



**KIM**

KOMPETENZZENTRUM  
INTELLIGENTE MOBILITÄT



# MOBILITY CONCEPTS FOR SUSTAINABLE NEIGHBORHOODS DRIVEN BY PARKING BYLAWS

An automated parking space reduction tool for Mainz

Caro Glandorf & Anna Lena Müller, Frankfurt am Main, 28.03.2023

Stand: 23.03.2023 | Klassifikation: öffentlich | AutorIn: U1382500



# KIM IS A DYNAMIC, INTERDISCIPLINARY TEAM...



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**KIM'S INTERDISCIPLINARY TEAM**

## **Competence Center Intelligent Mobility**

- ▶ Municipal Consulting



# ... WITH AN INNOVATIVE SKILLSET ...



## INTELLIGENT MOBILITY

- ▶ Digitization of public transport
- ▶ Traffic control
- ▶ Mobility management
- ▶ Showcase autonomous driving



## SMART CITY

- ▶ Smart City Applications
- ▶ Data Platforms



## DIGITAL TRANSFORMATION

- ▶ Requirement surveys
- ▶ Introduction of new software solutions
- ▶ Process optimization
- ▶ Analyses & studies



# ...IN MAINZ, GERMANY'S MOST DYNAMIC CITY.

- ▶ International prominence due to BioNTech (Covid-Vaccine developer)
- ▶ Billion-Euro budget surplus due to trade taxes
- ▶ In terms of dynamics, Mainz catapulted from 48th place to first place
- ▶ Several new development areas, i. e. Biotech Campus, in an otherwise highly densified urban area



The screenshot shows a news article from tagesschau. At the top, there is a navigation bar with the tagesschau logo, a play button icon, and the text 'Sendung verpasst?'. Below this is a breadcrumb trail: 'Startseite > Wirtschaft > Wirtschaftliches Städteranking: Mainz ist dynamischste Großstadt'. The main image is a night view of Mainz, Germany, featuring the illuminated spires of Mainz Cathedral and the modern architecture of the Biotech Campus along the Main river. The article title is 'Wirtschaftliches Städteranking Mainz ist dynamischste Großstadt' with a sub-headline 'Stand: 10.11.2022 11:07 Uhr'. The text of the article discusses Mainz's rise to the top of the economic city ranking, attributing this success to the presence of BioNTech and the city's high tax rates. It also mentions that Mainz is the most dynamic German city according to the study, a role played by the success of the Corona vaccine manufacturer BioNTech. A quote from Hanno Kempermann of IW Consult states that Mainz has jumped from 48th to 1st place due to increased municipal spending. The article also notes that Mainz has implemented various measures in the areas of climate, culture, and leisure.



**DYNAMIC CITIES  
GROW. BUT WHAT IF  
YOU'RE ALREADY  
HIGHLY DENSIFIED?**

# OUR MOBILITY CULTURE IS STILL A CAR CULTURE

- ▶ 57% of all daily trips in Germany are made by car
  - ▶ Car-centered infrastructure
  - ▶ Plenty of parking spaces close to residences
- ▶ Alternative mobility options remain unexploited

## We need to reduce car traffic.

- ▶ In times of high energy costs and urbanization, the need for the modal shift increases
- ▶ Fossil-fueled modes of transport should no longer dominate



# HOMES AND PLACES OF WORK ARE HUGE TRAFFIC GENERATORS

## Homes are enormous traffic generators

- ▶ 80% of all journeys in Germany start and end at home
- ▶ A climate-friendly shift in traffic systems needs new solutions for new and residential areas

## New area developments offer many opportunities

- ▶ Behavioral changes are especially likely in situations of transition
- ▶ Moving into a new home or starting a new job are perfect opportunities to change traffic habits





