Valencia:
Analysis of the City and Site

TASK 1

25.08.2023
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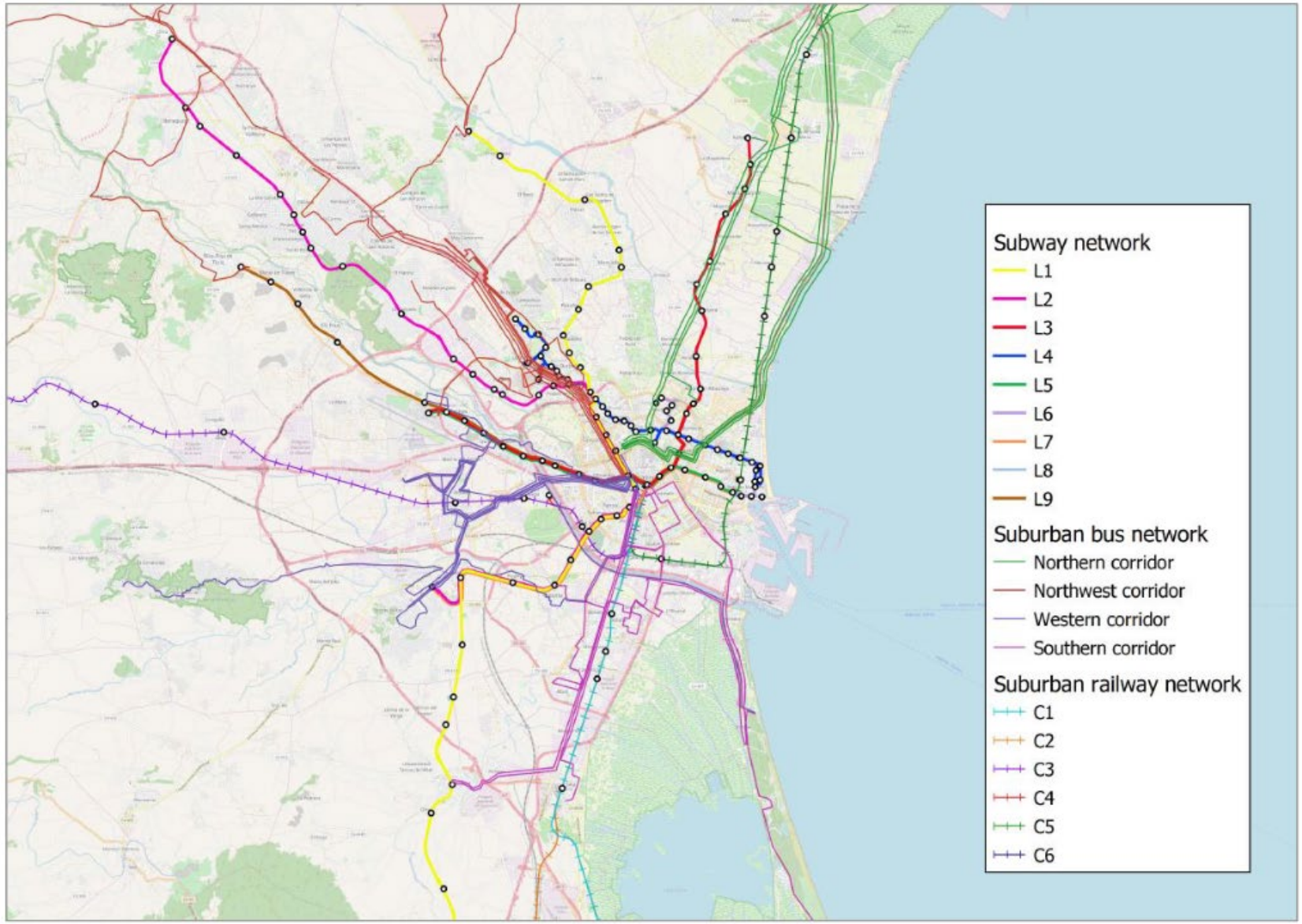
REGIONAL SCALE: **Existing Public Transport System**



Starting from the centre of the city, the public transport network in Valencia runs through **radial corridors** which are not linked one another; thus, municipalities located at different corridors are left with almost no connections between them.

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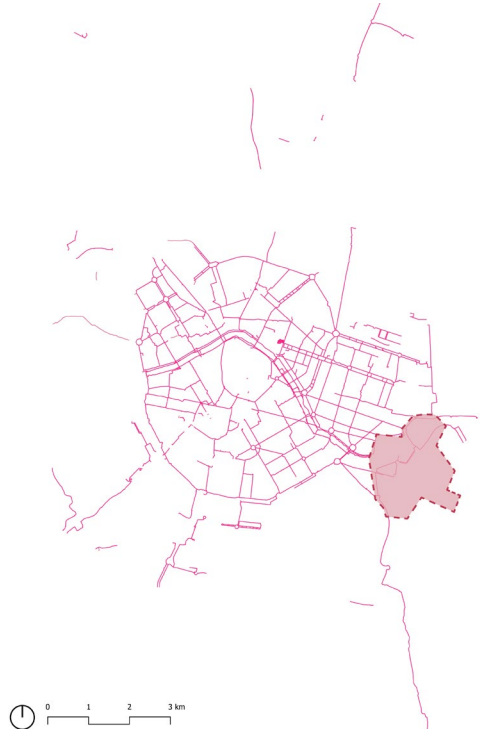
CITY SCALE: **Existing Public Transport System**

