Cycling for a better city

A roadmap for designing an Inclusive Bicycle Masterplan

July 2020

Lüleburgaz

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District Education Directorate
Directorate of Highways
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Local Public Transport Coop.
Taxis Assistance and Solidarity Association
İnci Cooperative
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Local engineering companies

Table of content

Foreword	5
Introduction	13
Analysis	23
Methodology	27
Hardware	35
Software	97
Orgware	121
Mock-up	133
Annex	187
Colofon	215

Foreword

Foreword

Cycling as a catalyst for achieving a higher quality standard of urban life

'Lüleburgaz bisiklete biniyor - Cycling for a better city' is a roadmap for designing an Inclusive Bicycle Masterplan. It investigates how to unleash the full potential of cycling in order to improve various aspects of urban development. The study explores cycling as a catalyst for change towards a more sustainable, healthy, inclusive and democratic urban environment and society.
This book is much more than a bicycle masterplan for a specific city. It represents not only an approach to traffic engineering but a holistic vision addressing hardware, software and orgware aspects in order to improve cycling and urban life at the same time. Using the example of the city of Lüleburgaz, this book formulates recommendations and general principles for cycling in (midsized) Turkish towns. But the content is also relevant for smaller towns and larger metropolises in Turkey and other countries that do not (yet) have a well-developed cycling culture and cycling infrastructure.

This document is the product of a joint international Dutch-Turkish-Belgian collaborative effort between designers, experts, public administrations, NGOs and private sector actors. This open and inclusive approach was an opportunity to combine Dutch expertise in the field of cycling and urban planning with in-depth knowledge of the local Turkish context and stakeholder involvement. The design proposals and recommendations are made to measure for the local context. They can hopefully inspire many municipalities in Turkey and abroad and act as an accelerator to improve city life.

De Korenmarkt Gent
Photo: Carlos S. Pereyra

Foreword

Why?

There are multiple challenges associated with a more sustainable and inclusive form of urbanisation in Turkey. These include ubiquitous tendencies such as climate change, migration from the countryside to the cities as well as from regions hit by war and economic misery; and specific cultural and socio-economic changes such as gentrification, growing inequality and further democratisation. It is in the cities where those tendencies become most tangible and translate into concrete spatial challenges – and more specifically in the public space as the backbone of urban life. Today, this public space is under pressure. The demand for mobility is exploding due to increases in the population, in economic activity and in individual wealth. More and more public spaces are becoming spaces for traffic. New infrastructure and increasing mobility often lead to segregating places and people rather than connecting them. In line with Western patterns of development, individual motorised transport is gaining ground in the cities, with all the well-known collateral damage associated with that (e.g. air pollution, congestion, making places less pleasant to live in, transport poverty (the lack of alternative means of transport for those who cannot afford to buy and run a motor vehicle) and exclusion for the 'weaker' members of society, such as the elderly, women and children.

Vismarkt Groningen
Photo: Groningen Fietsstad

Foreword

A change towards a new, sustainable and more just urban mobility is needed. It is time to reassess active mobility and cycling in particular. The positive effects of more cycling on a city are as considerable as the current challenges in relation to urbanisation are. Cycling is not only a sustainable and efficient mode of transport. It also has a positive impact on many other socio-economic aspects of the city. The positive effects range from the general level (e.g. reducing congestion and air pollution and improving public health) down to the local neighbourhood level. For example, 'bicycle repair cafés' can not only offer sales and a maintenance service to cyclists but also employment and education to locals. They can become places for exchange and debate between the creative class and cycling pioneers as well as with underprivileged people, who would not otherwise come together.

Within administrations, the awareness of the potential of cycling as a tool to improve the city in a holistic way is growing. Cycling has the power to trigger positive change: the bicycle is fundamentally democratic (except for some limitations relating to age and health, anyone can ride a bike irrespective of their gender, religion or economic status) and it is rather cheap (the means of transport itself as well as the infrastructure). Working on better cycling is something that many stakeholders can address. It can bring together politicians, entrepreneurs, designers and other creative minds as well as all the different inhabitants and users of the city. Thus, the 'goodold bicycle' has the power to steer the transformations of today's cities towards more sustainable, inclusive and democratic urban societies.

Damrak Amsterdam
Photo: DCE

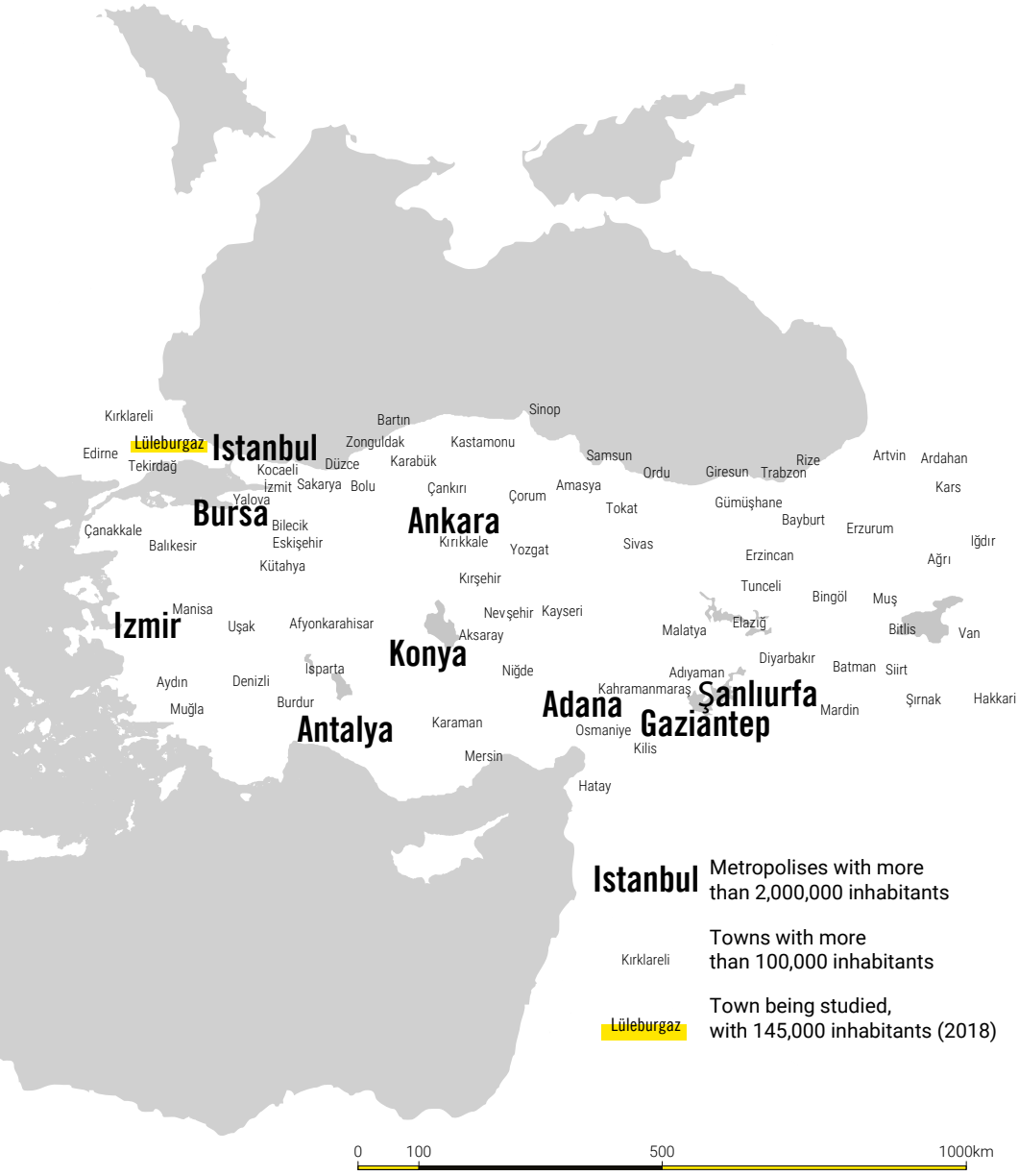
Introduction

Introduction

Case study: Lüleburgaz

Lüleburgaz is a mid-sized town, with a total population of 145,000, situated west of Istanbul (about a two-hour drive) with considerable potential for urban development. The city council declared 2017 to be the 'Year of the Bicycle', with many cycling-related activities and the construction of a cycling academy. Earlier than elsewhere in Turkey, this created an awareness of cycling in many different social classes and prepared the ground for the implementation of consistent cycling infrastructure. In addition, Lüleburgaz has an ambitious city administration together with societal structures that allow for the direct and effective involvement of citizens and various interest groups. In that sense Lüleburgaz is a pioneer and an ideal testing ground for the design and implementation of an inclusive bicycle masterplan.

Although mid-sized towns such as Lüleburgaz receive much less attention in the media, in research and in politics than metropolises, they also face major challenges with regard to mobility, air pollution and climate adaptation. In Turkey, there are about 200 mid-sized towns with a population of between 100,000 and 500,000 inhabitants. This makes Lüleburgaz an ideal pilot municipality, with the potential for a multiplier effect on other (Turkish) mid-sized towns and even metropolises such as Istanbul, Ankara or Izmir. Lüleburgaz is therefore an ideal test case for urban development through cycling. It could become a flagship project, guiding Turkish cities towards a more sustainable and inclusive future.



Agglomerations in Turkey and their sizes

Introduction

The *status quo*

Active transport (walking and cycling) has, until recently, been a rather forgotten value. Decades of focussing on motorised individual transport has left a mark on the make-up of cities and societal structures. Whereas walking often continues to be in a strong position as a means of 'first mile' and 'last mile' transport and is the predominant way to move around in densely packed city centres, cycling has almost completely vanished from public spaces and from public perception. Parked and moving cars dominate public spaces and hamper free movement throughout cities. Large swathes of city centres are occupied by car parking spaces and urban highways cut through the city. The car parking spaces and urban highways form spatial barriers that limit the ability of entire neighbourhoods to move easily from one place to another. In the absence of proper infrastructure, pedestrians and cyclists are forced to mix with cars and heavy traffic, to wait and cross roads at dangerous places and to park their bikes in inappropriate places.

The current car-dominated situation is not only disadvantageous to cyclists and pedestrians. Shops, cafés, schools and residents in general would benefit from less motorised transport and more cycling: the transformation of monofunctional traffic spaces into public spaces for everybody creates more space for outside shop displays and eating areas, safer routes to school, cleaner air and less noise. A revival of cycling comes with many advantages. And it requires relatively little individual and public investment to trigger a change.


Lüleburgaz, Turkey
N
0
0,5
1km

Shortage of safe pedestrian crossings

Residential streets dominated by street parking

Lack of cycling infrastructure forces cyclists to mix with car traffic

Conflicts with parked cars ('dooring': accidents involving motorists' opening their doors and hitting cyclists)

Conflicts with parked cars and delivery trucks in the city centre

Huge crossings, which drive people to 'jaywalk'

Pedestrian islands at traffic lights that are too small

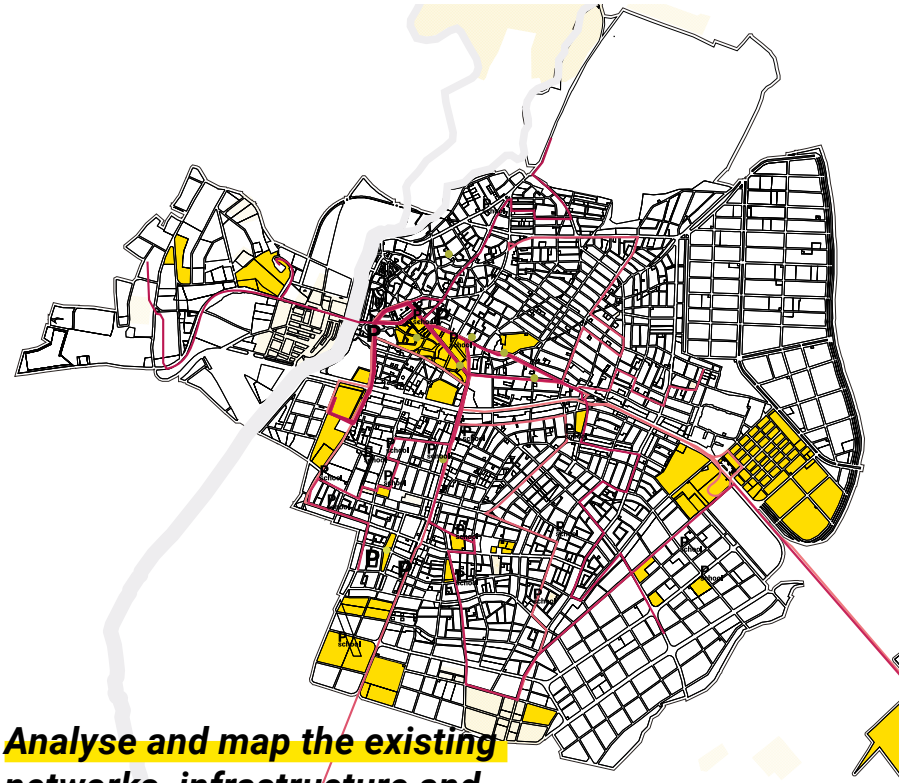
Vacant shops along urban highways

Analysis

Analysis

Context

Before starting to conceptualize cycle infrastructures for a specific context, it is important to understand the given situation. Besides experiencing the actual situation for cyclist in the town, a number of thematic maps were produced and superimposed. They serve as a starting point for the design work.



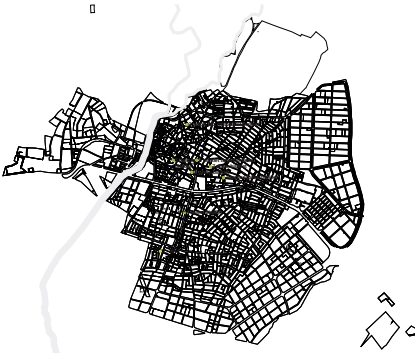
Analyse and map the existing networks, infrastructure and points of interest.

Superposition of all thematic maps

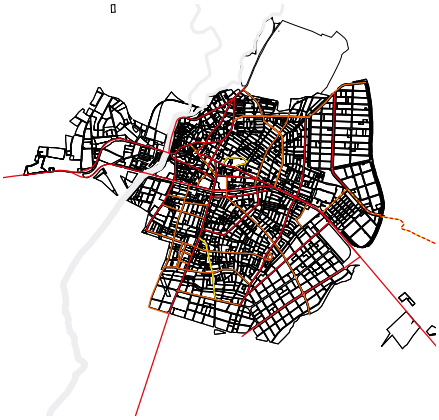
N 0 0,5 1km

Motorised individual transport network

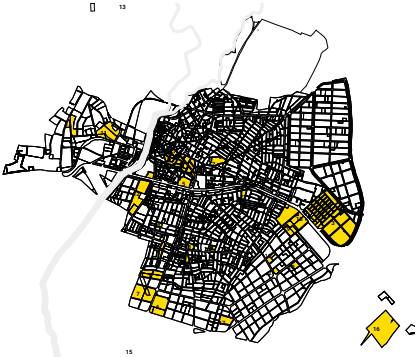
Bus network



Existing bicycle amenities



Dangerous roads for cyclists
(according to cyclists)



Points of interest

Existing car-free areas

Methodology

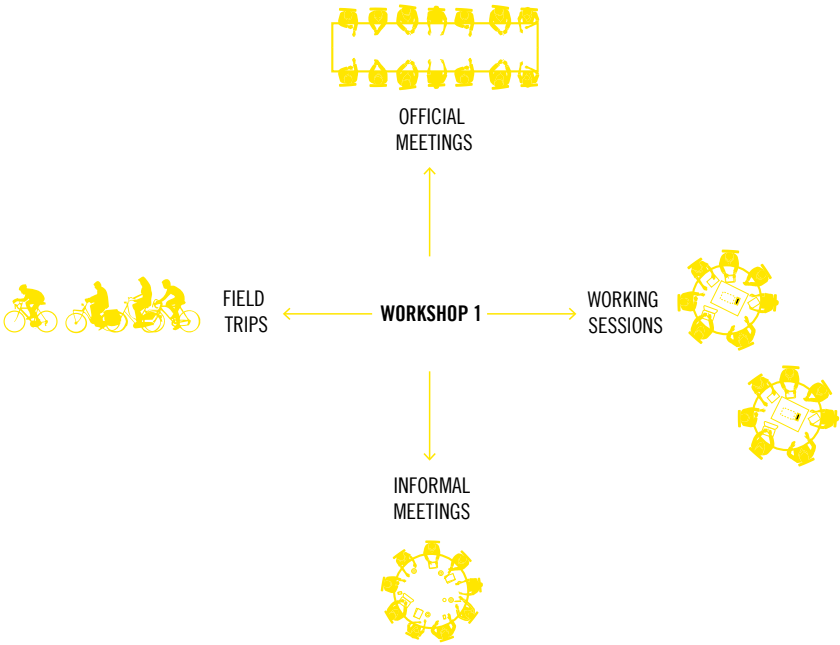
Methodology

Process

The creation of an inclusive bicycle masterplan is based on stakeholder involvement, co-creation and capacity building. This requires an interactive process with the involvement of various public and private stakeholders and close collaboration with the project team of the municipality. In Lüleburgaz, different formats aimed at different groups of participants were used: working sessions, informal meetings, field trips and official meetings.

Working sessions: These are sessions where the relevant issues are discussed, knowledge and inspiration is exchanged and specific topics are worked on. The participants are selected based on their particular expertise and role/position within the process. This format is geared towards a fixed core group of public and private professionals, enriched by a changing group of external stakeholders. The workshops take place during daytime and the format is structured and result-oriented.

Informal meetings: In addition to the formal sessions, it is important to give space to informal exchange with more freedom of speech also for 'weaker' groups. 'Stakeholder dinners' offer an opportunity for exchange between the 'professionals' and the 'experience experts' (NGOs, regular cyclists and entrepreneurs). To be able to integrate the 'informal' information into the official process, the informal meetings take place in the evening and run in conjunction with the working sessions during daytime. The format is informal, open to everyone and discursive.


OFFICIAL
MEETINGS
FIELD
TRIPS
WORKSHOP 1
WORKING
SESSIONS
INFORMAL
MEETINGS

Workshop

Methodology

Field trips: Even more convincing than talking about cycling and its benefits for the city is experiencing it for yourself. Field trips on bicycles are an indispensable source of information to understand the local context. In addition, they are also a great team-building opportunity. Besides field trips in the town itself, visiting and experiencing more advanced cycling cites, e.g. in the Netherlands, can be very inspiring and instructive.

Official meetings: The communication of (interim) results in official meetings is a necessary and important element to keep the various decision-makers up to date and involved. Here, it is important to include top level decision-makers such as the mayor and the aldermen in charge.

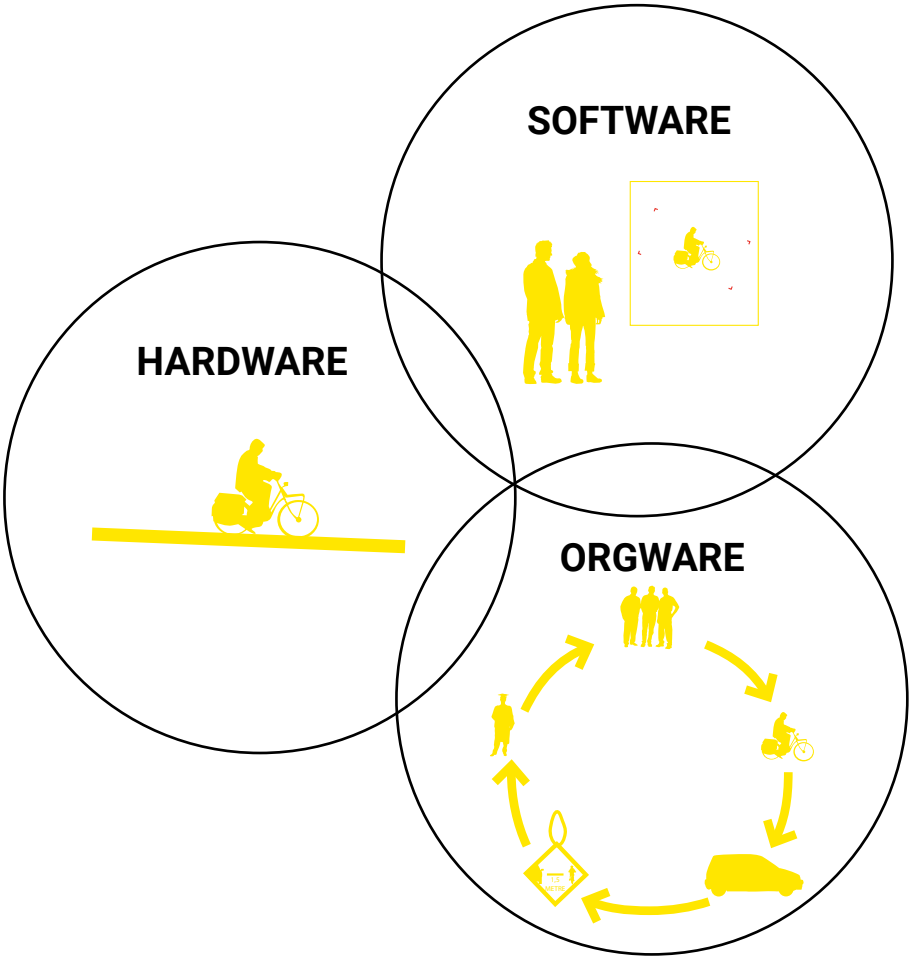
Working session

Informal meeting

Field trip

Official meeting

An inclusive bicycle masterplan comprises three aspects: Hardware, software and orgware.



All three aspects, hardware, software and orgware, are closely related to each other and have to work hand in hand. In the long run, it makes little sense to foster only one or two of the three aspects in a one-sided and unbalanced way. They should be given equal attention in order to create the necessary synergies between them.

Hardware

Safe bicycle paths
Upgrading existing roads
Building new roads
Safe crossings where there are (main) roads
Integration with public transport
Bicycle parking
Bicycle rental

Software

Education
Awareness
Communication
Target groups / pioneers
Role models / word of mouth
Bicycle-friendly city image
Routefinding systems

Orgware

Provision of sufficient budget
National and local legislation (traffic regulations)
Rewarding cyclists (tax incentives)
Engagement with relevant stakeholders
Enforcement of traffic rules
National research and standards
Restrictions (e.g. for car parking, trucks)

Hardware

Hardware

Introduction

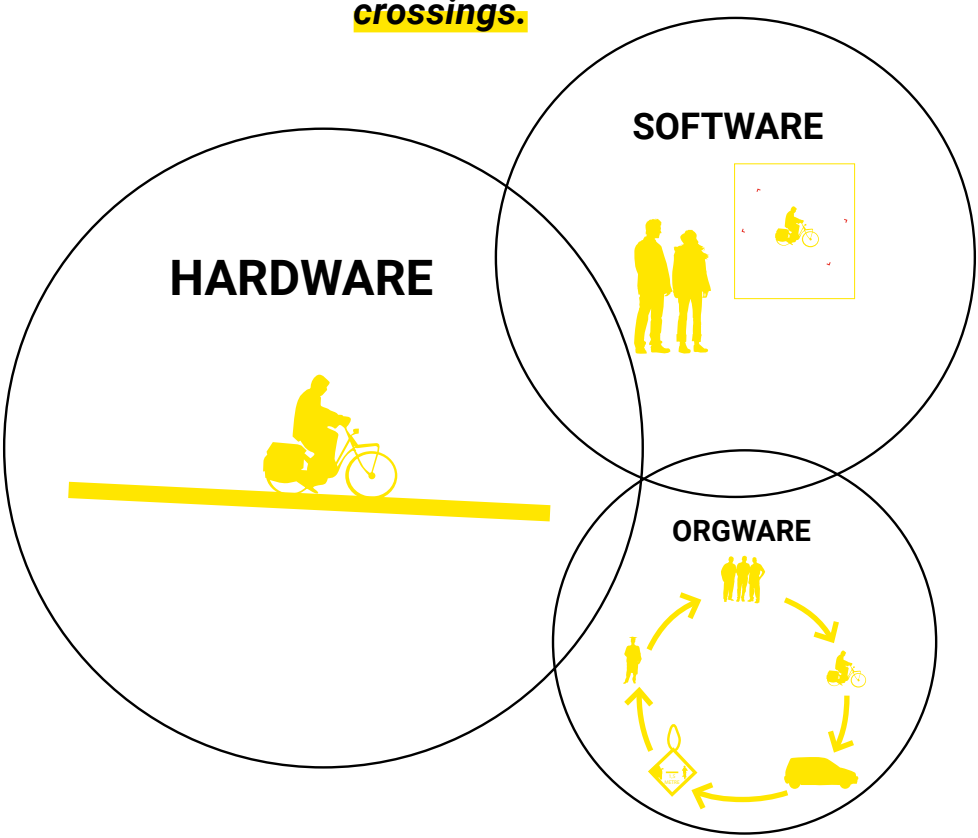
Hardware includes all aspects of the physical infrastructure. How can one build a safe, connected and relevant bicycle network? What should crossings look like? What kind of bicycle parking facilities have to be envisaged and where? What kind of bicycle sharing or rental system is suitable? How should cycling physically relate to other modes of transport (public transport and walking but also cars and motorcycles)? How can one successfully integrate cycling facilities into public spaces, creating added value for other aspects of urban life too?

So far Lüleburgaz has had a strong focus on software and orgware. The municipality has made an impressive effort to create awareness about cycling (software) and has built good internal and external organisational structures (orgware). The focus on software and orgware during the Year of the Bicycle in 2017 was a deliberate choice. The city administration decided to first 'prepare the ground' and create the (mental) foundations within the population instead of simply starting to build cycle paths that would not be used because nobody is able or willing to cycle.

Initially limiting oneself, as a city, to creating awareness and a positive perception of cycling in public opinion is a rather unusual approach but is a valid starting point so that the focus can be put on hardware now: Today, (potential) cyclists are eager to have good, comfortable and safe cycle infrastructure.

The following pages show some simple, general rules for designing cycling infrastructure:

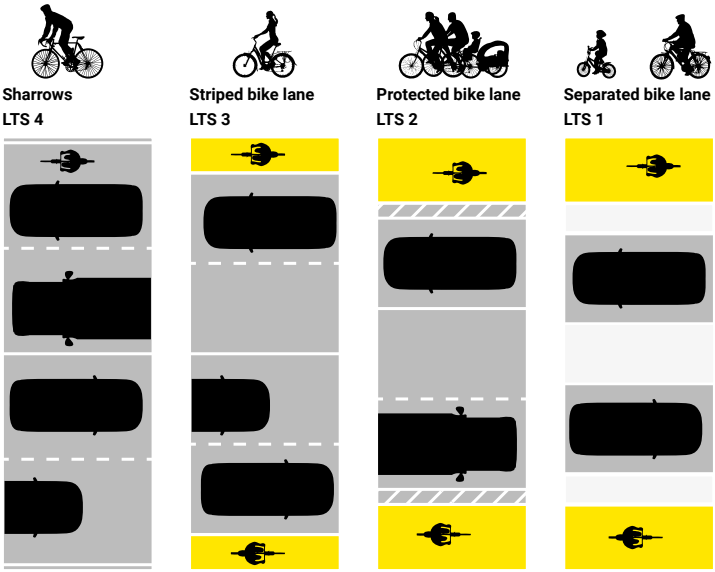
Focus on hardware includes design of bicycle infrastructure networks, road profiles and crossings.



60%	**“Interested but concerned”** “İlgili ama endişeli”	
33%	**“No way. No how.”** “Kesinlikle hayır”	
6,5%	**“Enthused and confident”** “Coşkulu ve kendinden emin”	
0,5%	**“Strong and fearless.”** “Güçlü ve korkusuz”	

For whom should one design cycle infrastructure?

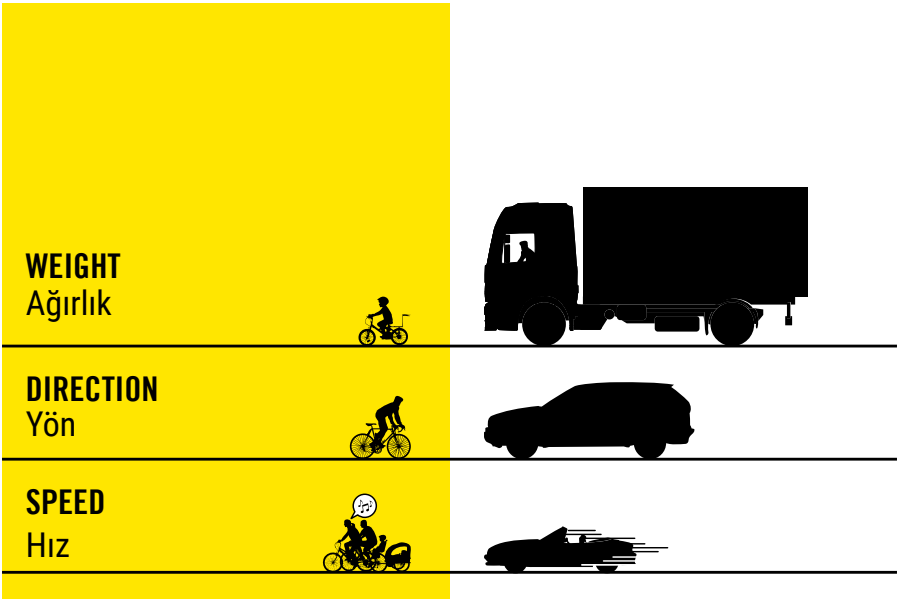
According to Roger Geller, bicycle coordinator for the city of Portland, USA, there are four types of cyclists: the ‘interested but concerned’, the ‘no way, no how’, the ‘enthused and confident’ and the ‘strong and fearless’. When designing bicycle infrastructure, one should not (only) focus on the people already cycling, but also on the ones who do not cycle yet. Hence the ‘interested but concerned’ is the primary target group that has to be addressed and provided with adequate bicycle infrastructure. The ‘enthused and confident’ and the ‘strong and fearless’ who cycle already or the ‘no way, no how’ that are difficult to get out of their cars come second.



What type of bicycle infrastructure should one design?

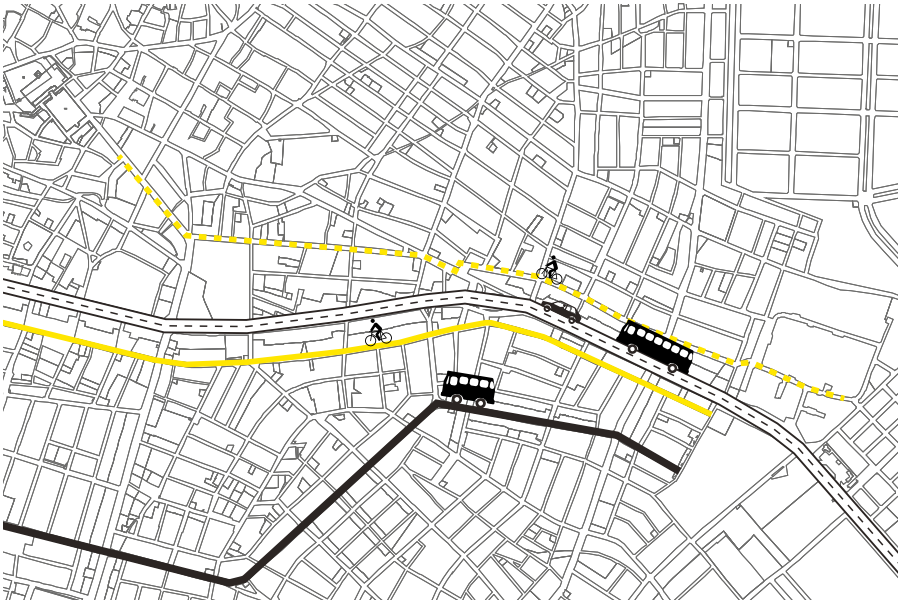
Different types of cyclists require different types of infrastructure to experience a safe, comfortable and stress-free ride. Level of Traffic Stress (LTS) is a rating given to a road segment or crossing indicating the traffic stress that it imposes on cyclists.
LTS 1: Robust separation from all except low speed, low volume traffic. Simple crossings. Suitable for children.
LTS 2: Cyclists have their own place to ride that keeps them from having to interact with traffic except at formal crossings. Physical separation from higher speed and multilane traffic. Crossings that are easy for an adult to negotiate. A level of traffic stress that people classified as 'interested but concerned' can tolerate.
LTS 3: Involves interaction with moderate speed or multilane traffic or close proximity to higher speed traffic. A level of traffic stress acceptable to those classified as 'enthused and confident'.
LTS 4: Involves interaction with higher speed traffic or close proximity to high speed traffic. A level of stress acceptable only to those classified as 'strong and fearless'.

