Welcome!

SmartHubs International Symposium

Governance of multi-modality in public space – what options do we have?

Friday, Sept. 16th, 2022

Vienna, aspern Seestadt

LAKEFIRST

Eva-Maria-Mazzucco-Platz 2, 1220 Wien

Agenda

Moderator: Oliver Roider

09:00 – 9:20 Welcome session

- Welcome by the Federal Ministry for Climate Action (Walter Wasner)
- Welcome by Seestadt Development Agency Wien 3420AG (Alexander Kopecek)
- Welcome and short introduction to SmartHubs project by the coordinator (Karst Geurs)

9:20 – 10:00 Mobility hubs in urban context

- **Shared mobility concept and guidelines on mobility stations in Vienna**

Alexander Scholz, Vienna Municipal Department MA18, Urban Development and Planning

- **Implementation of the hub concept in Vienna**

Leonie Schöch, Wiener Linien (Viennese Public Transport Operator)

10:00 – 10:45 Mobility hubs in rural context

- **Action plan for multimodal hubs in rural and urban contexts**

Christian Kainz, zukunftswege.at / Salzburger Verkehrsverbund

- **Lower Austrian Mobility.Lab and the implementation of mobility stations in the Weinviertel region and the City of Tulln (project LISA)**

Christoph Weber, NÖ Regional

Agenda

11:15 – 12:00 SmartHubs project

- SmartHubs integration ladder for designing mobility hubs

Karst Geurs, Centre for Transport Studies, University of Twente, The Netherlands

- Open data platform on mobility hubs

Linda Dörrzapf, Research Unit Transportation System Planning, TU Wien, Austria

- Policy and governance frameworks of implementing SmartHubs with particular focus on the Austria situation

Antonia Graf & Julia Hansel, Institute for Political Science, University of Münster, Germany

European Commission

URBAN EUROPE

Agenda

12:00 – 12:45 Tools and guidelines to assess mobility hubs

Parallel sessions

- Appraisal Tool for sustainability and stakeholder assessment

Mobility, Logistics and Automotive Technology Research Centre, Vrije Universiteit Brussel, Belgium

- Accessibility tool for mobility hubs in the urban space

Chair of Urban Structure and Transport Planning, TU Munich, Germany

- Resilience tool to assess accessibility, connectivity, and network resilience

Department of Economics, University of Bologna, Italy

- Policy guidelines and governance implications

Institute for Political Science, University of Münster, Germany

- Public debate and citizen participation

Institute for Political Science, University of Münster, Germany

European Commission

URBAN EUROPE

Shared mobility concept and guidelines on mobility stations in Vienna

Overview and objectives for Vienna

Alexander Scholz | Vienna Municipal Department, Urban Development and Planning

SmartHubs International Symposium | 16.09.2022

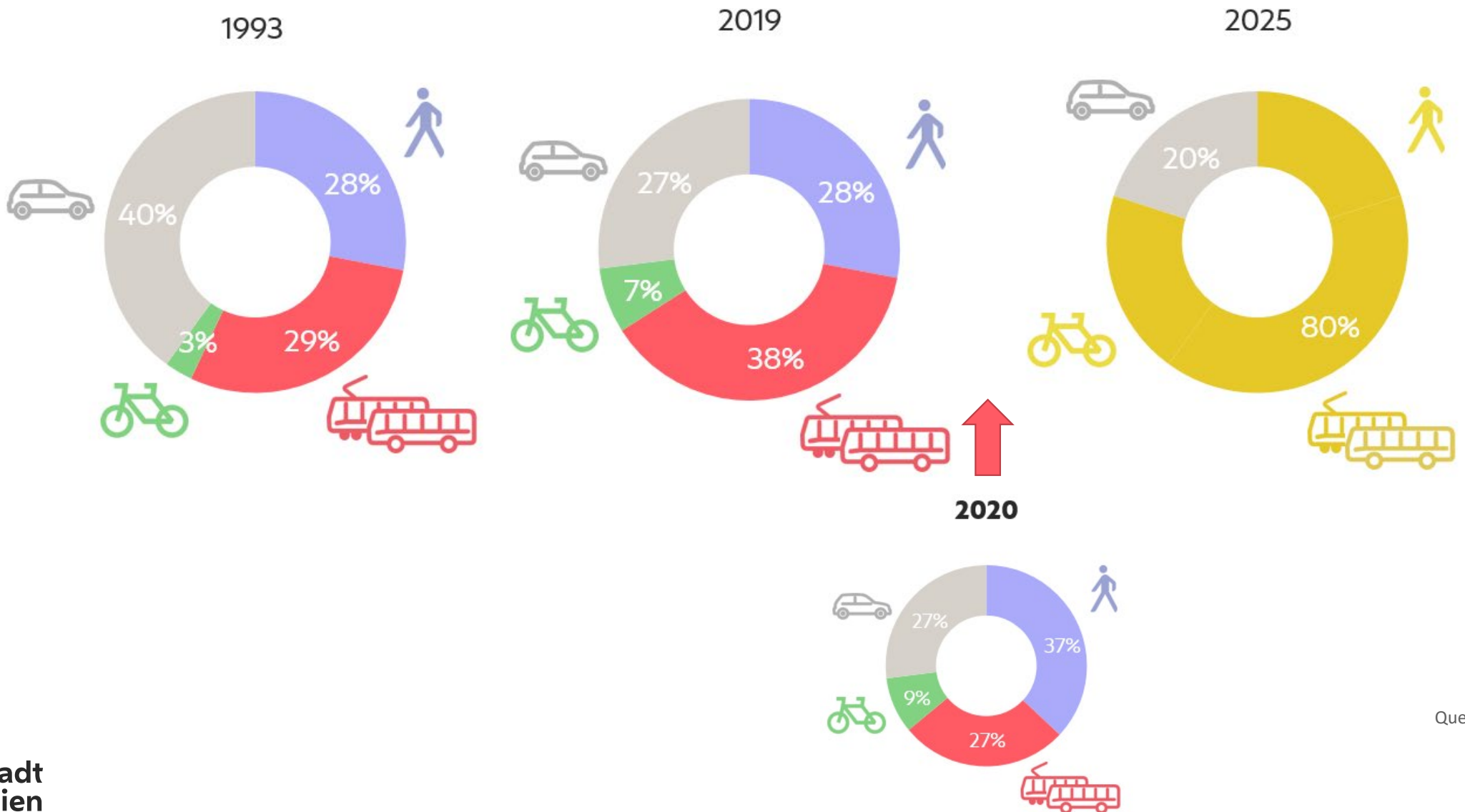**Stadt Wien** | Stadtentwicklung und Stadtplanung

Status Quo

Mobility objectives and challenges

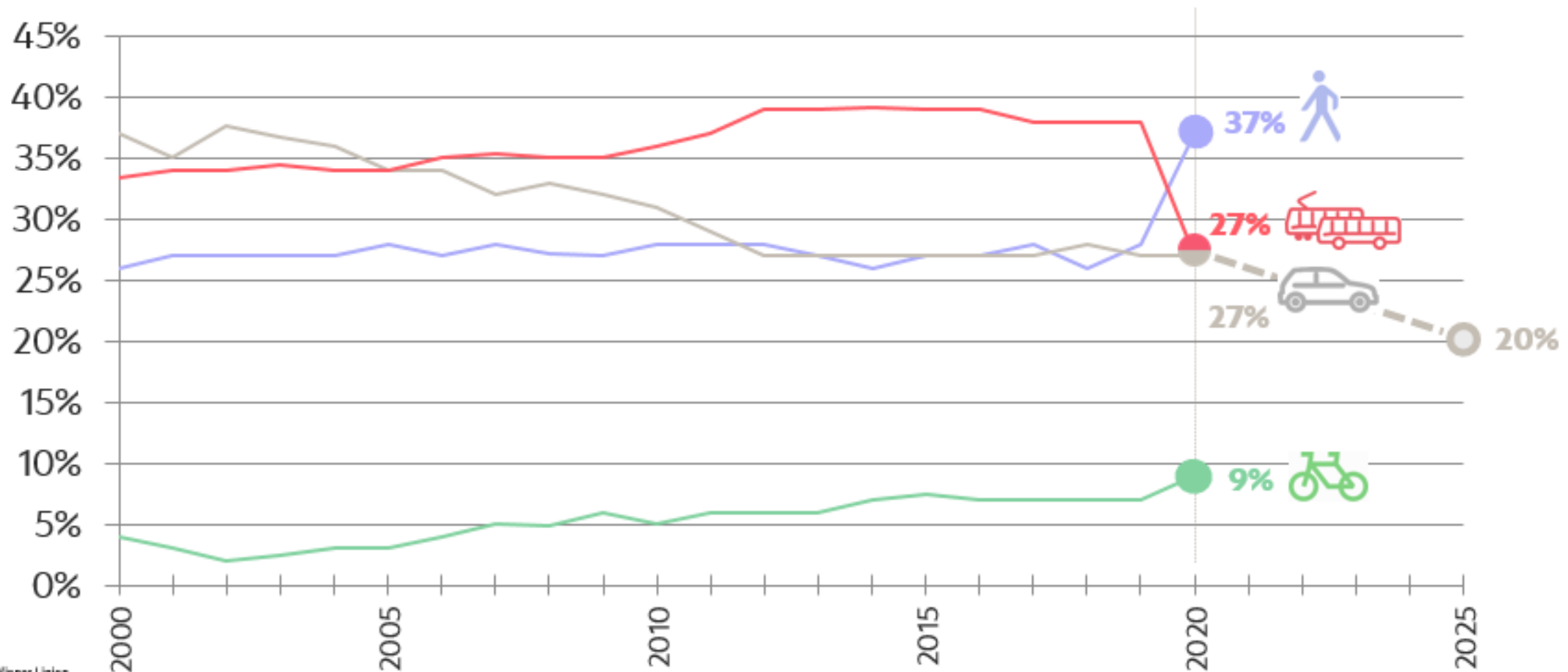# Die Wege der Wienerinnen und Wiener
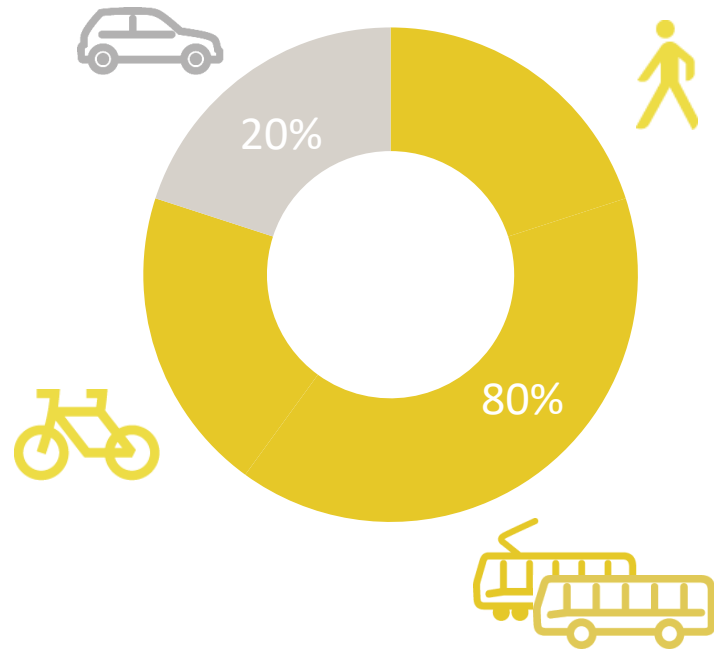## Status Quo & Zielsetzung

Quelle: Wiener Linien

Modal Split
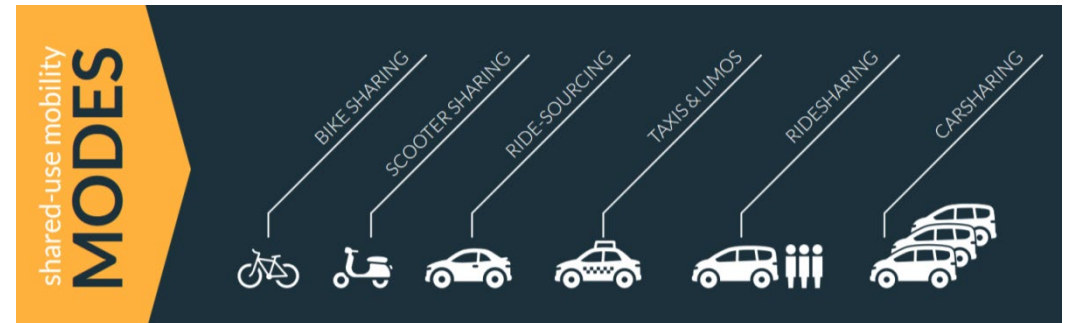Modal Split from 2000 to 2020 and objective for 2025

Quellen: MA 18, Wiener Linien
Grafik: MA 18

Stadt Wien

Challenge: an uneven market
The availability of sharing mobility divided

City Center ⟷ **Urban Fringe**

Good or excellent public transport

Lower car dependency

Sharing   High availability of sharing mobility

High car dependency

Lower availability of public transport

Sharing   Low availability of sharing mobility

Stadt Wien

Strategic Framework

for shared mobility

Strategic Framework

On basis of the coalition agreement of the city government

STEP 2025

SUMP

E-Mobility-Strategy

Smart Klima City
Strategie Wien

Wiener Klimafahrplan

STEP 2035

In development

Objectives for shared mobility

Mobility Guarantee: Enable full mobility without vehicle ownership throughout the city.

Services of general interest: (Daseinsvorsorge): Ensure a network of shared mobility services as part of public infrastructure.

Streets fair shared: Less need for parking cars in public space to ensure more space for everyone

Robust: setting the course for digitization, technological development and the time after the private car.

Customer focus: Further development of the existing shared mobility services without temporary disadvantages for the customers, uniform appearance for the customers

Organization: Use of the city's internal resources and build on existing responsibilities

Stadt
Wien

Guidelines for shared mobility
Mobility hubs is a important element for shared-mobility

Responsible and careful use of public space	Data governance for combined services and analyses	Different shared mobility services available across the city	**Mobility-services visible and bundled in mobility hubs**
Sharing mobility is decarbonized and sustainable	Predictable conditions for service providers	WienMobil as a strong brand	

Stadt Wien

Mobility Hubs

From a city perspective

Mobility Hubs
Overview

Resolution of the city council from the 24.06.2020 regarding „Mobility Sharing – Objectives and guidelines"

> „Die Stadt Wien steuert Errichtung und Betrieb eines **flächendeckenden Netzes an Mobilitätsstationen** im öffentlichen Raum … in Stadtentwicklungsgebieten sind Mobilitätsstationen vorrangig auf öffentlich zugänglichem Privatgrund verortet" …

Meeting of the Vienna Climate Council (Wiener Klimarat)

> „Neben den öffentlichen Verkehrsmitteln sollen **100 Mobilitätsstationen in ganz Wien** für die oft kurze Strecke von der Haustür zur Öffi-Station zusätzliche Lösungen anbieten und den Modal Split vor allem in den Flächenbezirken noch verbessern."

Urban Mobility Plan (2014)

> Maßnahme 22: Bekenntnis zum Ausbau von Mobilitätsstationen in Stadtentwicklungsgebieten und bestehenden Grätzeln.

Wiener Klimarat (2019, C.Jobst/PID)

Strategic considerations

- **Spatial integration of services in Mobility Hubs**
  - Cluster and foster mobility services with high visibility
  - Focus on customers convenience and flexibility

- **Digital platform as public infrastructure**
  - Don't leave it to Google and friends!
  - New infrastructure under public control

- **Mobility providers and data requirements**
  - providers required to provide data for platform integration
  - supply of aggregated data for analysis and improving the services
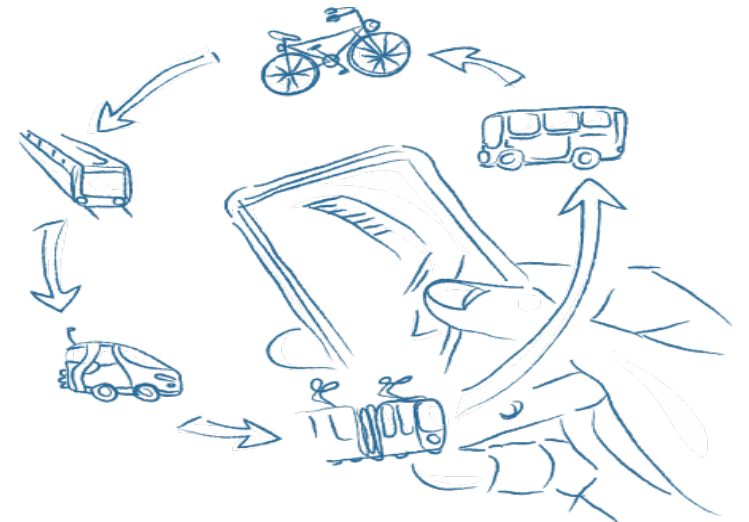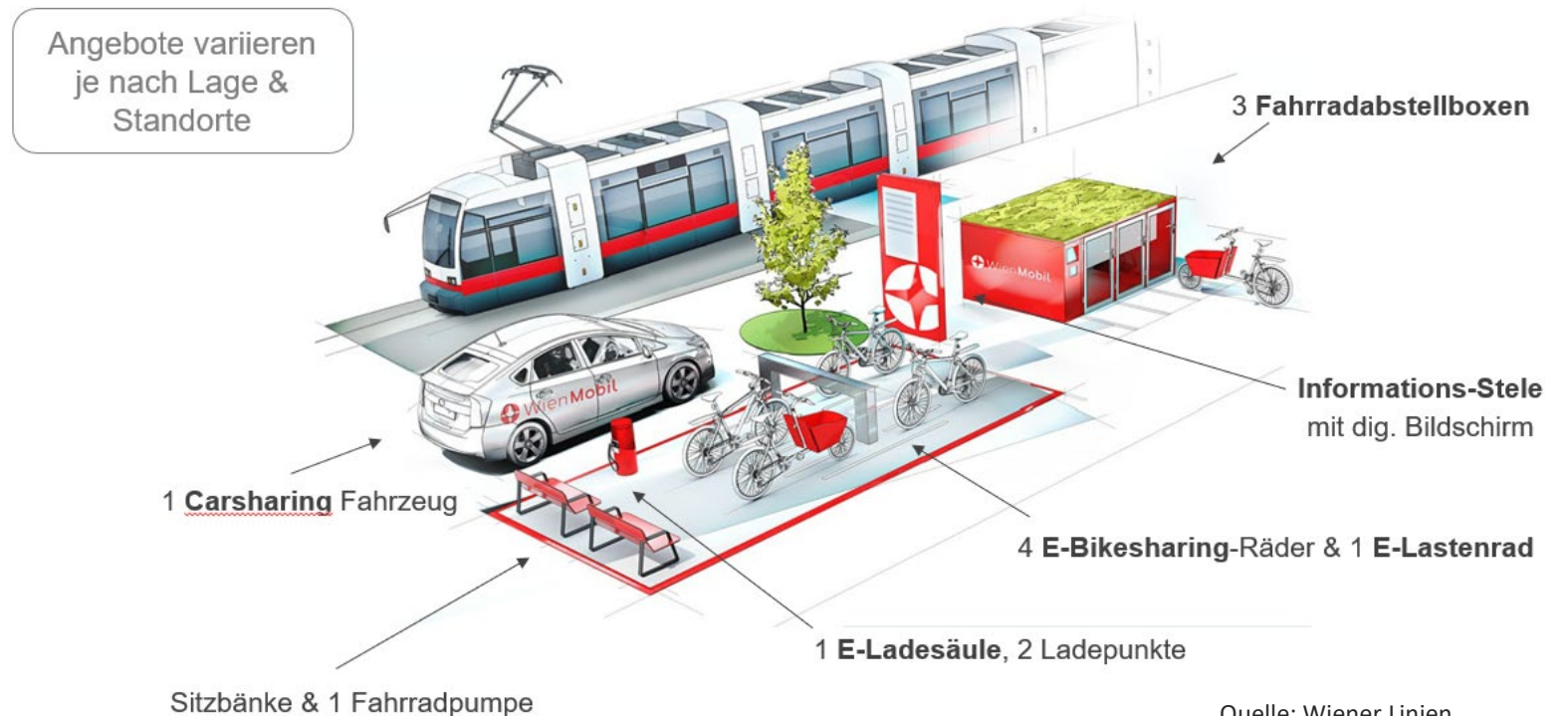
Mobility Hubs

Overview

Objectives

- Strengthening ecomobility transport modes

- „Mobility guarantee"

- Visibility of shared mobility services

Possible services

- E-Carsharing

- Bikesharing (incl. cargobikes)

- Service station

- Terminals

- Additional services (e-mopeds, …)

- Space for free-floating services

- City logistics

Added value

- Bundling of mobility services

- Visibility and accessibility of shared mobility services

- Reduce dependence on private cars

Angebote variieren je nach Lage & Standorte

3 **Fahrradabstellboxen**

Informations-Stele mit dig. Bildschirm

1 **Carsharing** Fahrzeug

4 **E-Bikesharing**-Räder & 1 **E-Lastenrad**

1 **E-Ladesäule**, 2 Ladepunkte

Sitzbänke & 1 Fahrradpumpe

Quelle: Wiener Linien

Stadt Wien

Different levels of mobility hubs

WienMobil mobility hubs
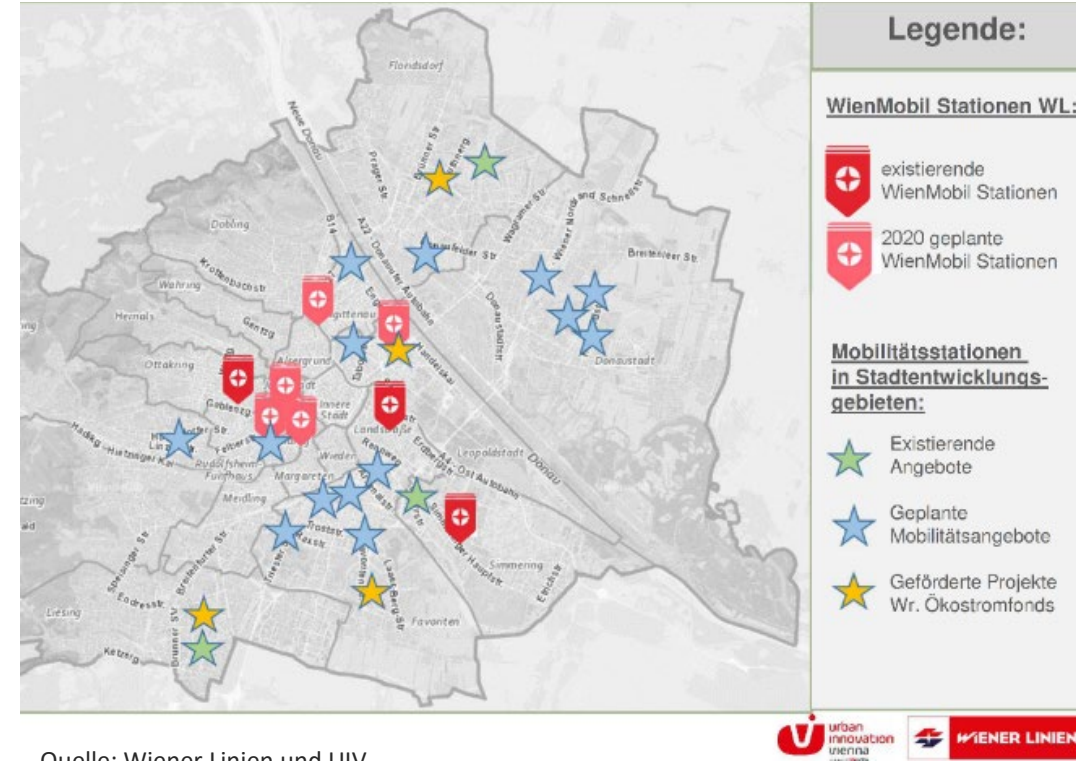
Mobility Hubs in urban development areas (private operator)

a. On private property (integrated in a building)

b. On private property or semi-public space

Mobility Hub in urban development area (WienMobil)

a. For example: WienMobil (Nordbahnhof)

In garages (private operator)

a. Commercial operator

b. Community-based (closed user group)

Quelle: Wiener Linien und UIV

Challenges

Mobility Hubs in urban development projects

Operating challenges

Commitment and financing

- §1a "Städtebauliche Verträge", Mobility-Fund, Subsidies

Long-term operation

- Investment costs, operating costs, operating model

Operator platform

- Avoid isolated solutions

Planning challenges

Dimension and spatial distribution

- Number of hubs, location of hubs, …

Design and layout

- Allocation of space, …

Planning process

- Coordination with city administration, project developer, …

Planning and decision making

Contractual foundation
(especially for public space)

What is the role of the city?

