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Improving the Last Mile

# Curbside management in the physical internet

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2022  
I-NUF



**9TH METRANS**

**International** Urban Freight Conference

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# Who We Are

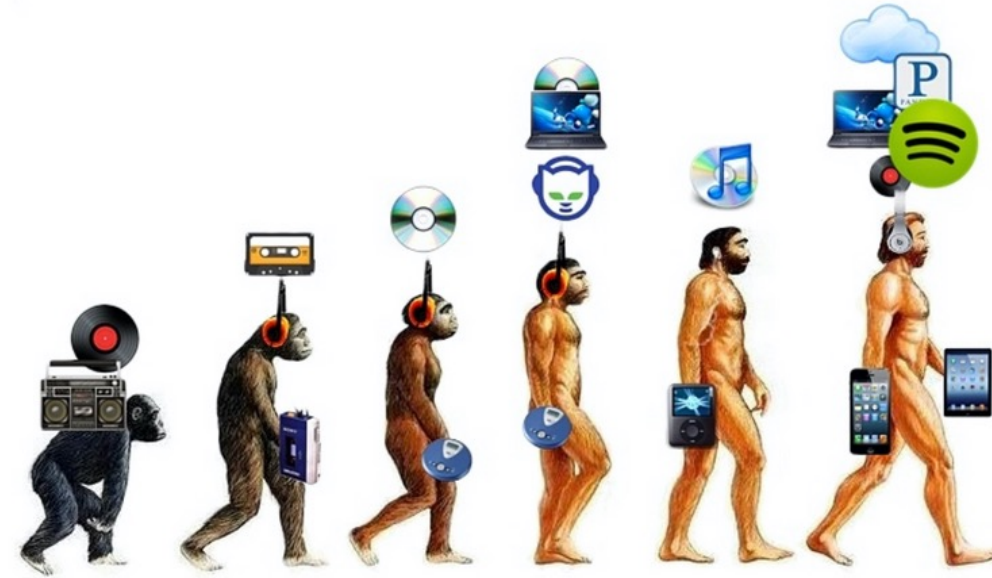
Fit Consulting srl was founded in 1997, from to a group of experts working in the field of sustainable mobility. Dynamic and professional, over time we have managed to build a network of over 300 partners in Europe, Asia and the USA, becoming members of the main European thematic networks.

The range of services we provide is based on recognized expertise at both the national and international levels addressing the sustainable mobility of people and goods.

We transform ideas into projects of excellence, demands of our customers in services.

We build paths translating hints into value by piloting future experiences of sustainable mobility for people and goods.





“

***My ambition is to promote the digital transition process in urban logistics. It can be compared to discography evolution: from vinyl to streaming, with music now supplied as commodity and mass adoption (uberization) by digital devices.***

*Sharing freight data is for companies, cities and society a priority for new value propositions in Europe, so that it can be a trustworthy, data-empowered and decarbonized continent, towards new generation of sustainable urban logistics plans (SULPs) considering all the stakeholders (e.g. real estate).*

”

# Major impacts of ecommerce

## CITY

Double parking  
congestion, accidents



## LOGISTICS

Uncertainty of parking  
Driver stress  
High cost



## CITIZEN

Low quality of life  
Pollution  
Delivery uncertainty



# Real problem: Inefficient use of space -10%

Highest occupancy in winter during the morning

Occupation %									
Hour of Day	November	December	Januari	Februari	Maart	April	Mei		
00:00-01:00	8	2	4	2	2	2	0	1	
01:00-02:00	8	1	4	0	1	1	0	0	
02:00-03:00	7	1	4	1	1	1	0	0	
03:00-04:00	7	1	2	1	1	1	0	0	
04:00-05:00	8	1	1	1	1	1	1	0	
05:00-06:00	8	1	2	2	2	2	3	1	
06:00-07:00	9	7	2	4	4	4	6	4	
07:00-08:00	14	12	9	9	12	12	6	8	
08:00-09:00	21	18	17	12	12	12	12	12	
09:00-10:00	27	22	25	18	17	17	14	16	
10:00-11:00	29	26	30	31	21	11	11	13	
11:00-12:00	28	25	24	25	19	11	11	12	
12:00-13:00	28	24	24	20	13	8	8	13	
13:00-14:00	27	20	16	18	10	5	5	8	
14:00-15:00	23	15	15	13	9	4	4	7	
15:00-16:00	19	13	14	12	8	3	3	7	
16:00-17:00	15	10	12	10	6	3	3	8	
17:00-18:00	13	8	12	9	4	4	4	6	
18:00-19:00	14	10	5	9	3	3	3	5	
19:00-20:00	12	6	9	9	4	2	2	3	
20:00-21:00	11	4	6	4	3	2	2	3	
21:00-22:00	9	6	4	5	2	2	2	1	
22:00-23:00	9	8	5	7	3	0	0	0	
23:00-00:00	9	6	2	3	3	0	0	1	

Lowest occupancy in summer and during evening and night

# Ahead of the curb as interaction space

Delivery vehicles and buses compete for curb space in Berkeley, California.



The evolution of the street and the curb –  
Place de l'Opéra, Paris



1909  
Much of the street space is devoted to mixed (horse-drawn) transport, commercial and social uses. The demarcation between the sidewalk and street is weak and fluid.



1920s  
Growing motorisation rates has put pressure on mixed use of the street, safety concerns emerge as car-pedestrian crashes rise



2008  
The allocation of street space is now formalised. Most of the space is reserved for vehicles in movement. Pedestrian access across this space is tightly regulated and controlled. The curb has become a hard border materialising the transition between transaction space and mobility space.

# Curb side is where movement meets access

Curbside space is hub of competing transportation modes and interests.

- **Delivery trucks riders** need space to drop off a package;
- **Cyclists and e-scooter riders** need safe lanes to pass parked cars;
- **Car Drivers** want to find the spot closest to their destination.



