



SLAM

Schnellladenetz an Achsen und Metropolen

Fast-Charging Network for Axes and Metropolises

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Fuels of the Future 2017
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SLAM – Fast-Charging Network for Axes and Metropolises

Selected goals of project SLAM

- Analysis and identification of the criteria for an ideal site for fast-charging stations
- Implementing a simulation tool to determine potential sites for fast-charging stations
- Investigating the impact of the fast-charging network on the power grids in Germany
- Developing a research charging network funded by private investors (€20.6 m; ca. €17 m in the fund)
- Conducting user studies at the charging network
- Duration: Jan. 2014 - Aug. 2017



Gefördert durch:



Bundesministerium
für Wirtschaft
und Energie

aufgrund eines Beschlusses
des Deutschen Bundestages

schaufenster
elektromobilität

Eine Initiative der Bundesregierung

BMW
GROUP



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Universität Stuttgart
Institut für Arbeitswissenschaft und
Technologiemanagement IAT



STELLA
Standortfindungsmodell für
elektrische Ladeinfrastruktur



Lehrstuhl und Institut
für Stadtbaugesund
und Stadtverkehr

RWTH AACHEN
UNIVERSITY

HansE – Creating a Charging Infrastructure Adapted to Traffic Streams in the Metropolitan Area of Hamburg

Selected goals of project HansE

- Installing 50 charging points in the metropolitan area of Hamburg (MAH) (regular and fast-charging stations)
- Selecting the sites with a site assessment model and strategy concept transferable to other regions
- The project partners want to make the entire MAH region reachable by electric vehicles.
- Valuable practical experience from the existing CI in the City of Hamburg can be transferred to the MAH region.
- Duration: Mar. 2015 - Dec. 2017



Federal Ministry
of Transport and
Digital Infrastructure



metropolregion hamburg



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Countrywide Fast-Charging Network

- Quantity structure of High-Capacity Charging Stations
- Publication of the results in „Nationaler Strategierahmen über den Aufbau der Infrastruktur für alternative Kraftstoffe als Teil der Umsetzung der Richtlinie 201/94/EU“ (9th November 2016, Berlin)
- Duration: Oct. 2015 – Jan. 2016



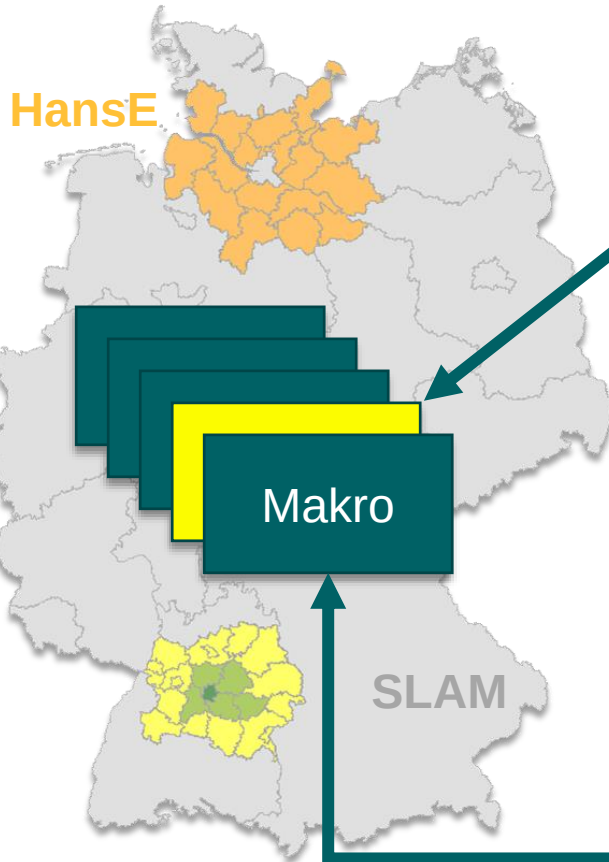
Federal Ministry
of Transport and
Digital Infrastructure

