

# Turning municipalities into focal points for electric mobility – the 6SEK-model

EVS30, October 9, 2017  
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**evs** / **30**

THE 30TH INTERNATIONAL  
ELECTRIC VEHICLE  
SYMPOSIUM & TRADE FAIR

OCTOBER 9–11, 2017 MESSE STUTTGART, GERMANY

**ISME**

Institut Stadt | Mobilität | Energie

# Stress field: Urbanism ↔ Mobility ↔ Resources

The perspective of a city dweller:



**Integrated solutions needed!**

# Paradigm for more sustainable traffic



Avoid / Reduce



Reduce or avoid the need to travel



Shift / Maintain



Shift to or maintain share of more environmental friendly modes  
(,Umweltverbund')



Improve



Improve the energy efficiency of transport modes or vehicle technology

# Paradigm for more sustainable traffic



Avoid / Reduce



Shift /Maintain

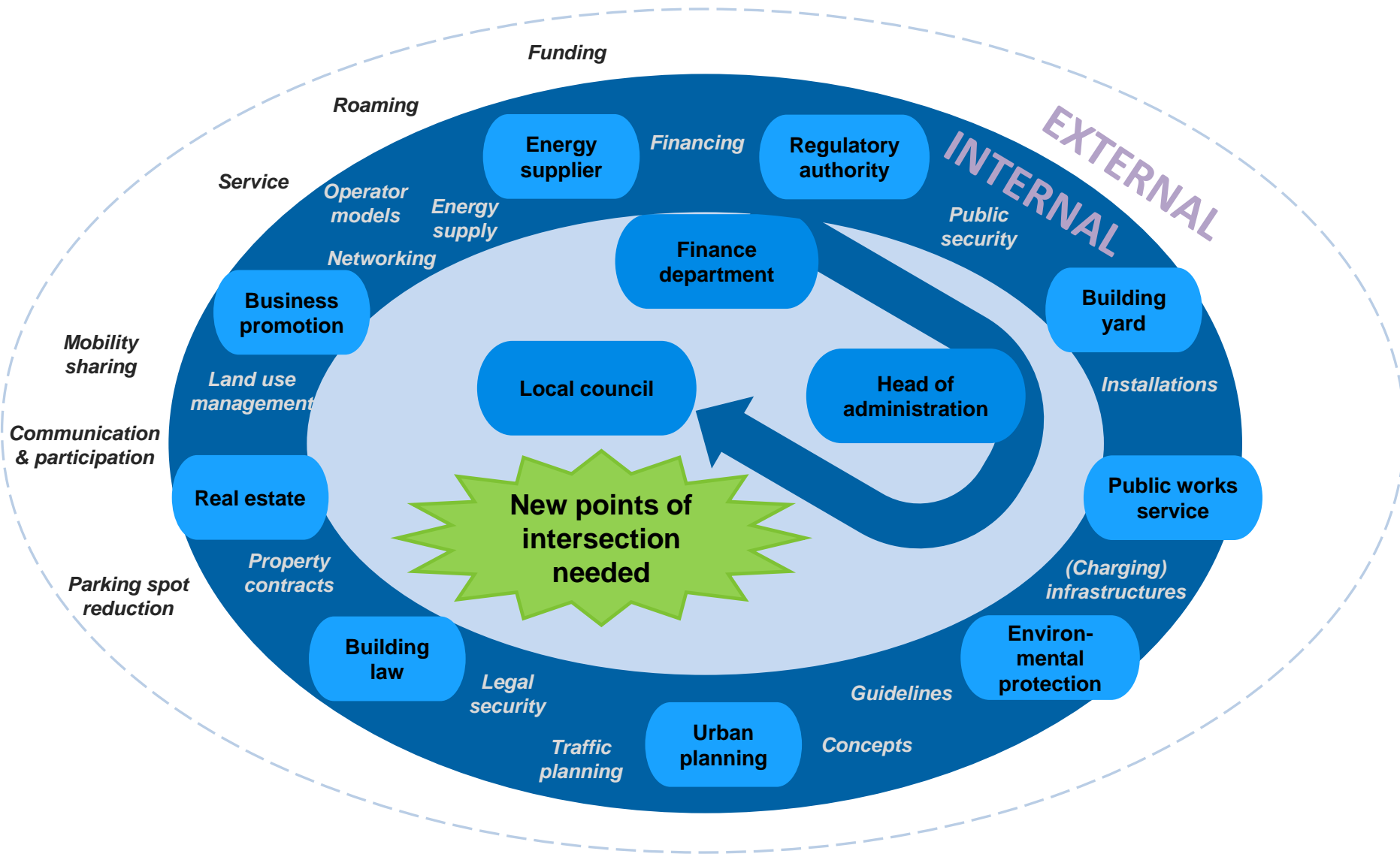


Improve

Social Innovations!

Technical Innovations!

# The Challenge: E-Mobility in Local Governments



# The Approach: 6SEK-Model

“6 Steps to the Electromobile Kommune”



Coordination & knowledge building



New forms of mobility



Charging infrastructure



Municipal & commercial fleets



Activation & motivation



Integrated urban & traffic planning

## Relevant municipal mobility issues, e.g.:

+

- high level of commuting
- parking management
- aging population in certain quarters
- development areas
- **Integration in local aims & strategies**
- **Increased chance of realization**