Car parking  
& loading



Sidewalk  
café



Bus stops



Freight  
delivery zone



Taxi stand



Bike  
lanes



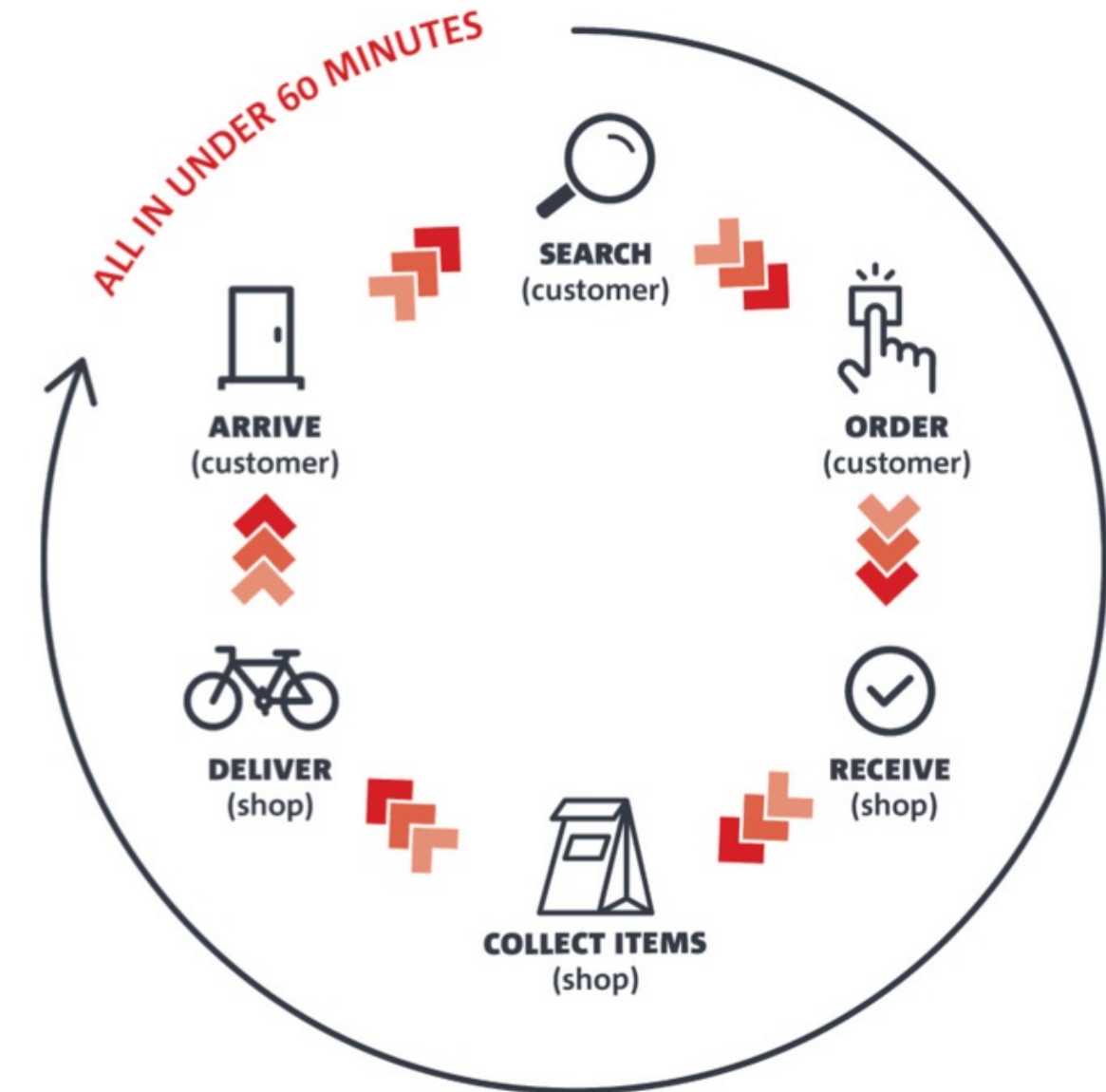
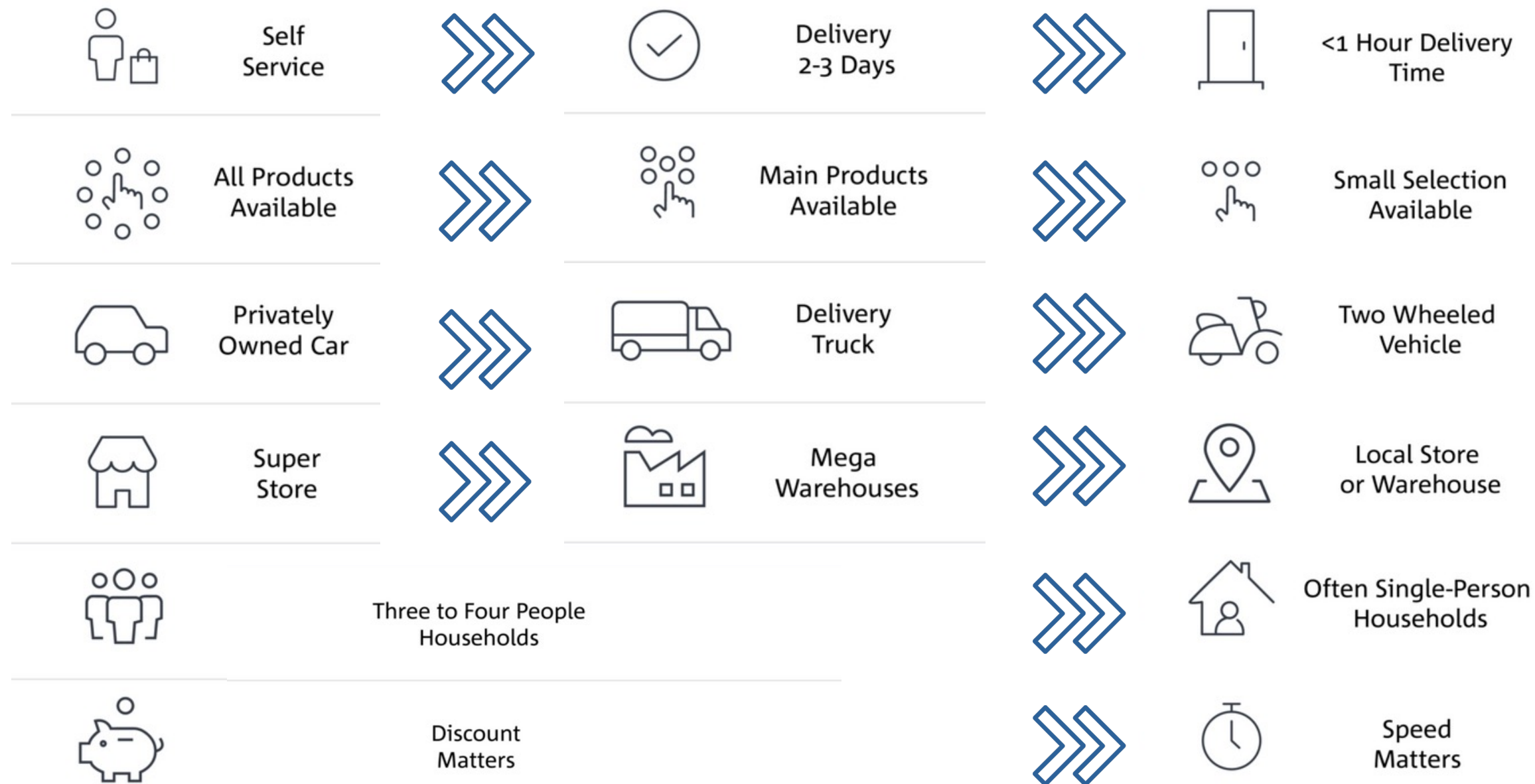
Front stoop

# The 3rd generation of e-commerce

1st generation commerce

2nd generation commerce

3rd generation commerce





# Managing the curbe in the age of eCommerce and Covid-19



A woman sits on top of a "throne" made of boxes containing toilet paper in Toowoomba, Australia, on March 5, 2020. Chris and Haidee Janetzki via Reuters

The COVID-19 has changed the retail system in cities: eCommerce is exploding.