Coordination

Financing
(if needed)

Stadt
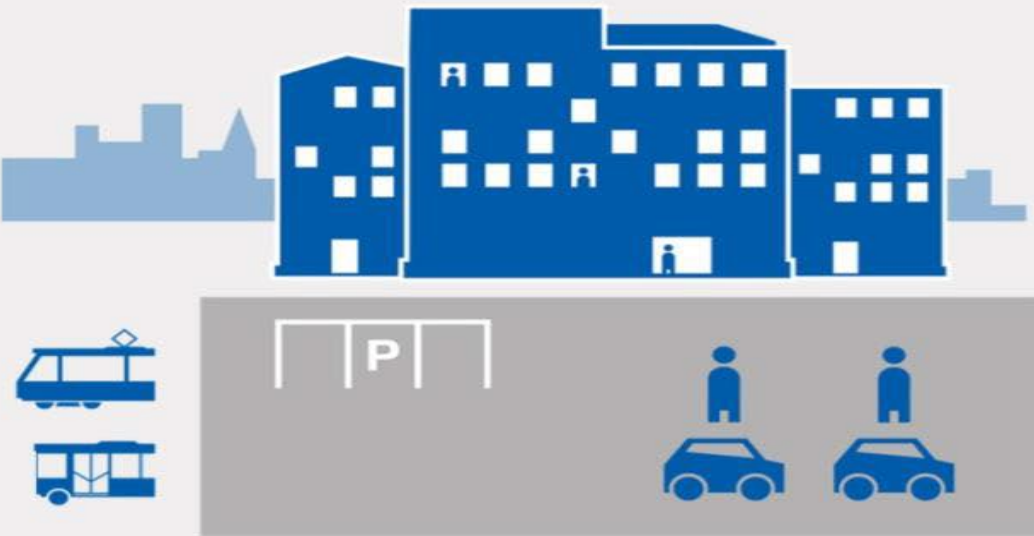Wien

Vision

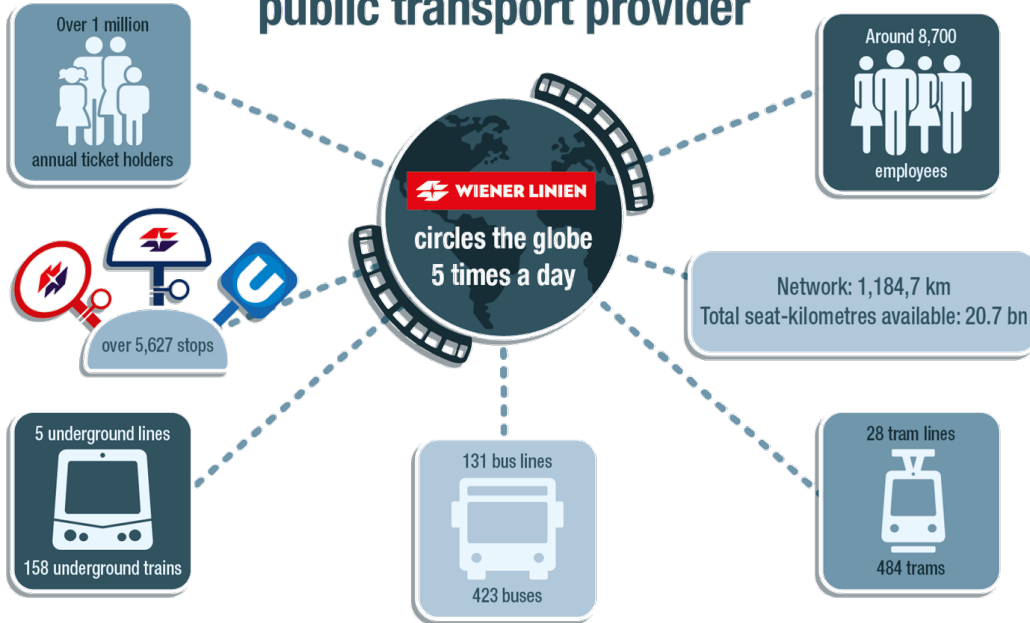From providing parking space → To care for mobility

Copyrights: Projektkonsortium WoMo – wohnen und mobilität. Spirit Design GmbH in Kooperation mit raum & Kommunikation GmbH.

Stadt Wien

Implementation of the hub concept in Vienna

Leonie Schöch
leonie.schoech@wienerlinien.at

Wiener Linien in numbers

Austria's largest local public transport provider

Over 1 million annual ticket holders

Around 8,700 employees

circles the globe 5 times a day

over 5,627 stops

Network: 1,184,7 km
Total seat-kilometres available: 20.7 bn

5 underground lines
158 underground trains

131 bus lines
423 buses

28 tram lines
484 trams

Source: Wiener Linien

WIENER LINIEN

Mobile freedom – Wiener Linien enable mobility

Wien Mobil

ÖPNV, Sharing & more mobility services under the umbrella brand
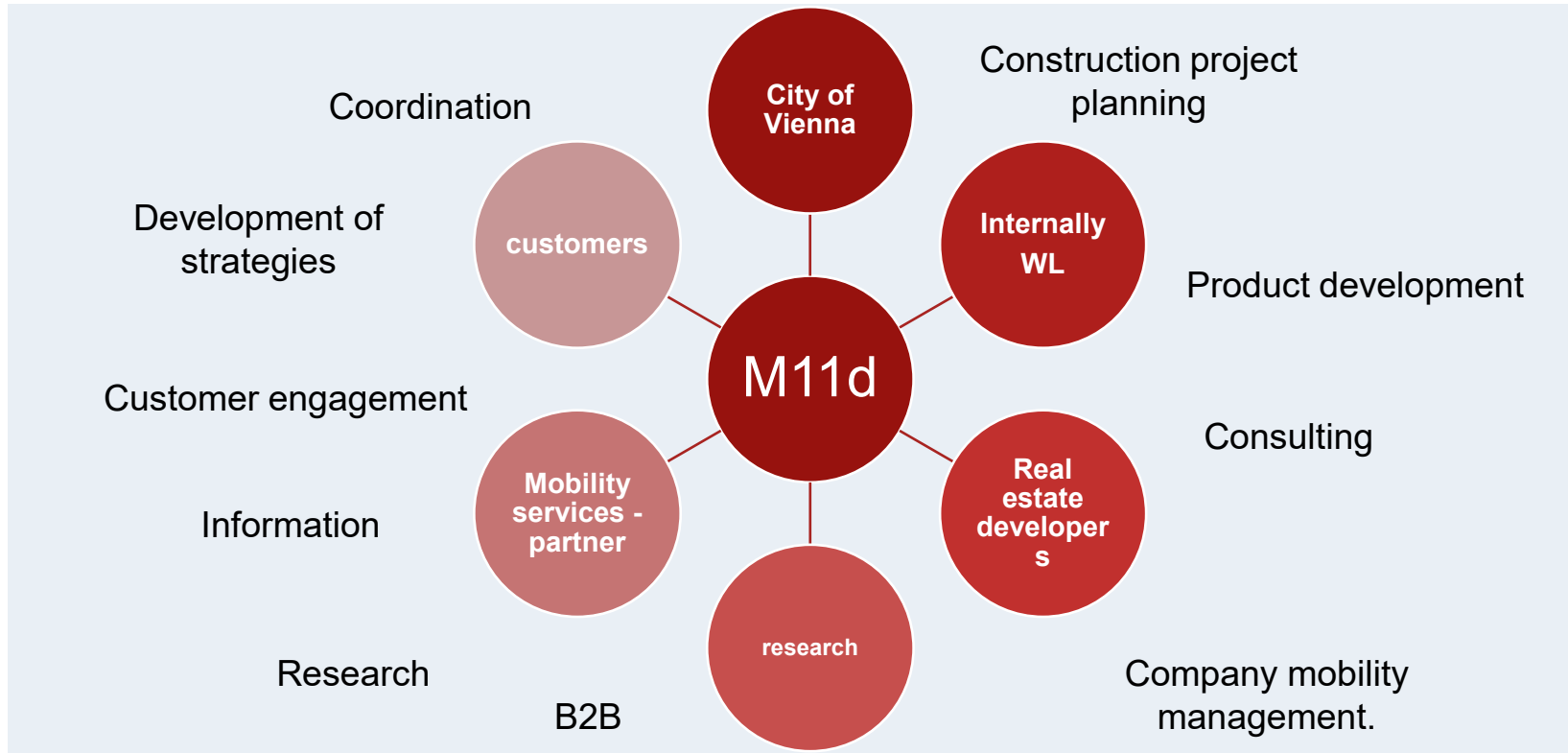
U-Bahn, Bim und Bus
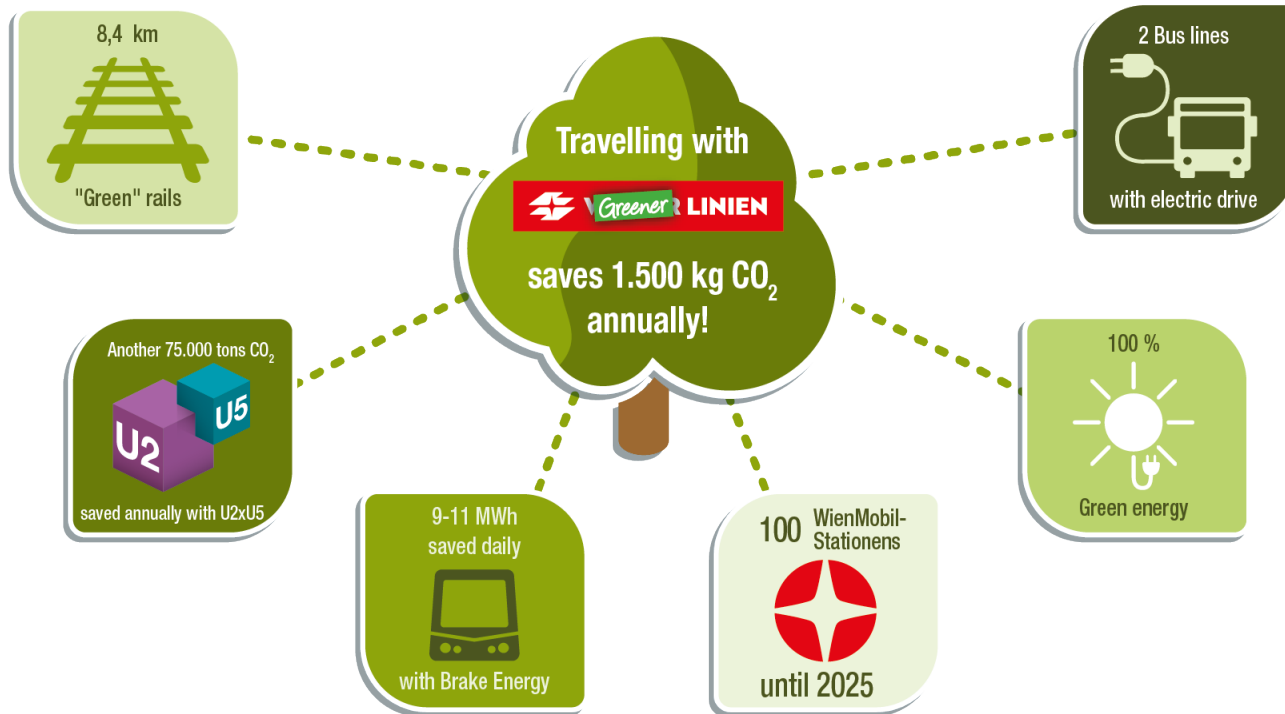
Wien Mobil Station

Wien Mobil Rad

Wien Mobil Auto

WIENER LINIEN

Mobility as a Service

WienMobil as umbrella brand

Digital
WienMobil App

⟷

Public Space
Public Transport &
WienMobil Points

◆ Connects PT and sharing mobility

◆ More than 20 service partners in Vienna

◆ Multimodal and intermodal routing
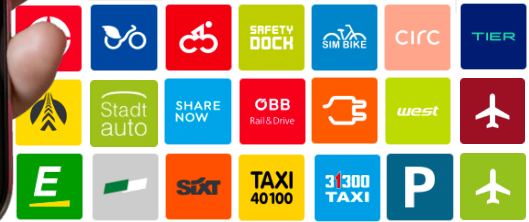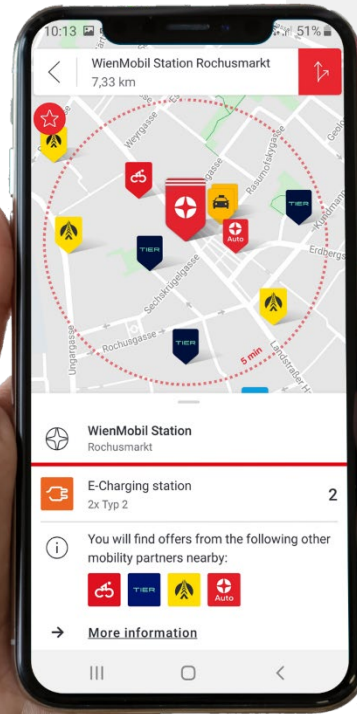
WL as integrated and integrating mobility provider

- WienMobil **App**

- WienMobil **points**

- WienMobil **car**

- WienMobil **bike**

- WienMobil **screen**

- WienMobil **…**

Digital environment
plattform
Communication
Etc.

New ways of mobility demand
Combined multimodal tariffs
bundles
Sharing
Etc.

Physical infrastructure
(infrastructure) network
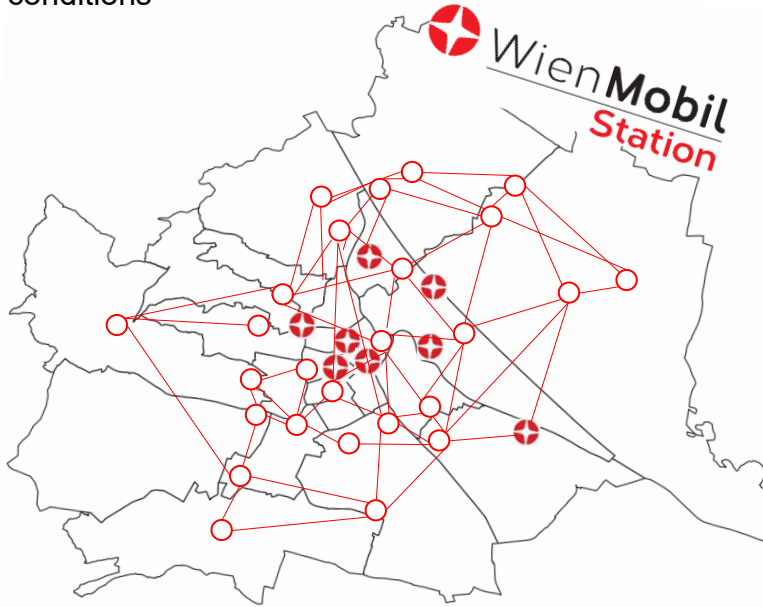*Stops and hubs*
Fleet
Etc.

WIENER LINIEN
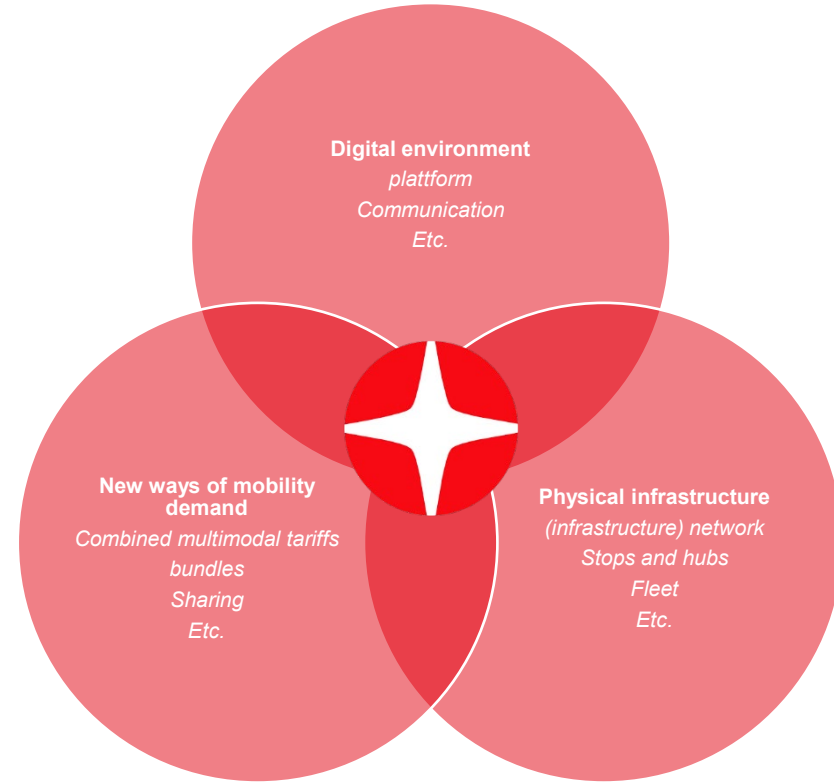
Offers at WienMobil Stationen:

- **WienMobil Auto** – Carsharing
- **WienMobil Rad** - Bikesharing
- information pylon
- bicycle storage boxes
- bike service station (cooperation with
  Austrian automobile clubs ÖAMTC and ARBÖ)
- E-scooter sharing parking spaces
- Etc.
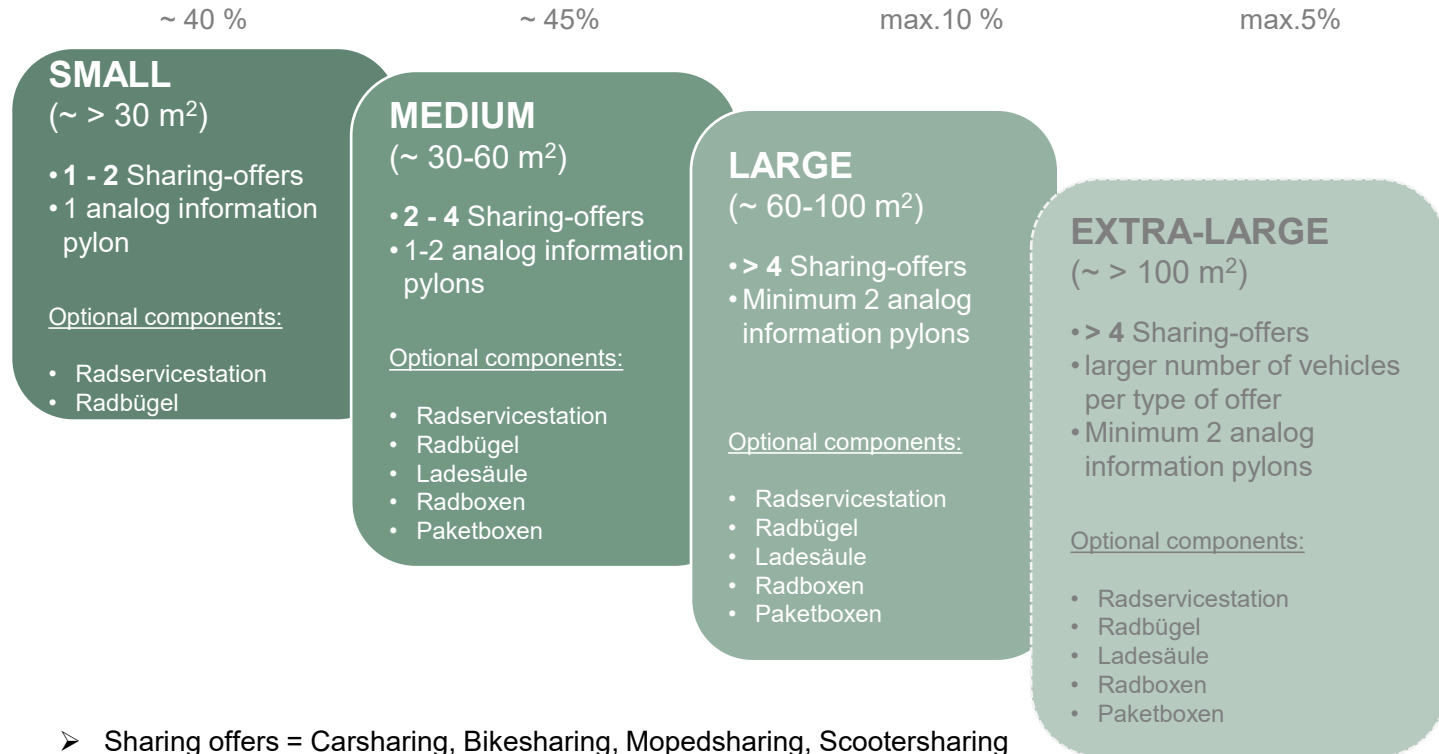
WienMobil Stationen – mobility points