# 1. Coordination and knowledge building

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Coordination



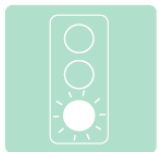
New mobility



Charging



Fleets



Activation



Integrated planning



# 1. Coordination and knowledge building

## - Inclusion of external knowledge



Coordination



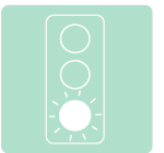
New mobility



Charging



Fleets



Activation

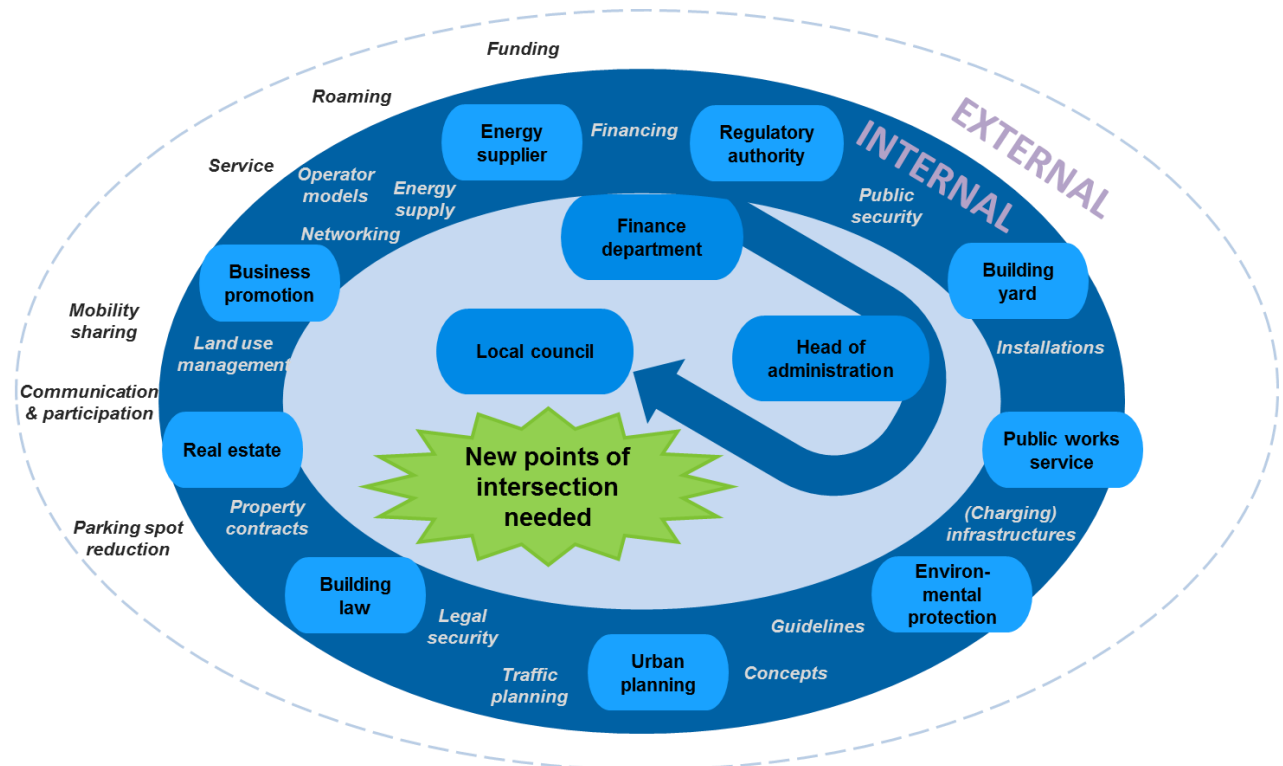


Integrated planning



# 1. Coordination and knowledge building

- Inclusion of external knowledge
- **Identification of stakeholders**
- **Implementation of steering committee**
- **Enabling authorities to decide**



Coordination



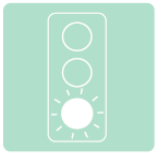
New mobility



Charging



Fleets



Activation



Integrated planning

## 2. New forms of mobility

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Coordination



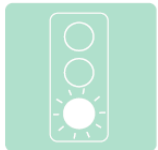
New mobility



Charging



Fleets



Activation



Integrated planning



## 2. New forms of mobility

### - eCarsharing

**Carsharing has high mileage → TCO opportunity for BEV!**

New business models, e.g. for property management:

- Closed user group in residential area (100 apartments)
- Site definition: Visibility, Accessibility, Access to electricity
- Procurement: Vehicle & Wallbox
- Vehicle operation: Charging, Service, Cleanup etc.)
- Organisation: Keycard, billing & booking system

- Minimum threshold: free in 1st year  
**DON'T DO THAT.**
- Better alternative: Discounts, credits for new registration etc.



Coordination

New mobility

Charging

Fleets

Activation

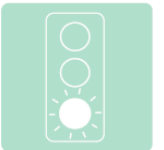
Integrated planning

## 2. New forms of mobility



Coordination

- eCarsharing
- **eBiking, Cargo bikes**



## 2. New forms of mobility

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Coordination



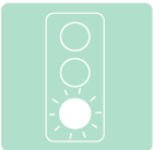
New mobility



Charging



Fleets



Activation



Integrated planning

- eCarsharing
- eBiking, Cargo bikes
- **eScooters**



Source: [www.stella-sharing.de](http://www.stella-sharing.de)

## 2. New forms of mobility



Coordination



New mobility



Charging



Fleets

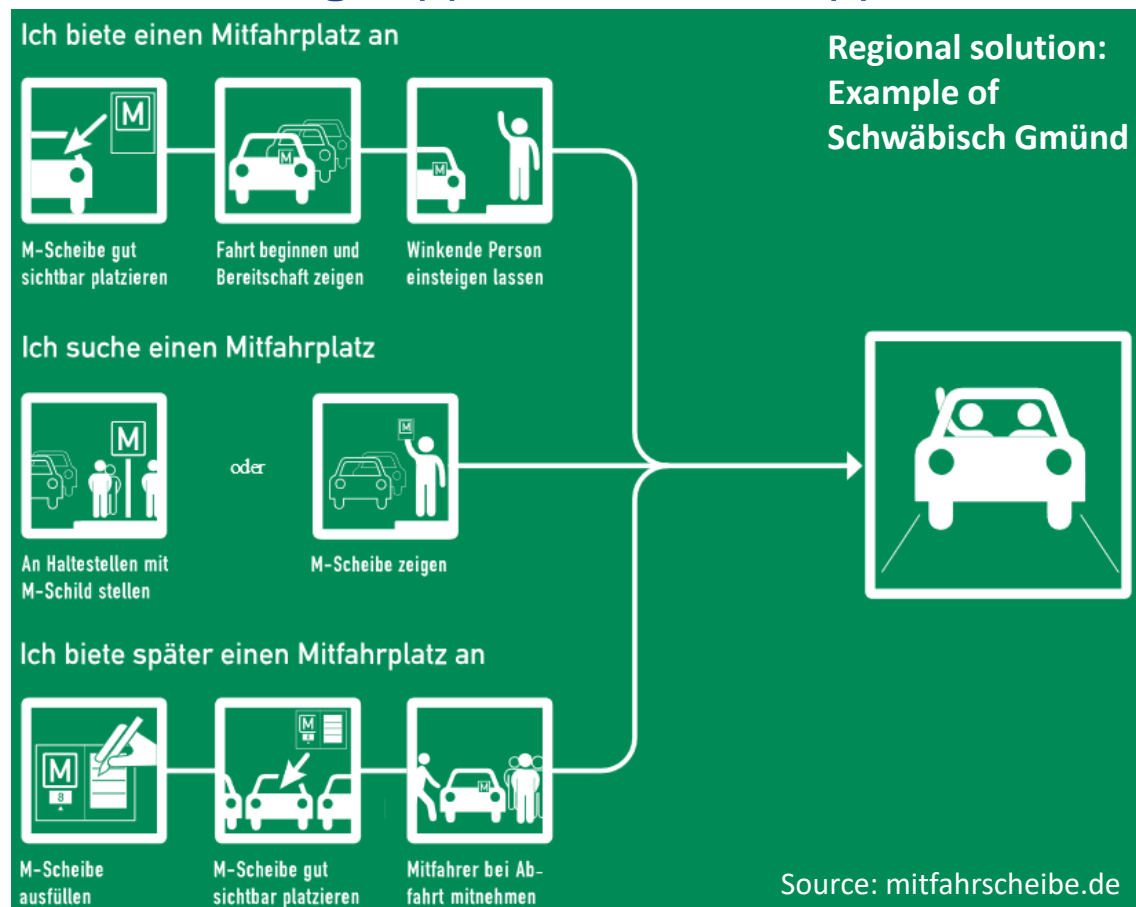


Activation



Integrated planning

- eCarsharing
- eBiking, Cargo bikes
- eScooters
- **Ridesharing: Apps AND offline approaches**