# IS THERE LEVERAGE FOR GROWING CITIES TO ENFORCE THE MODAL SHIFT?

# PARKING BYLAWS: PART OF THE PROBLEM...

- ▶ When a new building is constructed, a fixed number of parking spaces must be provided for it.
  - ▶ On average: one parking space per apartment
- ▶ If a project fails to provide these spaces, a compensation must be paid
- ▶ This approach is no longer up to date

## **Parking spaces carry high costs**

- ▶ The construction of one parking space costs up to € 50,000
- ▶ Vast areas of land are occupied



# ... AND PART OF THE SOLUTION?

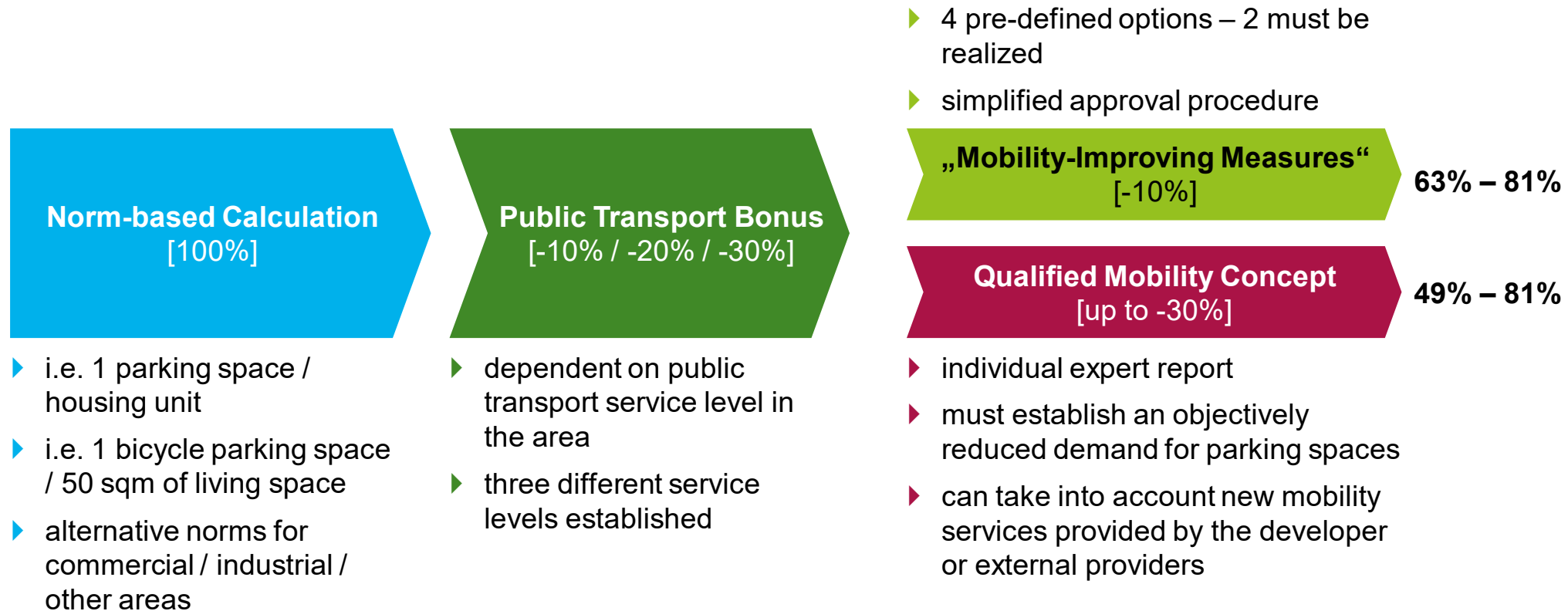
## Flexible parking space regulations

- ▶ Municipalities have already adapted their parking bylaws and integrated the possibility of parking space reduction through mobility concepts
  - ▶ Yet there is little practical guidance
- ▶ Best practices:
  - ▶ Amount of parking spaces is based on the conditions at the location
  - ▶ Reduced parking space requirements if mobility alternatives are provided
  - ▶ Simple process for the reduction of parking spaces



# THE MAINZ APPROACH: REDUCING MANDATORY PARKING SPOT PROVISION

Flexible parking bylaws with a focus on alternative mobility options  
– Calculating the amount of parking spots to be provided



# MAINZ APPROACH CAN STRENGTHEN THE MODAL SHIFT – IF TAKEN ADVANTAGE OF



Transparent calculation of required car parks



Straightforward description of simple mobility-improving measures



BUT: What is the (financial) potential for other mobility solutions?



