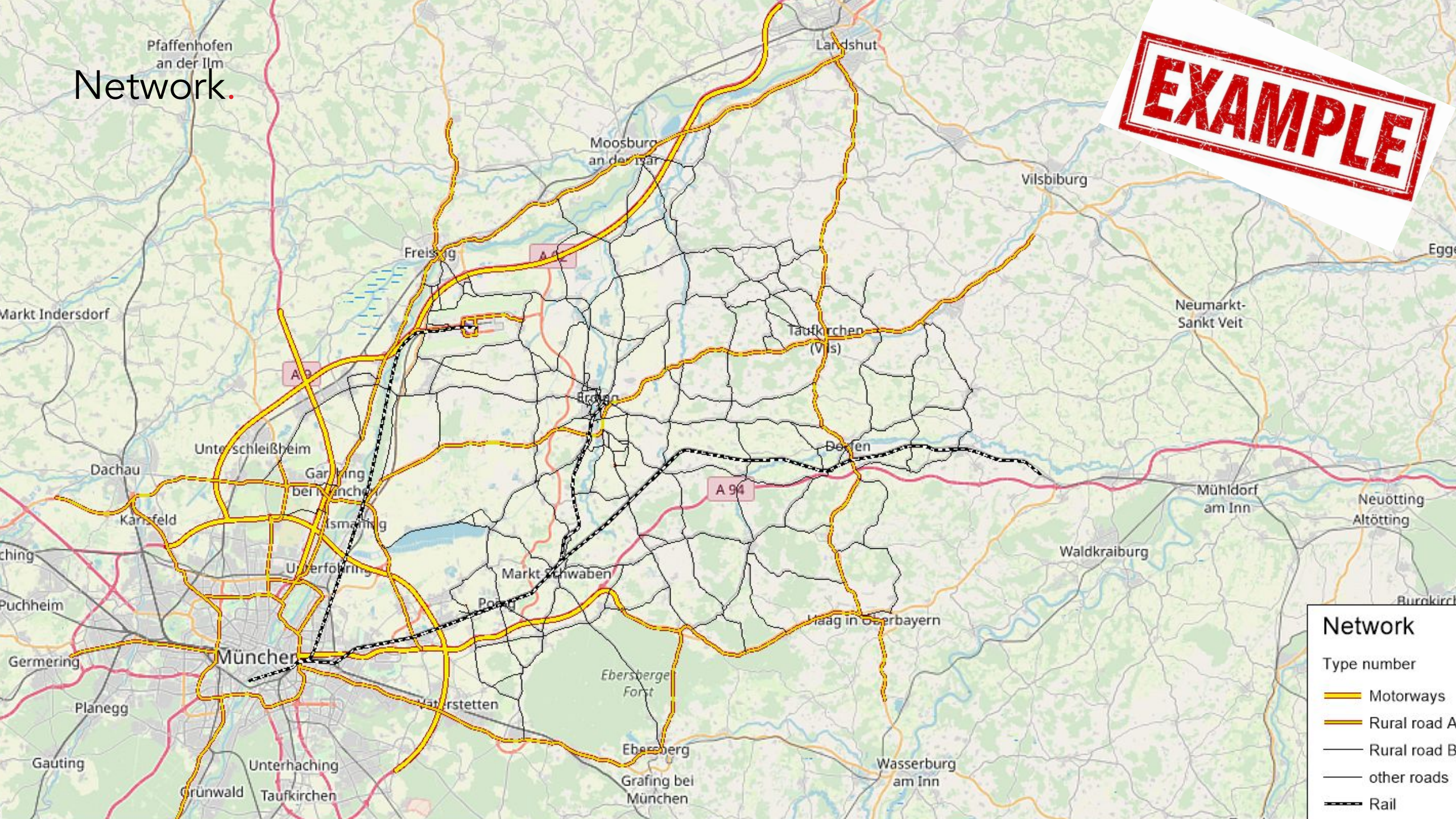
EXAMPLE

- Highly, but not fully automated vehicles (still “Car Driver”)
- Being driven in automated mode changes the perception of travel time
- Differentiation per “road type”