Source: Peter Furth, Professor of Civil Engineering at Northeastern University, Boston, Massachusetts



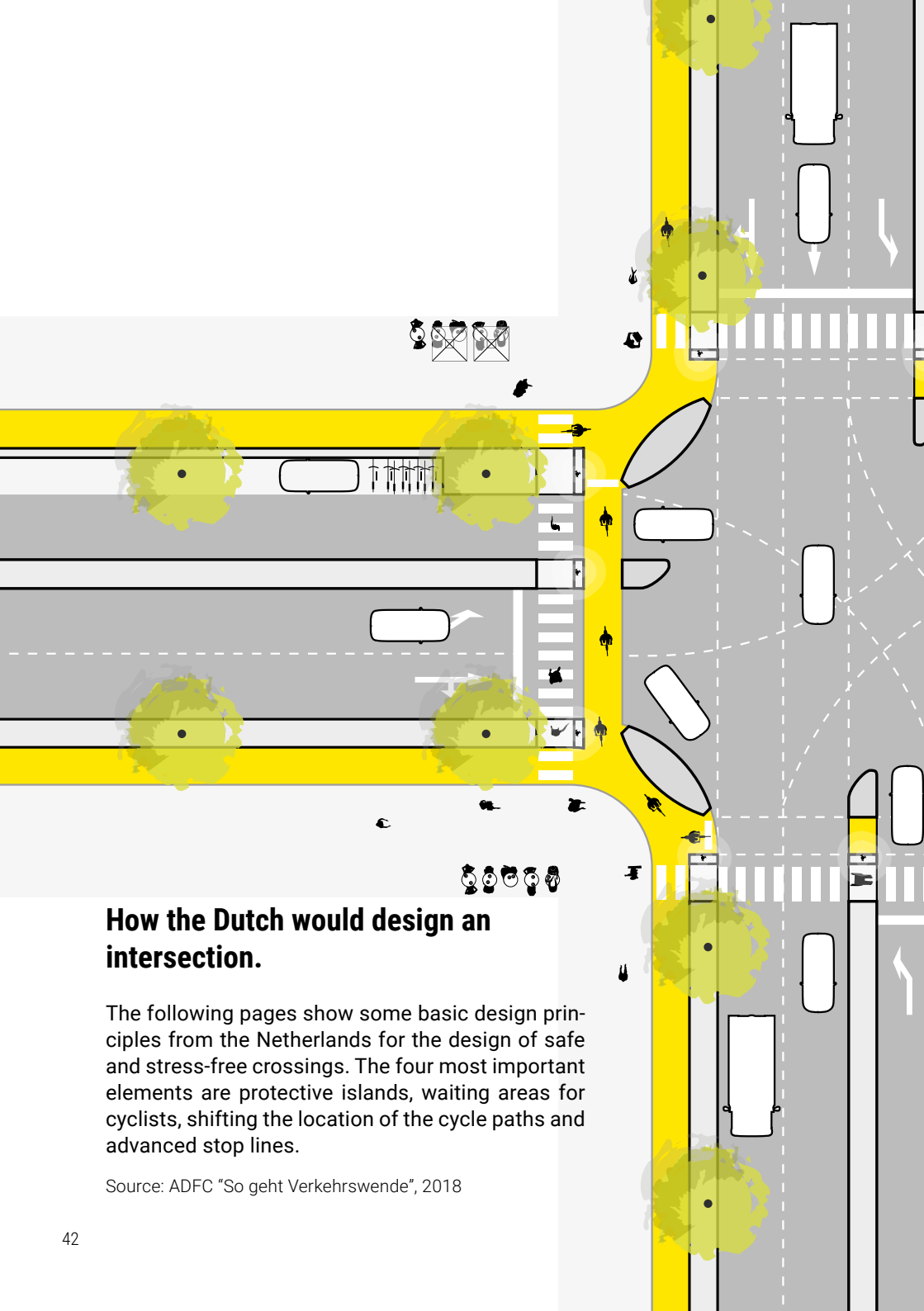
Separate modes of transport according to weight, direction and speed!

The question of whether different modes of transport can be combined or should be separated can be answered by applying common sense. Mixing different modes of transport in the same road space will only work if there are no major differences in weight, direction and speed. For example, heavy trucks and children on bicycles do not coexist well in the same narrow road profile. Cycling on or directly next to a road where cars can travel at 50km/h or faster is not safe. And, except at low speeds, traffic coming in opposite directions should be kept apart.



Offer specific corridors for cars, public transport and cycling!

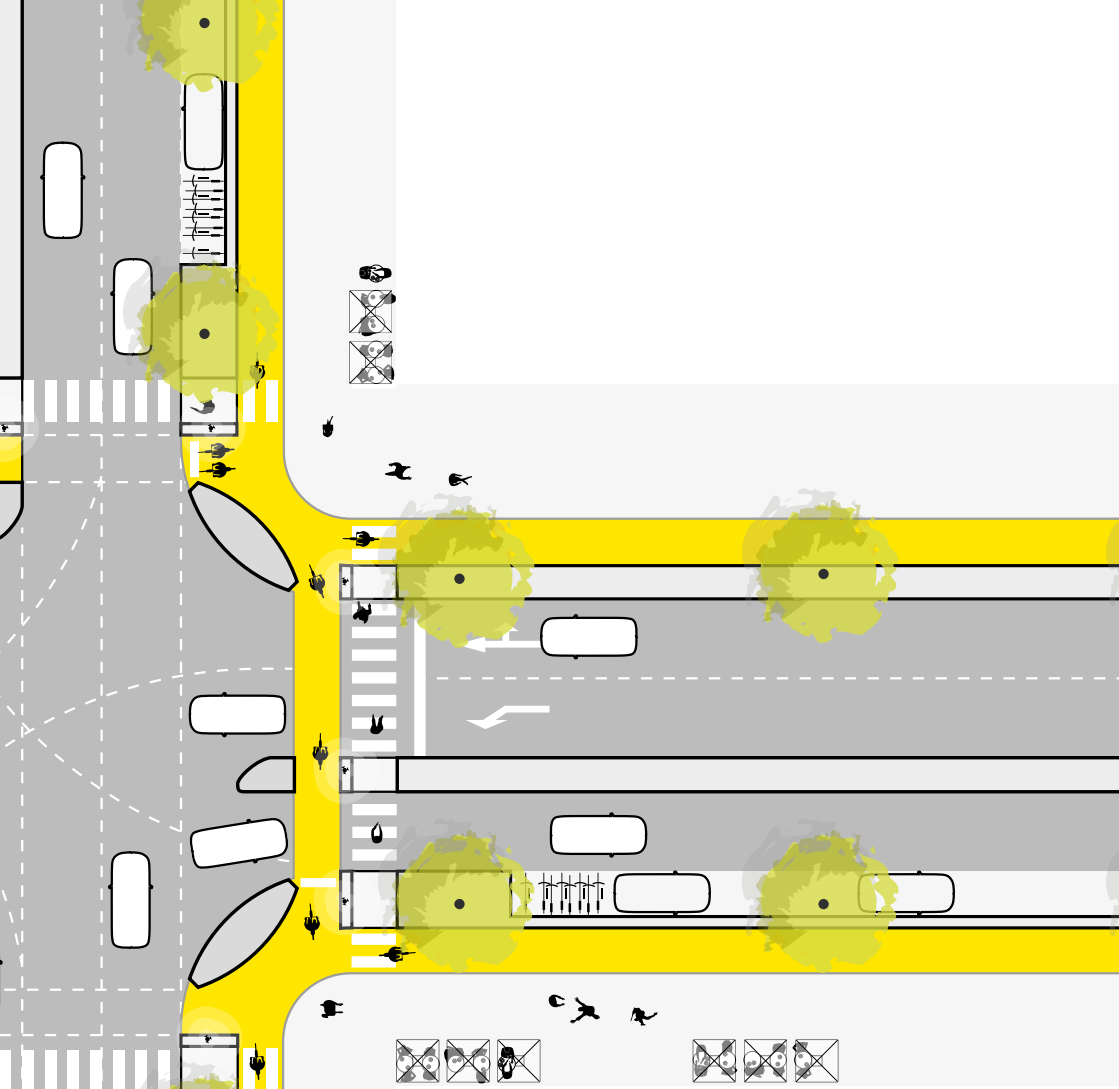
In most existing cities, there is simply not enough road space available to meet the needs of all modes of transport in all streets at the same time. It is therefore necessary to make choices per corridor as to which modalities should be given priority. In practice, this often means that, in some streets, space for driving and parking cars is limited in order to make room for public transport and/or cycling infrastructure. For main car corridors, parallel roads may be dedicated primarily to public transport, cycling or a combination of both.

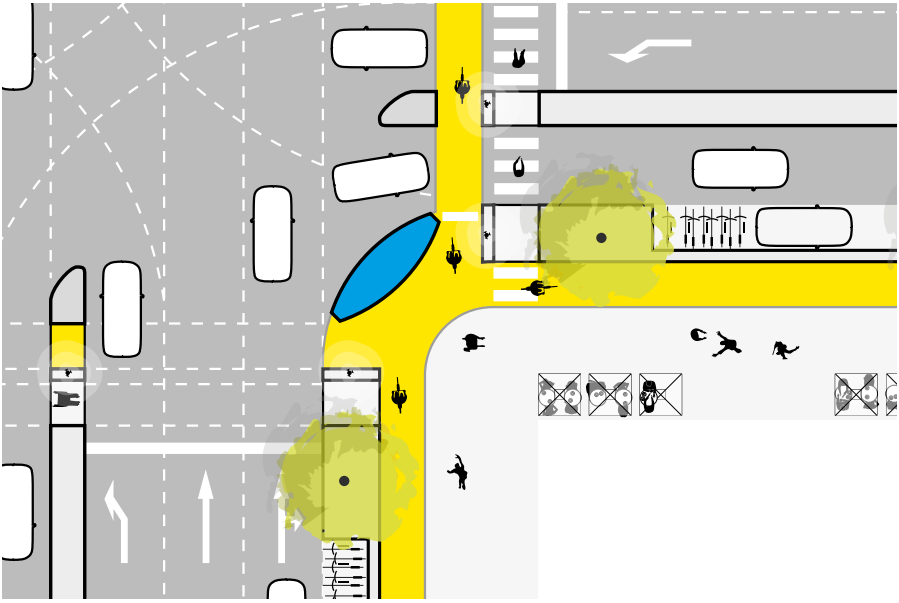


How the Dutch would design an intersection.

The following pages show some basic design principles from the Netherlands for the design of safe and stress-free crossings. The four most important elements are protective islands, waiting areas for cyclists, shifting the location of the cycle paths and advanced stop lines.

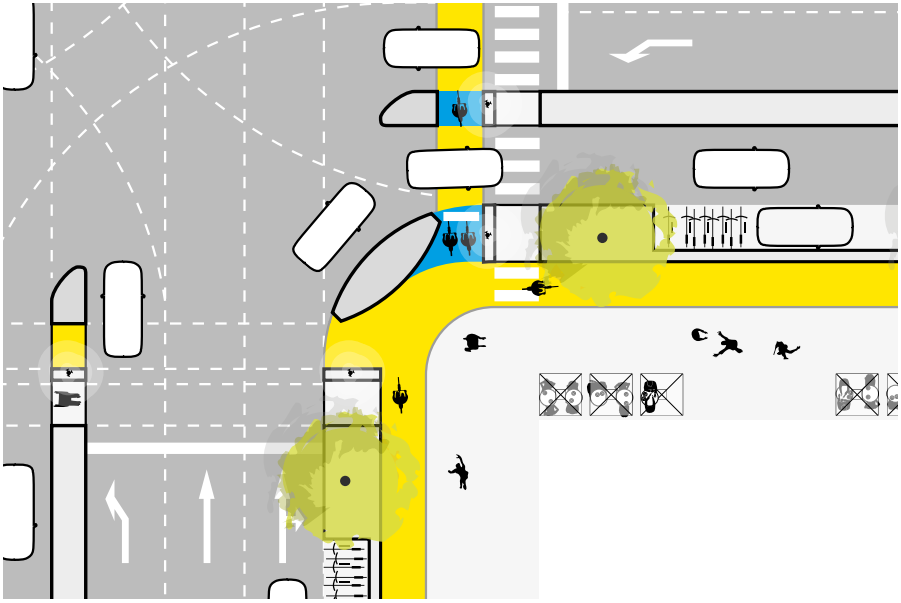
Source: ADFC “So geht Verkehrswende”, 2018





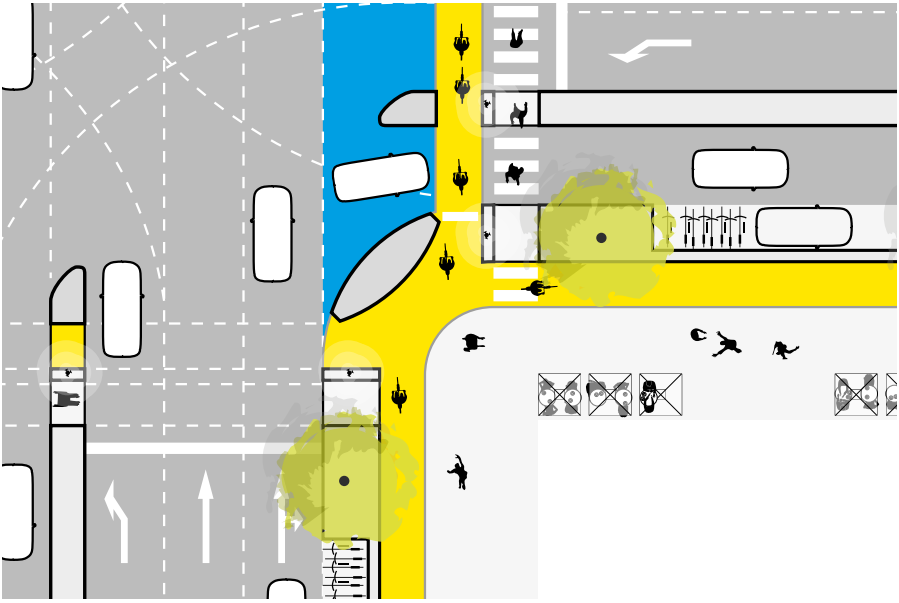
Protective islands.

A typical element of Dutch crossings are crescent-shaped traffic islands, so-called protective islands. These islands have a small radius and thus reduce the speed at which motor vehicles approach them. They can be driven over by trucks as they require larger turning circles. Protective islands mark a clear boundary between motorised traffic and pedestrians and cyclists. They thus ensure that people who cycle or walk feel safe and are clearly visible.



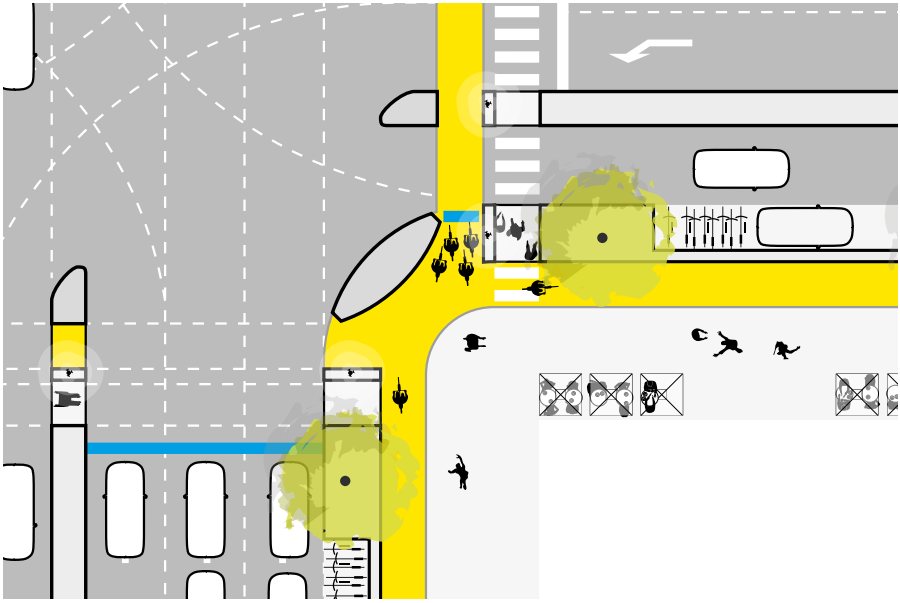
Waiting areas.

The protective islands automatically create waiting areas in which cyclists can line up when the traffic lights are on red, while not obstructing cycle traffic crossing behind.



Shifting the cycle path.

A slight shift in the axis of the cycle paths creates a waiting area for motor vehicles and ensures that motorists can concentrate on one thing at a time: first turning around the corner, then locating the cyclists approaching the crossing. As motor vehicles are positioned at a right angle to approaching cyclists, they can spot them more easily in their field of vision and the ‘blind spot’ is minimised. Consistently keeping cyclists at a distance from car traffic reduces the risk of collisions and the stress level to which cyclists are exposed.



Advanced stop lines.

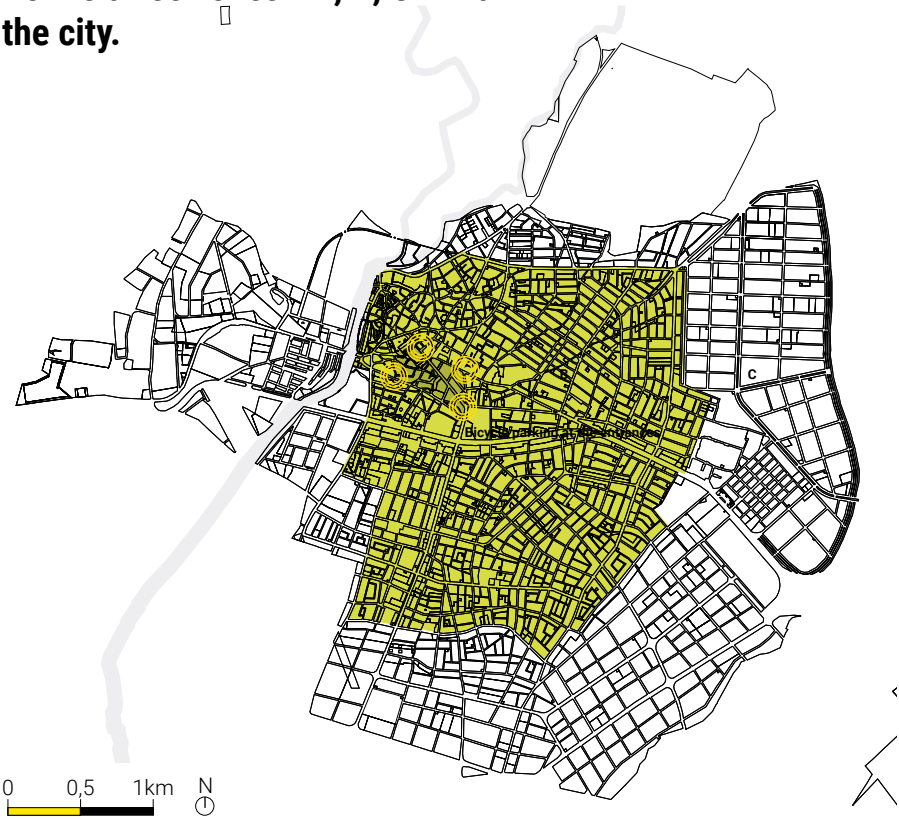
Consistently guiding cyclists to the side of the road automatically creates advanced stop lines for bicycle traffic, which helps to ensure that cyclists are more visible. In the best-case scenario, these stop lines ensure that the intersection is clear when the vehicle arrives as the cyclists are given a head start due to the advanced stop line.

Network sketch by workshop participants.

During a workshop with a large group of public and private stakeholders, points of interest, sources and destinations for (potential) cyclists in Lüneburgaz were identified and mapped. A first draft of a future primary cycling network was sketched out based on this collaborative exploration.


4
CENTRAL
PARK
10
HOSPITALS
22
POLICE
STATION
3
RESIDENTIAL
ZONE
9
ART
ACADEMY
18
SCHOOLS
21
GOVERNMENT
ADMINISTR.
17
PORTS
STORAGES
AGO
16
HIGH SCHOOL

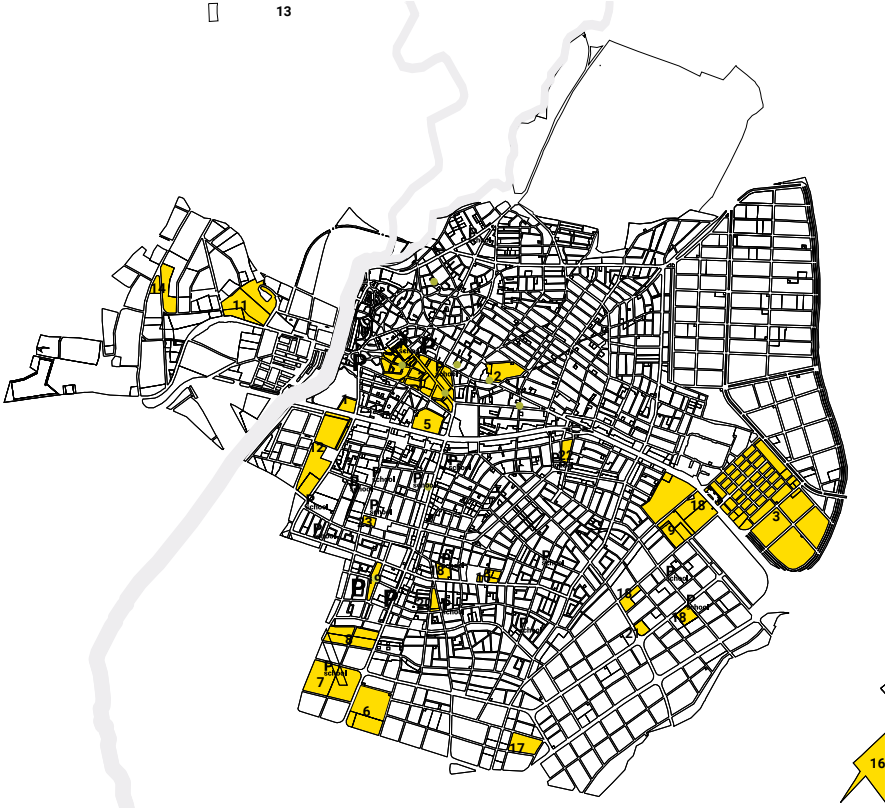
Define three zones - A, B, C - within the city.

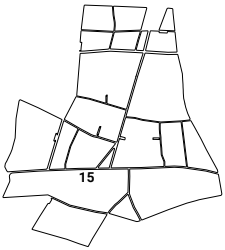


Not all parts of a city have the same preconditions and demands in terms of mobility. Defining different zones with different priorities in terms of urban development and traffic can help to ensure that the right and consistent choices are made on a smaller scale.

Zone A:
With priority for pedestrians and cyclists and bicycle parking at the entrances. Car access is tightly restricted.
Zone B:
Coexistence of car, public transport and bicycles. There are separate cycle lanes where necessary.
Zone C:
More space for cars and public transport. There are separate cycle lanes on all main roads.

Points of interest



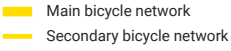


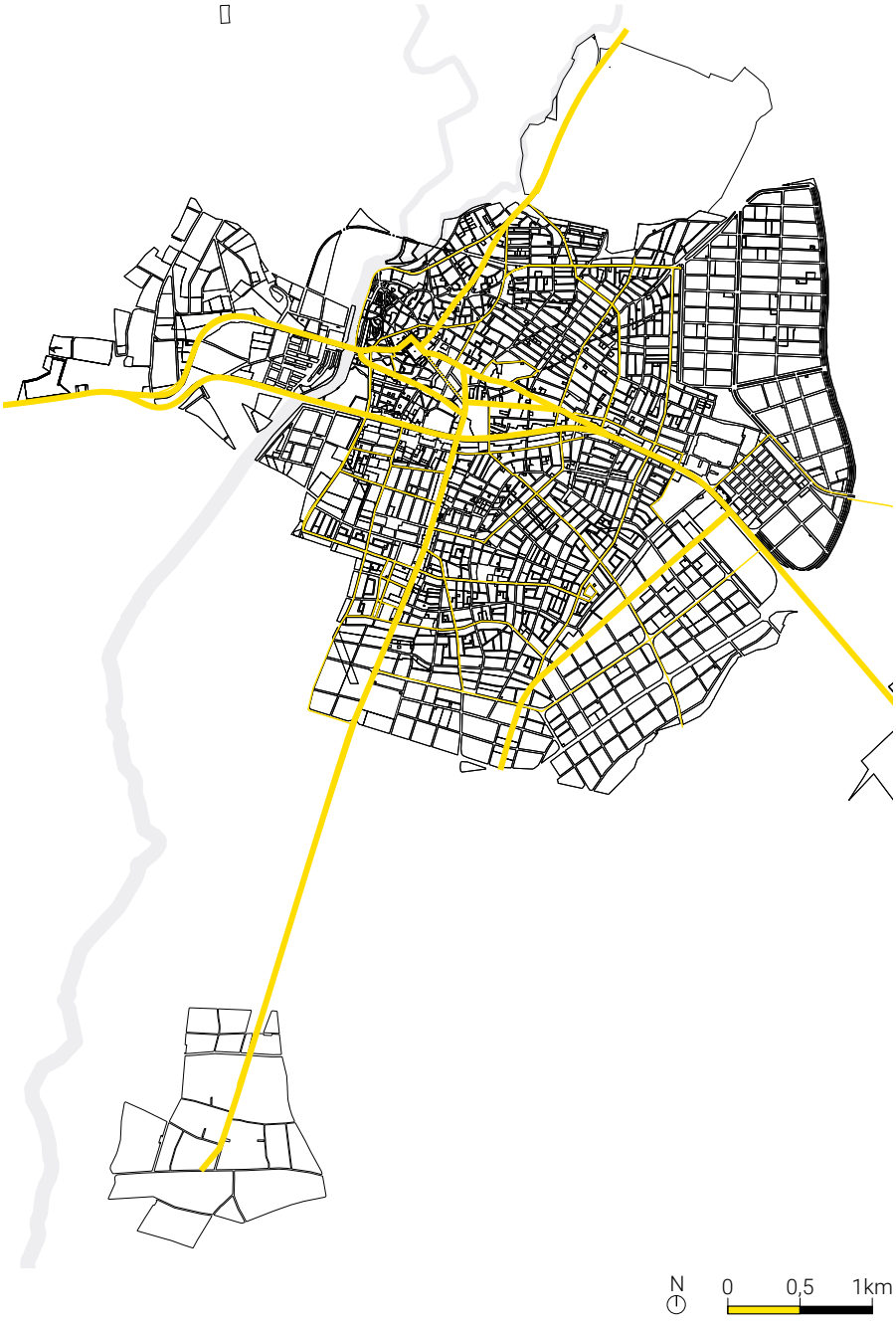
1 Bus station
2 Business centre
3 Industry
4 Central park
5 Soccer stadium
6 Shopping mall
7 Football academy
8 Women's academy
9 Art academy
10 Hospitals
11 Swimming academy
12 Market + shopping
13 Recreation area
14 Vineyard
15 (New) train station
16 High school
17 Dormitories for students (360)
18 Schools
19 Bicycle academy
20 New market
21 Government administration
22 Police station
23 Court house

P Bicycle parking
P School Bicycle parking at schools

N 0 0,5 1km

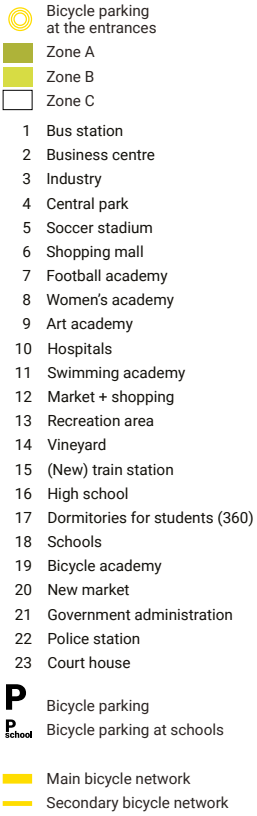
Proposed bicycle network.

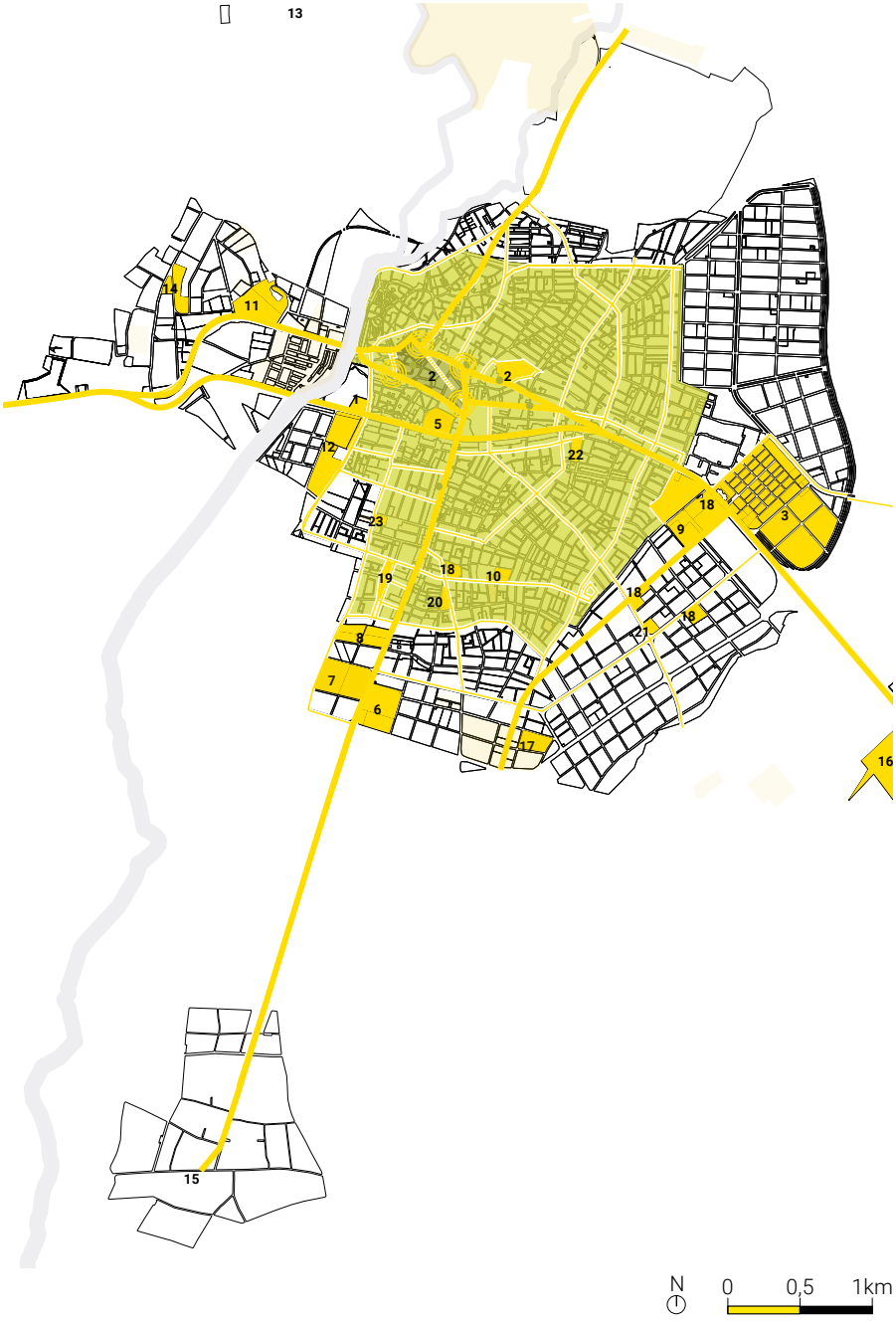



N
0
0,5
1km

Proposed bicycle network in its context.

- Three zones: A, B, C
- Points of interest
- Bicycle network




13
14
11
2
2
5
12
22
18
3
23
9
19
18
10
18
20
18
8
7
6
17
16
15
N
0
0,5
1km

Hardware

Typical road profiles

During the workshop sessions with public and private stakeholders, five typical road profiles in Lüleburgaz were investigated and tested for their potential to accommodate bicycle infrastructure. Based on the current situation in terms of the organisation of streets, the way in which the traffic is organised and the dimensions of the streets, new bicycle-friendly profiles were developed.

The five different typologies of road profiles are:
1 Urban highway
2 Large main road
3 Narrow main road
4 Neighbourhood road
5 Pedestrian area

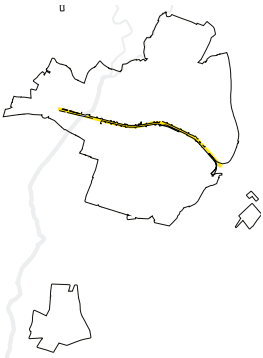
Road profiles studied during the second workshop

Urban highway

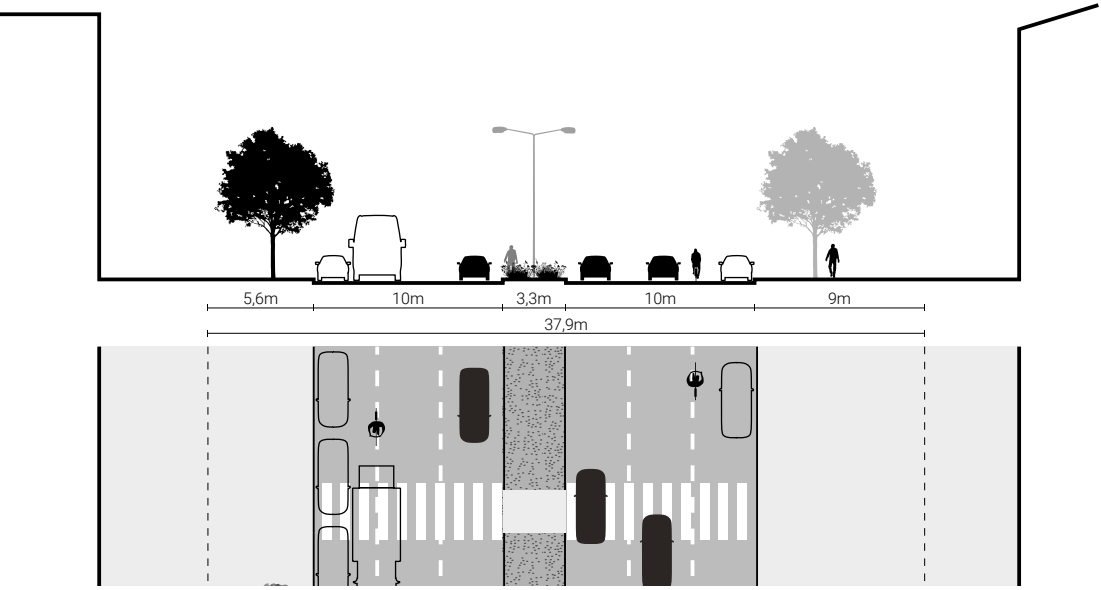
The D100 is an urban highway cutting through neighbourhoods with 2x2 lanes and former emergency lanes. The latter are currently used to park cars illegally. There is no cycling infrastructure and cyclists have to mix with motorised traffic. Double-parked cars and trucks pose an additional threat to cyclists. There are only a few pedestrian crossings, which are very unsafe as two lanes have to be crossed in one go.