→ Integration of a large number of WienMobil stations throughout the city
→ Varying offers depending on the location and local conditions

Status Quo: 18 WienMobil points
until 2025: 100 WienMobil points

Module

~ 40 %   ~ 45%   max.10 %   max.5%

SMALL
(~ > 30 m^2)

- **1 - 2** Sharing-offers
- 1 analog information pylon

Optional components:

- Radservicestation
- Radbügel

MEDIUM
(~ 30-60 m^2)

- **2 - 4** Sharing-offers
- 1-2 analog information pylons

Optional components:

- Radservicestation
- Radbügel
- Ladesäule
- Radboxen
- Paketboxen

LARGE
(~ 60-100 m^2)

- **> 4** Sharing-offers
- Minimum 2 analog information pylons

Optional components:

- Radservicestation
- Radbügel
- Ladesäule
- Radboxen
- Paketboxen

EXTRA-LARGE
(~ > 100 m^2)

- **> 4** Sharing-offers
- larger number of vehicles per type of offer
- Minimum 2 analog information pylons

Optional components:

- Radservicestation
- Radbügel
- Ladesäule
- Radboxen
- Paketboxen

➢ Sharing offers = Carsharing, Bikesharing, Mopedsharing, Scootersharing

➢ Number of offers depends on space availability and local conditions

WIENER LINIEN

WienMobil Auto – E-Carsharing

11/2020 - 08/ 2022 **pilot project**

(28 vehicles)

Staring from 09/ 2022
Rollout Phase 1

(50 vehicles)

From 03/2023 onwards
Rollout Phase 2

(50 vehicles)

- operator: share me
- 1 car category

- operator: Arac Gmbh / sharetoo
- 4 car cetagories (compact car, SUV, van, transport vehicle)

WienMobil Auto – E-Carsharing

Standardtarif
keine monatliche Grundgebühr

0€ pro Monat

	S Cupra Born	M Skoda ENYAQ
Stunde Tag 7:00 bis 22:00	2,30 €	3,60 €
Stunde Nacht 22:00 bis 7:00	0,50 €	0,50 €
Tag 24 Stunden	39,00 €	55,00 €
Wochenende Fr. 14:00 - Mo. 9:00 Uhr	95,00 €	135,00 €
zusätzlich **pro Kilometer**	0,15 €	0,18 €

Mix Tarif
für Stammkund*innen und WSTW Mitarbeiter*innen

0€ pro Monat

|	S Cupra Born	M Skoda ENYAQ
Stunde Tag 7:00 bis 22:00	2,07 €	3,24 €
Stunde Nacht 22:00 bis 7:00	0,50 €	0,50 €
Tag 24 Stunden	35,10 €	49,50 €
Wochenende Fr. 14:00 - Mo. 9:00 Uhr	85,50 €	121,50 €
zusätzlich **pro Kilometer**	0,15 €	0,18 €

14

WMR Extension of station based bike sharing

- **Densification** in already covered areas of station based bike sharing and **extension** towards outskirts of Vienna

- All together more than 185 docking stations und dozens of virtual bike sharing stops; more than **3000 bicycles** in **all 23 districts** until autumn 2022.

Doubling of amount of bikes sharing docks in Vienna

Doubling the amount of bicycles

Coverage of more than 50 % of built-up areas of Vienna (further extensions into urban development areas in preparation)
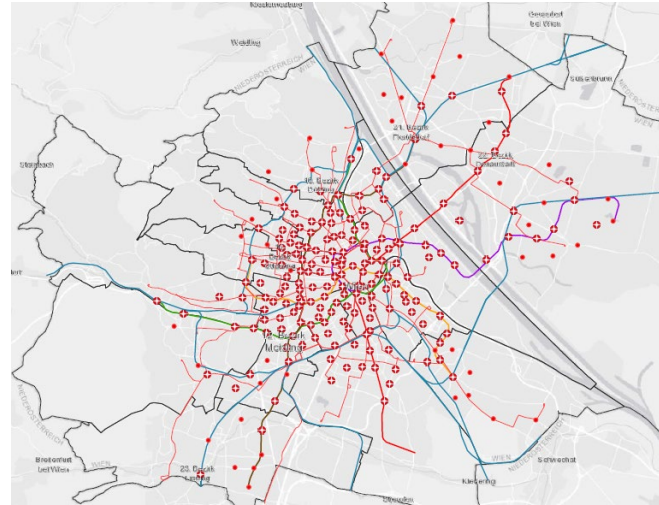
WIENER LINIEN

Tarife

Pay per use

Optimal, um WienMobil Rad auszuprobieren

50% Ermäßigung für Stammkund*innen* der Wiener Linien

€ 0,60 / 30 min

Standardtarif

€ 0,30 / 30 min
Für Stammkund*innen

WienMobil Mix Tarif

Abo

*Perfekt für regelmäßige Nutzer: die erste halbe Stunde jeder Fahrt ist für Abo-Kund*innen kostenlos.*

50% Ermäßigung für Stammkund*innen* der Wiener Linien

€ 49 / Jahr

Standard Jahresabo

€ 25 / Jahr
Für Stammkund*innen

WienMobil Mix Jahresabo

Stammkund*innen sind Besitzer*innen von Wiener Linien Jahreskarten, Semesterkarten oder Top-/Jugendtickets

Services by WL for real estate developers

Wiener Linien…

- **organize and coordinate** permissions.

- implement **digital accessibility**.

- coneceptualize **mobility service portfolios**.

- Organize and implement **actual mobility service** via licenesees.

- **operate** mobility services

- are responsible for **customer relations and marketing**

- **evaluate and adapt mobility services.**

WIENER LINIEN

But…

MaaS can never replace good city planning, attractive public transport and great biking and walking infrastructure

WIENER LINIEN

WIENER LINIEN

The city is yours.

ACTION PLAN FOR MULTIMODAL HUBS IN RURAL AND URBAN CONTEXTS

Christian Kainz

MULTIMODAL ACTION PLAN SALZBURG
Multimodal hubs

Concept

+ Integrated mobility planning

+ Structured development of multimodal hubs

+ Enhance attractiveness of mobility offers in the environmental alliance

+ Which hubs in the federal state are suitable for which type of multimodal equipment?

+ Different types with corresponding equipment features

+ Transferable concept according to a catalog of criteria

**MULTIMODALER AKTIONSPLAN SALZBURG
MULTIMODALE KNOTEN**

Bericht

Salzburg Verkehr verbindet | ULTIMOB

FEBRUAR 2022

FFG Forschung wirkt. | Bundesministerium Klimaschutz, Umwelt, Energie, Mobilität, Innovation und Technologie

MULTIMODAL HUBS
Location analysis

+ Approx. 2500 stops in the federal state outside the city of Salzburg

+ Categorization by public transport quality classes (ÖROK)

+ 704 stops analyzed in terms of demand
    + Boarding and exiting
    + Demographic data (primary and secondary residence; daytime population, etc.)

+ Representative school days or public holidays with more than 60 persons boarding

+ 260 stops
    + Photo documentation of the equipment, condition and surroundings of the stops

Nr.	Hst.-Name (Auswahlkriterium: Auspendler im 1.000/5.000m-Einzugsbereich)	Eignung (Klasse)
8	Seekirchen am Wallersee Bahnhof (2.485 / 8.479)	Besonders geeigneter Standort
Beschreibung	Günstige Lage; gute Infrastruktur, ausreichend Platz für Ausbau, Carsharing im Ort	
Vorteile	Vorhandene Infrastruktur gut erweiterbar, großes Einzugsgebiet, sowohl für Pendler als auch touristisch interessant	
Nachteile	Keine unmittelbaren Nachteile bei Erhebung erkannt	

(Quelle: Google Maps, 2021)

Anmerkung	Seekirchen ist für Behördenwege bedeutsam, da zukünftig Bezirkshauptmannschaft und Bezirksgericht hier sind, dies sollte bei der Auswahl der Austattung berücksichtigt werden.

MULTIMODAL HUBS

+ Evaluation according to quantitative and qualitative criteria

+ Categorization and prioritization
  + 35 stops were divided into four classes (according to suitability)

Quantitative Kriterien	
Kriterium	Beschreibung
ÖV-Anbindung an den Linienverkehr	Haltestellenkategorien 1 Fernverkehr/REX (sehr gut) 2 S-Bahn/U-Bahn, Regionalbahn, Schnellbus, Lokalbahn (gut) 3 Straßenbahn, Metrobus, O-Bus (befriedigend) 4 Bus (genügend)
	Intervallklassen der Haltestellenkategorien: <5 min 5 ≤ x ≤ 10 min 10 ≤ x ≤ 20 min (Sehr gut) 20 ≤ x ≤ 40 min (gut) 40 ≤< x ≤ 60 min (befriedigend) 60 ≤ x ≤ 120 min (genügend)
Pendlerstatistik	Ein- und Auspendler je Haltestelle im 1 000m-Einzugsbereich
	Ein- und Auspendler je Haltestelle im 5 000m-Einzugsbereich (relevant für die Haltestellenkategorien 1+2)
Tourismusstatistik	Ankünfte und Nächtigungen (auf Gemeindeebene) ab ca. 200.000 (sehr gut) ca. 100.000/ca.150.000 (gut) 50.000-80.000/75.000-100.000 (befriedigend) 20.000-50.000/50.000-75.000 (genügend) 0-20.000/0-50.000 (nicht genügend) -> Wertung nach Zusammenschau beider Zahlen

MULTIMODAL HUBS

+ Assignment of stops to three defined equipment categories
  + Cat. 1 full equipment
  + Cat. 2 basic equipment
  + Cat. 3 minimum level

+ Standardized cost estimation of the respective equipment category per stop

+ Priority ranking based on the potential of the respective stop
  + Potential number of users among residents and tourists

2x E-Car-Sharing oder*

ÖV

* 2x Car-Sharing (fossil)

(E-)Bike-Sharing

Bike&Ride

Salzburg Verkehr verbindet

öff. Laden

Mikro-ÖV (sofern vorhanden)

Smart-Locker-System

offenes WLAN

Park&Ride

Infoscreen und Pylon

Equipment features of category 1

MULTIMODAL HUBS
Results

+ The multimodal action plan is the basis for further steps towards multimodality at existing public transport stops

+ Enables a conceptual and structured approach and coordination with the state of Salzburg

+ Serves as a strategic base for the initiation and implementation of investment measures regarding new and location-specific mobility and sharing schemes in the federal state

MULTIMODAL ACTION PLAN SALZBURG
Multimodal hubs for the city of Salzburg

+ Approach according to the model for the federal state

+ Examination of approx. 280 stops in the city area

+ Result: priority ranking of 17 stops

+ Two of these stops were selected from model stops "Haltestelle 4.0" for implementation in the mobility lab zukunftswege.at

MULTIMODALER AKTIONSPLAN SALZBURG
MULTIMODALE KNOTEN STADT SALZBURG

Bericht

Salzburg Verkehr verbindet

Salzburg: Klimaneutrale Stadt

JULI 2022

FFG
Forschung wirkt.

Bundesministerium
Klimaschutz, Umwelt,
Energie, Mobilität,
Innovation und Technologie

HALTESTELLE 4.0

Mobility stations and sensor-based data for digital integration

# THE PROFILE OF HALTESTELLE 4.0
Neumarkt am Wallersee

+ Changing vehicles in the region
    + High demand potential for Park&Ride and Bike&Ride
    + Commuter traffic with a focus on continuity of the routing chain (route to/from public transport)...

+ Location
    + Regional hub with national public transport connections
    + Centrally located structure, proximity to settlement area

+ Living lab
    + Testing and evaluating technical and infrastructural components
    + Social scientific analyses, survey

TARGET VISION
Changing vehicles in the region

Linking different modes of transport and their effect at the stop (monitoring of the relationships between shifts in modes of transport)

+ Testing of innovative (digital) components, station equipment and new technical developments on designated test areas

+ Interlinking/digitization of existing components of the stop (e.g. e-charging station, e-parking spaces)

+ Prototypical development of an integrative data platform:

  + Interlinking real-time data

  + Evaluation of technical components

+ Space for social science investigation of mobility behavior
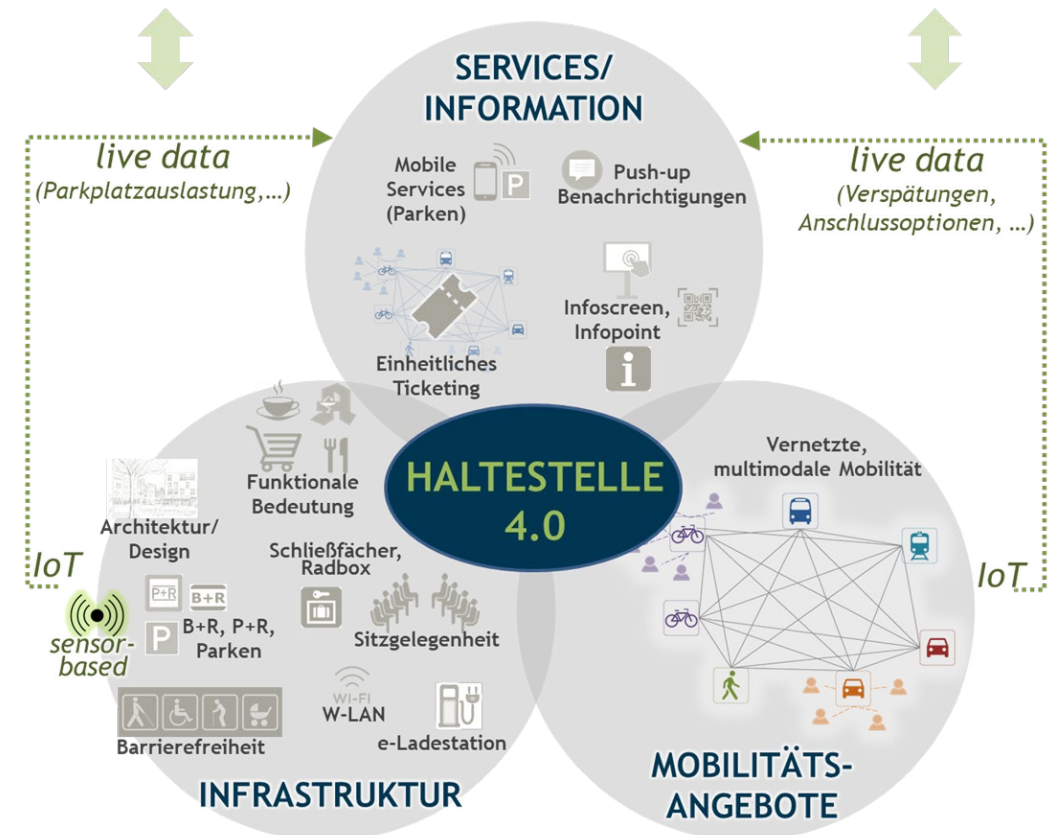
THE PROCESS
To Haltestelle 4.0

+ Ongoing process to involve the relevant stakeholders, in particular for the conception and the conversion of stops (beginning of 2018)

+ Working group is coordinated by zukunftswege.at, companies are continuously integrated and approached

+ The structural requirements are now being implemented by ÖBB/Federal State Salzburg

+ 2019/2020: detailed discussions with companies / infrastructure suppliers

+ First inquiries about expanding the laboratory stop (e.g. towards tourism, P&R)

+ A transferability to other locations in the Salzburg city region is aspired

LOCATION
of components

1a Dynamische Radboxen (südseitig, Neumarkt/ Steindorf)
1b Dynamische Radboxen (nordseitig, Köstendorf)
1c Sensorik zur Auslastung der klass. Radständer
     (südseitig, Neumarkt)
1d Sensorik zur Auslastung der klass. Radständer (nordseitig)
2a Schließfächer/ Abholbox
2b Parkplatz zur Ladetätigkeit der Abholbox

3a Sensorik Auslastung bestehenden P&R
3b Sensorik Auslastung geplanten P&R
4   e- Laden: Sensorik Lade- vs. Parkdauer
5a Innovative Sitzmöbel Standort 1
5b Innovative Sitzmöbel Standort 2
6   Freie Testfläche mit Stromanschluss
7   Ridesharing & Sharing- Aktivitäten
8   Low-power Sensorik
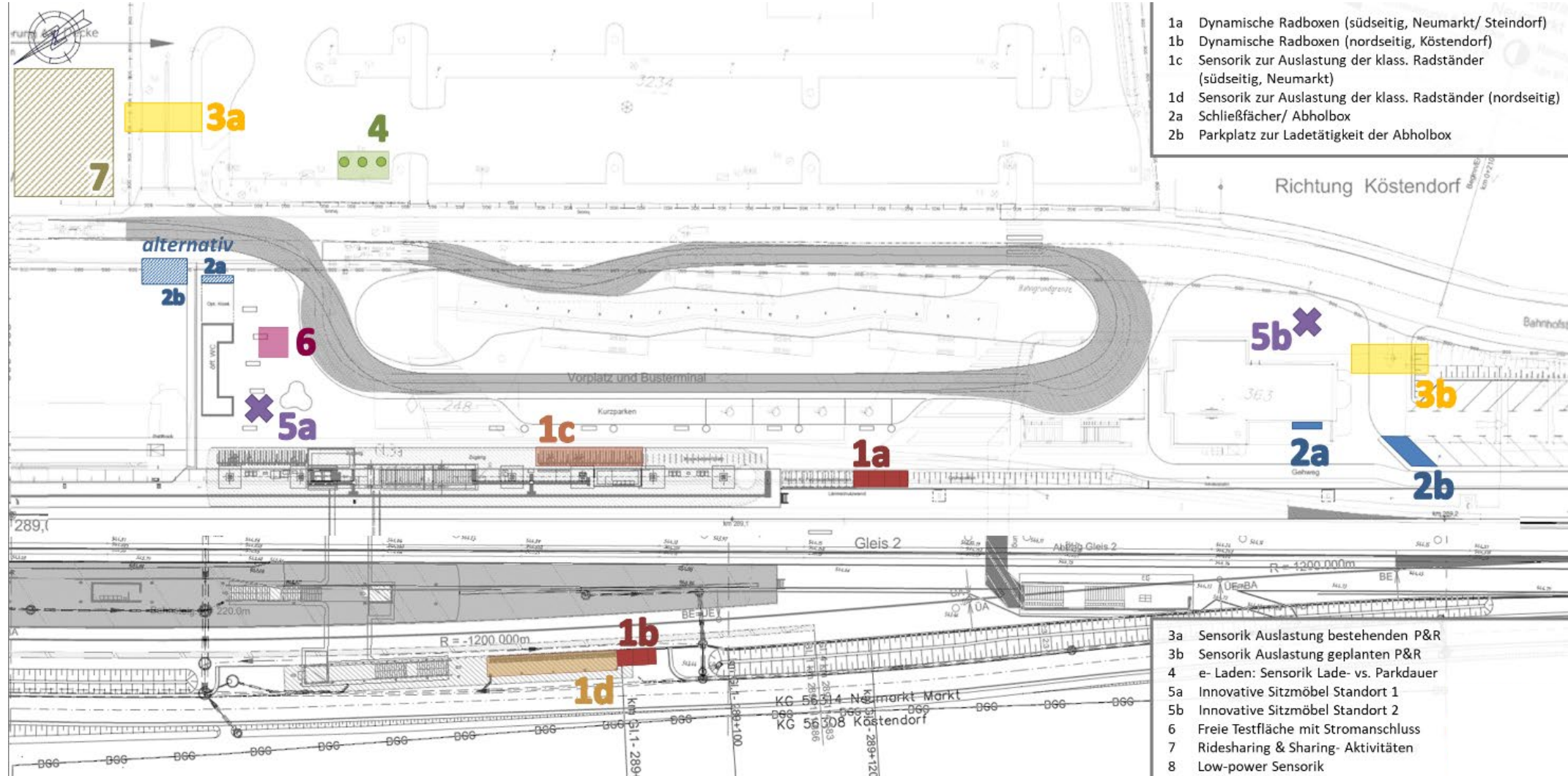
CONTACT

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Salzburger Verkehrsverbund GmbH
Mobilitätsbüro zukunftswege.at

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Postfach 74 | 5027 Salzburg
office@zukunftswege.at

www.zukunftswege.at

eLISA.