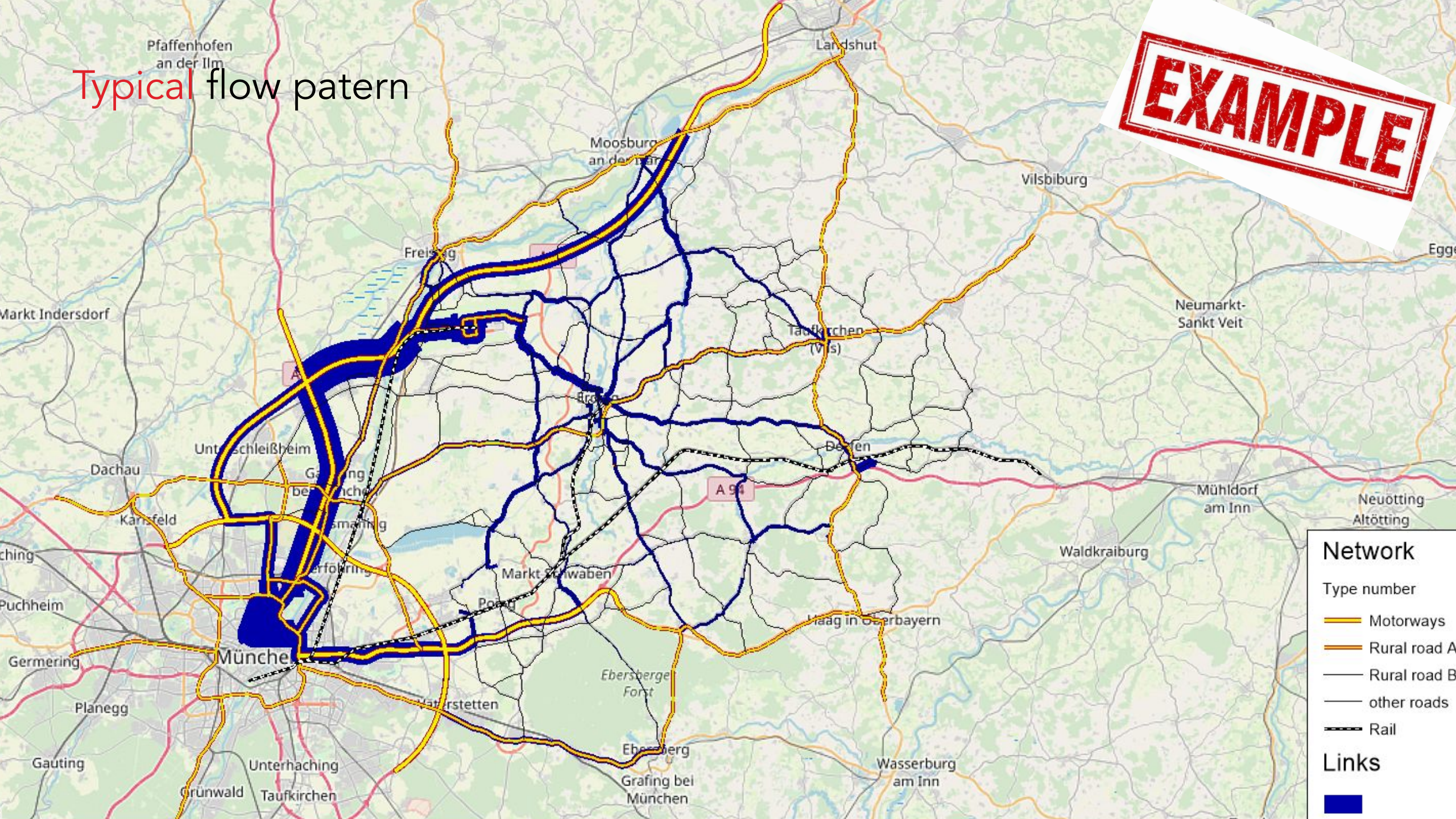
A simple example.



Network.