Railway connectivity

Bus connectivity



Bicycle connectivity

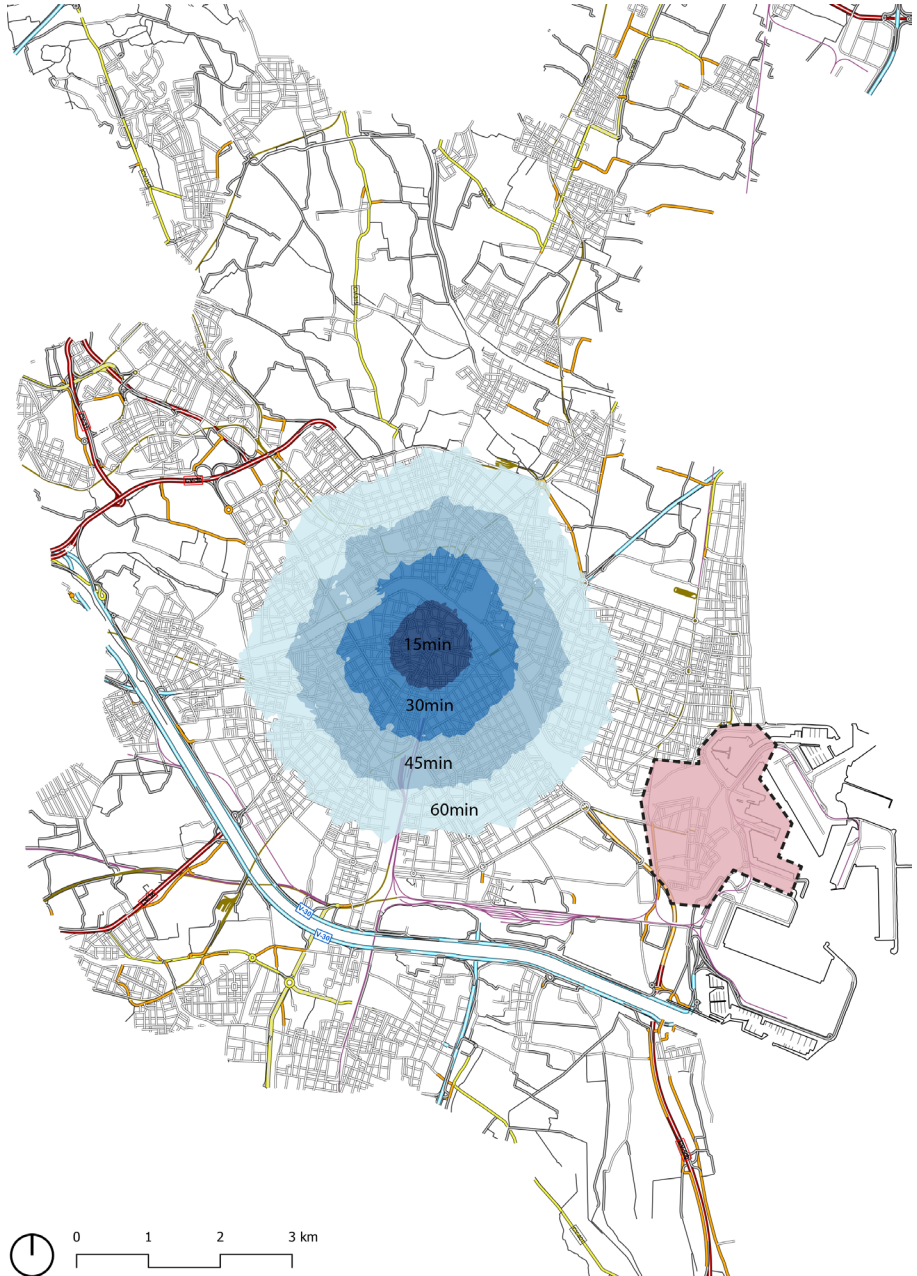
Proximity Metro Station

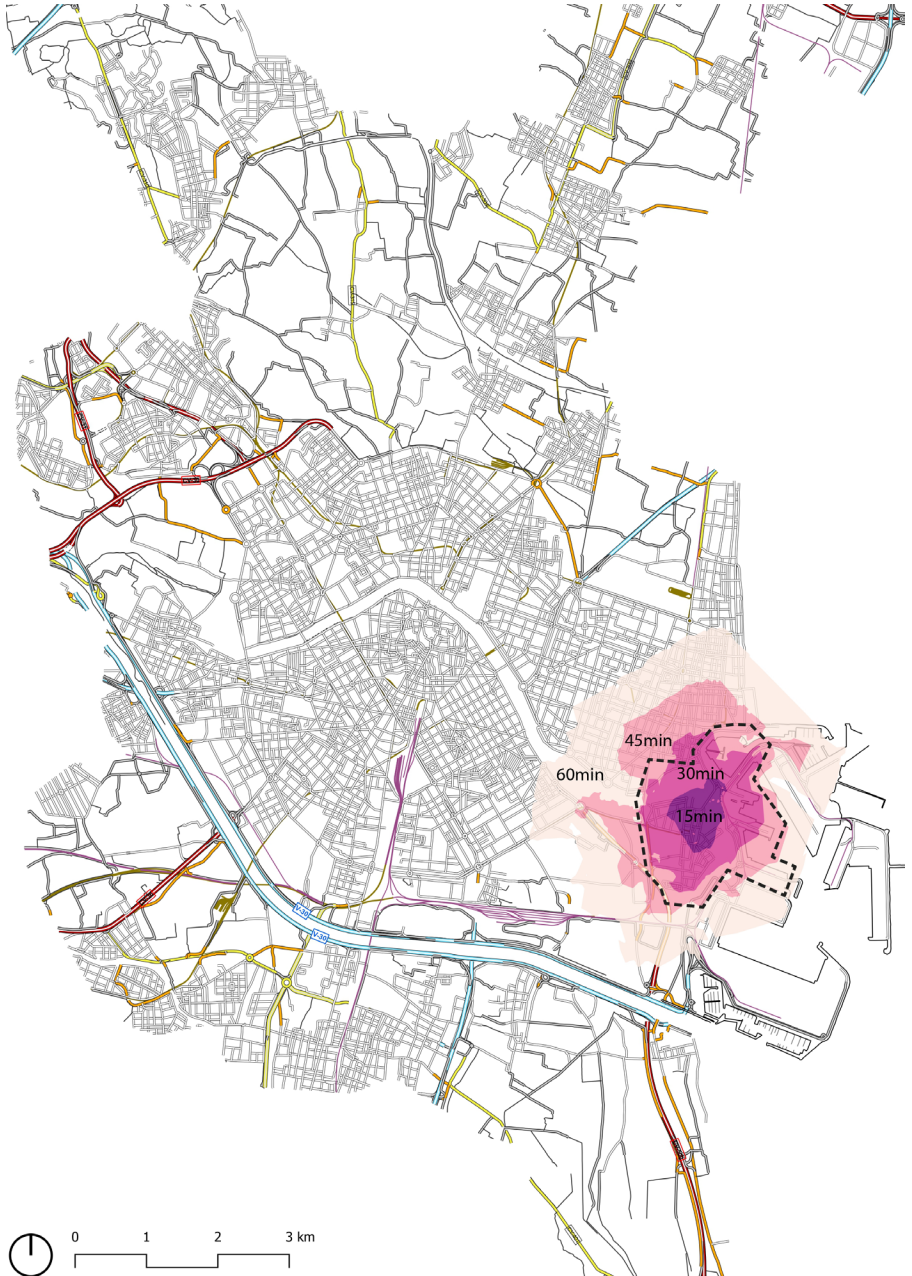
Proximity Bus Station

Proximity Bicycle network

Source: CARTO Builder

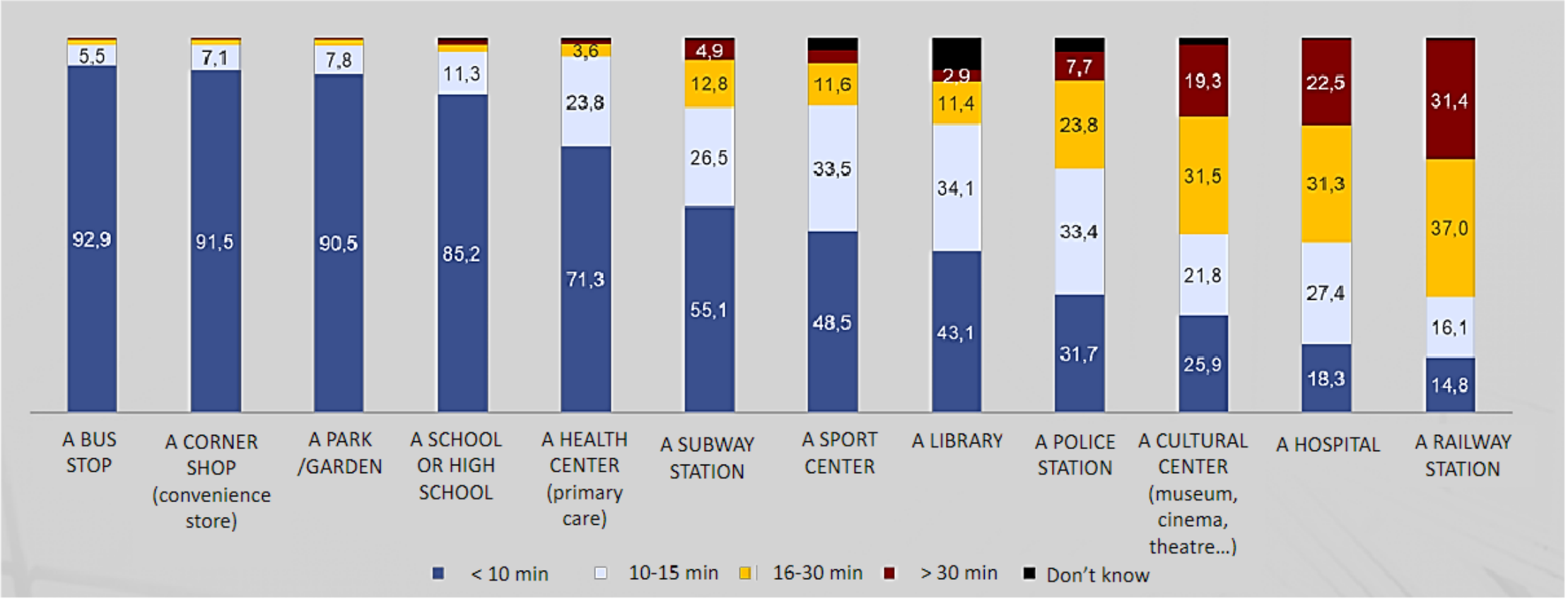
CITY SCALE: **PEDESTRIAN ACCESSIBILITY 15-60 min (isochrones)**





CITY SCALE: **TRAVEL TIME TO KEY POINTS OF INTEREST**

How long does it take you to go on foot to the following facilities/services from your home?



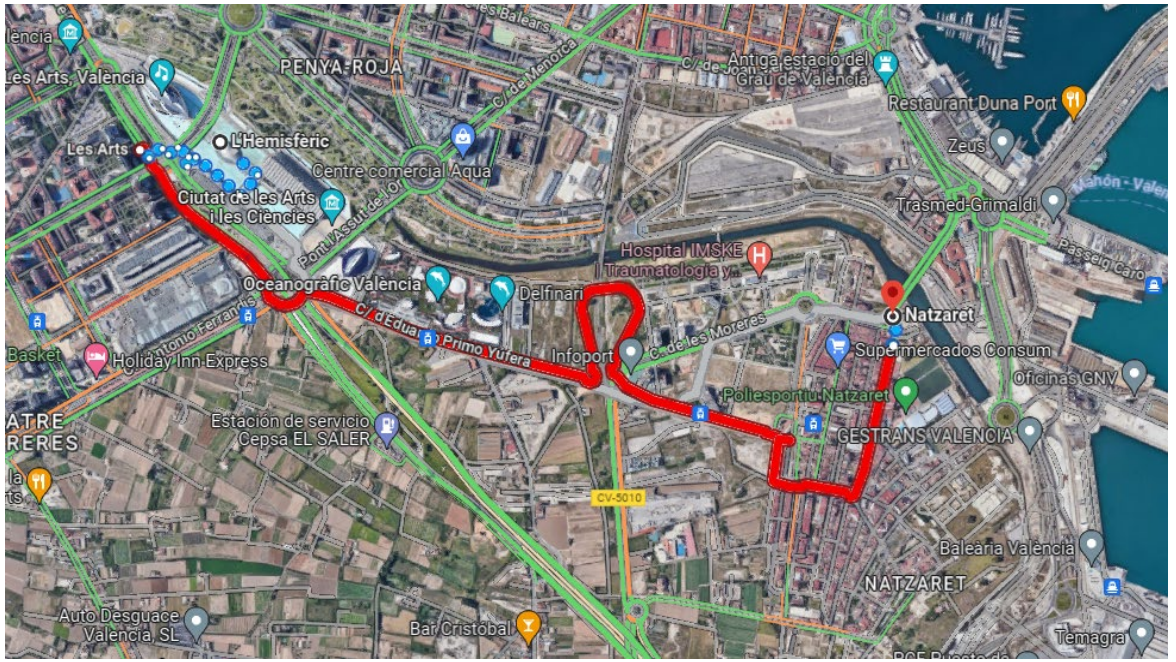
Barometer Valencia: https://www.valencia.es/es/cas/estadistica/barometro-municipal

CITY SCALE: **KEY POINTS OF INTEREST**

Date of traveling:
Wednesday 8:00 AM

22 min | **40 min** | 1 h 5 | 19 min

Inner City center
& La Lonja Selda (UNESCO) & Mercado Central
& St Nicolas de bari
& a lot of other attractions in the city center