From bulk-buying to online shopping, consumers are changing what they're buying, when, and how.

Demand for fast and flexible delivery is increasing, and more delivery vans and trucks are "cruising" streets looking for their slice of road space where to park and operate.

Good places for car drivers to stop are often bike lanes, loading zone, or by idling on the side of a busy road (double lane parking).



# The importance of data sharing, collaboration and governance

Picture from the Mobility Data Space <https://mobility-dataspace.eu/>

Data sharing can only flourish if trust and fairness are guaranteed, stimulating new business models and social innovation in a Data Space

- Different road users have **conflicting needs**: **purpose-oriented data acquisition and sharing** allows proper understanding how that curb is being used, how cities should regulate guaranteeing safety and efficiency.
- Local authorities and planners need to design, measure, price, and **flexibly manage the curb zone**, **in collaboration with** public transport companies, service providers, technology and business models innovators, and local/governmental players.
- Establish the **right governance** for setting foundation for a **data economy** in which people and businesses can trust - is fundamental.



## Coding the curb-key elements

- **Flexible use of city** – lower pressure on public authorities (e.g., increased by e-commerce), with the establishment of **priority zones** in the city (or in a Functional Urban Area).
- Urban roads can be seen as **open ecosystems**, **dynamically adapting curb space to uses and users** (new mobility services to manage space scarcity) within a safe, efficient, inclusive environment.
- **Integrating fragmented data** from many different sources, analyze it, and make decisions that **improve operational performance**.
- **Communicating the rules**. Users have to understand **rules and steps** to access the curb in a fair way.
- **Monitor use of curb**: the axiom “**what gets measured gets managed**” holds true for curb management programs.
- **Enforce the curb taking balanced decisions** with the support of technologies, enabling the enforcement and dynamic policies.



From «Government at work - curbing curbside congestion» 2020

# Curbside pick up: physical and digital innovation

Cities in Europe must consider how to make solutions scalable for opportunities ahead.

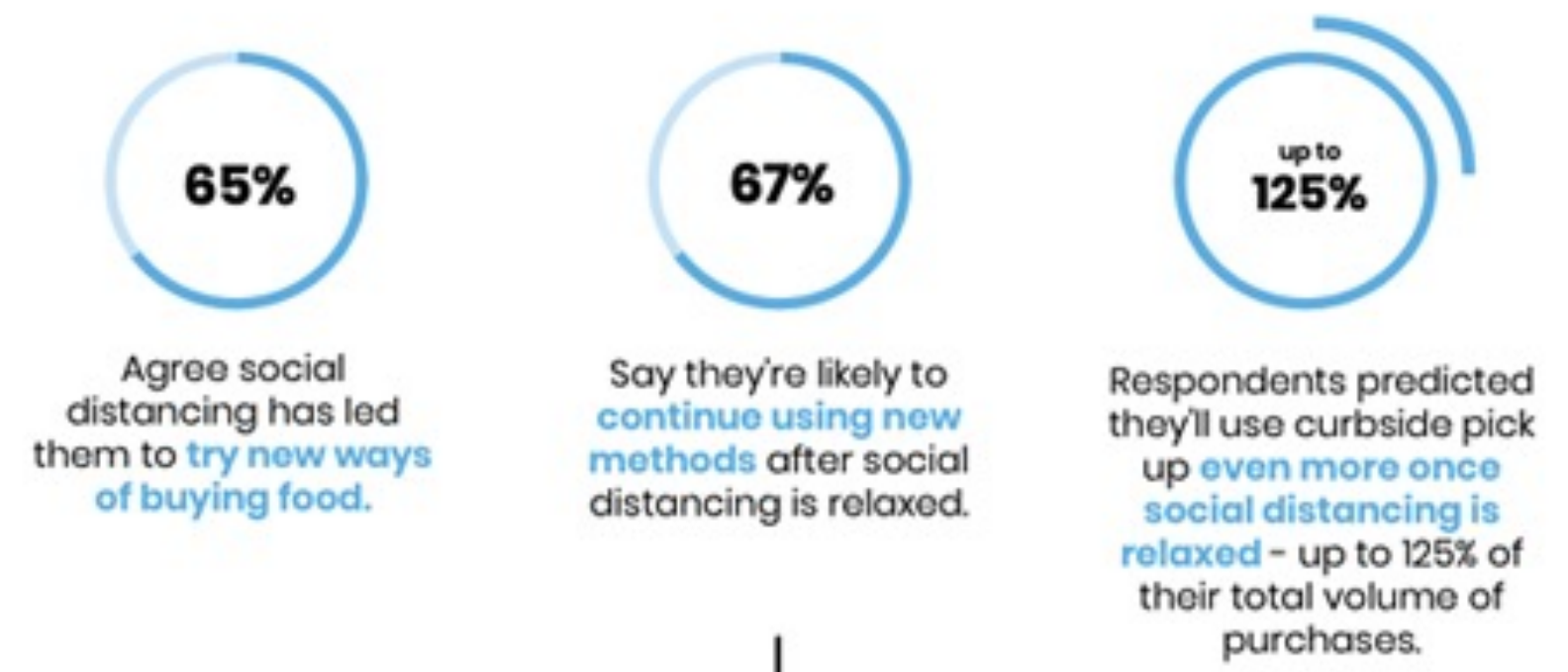
Technology solutions, such as augmented reality mapping tools and analytics to provide real-time availability of spaces, integrate into existing IT infrastructure enabling capture data, allowing city planners to better manage curb, and provide optimizations for data-based decision making around enhanced curb management programs.



During pandemic, restaurants and retail stores that are looking to deliver greater speed and convenience have several ways to improve their experience and pairing curbside pickup a fulfilment with a mobile app may be an effective new way to drive profits and customer loyalty and flexibility.