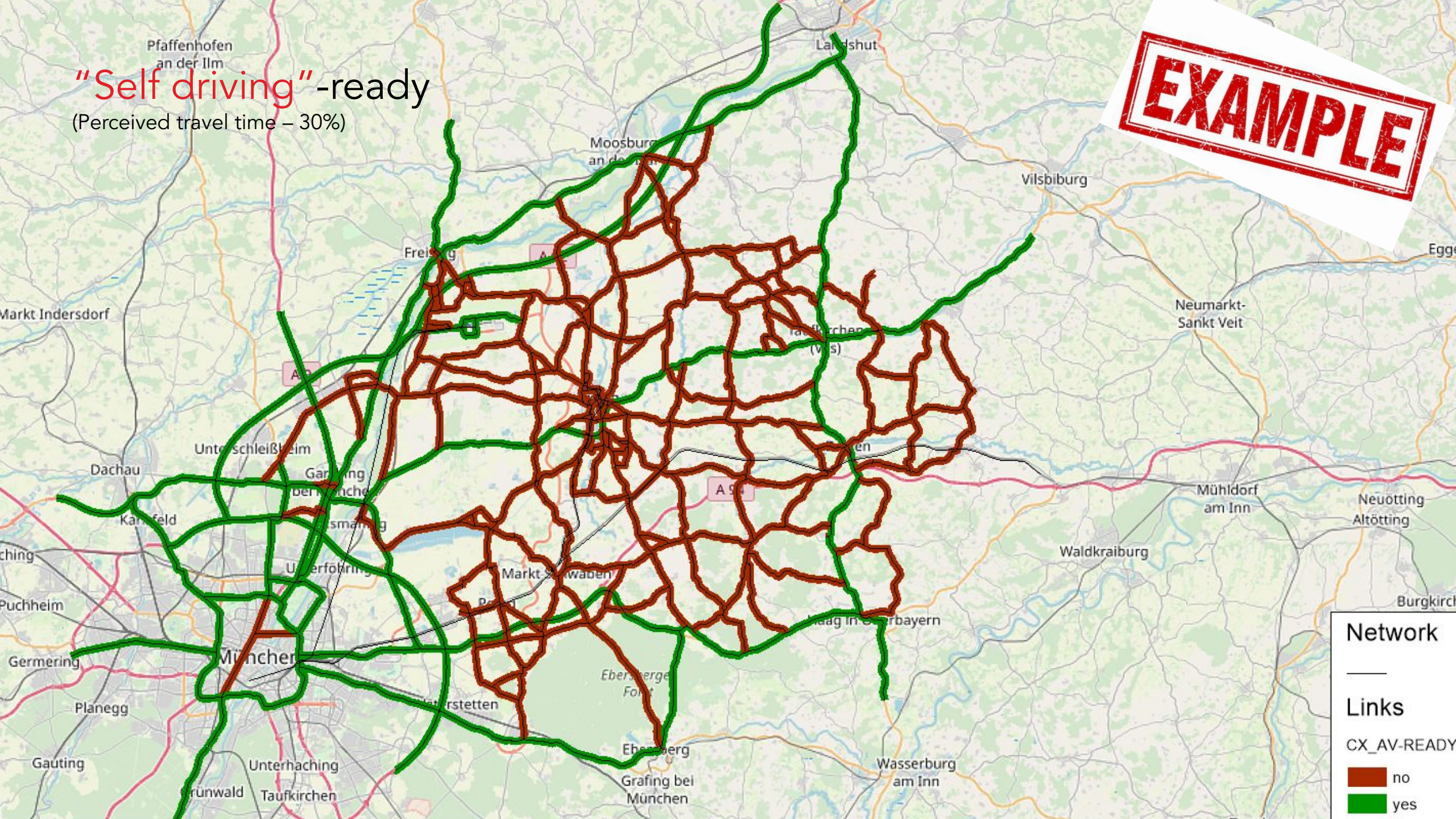

EXAMPLE
Pfaffenhofen an der Ilm
Landshut
Moosburg an der Isar
Vilsbiburg
Freising
Markt Indersdorf
Neumarkt-Sankt Veit
Taufkirchen (Vils)
Erding
Unterschleißheim
Dachau
Garching bei München
Ismaning
Karlsfeld
A 94
Mühldorf am Inn
Neuötting
Altötting
Waldkraiburg
Unterföhring
Markt Schwaben
Puchheim
Poing
Haag in Oberbayern
München
Germering
Ebersberger Forst
Planegg
Gauting
Unterhaching
Grünwald
Taufkirchen
Ebersberg
Grafing bei München
Wasserburg am Inn
Network
Type number
Motorways
Rural road A
Rural road B
other roads
Rail