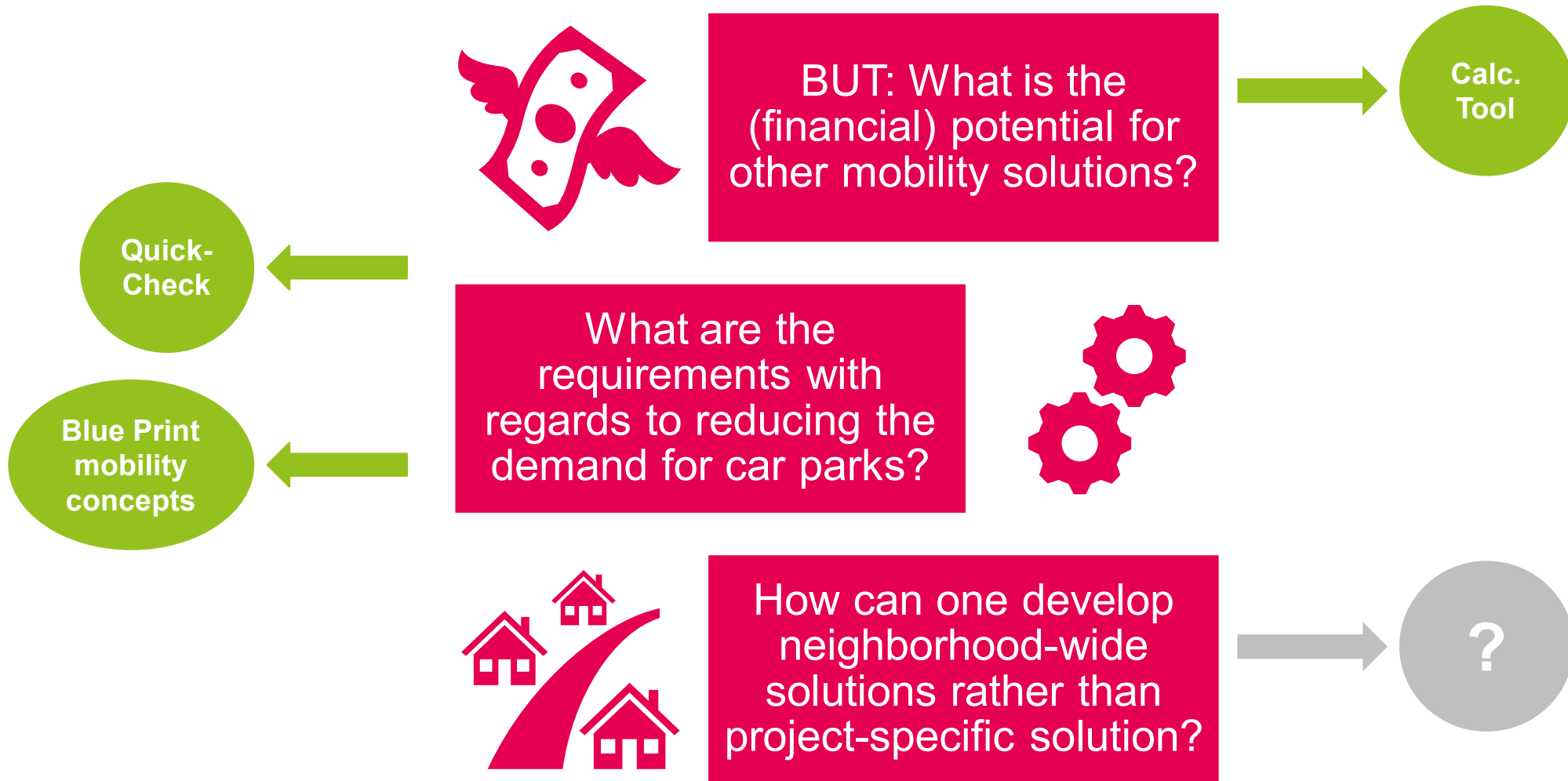
What are the requirements with regards to reducing the demand for car parks?