MOBIQUNITY curbside pickup system, contactless shopping for immediate gratification, convenience, and less effort on the consumer's part

## Our survey of consumers found:



# Curbside digitalization towards better governance

Achieving strong governance requires an equally strong understanding of the current and future use of the curb

## Better understanding...

Where, when, and who needs access to the curbside

## Digital curbside inventory:

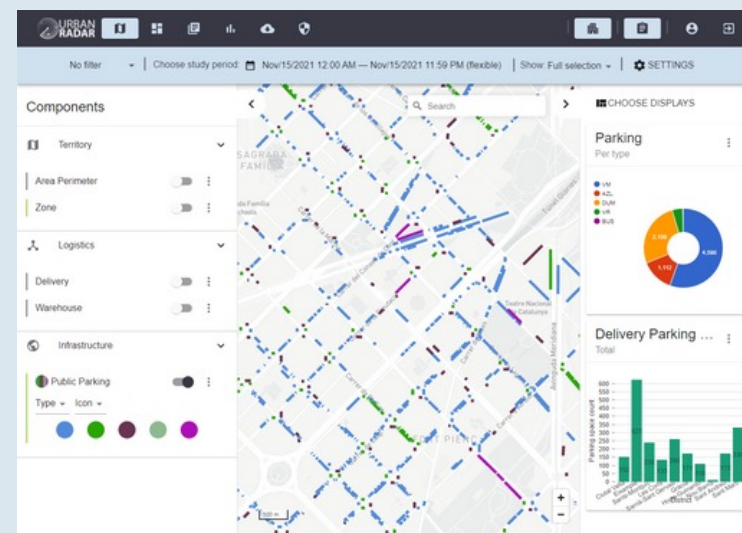
- Regulations: access, availability
- Permitted curbside uses

## Digitalization of curbside demand:

- App/web based
- Sensor based
- Survey based

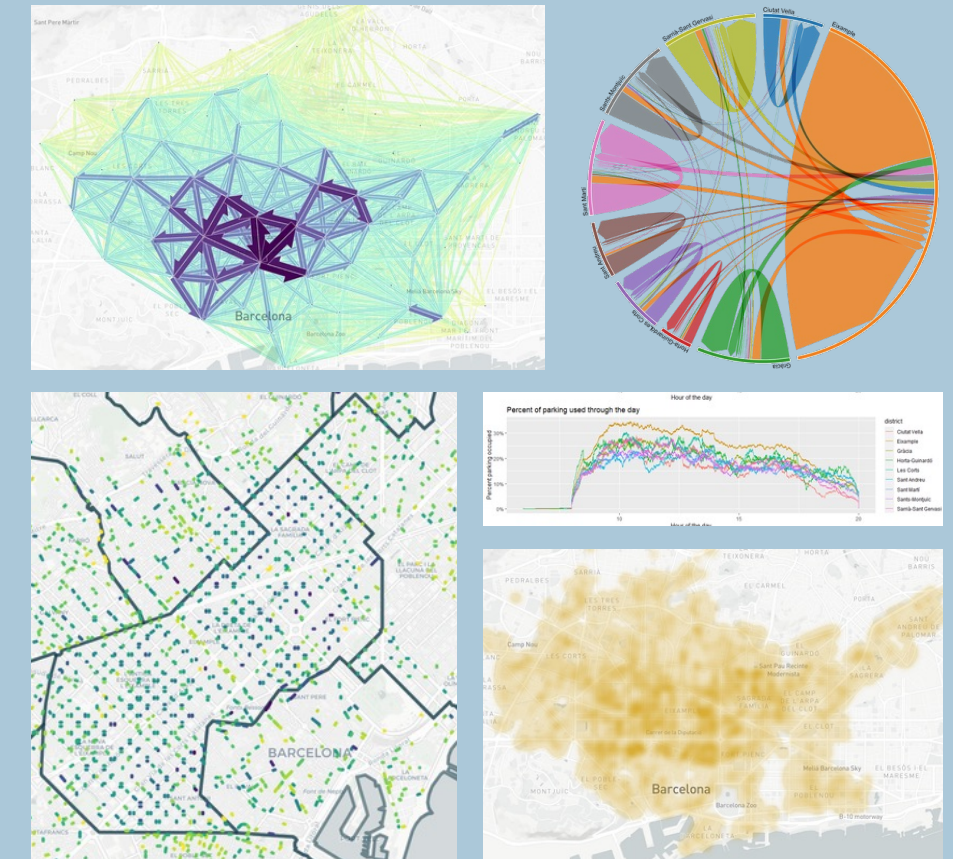
## ... for robust policy-making and management

- Communicating regulations with citizens
- Matching curb uses to city goals
- Enabling dynamic use
- Enforcing regulations
- Preventing congestion and pollution



## Barcelona, Spain

## Curbside use patterns identification



## Understand and act on urban logistics:

- Delivery patterns
- Use of delivery areas
- Traffic flows

# POLIS-ALICE-EPA Survey

- Joint initiative of POLIS, ALICE, EPA, UITP, FIT Consulting and Erasmus University Rotterdam
- **Aim:** to collect some information that could help us to steer the discussion on curb management
- **Target group:** European (transport) professionals
- **Period:** December 2020 and May 2021
- **Total Response:** N= 400+



# Two cross domain EU Surveys on curbside management

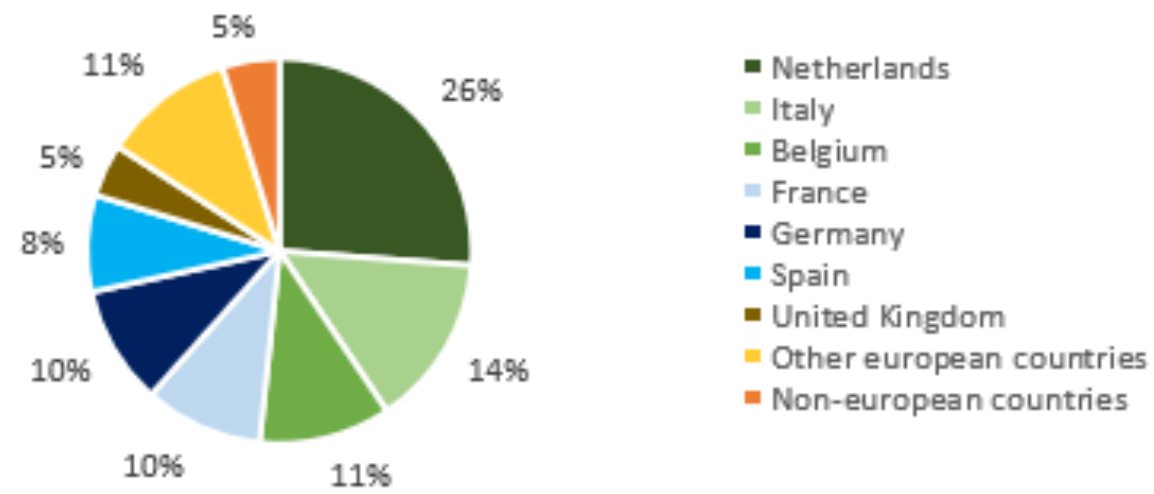


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- Aim: to collect some information that could help us to steer the discussion on curb management
- Target group: transport professionals in Europe
- Survey 1: Nov-Dec 2020 (N=276) – Focus: parking
- Survey 2: June 2021 (N=105) – Focus: urban logistics