Typical flow patern



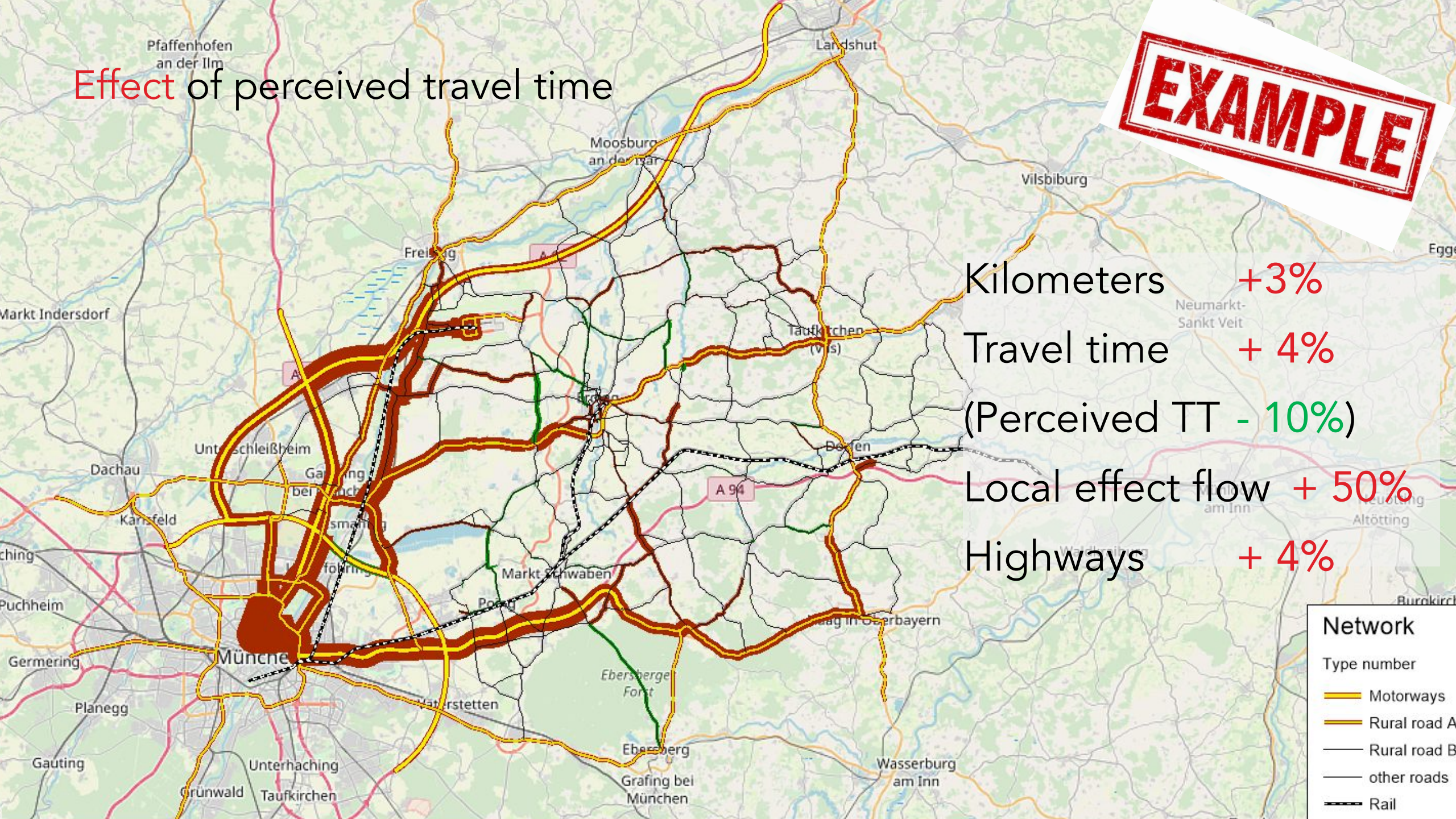
"Self driving"-ready

(Perceived travel time – 30%)