L'Hemisfèric (Museo) & Umbracle

8 min | **23 min** | 31 min | 9 min

10 min | **34 min** | 39 min | 12 min

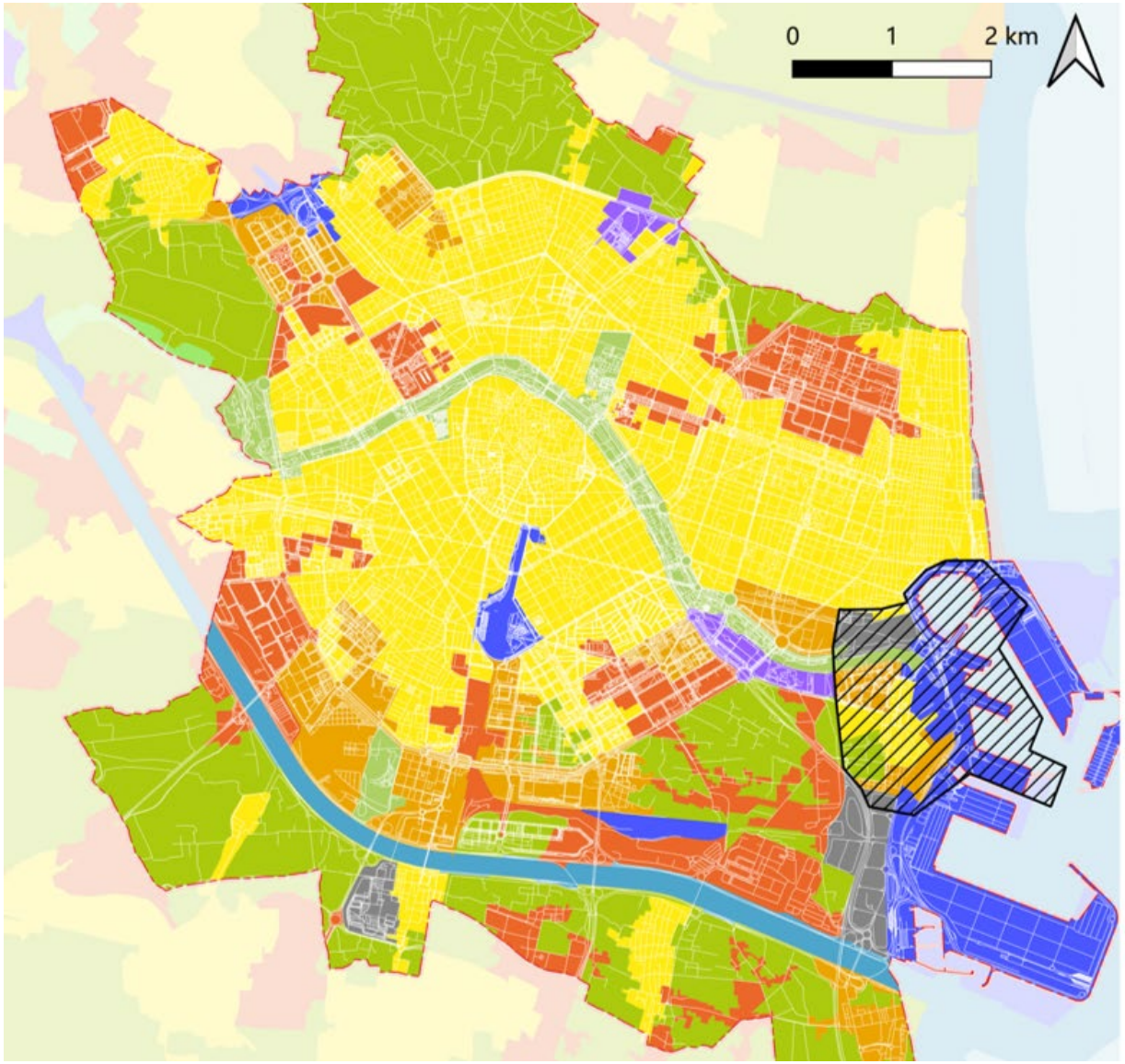
Politecnica VLC

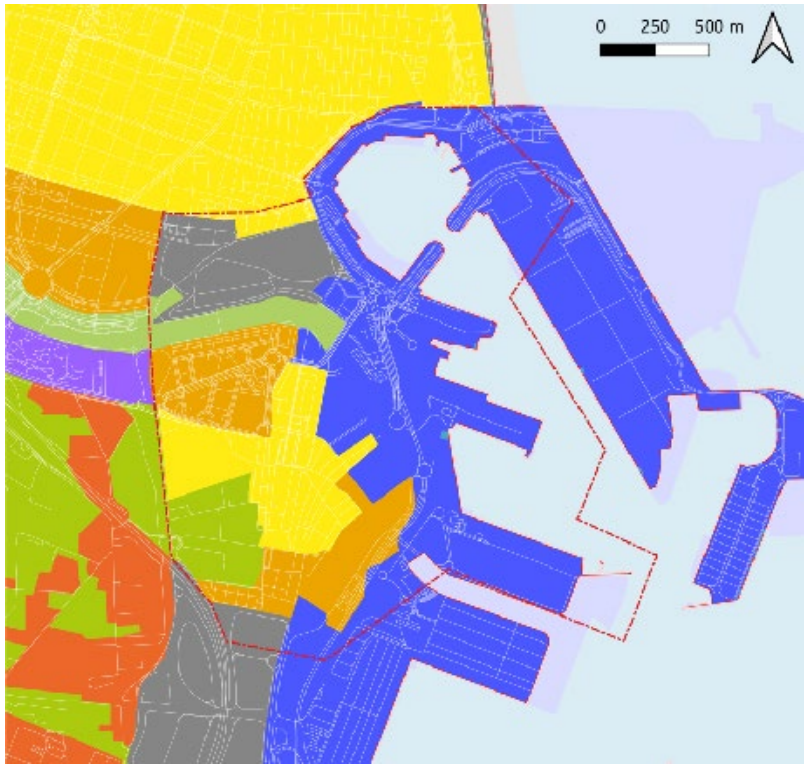
6 min | **33 min** | 28 min | 9 min

Beach

Source: Google Maps.

CITY SCALE: **SETTLEMENT STRUCTURE**



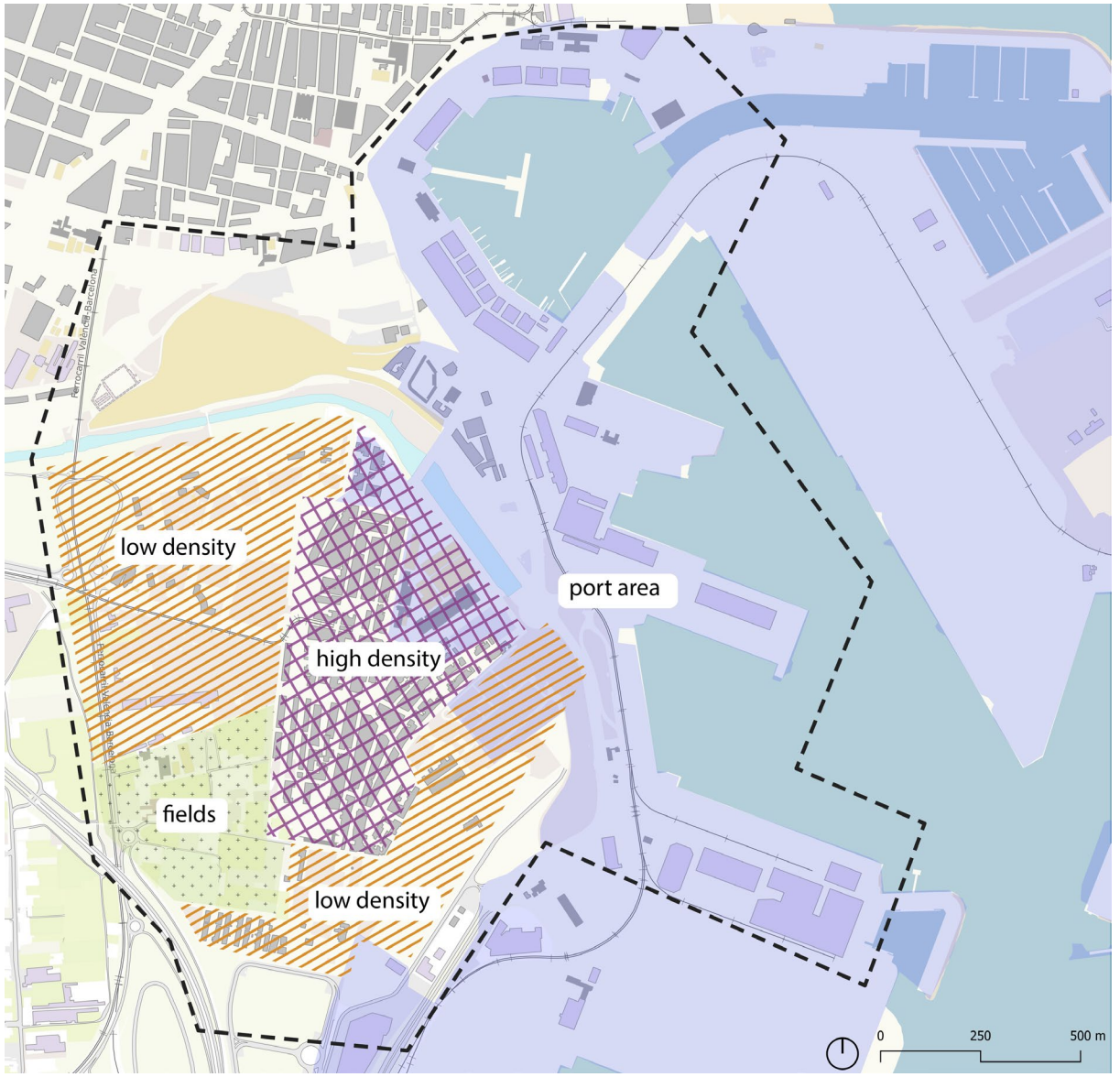


boundary of city
boundary of site

agricultural land
continuous urban fabric
discontinuous urban fabric
forest
grassland
industrial or commercial zones
others
sports and recreational space
transportation
urban green space
water