# 3. Charging infrastructure

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Coordination



New mobility



Charging



Fleets



Activation











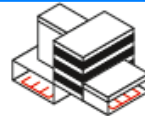
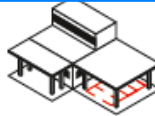


Integrated planning



# 3. Charging infrastructure

## - Demand for private and public charging

-  Coordination
-  New mobility
-  Charging
-  Fleets
-  Activation
-  Integrated planning

Verteilung Ladevorgänge	Privater Aufstellort 85%			Öffentlich zugänglicher Aufstellort 15%		
Typische Standorte für Ladeinfrastruktur	 Einzel- / Doppelgarage bzw. Stellplatz beim Eigenheim	 Parkplätze bzw. Tiefgarage von Wohnanlagen, Mehrfamilienhäusern, Wohnblocks	 Firmenparkplätze / Flottenhöfe auf eigenem Gelände	 Autohof, Autobahn-Raststätte	 Einkaufszentren, Parkhäuser, Kundenparkplätze	 Straßenrand / öffentliche Parkplätze

Source: NOW GmbH (Hg.) (2015). Ladeinfrastruktur für Elektrofahrzeuge in Deutschland. Statusbericht und Handlungsempfehlungen

# 3. Charging infrastructure

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Coordination

- Demand for private and public charging
- **Private charging**



New mobility



Charging



Funding of wallboxes etc. (private and/or semi-public)

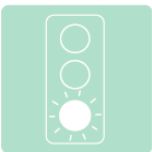


Parking slots for charging infrastructure

Urban development contracts



Fleets



Activation



Integrated planning

# 3. Charging infrastructure

- Demand for private and public charging
- Private charging
- **Public charging**



Coordination



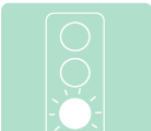
New mobility



Charging



Fleets



Activation



Integrated planning



Göppingen - Quartierstypologie

- Town center
- 1-3 family houses
- 3+ family houses
- 1 family houses
- Multi-story residential building
- Other (e.g. commercial)



# 4. Municipal & Commercial fleets

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Coordination



New mobility



Charging



Fleets



Activation



Integrated planning



# 4. Municipal & Commercial fleets



Coordination



New mobility



Charging



Fleets



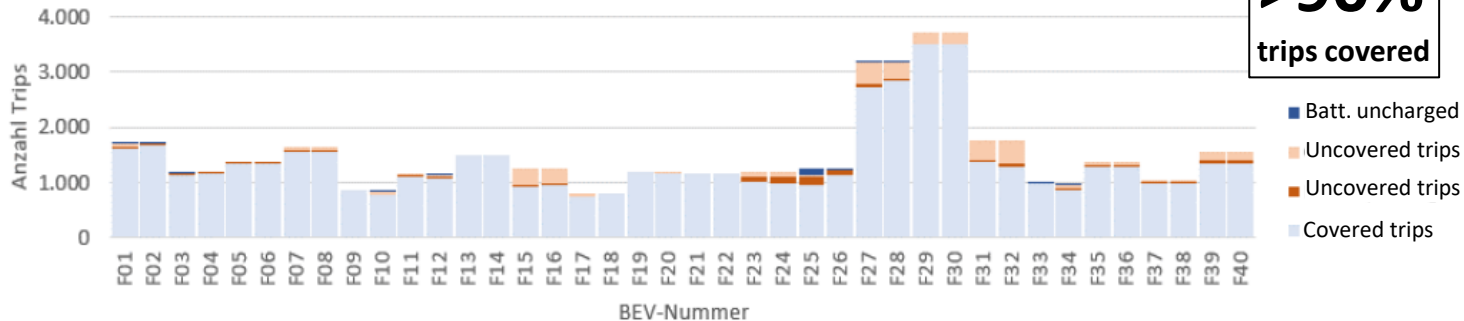
Activation



Integrated planning

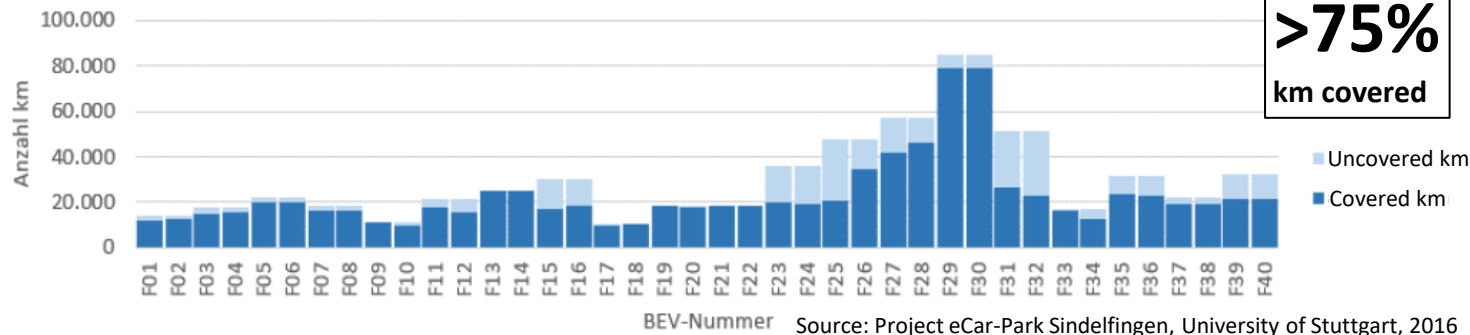
## - Fleet analysis

Company vehicles: Number of covered/uncovered trips per year



**>90%**  
trips covered

Company vehicles: Number of covered/uncovered kilometers per year



**>75%**  
km covered

Source: Project eCar-Park Sindelfingen, University of Stuttgart, 2016

**Substitution potentials:** **1:1:** **15-20%**  
**with minor adjustments:** **40-50%**

# 4. Municipal & Commercial fleets



Coordination



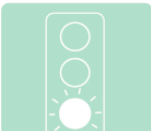
New mobility



Charging



Fleets



Activation



Integrated planning

- Fleet analysis
- **Vehicle diversification**



Source: www.badische-zeitung.de



eScooter. Source: conrad.de



Source: wikimedia.org



Source: wikimedia.org

# 4. Municipal & Commercial fleets

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Coordination



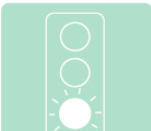
New mobility



Charging



Fleets



Activation



Integrated planning

- Fleet analysis
- Vehicle diversification
- **Fleet management**



Personnel resources



Fleet management software:  
Car disposition, trip planning etc.