In the future, when through traffic is deviated via a ring road around the centre, the road could be transformed into an urban boulevard, with two wide car lanes separated by a green median strip, with trees, official street side parking, two large one-directional cycle lanes and large sidewalks.

Aerial view - existing situation



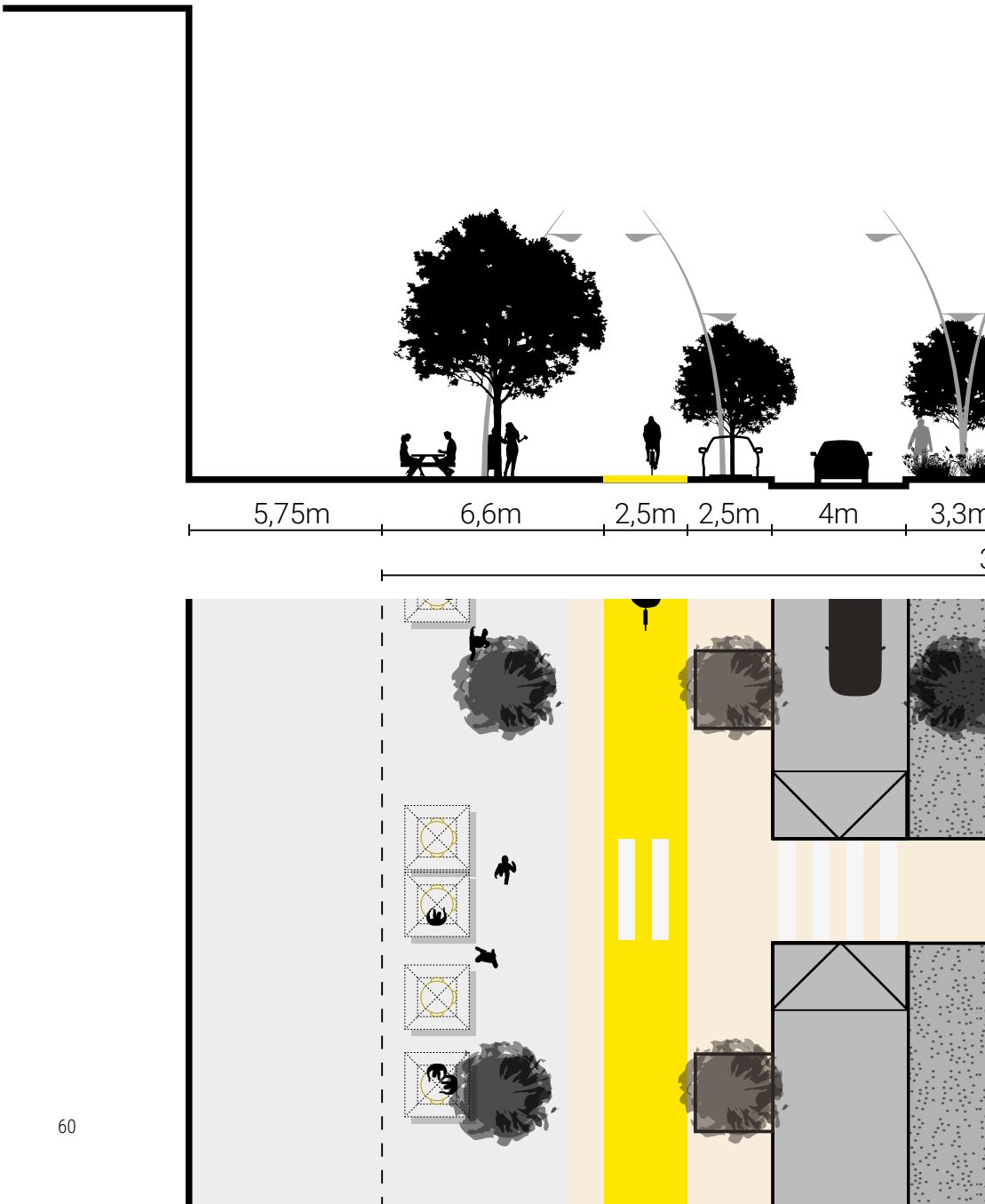
Localisation

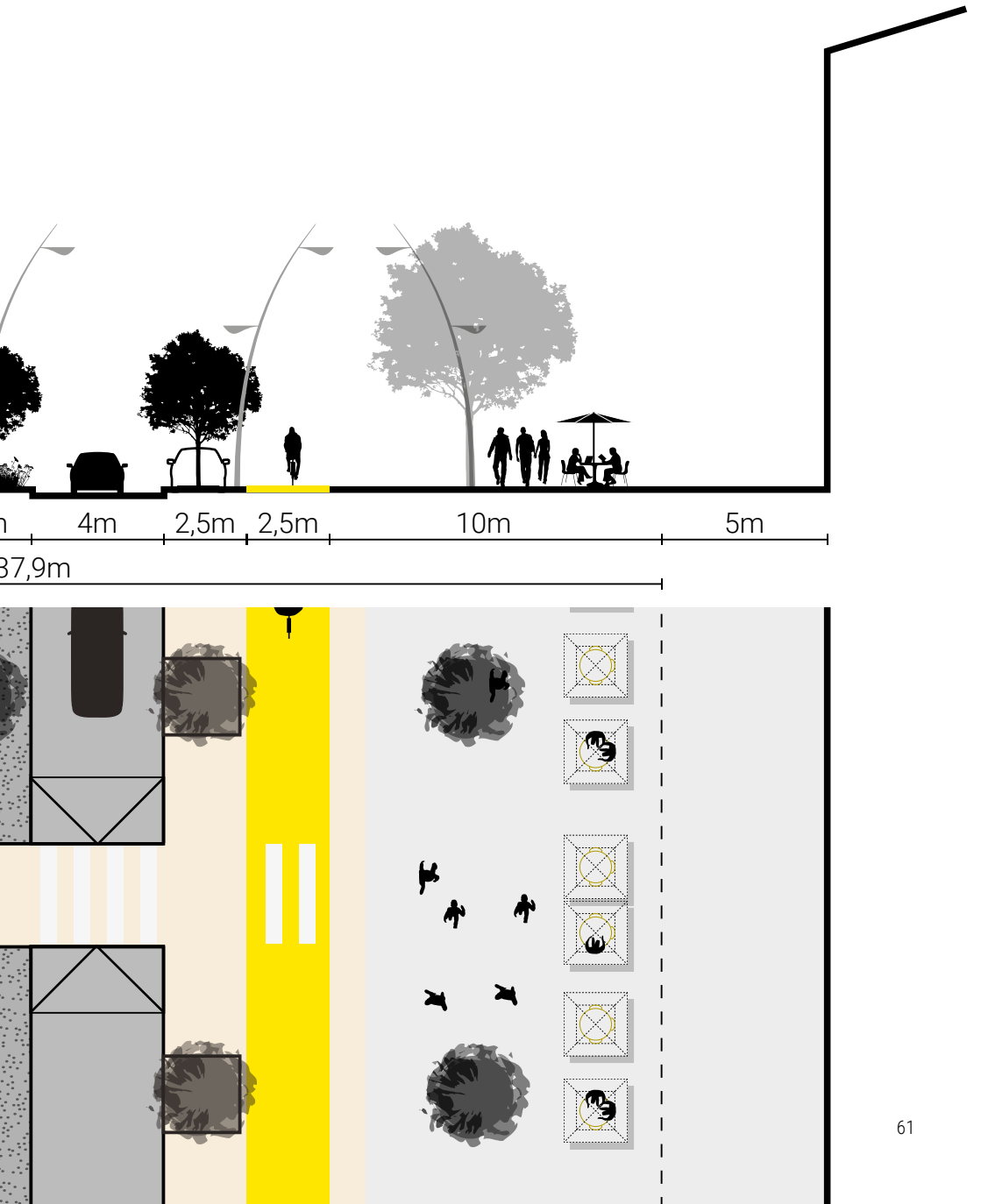


Section - existing situation

Photo - existing situation

What a former urban highway could look like in the future.



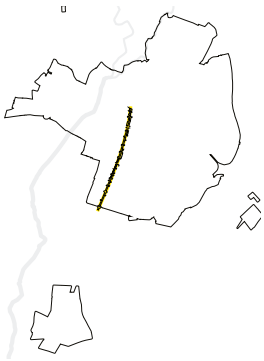

4m
2,5m
2,5m
10m
5m
37,9m

Large main road

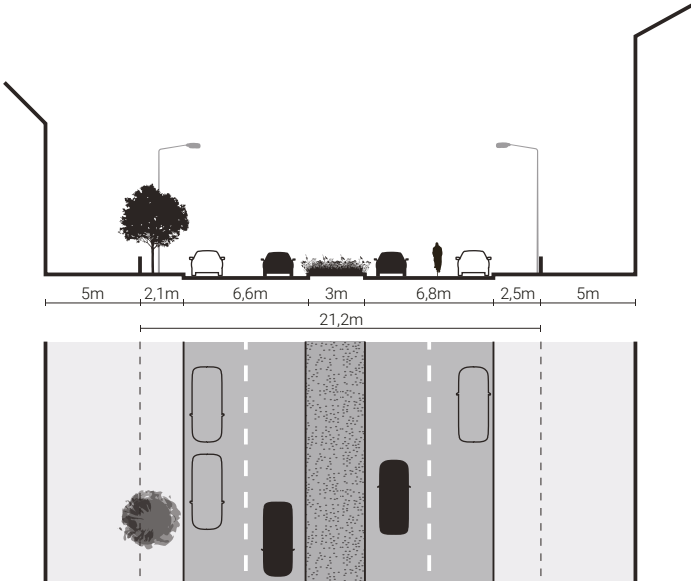
Istasyon Street is a large main road with 2x2 lanes separated by a green median strip. The outer lanes are currently used to park cars illegally. There is no cycling infrastructure and cyclists have to mix with motorised traffic. Double-parked cars and trucks pose an additional threat to cyclists. There is an insufficient number of pedestrian crossings, which turns the road into a barrier in the neighbourhood.

As the outer lanes are used for car parking, the road can be easily transformed into an urban boulevard with one car lane in each direction without reducing its capacity to accommodate motorised traffic. By eliminating the median strip, there is space for street-side parking on both sides, with trees, large one-directional cycle lanes and enlarged sidewalks.

Aerial view - existing situation



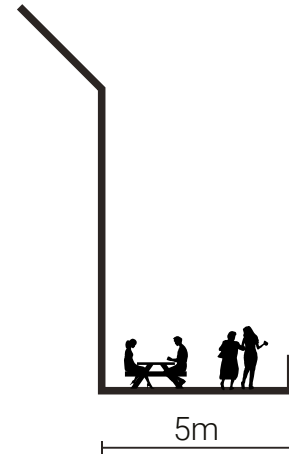
Localisation

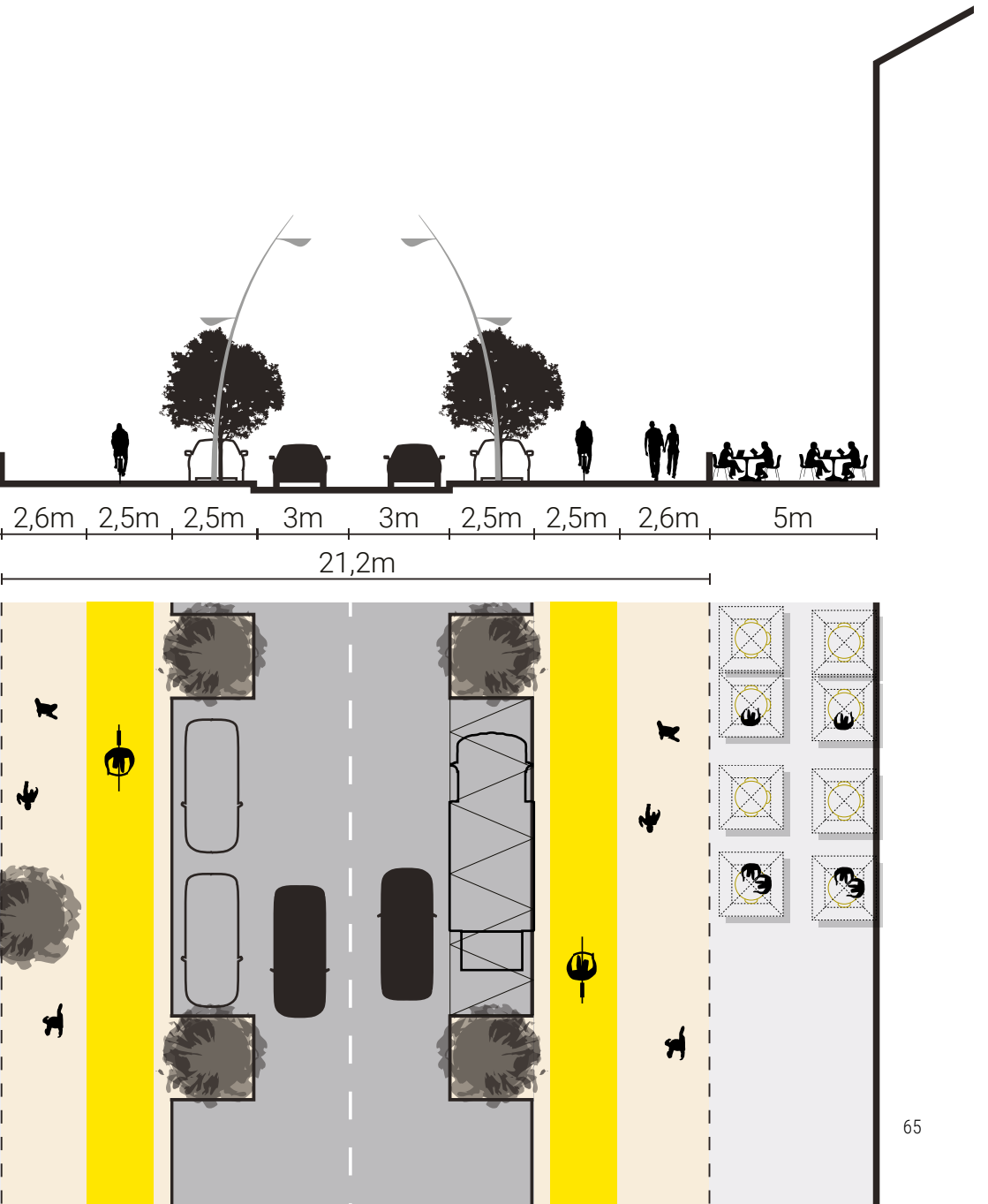


Section - existing situation

Photo - existing situation

What a large main road could look like.



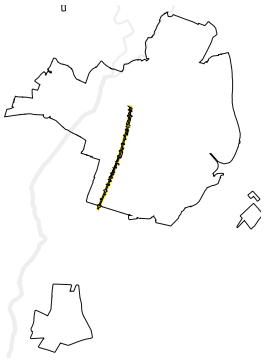

2,6m
2,5m
2,5m
3m
3m
2,5m
2,5m
2,6m
5m
21,2m

Narrow main road

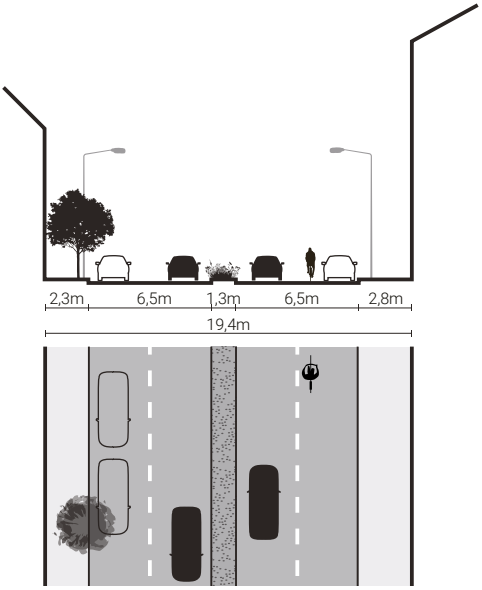
Other sections of the Istasyon Street have the same profile, but with a narrower median strip.

Here too, the road can be easily transformed into an urban boulevard with one car lane in each direction without reducing its capacity to accommodate motorised traffic. By eliminating the narrower median strip, there is space for street-side parking only on one side with trees, but large one-directional cycle lanes and enlarged sidewalks on both sides.

Aerial view - existing situation



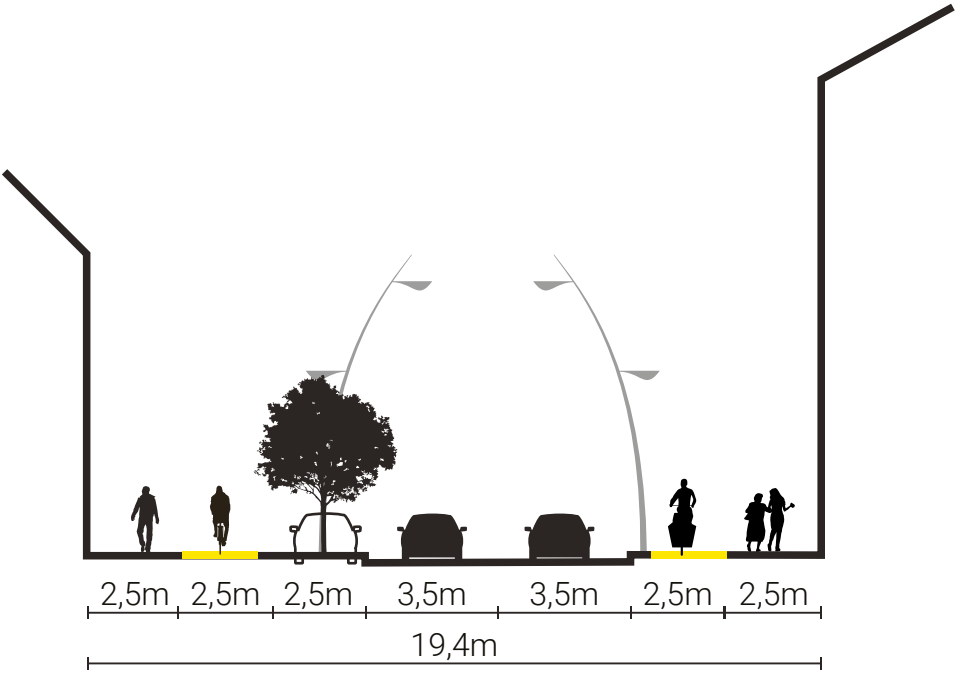
Localisation

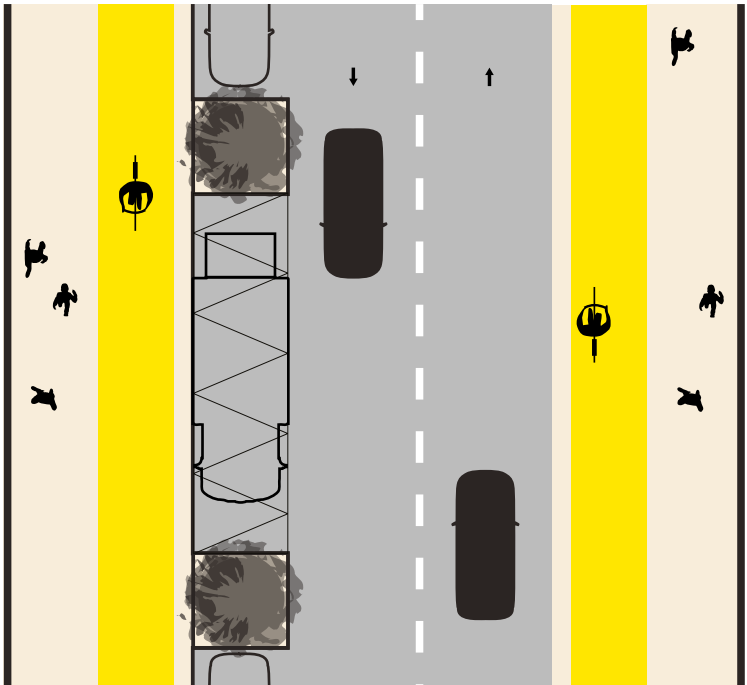


Section - existing situation

Photo - existing situation

What a narrow main road could look like.


2,5m
2,5m
2,5m
3,5m
3,5m
2,5m
2,5m
19,4m

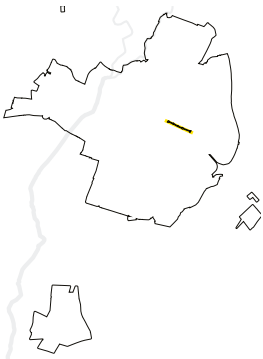


Neighbourhood street

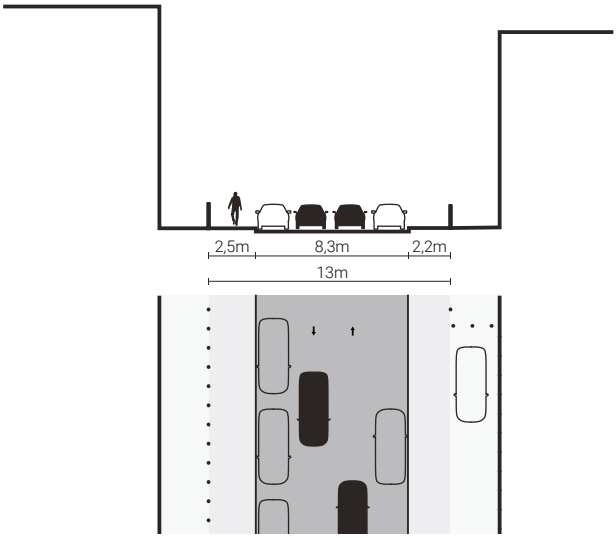
The Ibrahim Gercek Street is a typical neighbourhood road with bidirectional traffic and on-street car parking on both sides, although the profile of the road is actually too narrow to accommodate that. There are no trees and no cycling infrastructure. Cyclists have to mix with motorised traffic and cars overtaking with too little distance between them and the bicycles pose a threat to cyclists.

The street can be transformed into a 'bicycle street' with one-directional car traffic and bi-directional bicycle traffic. Car parking, bus and delivery spots can be organised on both sides in between trees in order to give the street a more liveable, residential character.

Aerial view - existing situation



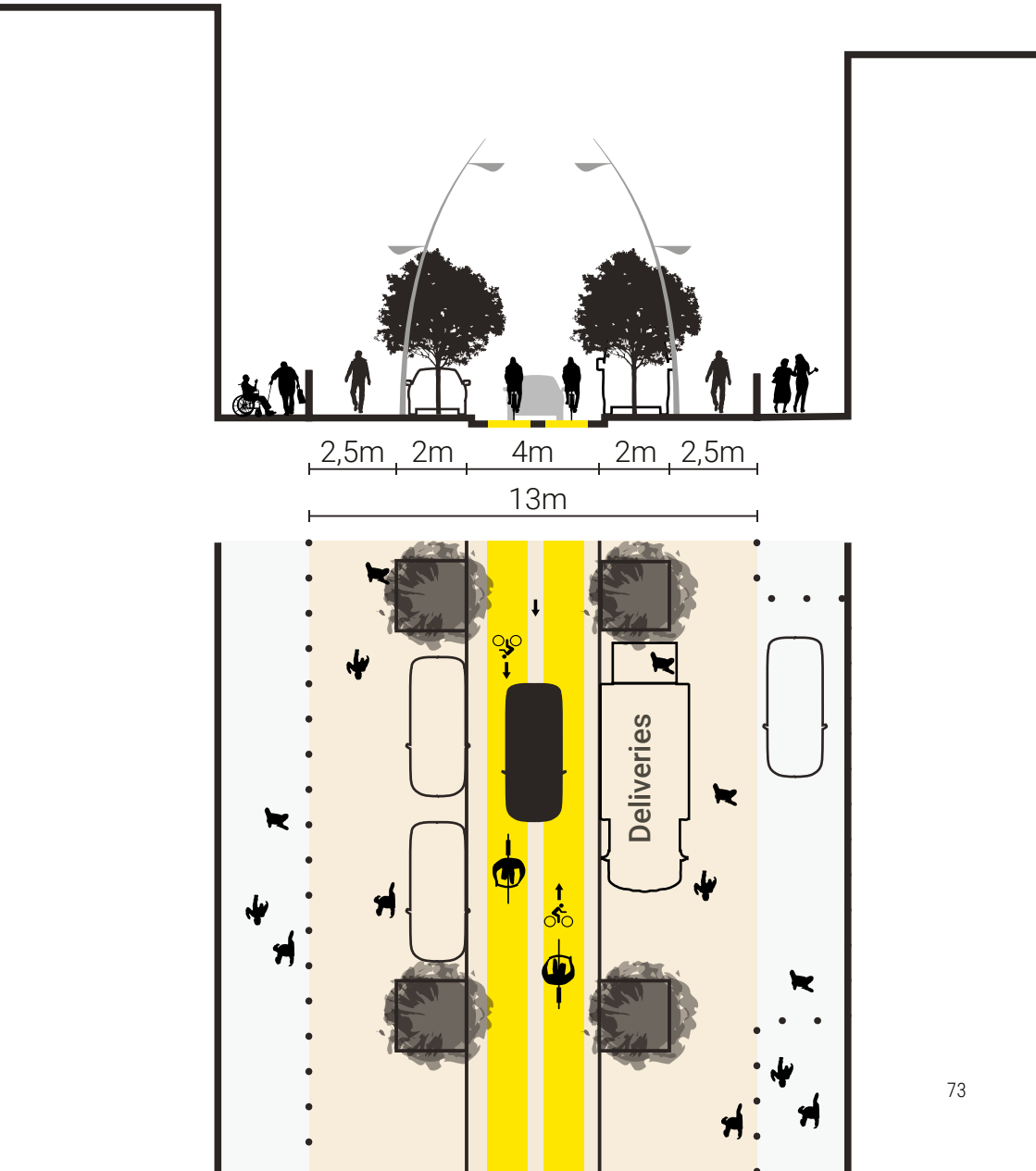
Localisation



Section - existing situation

Photo - existing situation

What a neighbourhood road could look like.

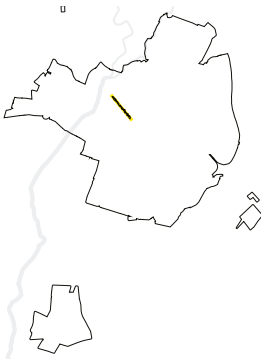

2,5m
2m
4m
2m
2,5m
13m
Deliveries

Pedestrian area

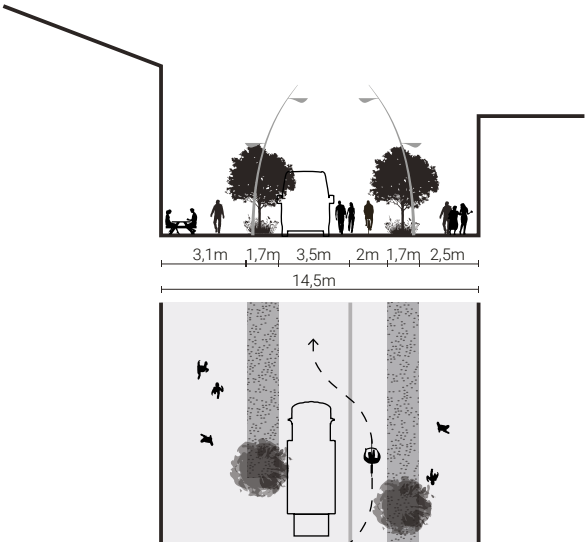
Istanbul Street is a typical pedestrianised street in the city centre. The recent refurbishment with high-quality materials and urban furniture defines protected zones for pedestrians along the façades, a narrow section for cyclists and a wider one for taxis and delivery services. Vehicles, which are regularly parked on the section for cycling, force cyclists to deviate. The deep, slippery natural stone gutters that separate these zones are potentially dangerous for cyclists crossing them.

Rather than by transforming the profile, the situation can be improved by simply swapping sides for cycling and deliveries. Delivery vehicles could be parked on the narrower section formerly reserved for cycling. Cyclists could then share the wide section of the street with occasional motorised traffic.

Aerial view - existing situation



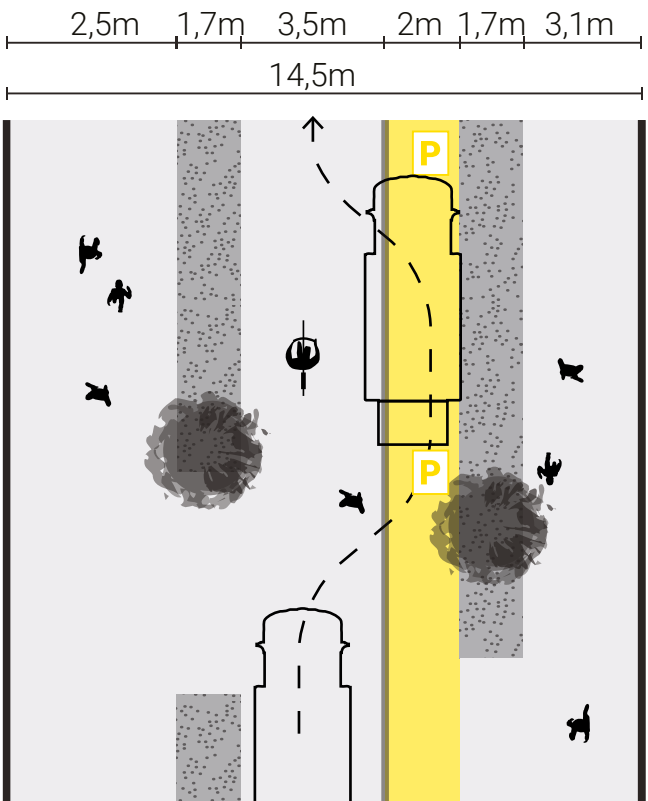
Localisation



Section - existing situation

Photo - existing situation

How to organise deliveries in the pedestrian area.


2,5m
1,7m
3,5m
2m
1,7m
3,1m
14,5m
P
P

Hardware

Typical crossings

During the workshop sessions with public and private stakeholders, four typical crossings in Lüleburgaz were investigated and tested for their potential to accommodate bicycle infrastructure. Based on the current situation of the crossings with their traffic organisation and given dimensions, new bicycle-friendly crossings were developed.

The four different typologies of crossings are:

1 Intersection with an urban highway
2 Intersection in the periphery
3 Roundabout in the periphery
4 Shared space at the train station

Crossings studied during the second workshop

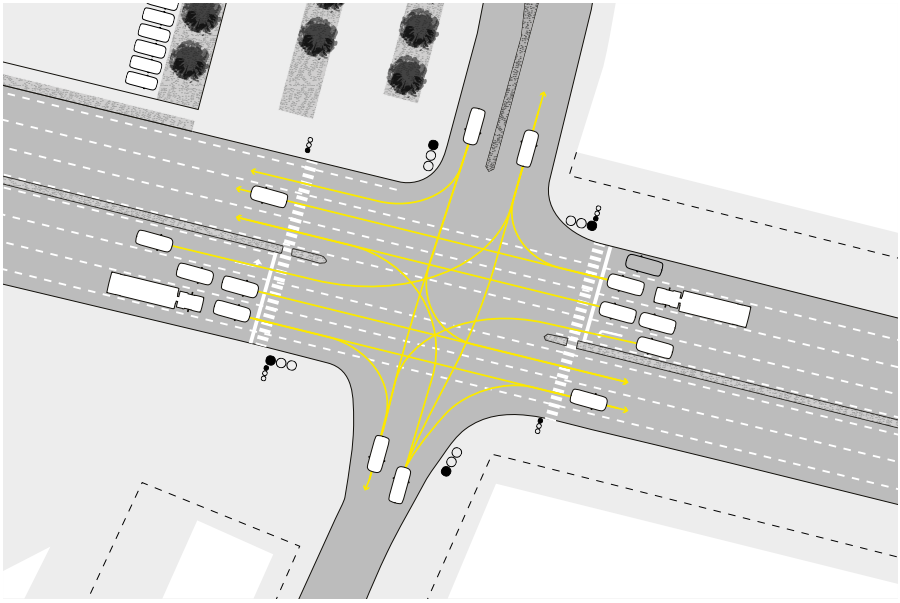
Intersection with an urban highway

The intersection of Istiklal / Murat Hüdavendigar Street near the Lüleburgaz bus terminal is one of the largest crossings in town with the D100 urban highway. All manoeuvres (going left, right, straight) are possible coming from all directions. There are dedicated left and right turn lanes. Pedestrian crossings are extremely long with very narrow waiting islands. There is no cycling infrastructure.