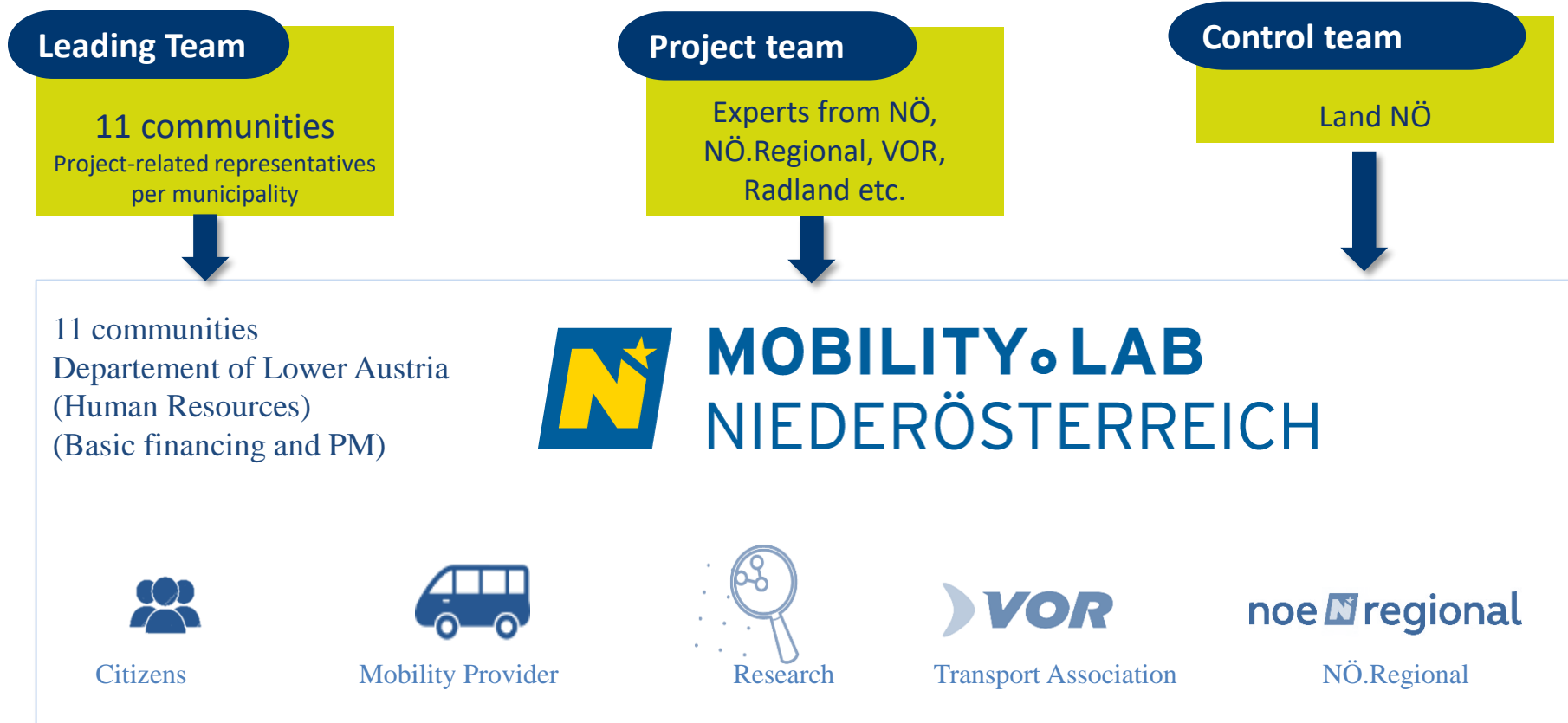## Implementation of mobility stations in Lower Austrian

let's start at the beginning

Mobility LAB Lower Austria

- **LISA is the first project of the Mobility.Lab**

- Implementation of innovative projects and policies

- Goals:

    – ideal mix of transportation modes

    – less dependence on your own car

    – easily accessible public transport

→ **More mobility for the countryside**

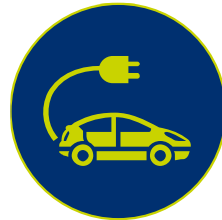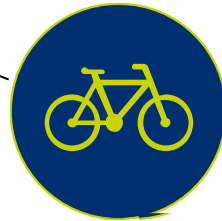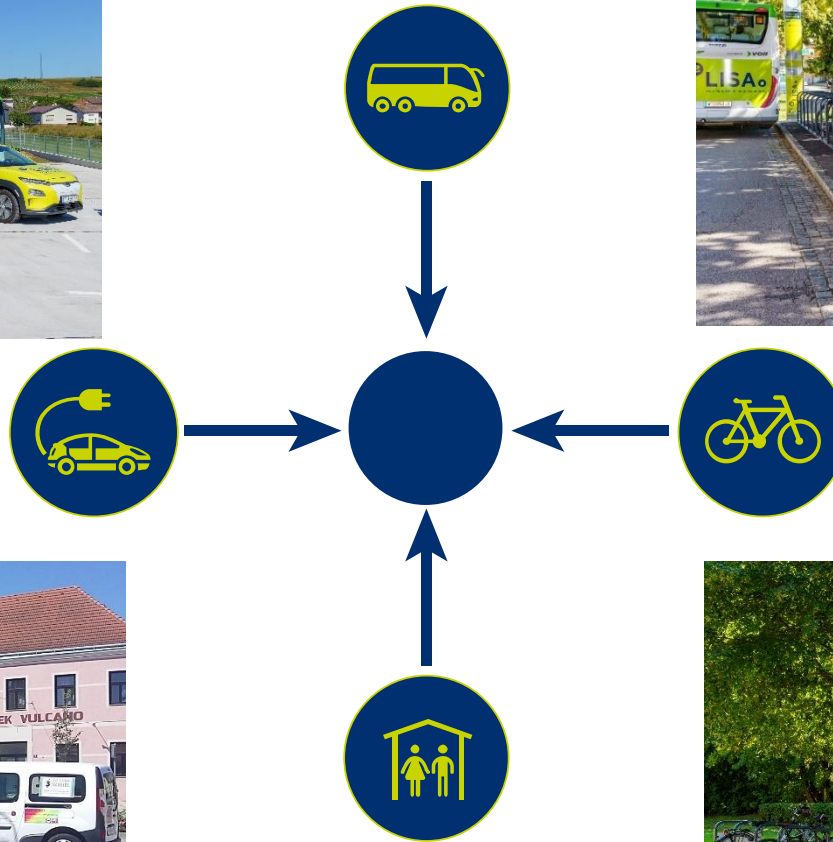# Region / Communities

- Auersthal
- Bad Pirawarth
- Bockfließ
- Gänserndorf
- Großengersdorf
- Groß-Schweinbarth
- Matzen-Raggendorf
- Pillichsdorf
- Prottes
- Schönkirchen-Reyersdorf
- Wolkersdorf

LISA.

is intelligent

- **New bus lines as the backbone of mobility intelligently link the offers in the region**

- **Mobility stations offer different services depending on location and needs**

New bus lines

- **2 new bus lines (530 & 535)**

- **Regular intervals (30 min / 1h)**

- **Fully electric since September**

- **Central mobility hub in Raggendorf**

MOBILITÄTSLAND
NIEDERÖSTERREICH

N TULLN/DONAU T eco plus Die Wirtschaftsagentur des Landes Niederösterreich ›VOR DER VERKEHRSVERBUND EFRE Europäische Union Investitionen in Wachstum & Beschäftigung. Österreich. noe N regional HERRY Verkehrsanalyse · Beratung · Forschung

LISA.
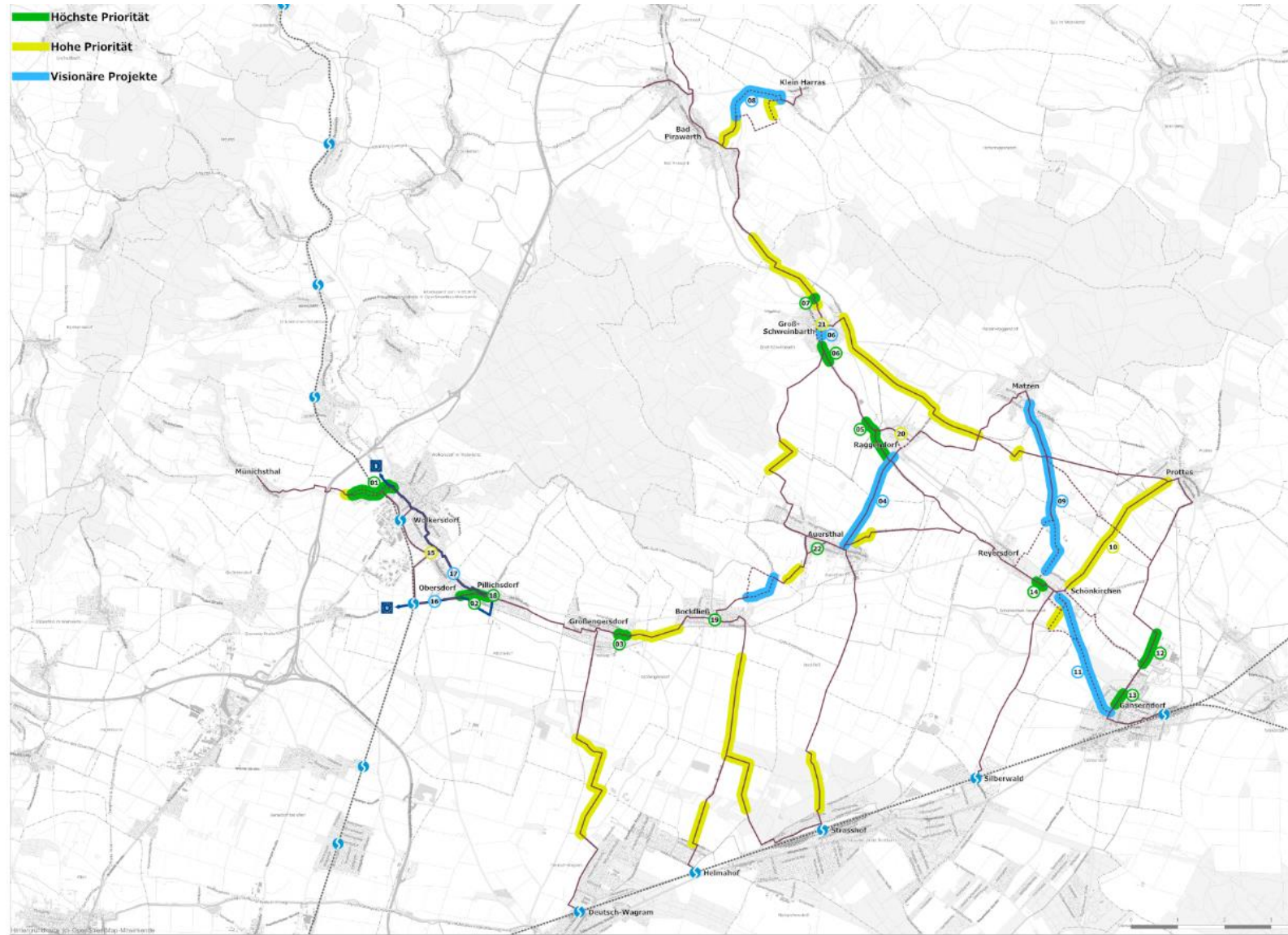
is clean (low polluting)

- **New offers in cycling (cycle paths, bicycle parking facilities)**

- **Environmentally friendly e-carsharing**

- **Electric buses in public service**

LISA.

Cycling
Lockable boxes

- Space for 49 bicycles at 11 locations

- Possibility to lock his bike safely

- Personal and secure

- Rent your own box for a year or more

Cycling
Bicycle parking facilities

- At the central
  bus and mobility stations

- Space for over 170 bicycles in
  total

- Safe from wind and rain

- Maximum capacity utilization
  since 2019 was 80%

E-Carsharing

- 4 new locations
  (in addition to existing cars)

- 4€ per hour
  (without registration fee)

- Modern fully electric cars

- Linking to existing vehicles via
  roaming → Carsharing Austria

Electric buses

- Since **05.09.2022 electric**

- Operated with Mercedes
  E-Citaro by Postbus

- Charging infrastructure:

  - Wolkersdorf (2 charging points)

  - Mistelbach (4 charging points)

  - Gänserndorf (5-6 charging points and charging

    masts)

MOBILITÄTSLAND
NIEDERÖSTERREICH

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LISA.

is simple

- **Simply use the transportation mode you need**

- **Easy orientation**

- **Simple design and information**

LISA.

is attractive

- **Consistent design**

- **Easy orientation**

- **Mobility stations are open & friendly**
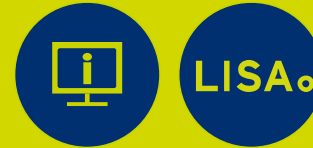
Design

T LISA.TULLN

Bike rental & parking facilities
available at all mobility stations &
main locations

LISA.Shuttle
Mon-Sun
bookable via app & hotline
standard public transport tariff

Environmentally friendly
all offers are fully electric

LISA.E-Carsharing
using existings systems
& adding new locations

Mobility Hubs
6 central Mobility Hubs
(Tulln & Train station
„Tullnerfeld")

MOBILITÄTSLAND NIEDERÖSTERREICH

TULLN/DONAU   T   eco plus   Die Wirtschaftsagentur des Landes Niederösterreich   VOR DER VERKEHRSVERBUND   EFRE Europäische Union   noe regional   HERRY Verkehrsanalyse · Beratung · Forschung

What's next?

Autumn 2022	Construction phase
End 2022	End of „LISA Weinviertel"
Start 2023	Start of test phase
End 2025	End of test phase & change to normal operation
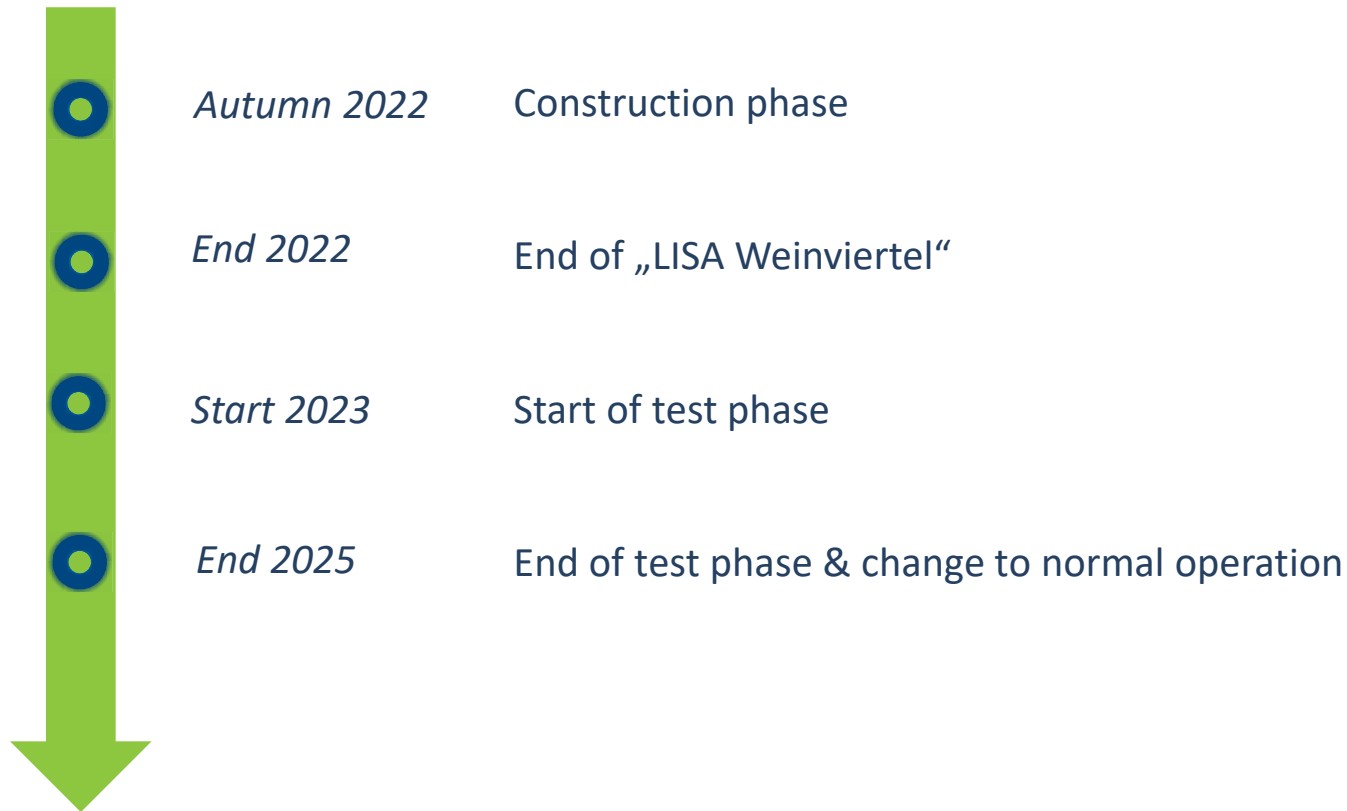
LISA.

Thank you for your attention!

www.lisa-tulln.at
www.lisamachtmobil.at

Christoph Weber | christoph.weber@noeregional.at

Prof. dr. ing. Karst Geurs

University of Twente

Content

- Introduction to mobility hubs and SmartHubs

- The SmartHubs Integration Ladder

- Conclusions and next steps

Mobility hubs

- Integration: helps to provide an integrated planning approach, integrating between policy instruments, modes, infrastructure provision, transport and land use measures and other policies.

- Focuses on improving the user experience of transport options – seamless integration

- Offers shared transport modes, public transport and (potentially) other services at a physical location

- Large variety in hubs (goal, functionality, size)

- Buzz word in transport policy making

SmartHubs

Components of mobility hubs

Mobility hubs can be seen as an interface between the transport network and spatial structure of an area. Mobility hubs include a range of different components, This diagram illustrates some of the most commonly used components:

A1: Mobility components: Public Transport

A2: Mobility components: Non - public transport

B: Mobility related components

C: Non-mobility & Urban realm improvement

C: NON-MOBILITY & URBAN REALM IMPROVEMENT
- Package delivery lockers
- Mini fitness or play area
- Café and Co-working space
- Outdoor water fountain

A1: MOBILITY COMPONENTS - PUBLIC TRANSPORT MODES & OTHER PICK UP /DROP OFF:
- Bus
- Tram
- Rail
- Demand responsive mini-buses (all one points)
- Ride hailing, (shared) taxis

A2: MOBILITY COMPONENT: SHARED MOBILITY
- Car share: back to base, one way, electric.
- Bike share: back to base, one way, electric.
- Cargo bike share, cargo bike logistics store
- Other future micro-mobility options e.g. e-scooters, moped share
- Ride sharing

B: MOBILITY RELATED COMPONENTS
- EV car charging
- Bike parking, (Standard, covered, restricted access, EV charging)
- Bike repair, pumps
- Digital pillar, (transport info, ticketing, way finding, walk distances, local services)
- Child car seats, bike seats & trailers
- Community concierge parcel last mile delivery

C: NON-MOBILITY & URBAN REALM IMPROVEMENT
- Improved public realm, safer crossings, step free access, road repairs, adjustments for disabilities.
- Waiting area space, covered, seating, planting, artwork, kiosks for coffee etc.
- Wi-Fi, phone charging

Branded pillar

Mobility hubs require a prominent sign or pillar with a common brand to make them visible to the public. The inclusion of a digital elements in a pillar can provide:

- Access to a local transport website for information on services
- A journey planning service for multi-modal trips
- A way finding option for local walking and cycling trips
- Registration and ticketing
- Customer services.
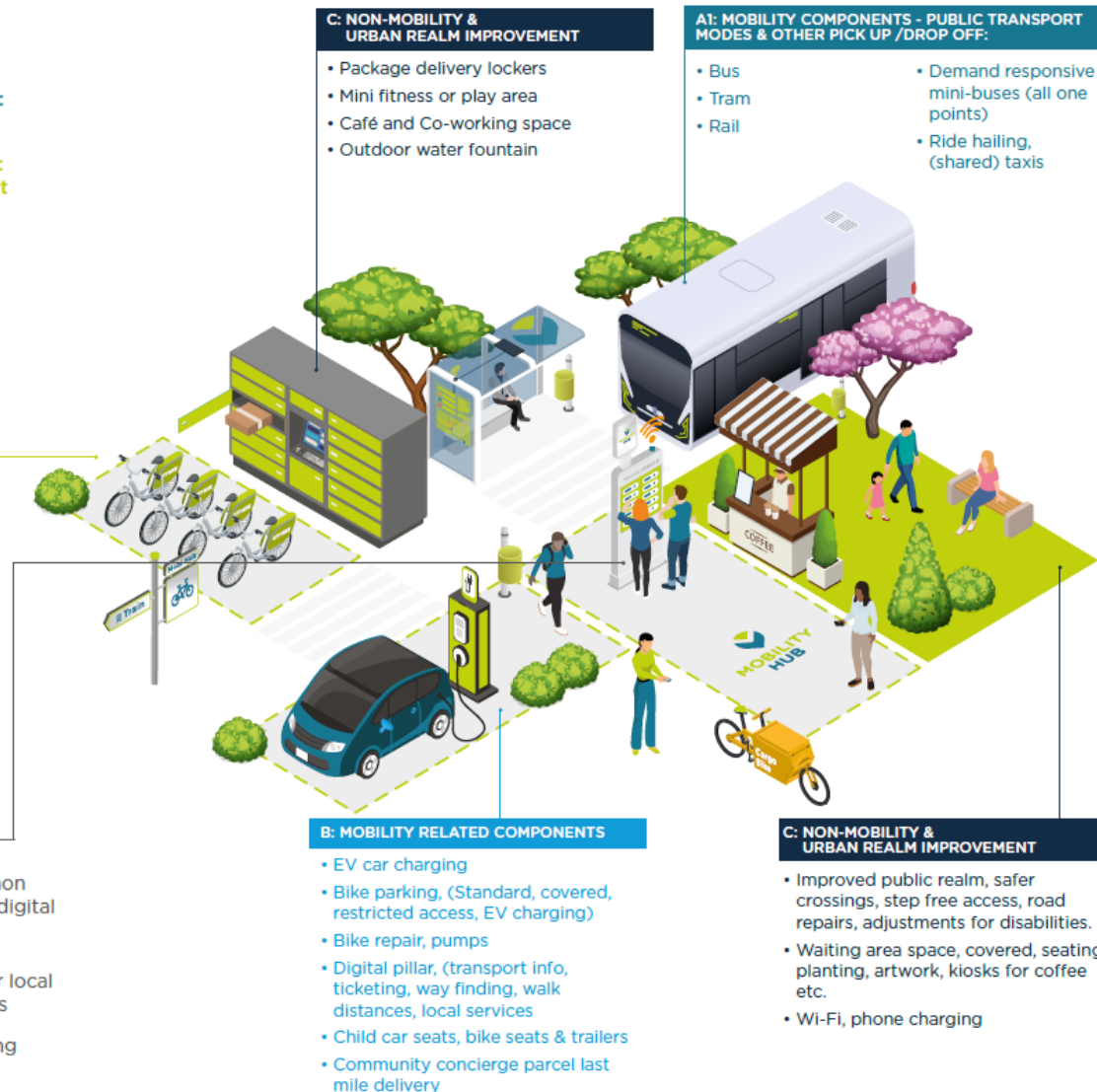
CoMoUK, 2019. UK Mobility Hub Guidance.