SITE: **DENSITY**

High-density area

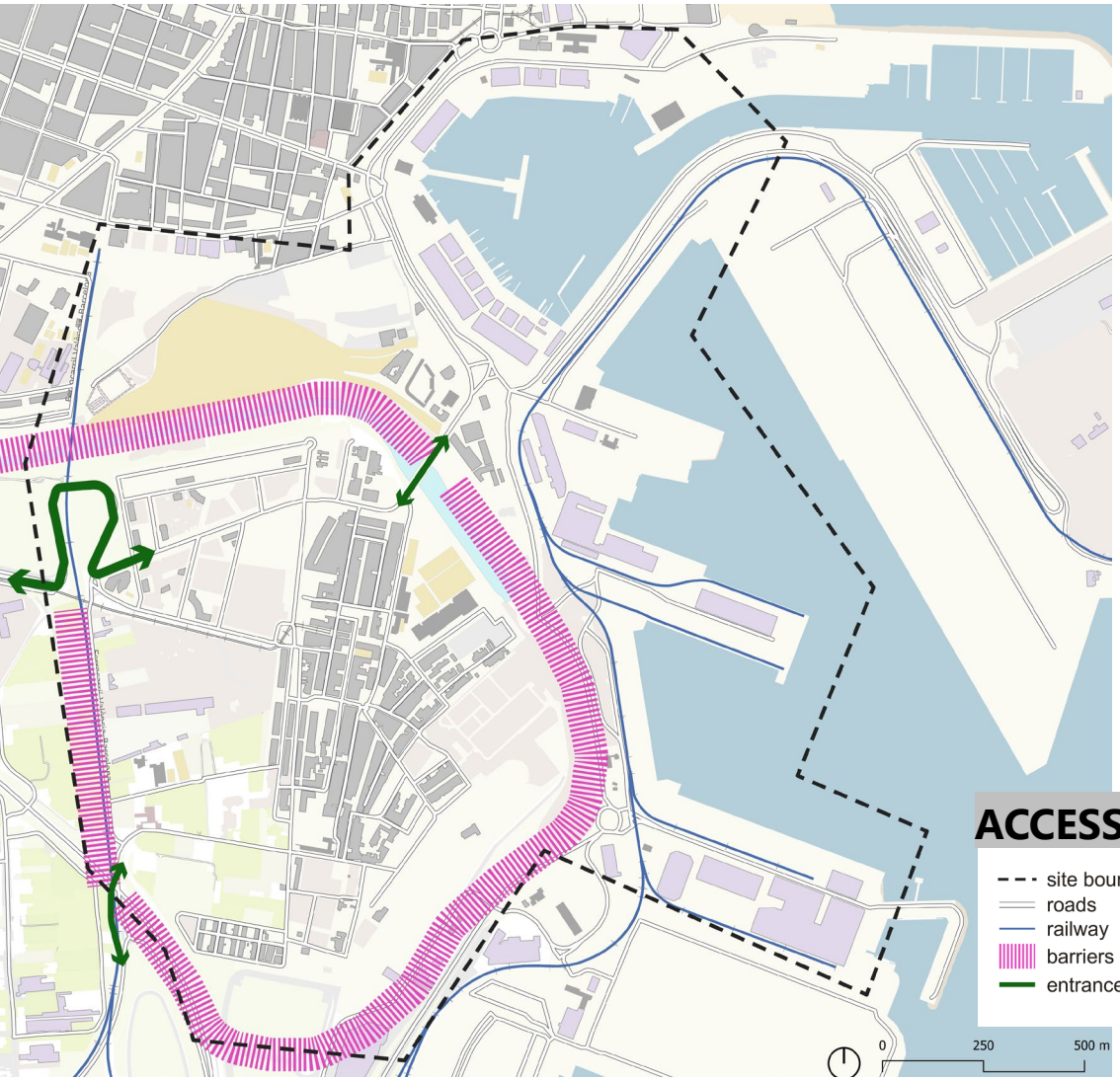


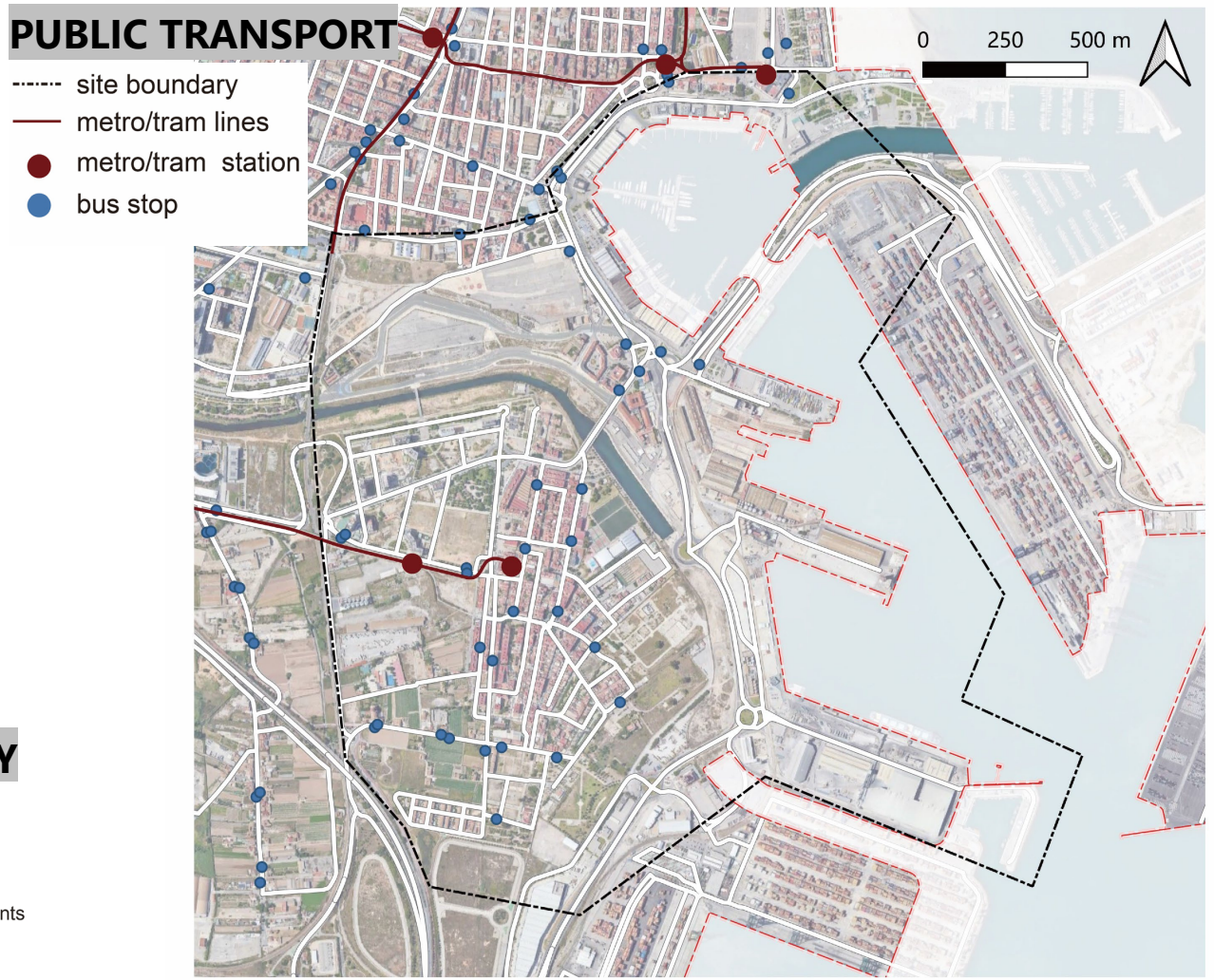
Low-density area

Agricultural area

Port area

SITE ANALYSIS: ACCESSIBILITY & PUBLIC TRANSPORT





SITE ANALYSIS: ACCESSIBILITY & PUBLIC TRANSPORT

Occupied by car, lack of space for pedestrians and cyclists

SITE ANALYSIS: ACCESSIBILITY & PUBLIC TRANSPORT

Lack of accessibility

SITE ANALYSIS: ACCESSIBILITY & PUBLIC TRANSPORT

Lack of accessibility across waterbody

SITE ANALYSIS: ACCESSIBILITY & PUBLIC TRANSPORT

Blank walls next to social spaces

SITE ANALYSIS: ACCESSIBILITY & PUBLIC TRANSPORT

Change of landscape towards the south of Nazaret

SITE: **MOBILITY BEHAVIOUR**

19 administrative districts

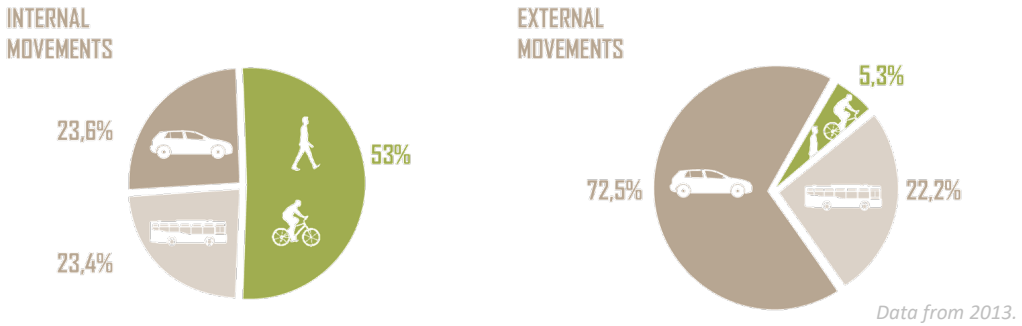
and each district is divided up into several quarters

Transportation Hubs	**Central Business District (CBD)**	**Residential Areas**	**Recreational and Entertainment Zones**	**Industrial Zones**	**Educational Institutions**	**Medical Facilities**
Mercat Central, Aeropuerto	**Benimaclet**	**Ruzafa**	**Jardines del Real, Marítimo**	**Polígono Vara de Quart**	**Blasco Ibáñez**	**Hospital Clínic Universitari**
Train station, bus terminal. airports	Public transportaton networks	Adequate roads, sidewalks, and cycling lanes	Accessible and convenient public transportation	Efficient road connections and transportation networks	Safe pedestrian routes and well-organized bus stops	Ambulance routes and well-connected public transport
Requires effecient connections	High level of commuting from and to work	Daily commute	Non-commuting mobility	Freight and logistics traffic	High mobility during specific times of the day	Non-commuting but easy access

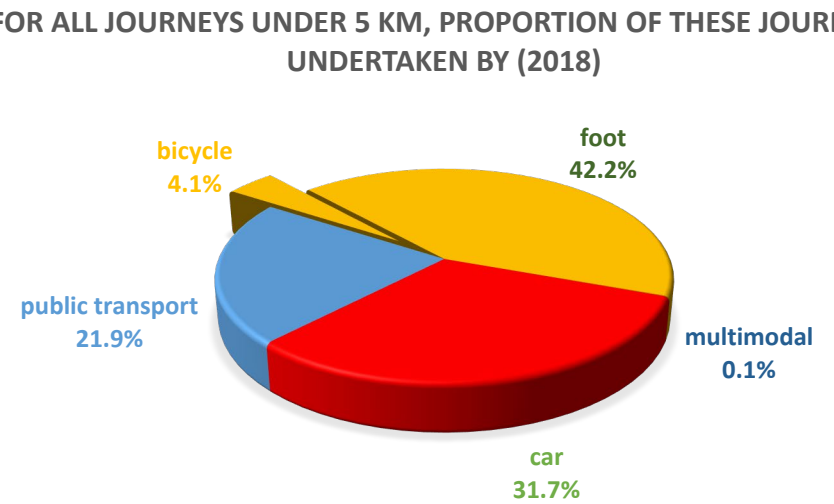
Turia River Park

The gardens repurpose a diverted riverbed to create a green corridor that connects different parts of the city, providing pathways for pedestrians and cyclists.

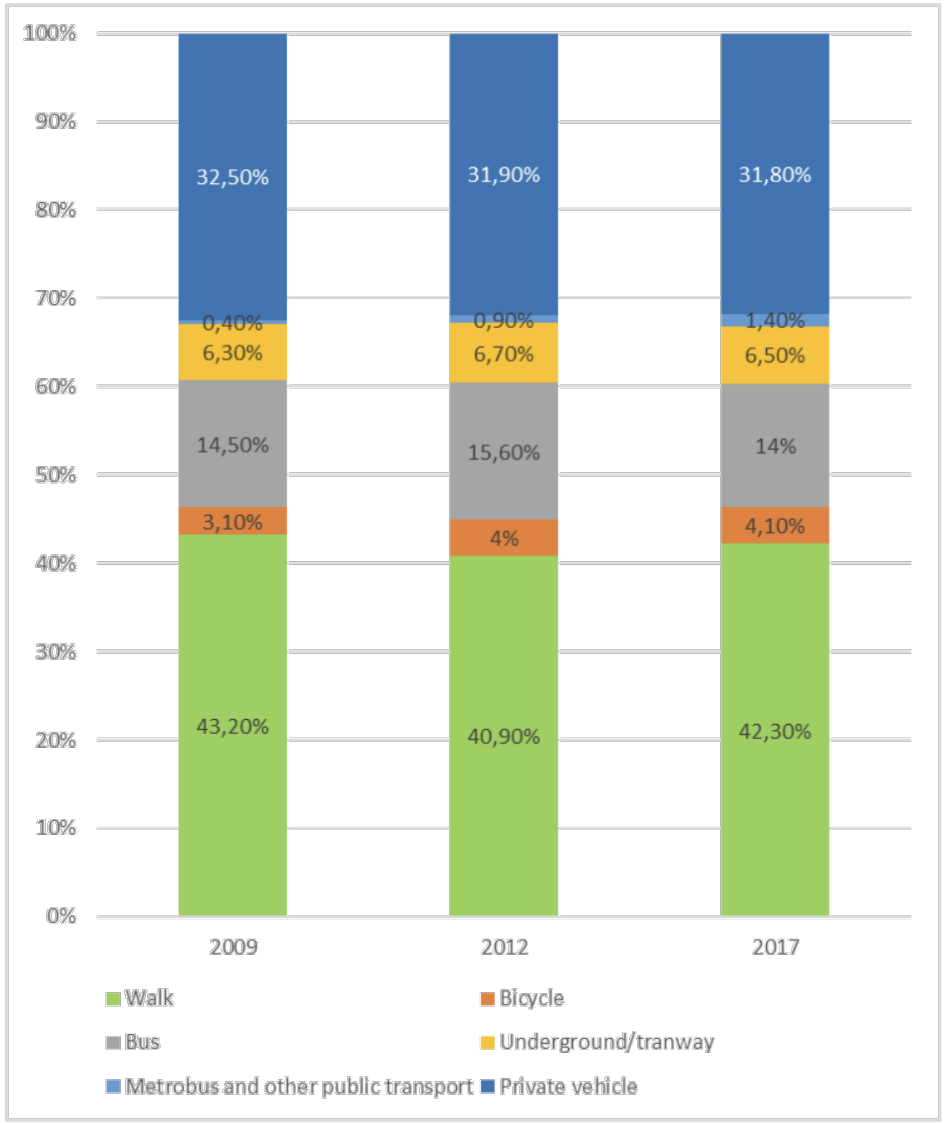
CITY: **MODAL SPLIT**



Car Usage for external movements dominates.



Even in short-distance travel, bicycles are still hardly used.



Source: GREEN CAPITAL VALENCIA indicators application_Indicator 10_MOBILITY

Sustainable Metropolitan Mobility Plan for the València Area

CITY: **MODAL SPLIT**

Vehicle Fleet	
Total	473946
Cars	354200
Private cars	329157
Per 100 inhabitants	**41.3**
Buses	876
Trucks	21662
Tractors	6979
Trailers	7132
Motorcycles	63198
Mopeds	19899

Public Transports (Weekdays)	
People transported by metro	42819679
People transported by EMT	58328394
People transported by metrobus	6821413
Taxi ranks	124
Length of bike lanes	**168km**
Average number of trips by public bicycle.	**11127**

- Car ownership is quite high.
- Cycling share is rather low.
- Length of bike lanes is quite short. Compared to a small size town in Netherlands, the length of bike lanes is 128km.