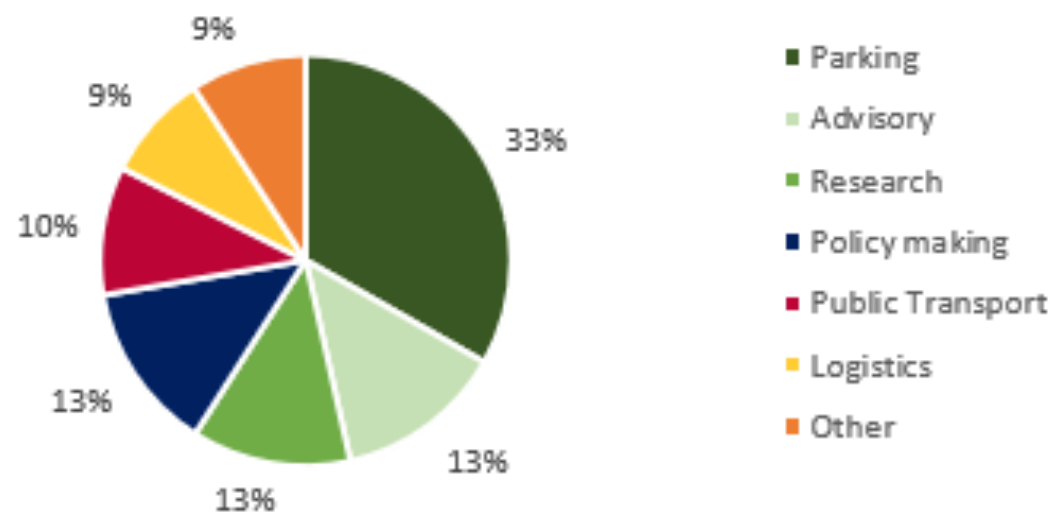
# Descriptive statistics

## Survey 1

Nationalities  
(N = 276)

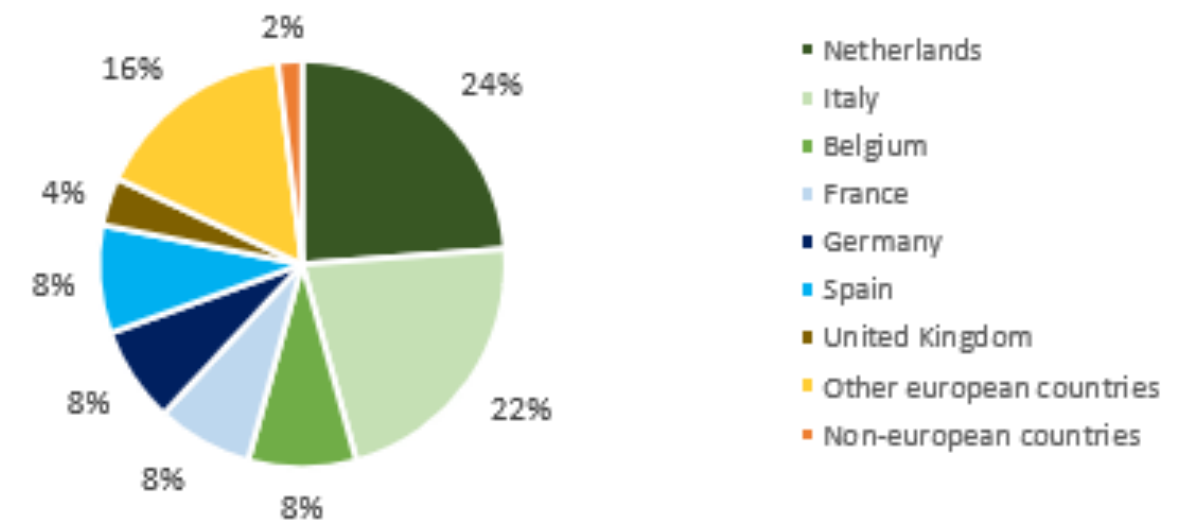


Sector  
(N = 230)

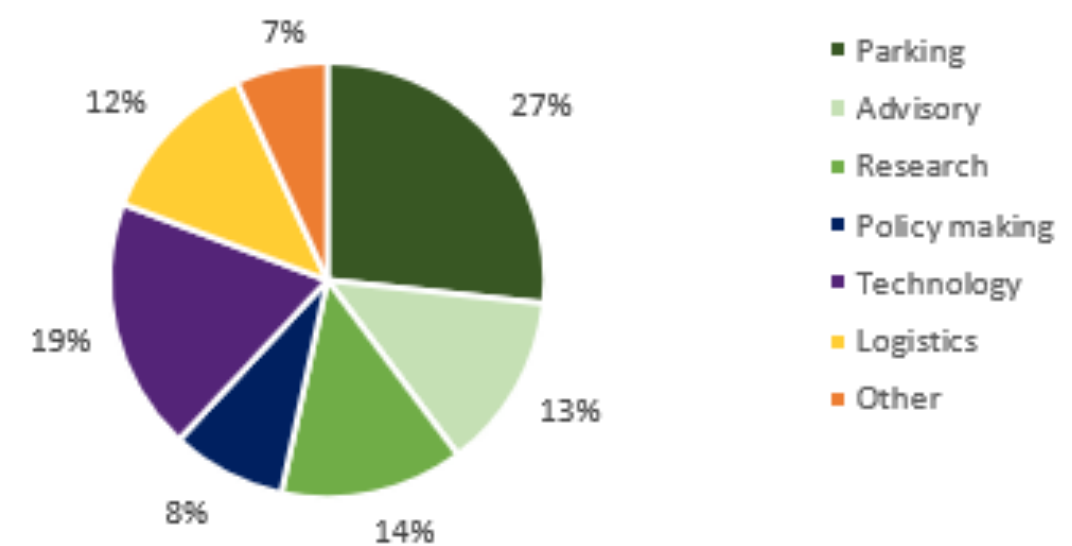


## Survey 2

Nationalities  
(N = 105)