Further application of the model STELLA for



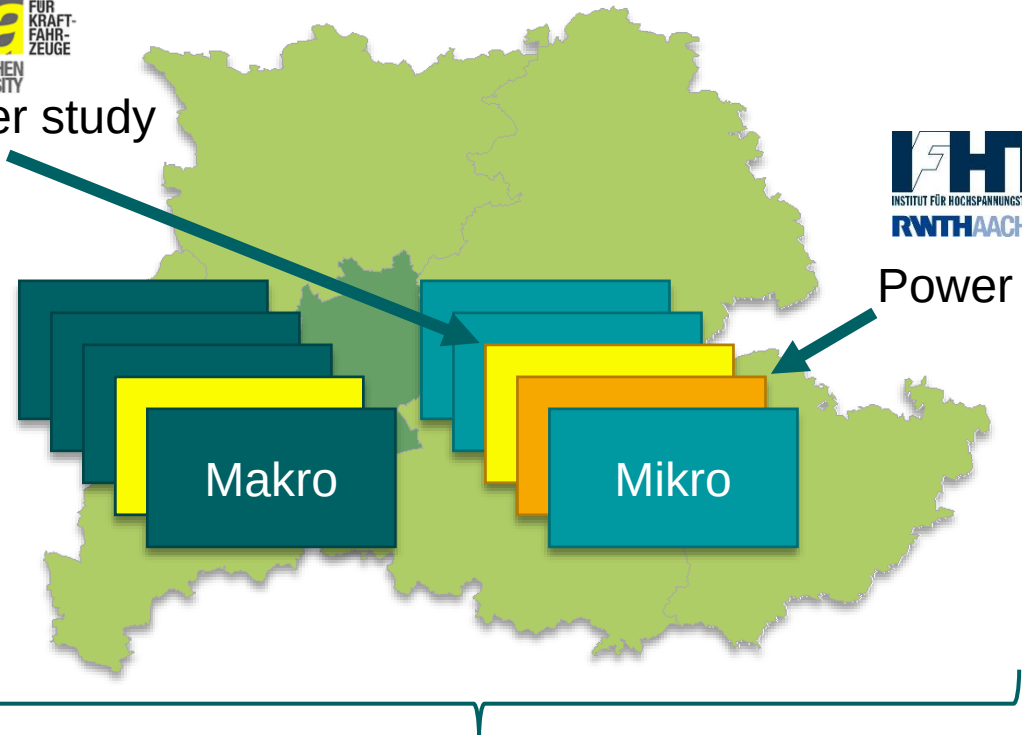
STELLA – Study Areas

German model



User study

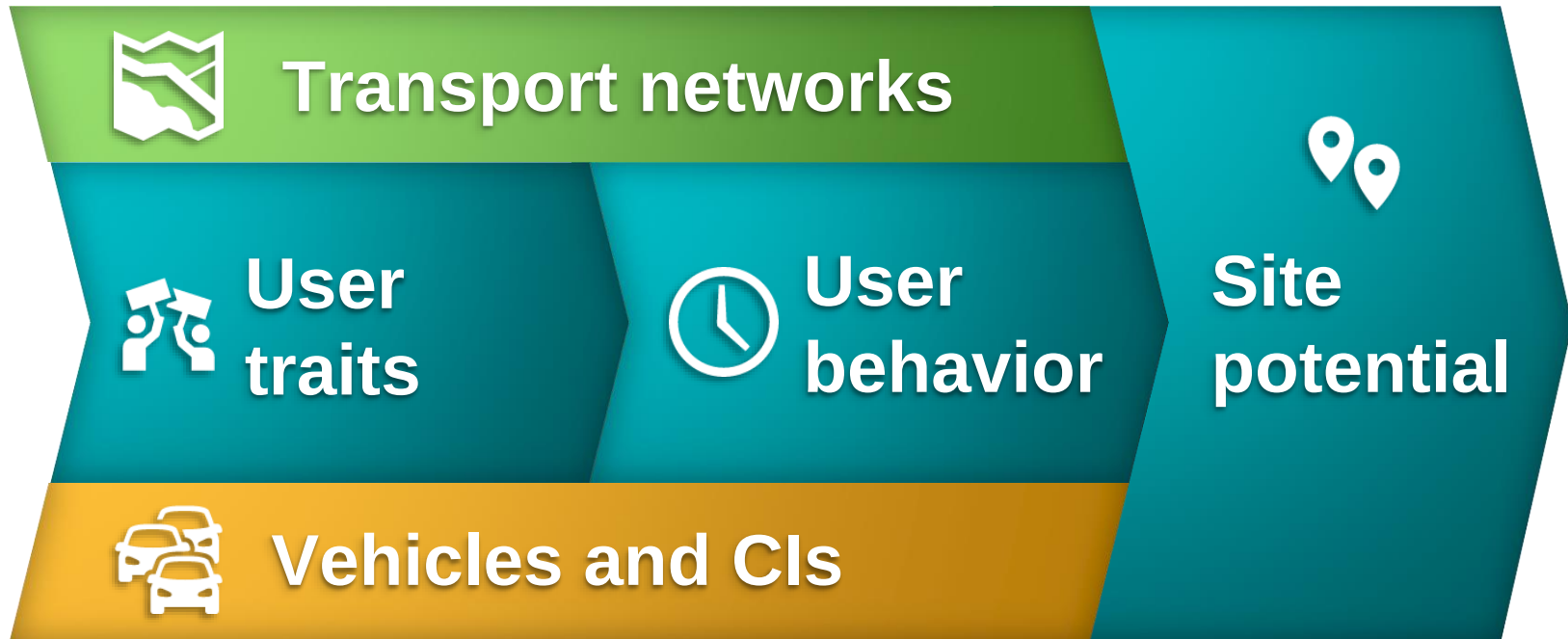
Model region Stuttgart



Power grid

Transfer of knowledge
(Parameters, connection models)