ERA-NET Cofund Urban Accessibility and Connectivity

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Smart Mobility Hubs as a game changer towards inclusive, sustainable urban mobility and accessibility in European cities
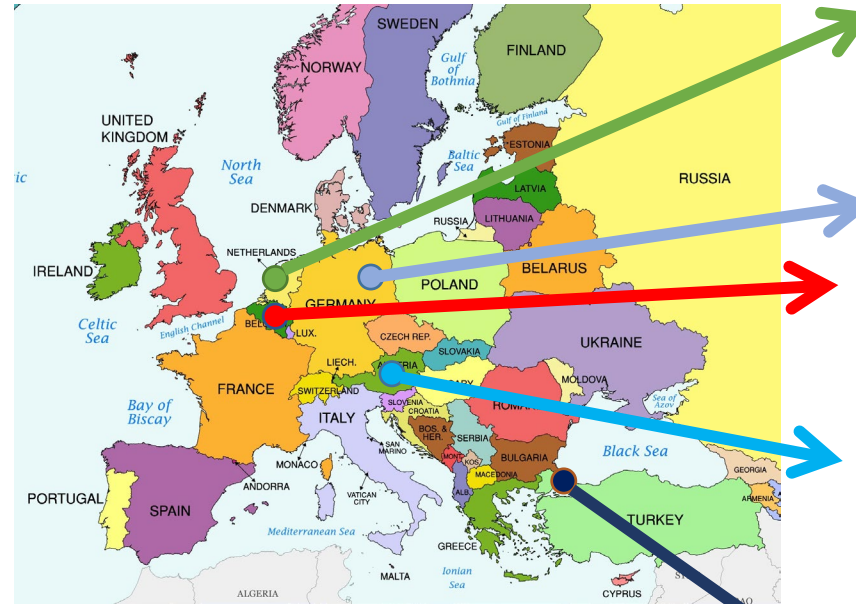## (May 2021-May 2024)

SmartHubs

Full partners

UNIVERSITY OF TWENTE.

TITI

WESTFÄLISCHE
WILHELMS-UNIVERSITÄT
MÜNSTER

Vrije Universiteit Brussel

mpact

ANDERLECHT

BOKU

TU WIEN

MO.Point
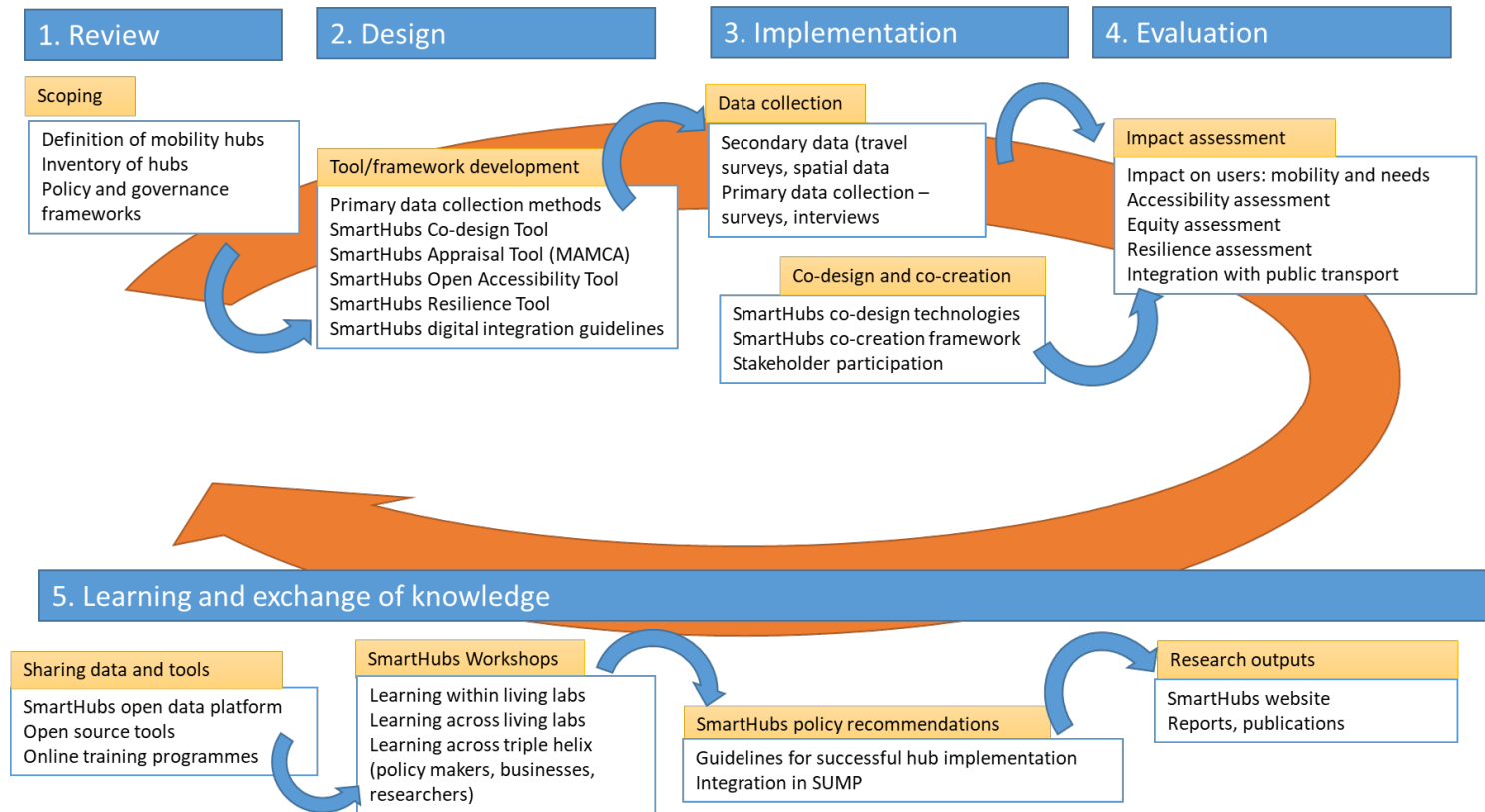
ALMA MATER STUDIORUM A.D. 1088

Lojika Field Labs

Living Labs and Associate partners

- **Rotterdam-The Hague (NLD)**: Gemeente Rotterdam, Gemeente Den Haag, MRDH, HTM, RET, NS Stations, CROW

- **Munich (GER)**: Munich PT (MVV), City of Munich, UPS

- **Brussels (BEL):** Anderlecht, Brussels mobility

- **Vienna (AUT):** Fed. Govt. Lower Austria, ITS Vienna region, Aspern-mobil LAB, Mobility Lab Graz, Stadt Umland Management Wien, 3420AG

- **Istanbul (TUR)**: Istanbul Metropolitan Municipality

SmartHubs approach and outputs

1. Review

Scoping
- Definition of mobility hubs
- Inventory of hubs
- Policy and governance frameworks

2. Design

Tool/framework development
- Primary data collection methods
- SmartHubs Co-design Tool
- SmartHubs Appraisal Tool (MAMCA)
- SmartHubs Open Accessibility Tool
- SmartHubs Resilience Tool
- SmartHubs digital integration guidelines

3. Implementation

Data collection
- Secondary data (travel surveys, spatial data
- Primary data collection – surveys, interviews

Co-design and co-creation
- SmartHubs co-design technologies
- SmartHubs co-creation framework
- Stakeholder participation

4. Evaluation

Impact assessment
- Impact on users: mobility and needs
- Accessibility assessment
- Equity assessment
- Resilience assessment
- Integration with public transport

5. Learning and exchange of knowledge

Sharing data and tools
- SmartHubs open data platform
- Open source tools
- Online training programmes

SmartHubs Workshops
- Learning within living labs
- Learning across living labs
- Learning across triple helix (policy makers, businesses, researchers)

SmartHubs policy recommendations
- Guidelines for successful hub implementation
- Integration in SUMP

Research outputs
- SmartHubs website
- Reports, publications

- SmartHubs Open Data Platform
- SmartHubs Co-design Tool
- SmartHubs Appraisal Tool (MAMCA)
- SmartHubs Open Accessibity Tool
- SmartHubs Resilience Tool
- Guidelines for hub development
- Online training programmes
- Dissemination, reports, papers

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SmartHubs

SmartHubs Deliverable D2.1 (Jan 2022)

1. Literature review on definitions, impacts and practices of mobility hubs around the world from different viewpoints

2. Multidimensional mobility hub typology: physical, digital and democratic integration

3. Interactive open data platform that allows an easy "expert crowd" mapping of operational and planned mobility hubs

The SmartHubs Ladder

DESCRIPTION OF THE MULTIDIMENSIONAL MOBILITY HUB TYPOLOGY

SmartHubs

https://www.smartmobilityhubs.eu/data

Physical integration

- Location of the mobility hub (e.g, residential density, proximity to other activities and services)

- Placement different modes of transport in the vicinity of each other (shared bike, car, public transport etc)

- Design of mobility hubs that are accessible for all (e.g. barrier free)

- Design of mobility hubs that are clearly visible with information and common logos.

- Design of mobility hubs as a placemaker

Mobility hub in Vienna (Photo: Yusak Susilo)

European Commission

Digital integration

- The Mobility as a Service (MaaS) promise is to deliver digital integration of mobility options - planning, booking and payment using a single app or platform.

- But: low levels of digital engagement may create a new layer of transport disadvantage on top of existing ones. On third of the European population lacks basic digital skills (finding information on internet)

- A case study examining a major public transport stop in The Hague found 60% of the users and residents do not have sufficient digital skills to use plan, book and pay for shared transport modes (Jorhus et al., 2022)

Democratic integration

- Have residents, users and other stakeholders been consulted in the development of hubs?

- Have their inputs had influence on the decision making process?

- Have vulnerable user groups been reached?

- Different levels of democratic integration: no participation, information, deliberate engagement to permanent participation

Degree of co-operation and involvement

Givers

Giving room for participation // self dependent acting

giving cooperative influence on decision making // Cooperation, taking part in decision making

Consultation, listening // Following somebody's thoughts

to inform // to search for information, to inquire

Takers
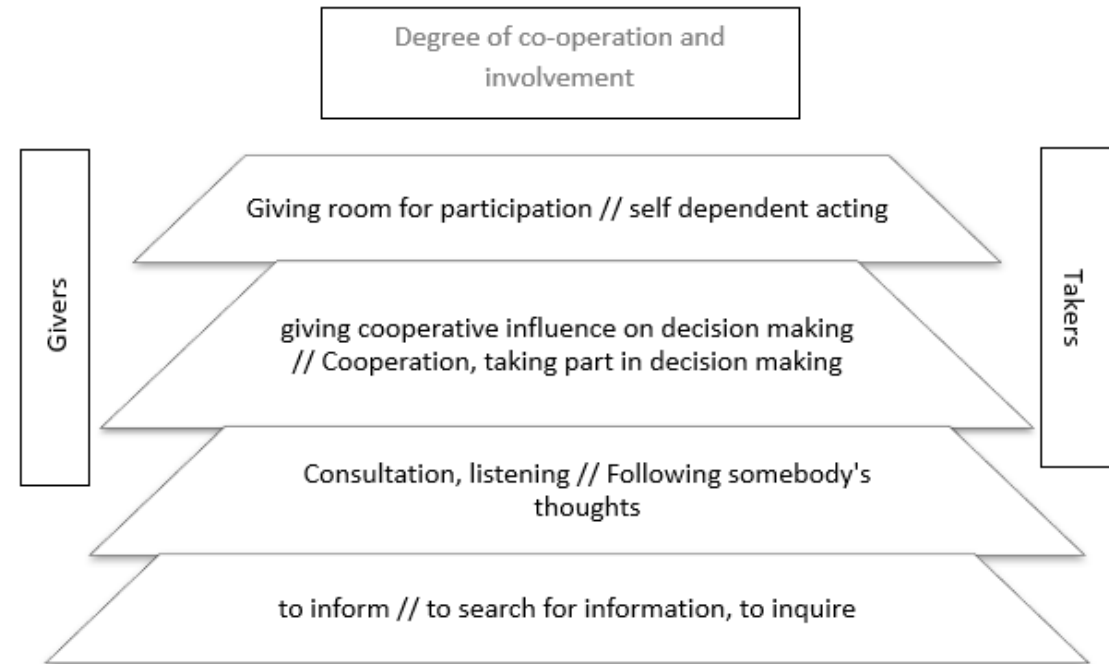
Source: based on Schweizer-Ries (2011),

	Physical integration	Digital integration	Democratic integration
4	Conflict free and place making	Integration of societal goals and policies, and consideration of universal design principles	Social learning
3	Visibility and branding	Integration of service offers and consideration of universal design principles	Integration of different knowledge
2	Wayfinding and consideration of universal design principles	Integration of booking and payment and consideration of universal design principles	Deliberative engagement of stakeholders, including (vulnerable) user groups
1	Walking distance to shared and public transport, minimum inclusive design standards	Digital integration of information	Appropriate representation of stakeholder interests, no or limited attention for vulnerable user groups
0	No physical integration	No digital integration	No stakeholder involvement and consideration of (vulnerable) user needs

SmartHubs		Physical integration	Digital integration	Democratic integration
Smart Mobility Hub	4	Conflict free and place making	Integration of societal goals and policies, and consideration of universal design principles	Social learning
	3	Visibility and branding	Integration of service offers and consideration of universal design principles	Integration of different knowledge
	2	Wayfinding and consideration of universal design principles	Integration of booking and payment and consideration of universal design principles	Deliberative engagement of stakeholders, including (vulnerable) user groups
Mobility hub	1	Walking distance to shared and public transport, minimum inclusive design standards	Digital integration of information	Appropriate representation of stakeholder interests, no or limited attention for vulnerable user groups
Single mobility services	0	No physical integration	No digital integration	No stakeholder involvement and consideration of (vulnerable) user needs

Analysis of expert verified hubs (N= 38)

Geurs, Grigolon et al. (submitted) te SmartHubs Integration Ladder: A Conceptual Model for the Categorisation of Mobility Hubs.

	Level 2 or higher		
	Physical	Digital	Democratic
Austria	9	6	3
Belgium	0	0	0
Croatia	0	0	0
Czech Republic	1	0	0
Denmark	0	0	0
Germany	2	1	0
Hungary	1	0	0
Italy	4	3	3
Netherlands	2	0	1
Slovenia	1	0	0
Spain	1	0	2
Sweden	0	1	0
	21	11	9
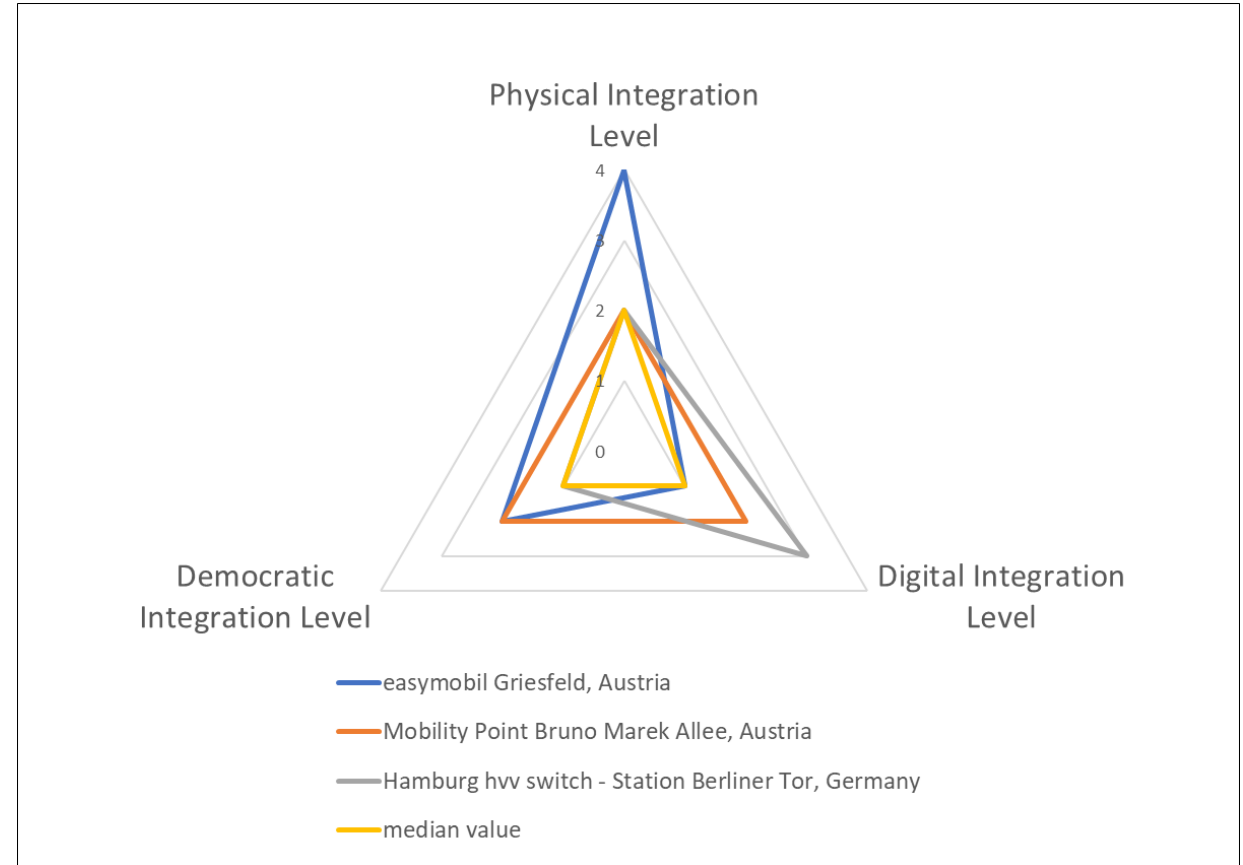
Conclusions

- Mobility hubs differ in size and functionality. Importance of public transport and non-mobility functions varies.

- A *Smart* Mobility Hub is a mobility hub which offers advanced levels of physical, digital and democratic integration

- The higher up the ladder, the "smarter" the mobility hub, and the higher the expected impact on user behaviour and societal impacts

- Mobility Hubs in Europe typically have advanced levels on one or two integration dimensions, but not on all three dimensions
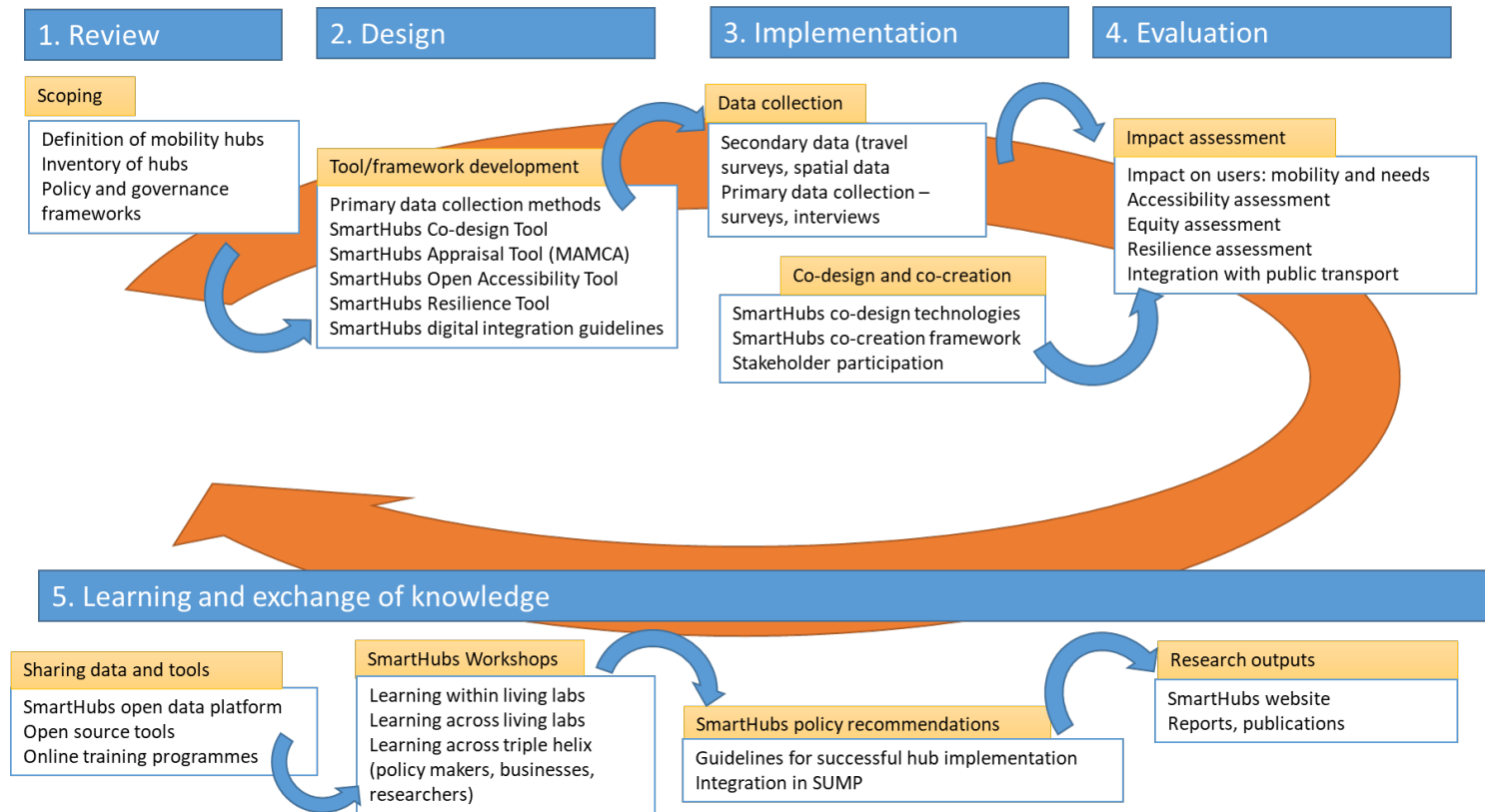
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SmartHubs approach and outputs

- SmartHubs Open Data Platform

- SmartHubs Co-design Tool

- SmartHubs Appraisal Tool (MAMCA)

- SmartHubs Open Accessibity Tool

- SmartHubs Resilience Tool

- Guidelines (digital integration, integration of hubs into SUMPs etc.)