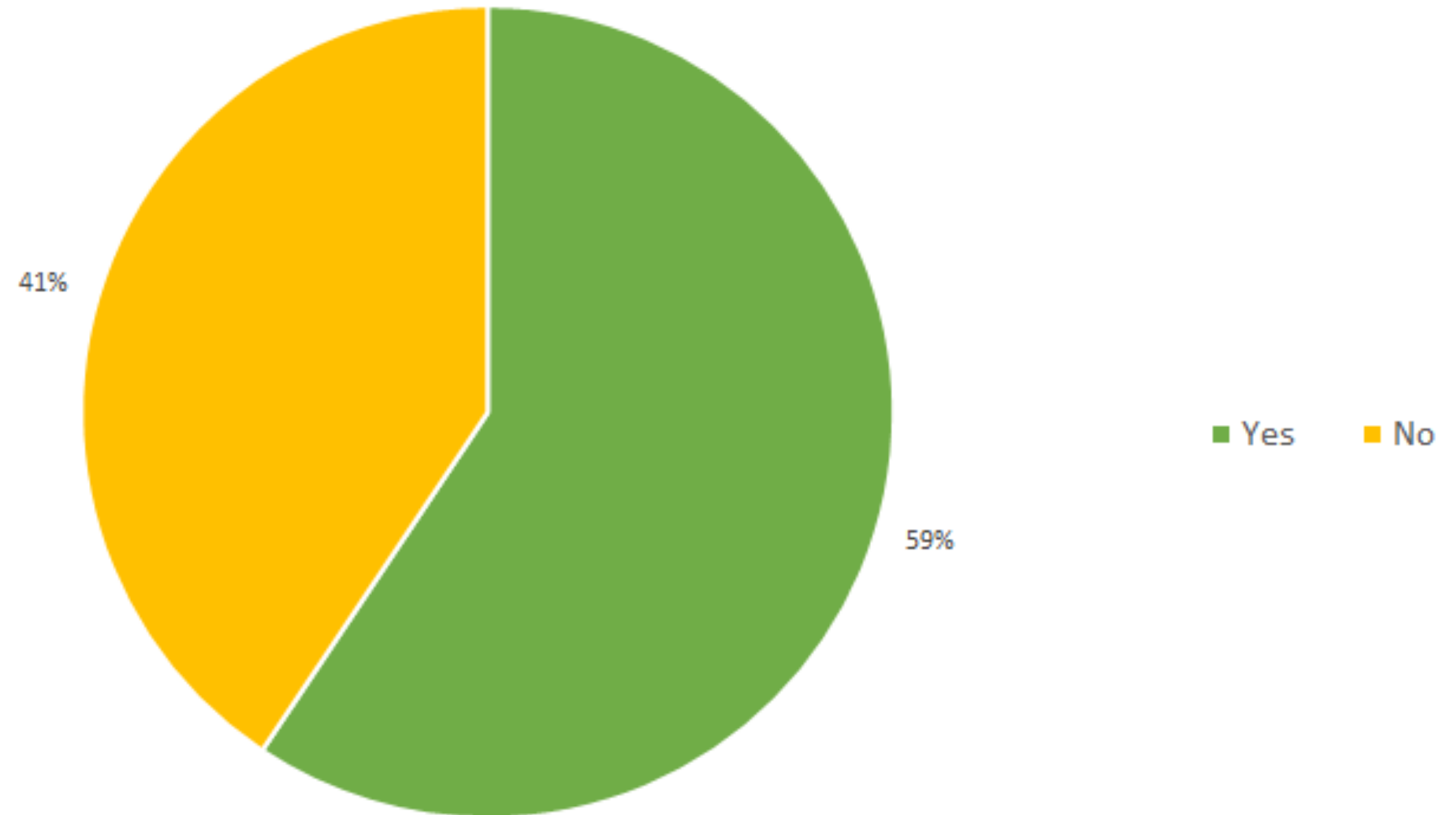
Sector  
(N = 105)