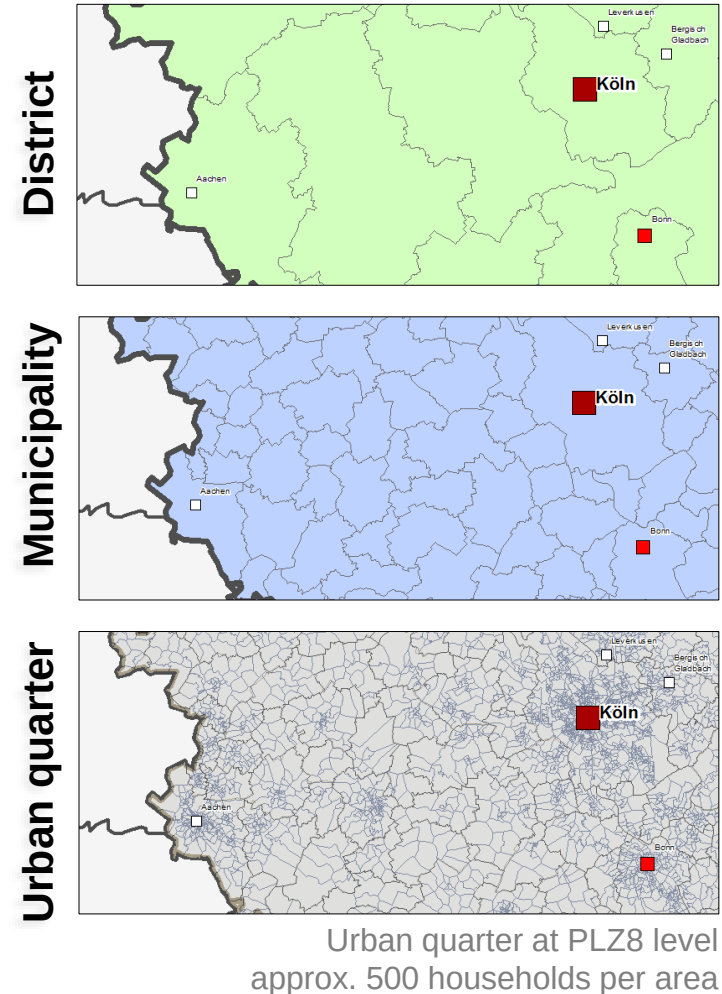
STELLA – Main Indicator Groups



Demand in levels

The demand determined at the level of the municipal associations is allocated to the other levels.

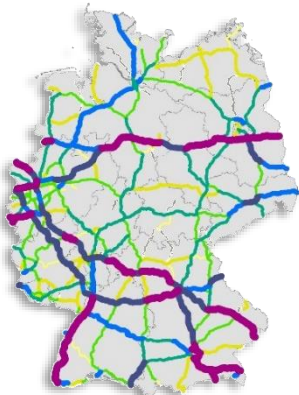
Further data, such as commuter traffic, is added to the calculation at the level of urban quarters.