- Online training programmes

- Dissemination, reports, papers

Living labs and impacts of SmartHubs

- Experiments with physical integration, e.g. hub design

- Experiments with digital integration, e.g. digital pillar

- Experiments with democratic integration: co-design games

- Impact analysis: surveys, appraisal tools, etc

- Will mobility hubs be a game changer?
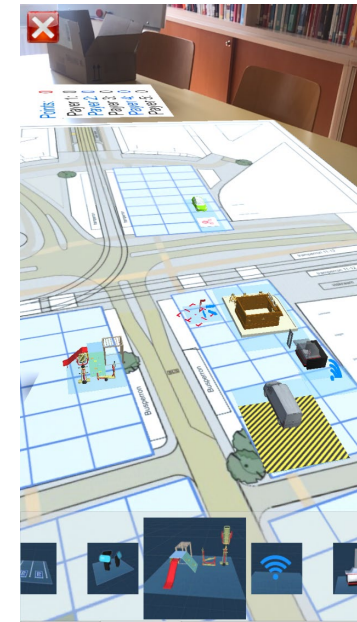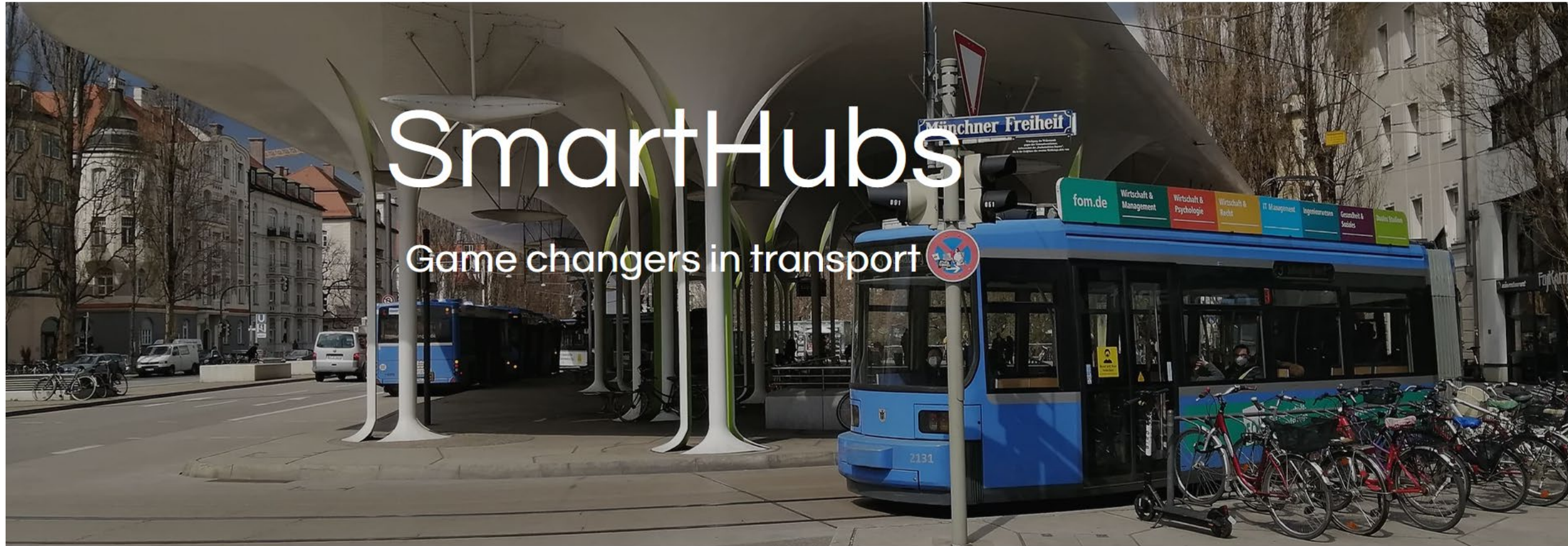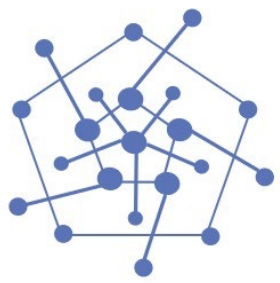
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www.smartmobilityhubs.eu

Smart Hubs Open Data Platform (ODP)

The ODP is the **first cross-project open data platform for mobility hubs** learning cases!

This Semantic-media Wiki based platform allows to …

… collect data on mobility hubs following a **standardized layout**

… **compare** similar hubs

… analyze **integration levels** connected to other characteristics

… generate cross-network **overview** in regions

… download **data** for further analyses

… **collectively edit and contribute!**
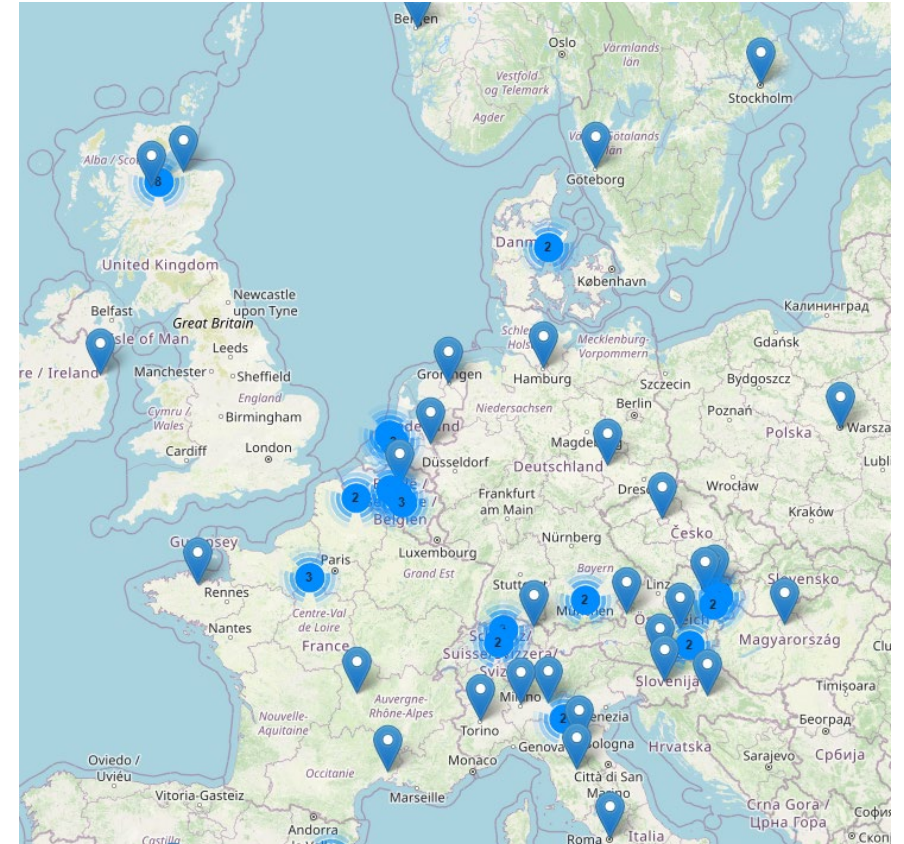
in the database: **83** Hubs (**9** of which are Case Studies in the SmartHubs Project), **17** Mobility Hub Networks, **68** Mobility Providers

Purpose of the ODP

- A internal research tool to structure data around the Case Studies in the 5 Living Labs

- an open platform for knowledge generated in the SmartHubs project for the public

- an open platform to allow every interested person to showcase and analyze Mobility Hub examples

Mobility hub distinction between

- learning cases (collection of well-equipped mobility hubs across Europe) and

- case studies (single selected hubs in living labs with defined location and more detailed information on the ODP)

Examples on the platform WienMobil Maria-Tusch-Straße

TYPOLOGY

urban neighbourhood hub - large
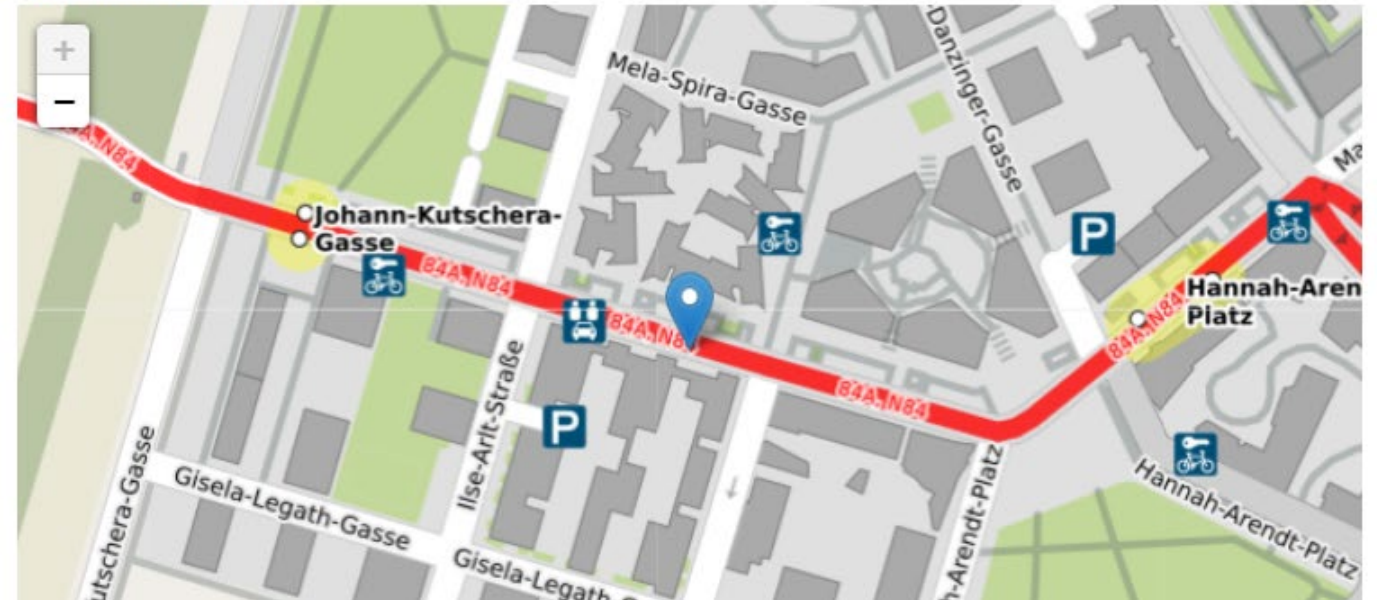
show comparable hubs

STATUS

ongoing

Launched in December 2021 with car, scooter & Moped-Sharing. Bikesharing will start early 2022
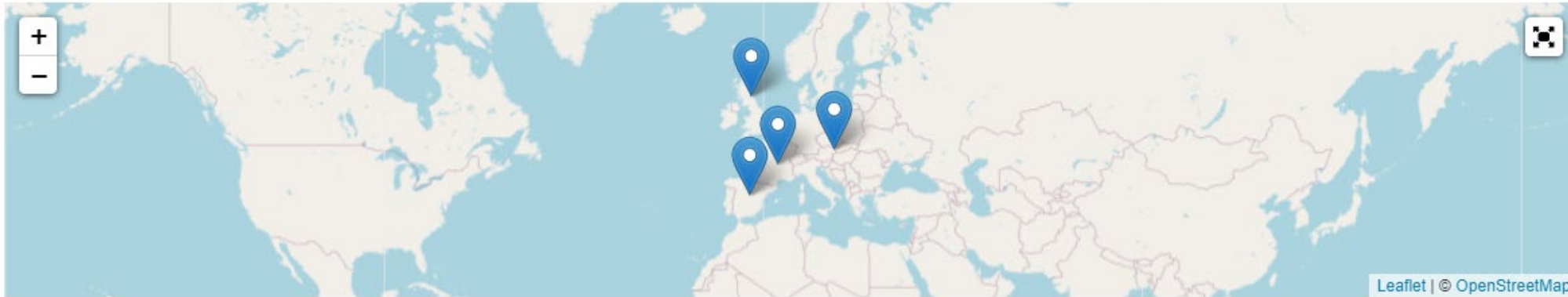
OPERATION START (YEAR)

2021

LOCATION

Vienna, Austria

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Examples on the platform

Examples on the platform

| PHYSICAL INTEGRATION	**Level 2**
	Definition Level 2 (Wayfinding and universal design): At least two shared transport modes in acceptable walking distance to public transport with wayfinding and information of using the service and at least one service (e.g., parcel locker, kiosk) in acceptable walking distance. Universal design principles are considered
	The services are located on both street sides of a easy to cross street in Seestadt aspern. Public transport (bus) can be reached within 200m.
DIGITAL INTEGRATION	**Level 1**
	Definition Level 1 (Integration of information): Multimodal travel planners can be used to plan mobility offerings at hubs. Minimum inclusive design requirements are considered such as simple and intuitive app design.
	The mobility services present at this station are integrated into the Wien Mobil App which allows route planning and gives information on booking option (outside of the app).
DEMOCRATIC INTEGRATION	**Level 1**
	Definition Level 1 (Appropriate representation of stakeholder interests): Participation takers got asked into a consultation process, Information are recognized. No or limited attention to involve vulnerable user groups.

Statistics

Distribution of Integration Level
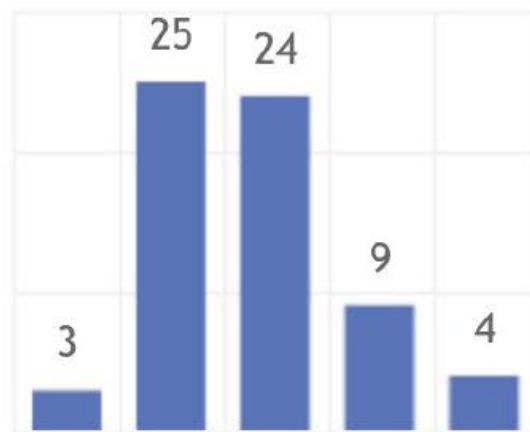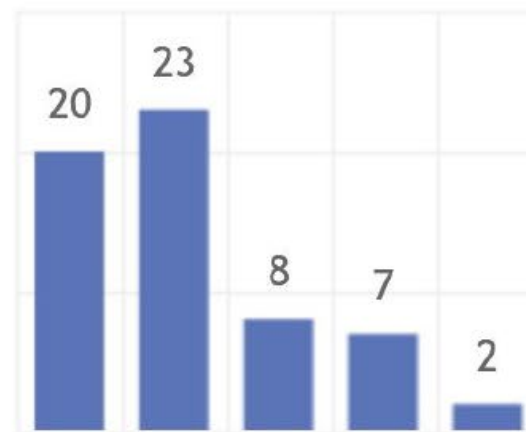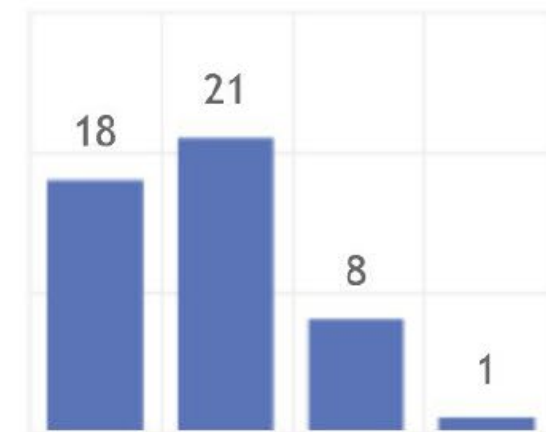
Statistics

Hub Typology Distribution
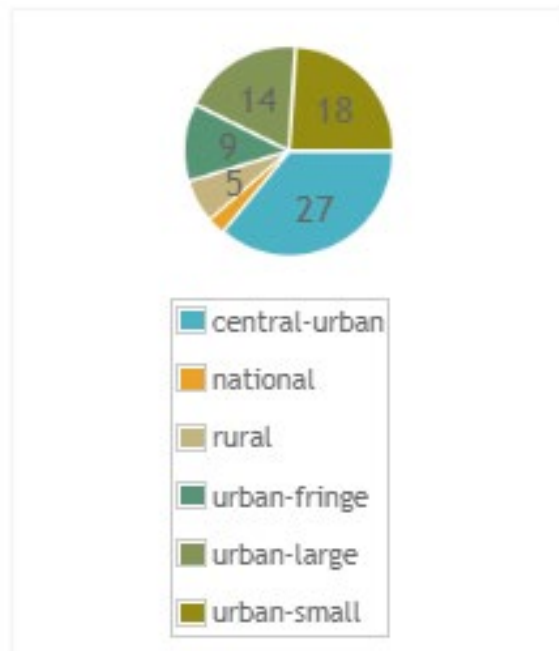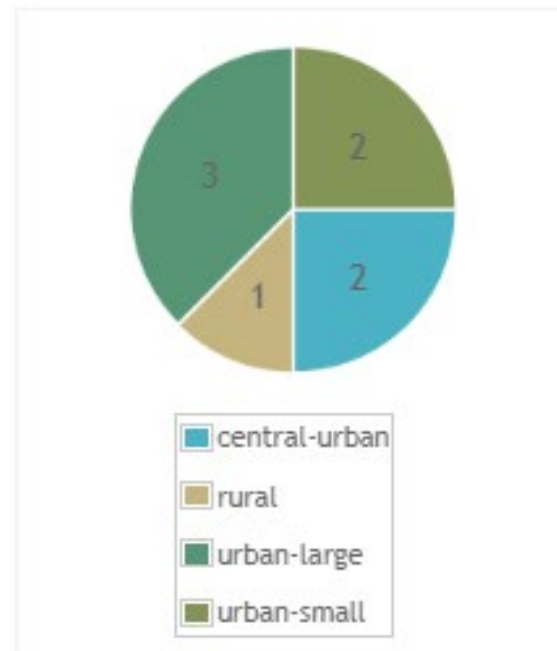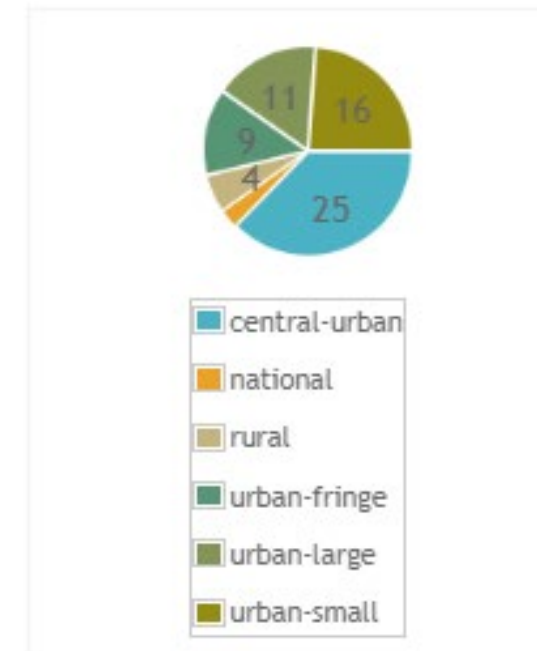
What comes next?

The ODP is planned to serve as a open tool for research and practitioners – also after the end of the SmartHubs project.

Next planned developments are:

- Pre-defined **export** options and automated **data interfaces**
- Cooperation with Hub-Providers / Hub-Consultancies regarding **open editing**
- Adding contacts per Hub to support **Peer-to-Peer exchange** via the ODP
- **Further Collection** of Hub entries via online survey

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Invitation to contribute!

We are happy to welcome new contributors on the OPD, you can register on the ODP
As editor you are able to …

… create new **hubs**
… create new **research projects** (and link them to hubs)
… create new **providers** (and link them to hubs)
… create new **networks** (and link them to hubs)
… add information to other hubs in the ODP
… add pictures (only copyright-free content!) to hubs

For further information reach out to
linda.doerrzapf@tuwien.ac.at
christoph.kirchberger@tuwien.ac.at

Create account

Username

Christoph Kirchberger

Password

●●●●●●●●●●●●●●●

It is recommended to use a unique password that you are not using on any other website.

Confirm password

Enter password again

Email address (optional)

Enter your email address

Real name (optional)

Real name is optional. If provided, it may be used to give you attribution for your work.

Create your account

SCAN ME

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+43 1 58801280521

Thank you!

Policy and Governance Frameworks of implementing SmartHubs

(focus on Austrian Case)

SYMPOSIUM: Governance of multi-modality in public space – what options do we have?
16.09.2022, Vienna, aspern Seestadt

Presenting: Prof. Dr. Antonia Graf & Julia Hansel, M.Sc. (WWU)

WP02 Task 2.4 Policy and Governance Frameworks

Task 2.4: Governance Framework

Political science perspective on mobility hubs: no hubs without governance

Output: D2.3 Governance frameworks for mobility hubs in the five living lab areas (October 2022)

RQ: How does the governance framework influence the implementation and operation of mobility hubs?