Source:Resumen Estadístico de la Ciudad de València (Recull) 2022

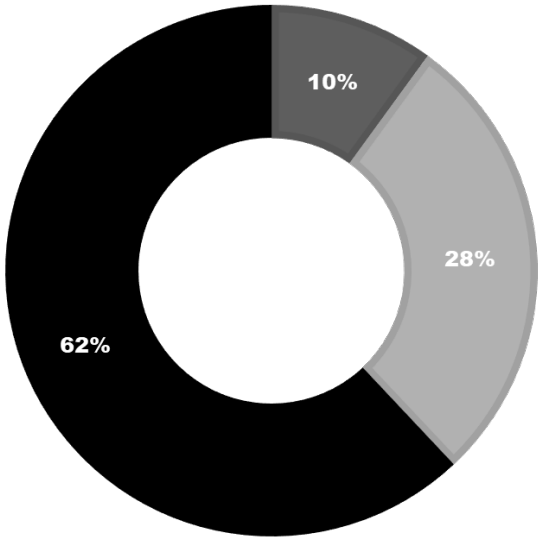
CITY: **EXISTING AND ONGOING PLANS 2020/2030**

Energy Strategy 2020/2030: Envisions Mobility with **50% Reduction of Vehicles**

Synergies with: Energy & Social Infrastructure

INTERNAL MOVEMENT

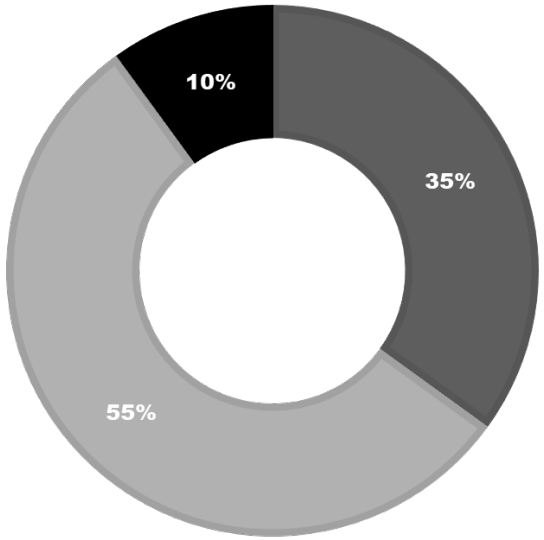
■ Private vehicle ■ Public Transport ■ Pedestrian and bicycle



62% will be Pedestrian and bicycles for internal movement

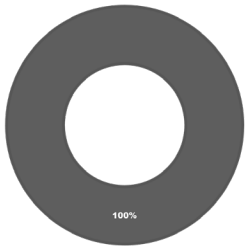
EXTERNAL MOVEMENT

■ Private vehicle ■ Public Transport ■ Pedestrian and bicycle

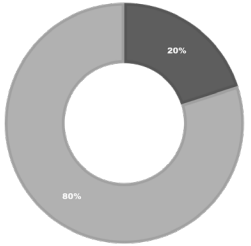


55% will be Public transport for external movement

ELECTRIFICATION



100% Municipal Electric Vehicles



20% Private Electric Vehicles

350 charging points

Source: Mobility Targets set for 2030 in Energy Strategy 2020/2030. Source: Valencia City Council

CITY: **TOWARDS a (+) sustainable mobility in Valéncia**

A City That Walks

A City of Bicycles

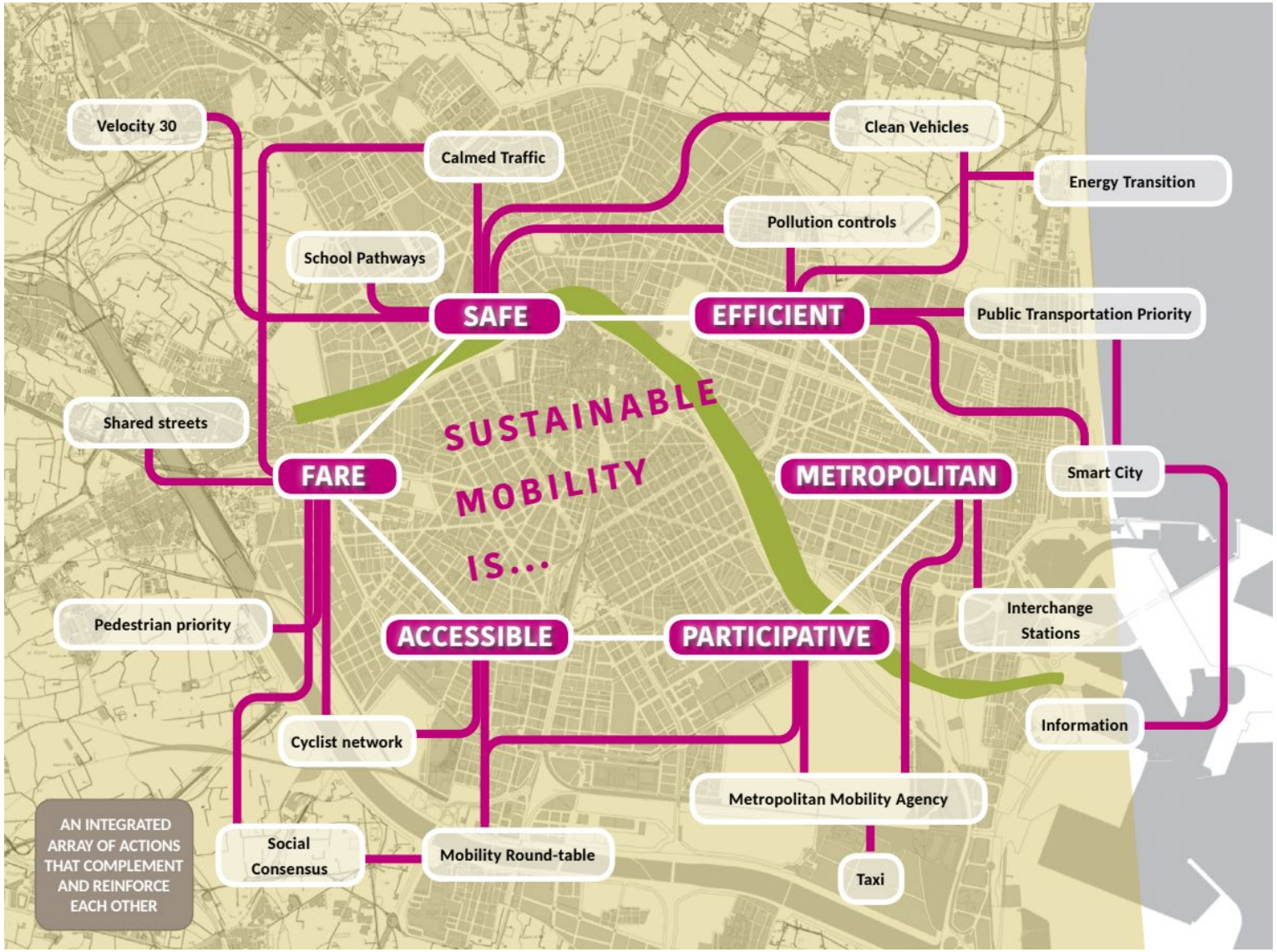
Public Transport Priority

Rational use of Motor Vehicles

Safer Mobility

Intelligent Mobility

Participative Mobility



Source: Valencia Sustainable Urban Mobility Plan. Source: Valencia City Council

FURTHER STEPS & QUESTIONS

1. As the Study area appears fragmented and disconnected, further developed tools will focus mainly on solving this issues
2. Identify any plans for the usage of ferries or boats for public transport at our site
3. Explore other challenges and opportunities in cross-teams
4. Integrate additional information from other groups into our toolkit

KEY CONSIDERATIONS:

Accessibility

Speed limitations

Materials

Cycling routes

Shared space

Public transport development

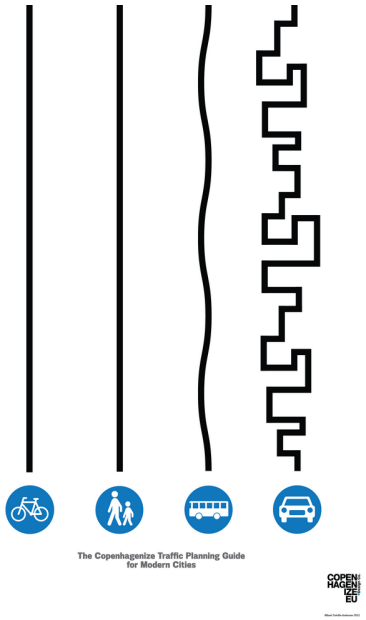
Smart solutions

Car/bike-sharing

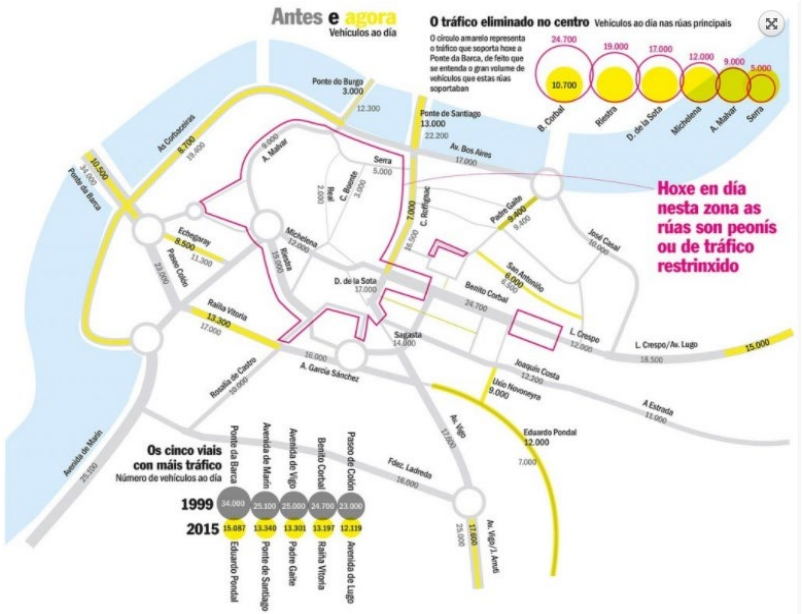
Sustainable solutions

CASE STUDIES, LEARNINGS & SYNERGIES

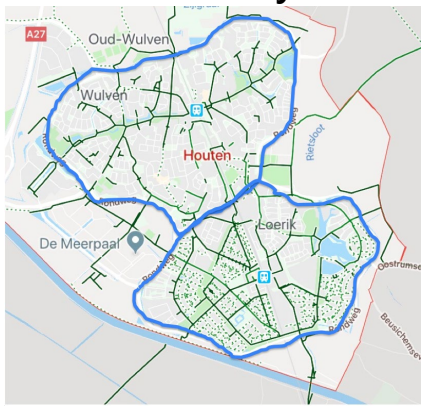
1.Paris, France: The 15-Minute City | more options for travel distance | **Social Infrastructure & Mobility**



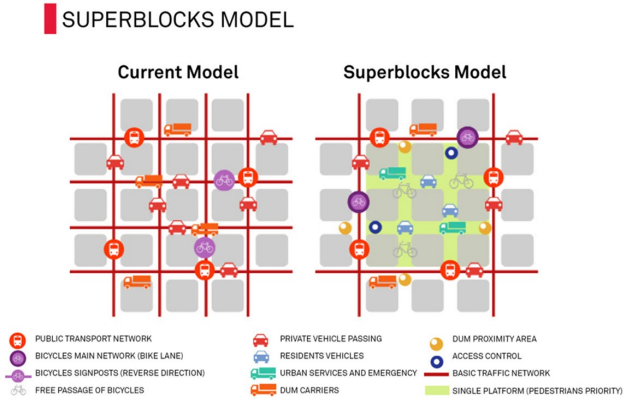
2.Copenhagen, Denmark: meeting diverse needs | **Social, Blue & Green Infrastructure & Mobility**