How can one develop neighborhood-wide solutions rather than project-specific solution?



# WE TACKLED THE PROBLEMS!



# #1: WE CREATED A TOOL TO DETERMINE POTENTIAL

- ▶ Automated tool for determining the parking space requirements
- ▶ Translation of complex bylaws into a straightforward spreadsheet tool
- ▶ Demand is determined based on conditions at the specific location:
  - ▶ Function(s) within the project development
  - ▶ Service level of public transport

## The outcome

- ▶ Number of car parking spaces required
  - ▶ + Potential for reduction with the 2-out-of-4 rule
  - ▶ + Potential for reduction with a qualified mobility concept
- ▶ Number of bicycle parking stands required

Eingangsparameter	
Objekt	
Bezeichnung	Test
Funktionen	
Funktion enthalten?	Bitte ausfüllen:
Wohngebäude	ja <a href="#">Wohngebäude</a>
Gebäude mit Büro-, Verwaltungs- und Praxisräumen	ja <a href="#">Gebäude mit Büro-, Verwaltungs- und Praxisräumen</a>
Verkaufsstätten	ja <a href="#">Verkaufsstätten</a>
Versammlungsstätten	nein
Sportstätten	
Gaststätten und Beherbergungsbetriebe	nein
Krankenanstalten	
Schulen und Einrichtungen der Jugendförderung	ja <a href="#">Schulen und Einrichtungen der Jugendförderung</a>
Gewerbliche Anlagen	ja <a href="#">Gewerbliche Anlagen</a>
Sonstiges	

Wohngebäude				
Typen	Anzahl Wohnungen	Anzahl Betten	Wohnfläche in qm	Stellplatzbedarf PKW
Mehrfamilienhäuser und sonstige Gebäude mit Wohnungen (nicht geförderter Wohnungsbau)	ja <a href="#">Bitte ausfüllen:</a> 30		3000	30
Mehrfamilienhäuser und sonstige Gebäude mit Wohnungen (geförderter Wohnungsbau)	ja <a href="#">Bitte ausfüllen:</a> 15		750	12
Gebäude mit Altenwohnungen				0
Wochenend- und Ferienhäuser				0



**Taxi-Stationen**

Vorteile: Erhöhte Transparenz und Auslastung, Reduktion des Verkehrsbedarfs durch die Optimierung und Reduzierung des Flächenbedarfs.

Kategorie	Maßnahme	PKW	EV	EV+PKW	EV+EV
Zielsetzung	PKW				
	EV				
	EV+PKW				
	EV+EV				

**Seitliche Nutzung, Verknüpfung und Priorisierung**

Typen: Ein- und Ausfahrten, Ein- und Ausfahrten, Ein- und Ausfahrten, Ein- und Ausfahrten.

Kategorie	Maßnahme	PKW	EV	EV+PKW	EV+EV
Zielsetzung	PKW				
	EV				
	EV+PKW				
	EV+EV				

**Verknüpfung**

Typen: Ein- und Ausfahrten, Ein- und Ausfahrten, Ein- und Ausfahrten, Ein- und Ausfahrten.