When through traffic is eliminated, car lanes can be reduced on the D100, as well as the side streets. This frees up space for bicycle lanes all around the intersection and larger median strip, thus creating larger waiting areas for pedestrians in the middle of the road. Dutch features such as protective islands, waiting areas, shifts in the cycle paths and advanced stop lines can be applied.

Aerial view - existing situation

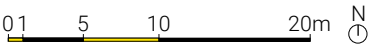
Localisation

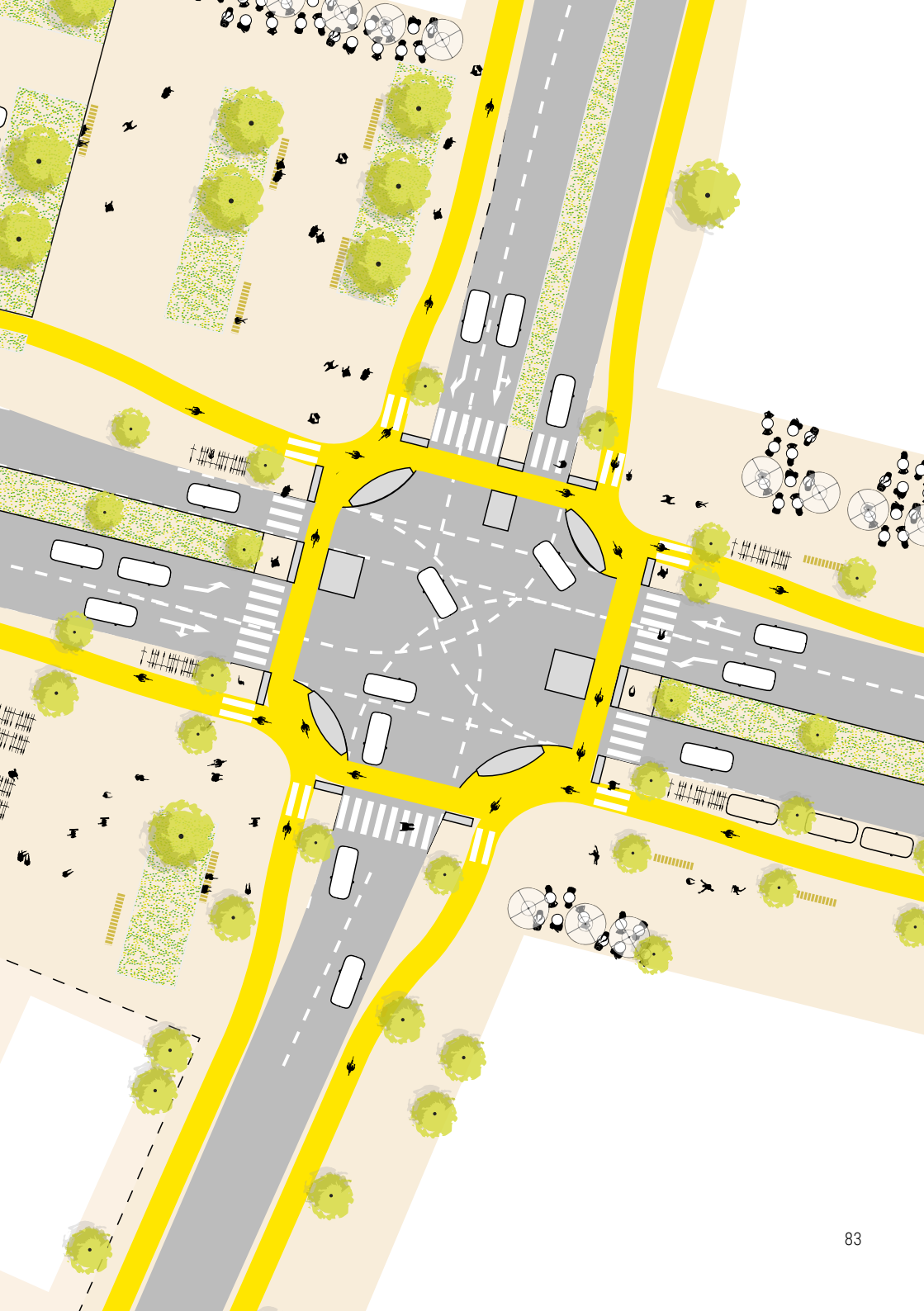


Section - existing situation

Photo - existing situation

What an intersection with an urban highway could look like.





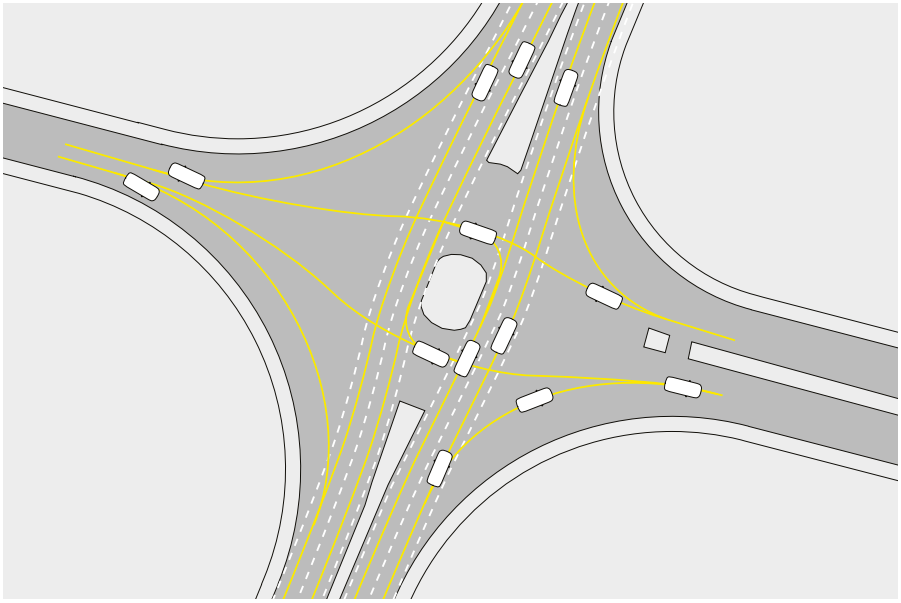
Intersection in the periphery

The intersection of Istasyon / Millet Street near the Lüleburgaz Football Academy is a vast crossing at the edge of the town. The large radii allow cars to turn at high speed. For that reason, the pedestrian crossings had to be positioned far from the centre of the intersection. This obliges pedestrians to make long detours. As a result, many of them put themselves in danger by crossing the intersection in a direct line. There is no cycling infrastructure.

Reducing the radii not only reduces the speed of cars and allows for the pedestrian crossings to be better positioned but also frees up space for proper cycling infrastructure and urban amenities and trees. Elevating the entire intersection and bringing the pedestrian crossings to the level of the sidewalks reduces the speed of the cars and further improves road safety.

Aerial view - existing situation

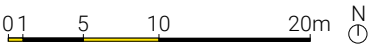
Localisation

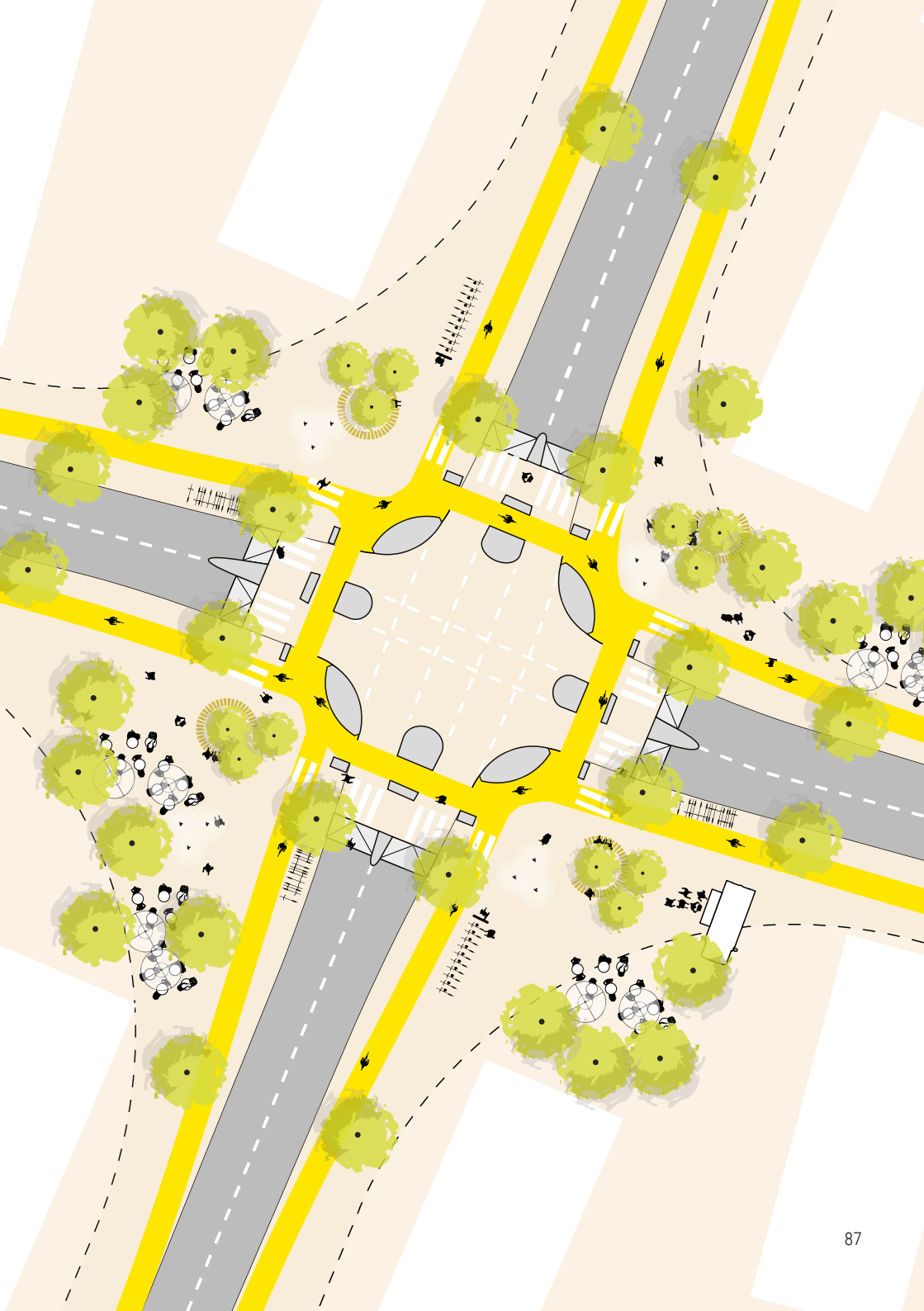


Section - existing situation

Photo - existing situation

What an intersection in the periphery could look like.





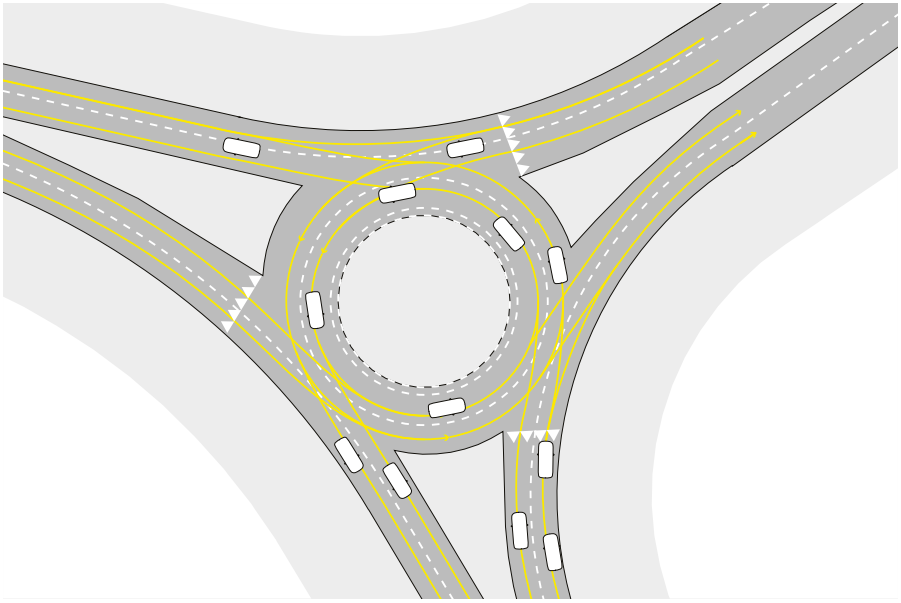
Roundabout in the periphery

The intersection of Toki Bölgesim, Millet Street and Hükürnet Street in a new development area has not yet been built but has been conceptualised as a roundabout where it is possible for cars to make a right turn without slowing down. This makes changing lanes (for motorised transport) and crossing (for pedestrians) a dangerous undertaking. Cycling infrastructure has not been foreseen.

Directing the streets to the centre of the roundabout and reducing its diameter forces motorists to slow down and hence improves traffic safety for all modes of transport. Safe pedestrian crossings and cycle paths can be placed outside the roundabout. The more compact layout of the roundabout frees up public space for urban amenities such as benches and trees.

Aerial view - existing situation

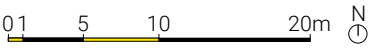
Localisation

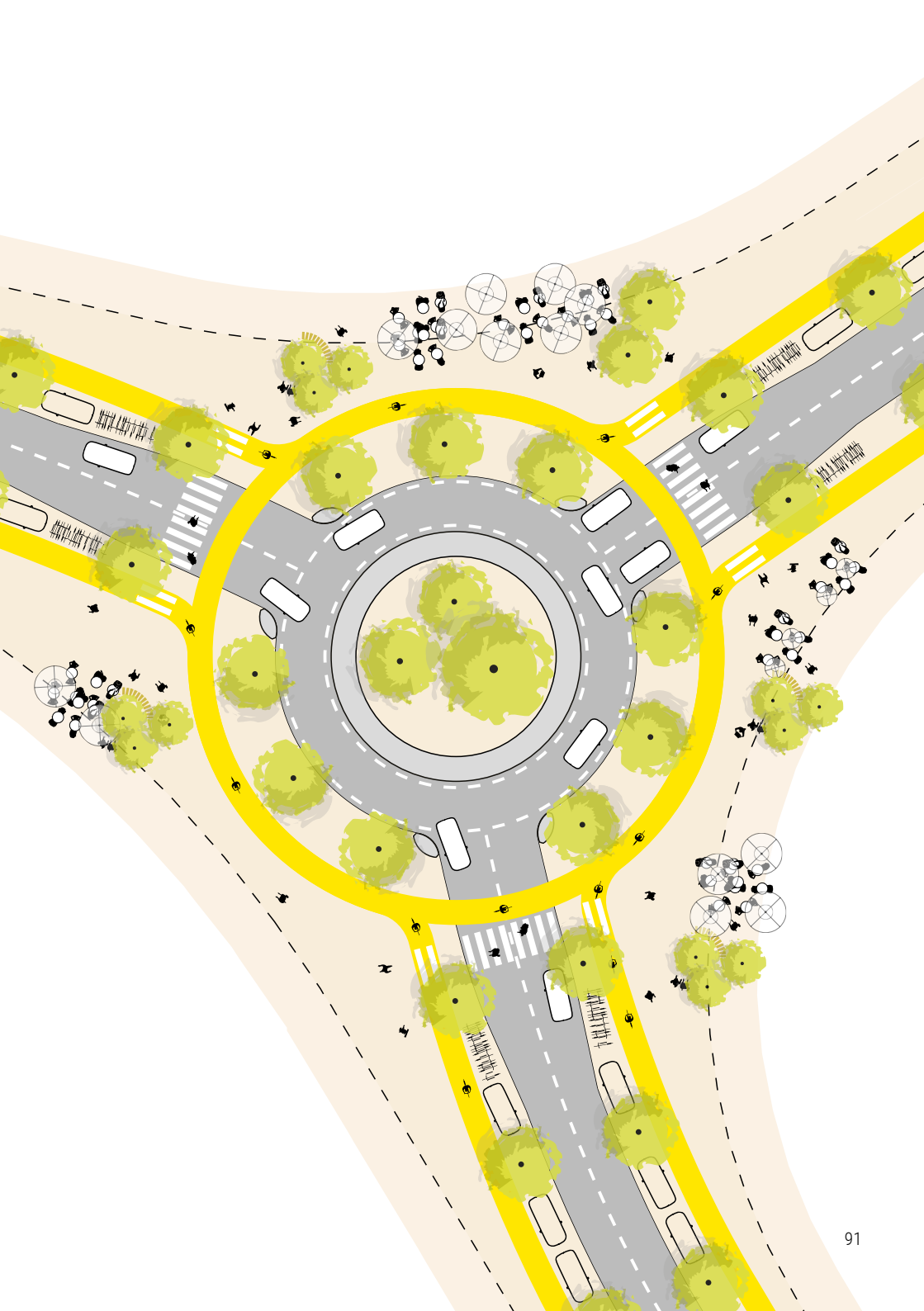


Section - existing situation

Photo - existing situation

What a new roundabout in the periphery could look like.





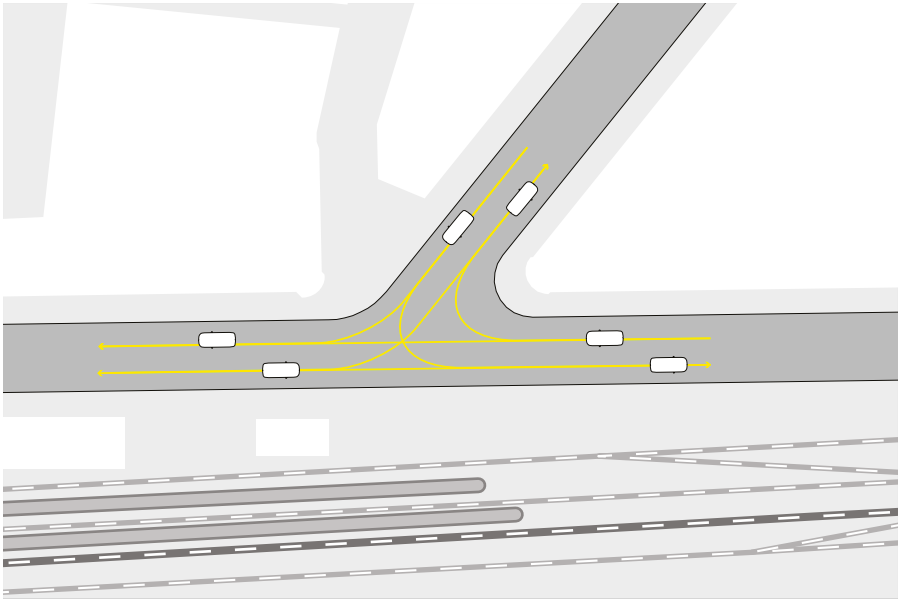
Shared space at the train station.

The space around Durak Mahallesi, Istasyon and Demir Hatti Street in front of Lüleburgaz train station is today a T-shaped intersection with no particular traffic engineering design. There is a small eatery at the corner and sidewalks, but no cycling infrastructure.

When train services will be improved in the future this space can be transformed into a shared space, a multifunctional public space where different users and modes of transport mix. To simplify traffic circulation, Istasyon Street should become a one-way street. The entire space from façade to façade should be equipped with the same high-quality pavement. Pedestrian crossings and dedicated cycle paths are not necessary in a shared space. However, on street car parking should be prevented by bollards and these should delimit free public spaces for urban amenities such as benches, trees and an outside terrace for the eatery. A café or kiosk, as well as bike parking and sharing, can be put in place in the vacant station buildings next to the platform.

Aerial view - existing situation

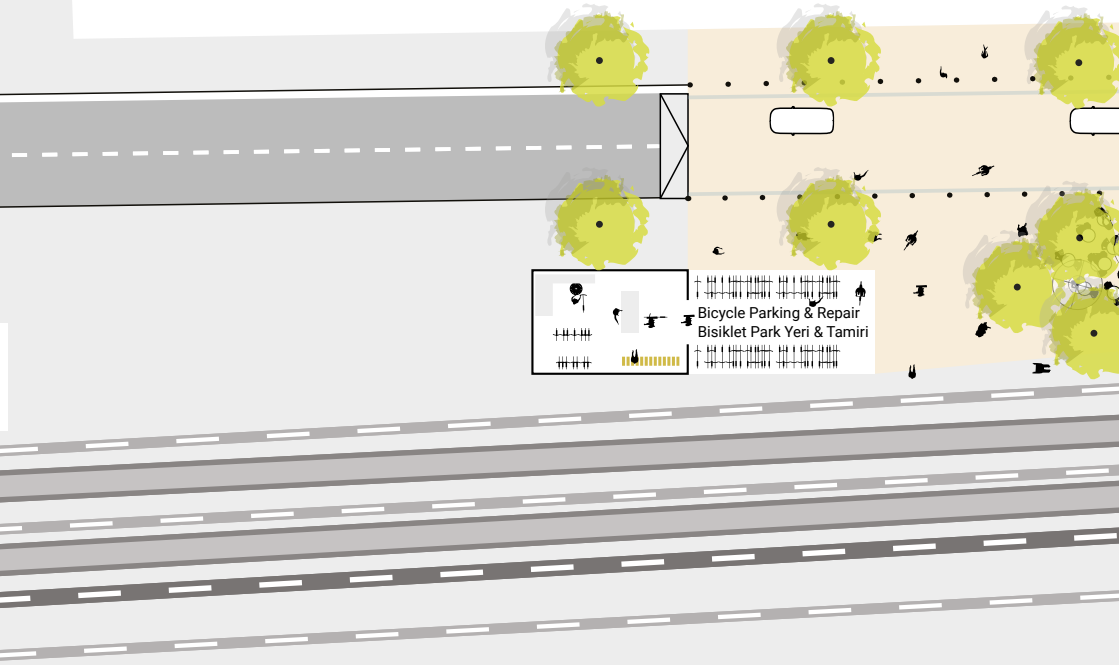
Localisation



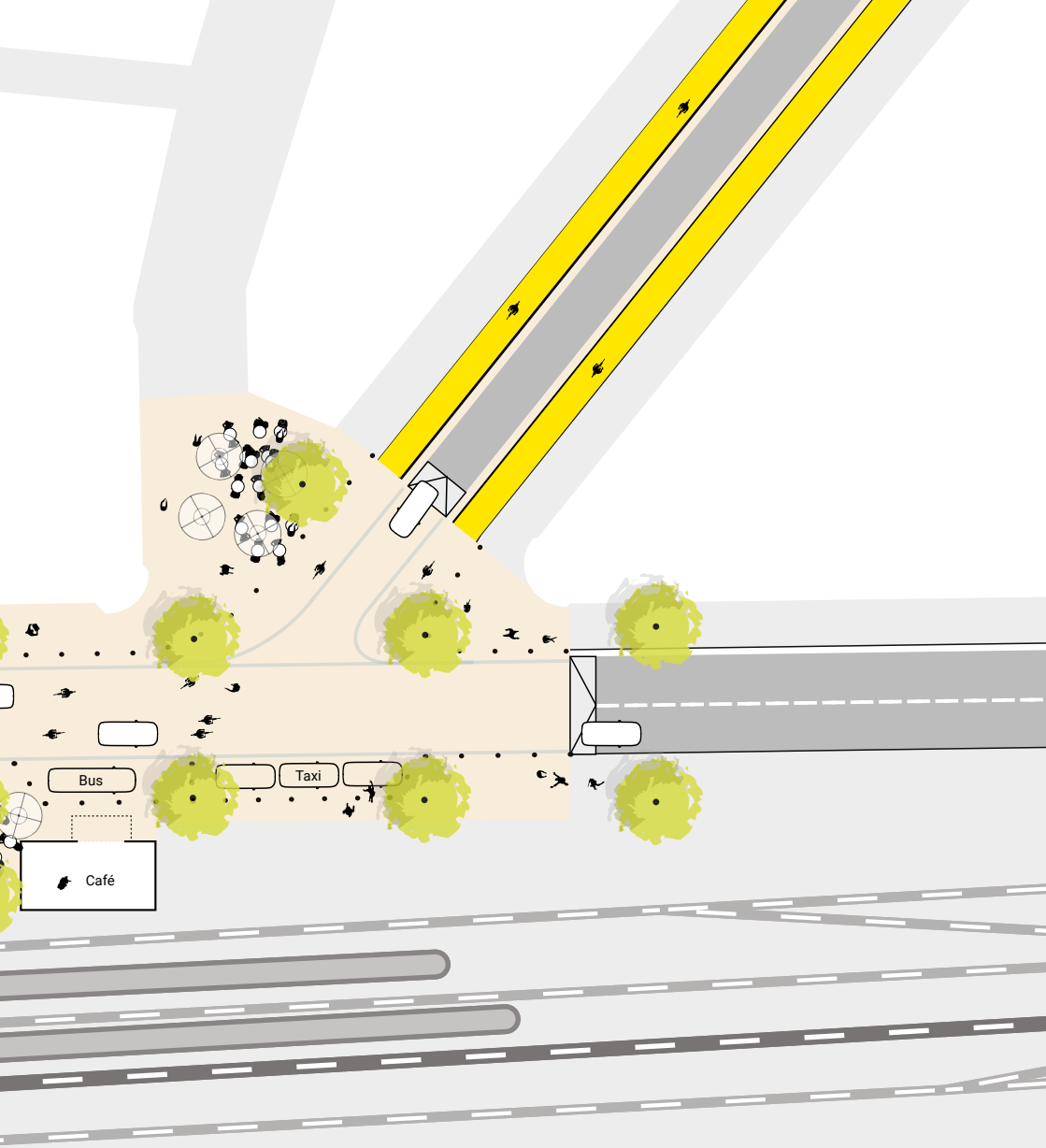
Section - existing situation

Photo - existing situation

What a shared space at the train station could look like.



0 1 5 10 20m N


Bus
Taxi
Café

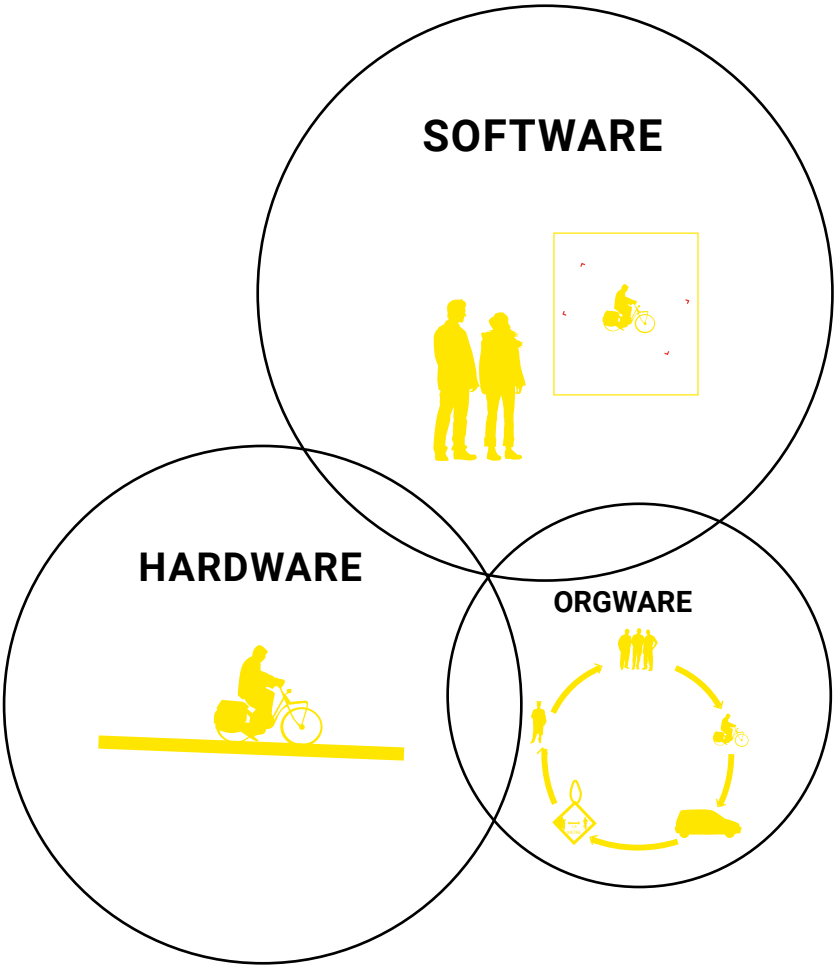
Software

Software

Introduction

Software relates to all social, cultural and economic aspects of cycling. Why are people cycling? How can one encourage people to take up cycling? Who are the possible first movers to encourage other people to take up cycling? What kind of instruments can be used to reach these groups and to make it easier for them to take up cycling? How can new technologies be involved in (the promotion of) cycling? This includes communication strategies, ideas for smartphone applications and ICT integration in public spaces.

In the recent past Lüleburgaz has already made some very good progress in terms of software. During the Year of the Bicycle and the construction of the Lüleburgaz Stars Motorcycle and Bicycle Academy (LYMBA) many activities were organised and there was a lot of communication to create awareness of and raise interest in cycling. The academy offers cycling classes and bicycle repair workshops. In addition, the local cycling community is rather active, engaged and open minded towards the idea of expanding the target group of cyclists in the town. Events such as the 'Flamboyant Women's Bike Ride' are proof of that.

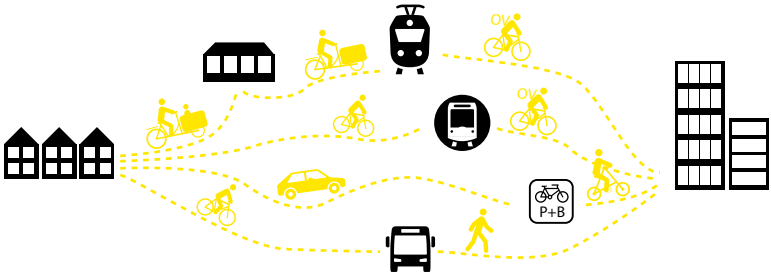

SOFTWARE
HARDWARE
ORGWARE

Software

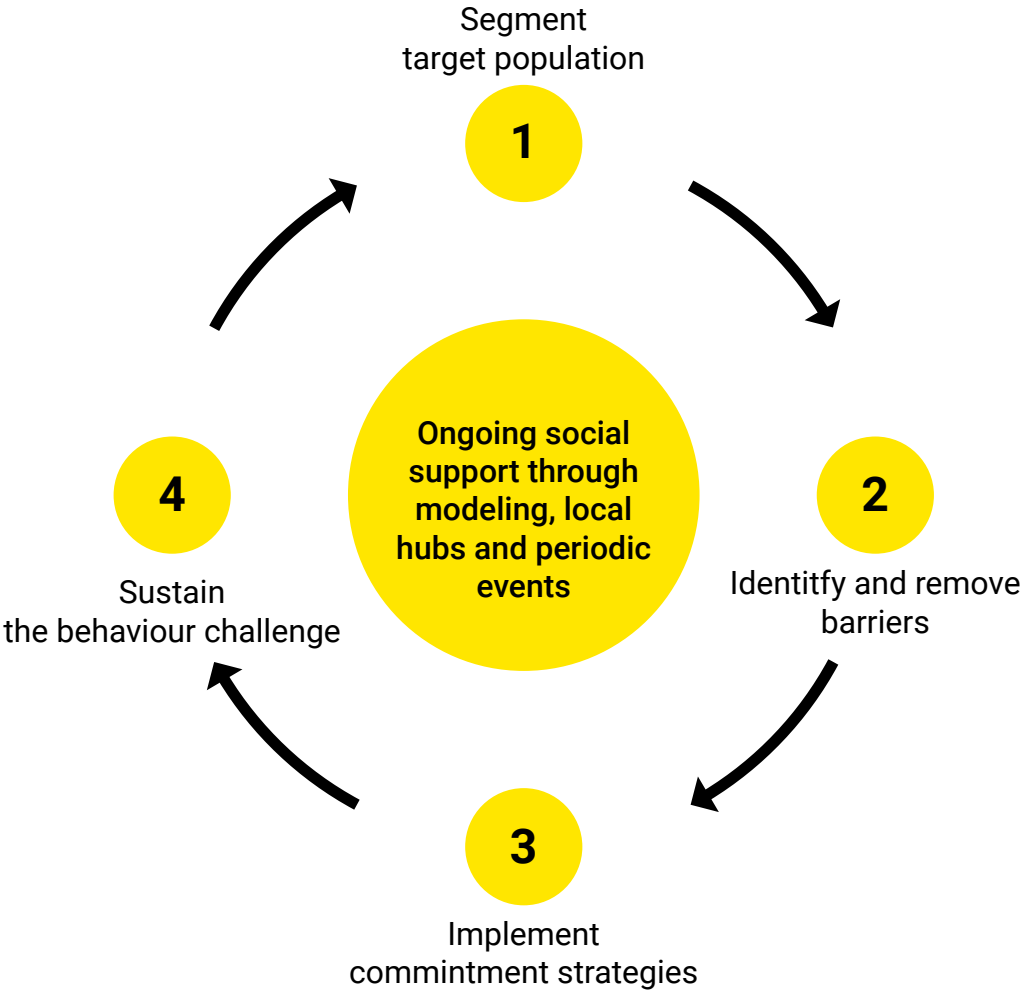
Introduction

A United Nations goal is for a large majority of urban populations to make their daily journeys sustainable by the year 2030 – by bicycle, bus, tram, metro, electric or hybrid car or on foot. Digital apps for car and bike sharing, ridesharing and taxis, services, timetables and route information for public transport networks, will play a particular role in sustainable urban mobility.