# 4. Municipal & Commercial fleets



Coordination



New mobility



Charging



Fleets



Activation



Integrated planning

- Fleet analysis
- Vehicle diversification
- Fleet management & **external services:**  
**Sharing & rental, Taxi, public transport**



Source: wikimedia.org



Source: www.stella-sharing.de



Quelle: www.stuttgarter-zeitung.de



Source: www.projekt-guest.de



Source: vm.baden-wuerttemberg.de

# 4. Municipal & Commercial fleets



Coordination



New mobility



Charging



Fleets

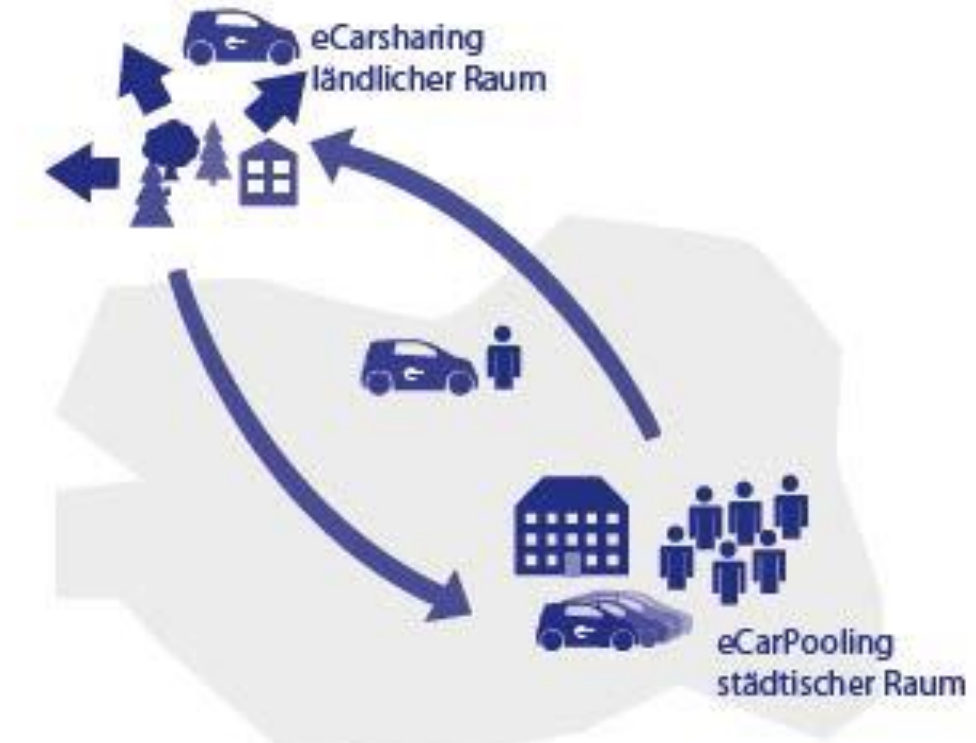


Activation



Integrated planning

- Fleet analysis
- Vehicle diversification
- Fleet management & external services:  
Sharing & -rental, Taxi, public transport
- **Open fleet cars for private use**



# 4. Municipal & Commercial fleets



Coordination



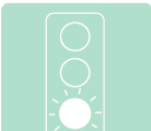
New mobility



Charging



Fleets



Activation



Integrated planning

- Fleet analysis
- Vehicle diversification
- Fleet management & external services:  
Sharing & -rental, Taxi, public transport
- Open fleet cars for private use
- **Mobility management & procurement**

Company bikes  
for employees

Procurement  
directive

Biking conditions  
save sheds    bike lanes  
showers      drying room  
lockers

Procurement  
cooperative

# 5. User Activation & Motivation

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Coordination



New mobility



Charging



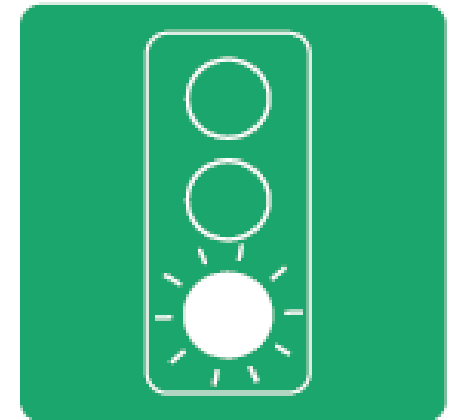
Fleets



Activation



Integrated planning



# 5. User Activation & Motivation

## - Information & questioning



Coordination



New mobility



Charging



Fleets



Activation



Integrated planning



# 5. User Activation & Motivation

- Information & questioning
- **Promotion & advertising**



Ride & Drive



eBike test runs



Charging infrastructure







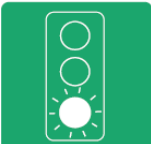

Family attractions



Services/Information



Source:  
[www.region-stuttgart.de](http://www.region-stuttgart.de)

-  Coordination
-  New mobility
-  Charging
-  Fleets
-  Activation
-  Integrated planning

# 5. User Activation & Motivation

- Information & questioning
- Promotion & advertising
- **Ticketing & low-threshold**

## eCarsharing

- Residents get free registration
- No Carsharing basic fee for owners of monthly public transport ticket



Coordination

New mobility

Charging

Fleets

Activation

Integrated planning

# 5. User Activation & Motivation

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Coordination



New mobility



Charging



Fleets



Activation



Integrated planning

- Information & questioning
- Promotion & advertising
- Ticketing & low-threshold
- **Participation & Co-Creation**