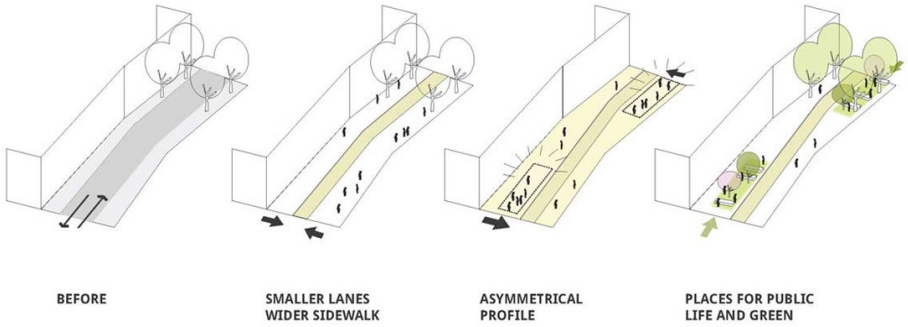
3.Pontevedra, Spain: Pioneer of car free city centers | **Housing, Social Infrastructure & Mobility**



4.Houten, Netherlands: Holistic cycling- and pedestrian oriented design | **Social Infrastructure & Mobility**



5.Barcelona, Spain: Superblocks | **Social and Energy Infrastructure, & Mobility**



6.Vienna, Austria: Redesigning “Mariahilfer Straße” | **Social Infrastructure & Mobility**

TOOLBOX: **MOBILITY INFRASTRUCTURE**

OVERARCHING GOALS

1. Reduce private cars
2. A strong sharing system of bikes (& cars)
3. Reduce traffic because of deliveries

TOOLBOX: **MOBILITY INFRASTRUCTURE**

TOOLBOX GOALS		**General Aspects of Modal Split on a balanced level**	**Strong public transport network**	**Attractive walkable network**	**Attractive bicycle network**	**Reduce number of private cars**	**Sustainable and eco-friendly Cargo & Delivery systems**
MEASUREMENT of Status quo ***Is it possible to measure it by indicators? e.g. parameters for distances***	quantitative	- **Number of network layers** - **Access** to public transport within 500m	- Variety and number of public transport vehicles (metro, bus,tram)) - -integrated fare system - "Bonometro"	- Width of Sidewalk - No. of Obstructions - Adequate public seating - Percentage of shaded areas - No. of streets with reduced vehicle speed - No. of crosswalks	- Coverage percentage of parking space and cyclists service - Coverage percentage of green, blue and commercial interfaces in bike lanes - Percentage of number of two-, three-, and four-lane roads	- No. Of shared vehicles - Parking fees	- time of delivery - number of transitio ns - Wait time - Amount of emissions - N of damages
	qualitative	- **Intersection** / knots of those networks *(multi modal spots or is every network existing for itself?)*	- Intersection of networks - Distance to transport network - .Pedestrian crossing	- Presence of Plants/Trees - Lighting - Traffic calming features - Human social interaction opportunities/activities	- Riding accessibility to metro and bus stops - Condition of a cyclist hitting a red light - Occupation condition of road space by cycling and driving	- Traffic light timing - No. of Parking space - Distance between gas stations - Separating slower and faster modes of transport	- type of fuel - Circularity (materials) - carbon footprint - costs
TOOLS in order to improve		Create **multi-modal hotspots /terminals /mobility hubs** within the city *(probably such as the main Station in every city – but more of them).*	-Should be accessible and for everyone -Expand and upgrade infrastructure -Integrated transport planning -Implement real-time tracking, increase frequency .	- Pacification of internal roads (Social Activities) - Expand areas devoted to pedestrians - Implement 30 zones - Safe mobility to schools - Publicise benefits of walking	- Enhancing travel convenience through parking space, services, transition possibilities and riding-friendly traffic light - Enhancing the diversity of the cycling experience by passing through more green space, blue space and commercial interfaces - Improving safety by addressing the relationship between cycling lanes and drivingroad and increasing the number of cycling lanes	- Parklets creation - Cul -de-sacs Repurposing - Improvement of the traffic signal timing on individual roads - Use span to separate slower and faster modes - In each neighborhood there's a carsharing point and charging piles - Car free zone	• Multi-Modal Freight Terminals • Last-Mile Delivery Robotics and Drones • Eco-Friendly Packaging • Certification System for emissions monitoring • Behavioral Apps • Smart Route Optimisation

GOAL 1: **General Aspects of Modal Split on a balanced level**

Goal	Aspects	Measurement of status quo	Tools	Relation to other infrastructures
Sustainable Modal Split	**Accessibility**	How many people have access to the public transport system within 150 m?	**Have at least one accessible public transport system within 150m.**	
		How many different networks of modalities are there?	**Providing more options, developing micro-mobility, car/bike-sharing, jeli station**	Social infrastructure
		Costs	**Have a balance between affordable public transportation costs & usage of sustainable energy**	Social Infrastructure
	Sustainability	Ratio of Pedestrian – cars – bikes – public transport	**25/25/25/25**	
	Time	How much time differences do we have in-between the different modals?	**Have a balanced network, emission free networks should be more attractive**	
	User Groups	Who is Using the different networks?	**Create a safe space for all categories, including women, elder generation, kids, disabled etc**	Social Infrastructure

Jelbi station: Multimodal transition, micromobility promotion

Mobility hub: Different scales for multimodal transition

GOAL 2: **Strong Public Network**

Goal	Aspects	Measurement of status quo	Tools	Relation to other infrastructures
Strong Public Transport Network	Speediness	Average travel time, On-time performance	**Calculating departure and arrival times and defining acceptable thresholds**	Energy infrastructure
		Average frequency and waiting time	**Identifying discrepancies for the actual and estimated travel time**	Energy infrastructure
	Convenience	Number of shared vehicles	**Planning more integrated modes of travel**	Blue and Green infastructure
		Coverage percentage of transport network	**Making every (key) area well-connected**	Social and Housing infrastructure
	Security and Comfort	Incident rate, Number of vandalism and crime	**Implementing more security measures**	Social inrastructure
		User Experience	**Providing amenities like Wi-fi, charging station**	Energy and Social infrastructure
	Expense	Ticket fees	**Evaulating and adjusting the fare structure (Regular commuters, student, seniors)**	Social infrastructure
		Tourism	**Ensuring public transport is the most desirable option for (Transport Pass)**	

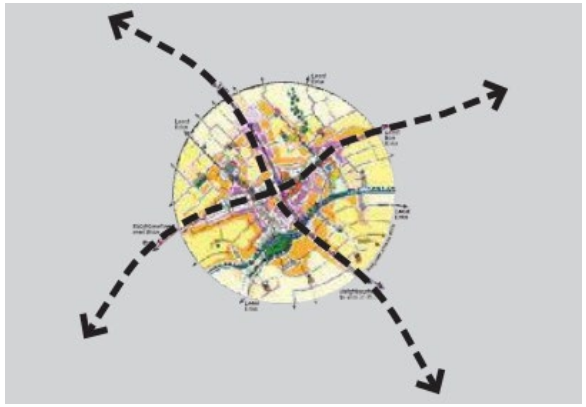
Accessibility

Measurement: Coverage of area, walking distance from public transportation, percentage of inclusivee facilities

Each and every areas with access of bus,tram,metro and cycle network

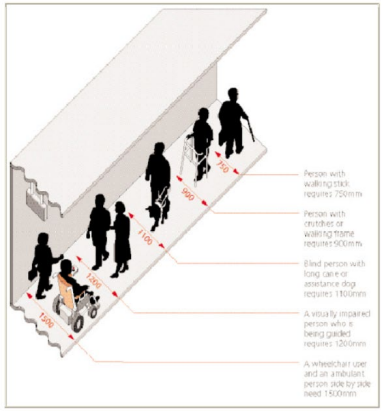
Extend metro and tram lines to cover underserved areas, especially suburbs and neighborhoods with high population density.

Source_ Design Manual For Urban Roads and Streets



Entire population including people with reduced mobility

Provide tactile paths, ramps, elevators and audible annpuncements for visually impaired passengers



Source: gov.uk Guidance Inclusive Mobility

Integrated Transport Planning

Measurement: Number of connected services, average waiting time and delay/arrival on time

- Foster collaboration between different transportation authorities
- Increase the frequency of buses, trams and metro services
- Implement real-time tracking, minimize waiting time

GOAL 3: **Attractive Walkable Network**

Goal	Aspects	Measurement of status quo	Tools	Relation to other infrastructures
Attractive Walkable Network	**Diversity**	Density of Opportunities/Activities for human social interaction	**Pacification of internal roads**	Social Infastructure
		Ease of walking (Ratio of faciltation & obstructions)		
	Comfort	Percentage of shaded areas	**Expand areas devoted to pedestrians on streets**	Social Infastructure Green Infastructure
		Width of sidewalk		
	Safety	No. Of crosswalks/intersections around educational buildings	**Safe mobility for children**	Social Infastructure
		No. of streets with reduced vehicle speed	**Implement 30 zones**	Housing Infrastructure
	Convenience	Tracking pedestrian usage on internal streets	**Reduce external vehicles in residential areas by rerouting traffic**	Housing Infrastructure
		Percentage of people choosing to walk – before and after	**Publicise Benefits of Walking**	Social Infastructure

Shared Street

Mariahilfe strasse transformation:
Shared space for pedestrians and cars

Change of materials, reduction of speed, narrowing the lane, addition of furniture

GOAL 4: **Attractive bicycle network**

Goal	Aspects	Measurement of status quo	Tools	Relation to other infrastructures
Attractive bycicle network	**Convenience**	Coverage percentage of parking space (Length of cycling paths/number of parking spots)	**Parking Space**	Housing infrastructure Social infrastructure
		Coverage percentage of cyclist service facilities (Length of cycling paths/number of service points)	**cyclists service**	Energy infrastructure Social infrastructure
		Riding accessibility to metro and bus stops	**Transition possibility**	
		Condition of a cyclist hitting a red light	**Riding-friendly traffic light**	
	Diversity	Coverage percentage of green interfaces in bike lanes	**Green interfaces**	Green infrastructure
		Coverage percentage of blue interfaces in bike lanes	**Blue interfaces**	Blue infrastructure
		Coverage percentage commercial interfaces in bike lanes	**Commercial interfaces**	Social infrastructure
	Safety	Occupation condition of road space by cycling and driving	**Different types of cycling lanes**	
		Percentage of number of two-, three-, and four-lane roads	**Number of cycling lanes**	

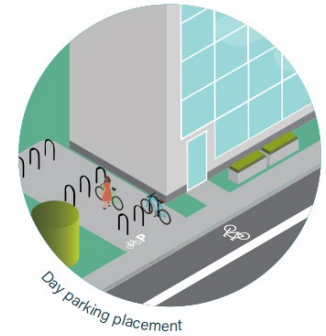
GOAL 4: **Attractive bicycle network**

Convenience： Enhancing travel convenience through parking space, services, transition possibilities and riding-friendly traffic light