Software includes all elements related to the social, cultural and economic aspects of cycling, which is an important link in the multi-modal transport chain.



The bicycle is an important link in the multimodal transport chain
Source: Artgineering



Cycling adoption theory cycle
Source: 'Integrated strategies to accelerate the adoption of cycling for transportation1'
(By Beth Savan, Emma Cohlmeyer, Trudy Ledsham, 2017)

Software

Within the context of software, ensuring the socio-cultural adoption and dissemination of bicycle use among citizens is a complicated process that requires long term planning and patience as behavioural changes take time.

According to a ScienceDirect article entitled 'Integrated strategies to accelerate the adoption of cycling for transportation'(1), attempts to encourage modal shift towards active transportation and cycling have so far focused on physical infrastructure, particularly visually or physically separated cycle lanes and bicycle parking. However, the growing popularity of cycling in many cities around the world demonstrates that behavioural change is possible, even where investment in infrastructure is minimal or less than optimal (Pucher and Buehler, 2011, Reid, 2009).

1 'Integrated strategies to accelerate the adoption of cycling for transportation1' (By Beth Savan, Emma Cohlmeyer, Trudy Ledsham, 2017)

The same study provides a framework for changing cycling behaviour. The figure on page 101 describes the series of steps for adoption and reinforcement of cycling for transportation. These elements are presented in sequence but users should keep in mind that repeating many steps, interventions and techniques throughout the process is part of the strategy's effectiveness. In particular, options in terms of ongoing social support through modelling and the local hubs and periodic events section provide suggestions for inclusion and repetition throughout the implementation of the programme.

Lüleburgaz Stars Motorcycle and Bicycle Academy (LYMBA)

The Lüleburgaz Stars Motorcycle and Bicycle Academy (LYMBA) was opened in 2017 by the Lüleburgaz Municipality and is the only example of its kind in Turkey aiming to promote the use of bicycles in the city and the region. The academy occupies about 10,000 square metres of space, has a 640-metre bike trail and provides free bicycle training and bicycles for the city's citizens. The LYMBA also provides free accommodation for bikers passing through the city and acts as a major hub for international long-distance cyclists entering Turkey from its north-west borders. The bicycle academy also has a repair workshop, kitchen, bathroom and toilet for its visitors (http://bisikletkenti.com/).

The Lüleburgaz Stars Motorcycle and Bicycle Academy opened in 2017

Software

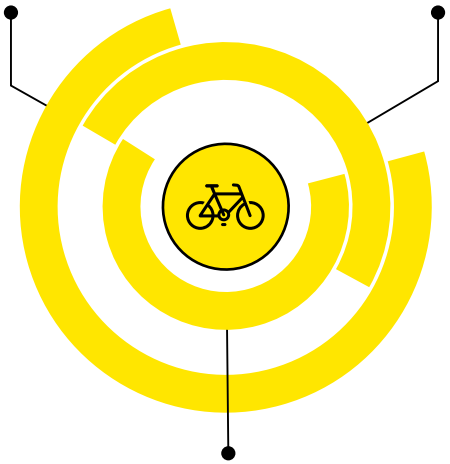
This is where the software measures come into play as part of the transition planning process. The roadmap included in the relevant planning usually covers the social and cultural aspects and a variety of creative activities need to be designed and implemented in order to raise the public's awareness. On the other hand, sustainable urban mobility plans need to be taken into consideration as a high priority area.

It is normally the practice that all the three dimensions - hardware, software and orgware – work and progress in parallel. However, there are also different approaches and one such example is the case of the city of Lüleburgaz. The city first invested in the social and cultural aspects of cycling and has started to work on bicycle infrastructure after raising public awareness. In 2016, the Lüleburgaz municipality decided, in collaboration with local and national bicycle associations and agencies, to make 2017 the Year of the Bicycle before any bicycle infrastructure had been established.

This was an intentional strategy which sought to create the demand for bicycles and strengthen the city's bicycle culture and has continued up to the present day. The city of Lüleburgaz believed that once a level of positive social and cultural change in favour of cycling has been established and demand for bicycles has increased, it would be a more effective and efficient approach to promote these efforts by developing the city's bicycle infrastructure and applications and extending the base of bicycle users.

Communication

Education



Innovation and technology

Software

Communication

The way in which bicycles are perceived by the citizens of a city largely depends on circumstances such as where the city is situated, its geography, demography, culture, infrastructure and the number of cyclists. While citizens of cities that have already developed a cycling culture may take some aspects of cycling for granted, the situation is quite different for cities that are in the process of developing such a cycling culture.

In communities that are at the beginning of their journey towards the development of a cycling culture, there are usually negative perceptions such as cycling being dangerous, uncomfortable, old fashioned, slow, only suitable for sporty people and being a one-off fun activity. Such perceptions may be overcome by communication and the preparation of a communication strategy and plan for the city.

In the case of Lüleburgaz, the city benefitted from a head start with the 'Year of the Bicycle' and the establishment of the Lüleburgaz Stars Motorcycle and Bicycle Academy back in 2017. To take this great start in 2017 to a new level, a multi-year communication strategy and plan will prove very useful. Effective and efficient use of centres of attraction such as the LYMBA bicycle academy within cycling communication plans is of great importance for the development of a bicycle culture in cities like Lüleburgaz.

For this reason, working on the governance, operation and management model of the LYMBA during the project activities has been noted as a critical priority.

For example, during the workshops, there was an agreement that a permanent and professional core team needed to be established to manage the LYMBA to carry out activities such as those listed below:

- A Lüleburgaz Bicycle communication strategy and plan
- LYMBA website development
- Updating LYMBA social media accounts and sharing relevant messages within a plan
- Preparation of a Lüleburgaz Bicycle manifesto and announcing it on the website, at the entrance of the city and on social media.
- Ensure communication and coordination between cyclists and bicycle groups through mobile applications
- Organise an international bicycle festival
- Finding role models in Lüleburgaz to encourage ordinary citizens to use bicycles

During workshops, the software working group advised employing an LYMBA core team consisting of at least one manager, one financial and administrative affairs member of staff and three security staff members. After the workshop held in July 2019, a manager was employed in the LYMBA in addition to the three current security officers and the process of hiring other people in the core team was initiated.

In order to develop and promote a bicycle culture in cities, it is also of great importance to ensure that the related non-governmental organisations such as bicycle clubs and the like are actively engaged in any communication plans and efforts.

Software

In the case of Lüleburgaz, it was indicated during the workshops that the inclusion of local non-governmental bicycle organisations in the Lüleburgaz LYMBA is critical to make the LYMBA more effective and a proposal was made to allocate space for these organisations within the LYMBA.

Festivals play an important role in the promotion of bicycles in cities. Bicycle festivals organised even once a year have the potential to bring new and existing cyclists together, to overcome negative perceptions, to share experiences and knowledge, to create demand for cycling training, seminars, workshops and to create opportunities for cooperation.

During the Lüleburgaz project, in addition to the annual LÜBİFEST, the local bicycle festival, there was a proposal to organise an international cycling festival, to be hosted by the LYMBA bicycle academy, once a year in Lüleburgaz.

Electric-Bike taxis in Lüleburgaz funded by the EU's 'We fight against climate change with our bicycles' project'

The LÜBİFEST Bicycle Festival was organised for the third time in 2019
https://luleburgaz.bel.tr/tag/lubifest/

Role Models

Cycling ambassadors' programmes, including the recruitment of well-trained cyclists (from different age, ethnic and other population groups) who visit residential neighbourhoods and/or target group areas, serve as role models for safe cycling and help with the promotion of cycling, route planning, the distribution of newsletters and information (Davis, 2008). Rides organised by bicycle groups and NGOs offer an opportunity for visible role models to help change cycling behaviour.

"Life is like riding a bicycle. To keep your balance, you must keep moving."
Albert Einstein

"The bicycle has done more for the emancipation of women than anything else in the world."
Susan B. Anthony

"Bicycling is a big part of the future. It has to be. There's something wrong with a society that drives a car to work out in a gym."
Bill Nye, Science Teacher

Software

Education

Riding a bicycle safely, efficiently and comfortably requires skills which are by no means a matter of course, in particular for citizens of cities with a low proportion of cyclists. This is particularly true for cities with a modal share of less than 5% (starter cities) because the other road users are not used to interacting with cyclists. (2)

In this regard, targeted theoretical and practical bicycle training sessions for students, youngsters and women as well as for the general public are necessary to change possible negative perceptions towards cycling and to develop a bicycle culture in cities. Bicycle training and education organised regularly for existing or potential cyclists and provided at designated places such as bicycle centres can play a major role in developing the required skills.

For example, in Lüleburgaz, the LYMBA has already been providing training sessions in collaboration with local bicycle NGOs. As a result of the workshops held in May and July 2019 within the scope of the project, a consensus was formed for the training sessions to be provided at the LYMBA regularly and by the LYMBA's cycling professionals.

In addition, the provision of training sessions outside the bicycle centre such as in K12 schools, scout groups or within traffic courses will be an important complementary factor. The same recommendations were jointly established for Lüleburgaz. During the project workshops in Lüleburgaz, it was indicated that cycling is "safe and healthy".

2 Deffner, Jutta; Hefter, Tomas; Rudolph, Christian; Ziel, Torben Eds. (2012): Handbook on cycling - inclusive planning and promotion

Cycling should have a top priority among other training subjects and be provided to all groups.
The suitability of the venue for practical bicycle training is an important factor for the effectiveness of the training sessions. Special attention needs to be paid to the design of the bicycle roads where training sessions will be held.

Training sessions can also be provided to citizens who are not cyclists or do not intend to become a cyclist. One such proposal was made during project workshops in Lüleburgaz. Educating the owners of car driving schools on cycling culture in the Lüleburgaz Stars Women's Academy (under the leadership of the municipality and NGOs) is expected to help make the streets safer for existing and potential cyclists. Proposals to use technology in training sessions were also made, such as making use of Augmented Reality (AR)/Virtual Reality (VR) and simulation/gaming.

Bicycle training sessions provided at the LYMBA - Lüleburgaz Bicycle Academy
Source: http://www.hurriyet.com.tr/ogrencilere-bisiklet-egitimi-verildi-40854668

Bicycle Training Billboards across Lüleburgaz
Source: http://www.sinirkent.com/7-den-70-e-herkes-icin-bisiklet-egitimleri-basliyor/6506/

Software

Innovation & technology

One of the effective ways to develop and promote a bicycle culture in cities is the innovative applications that make use of technology and new business models. In particular, innovative technologies that promote the use of bicycles by collecting data and providing analysis of the results as a service to citizens is a growing trend both globally and in Turkey. One good example is the reward system applications that attract citizens and ultimately encourage the use of bicycles.

The Ring-Ring application, which was developed in Amsterdam, Netherlands, is one of the best applications that can be given as an example for technology-assisted reward/incentive systems.

Janine Hogendoorn, the founder of Ring-Ring, was invited to the project workshop held in July 2019 in Lüleburgaz, where her experiences were shared and suggestions for Lüleburgaz were evaluated.

Another innovative model driven by technology that encourages the use of bicycles is 'Bicycle Sharing Systems'. As cited in the article entitled 'The role of bicycle sharing systems in normalizing the image of cycling: An observational study of London cyclists', (3) apart from providing affordable cycling opportunities for citizens through short distance rentals, bicycle sharing systems have another use.

A perception of cycling being unsafe is a major reason that discourages people from cycling. Some current or potential cyclists may also be put off by this perception.

Ring-Ring®

Ring-Ring® values healthy mobility by connecting people, employers, cities, healthcare and entrepreneurs through its platform and mobile app. Its state of the art platform promotes bicycle use by connecting cyclists, shop owners/entrepreneurs, employers, insurance companies and cities. Examples of benefits include shops giving discounts for each 100 cycle miles or employers rewarding healthy commuting and organising challenges or cities converting cycle miles into a local social initiative fund (https://ring-ring.nu).

Ring-Ring® - An example of a technology-assisted bicycle reward system

Software

There is a perception that cycling is exclusively an activity for 'sporty' people, an identity that people may feel unwilling or unable to embody (Aldred, 2012b, Steinbach et al., 2011). Such perceptions are thought to be reinforced with cyclists wearing appropriate safety clothing or helmets. As bicycle sharing systems usually involve short distances between stations, users of such systems tend to ride their rented bikes with their daily clothes and the idea that cycling is for ordinary people is given a boost.

In an observational study of 3,500 adult London cyclists carried out in 2013, London Bicycle Sharing System bicycles were much less likely to be ridden by someone wearing distinctive cycling clothing. The Mayor of London announced later his ambition to "de-Lycrify" cycling (The Independent, 2013) and encourage "more of the kind of cyclists you see in Holland, going at a leisurely pace on often clunky steeds" (Greater London Authority, 2013, p. 5).

3 'The role of bicycle sharing systems in normalizing the image of cycling: An observational study of London cyclists', Anna Goodman, Judith Green, James Woodcock, 2013

Within the scope of the Lüleburgaz project, F+ Ventures, located in Istanbul, and Accell Bicycles, located in Manisa, have contributed to the project in a joint collaboration to conduct a proof of concept project (POC) in Lüleburgaz.
During the project workshops, a number of alternatives were discussed with the participants with regard to the design of the proof of concept. A robust bicycle frame was selected as a base while a GSM/GPS integrated bike lock was the preferred choice.

Incentives

Simple incentives are often used to encourage newcomers to cycle. Cooper (2007) and Davis (2008) reference incentives, such as balloons, candy and bike accessories, as particularly effective to attract school-age children. Mass cycling events, often fun, community-based promotional activities, are known to attract new and novice cyclists and to get them interested in cycling and the cycling community (Bowles et al., 2006, Mason et al., 2011, Rose, 2007, Sloman et al., 2010, The National Safe Routes to School, 2007).

'Why We Cycle?'

As part of European Mobility Week, the documentary 'Why We Cycle?', which explores bicycle culture in the Netherlands, was screened at the LYMBA Lüleburgaz Bicycle Academy.

Software

Another requirement for the proof of concept (POC) is for the system to be dockless. In Turkey, a large majority of bike sharing systems use docking stations. The POC project will therefore provide useful insights into a relatively new area in Turkey. The main properties of the bicycle sharing POC are:

- GPS positioning/tracking
- GSM connectivity
- Geo-fencing
- Battery & solar energy operated
- App supported platform

As to the functionality of the proof of concept project, users will be able to find or reserve a bicycle from the web browser or through the mobile app that is available. The users can unlock the bicycles by scanning a QR code or by using an SMS, GPRS or Bluetooth. After each ride, users can view and share their rides and statistics, including distance travelled, calories burned etc.

Proof of Concept of a Dockless shared bicycle for Lüleburgaz

Robust and easy to use GSM+GPS bicycle lock

The proof of concept involves four bicycles with specially fitted hardware and software to be tested by the Lüleburgaz Municipality. The application will be tested with actual users and the experience will be a helpful guide as to how such efforts will be shaped in Lüleburgaz to implement a bicycle sharing system in the near future.

Other innovative, technology-assisted models that have been proposed by workshop participants which would help develop a cycling culture are listed below:

'Bicycle Card' applications already being used in various cities in the world and in Turkey, which is an innovative application that could be used more widely in cities. During the Lüleburgaz project, it is understood that the municipality is already preparing such a project and suggestions have been developed to support the relevant implementation.

One of the creative examples is students/ youngsters earning city points as a result of activities such as waste collection/cleaning and using these points to acquire a bicycle. During Lüleburgaz workshops, a similar initiative was proposed.

Another innovative application implemented in cities is the identification of inactive bicycles and giving them to those who do not have bicycles. An opportunity will thus be created for the dissemination of bicycle usage. During Lüleburgaz workshops, a similar idea was worked out and a decision was taken to identify the bicycles that were idle in the houses and warehouses of companies and to give them to groups without bicycles. The project is being carried out using the name ZOMB-BIKE.

Software

Car parking problems in cities, especially in city centres, have a negative impact on urban life. Within the scope of sustainable urban mobility plans, environmental and integrated transportation designs are being prepared and efforts are being made to find creative solutions. One such example was proposed by a young entrepreneur during the Lüleburgaz workshops:

A 'Bike & Ride' project, which is a creative idea that encourages the use of bicycles in the city centre and also facilitates transportation, envisages that people coming from outside the city park their vehicles and reach their destination by bicycle. It was agreed that it would be beneficial for bus companies to support this model, which is an environmentalist approach to relieve traffic congestion. Alternative locations have also been identified.

One of the most important factors in disseminating the use of bicycles in cities is the design of special bicycles that will meet, encourage and support the needs of different groups. Bicycle centres are the ideal environment for the design workshops. In Lüleburgaz, the idea of starting bicycle design workshops in LYMBA was proposed by bicycle non-governmental organisations.

One of the rapidly increasing innovative services in cities are provided by bicycle couriers. It was also proposed as one of the innovative applications during the Lüleburgaz workshops.

The repair and restoration of bicycle parts plays an important role in all bicycle initiatives in the cities. In the workshops held in Lüleburgaz, local bicycle non-governmental organisations recommended the repair of bicycle parts at the LYMBA.

In addition, the introduction of new creative campaigns from time to time in order to promote and disseminate the use of bicycles in cities is an important incentive. In Lüleburgaz, the integration of a similar approach to the LYMBA programme was agreed on.

Due to the difficulties of implementing many large scale multi-stakeholder projects at the same time, use of the Business Model Canvas for priority projects will help ensure that ideas/projects are implemented in an effective way. Within the scope of the project, Business Model Canvas was presented at the workshop held in May 2019 in Lüleburgaz and examples of cycling were shared.

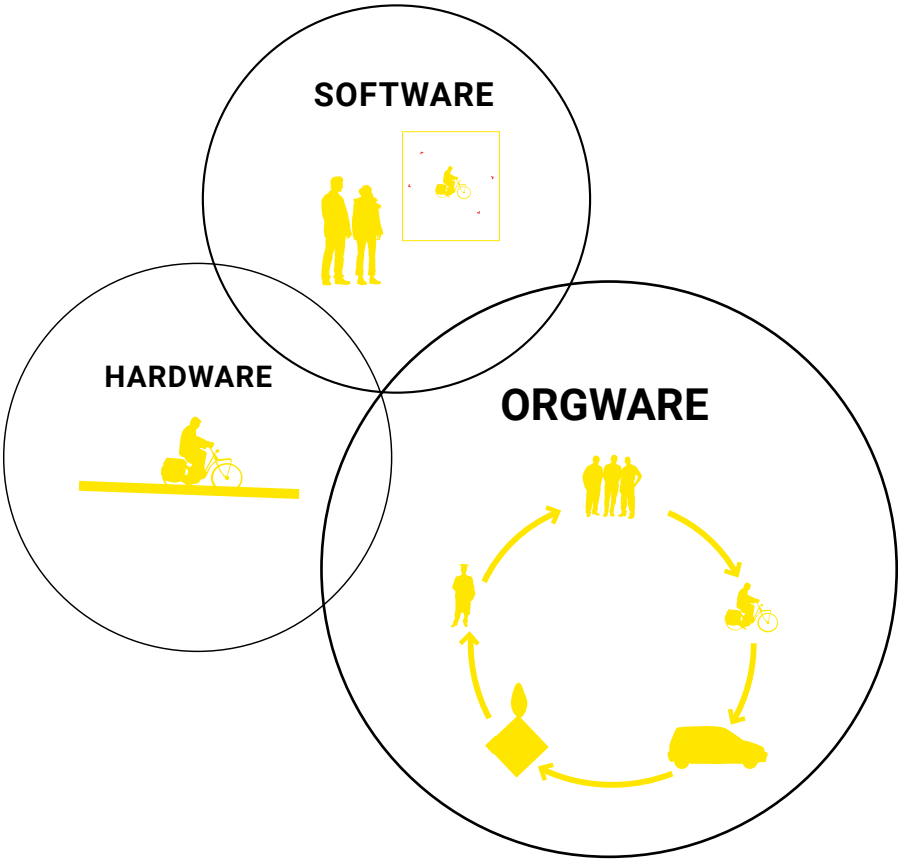
Orgware

Orgware

Introduction

Orgware includes all elements related to the organisation and preconditions to make a successful development of the Inclusive Bicycle Masterplan possible. This includes national and local legislation as well as tax incentives and subsidies. What is the necessary budget for the short and the long term? What is the working structure within the municipality? And how is the involvement of the stakeholders organised? Which regulations should be changed in order to protect and stimulate cyclists? How can enforcement of road traffic rules be strengthened in order to prevent speeding offences, illegal parking of cars, etc. and thus help the development of cycling?

Good orgware is the basis of a successful cycling masterplan. The municipality of Lüleburgaz organized the Year of the Bicycle in 2017 and laid down the structures for an internal organisation within the municipality in order to promote and foster cycling as an important mode of transport and a city changer. To do so, the municipality cooperated in different ways with local NGOs but also drew on international expertise (from the Netherlands and Belgium) to exchange knowledge in the field of cycling-related capacity building.


SOFTWARE
HARDWARE
ORGWARE

Orgware

Municipality

The municipality plays a crucial role in the introduction and development of cycling as a relevant mode of transport. The municipality should develop and determine a long term sustainable bicycle policy as part of an integrated mobility vision and strategy. The vision and strategy includes qualitative goals and quantitative results. In the case of Lüleburgaz, see the table below.

Strategic Objective 2 To be a liveable and sustainable city that offers a high quality of life and creates value.		
Strategic Goal 3 Develop sustainable urban transport and transport policies.		
Performance indicator	**5 year**	**Responsible Department**
3.1 Length of bicycle roads made 5 km Dept. of	5 km	Dept. of Infrastructure & Construction
4.1 Bicycle Year Activity Plan 1	1	Dept. of Coordination-Planning & Projects
4.2 Feasibility report of urban bicycle roads 1	1	Dept. of Coordination-Planning & Projects

Activities and Projects:	Construction of bicycle paths
	Developing strategies to promote bicycle use

Strategic Objective 5 Being a smart city that produces, develops and applies innovative thinking		
Strategic Goal 4 Implementing projects that offer viable smart solutions to become a smart city		
Performance indicator	**5 year**	**Responsible Department**
8.1 Number of Smart Bicycle Stops	5	Dept. of Support Services

Activities and Projects:	Establishment of smart bicycle stops in the city

The increase in the modal share of cycling over a certain period of time is an important instrument to set targets and to evaluate the results in a quantitative way.

Based on these targets and results, the question 'what is needed to achieve this?' should be answered. This should be part of the long term and short term bicycle and mobility policy and strategy. Quick wins will show what cycling can do to improve accessibility, air quality and can develop support in the community for cycling.
The hardware and software measures in this document are the concrete steps in the Lüleburgaz strategy. These are not measures that stand alone, but they should be part of an integrated strategy.

This integrated approach also needs integrated, controlled policy and processes within the municipality structure. It is therefore helpful to have one of the deputy mayors (traffic and transportation) responsible in close collaboration and coordination with other deputy mayors (spatial planning, public space, education and economy). Furthermore, an integrated team of municipal officers should be formed under the leadership of one officer responsible for the development and execution of the bicycle strategy. The team should produce an execution programme including when which measure will be executed by who, as well as the costs and the allocated budget. As mentioned before, an integrated approach is crucial for a successful bicycle policy in practice. The construction of a cycle path in a shopping street provides the opportunity for the refurbishment of the public space and to improve accessibility, which are conditions for entrepreneurs to settle down and invest in the area. This will all improve the value of the real estate and the economy. Such a result can only be gained via an integrated approach.

Orgware

The municipality should be aware that this needs investment and budget today but there will be a return on the investment in the future.

The following municipal departments should participate in the integrated team:
- Traffic and transportation.
- Spatial planning.
- Design and maintenance of the public space.
- Economy.
- Education.
- Sustainability/environment.

In Lüleburgaz, the following team has been formed and took part in all the studies:
- Department of Transportation
- Department of Urban Planning
- Department of Enforcement
- Department of Public Space
- Department of Coordination & Planning Projects

Laws and regulations

Cyclists are vulnerable in traffic and should be sufficiently protected against cars and motorcycles. By developing cycle-friendly infrastructure, protection can be improved considerably. Nevertheless, in addition to the infrastructure design, protection by legislation and regulation is also needed. In case of an accident between a cyclist and a car, the driver of the car is, in principle, always partly guilty according to Dutch legislation. Hence, the costs incurred as a result of the accident should be paid by the car driver or his/her insurance. This protection is very important for cyclists and the development of cycling. The question of whether wearing a helmet as a cyclist is an obligation or not is a relevant issue

in this regard. These issues are the responsibility of the national government but municipal authorities could address the issues at this level. At local level, municipalities have the possibility to put in place regulations which can stimulate cycling, for example by creating good regulation that is advantageous for bicycle parking in public spaces and charging fees for car parking in the city centre. Another form of fostering cycling through legislation is the creation of good regulations for bike sharing which fits in with the city's bicycle policy. Also, the orientation session during driving licence courses to increase the awareness of driver candidates about cycling safety measures, as proposed by the software group during the Lüleburgaz workshops, fits in with this legislation strategy.

Enforcement

In order to keep the bicycle paths free from cars and motorcycles, enforcement by the police is very important. Without enforcement, investment in the infrastructure could be useless and a waste of money. The backdoor for unauthorised traffic and traffic that is trying to find short cuts should be kept closed. Cooperation with the police or other authorised enforcement organisations is crucial for the success of the introduction of cycling infrastructure. Giving priority and sufficient manpower to the protection of cyclists is crucial here. Some cities successfully work with police patrols on (electric) bicycles to show presence on the bicycle lanes and to communicate that cycling is a valid mode of transport to be respected.

Private sector

The private sector also can play a relevant role in the introduction of cycling in the city. Private companies have an interest in this development and can directly benefit from it. The main sectors are:

- Bicycle producers.
- Bicycle shops/retailers.
- Bicycle sharing companies.
- The tourist industry such as hotels, booking and travel agencies.

The municipality should therefore involve the private sector in the development and execution of the cycling policy. What are potential benefits for local entrepreneurs and what kind of innovations can they contribute? These are relevant questions for the municipality. The private sector could also be an investor, especially via in-kind contributions. This can be done through technological innovation, tourist promotion or the opening of new bicycle shops. In order to promote bike-sharing programmes economically, the municipality should strive to include bike-sharing in its own mobility policy and have its civil servants use shared bikes for short-distance business trips.
In Lüleburgaz, the city council is keen to create an attractive urban environment for innovative start-ups and scale-ups. A bicycle-friendly city with a human-oriented high-quality public space is also an economic opportunity for the city. This will add value and make the city more attractive for innovative entrepreneurs.

Bicycle organisations

The local bicycle groups and non-profit organisations are other important stakeholders and partners in the development of cycling. These groups and organisations often have a lot of local knowledge about cycling in the city, such as information about dangerous spots, but also about infrastructure opportunities, such as quick wins, by changing a crossing. Furthermore, they are the ambassadors of cycling who can play an important role by promoting and building up support within the cycling community. In addition, it can be helpful if these organisations have a consultative role in the process of the design of bicycle infrastructure.

Educational organisations

The education of cyclists but also other road users, such as car, bus and taxi drivers is very important to improving cycling and creating a cycling-friendly culture. See also the Software chapter of this document. Education comprises different elements, such as education for students at primary and secondary schools, but also adults, e.g. as an integrated part of car driver licence training. The involvement of trainers and teachers in the bicycle introduction programme is therefore relevant to ensure the integrated approach.

Orgware

Traffic police

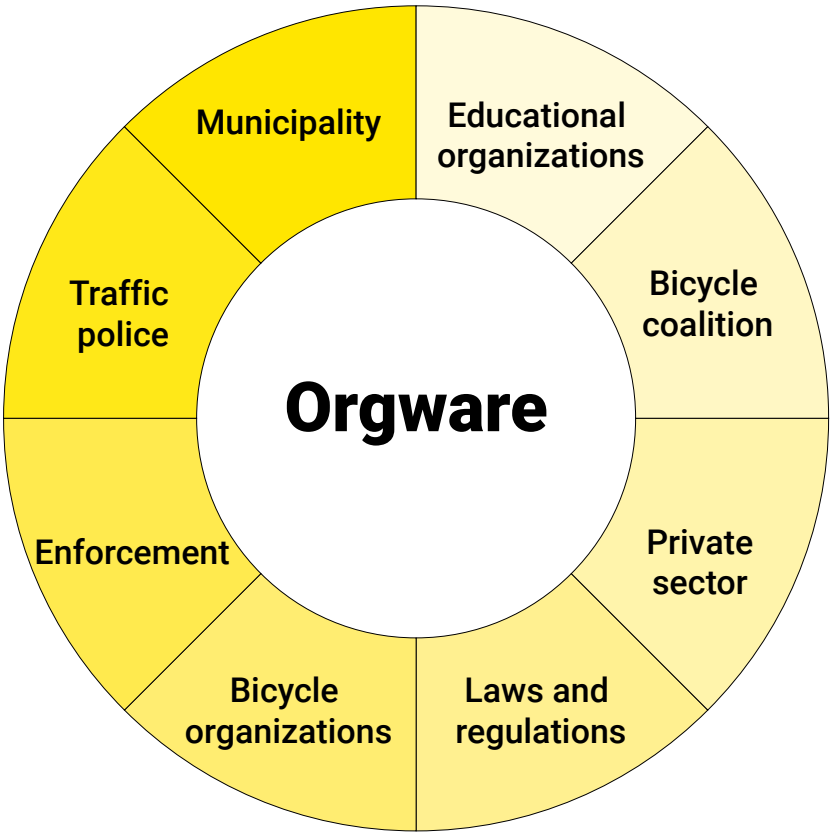
As mentioned before, the constructive involvement of the traffic police to ensure the enforcement of traffic rules is needed. At the same time, the knowledge and experience of the traffic police is of great value for the design and use of bicycle infrastructure. In this regard, it is recommended that representatives of the traffic police be given a consultative role in the design and use of the bicycle infrastructure.

Bicycle coalition

Above we have listed the relevant parties in society that can play a major role in the development and implementation of an inclusive bicycle master plan. Bringing these parties together in a coalition for cycling will empower the process in terms of quality, support in society and speed of implementation. It is the municipality that should coordinate this coalition for cycling.

In Lüleburgaz, the following stakeholders are part of the coalition:

Lüleburgaz Municipality, representing different departments (coordination)
Lüleburgaz City Council
District Health Directorate
District Education Directorate
Directorate of Highways
Chamber of Drivers
Local Public Transport Cooperative
Taxis Assistance and Solidarity Association
İnci Cooperative
1st Regional Directorate of Highways Lüleburgaz 11th Branch Office
District Bureau of Traffic
Startup Trakya
LUBIDER Lüleburgaz
Motorbike and Bicycler Club Association
Hedef Nature Sports Group
Cyclists Association Lüleburgaz Branch
Local (landscape) architects
Local engineering companies


Municipality
Educational organizations
Traffic police
Bicycle coalition
Orgware
Enforcement
Private sector
Bicycle organizations
Laws and regulations

Mock-up

Mock-up

Testing bicycle infrastructure

In the context of this study, a ‘mock-up’ is a real live laboratory, a temporary installation in a public space to test a specific design. The advantage over other forms of simulation is that the effects of the intervention can also be experienced ‘live’ by non-experts.

For complex transformations of public spaces, the mock-up is a great tool for experimenting, communicating and evaluating new, more advanced ideas that could otherwise not be implemented. Making use of a mock-up can extend the scope of possible solutions for the organisation of traffic circulation and parking, the design of public space and the multifunctional use of space.

Temporary refurbishment Quai de l'Hotel de Ville, Paris © Fred Kent

Guerrilla Toilet Plunger Bike Lanes, Providence, Rhode Island © James Kennedy

Mobility challenge Hoogkwartier, Rotterdam © MVRDV

Do-it-yourself cycle path, Brussels

Pop-up bike lane, Mountain view © IFDESIGN

Public transport and cycle lane mock-up Nörrebrogade Copenhagen © Troels Heien / © Monoline

Mock-up

A mock-up for Lüleburgaz

During the workshop sessions with public and private stakeholders, a large number of possible locations for a mock-up of a cycle path in Lüleburgaz were discussed and evaluated. Besides relevance (sufficient sources and destinations along the route), space (dimension of the profile and adjacent buildings and spaces), traffic (amount and modes of transport), feasibility (political will and eventual resistance) was also an important aspect.