# 6. Integrated Urban & Traffic Planning

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Coordination



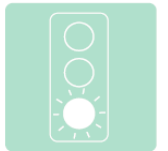
New mobility



Charging



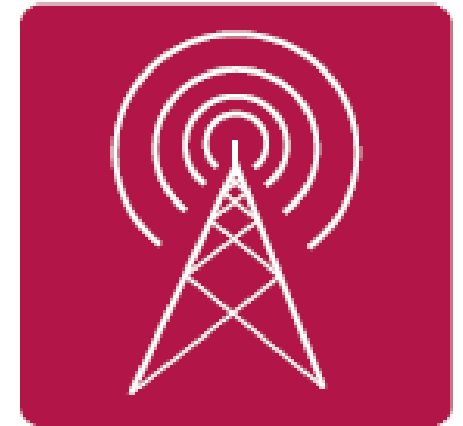
Fleets



Activation

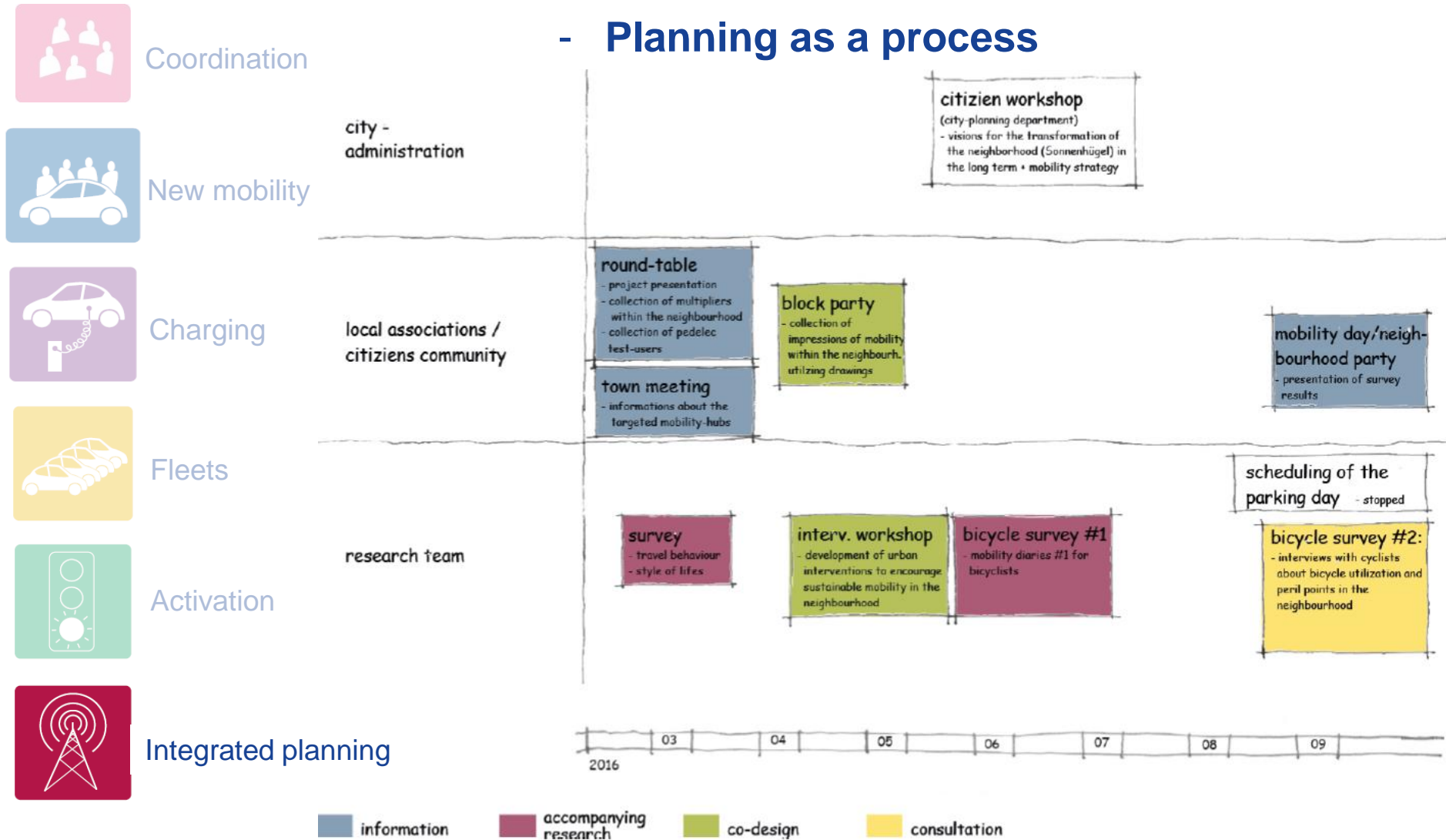


Integrated planning



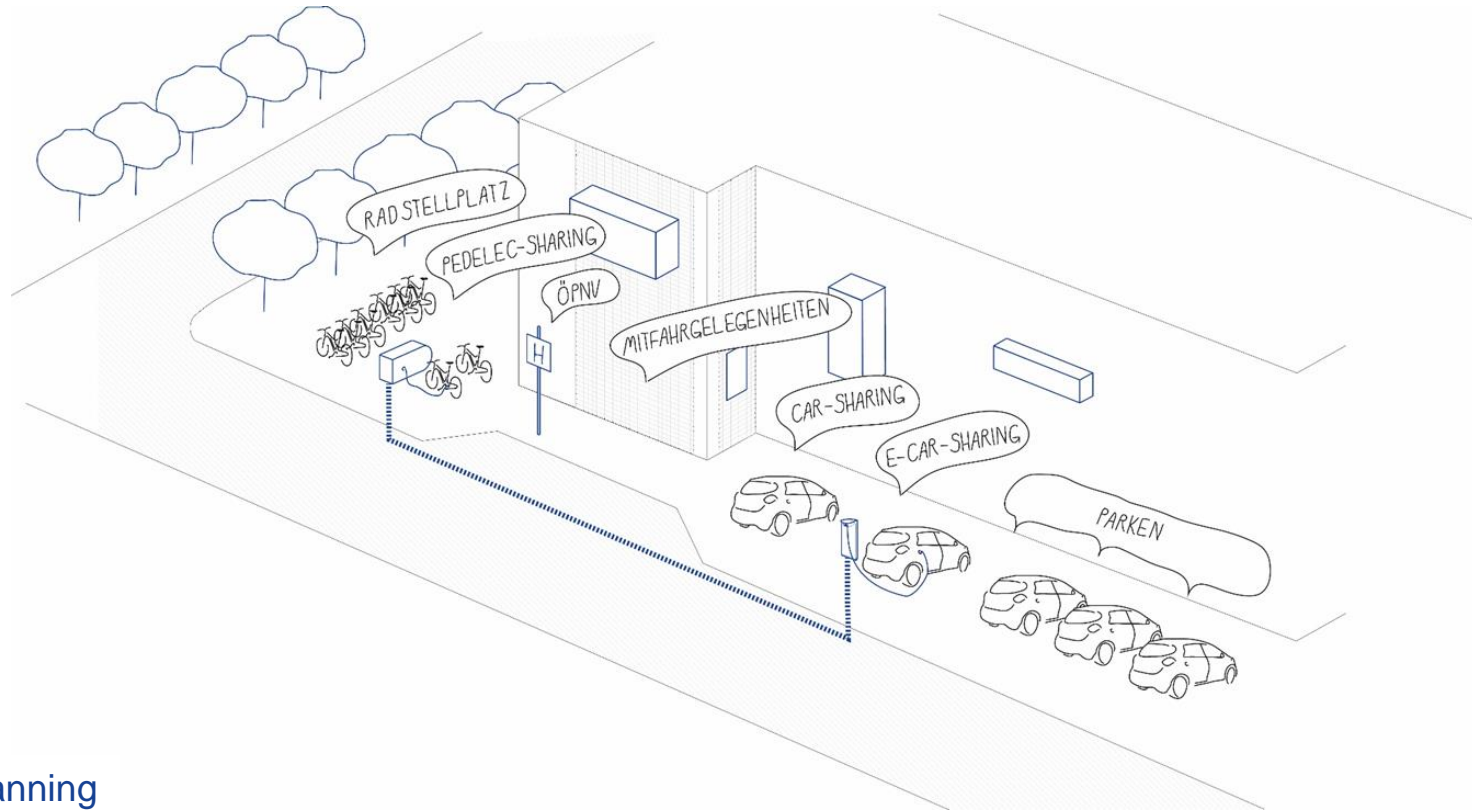
# 6. Integrated Urban & Traffic Planning