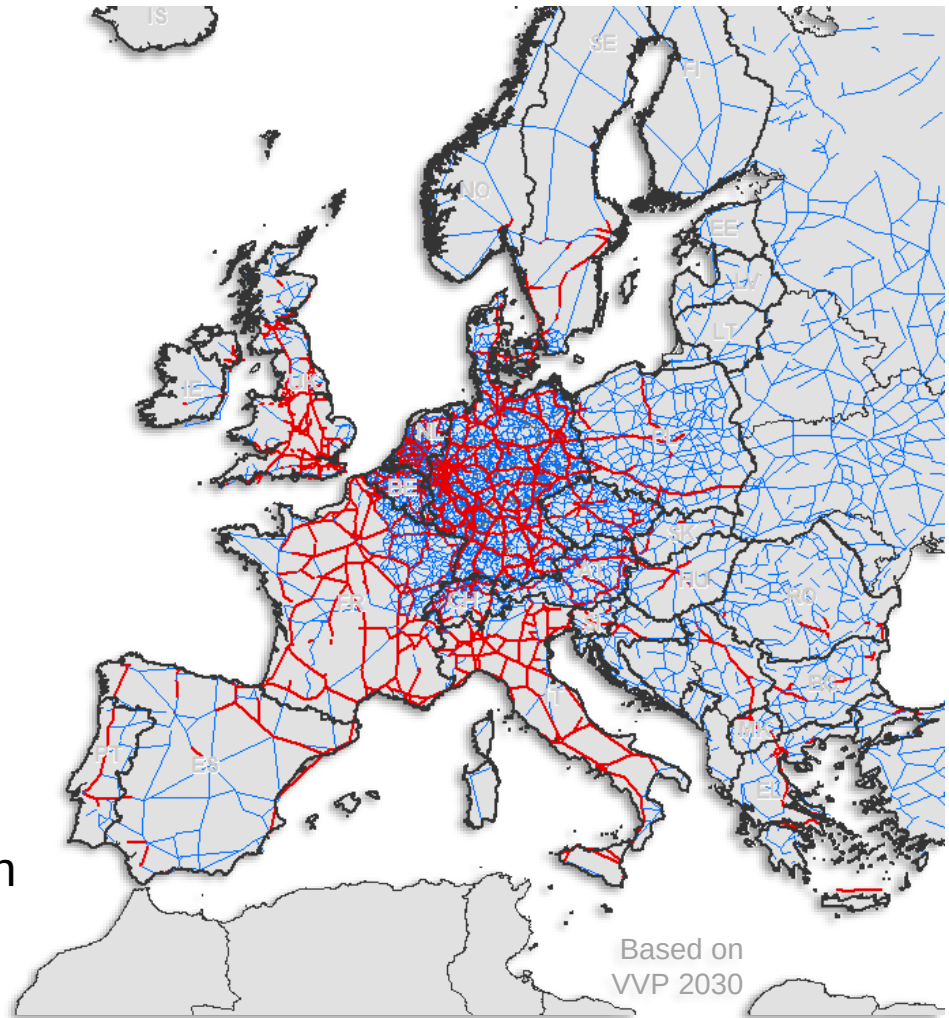
Classified network

Constitutes the basis for network analyses and numerous depictions.

Covers all of Europe and is increasingly simplified the further it is from Germany.



Axes are linked with international traffic. Allows for consideration of international connections.



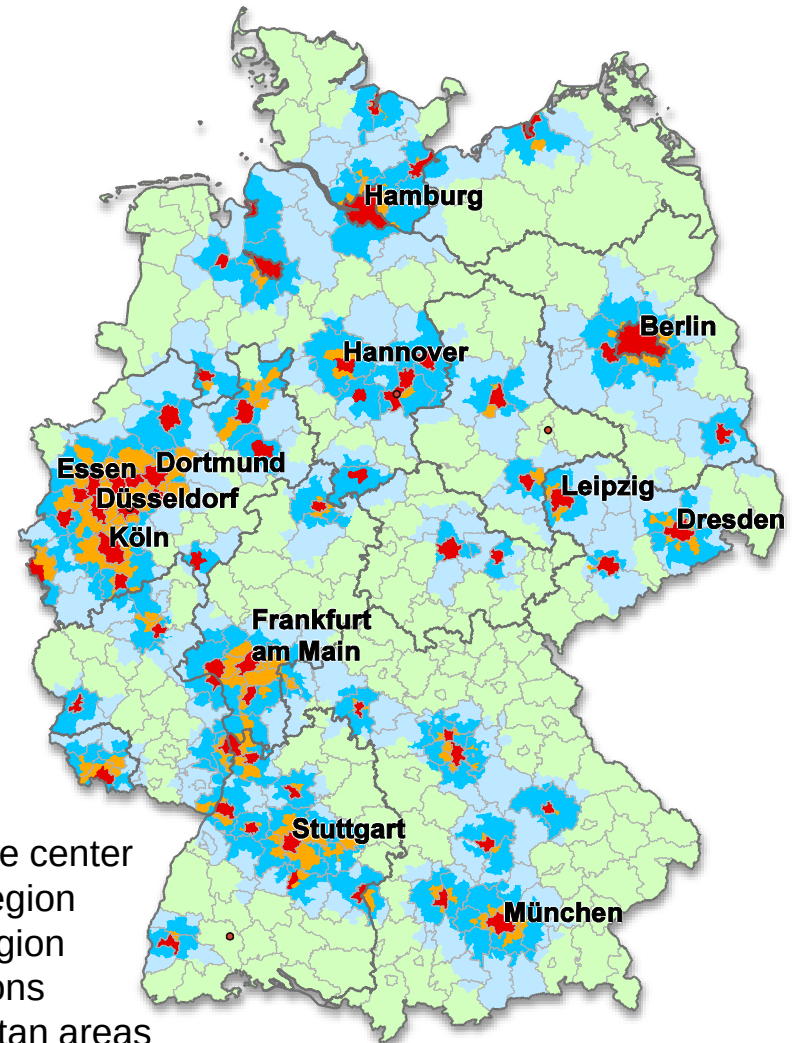
Spatial distribution

At the regional level, a connection between the municipal associations is formed.

They represent linkages independently from administrative boundaries and take a realistic view on traffic.