Effect of perceived travel time

EXAMPLE



Kilometers +3%

Travel time + 4%

(Perceived TT - 10%)

Local effect flow + 50%

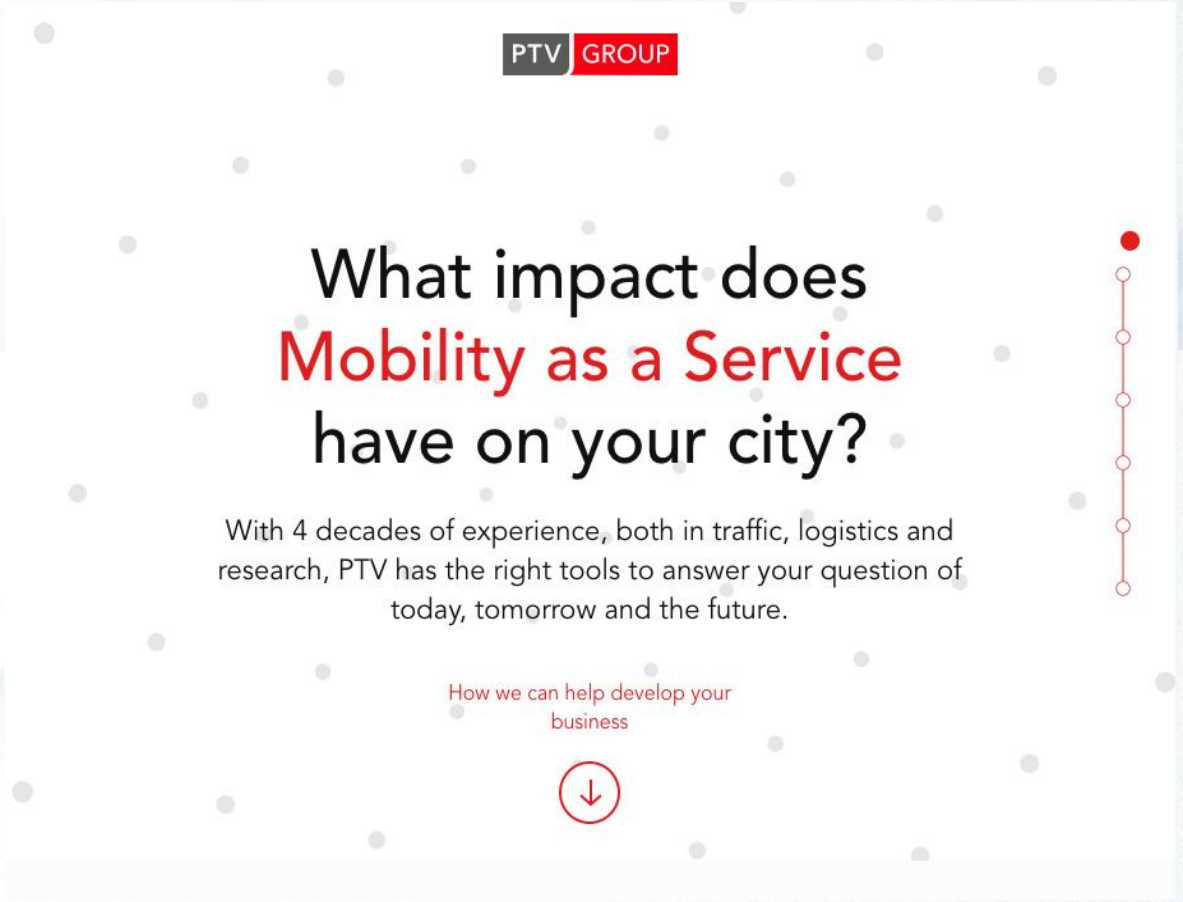
Highways + 4%

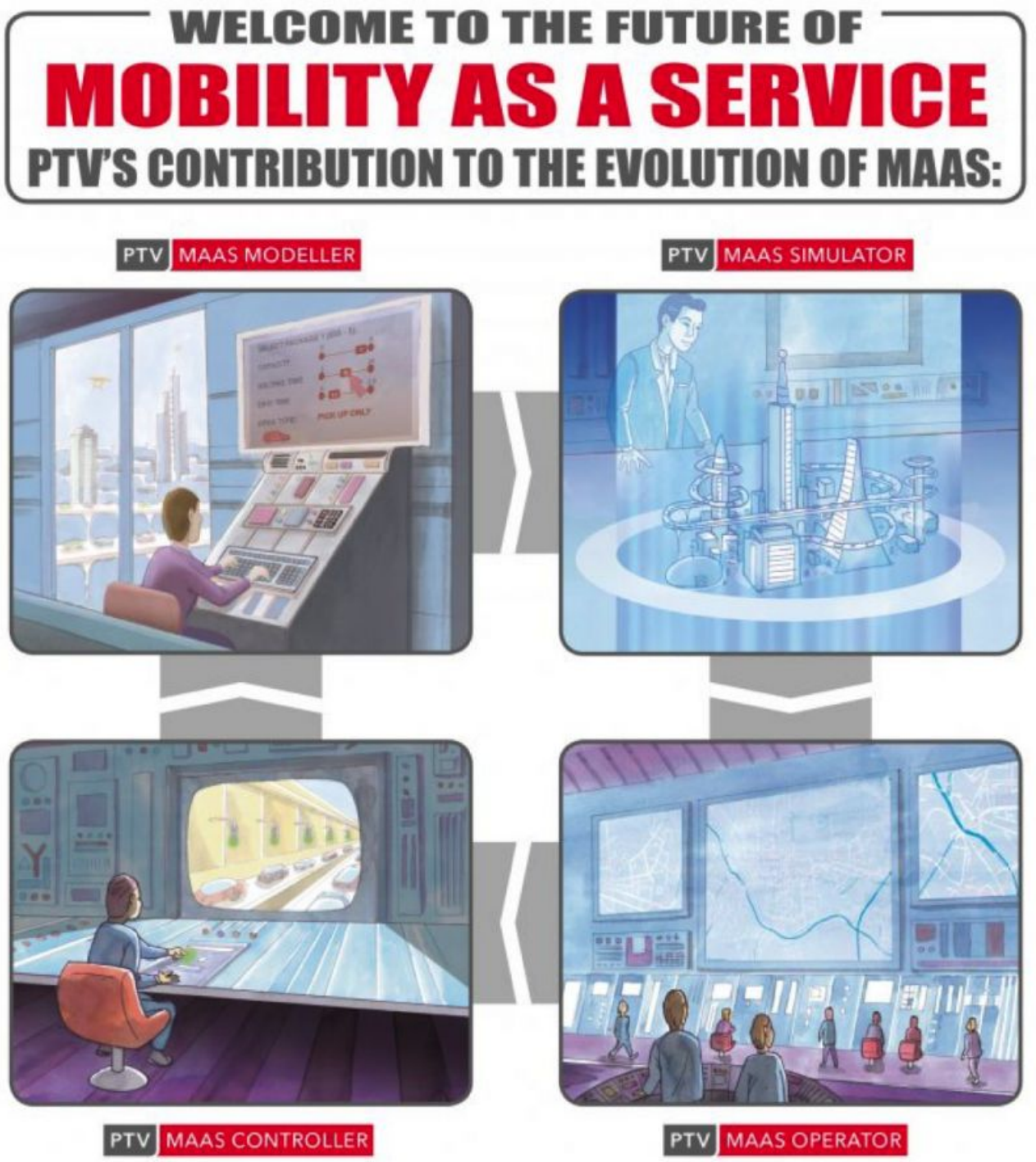
So MaaS connected to (semi-) autonomous vehicles .....

Strategic MaaS planning needs to contain AV as second pillar, containing Level 5 with enormous impact (but still far away).

Tactical impact Level 3/4 with in general small (but local big impact), that can be there “tomorrow”.

Operational MaaS Piloting for today’s optimization is good and needed!



For futher info...

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