## - Planning as a process



# 6. Integrated Urban & Traffic Planning

- Planning as a process
- **Mobility hubs**



Project namos – Nachhaltig mobiler Stadtteil Gmünder Sonnenhügel; Source: University of Stuttgart, 2017



Coordination



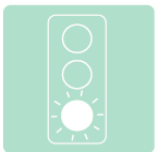
New mobility



Charging



Fleets



Activation



Integrated planning

# 6. Integrated Urban & Traffic Planning

- Planning as a process
- **Mobility hubs**



Coordination



New mobility



Charging



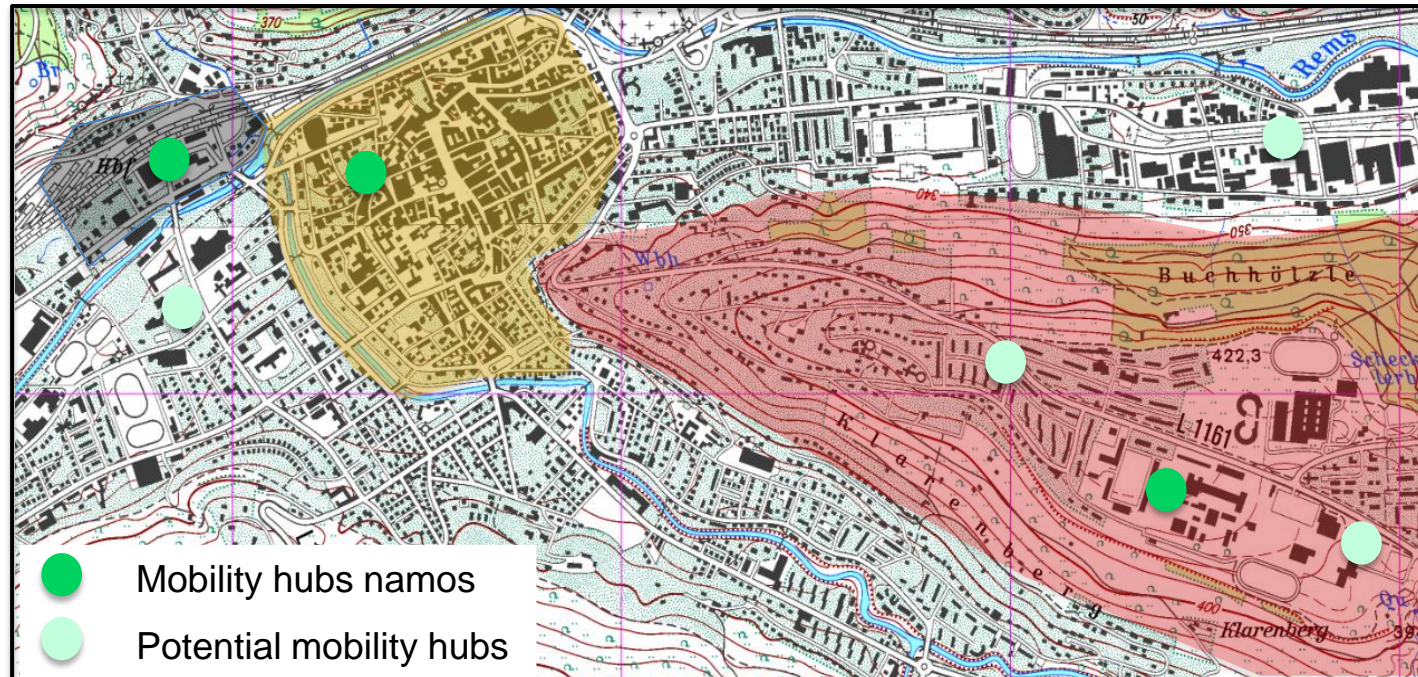
Fleets



Activation



Integrated planning



Project names – Nachhaltig mobiler Stadtteil Gmünder Sonnenhügel; Source: University of Stuttgart, 2017

# 6. Integrated Urban & Traffic Planning



Coordination



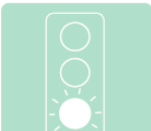
New mobility



Charging



Fleets

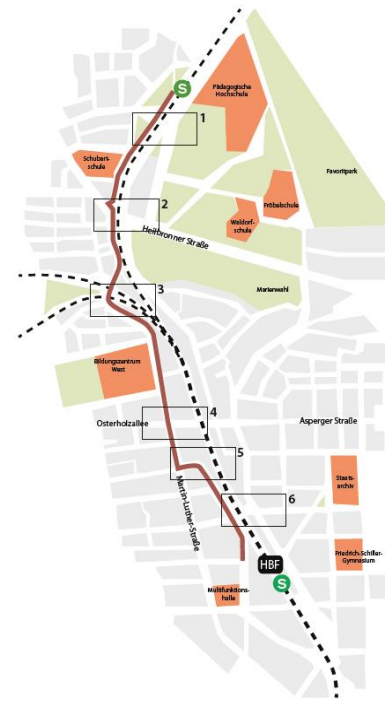


Activation



Integrated planning

- Planning as a process
- Mobility hubs
- **Strengthen the “Umweltverbund”**  
e.g. bike & pedestrian traffic ways



Karte Ludwigsburg Zentrum  
PEDELEC-STRECKE WEST

Pedelec-Route planning  
Ludwigsburg Intermodal  
Source:  
University of Stuttgart, 2016



Standorte

Problematische Verkehrssituationen

# 6. Integrated Urban & Traffic Planning



Coordination



New mobility



Charging



Fleets



Activation



Integrated planning

- Planning as a process
- Mobility hubs
- Strengthen the “Umweltverbund”  
e.g. bike & pedestrian traffic ways
- **Implementation of renewable energies**  
**PV, cogeneration**