Database: continuous spatial monitoring by the BBSR
Geometrical Basis: BKG, municipal associations/ urban-rural-regions 31. Dec 2013
Editing: P. Kuhlmann

-  Center
-  Area surrounding the center
-  Closer connected region
-  Wider connected region
-  Municipal associations outside of metropolitan areas

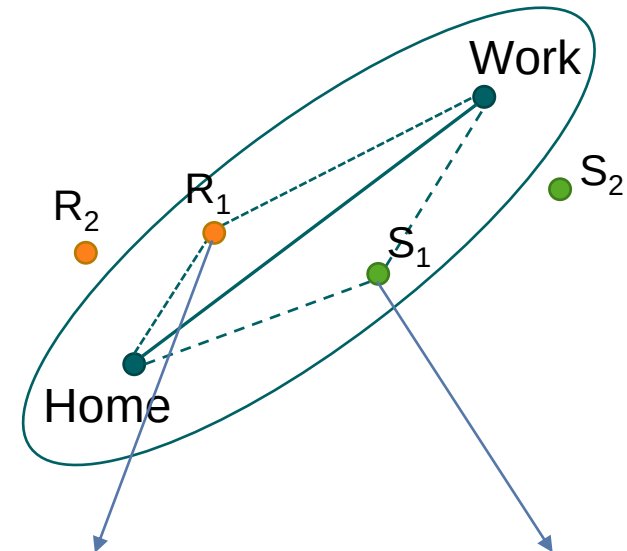


– under construction –

Bipolar consideration of the trip relations

By identifying catchment areas and sensitivity to detours, the acceptance level of individual sites can be determined.

Comparison of the MiD* trips – difference between the trips to and from the destination.



RECREATION

Detour in km	
P ₂₅	1,9
Median	5,7
P ₇₅	12,4

SHOPPING

Detour in km	
P ₂₅	1,0
Median	2,9
P ₇₅	9,5

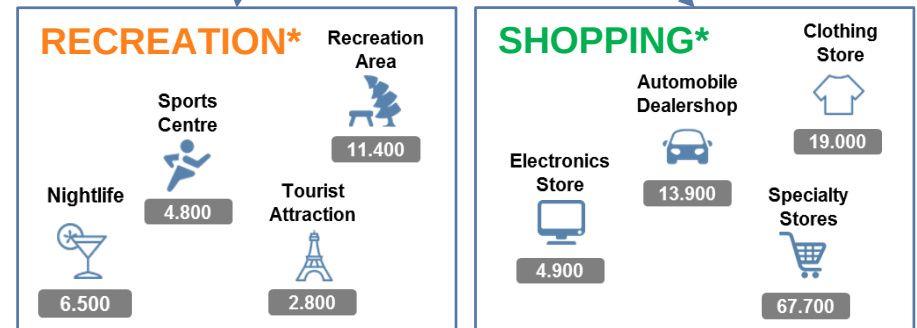
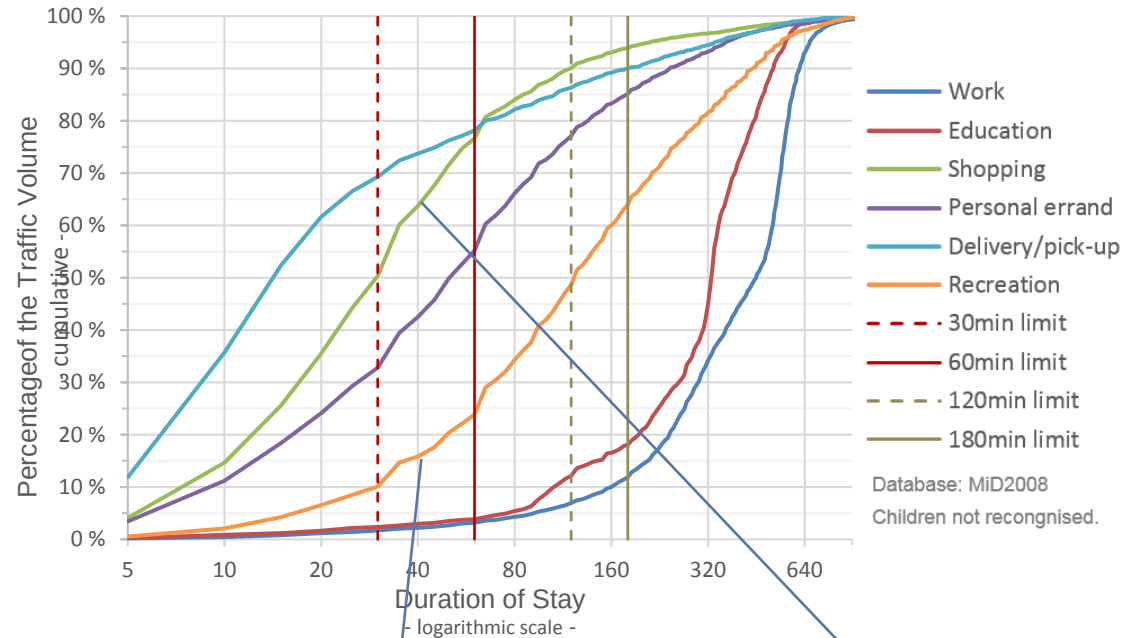
* Mobilität in Deutschland - Mobility in Germany
Continuous Survey on Travel Behaviour

Duration of Stay

Frequency of the duration of stay at a place of activity.