What implications could be drawn from the results?

What can we learn from a comparative perspective amongst different cities?

Theoretical Framework

Mobility as a multi-level, -actor and -sector governance field

Only few academic literature on governance of mobility hubs or multimodal/ shared mobility

*Policy Arrangements: "[T]he temporary stabilisation of the **content** and **organisation** of a particular policy domain at a certain policy level or over several policy levels -- in case of multi-level governance" (Leroy and Arts 2006)*

PLUS: Literature from governance architecture & (smart) mobility governance

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Organizational	Ideational
Structural components Actors (municipalities, governments, PT and others) Resources (e.g. human, financial, etc.) Local and regional networks	**Normative drivers** Normative claims for future developments Norms (sustainability, digitalisation, equity)
Policy instruments Local Mobility Plans (e.g. SUMPs) Regulation on public space	**Discursive negotiations** Citizen participation (In)formal cooperation between actors Political opposition and public debate

Policy arrangements of Mobility Hubs

Own illustration, based on Arts, Tatenhoven 2004; Leroy and Arts 2006; Borras, Radelli 2011

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Methodology & Cases

SmartHubs

Empirical Data

- 29 semi-structured expert interviews

- Policy documents

Method

- Qualitative Content Analysis with MAXQDA

- First order code system, additional inductive codes

Vienna, Bruno-Marek-Allee

Anderlecht (Brussels), Place du Conseil

The Hague, Haagse Markt

Munich, TUM Campus

Source:
Anderlecht, Conseil & The Hague, Haagse Markt: Google Maps / Street View (13.05.2022)
Munich, TUM Campus & Vienna, Bruno-Marek-Allee, OPD SmartHubs
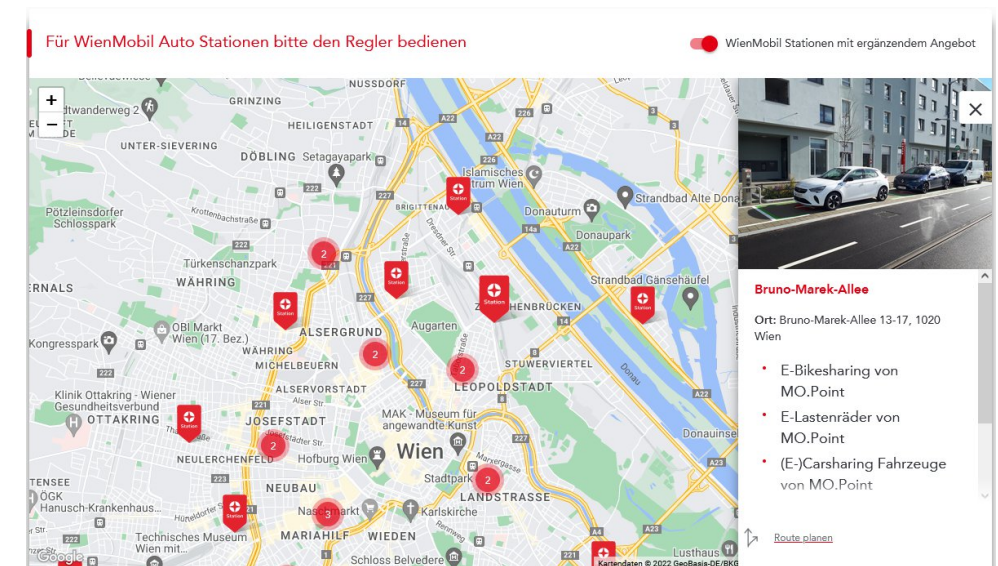https://data.smartmobilityhubs.eu/wiki/Main_Page (13.05.2022)

Overview

City of Vienna: Municipality & Federal State

Goal: Climate neutrality by 2040

Goal mobility hubs: 100 hubs by 2025

WienMobil Stationen

- Currently 30 stations online

- Our case study: Bruno-Marek Allee, operated by MO.Point

Source: Wiener Linien (2022): https://www.wienerlinien.at/wienmobil/stationen#tabs-0-0-carsharing;
City of Vienna (2015) STEP 2025, Fachkonzept Mobilität, City of Vienna (2022) Smart Klima City Strategie Wien.
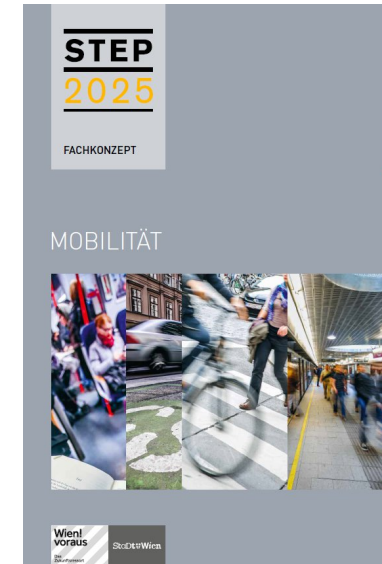
Results: Bruno-Marek Allee, Vienna

Structural components

First pilots initiated by Wiener Linien

Institutionalisation:

- Working group on mobility stations

- Contract between Wiener Linien & Magistrat incl. public funding (pol. Announcement 100 WienMobil Stationen by 2025)

Informal networks of like-minded actors, limited inter-actor communication

Districts as powerful players in regulation of public space

„[…] weil wir [Anm. die Stadt Wien] sind föderalistisch strukturiert, dass die Bezirksvorstehungen sehr viele Entscheidungen treffen können, die teilweise entgegen der Ziele, die auf Stadtebene eigentlich definiert wurden, wirken."
(LLEA Interview 3)

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Results: Bruno-Marek Allee, Vienna

„Da würde ich schon eine Schwäche verorten, insbesondere die Strategien, [die] zwar oft die richtigen Baustellen beziehungsweise Entwicklungspfade skizzieren. Aber nicht skizzieren, wie diese Ziele umgesetzt werden sollen." (LLEA Interview 6)

Policy instruments

Mobility hubs part of strategic mobility & climate plans

Critique raised in interviews:

- no quantifiable goals and indicators, undefined responsibilities and long timeframe

- slow implementation

Additional instruments: parking restrictions

Request: Car-Sharing Law

Results: Bruno-Marek Allee, Vienna

Normative drivers

Stronger focus on climate neutrality than mobility transition

'Mobility guarantee' (Mobilitätsgarantie)

Business logic: Public transport and mobility providers operate profit-oriented

Fuzzy understanding of social justice dimension of shared mobility

„[G]erade bei Mobility Hubs, muss man auch noch mitdenken, dass das durchaus eine neue Technologie ist. […]. Also wessen Erreichbarkeit verbessert das wirklich, ne? (LLEA Interview 4)

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Results: Bruno-Marek Allee, Vienna

„Also das darf man echt nicht vergessen, dass in Wien halt nach wie vor der Stellplatz sehr, sehr heilig ist."
(LLEA Interview 1)

Discursive negotiations

Mobility highly political topic, conflicts among political parties

Political opposition along geographical location (city centre vs. periphery)

Conflicts over priorities & public space:

- "old school transport planners" vs. transition-oriented people

- Tendency to avoid conflicts: Car parking as "holy" & focus on creating alternatives, difficult redistribution of public space

Fear of change or loss

Next steps

- Stronger emphasis on interdependency of analytical dimensions
- Contextualization with analysis of other SmartHub cases
- Communication of results to policy-makers

SmartHubs

(Preliminary) 'Checklist' for Mobility Hubs

Coherent Strategy & Normative Setting

Responsibilies & Resources

Stakeholder cooperation & Working procedure

Discursive Setting

Additional aspects...?

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Thank you!

Prof. Dr. Antonia Graf,
antonia.graf@uni-muenster.de

Julia Hansel, M.Sc.
julia.hansel@uni-muenster.de

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Summary of Session 'Appraisal Tool for sustainability and stakeholder assessment'

Session hosts: Jesse Pappers and Lluis Martinez

Session Outcome Summary:

- During the session, the SmartHubs appraisal tool is explained:

- Firstly, conducting the MCA to appraise the sustainability of two fictional co-designed options of mobility hubs. The criteria obtained in task 3.5 to measure sustainability are presented.

- Secondly, the stakeholder assessment (MAMCA) tool is explained and demonstrated using a fictional case of a co-creation process of a mobility hub.

- After the presentation, a discussion with the two participants and the two hosts took place. This allowed participants to ask for clarifications while giving relevant insights to the facilitators.
  - To what extent the weightings of criteria are well-justified?
  - Must all criteria be considered regardless of the context?
  - The use of the tool in the living labs should allow to answer the previous questions.

Further material on the session content: Slides used during the session

Contact details for questions: jesse.pappers@vub.be

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SMARTHUBS APPRAISAL TOOL
MOBILISE

Lluis Martinez Ramirez

Prof. Dr. Imre Keserü

Jesse Pappers

MCA – SUSTAINABILITY APPRAISAL

MCA – SUSTAINABILITY APPRAISAL

STEPS

1. Alternatives

2. Criteria

3. Weights

4. Evaluation

5. Results

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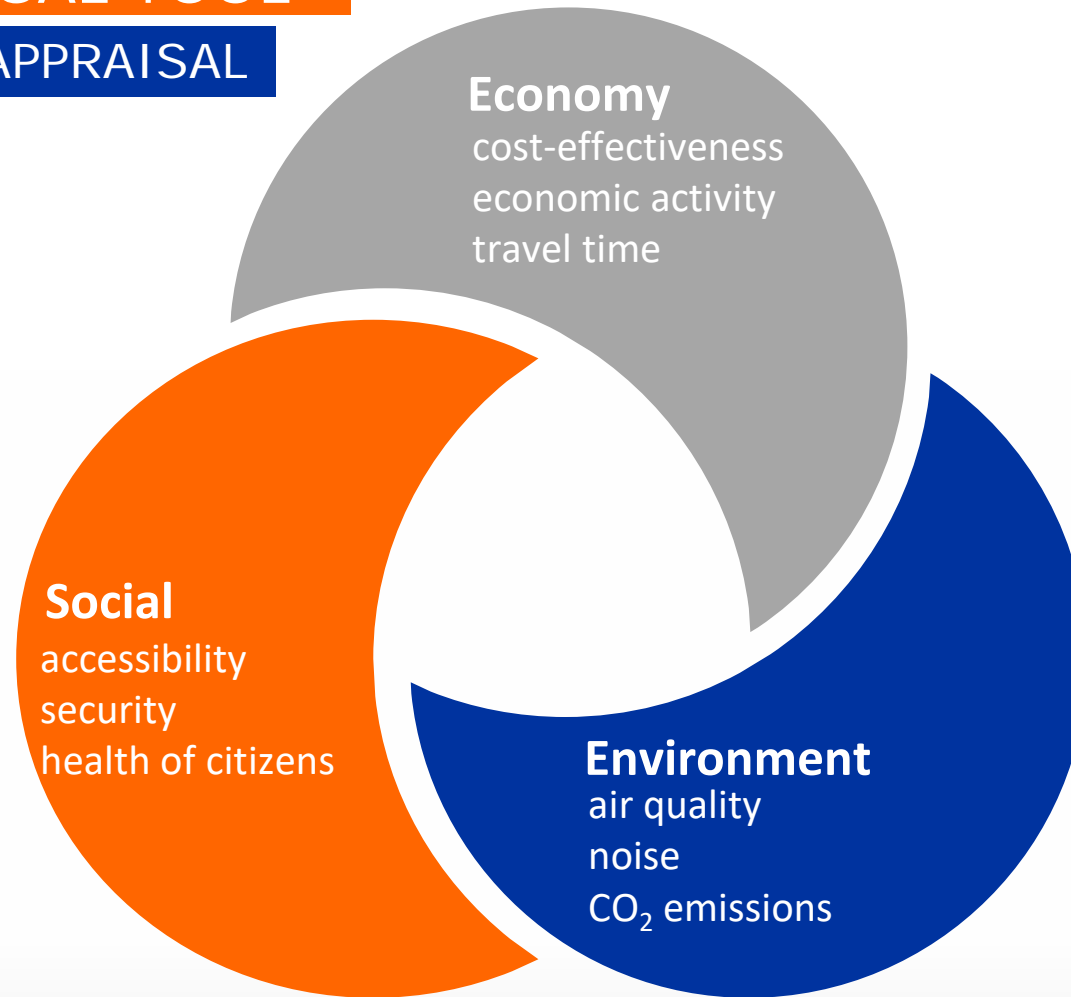
MCA – SUSTAINABILITY APPRAISAL

ALTERNATIVES

1. Business as usual (= no change)

2. Mobility hub at metro station

3. Mobility hub at tram stop

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MCA – SUSTAINABILITY APPRAISAL

ALTERNATIVES

① Alternatives	② Criteria	③ Weights	④ Evaluation	⑤ Result

+ Create a new alternative

Alternative Name	Action
Business as usual	Edit | Delete
Mobility hub at metro station	Edit | Delete
Mobility hub at tram stop	Edit | Delete

< 1 >

MCA – SUSTAINABILITY APPRAISAL

CRITERIA & WEIGHTS

Economy (33%)		Environment (33%)		Society (33%)	
Economic activity	18,5%	Greenhouse gas emissions	14,4%	Safety	8,3%
Cost-effectiveness	22,1%	Air quality	8,4%	Security	7,8%
Reliability	23,8%	Resource use	15,3%	Access to opportunities	12,6%
Public funding	17,1%	Noise	10,4%	Universal accessibility	15,6%
Adaptability	18,6%	Material use	8,2%	Social inclusion	10,2%
		Climate adaptation measures	10,7%	Gender equality	6,7%
		Flexibility	13,3%	Affordability	12,9%
		Resilience	19,3%	Active mobility	7,8%
				Liveability	6,3%
				Socio-political acceptance	6,3%
				Policy integration	5,5%

Project name: Test Jesse   Project type: MCA

✓ Alternatives ——— ② Criteria ——— ③ Weights ——— ④ Evaluation ——— ⑤ Result

+ Create a new criterion

Criteria Name ⇅	Criteria Indicator	Action
+ Social		Edit Delete
- Economy		Edit Delete
Cost effectiveness		Edit Delete
Economic activity		Edit Delete
Public funding of transport		Edit Delete
Reliability and travel time		Edit Delete
+ Environment		Edit Delete

< 1 >

MCA – SUSTAINABILITY APPRAISAL

EVALUATION

### Evaluation Table

Alternative	Cost effectiveness	Economic activity	Public funding of transport	Reliability and travel time	Air quality	Greenhouse gas emissions	Land consumption	Noise
Status quo	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Replace parking with bike lane	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Pedestrian zone	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral

Criteria Group Evaluation Line/Bar Chart
MCA example, MCA
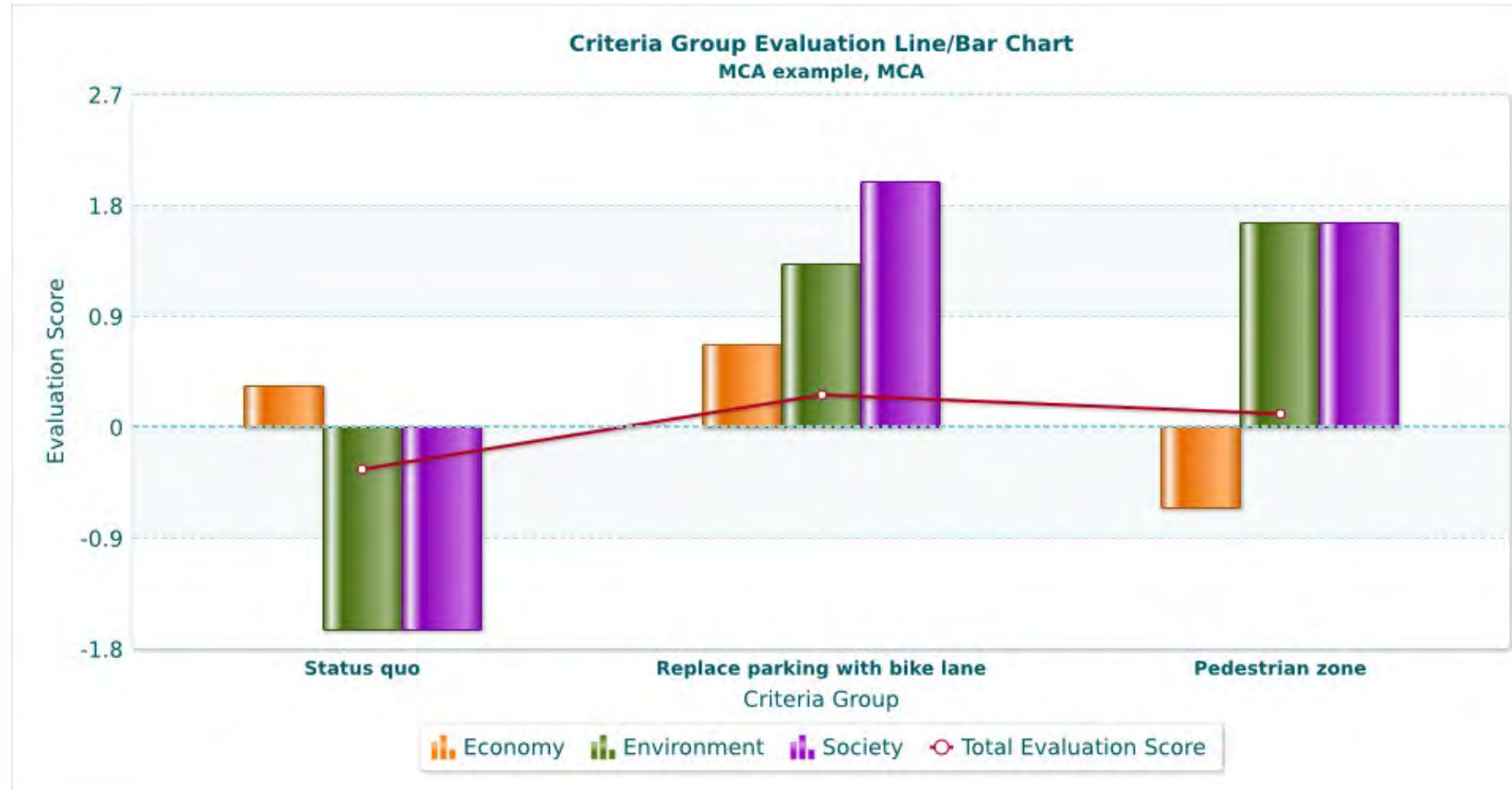
MAMCA – STAKEHOLDER ASSESSMENT

STAKEHOLDER ASSESSMENT - MAMCA

STEPS

1. Alternatives

2. Actors

3. Criteria

4. Weights

5. Evaluation

6. Results

STAKEHOLDER ASSESSMENT - MAMCA

SCENARIOS FOR CONNECTION UNIVERSITY – CITY CENTRE

Bus scenario
Upgrade infrastructure for bus line.

Metro scenario
A new underground metro line.

Tram scenario
A new aboveground tram line.

MAMCA

Homepage

Invited Projects

Manage Invitations

Profile

Logout

Project name: New Connection VUB to Brussels-Centre - SML course 2021/10/28

Project type: MAMCA

① Alternatives   ② Actors   ③ Criteria   ④ Weights   ⑤ Evaluation   ⑥ Result

+ Create a new alternative

Alternative Name	Action
Bus Scenario	Edit Delete
Metro Scenario	Edit Delete
Tram Scenario	Edit Delete
BAU	Edit Delete

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Next

STAKEHOLDER ASSESSMENT - MAMCA
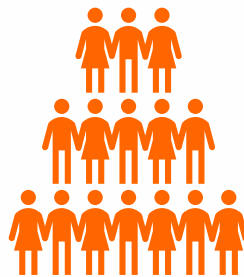
EVALUATION

Criteria	Metro	Tram	Bus upgrade
Costs			
Implementation time			
Travel time gain centre - VUB			
Number of parking places maintained			
Nuisance of the works			
Accessibility of Elsene (no. stops)			
Quality of public space (noise, road safety)			
Distance to walk from station to campus			

STAKEHOLDER ASSESSMENT - MAMCA

EVALUATION

Criteria	Metro	Tram	Bus upgrade
Costs	€ 1.500 mln (---)	€ 200 mln (-)	€ 50 mln (o)
Implementation time	8 years (--)	3 years (-)	1 year (o)
Travel time gain centre - VUB	20 minutes (+++)	10 minutes (++)	5 minutes (+)
Number of parking places maintained	100% (+++)	10% (---)	50% (o)
Nuisance of the works	Quite much (--)	Really much (---)	A bit (o)
Accessibility of Elsene (no. stops)	3 (o)	6 (++)	11 (+++)
Quality of public space (noise, road safety)	Much better (+++)	A bit better (+)	Little change (o)
Distance to walk from station to campus	500m (-)	100m (o)	100m (o)

STAKEHOLDER ASSESSMENT - MAMCA

EVALUATION

Criteria	Metro	Tram	Bus upgrade
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STAKEHOLDER ASSESSMENT - MAMCA

EVALUATION

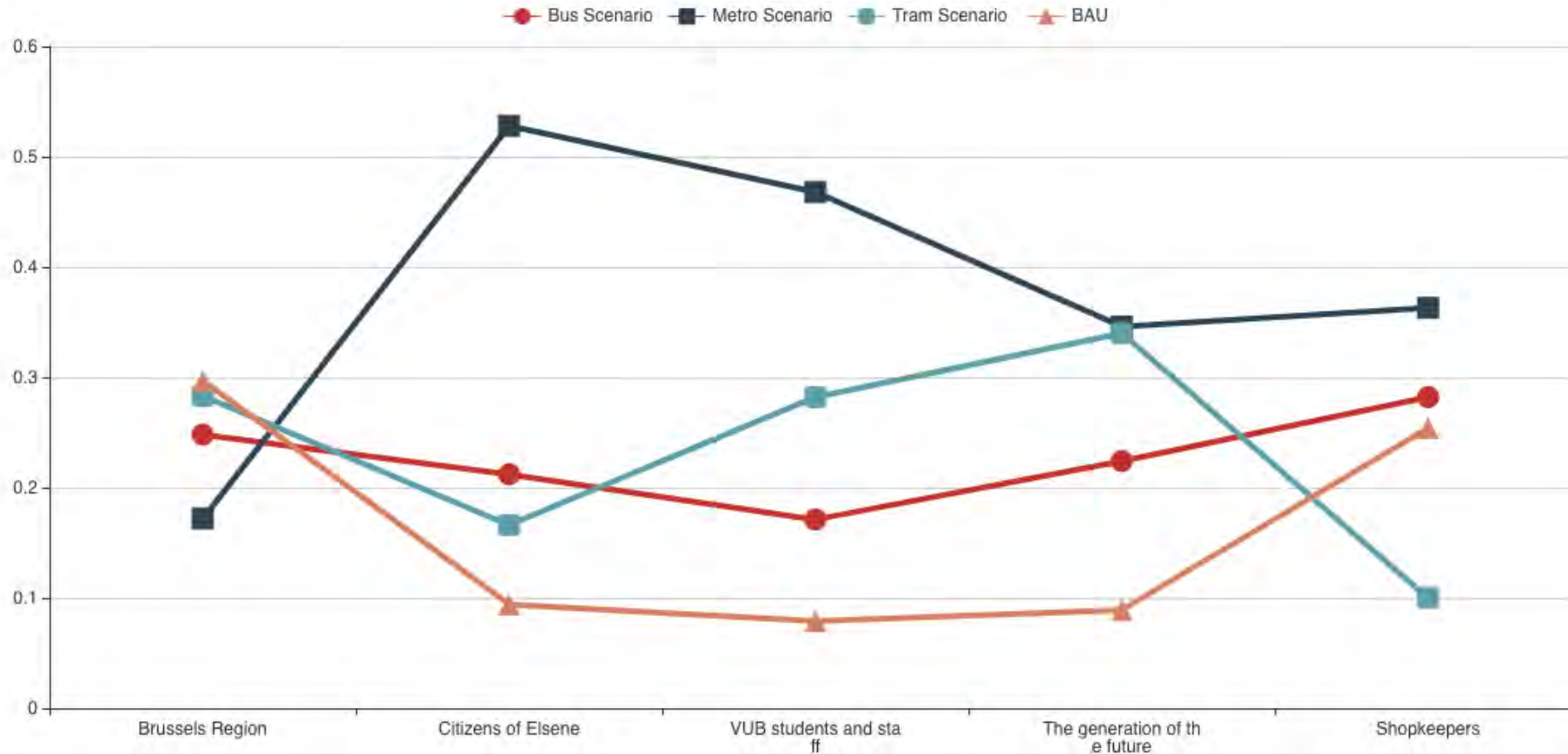| Criteria	Metro	Tram	Bus upgrade
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Accessibility of Elsene (no. stops)	3 (o)	6 (++)	11 (+++)
Quality of public space (noise, road safety)	Much better (+++)	A bit better (+)	Little change (o)
Distance to walk from station to campus	500m (-)	100m (o)	100m (o)

RESULT

Summary of Session: Accessibility tool

Session hosts: TUM

Session Outcome Summary:

The SmartHubs accessibility tool aims to evaluate "automatically" the accessibility of a potential location of a mobility hub by different transport modes.