PHOTOVOLTAIK + E-MOBILITÄT FÜR EFH

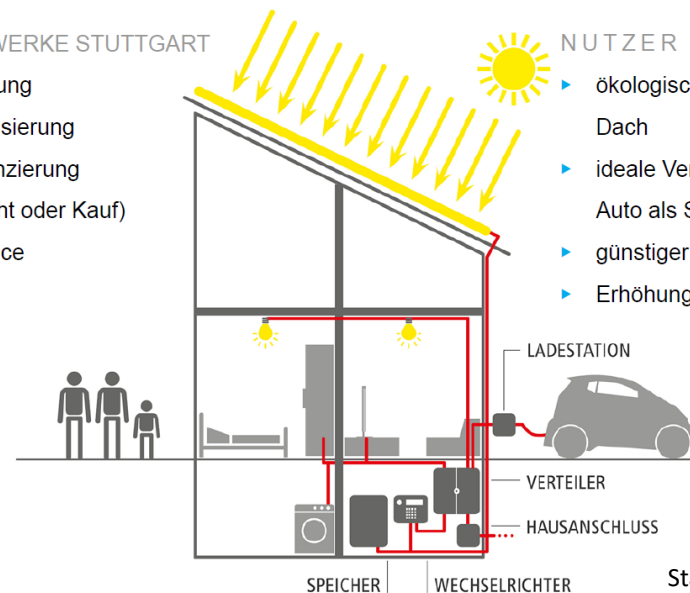
In der Verbindung E-Mobilität mit Photovoltaik kann der Kunde direkt den ökologischen Strom vom eigenen Dach „tanken“.

STADTWERKE STUTTGART

- ▶ Planung
- ▶ Realisierung
- ▶ Finanzierung  
(Pacht oder Kauf)
- ▶ Service

NUTZER

- ▶ ökologisches Laden direkt vom eigenen Dach
- ▶ ideale Verbindung: Ökostrom und E-Auto als Speicher
- ▶ günstiger Strom vom Dach
- ▶ Erhöhung Eigenverbrauchsquote



# Contact

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## **Institut Stadt|Mobilität|Energie (ISME)**

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### **Manfred Schmid**

Managing Director

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[manfred.schmid@i-sme.de](mailto:manfred.schmid@i-sme.de)

# Stress field: Urbanism ↔ Mobility ↔ Resources

## Mobility & User

- » Transport mode choices of relevant user groups
- » Mobility information/-culture
- » Participation & Co-Creation

→ **Socio-scientific Data**

## Traffic & Environment

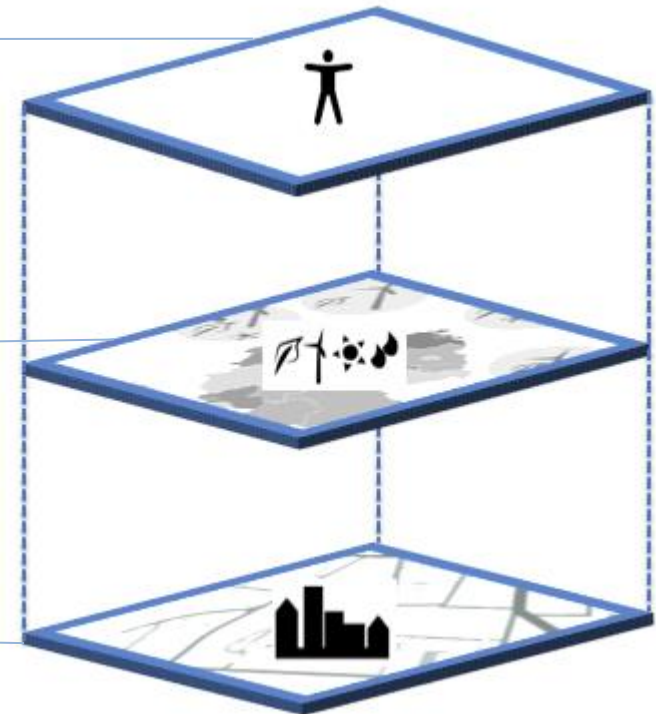
- » Avoid – Shift – Improve
- » Implementation of Renewable Energies
- » Energy flow analysis (i.e. Vehicle-Tracking)

→ **Natural-scientific Data**

## Spatial & urban development

- » Urban development as a process
- » Charging infrastructure concepts
- » Quarter-Perspective

→ **Spatial Data**



# Research Group Stadt|Mobilität|Energie

Interdisciplinary Team

Management



**Prof. Dr.-Ing. Wolfgang Rid**  
Dept. Urban and  
Regional Economy

Head of Research Group and  
Scientific Advisory council



**Manfred Schmid**  
Industrial Engineer/  
Material Flow Manager

Managing Director ISME



**Karsten Hager**  
Geographer

Vice Managing Director ISME



**Andreas Braun**  
Geographer



**Carolin Herdtle**  
Sociologist



**Felix Märker**  
Urban Planer  
& Architect



**Sandra Pardo**  
Urban Planer



**Meike Reisle**  
Participation Planer

# Project Experience in E-Mobility



- Several projects in municipalities (Schwäbisch Gmünd, Göppingen, Ludwigsburg, Sindelfingen, Ilm-Kreis etc.)
- Evaluation-Program „Modellregionen Elektromobilität“
  - 2011-2013 „Urban- & traffic planning“
  - 2013 – 2014 „Fleet management“
  - 2014 – 2015 „E-Carsharing“
  - 2016 – 2019 „Connected mobility“ (BMVI)

## Sourcen:

Rid, W., Grausam, M., & Müller, U. (2014). Elektromobilität in Flotten – Handlungsleitfaden. Berlin.

Rid, W., Grausam, M., Parzinger, G., Müller, U. & Schmid, M. (2015). Elektromobilität in Flotten – Handlungsleitfaden. Berlin.

Rid, W., Parzinger, G., Müller, U. & Grausam, M. (2016). Elektromobilität im Carsharing – Status quo, Potenziale und Erfolgsfaktoren. Berlin.