1.Parking Space

temporary

24h



long-term

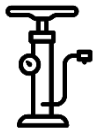
transition

Source: The Micromobility Planning Toolbox of Copenhagen

2.Cyclist service

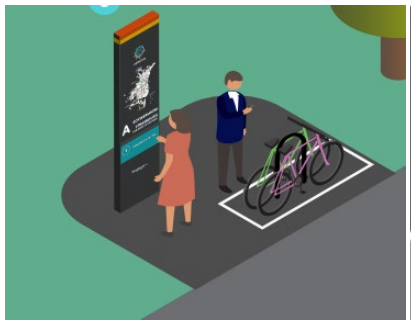
Repairing

renting



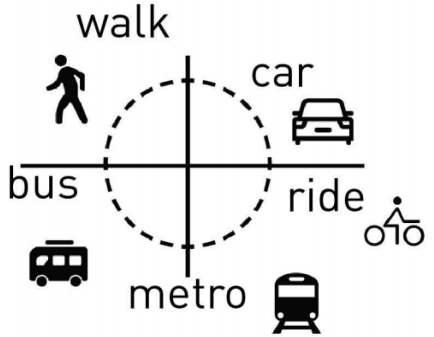
pumping

Wayfinding boards

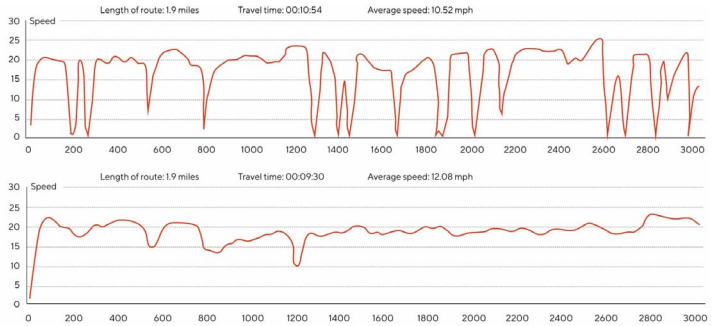


Source: The Micromobility Planning Toolbox of Copenhagen

3.Transition



4.Riding-friendly traffic light



Source: Copenhagenize Design Company

Diversity： Enhancing the diversity of the cycling experience by passing through more green space, blue space and commercial interfaces

1.Green interfaces

- parks
- forests
- playground
- ……

2.Blue interfaces

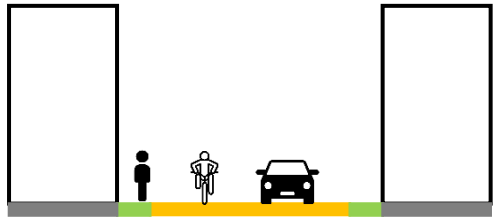
- near river
- near lake
- near sea
- ……

3.Commercial interfaces

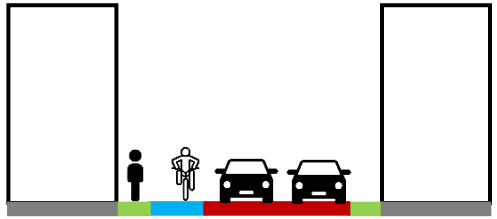
- cafe
- convenience stores
- clothes stores
- flowers stores
- ……

Safety: Improving safety by addressing the relationship between cycling lanes and drivingroad and increasing the number of cycling lanes

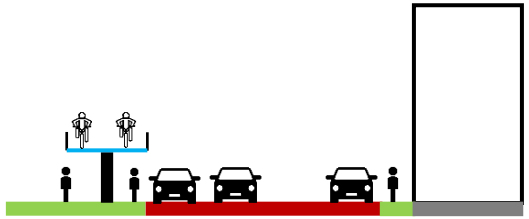
1.Types of cycling lanes: according to the traffic flow and road width



Shared streets

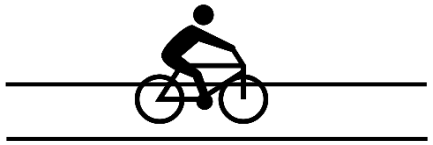


highlighted streets



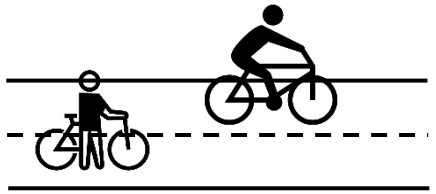
separated streets

2.Number of cycling lanes: providing lanes for different speed requirements



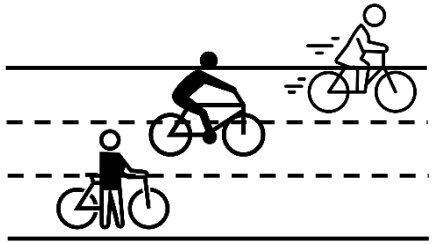
one lane

riding lane



two lanes

riding lane
stopping lane



three lanes

overtaking lane
riding lane
stopping lane

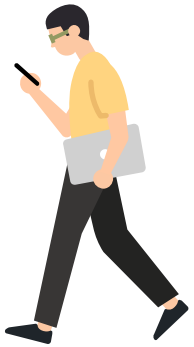
GOAL 5: **Reduce Number of Private Cars**

Goal	Aspects	Measurement of status quo	Tools	Relation to other infrastructures
Attractive Car Sharing Systems (Non-Traffic	**Convenience**	Number of shared vehicles	**In each neighborhood there's a carsharing point and charging piles**	Housing & Energy & Social infrastructure
		Number of parking space	**Use neighborhood's garage**	Housing & Social infrastructure
		Traffic light timing	**Improvement of the traffic signal timing on individual roads**	Social infrastructure
	Expense	Parking fees	**Parking fee discount for shared vehicles**	Social infrastructure
	Speediness & Traffic	Separating slower and faster modes of transport	**Use span to separate slower and faster modes**	
			Speed limitation in some roads (Filtered Permeability)	
	Safety	Integrated with pedestrians and cyclists	**Pedestrian and cyclist first rule**	Social infrastructure
			Car free zone	Housing & Social infrastructure
			Transition zone to other modals	Housing & Social infrastructure

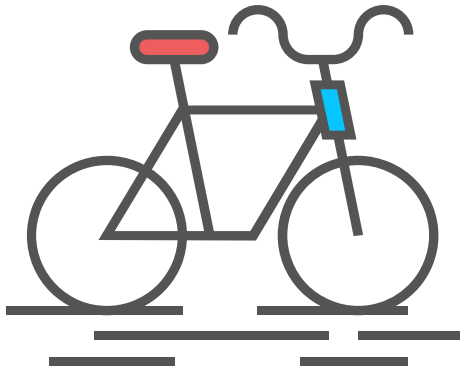
Reduce Number of Private Cars

User Priorities

Measurement: To encourage more sustainable travel patterns and safer streets, designers must place pedestrians at the top of the user hierarchy



Pedestrians



Cyclists

Public transport

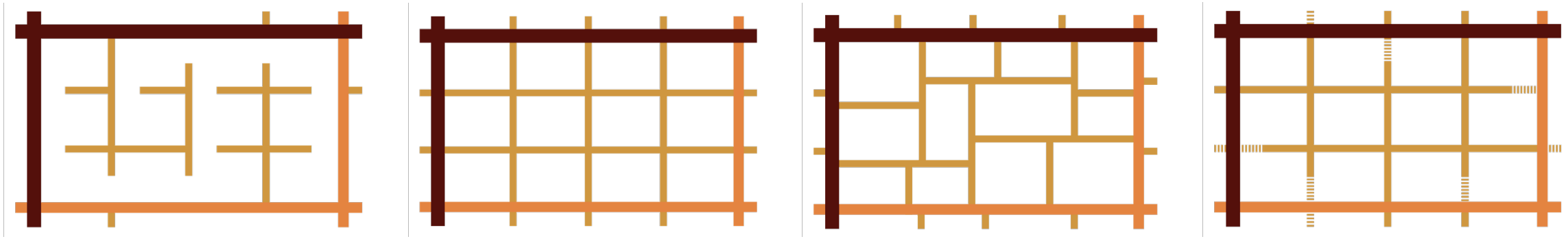
Motor Vehicles

Consider First **Consider Last**

Reduce Number of Private Cars

Integrated street networks (Vehicle Permeability)

Measurement: Integrated networks do not require the same degree of restrictions to be placed on the movement of vehicles as is applied to more conventional/segregated networks.



Dendritic Network | **Open Network** | **3 Way Off-set Network** | **Filtered Permeability Network**

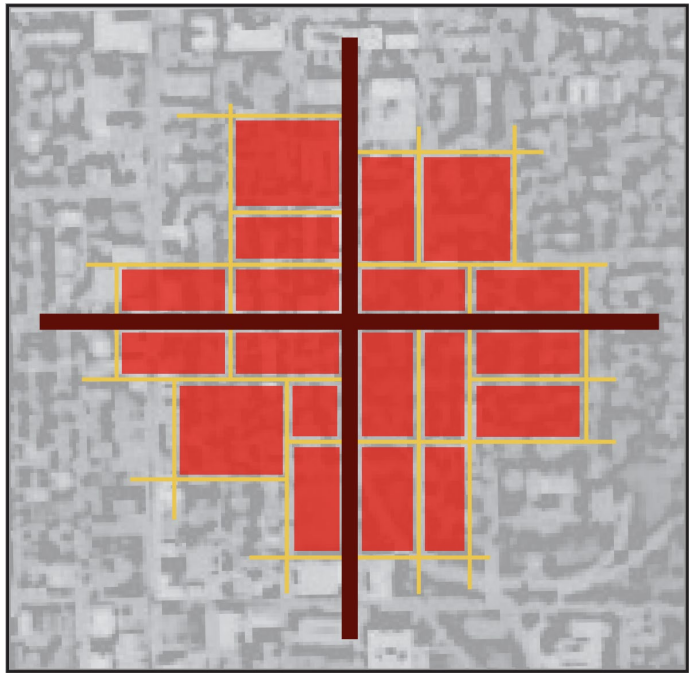
A network of integrated/self-regulating streets provides the framework for higher levels of accessibility for slow modes (including motor vehicles at slow speed) and strategic continuity for cross-network modes at more moderate speeds (such as public transport)

Source: Design Manual for Urban Roads and Streets

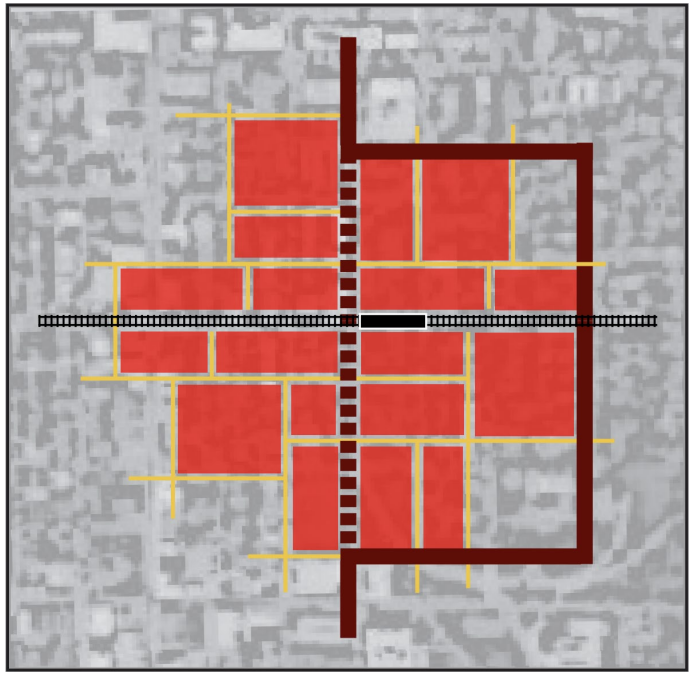
Reduce Number of Private Cars

Integrated street networks (Car free zone)

Measurement: To create pedestrian and public transport orientated centres at the convergence of strategic links