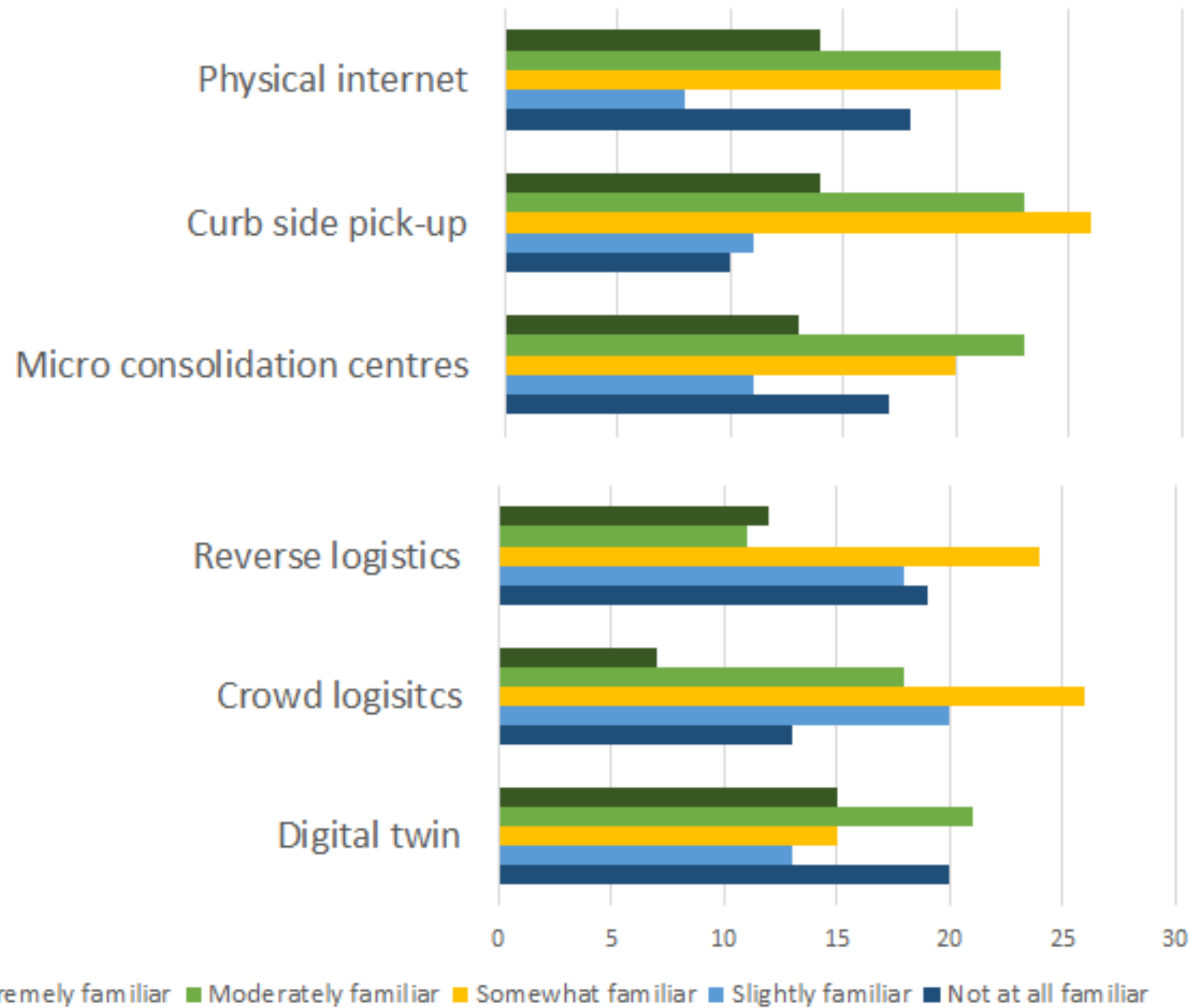


# Does everyone know what curbside management is?

Are you familiar with the concept of curbside management?



# Knowledge gaps



Concepts that professionals are not familiar with.

# “Now that we are smart, how can we be good?” – from the POLIS Parking paper 2019



The dynamic dialogue among these flagship associations aims at encouraging:  
Digital and flexible curbside management in Europe

To understand and manage new mobility conflicts, boosting for all the different needs of city users, and collaborative ecosystem between forward-thinking municipalities, citizens and logistics operators, as curbside community.

Enabling the curb appeal will generate value from existing assets, clear advantages for zero-emission powered cars and better satisfaction of individual and societal needs and smarter planning and proper consideration in the SUMP and SUDP, supporting the **Physical Internet vision**.

## Parking street

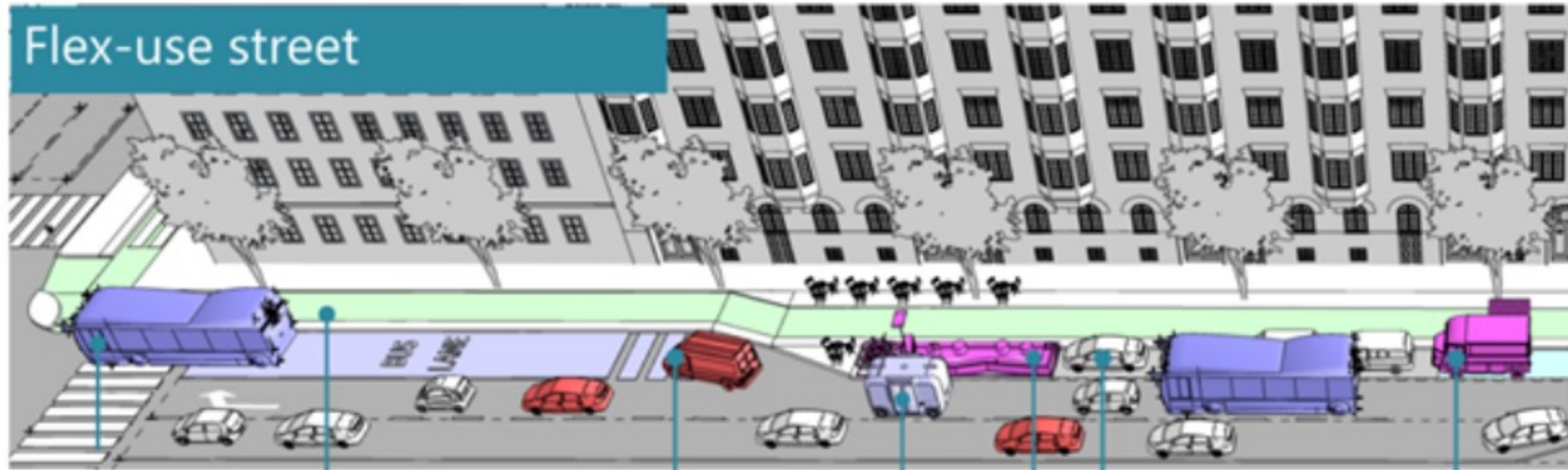


**Public transport curb access conflicts**  
Unauthorised use of public transport space contributes to delays and unreliability

**Ride service double-parking**  
In busy areas and at peak times ride-service and taxi double-parking triggers congestion and places passengers in danger.

**Poorly-managed loading/unloading**  
Abusive occupation of parking or other reserved space leads to more cruising for parking.

## Flex-use street



**Public transport:**  
early start and priority at junctions

**On-demand micro-transit**  
accommodated with public transport

**Semi-automated people movers** provide first and last kilometre links alongside cycling walking

**Metered parking**  
15 vehicles/day

**Food truck**  
150 meals/day,  
€650-€1500  
income/day

**Separated bike track**  
and safe junction treatment for cycling. Entices a broad segment of the population to cycle conveniently and safely

**Parklets and "streeteries"**  
activate public life in the street and spur commerce  
Parklet: 100 visitors/day, 10-20% additional revenue to nearby businesses

 Cycling

# Deconflicting the Curb: from parking lanes to flex zones

Sharing of best practice towards a city-wide approach to curb space management, putting people at the center of urban transformation and address the challenge to 15-minutes cities, a new urban approach to improve quality of life in cities where everything a resident needs can be reached within 15 minutes by foot, bike or public transit.

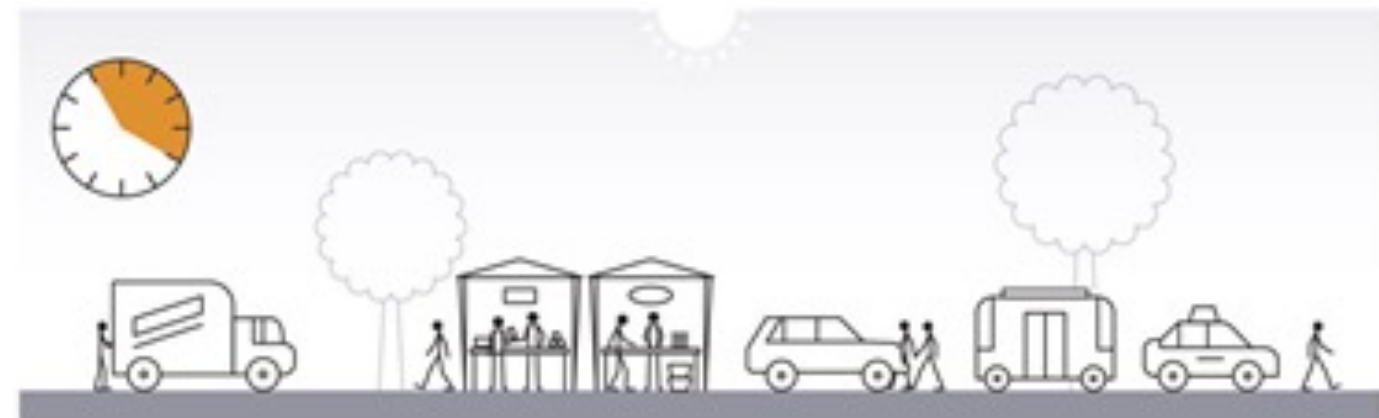
# The Curbside flex zones

It can play many roles – from public space to loading zones

*Graphic by Haisam Hussein based on NACTO data.*



**Morning – 6 a.m. to 11 a.m.:** Before the peak of the morning rush, **freight deliveries arrive to stock stores with their goods for the day.** By 7:30 a.m., delivery vehicles give way to vehicles dropping off employees, many enjoying breakfast or coffee in a parklet on their way to work.