Kategorie	Maßnahme	PKW	EV	EV+PKW	EV+EV
Zielsetzung	PKW				
	EV				
	EV+PKW				
	EV+EV				

**Verknüpfung und Ein- und Ausfahrten**

Typen: Ein- und Ausfahrten, Ein- und Ausfahrten, Ein- und Ausfahrten, Ein- und Ausfahrten.

Kategorie	Maßnahme	PKW	EV	EV+PKW	EV+EV
Zielsetzung	PKW				
	EV				
	EV+PKW				
	EV+EV				

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01.28

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Typen: Ein- und Ausfahrten, Ein- und Ausfahrten, Ein- und Ausfahrten, Ein- und Ausfahrten.

Kategorie	Maßnahme	PKW	EV	EV+PKW	EV+EV
Zielsetzung	PKW				
	EV				
	EV+PKW				
	EV+EV				

**Umgebung**

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**PKW-Stellplatzbedarf optimiert**

Typen: Ein- und Ausfahrten, Ein- und Ausfahrten, Ein- und Ausfahrten, Ein- und Ausfahrten.

Kategorie	Maßnahme	PKW	EV	EV+PKW	EV+EV
Zielsetzung	PKW				
	EV				
	EV+PKW				
	EV+EV				

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Siehe 4.10.18

möglicher zusätzlicher Bonus durch mobilitätsorientierte Flächenformen

ALTERNATIVE: maximaler zusätzlicher Bonus durch Mobilitätskonzepte (Seitenverknüpfungsmöglichkeiten)

10%  
20%

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**PKW-Stellplatzbedarf optimiert**

Typen: Ein- und Ausfahrten, Ein- und Ausfahrten, Ein- und Ausfahrten, Ein- und Ausfahrten.

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	EV				
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**PKW-Stellplatzbedarf optimiert**

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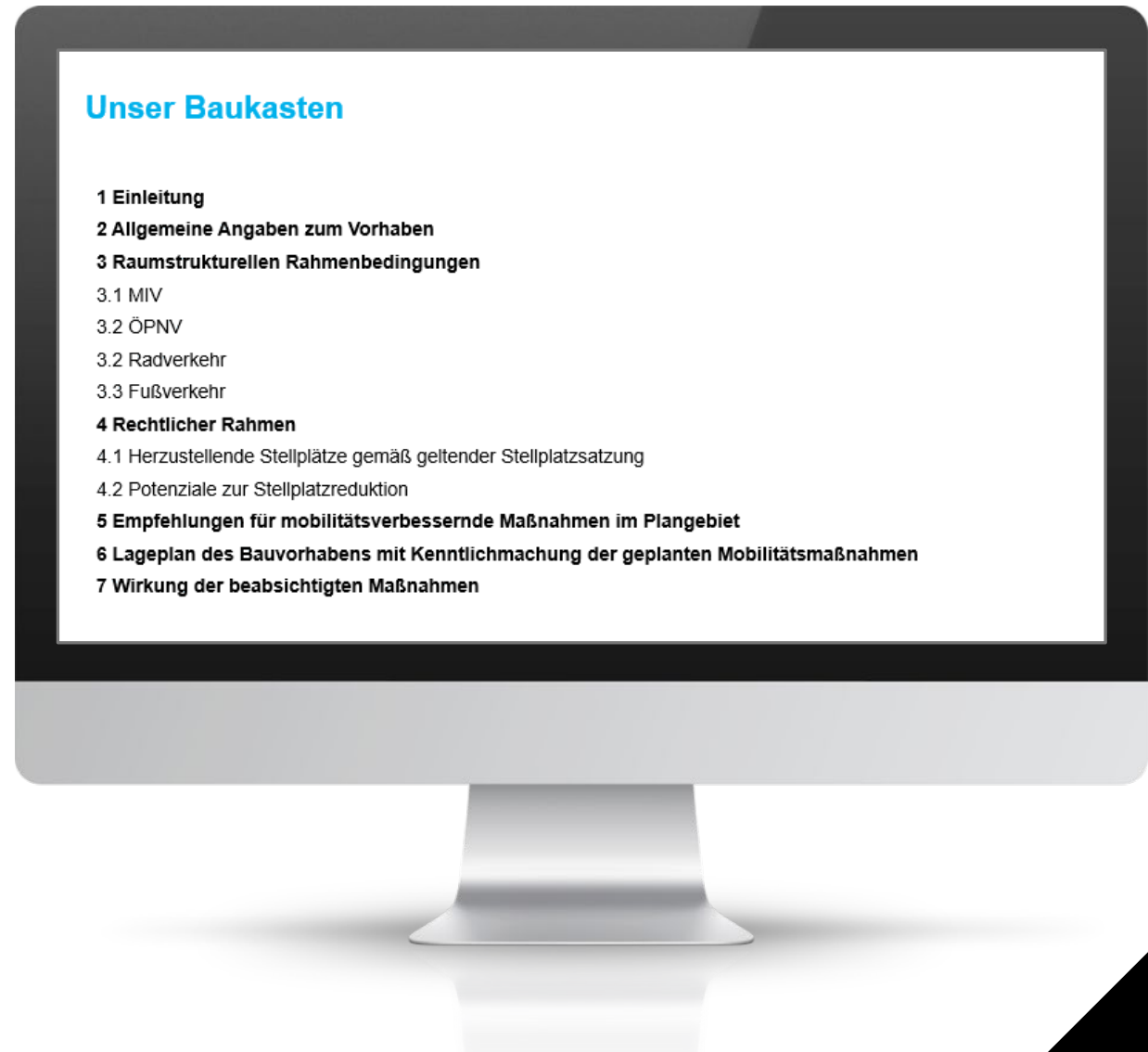
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# #2 WE CREATED AN ADDITIONAL BLUEPRINT