Currently the tool's outcome are isochrones considering a walking time and the amenities within it.

In the session, participants considered it a useful tool for network analysis and comparison between hubs' location. Furthermore, they gave the following feedback:

- It should include trip costs (and budget constrains), consider different users, user-based selection of different amenities, and intermodal options.

- Improve graphic interface
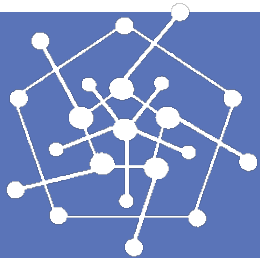
Further material on the session content:
https://syncandshare.lrz.de/getlink/figW7o64ExQD523LNczjH/WP5_2%2014_09.pptx

Contact details for questions: aaron.nichols@tum.de, david.duran@tum.de

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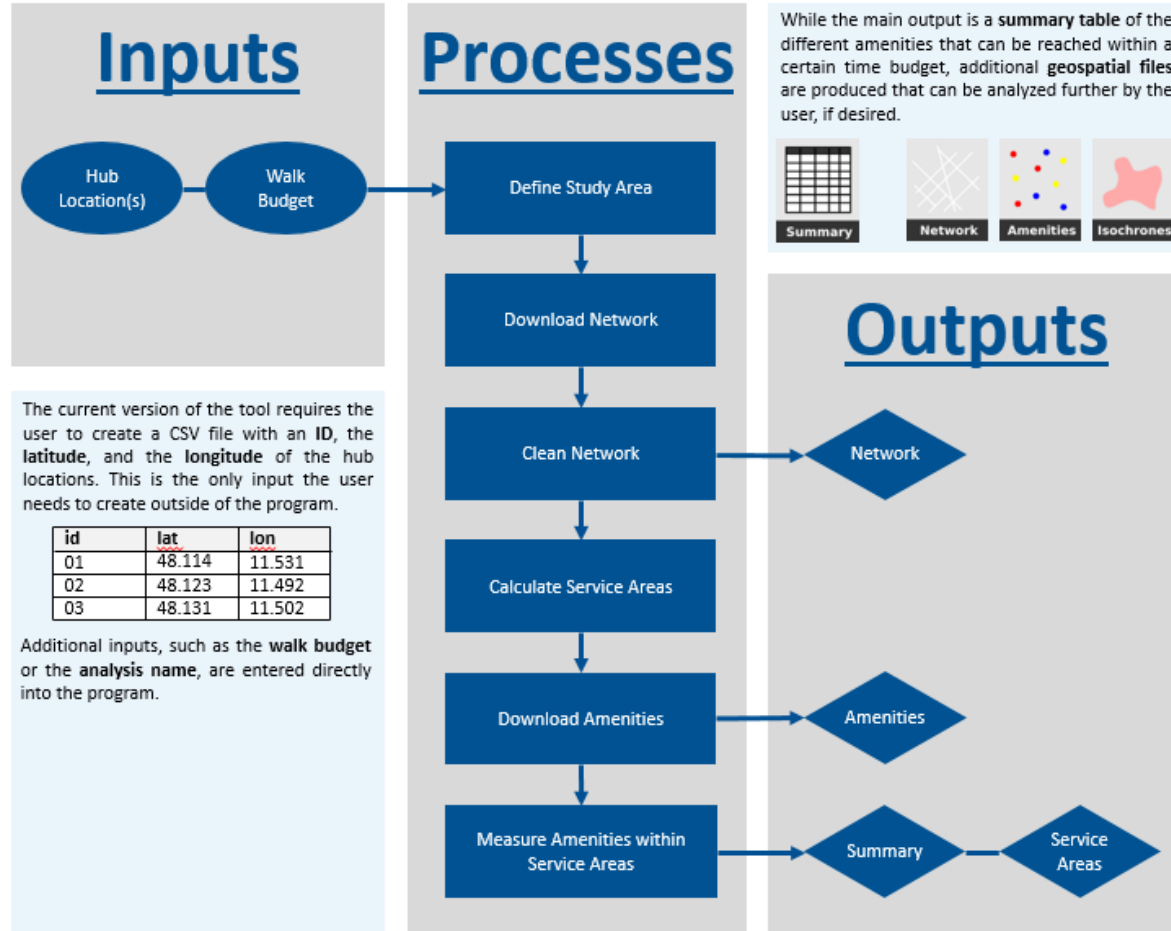
What?

Automated accessibility tool that can assess the accessibility of a potential hub location.

The tool should require **minimum input** from the user and allow for a **customizable analysis** that fits the desired needs of the user.

How?

Output

id	walk_time	stop_position	restaurant	bakery	supermarket	kindergarten	doctors	pharmacy	pub	toilets	school
h01	15	120	391	38	24	9	39	21	30	12	19
h02	15	106	275	22	31	12	33	15	16	13	14
h03	15	115	160	20	43	15	35	14	18	12	9
h04	15	114	269	21	29	2	32	13	23	12	9
h05	15	22	6	0	2	0	1	0	0	6	0

What is next?

Accessibility Analysis: Vienna
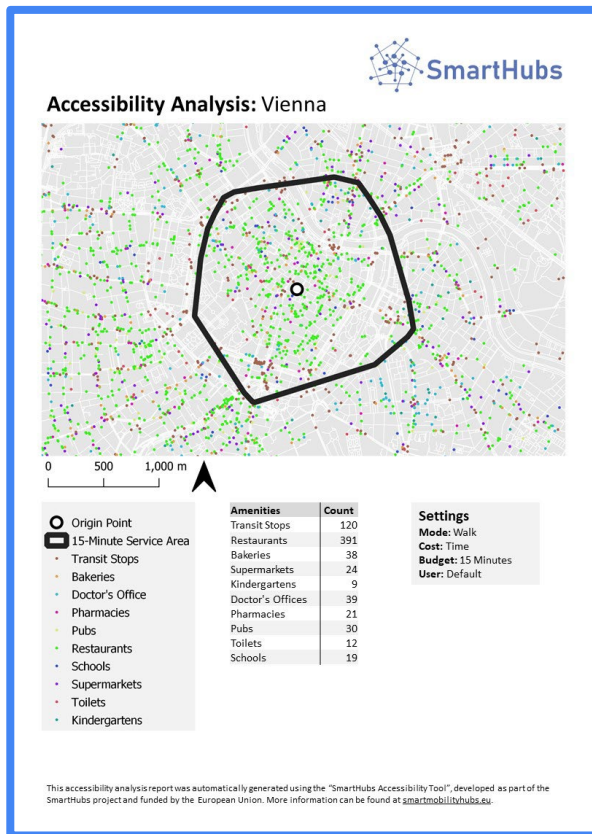
Scenario Building: The current tool has fixed variables for things like walking speed and network use. Future versions will allow for scenario building directly within the program to define things like walking speeds, departure times, and network types that can be used (pedestrian, cycling, etc.).

Additional Modes: At the moment, only walking is supported. Support for cycling and transit accessibility will also be added. For transit support, the users will have to provide a GTFS dataset.

Customized Data Analysis: The basic analysis only considers access to amenities that are included in the OpenStreetMap (OSM) data. This can be done anywhere in the world. Future versions should allow for the user to add additional data (socio-demographic, land-use) to be considered in the analysis.

Improved Service Area Calculation: The current tool calculates "convex hulls" as the service areas because they are computationally simple. A new algorithm can be implemented to calculate more detailed service area polygons to improve the accuracy of the analysis.

Automated Map/Report Export: The current output is a CSV file with summary results from the analysis. A more advanced version of the tool could automatically generate maps and reports from the analysis.

5

Summary of Session: Resilience Tool to assess Accessibility, Connectivity, and Network Resilience

Session hosts: Roberto Patuelli, Michele Rabasco

Session Outcome Summary:

The session covered the progress of the "Resilience Tool." This tool was designed with the goal of analysing the resilience of city areas and public transport networks after hypothetical disruptive scenarios. The indications resulting from it can be particularly useful in the evaluation process concerning the choice of the most suitable locations for mobility hubs.

A first phase of planning, including literature review, selection of indicators to measure resilience and tool designing, has been completed. As a result, the analysis of resilience will be related to accessibility and connectivity.

In a second phase, which is the current one, efforts are focused on the development of the software underlying the tool, data collection and testing.

At present, the tool is able to calculate (a) the accessibility of each area under analysis using spatial interaction models, and (b) network connectivity for a single (unimodal) transportation network. Upcoming developments will include the integration of multiple transportation modes into a single (multimodal) network.

Next, an open online Resilience Tool combining accessibility and connectivity will be released to provide assessments on zonal and transport network resilience.

Finally, the tool will be applied to the Living Labs, ideally enabling differentiated analyses for different socio-economic groups.

At the current stage, data collection is a crucial aspect. The availability of mobility flows is being evaluated. Collecting socio-demographic data appears less problematic.

Preliminary tests conducted using a mix of simulated and real data have shown that the current version of the tool is working properly.

Contact details for questions:

roberto.Patuelli@unibo.it; michele.rabasco2@unibo.it

ERA-NET Cofund Urban Accessibility and Connectivity

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Resilience Tool

to assess

Accessibility, Connectivity, and Network Resilience

University of Bologna (UNIBO)

Overview

Purpose

Including **transport network resilience** assessment in "mobility hubs" discourse

The ability of a transportation network to **resist and adapt to internal or external disturbances, without** result in **considerable** reductions of its functionality

How?

Providing a **Resilience Tool** able to measure network resilience, from two perspectives, accessibility and connectivity, trough scenario analysis (hypothetical network disruptions)

The indications resulting from the Tool can be particularly useful in the evaluation process concerning the choice of **the most suitable locations for mobility hubs**

Some specifications
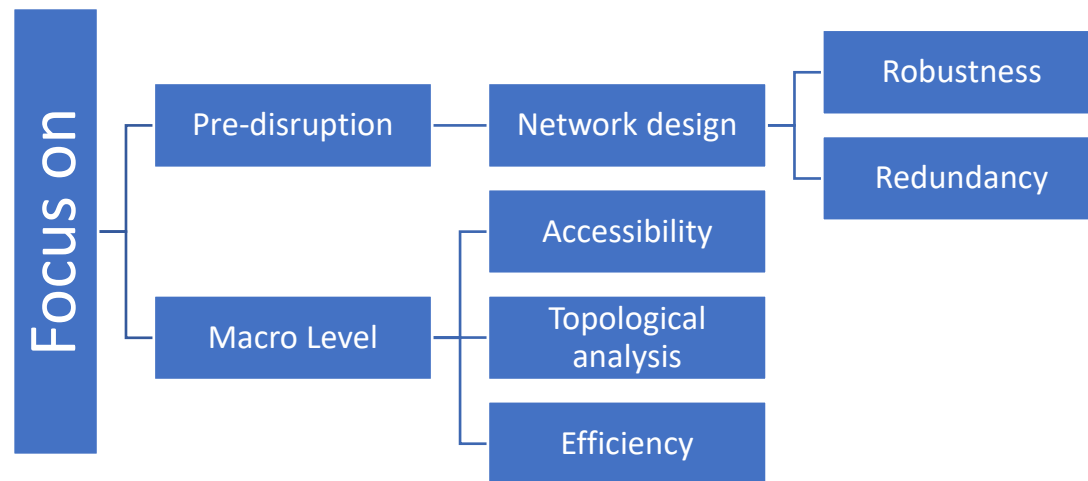
- We focus on the pre-disruption phase. Particular attention is placed on **robustness** (the ability of withstand a given level of stress) and **redundancy** (the existence of different routes/means of transport between origins and destinations)

- We conduct macro-level analysis regarding:
  - **accessibility**, which refers to opportunities present in a particular area and the relative ease of reaching them
  - **topological analysis**, to study the structure of networks
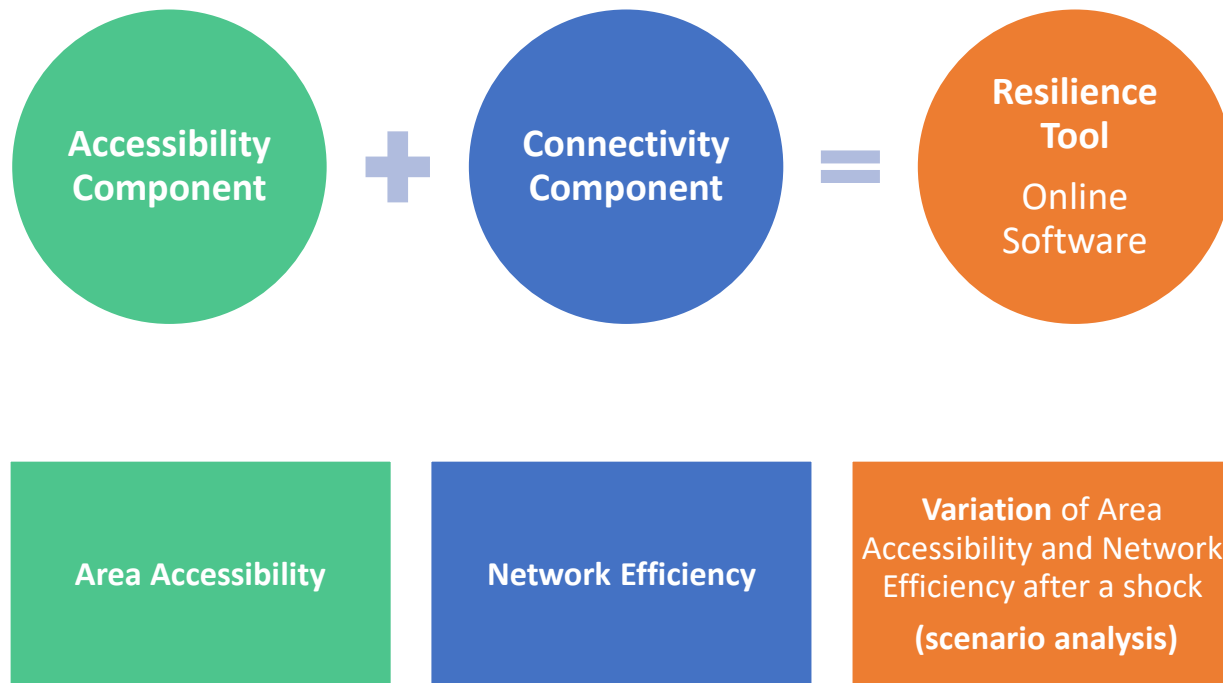 - **efficiency**, which we interpret as "how fast people can move in a network"
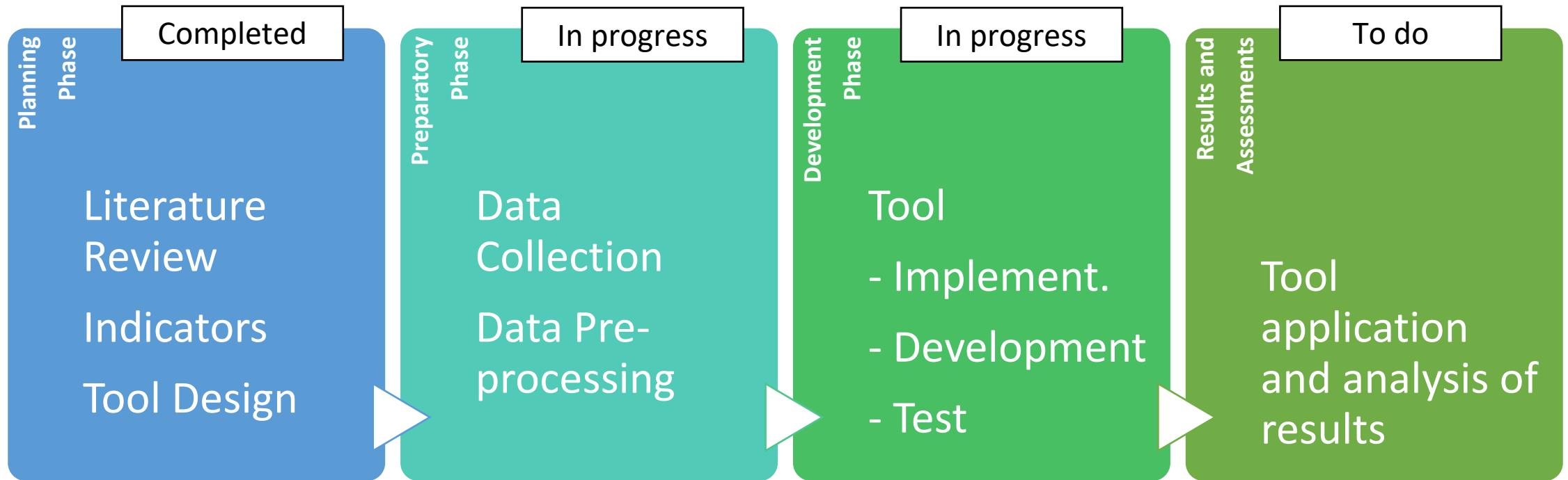
Planning Phase

- Among the aspects that emerged from the literature review on resilience of transportation networks, the relationship between **accessibility, connectivity and resilience** appears to be relevant, although not fully explored, and therefore worth further attention

- We selected the change in accessibility of an area and efficiency of the transportation network, following disruptive episodes in the network itself, as measures of resilience

- The Resilience Tool is designed to integrate assessments on accessibility, connectivity and resilience, and provide results based on scenario analysis

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Tool Design

Accessibility Component + **Connectivity Component** = **Resilience Tool** Online Software

Area Accessibility

Network Efficiency

Variation of Area Accessibility and Network Efficiency after a shock **(scenario analysis)**

The indications resulting from the Tool can be particularly useful in the evaluation process concerning the choice of **the most suitable locations for mobility hubs**

Preparatory and Development Phases

- **At present**, the tool is able to calculate (a) the accessibility of each area under analysis using spatial interaction models, and (b) network connectivity for a single (unimodal) transportation network

- **Upcoming developments** will include the integration of multiple transportation modes into a single (multimodal) network

- An open online Resilience Tool combining accessibility and connectivity will be released to provide assessments on area accessibility and network resilience

- The tool will be applied to the Living Labs, ideally enabling differentiated analyses for different socio-economic groups

- **Data collection** is a crucial aspect. The availability of mobility flows is being evaluated. Finding socio-demographic data appears less problematic

- **Preliminary tests** conducted using a mix of simulated and real data have shown that the current version of the tool is working properly

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Summary of Session
Policy Guidelines & Governance Implications

Session hosts: Julia Hansel, University of Münster (WWU)

Session Outcome Summary:

Along with the guiding question, "*what political and administrative preconditions need to be solved in order to implement SmartHubs successfully?*" a checklist of governance implications was discussed.

The participants agreed that a coherent strategy with clear political goals and a mutual understanding of all stakeholders is crucial. Also, defined responsibilities and resources, as well as cooperation amongst stakeholders, are essential.

Open discussion points were, for example, what relation precise goals and an overall vision for future development can have and which institution might be best to organise mobility hubs.

Image: Julia Hansel

Contact details for questions: julia.hansel@uni-muenster.de