The optional locations for a mock-up were:

- D-100
- Akin Koleji to Istasyon Mahallesi
- LYMBA to Durak Mahallesi
- Street from Fatih Street, to Luleburgaz High School, LYMBA, six schools (Okullar Bolgesi)
- Saglikli Yasam Merkezi (at the end of Ibrahim Gercek Str.) to city centre (Genclik Park)
- Turkiye Petrolleri to Hastane Cikisi
- Dere Mahallesi, Yilmaz Mahallesi
- Rustu Akin: Bus terminal to LYMBA
- Istasyon Street: Eski Musellim to AVM

Dere Mahallesi, Yilmaz Mahallesi
D100
Istasyon Street: Eski Muselim to AVM
LYMBA to Durak Mahallesi
N
0
0,5
1km

Mock-up

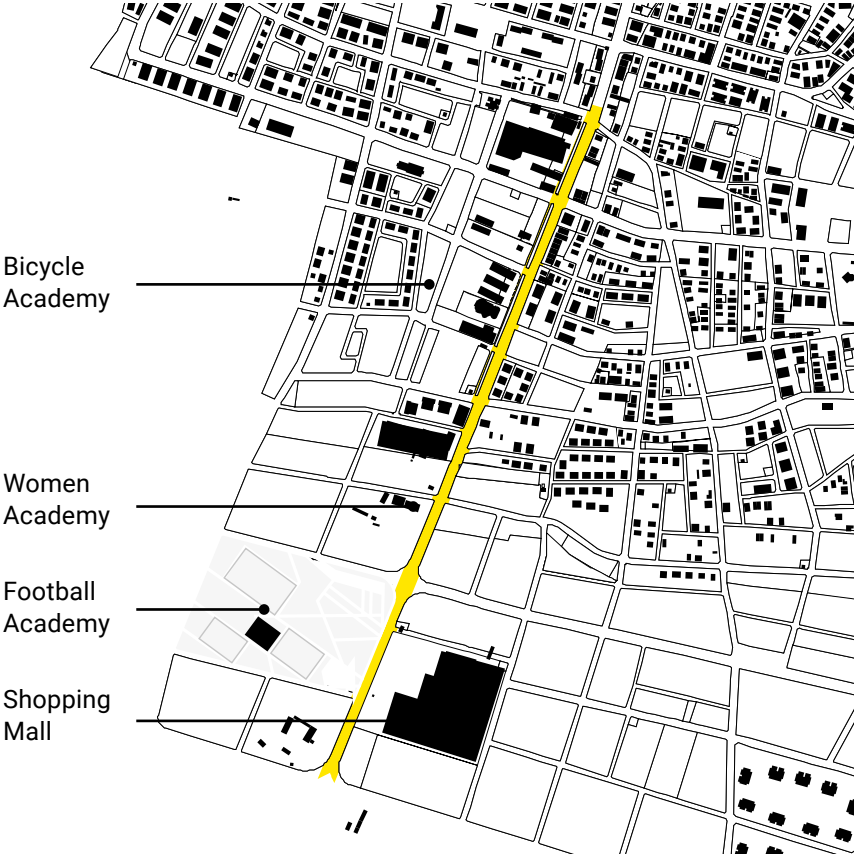
Mock-up Istasyon street

During the workshop session, the group agreed on a section of Istasyon street as the most interesting and feasible testing ground for the implementation of cycling infrastructure in Lüleburgaz. The selected section from Zeliha Özbek Street outwards comprises large and narrow main road profiles. Unlike the urban highway D100, it is under the control of the municipality. It connects to important points of interest such as the bicycle, women's and football academy as well as schools and a shopping mall. In the future, it will be an important connection for cycling to the train station.

On the selected route, closer to the city centre, there is street parking on the outer lanes. Further outside there are no parking spaces along the road. This makes it easier to suppress one lane for the creation of a bicycle lane without reducing the capacity for motorised transport. Municipal waste containers are placed between the parked cars on the outer lanes. Here and elsewhere, parking in double rows creates dangerous situations and obstructions for all road users and especially for cyclists.

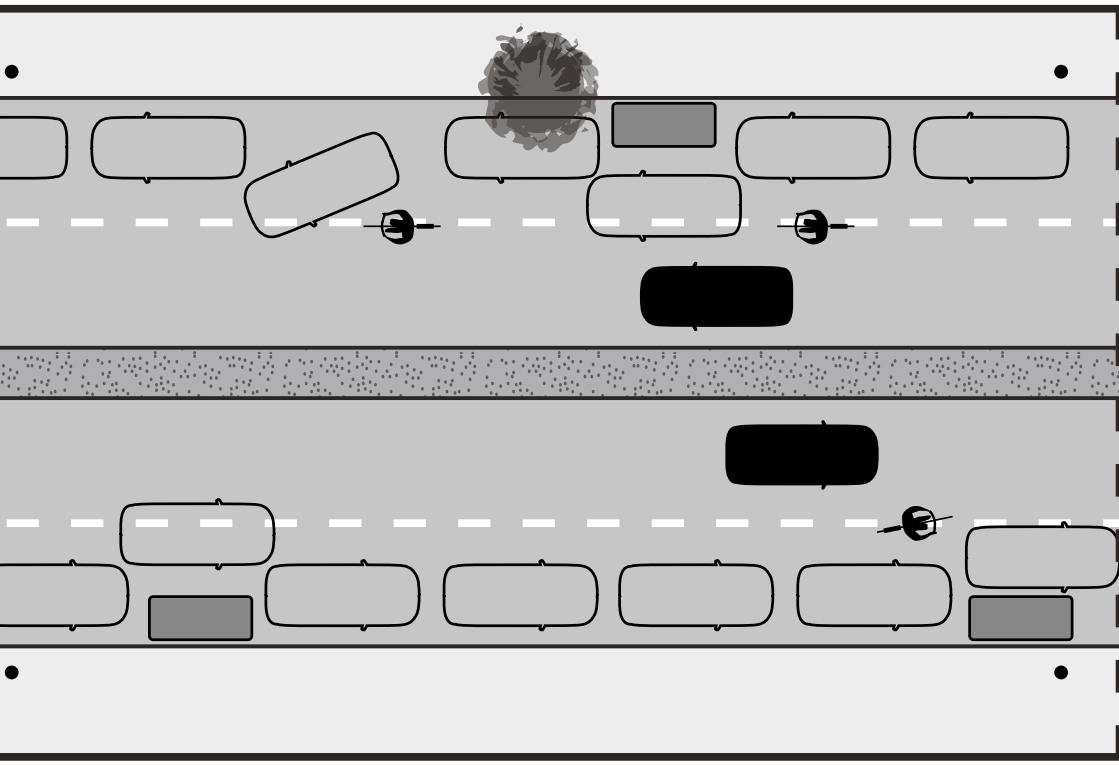
For an ideal temporary refurbishment, the parking spaces should be removed in both directions to create suitable 2m wide protected cycle paths, separated by trees and traffic bollards or alternatively a green strip for rainwater infiltration. Trash containers can be installed in side streets or between bike and car lane. Another option, which is less favourable, would be to remove the parking spaces on just one side to make room for a bidirectional protected cycle path.

For the mock-up phase, a simple intervention can create temporary space for cycling: The row of parked cars and the waste containers are moved from the curb to the boundary between the lanes. To mark and delimit the new situation and to structure the parking spaces, trees in plant boxes will be provided after every three parking spaces. This configuration prohibits parking in the second row. In the following temporary solutions for bus stops, delivery zones and bicycle parking have been sketched out. In addition, archetypal design options for intersections with adjacent streets were proposed. All of them require further site-specific elaboration. The median strip is maintained in all mock-up options.



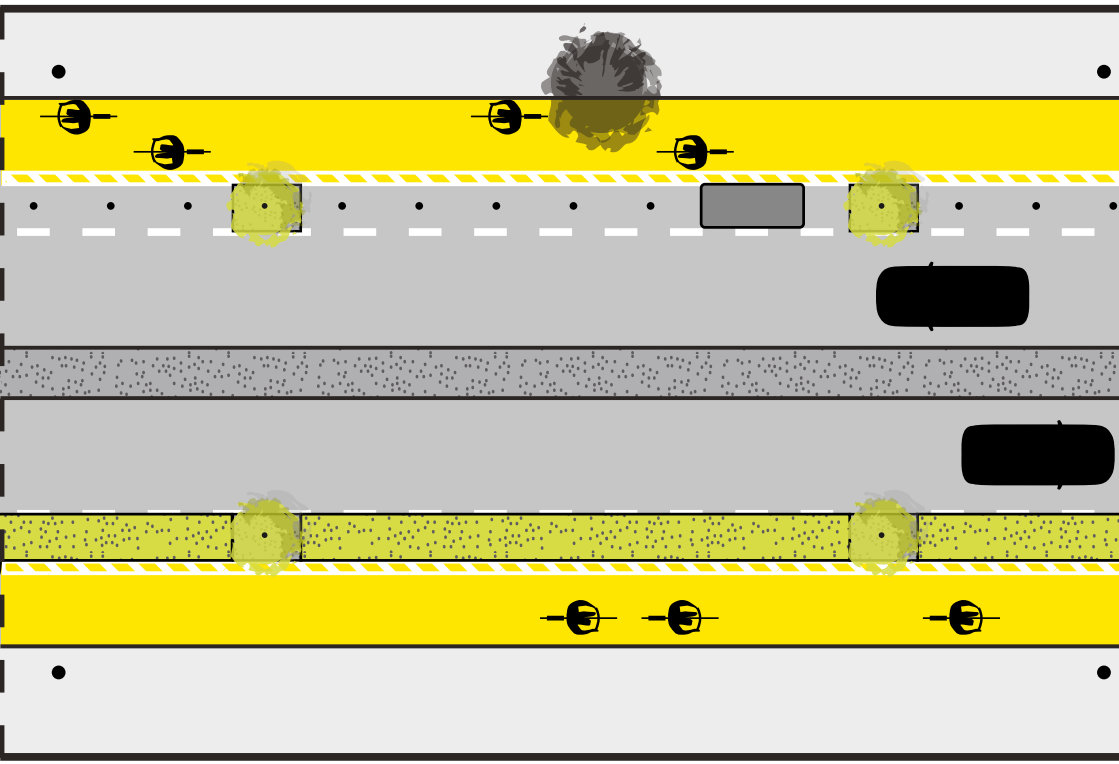
Double parked car

Trash container



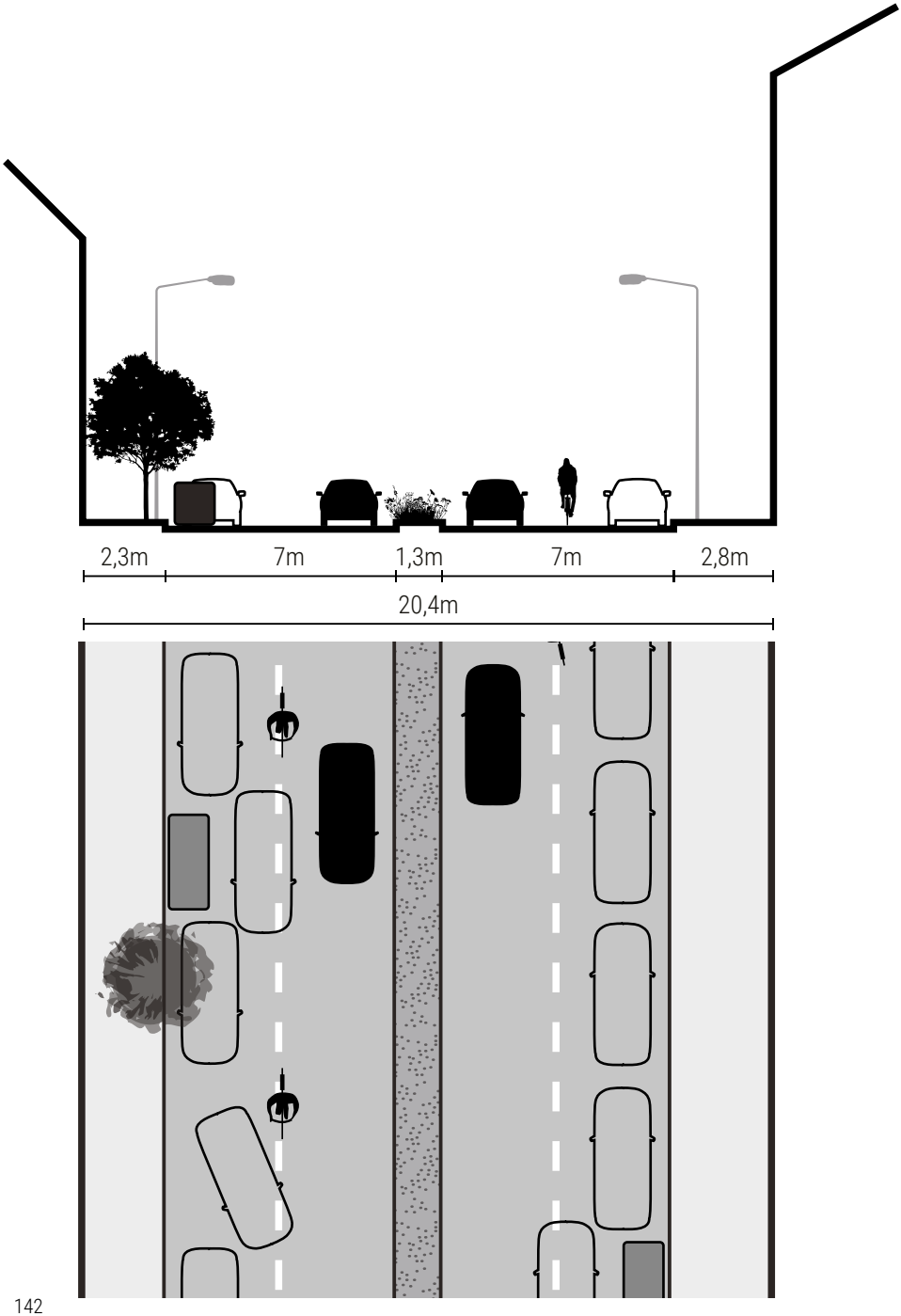
Existing situation

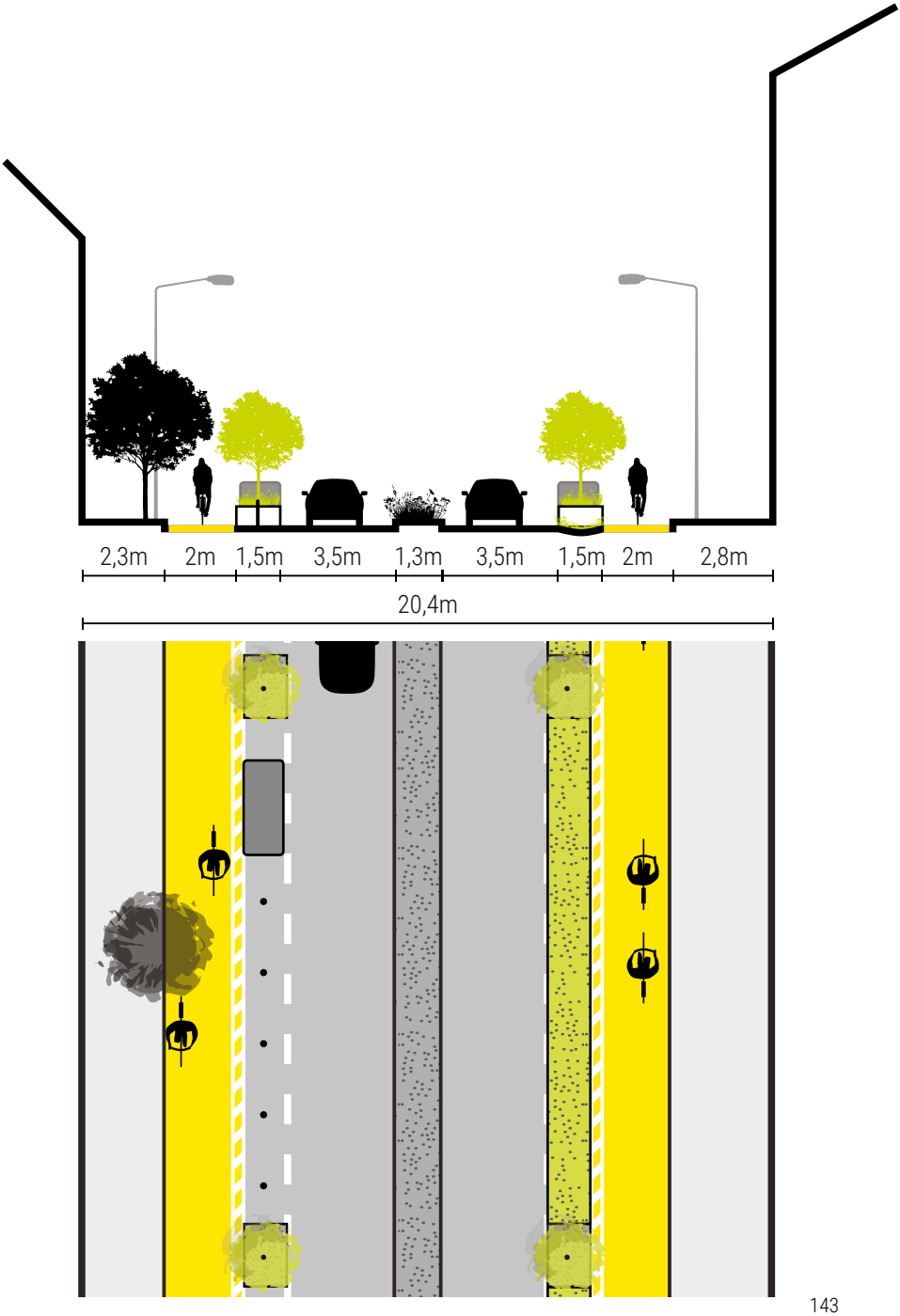
One-directional bicycle lanes on both sides, separated by traffic bollards or a green strip with trees for the infiltration of rain water; removal of parked cars on both sides.

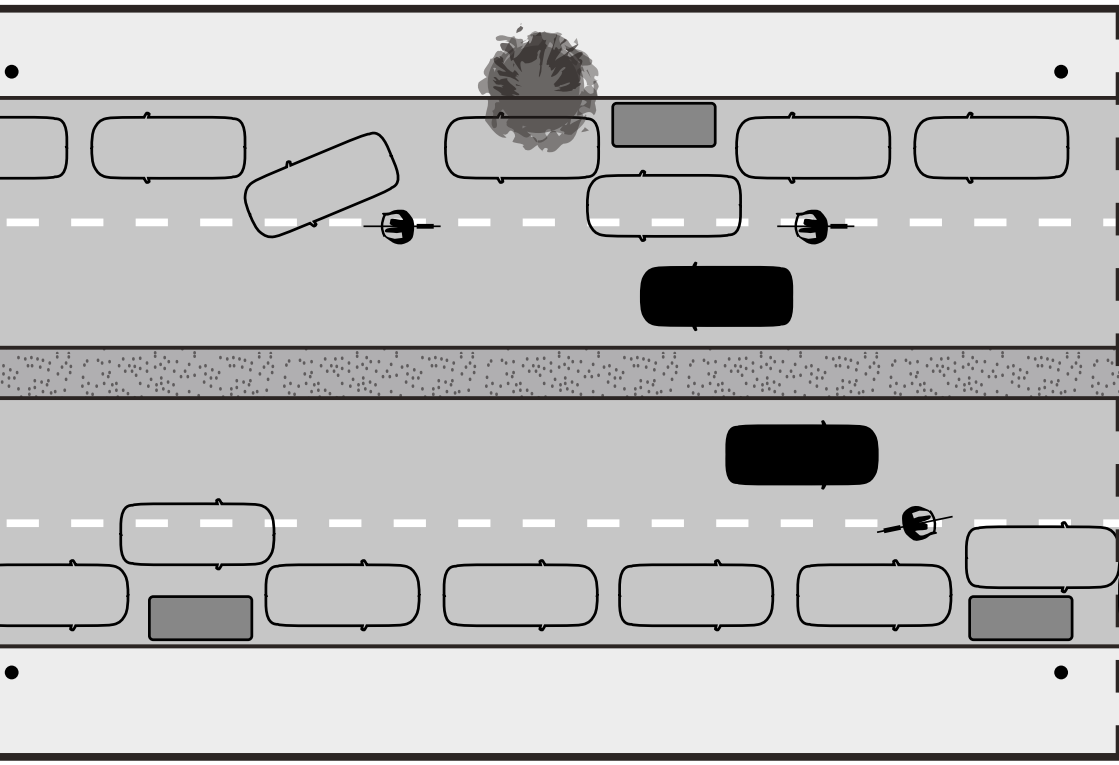


Ideal temporary refurbishment

0 1 2 5m

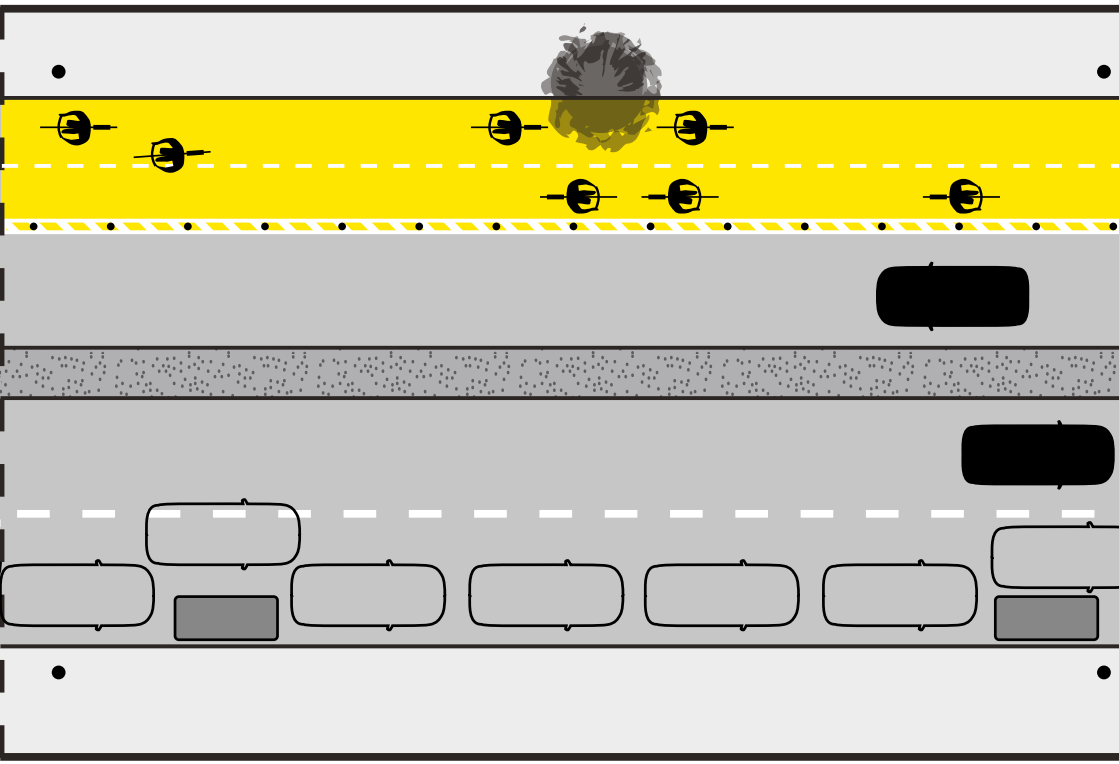

2,3m
7m
1,3m
7m
2,8m
20,4m


2,3m
2m
1,5m
3,5m
1,3m
3,5m
1,5m
2m
2,8m
20,4m



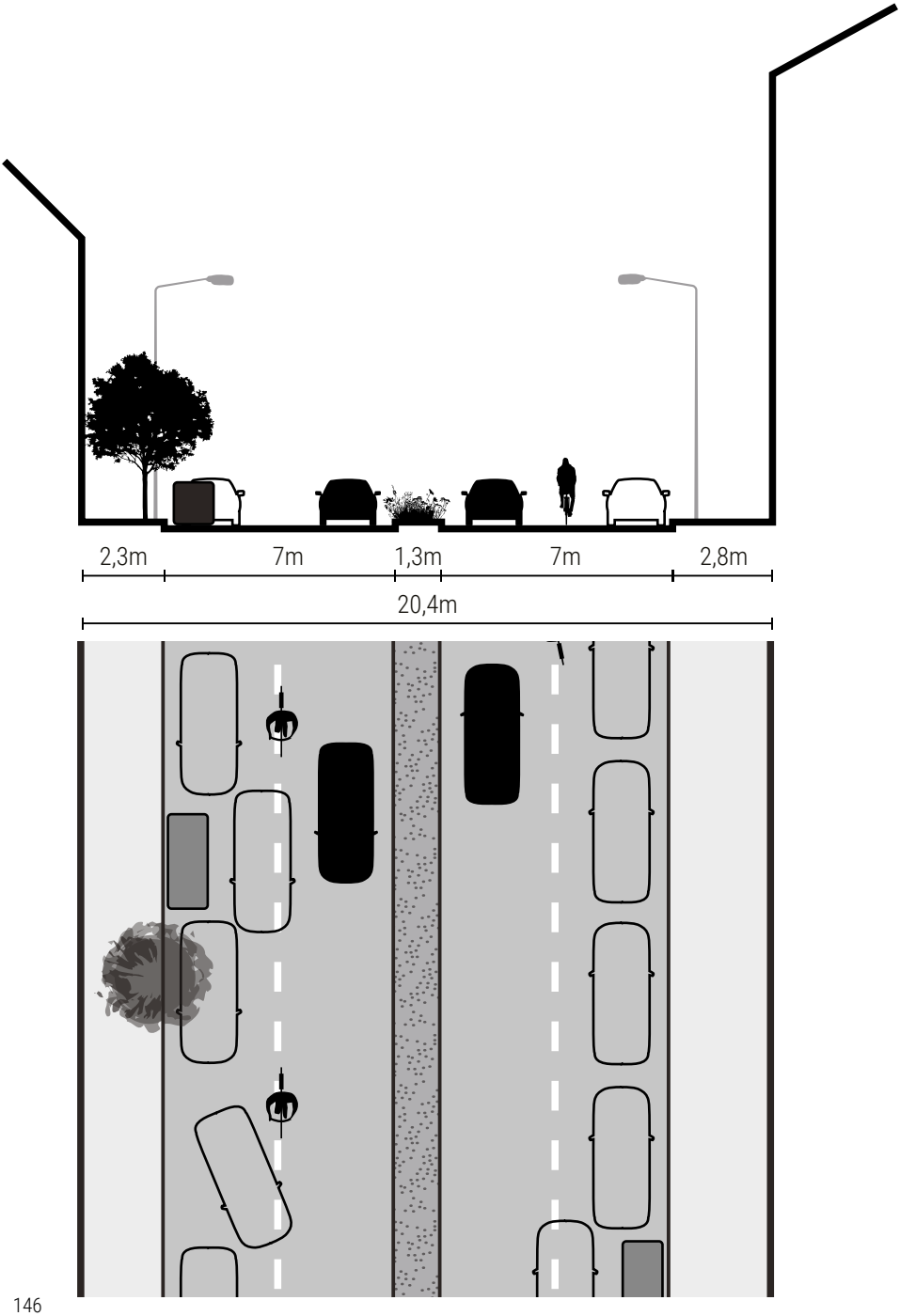
Existing situation

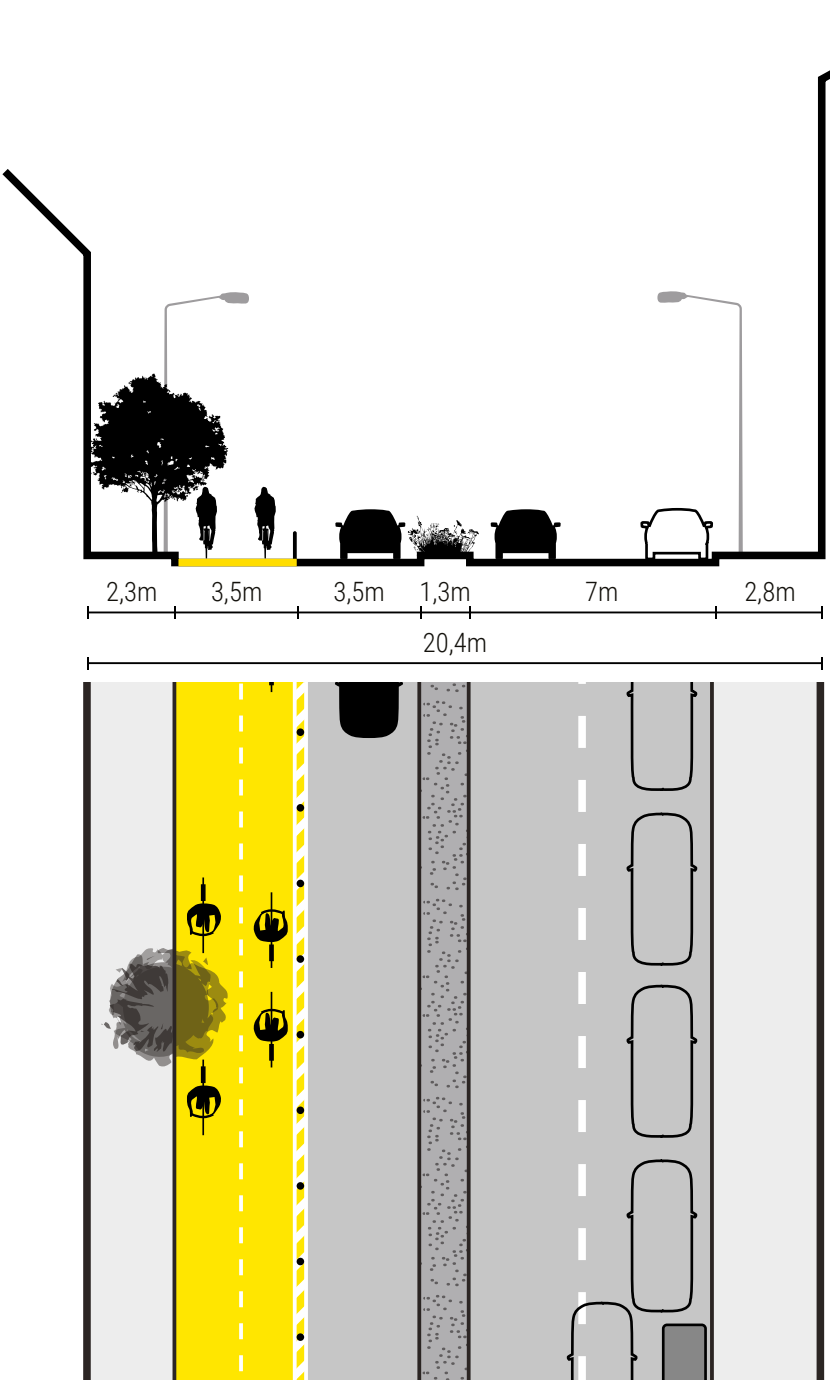
Bidirectional bicycle lane on one side, separated by traffic bollards; removal of parked cars on one side.