- ▶ Contains all the information that constitutes a qualified mobility concept
- ▶ Agreed-upon standard for the collaboration with local authorities
  - ▶ Establishes the formal requirements for “qualified mobility concepts” used to prove a reduced need for parking spots
  - ▶ Establishes quantitative and qualitative efficacy rates for the reduction, based on an analysis of technical literature
- ▶ Short descriptions facilitate the completion of the blueprint
  - ▶ Contents can be filled in independently
- ▶ “Quick-Check”: early transparency, outline of plans and efficacy rates



# WELL-DESIGNED PARKING BYLAWS BENEFIT EVERYONE



## CITIES

- ▶ Project developers are held accountable for the mobility issues they generate
- ▶ Dedicating more space for sustainable mobility solutions



## DEVELOPERS

- ▶ Financial transparency and guidance from the beginning
- ▶ Offering sustainable solutions has a positive influence on ESG reporting requirements in corporate finance (reporting on environmental, social, and corporate governance)



## RESIDENTS

- ▶ Residents benefit from new mobility services at their homes
- ▶ Reducing costs for mobility



**FLEXIBLE PARKING  
BYLAWS CAN  
STRENGTHEN THE  
MODAL SHIFT  
BUT MORE  
TRANSPARENCY IS  
NEEDED.**

# AN AUTOMATED PROCESS PROVIDES GUIDANCE

## Lessons Learnt

- ▶ Early transparency for developers
  - ▶ calculation of required car parks
  - ▶ efficacy rates
  - ▶ approval procedures
- ▶ Early answers:
  - ▶ How much can I save?
  - ▶ What do I have to do?
  - ▶ Which providers of mobility solutions can I count on?
- ▶ Important to contact local authorities early



# YET THERE IS STILL MUCH TO DO

## Next steps

- ▶ Improving the developed tools
- ▶ Applying the tools in actual project developments
  
- ▶ Thinking big: Developing solutions on an urban district level
- ▶ Thinking bigger: Proliferation of progressive parking bylaws in urban areas in Germany



# GET IN TOUCH WITH US!

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