Traditional Centre



Transit Orientated Centre

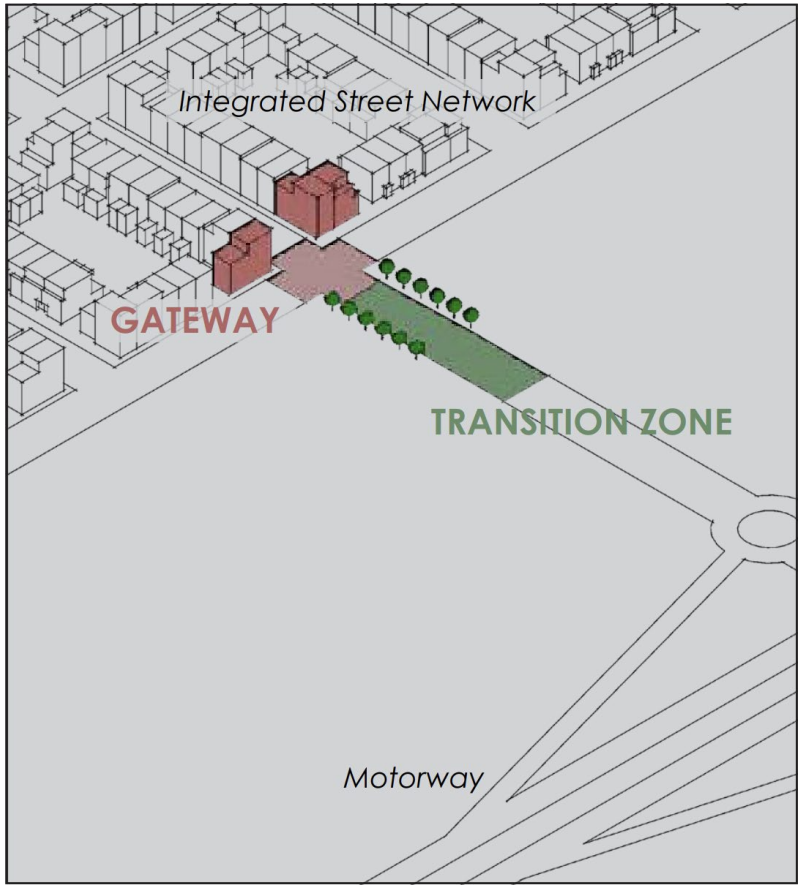


Illustration of a Gateway and Transition Zone that reinforces a large speed reduction when entering an integrated street network

Source: Design Manual for Urban Roads and Streets

Reduce Number of Private Cars

Parklet Tool 2 types of reinforcing streets

Parking Day Initiative: claiming the area from cars

Urban hives: claiming the area from cars

Source: Design Manual for Parking Day

GOAL 6: **Sustainable and eco-friendly Cargo & Delivery systems**

Goal	Aspects	Measurement of status quo	Tools	Relation to other infrastructures
Sustainable and eco-friendly Cargo & Delievery Systems	**Sustainability**	Number of certified companies & Number of emissions from delivering	**Green Certification System / Emission Monitoring**	Energy
		single-use plastic waste	**Eco-Friendly Packaging Materials**	
		usage of sustainable delivery methods	**Behavioral Mobile Apps**	Social
	Efficiency	travel time, fuel consumption	**Smart Route optimization**	
		travel time, fuel consumption	**Multi-Modal Freight Terminals**	
		delivery time, cost, and emissions	**Last-Mile Delivery Robotics and Drones**	

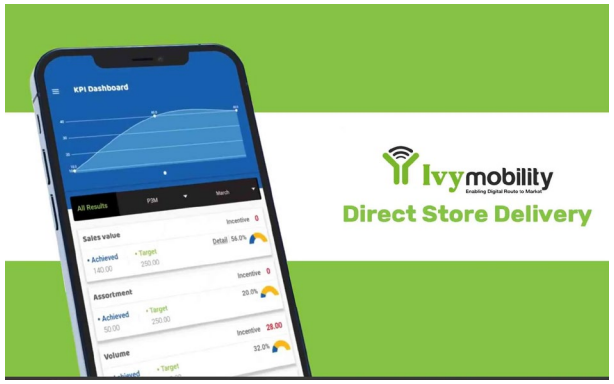
GOAL 6: **Sustainable and eco-friendly Cargo & Delivery systems**

>>Short/Medium Term Tools

Eco-Friendly Packaging Materials

Increase usage of sustainable delivery methods

Attractive delivery spots

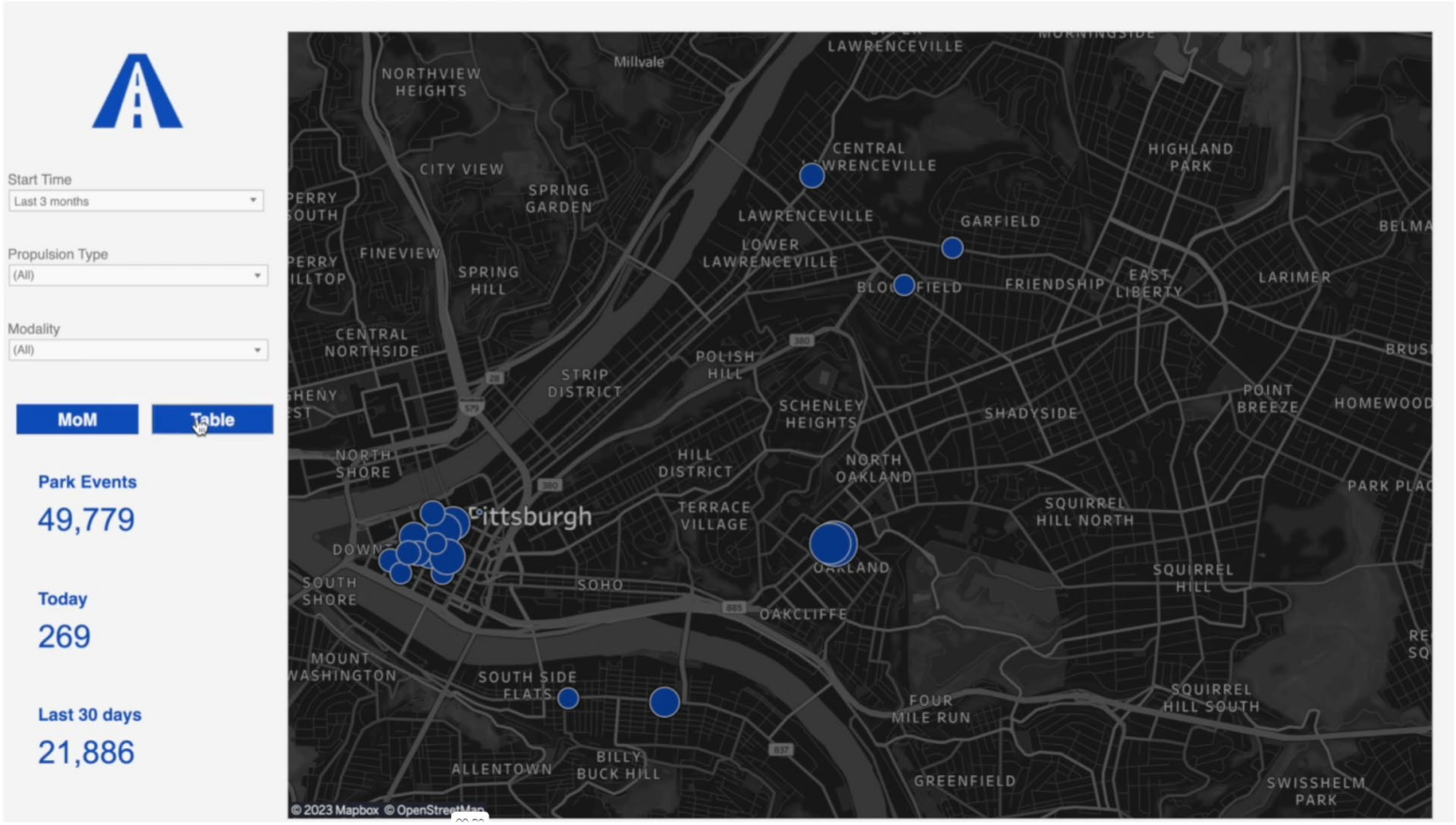


Behavioral Mobile App

Sources: Delipop / France, Ivy Mobility

GOAL 6: **Sustainable and eco-friendly Cargo & Delivery systems**

>>Long - Term Tools



Smart Route Optimization & Certification

The Future of Urban Delivery: A Battle for the Last Meter

Source: Bits and Atoms and Dash Marshall

	System Advantages	Common Sense Challenges	Main Technical Challenge
Drones	Shifts freight traffic off congested surface streets.	Shortage of suitable landing sites and noise mitigation measures.	Dense urban environments can interfere with the wireless connections needed to operate drones, making them unreliable.
Unaided Conveyors	Lighter construction than streetworthy AVs, higher capacity and range than drones. Lower cost than both.	Sidewalks congested with AVs, crowding out humans.	Robotic systems to navigate stairs, ramps, elevators, and other access into buildings are still under development.
Conveyors & Porters	Dramatically reduces need for non-driving-related R&D. Creates opportunity for innovative human roles in local logistics.	Identifying business models for porters that create additional value while continuing to drive delivery costs down.	Viable today

Autonomous / Semi-autonomous delivery

Source: https://www.automotus.co/ , http://avfutures.nlc.org/

SYNERGIES WITH OTHER DISCIPLINES

MOBILITY INFRASTRUCTURE					
	ENERGY	**BLUE**	**GREEN**	**SOCIAL**	**HOUSING**
How does Mobility relate to other disciplines?	Energy consumption to power vehicles and transportation systems, influencing both their efficiency and environmental impact.	Transportation networks utilizing water bodies, influencing accessibility, trade, and urban development along coastlines and rivers.	Sustainable transportation systems that integrate with natural elements, promoting eco-friendly modes of travel and enhancing urban resilience.	Enabling access to essential services and fostering community interactions through well-connected transportation networks that enhance societal well-being and inclusivity	Availability of efficient transportation options significantly influences housing accessibility, location choices, and urban development patterns.
Mobility Infrastructure Tools & their relation to other disciplines	- In each neighborhood there's a carsharing point and charging piles - Setting up bicycle pump points in the city	- Planning cycling paths in blue spaces integrated into the city's cycling network	- Long walkable green coridors/ Garden Streets - Car free zone - Planning cycling paths in green spaces integrated into the city's cycling network	- Pacification of internal roads (Social Activities) - Safe mobility to schools - Publicise benefits of walking - Expand areas devoted to pedes trians - Digitally enabled high street - Integration of bicycle parking space and services into social infrastructure planning - Integration bikeway planning with commercial facilities	- Implement 30 zones - In each neighborhood there's a carsharing point - Planning bicycle parking space in conjunction with housing infrastructure
Issues/Concerns to be considered while planning for Mobility	The balance between costs and sustainable solutions,		- Poor air quality, availability of shaded spaces	- Pedestrian Safety and Accessiblity	

SOURCES

- Mobility Targets set for 2030 in Energy Strategy 2020/2030, Valencia City Council
- València 2030 Urban Strategy – Local Action Plan
- Valencia Sustainable Urban Mobility Plan
- GREEN CAPITAL VALENCIA indicators application_Indicator 10_MOBILITY
- Dades 2023. Segundo Trimestre
- Sustainable Metropolitan Mobility Plan for the València Area
- Resumen Estadístico de la Ciudad de València (Recull) 2022
- CARTO Builder https://pinea.app.carto.com/map/88f75390-4542-44c2-8e91-f0834b581a31
- Design Manual for Urban Roads and Streets

THANK YOU
FOR YOUR ATTENTION