Every point of interest (POI) can be selected as a destination with a specific duration of stay.

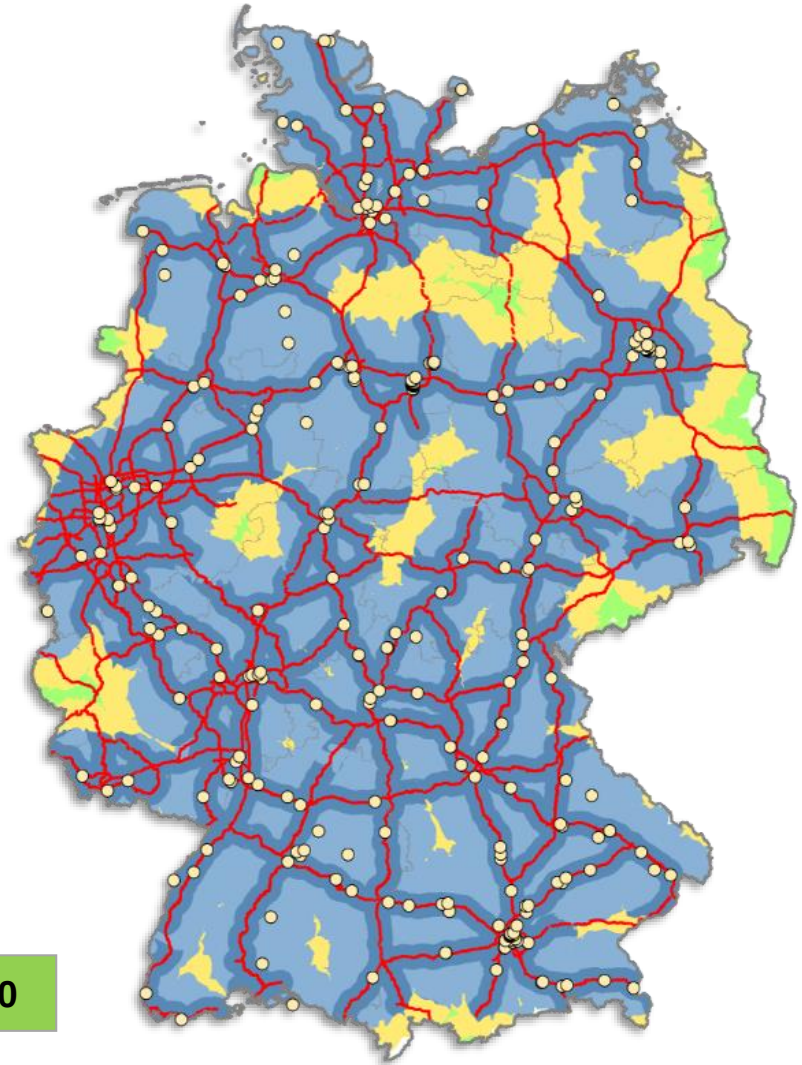
On this basis it is possible to describe the need for normal or fast-charging infrastructure.



* selection an Points of Interest and number (March 2016)

Accessibility radii

The existing and planned sites are analyzed in the network regarding their spatial impact. The resulting coverage is passed on to further model steps.