# 2. New forms of mobility



Coordination



New mobility



Charging



Fleets



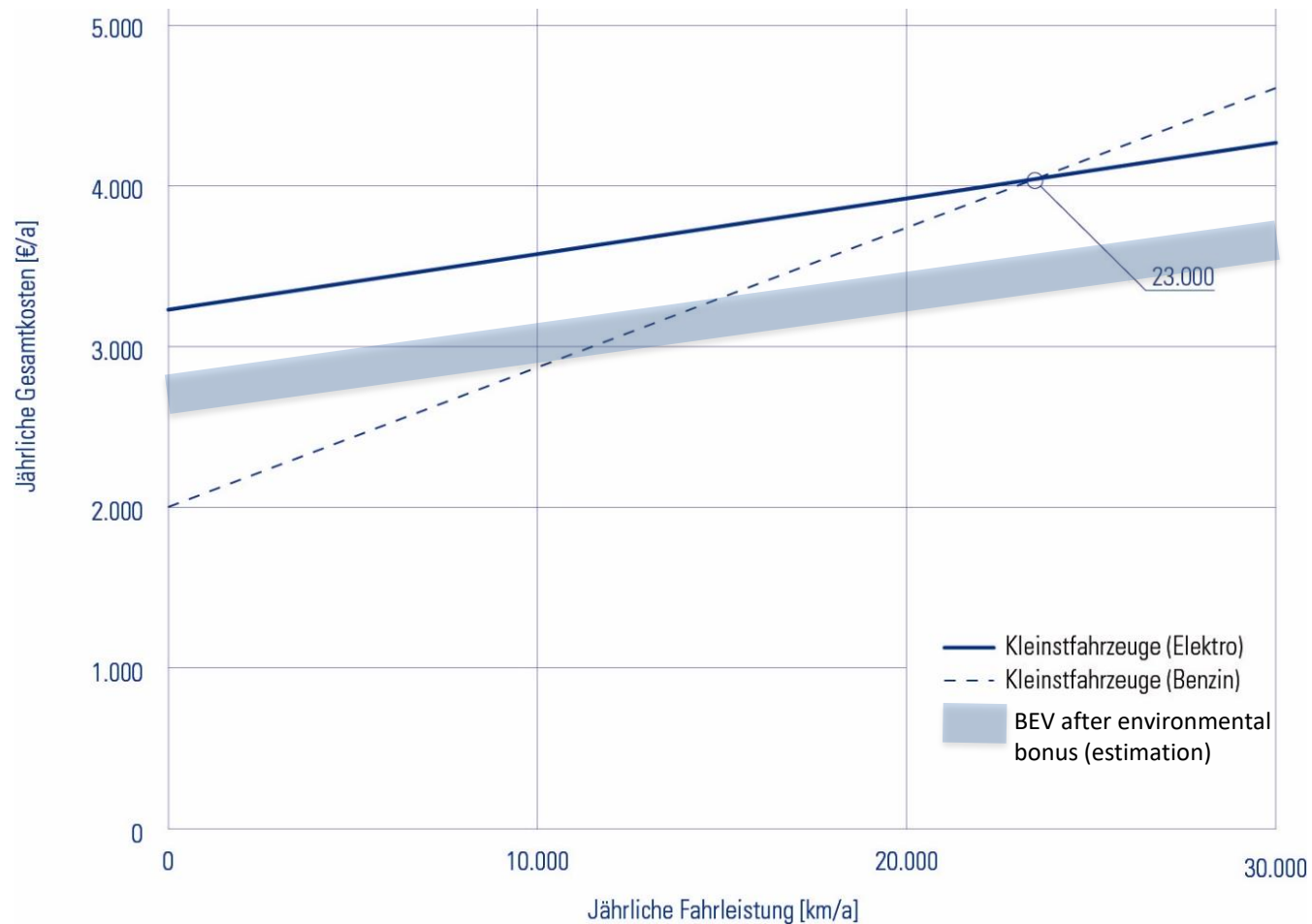
Activation



Integrated planning

## - eCarsharing

Mileage & TCO – iMiEV (BEV) vs. Renault Clio (ICV)



# 2. New forms of mobility



Coordination



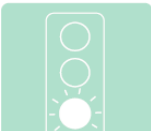
New mobility



Charging



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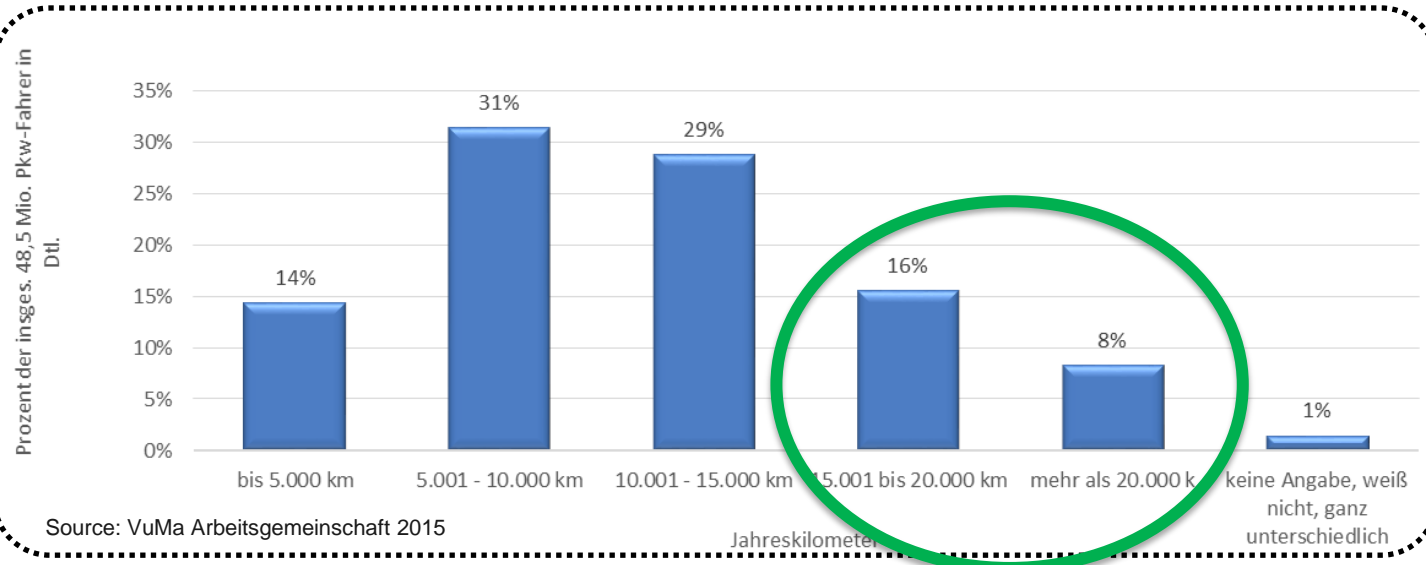
Activation



Integrated planning

## - eCarsharing

### Mileage of German Car Owners 2014



Only 8% of German Car Owners drive more than 20.000 km per year.

Carsharing is characterized by high mileage, e.g.:

Berlin Ø 18.500 km per year

Munich Ø 26.500 km per year

Sources: Landeshauptstadt München & Senatsverwaltung für Stadtentwicklung und Umwelt Berlin 2015, S.20; vgl. BAST 2015, KBA 2015).