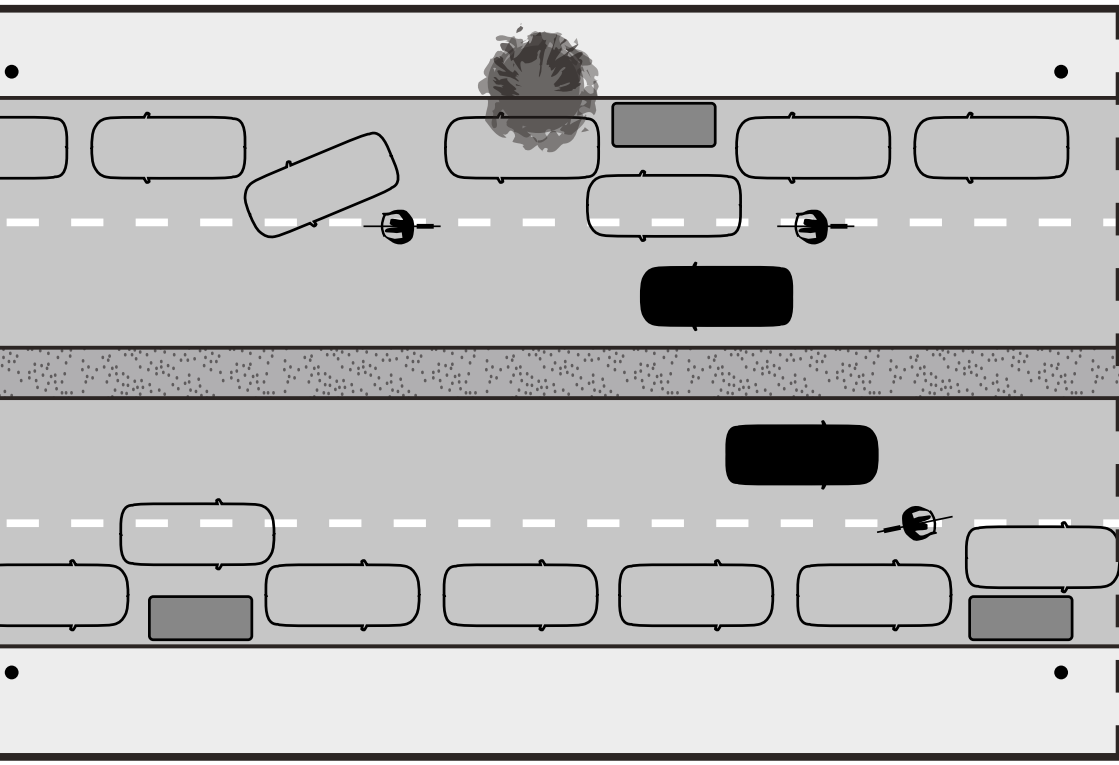


Alternative temporary refurbishment

0 1 2 5m

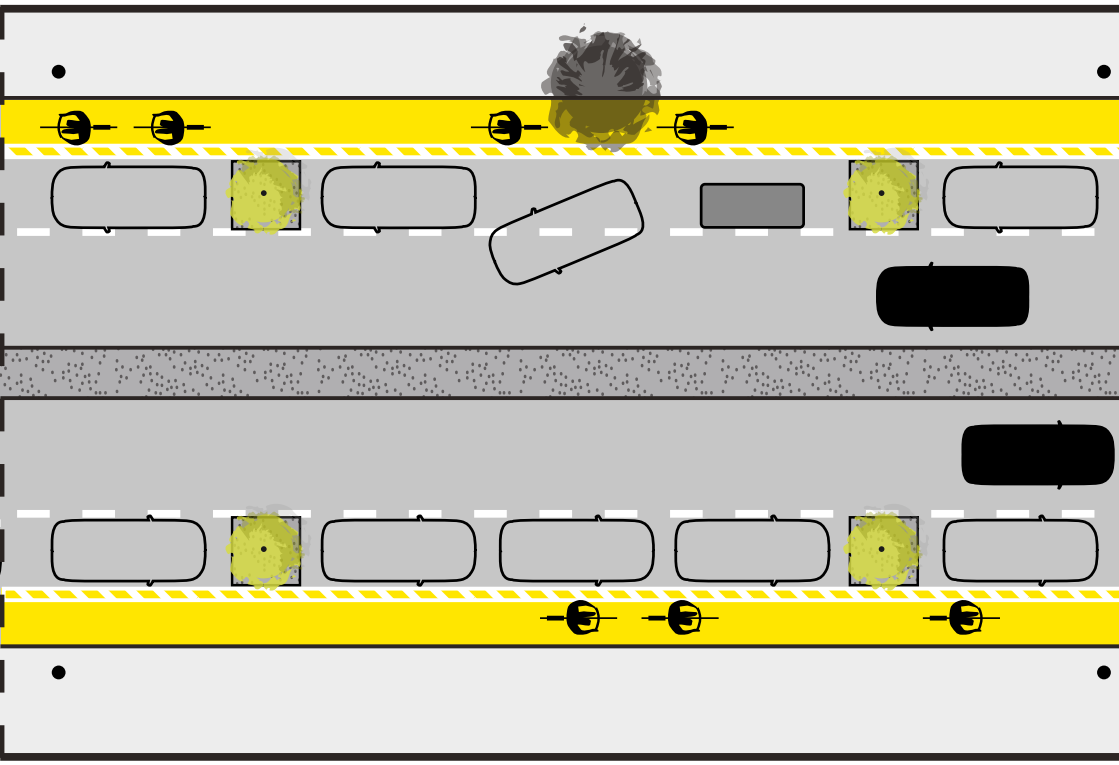

2,3m
7m
1,3m
7m
2,8m
20,4m


2,3m
3,5m
3,5m
1,3m
7m
2,8m
20,4m



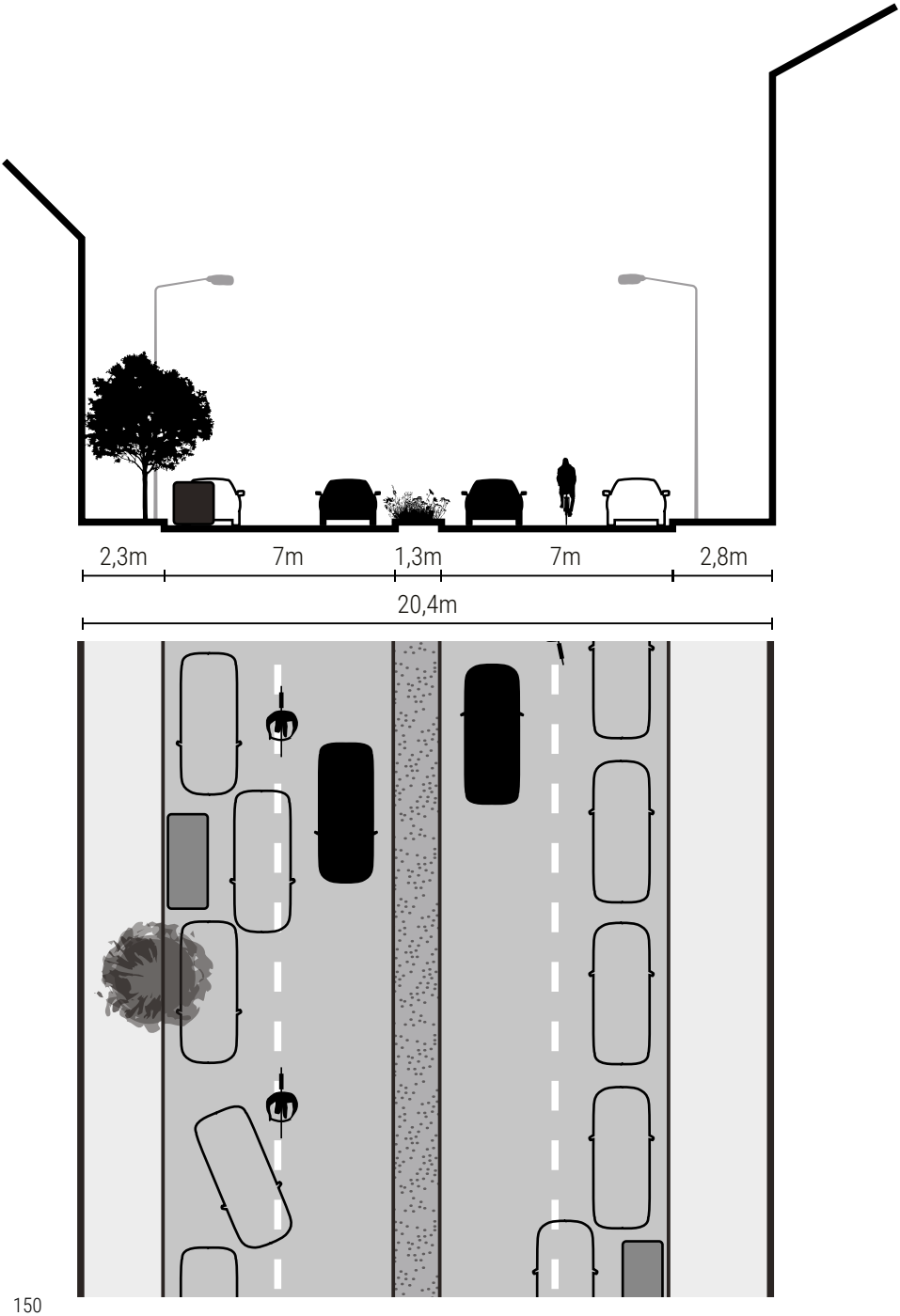
Existing situation

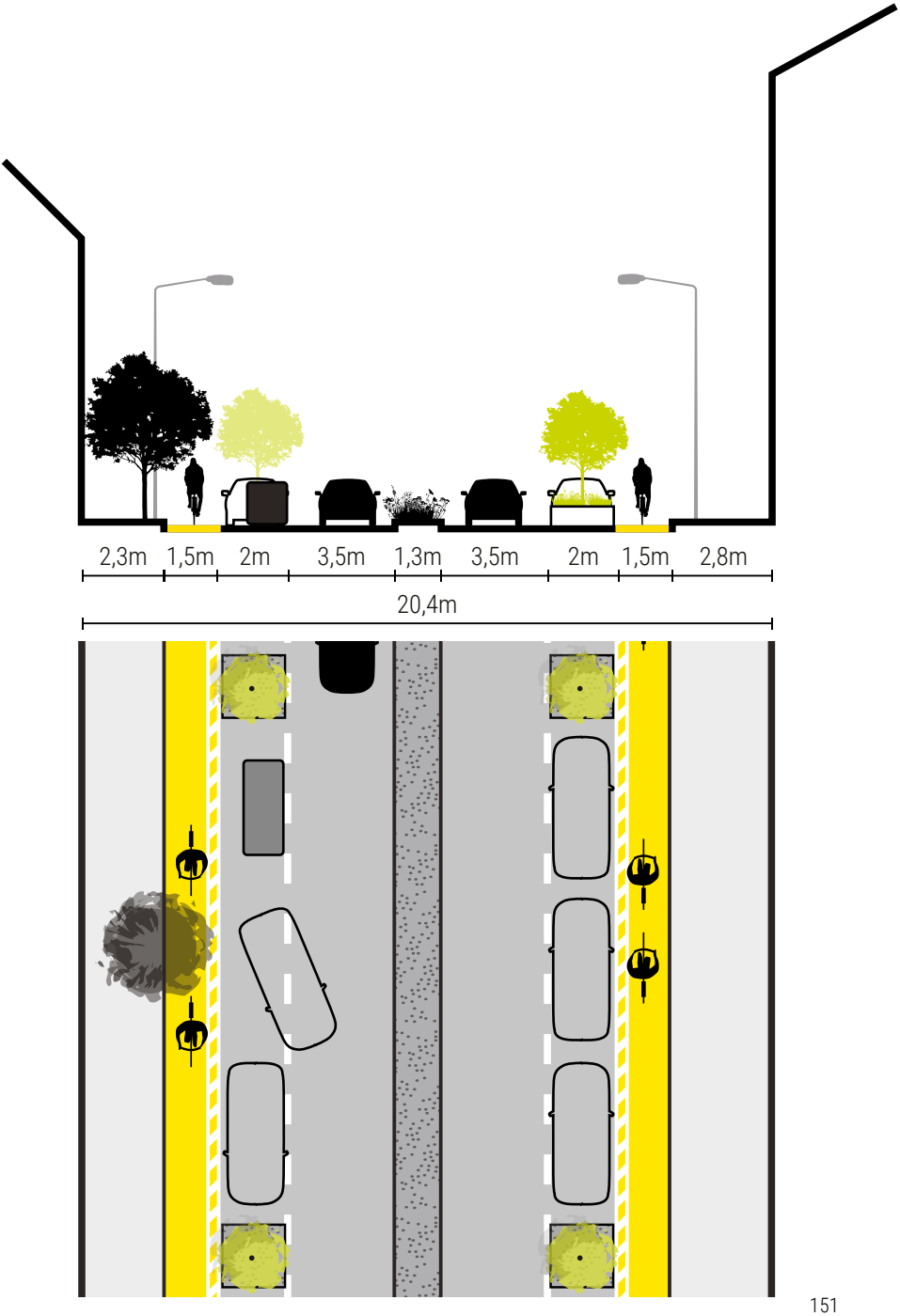
One-directional bicycle lanes on both sides, separated by parked cars, waste containers and trees in plant boxes; car parking is maintained on both sides.



Proposed temporary refurbishment

0 1 2 5m


2,3m
7m
1,3m
7m
2,8m
20,4m


2,3m
1,5m
2m
3,5m
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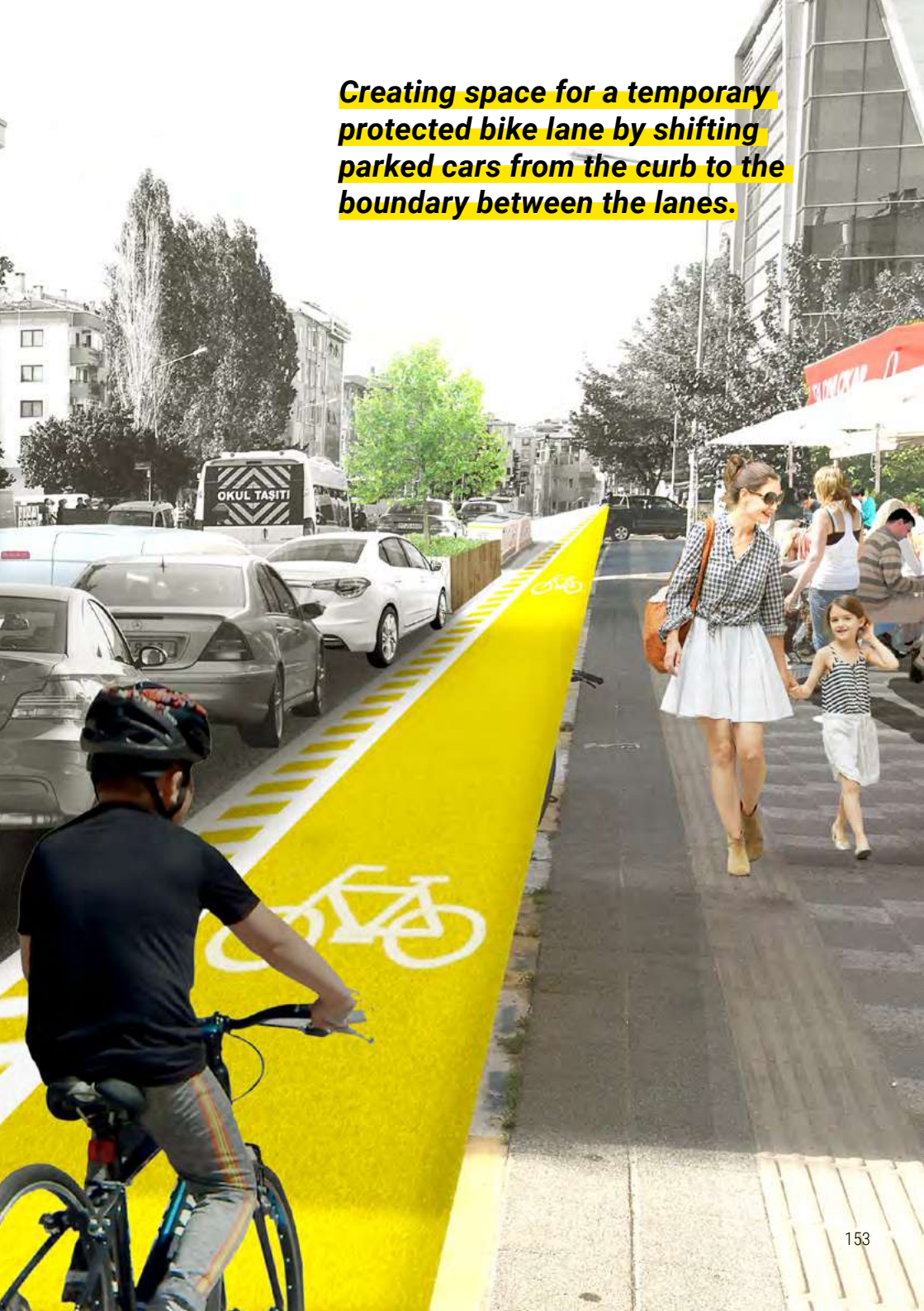
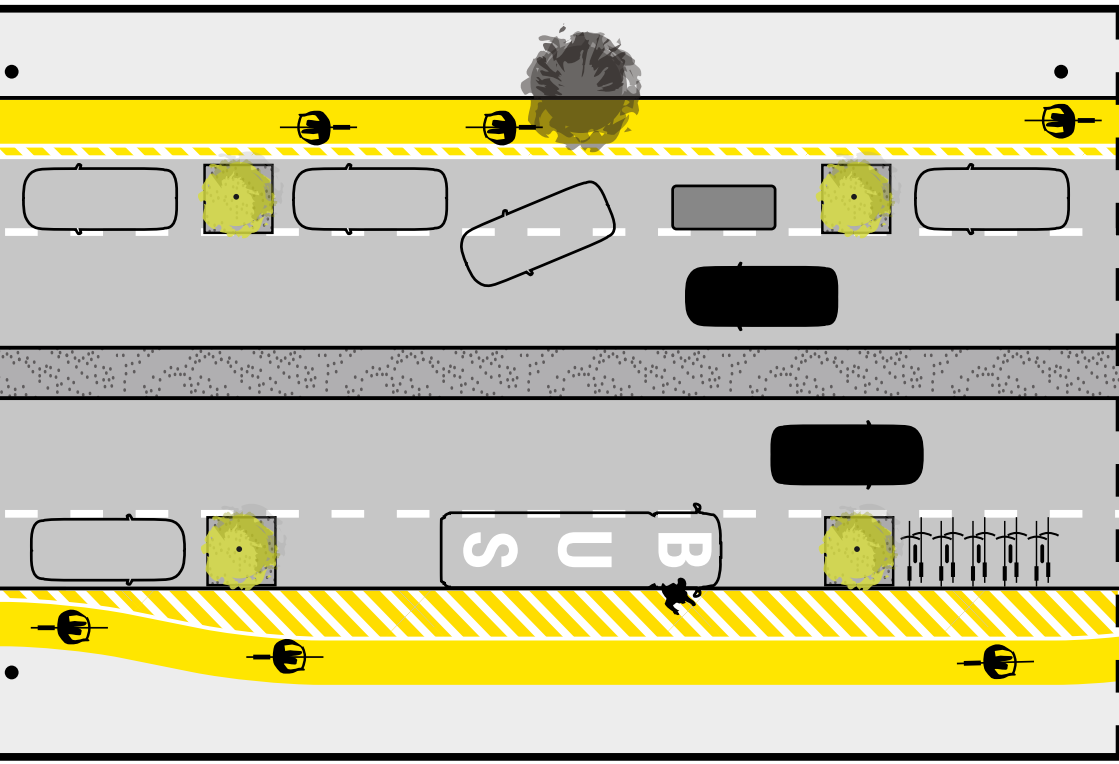
3,5m
2m
1,5m
2,8m
20,4m


M JS 4649



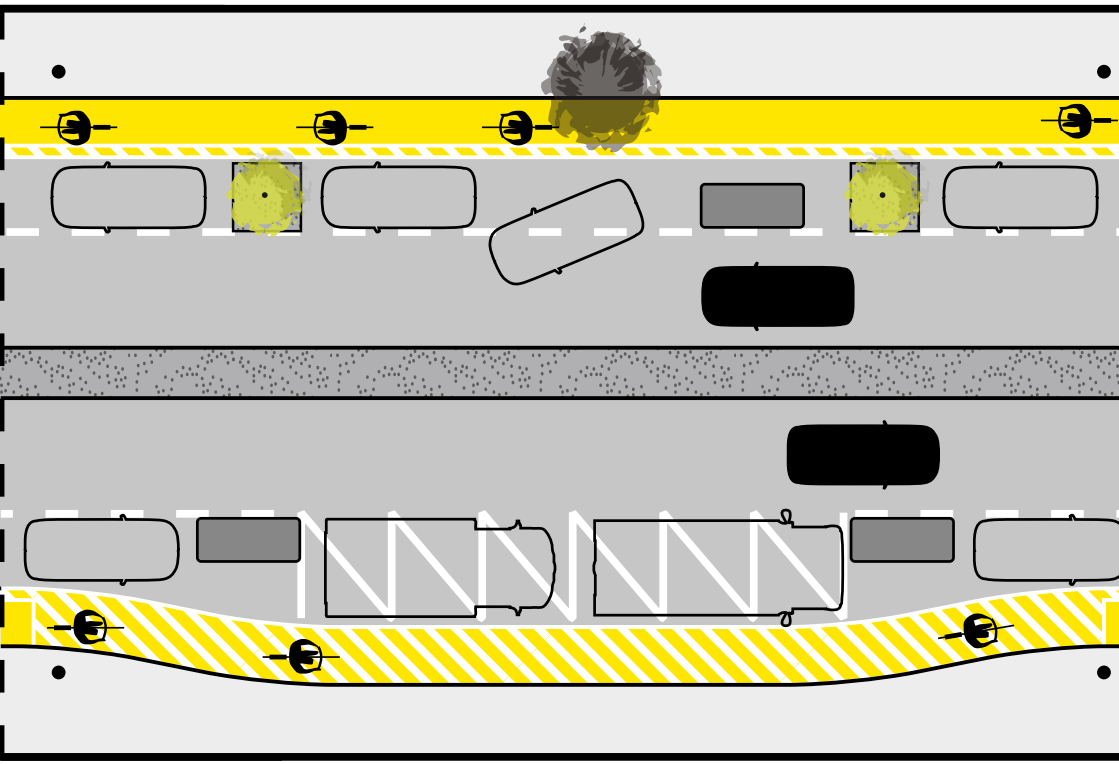
Creating space for a temporary protected bike lane by shifting parked cars from the curb to the boundary between the lanes.

How to integrate a bus stop.



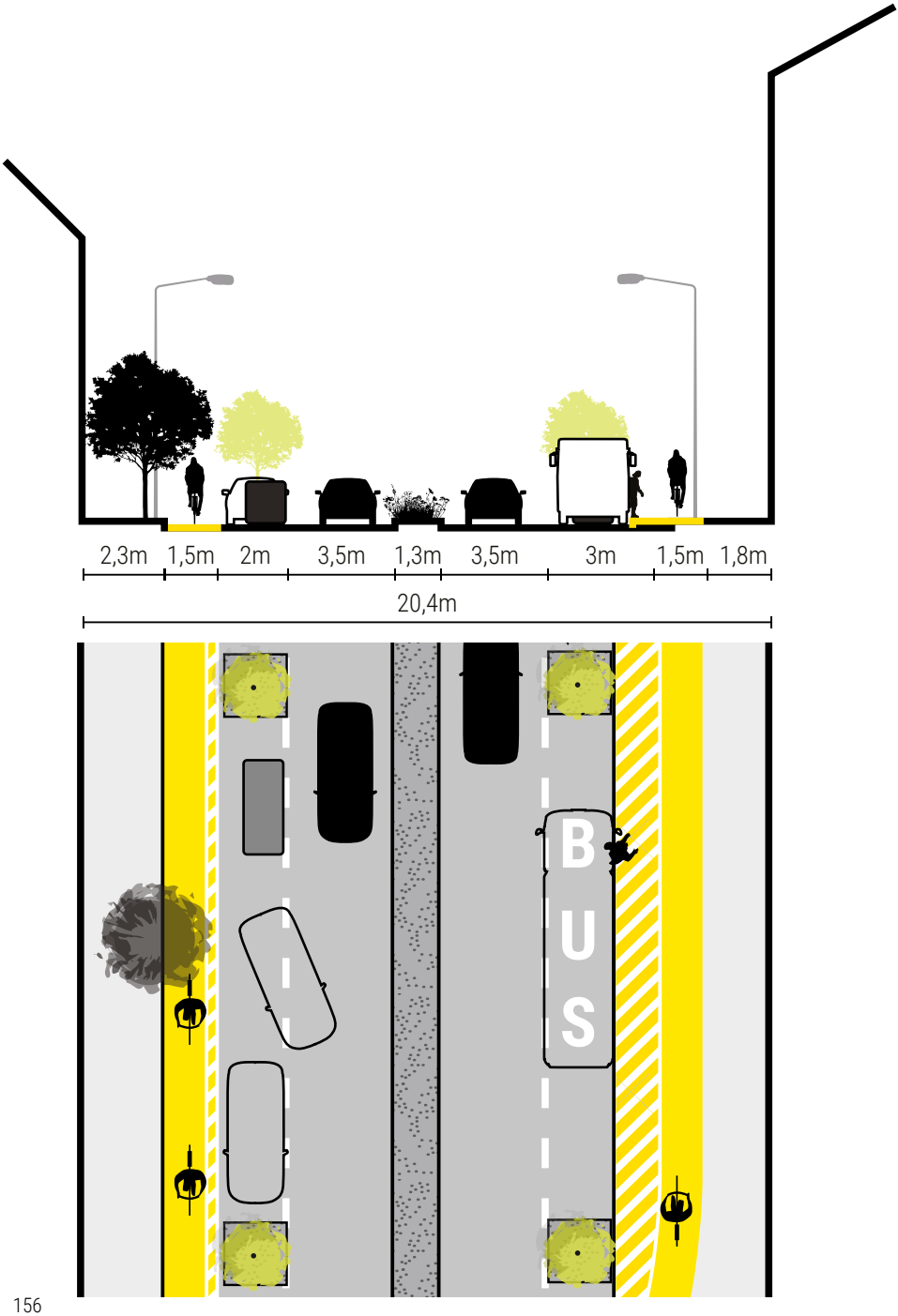
Proposed temporary refurbishment

How to integrate delivery zones.



Proposed temporary refurbishment

0 1 2 5m


2,3m
1,5m
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3,5m
3m
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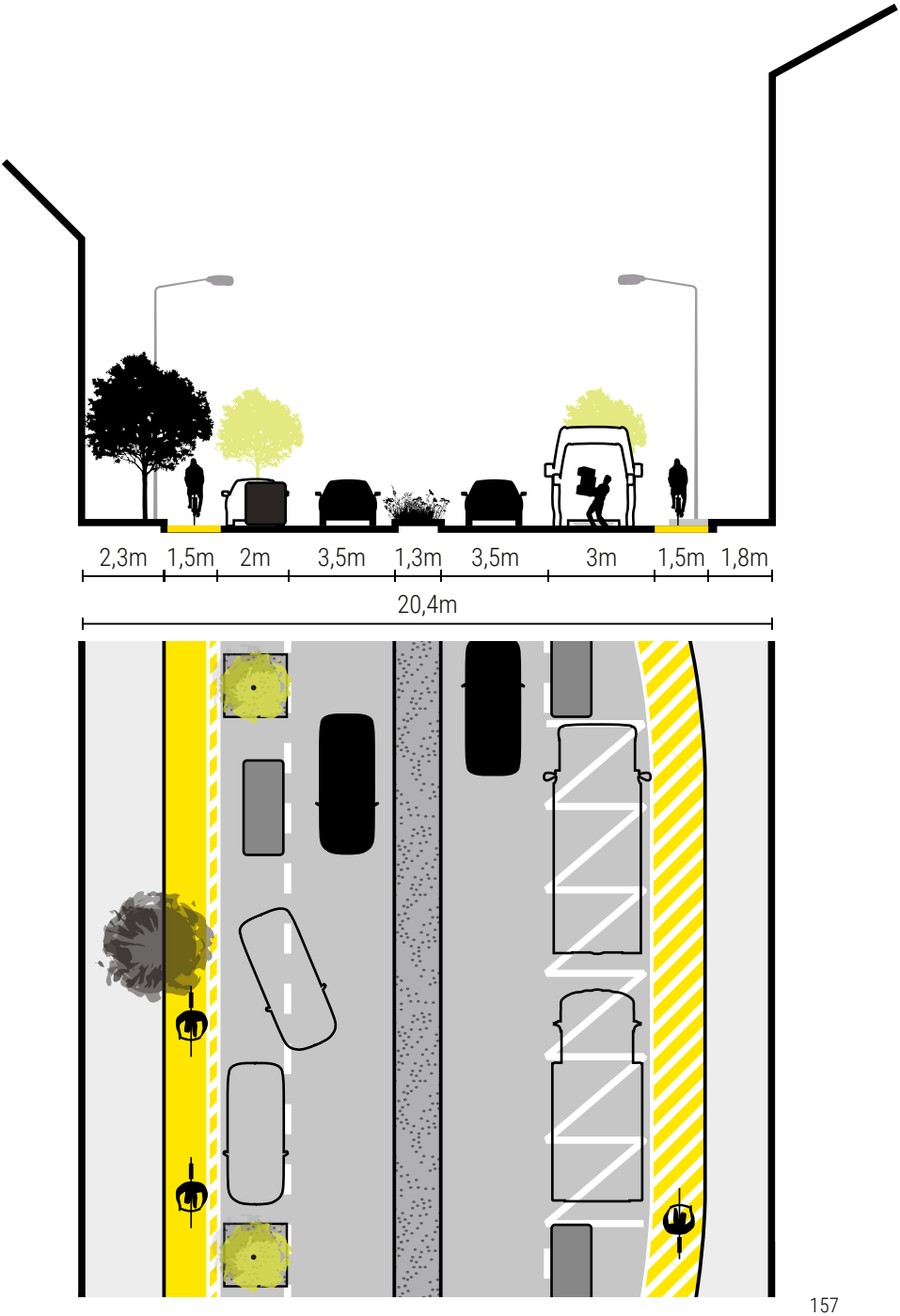
1,8m
20,4m
BUS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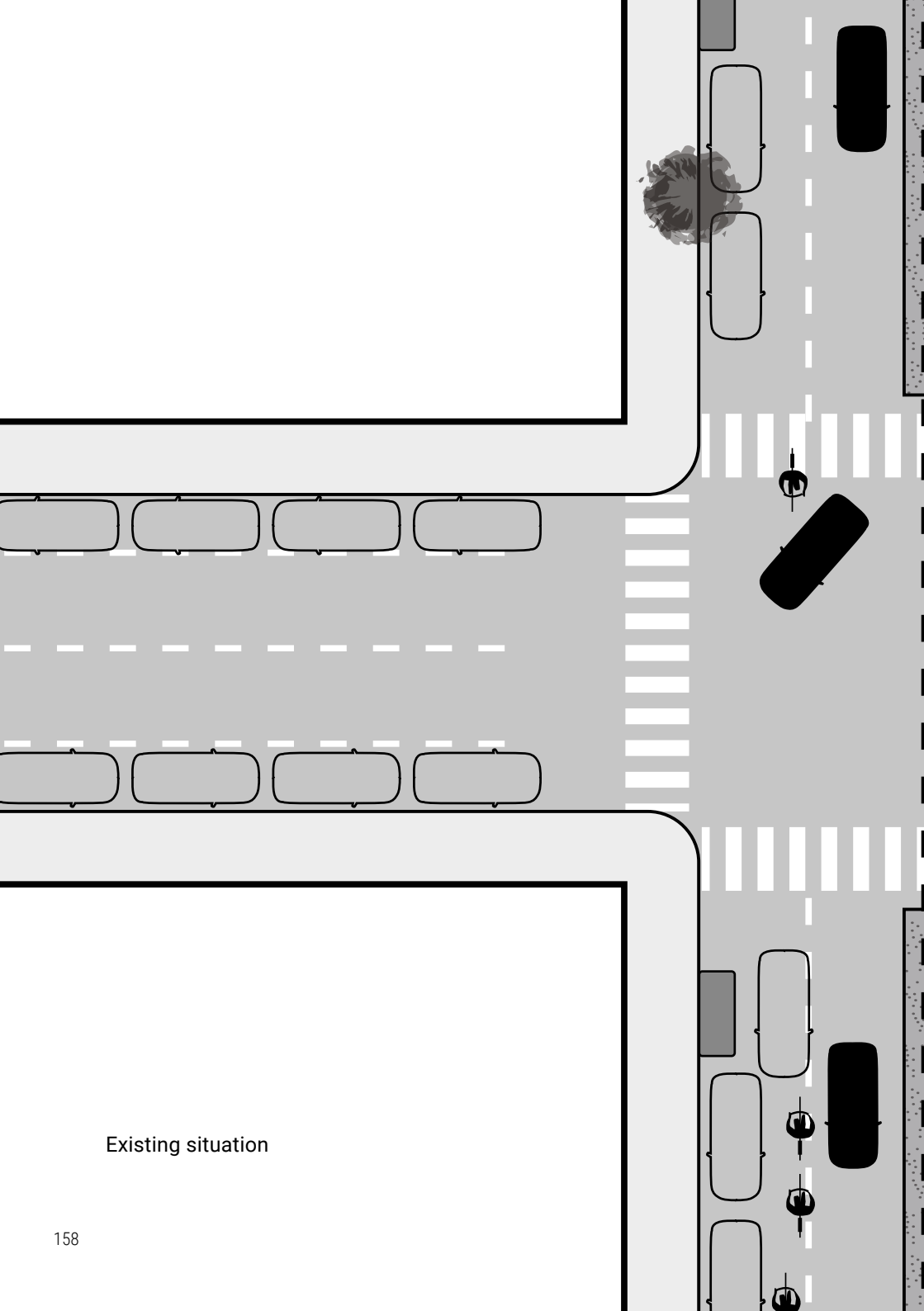
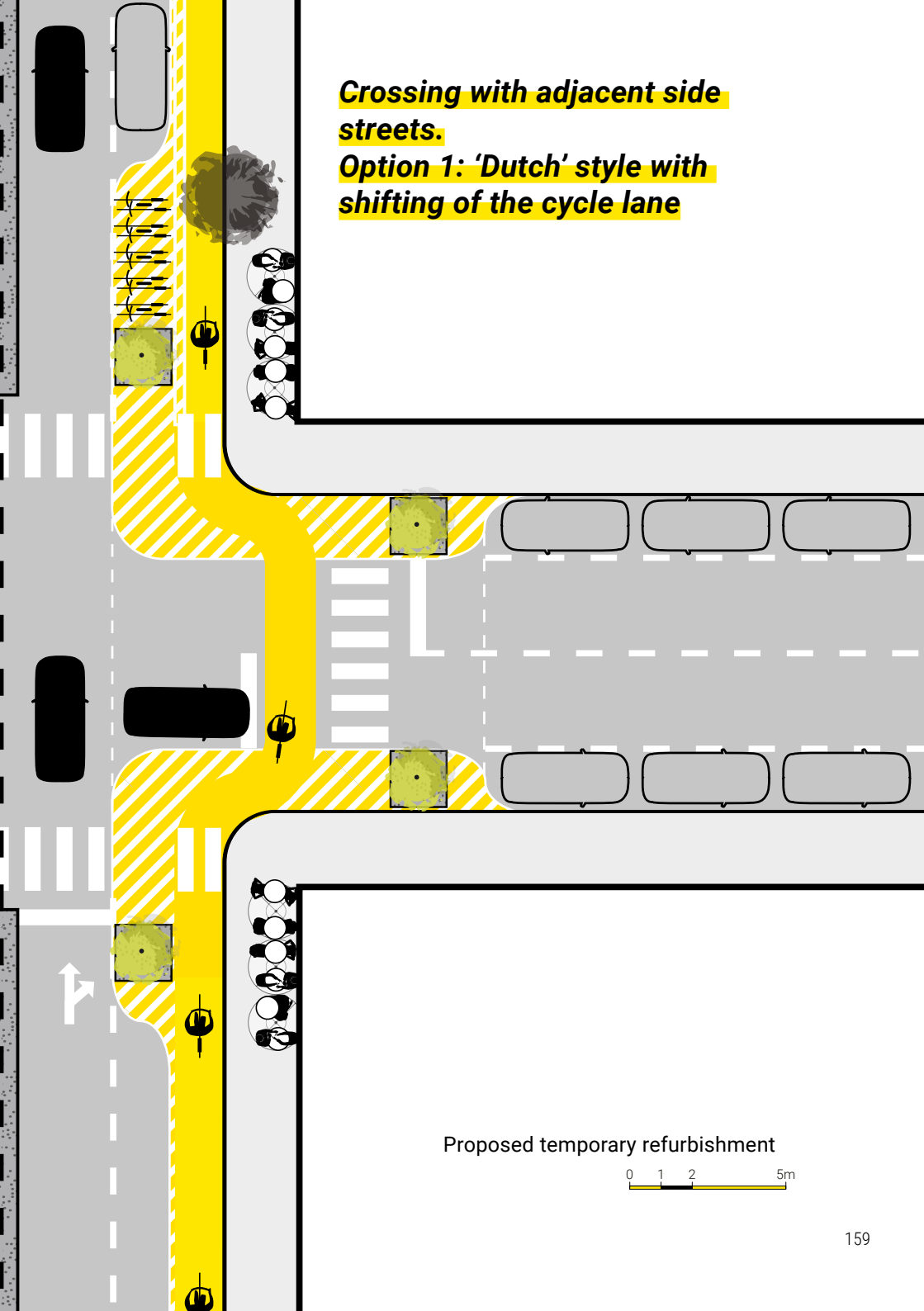
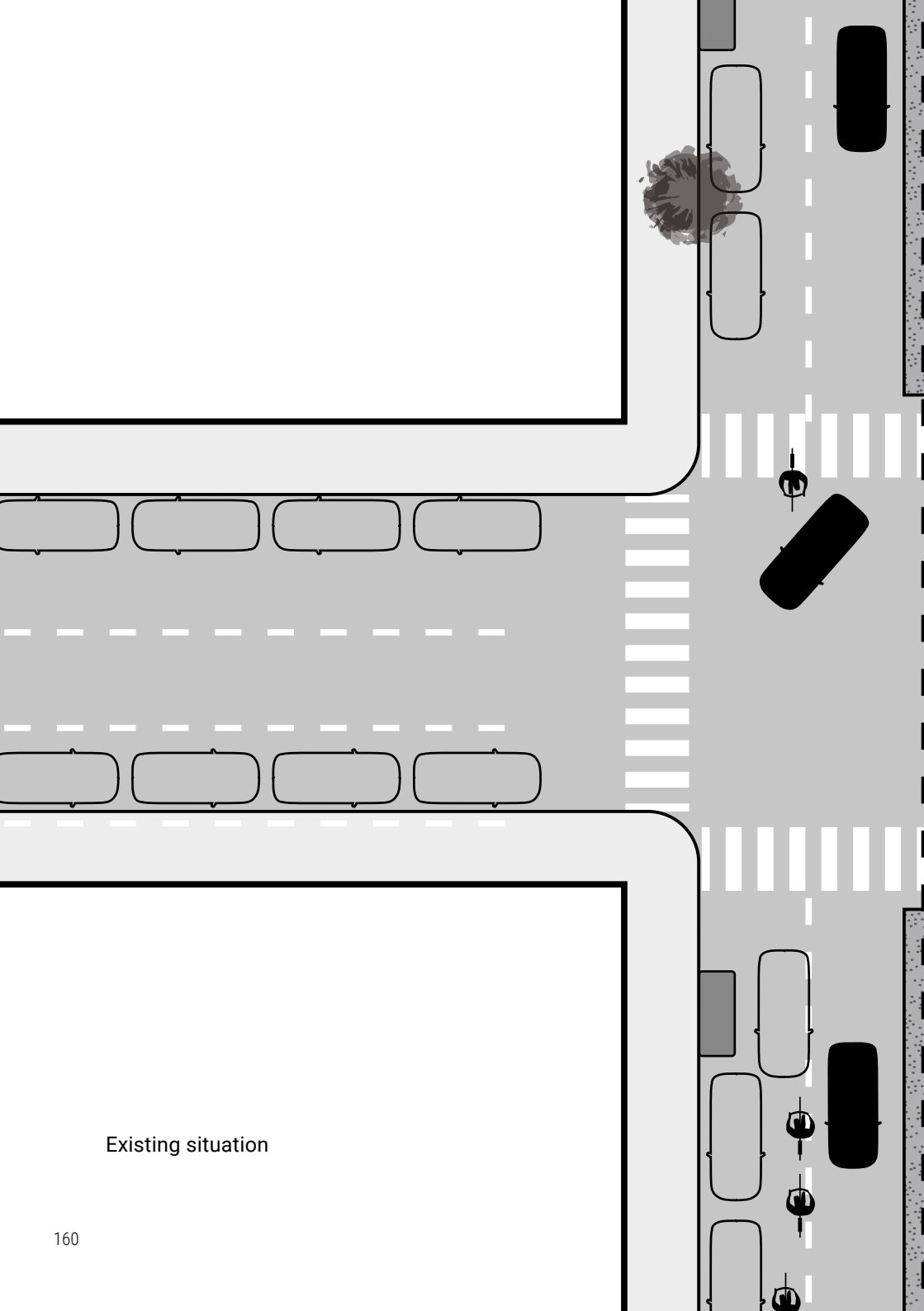
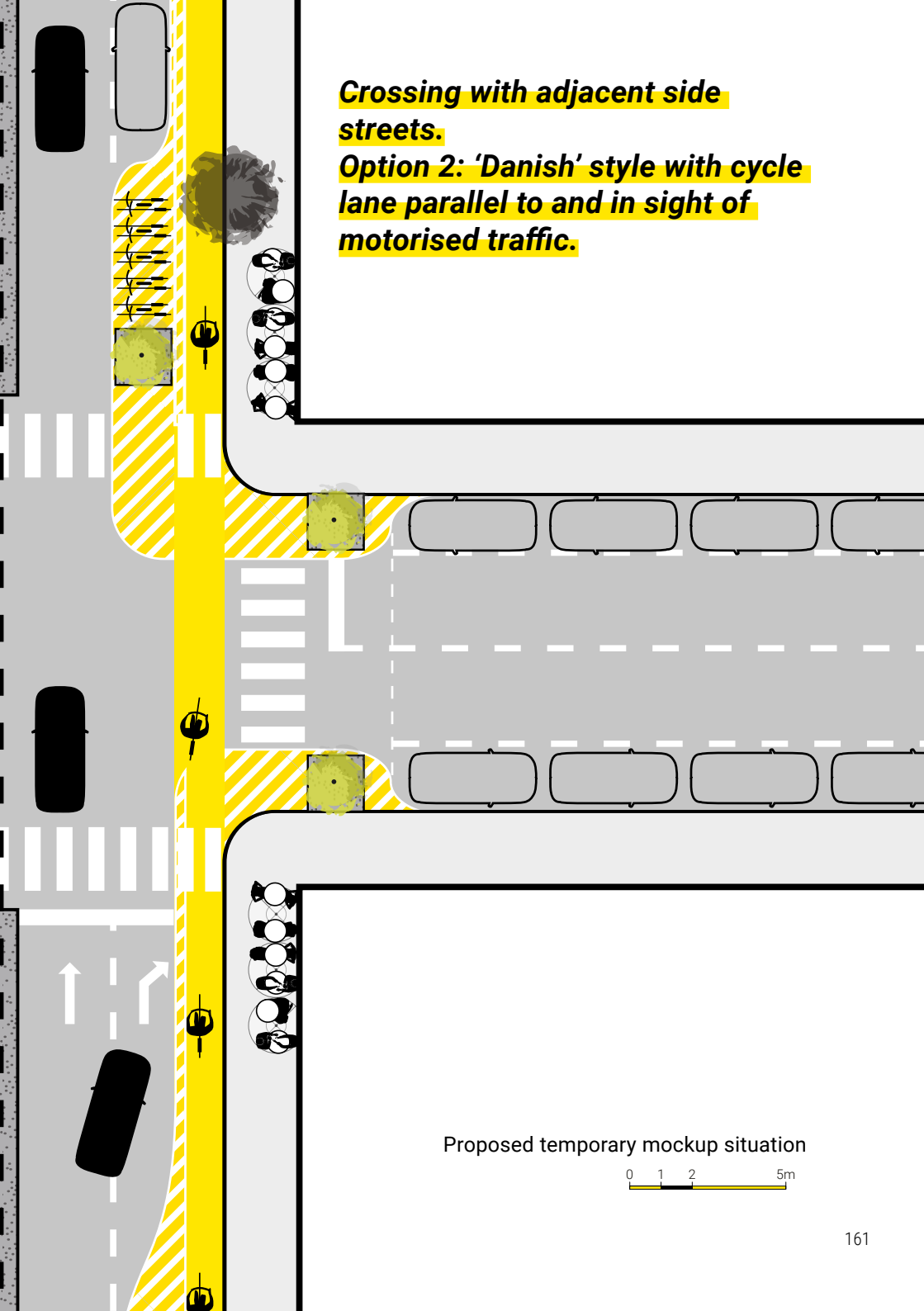