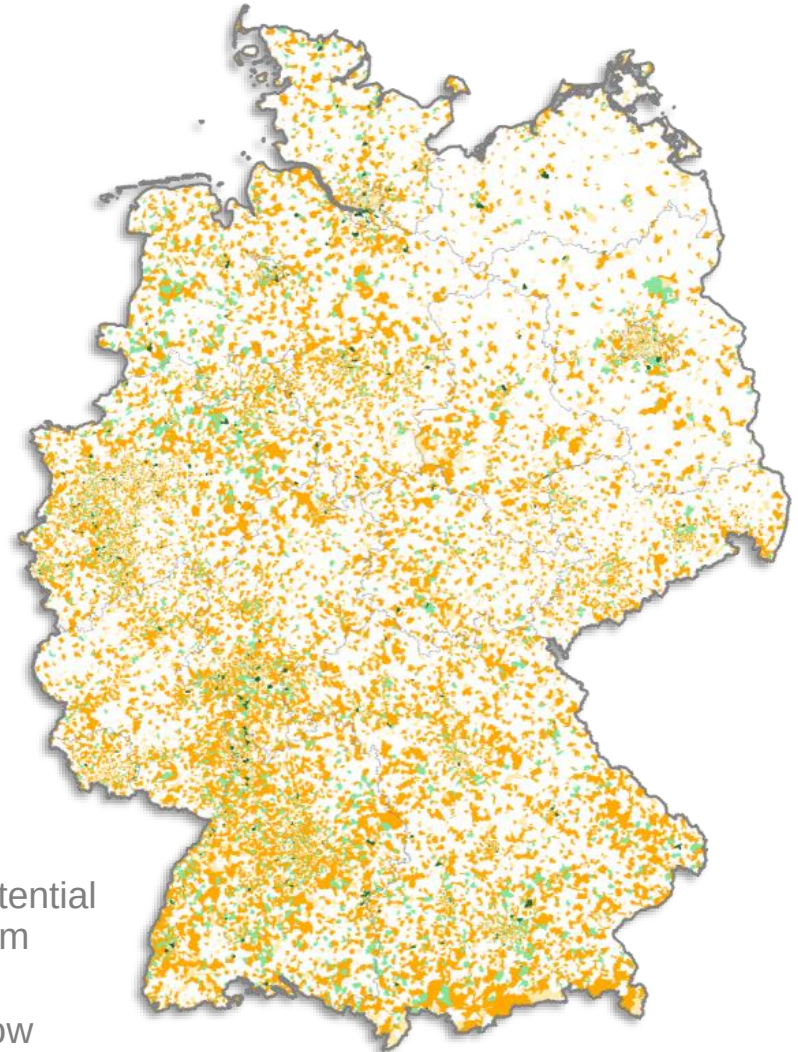
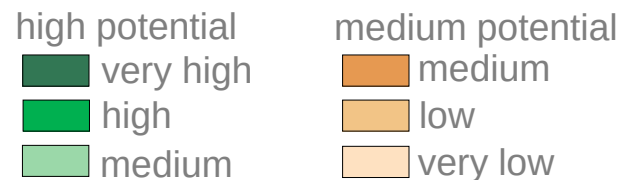
Routed scope [km]



Settlement structure

STELLA calculates potentials for charging infrastructure at existing developed areas at national level.

This approach is flexible in terms of temporal resolution und spatial components.



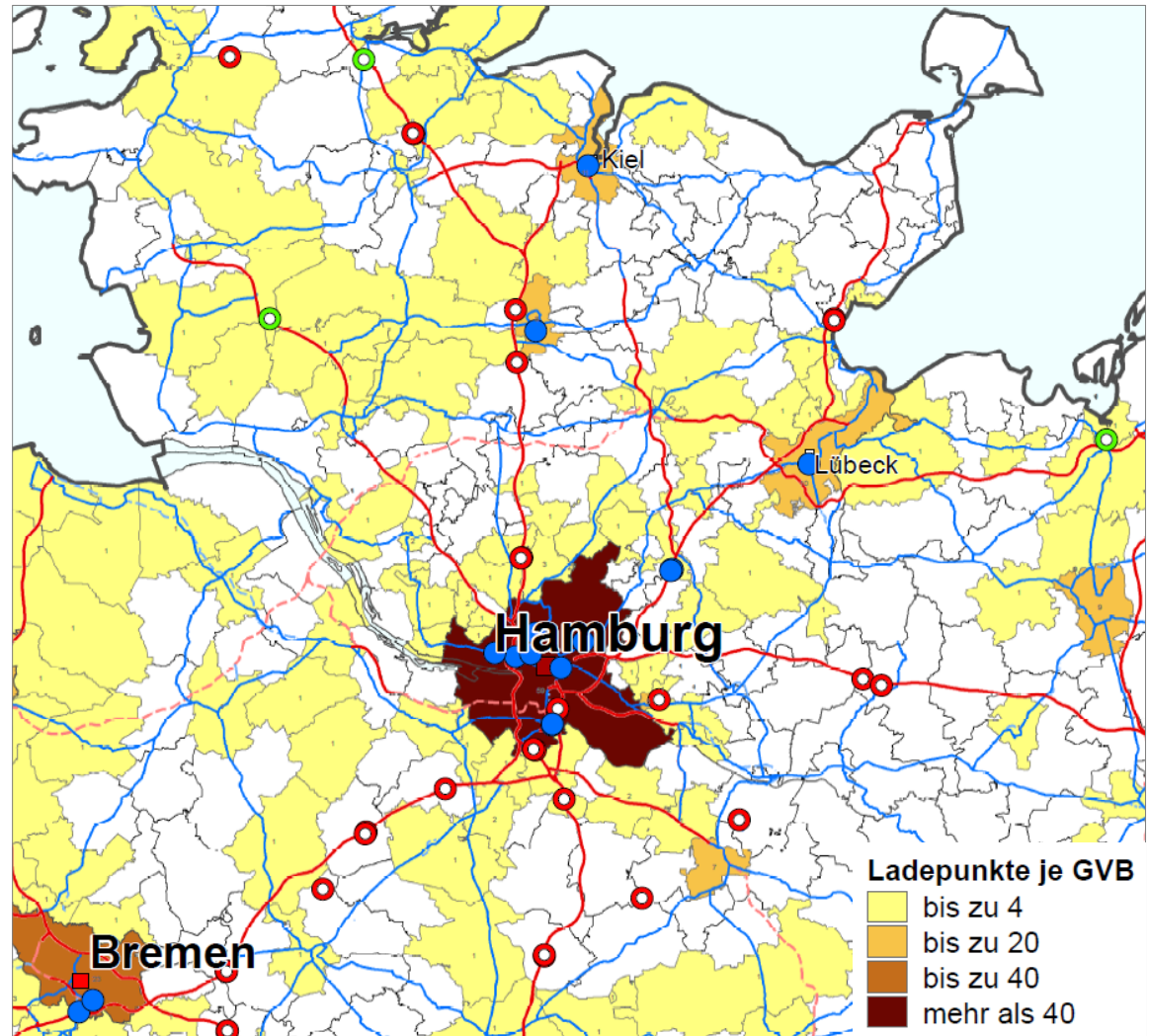
STELLA – Main Groups at the National Level