**Midday – 11 a.m. to 4 p.m.:** Late morning brings **package and mail deliveries to businesses and residents.** At noon, the lunch rush begins, and workers head to street vendors for their midday meals. By 2 p.m., most diners are back inside and light delivery activity continues until the evening rush.



**Evening – 4 p.m. to midnight:** The evening rush stops delivery activity as **street and vehicle capacity is shifted to move people instead of goods.** Passenger movement continues into the evening as people grab dinner or drinks, pick up children, or head to events. Automated evening and late-night delivery activity allows for easy movement of large goods on underused streets.



**Nighttime – midnight to 6 a.m.:** Late at night the curb **prioritizes freight vehicles.** Passenger movement is at a **minimum** through the early hours of the morning, leaving more curb space for delivery services. Nearby storage lockers increase package delivery efficiency. In the morning, freight makes way for transit vehicles.

# The mobility +: mobility hubs and flex zones

## DYNAMIC USE OF KERB SPACE OVER THE DAY



15. Dowling et al., 2017. How much urban traffic is searching for parking?

«A mobility hub is a place where people can switch from one mode of transport to another with convenient facilities designed for a low-carbon society» from Future Mobility Hubs – Go Ahead and Arup 2020

**The Curbside Flex zones –  
from NEW MOBILITY AND URBAN SPACE, UITP  
(2020)**

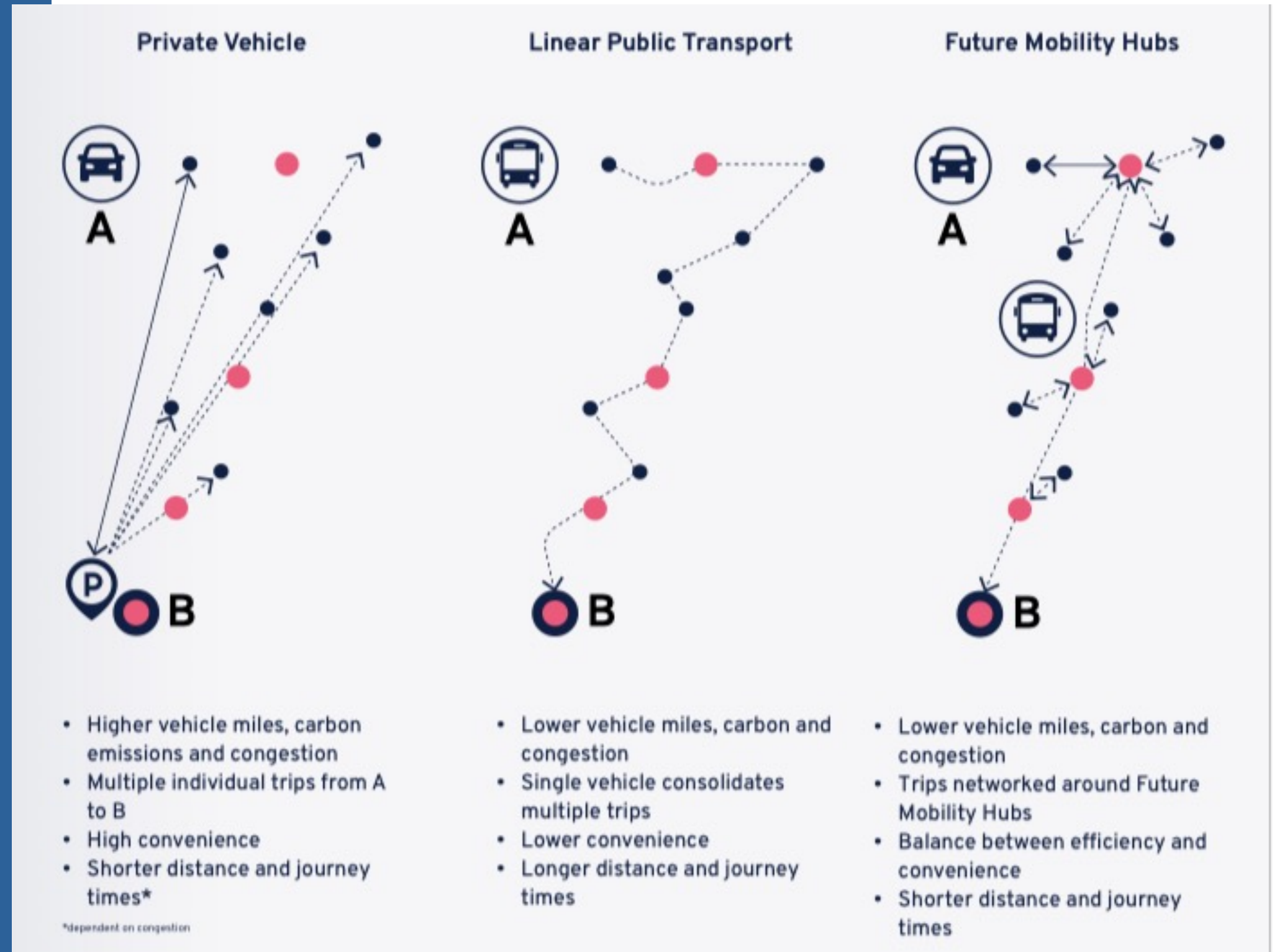


Mobility hubs are increasingly becoming an operational reality in several European cities, with working examples being seen in Belgium, Austria, Germany and Norway.

# Looking into the Mobility Hub of the Future

The Mobility Hubs of the future are developed around existing transport nodes, e.g. bus stops, railway stations/metro, car sharing hubs, also promoting active travel and avoiding necessary mobility

(Future Mobility Hubs – Go Ahead and Arup 2020)





# Future thinking cities

(Source Metropolitan Planning Organisation)



Thanks!



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