Partial output of indicators

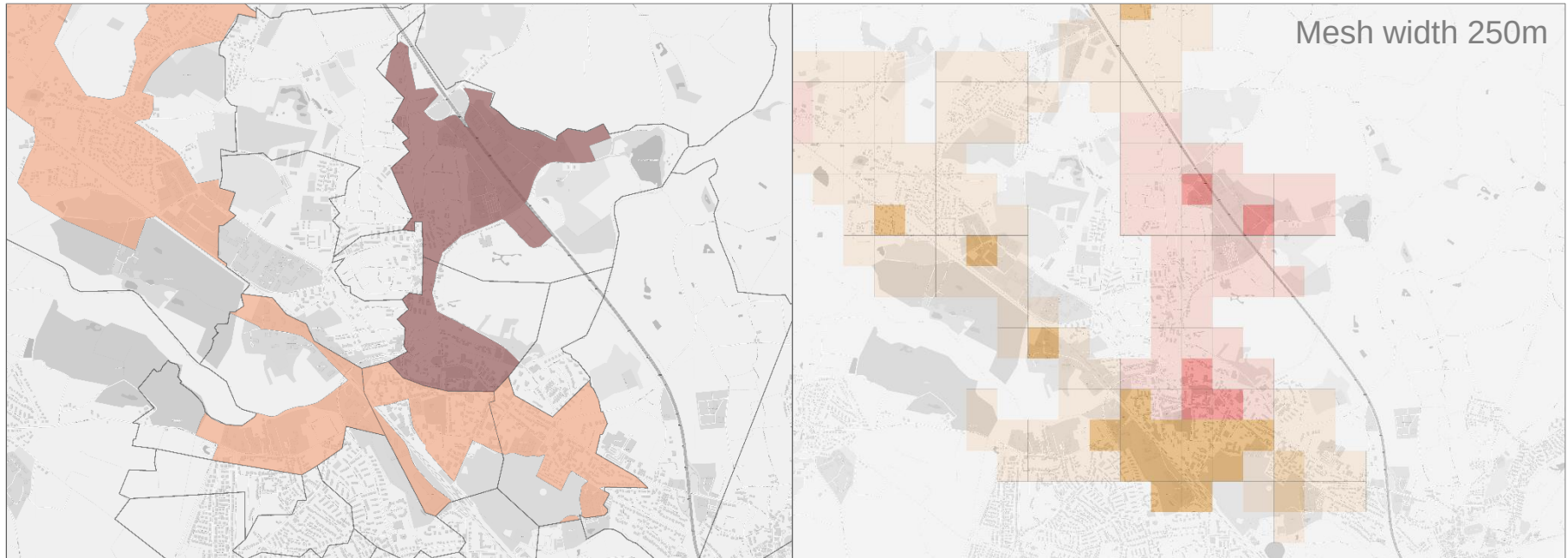
Quantifying fast-charging points at the level of municipal associations

250,000 BEVs in 2020 based on settlements

Map basis:
BKG; BVWP; BAST; DDS; OSM
Bundesverflechtungsprognose;
Projekt SLAM; GoingElectric;
RWTH Aachen University



Distribution of the potentials on potential areas



Potential of the settled area within the urban quarters

high potential
very high
high
medium

medium potential
medium
low
very low

Research questions covered

- positioning charging infrastructure
- nationwide / demand-based calculation
- charging point demand at the sites
- different charging standards (11, 22, 50, 150, 350 kW)
- users mobility demands
(number, distance and purpose of trips, trip chains)

Input data

Transport networks, track loads, spatial structure, user behavior, POIs

Model output

Spatially detailed sites for charging infrastructure throughout Germany (250m)

Thank you for your attention

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EuroRastpark in Lippetal

- 1 x CHAdeMO - 50 kW
- 4 x Combined Charging - 50 kW
- 2 x Typ 2 43 kW
- 2 x Typ 2 22 kW