Existing situation


Crossing with adjacent side streets.
Option 1: 'Dutch' style with shifting of the cycle lane
Proposed temporary refurbishment
0 1 2 5m



Existing situation



Crossing with adjacent side streets.
Option 2: 'Danish' style with cycle lane parallel to and in sight of motorised traffic.

Proposed temporary mockup situation

0 1 2 5m

Mock-up

Bicycle parking mock-up

Every bicycle journey begins and ends with the parking of the bicycle. It is therefore essential to think about bicycle parking when introducing cycling infrastructure in a city. Safety and convenience are just as important as the correct positioning of bicycle parking facilities close to cycle paths and places of interest, such as public transport stations, schools and shopping facilities.
Besides good examples of permanent bicycle parking in public spaces, there are also a number of interesting best practices for temporary bicycle parking. A recent intervention in that respect are the so-called *'Fietsvlonders'* in Rotterdam: Temporary platforms with attached bike racks are placed in a street where residents or shop owners request bicycle parking. The bicycle parking platforms occupy one or more parking spots. After a test period of several months the situation is evaluated and eventually turned into a permanent refurbishment of the street. The *'Fietsvlonders'* are reused at another location in town.
On the following pages, you will find some recommendations and guidelines for parking bicycles and their correct positioning and dimensioning.

Permanent bicycle parking at Nörrebro train station, Copenhagen © Gottlieb Paludan Architects

Permanent bicycle parking at Blaak train station, Rotterdam © Plej92

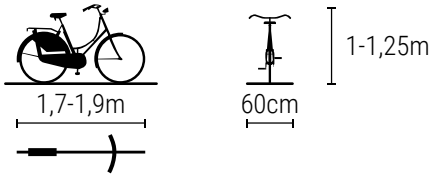
Mobile Bicycle Shed, Bruges © Verhofsté / Public Space Solutions

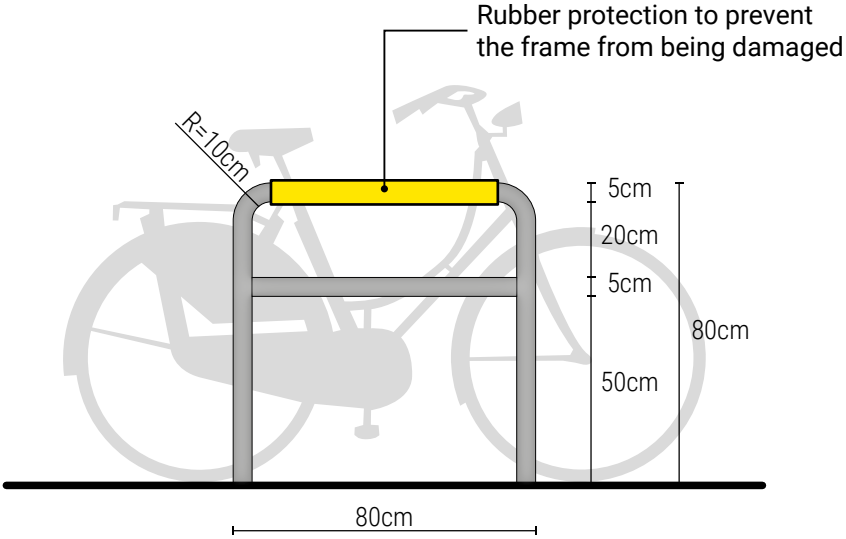
Mobile parklet installation for bicycle parking, Amsterdam © Union

'Fietsvlonder': temporary bicycle parking platform, Rotterdam © Fietsberaad

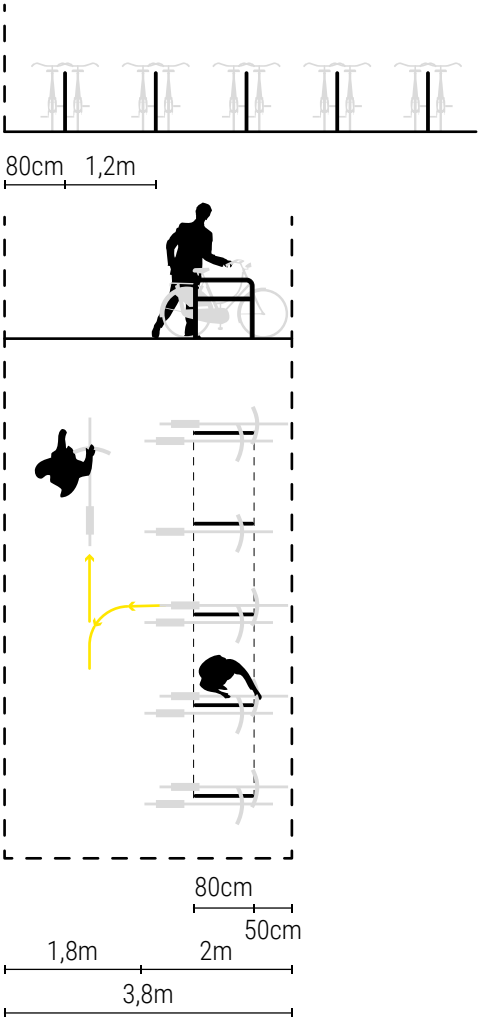
Permanent bicycle parking on enlarged pavement, Rotterdam © Fietsberaad

Robust bicycle racks are a safe and convenient facility for stalling and attaching different types of bicycles.

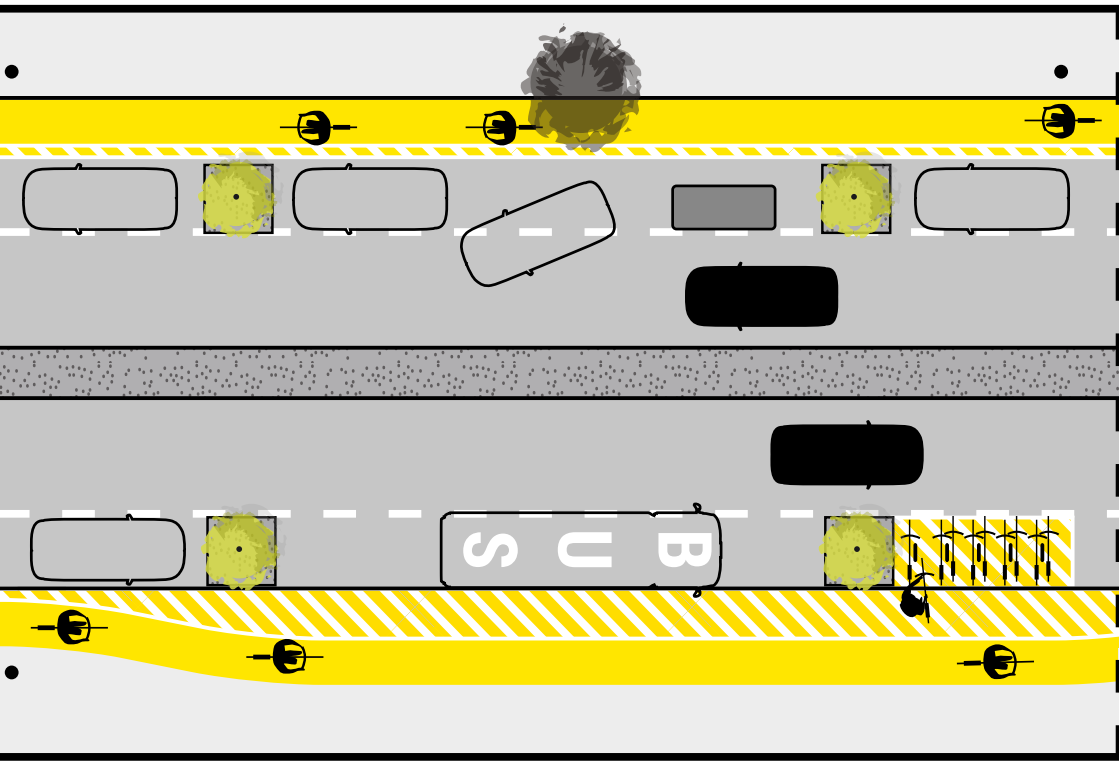




Enough space between and in front of the racks enables safe and convenient manoeuvring of the bicycles.

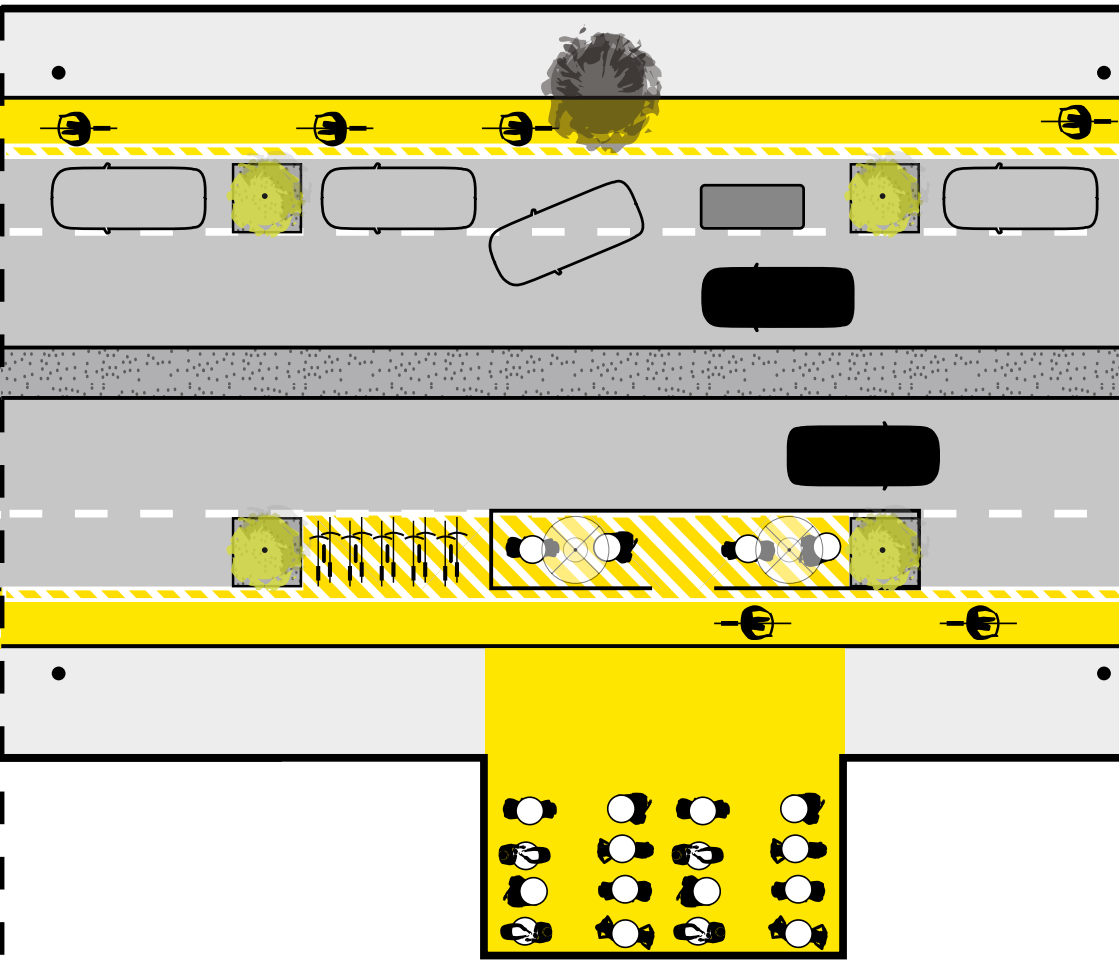


Provision of bicycle parking next to bus stops.



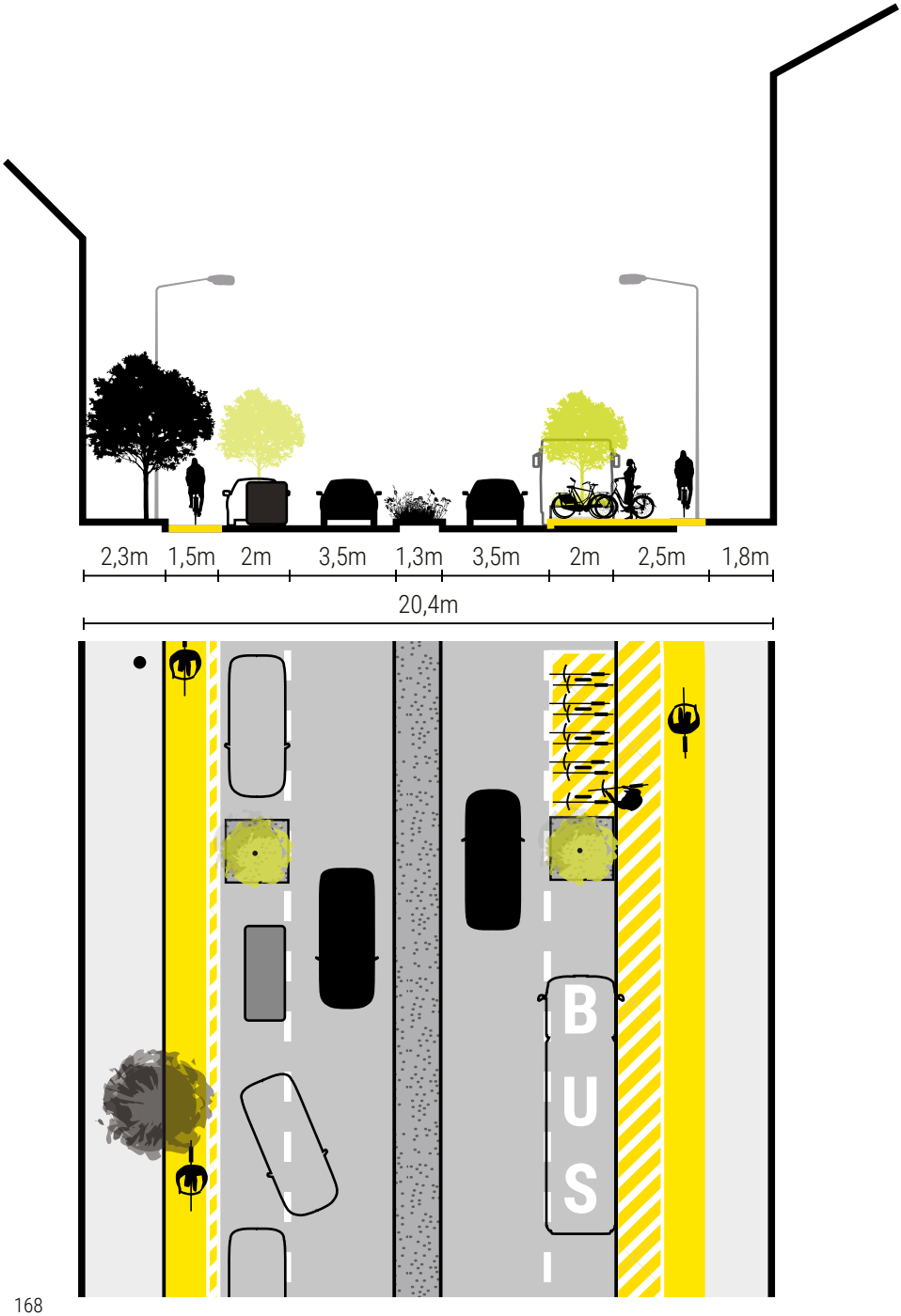
Proposed temporary refurbishment

Combination of bicycle parking with outside seating of cafés.



Proposed temporary refurbishment

0 1 2 5m


2,3m
1,5m
2m
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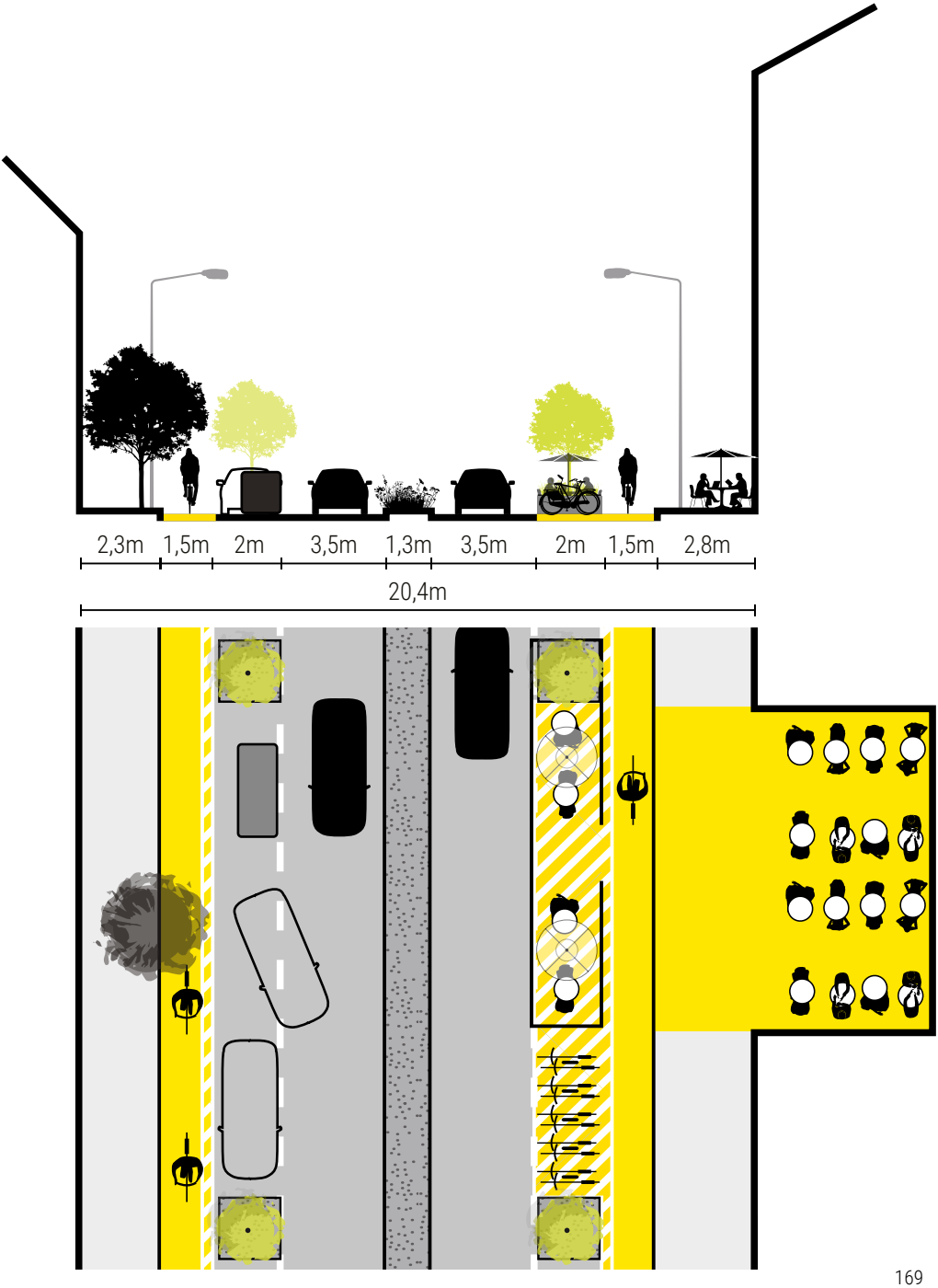
1,3m
3,5m
2m
2,5m
1,8m
20,4m
BUS


2,3m
1,5m
2m
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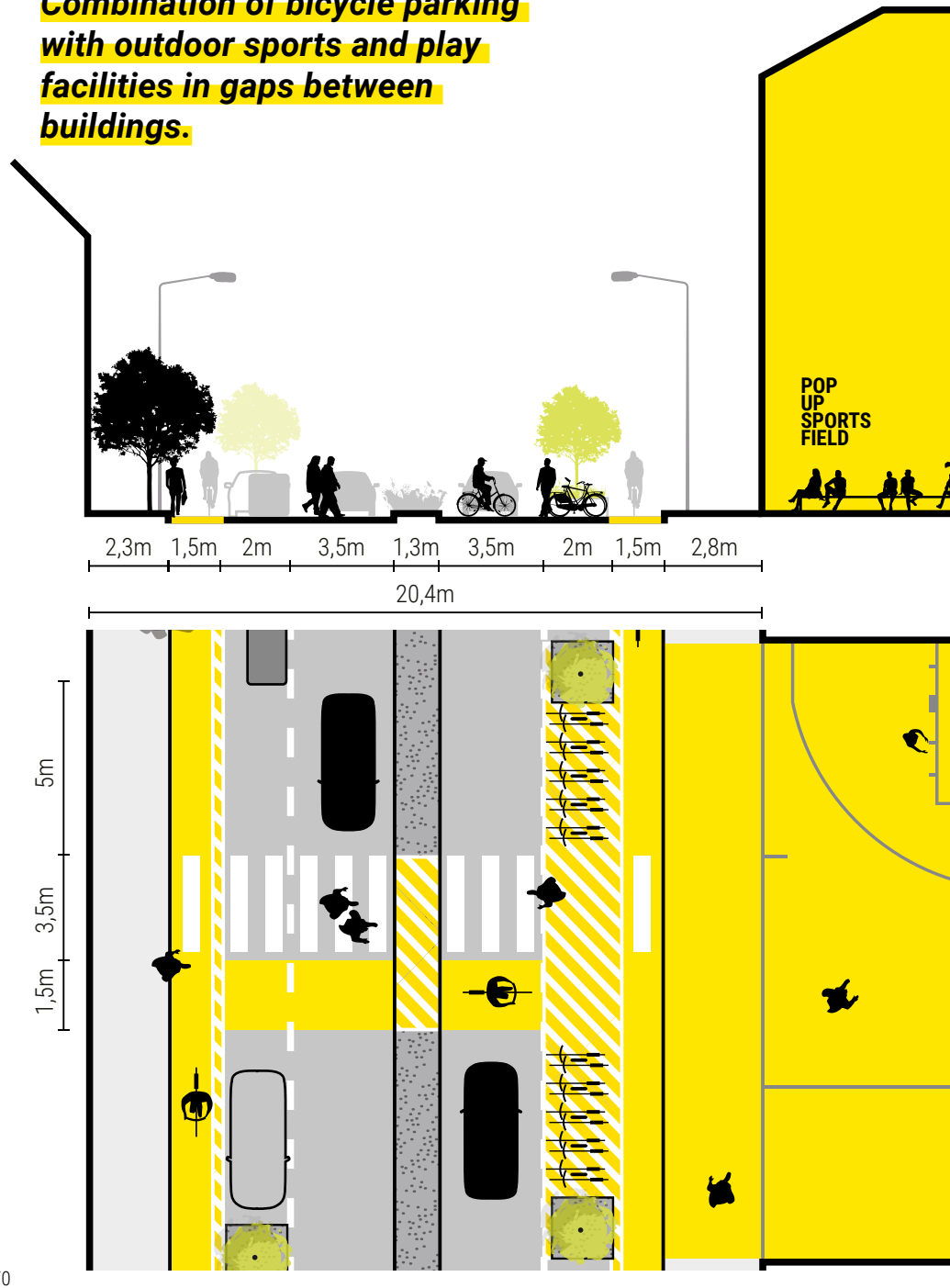
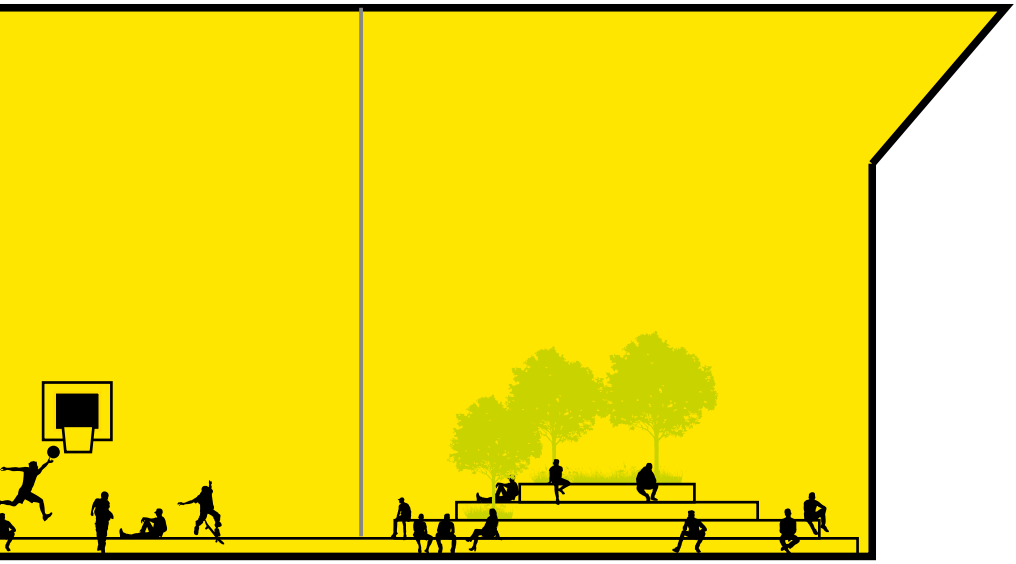
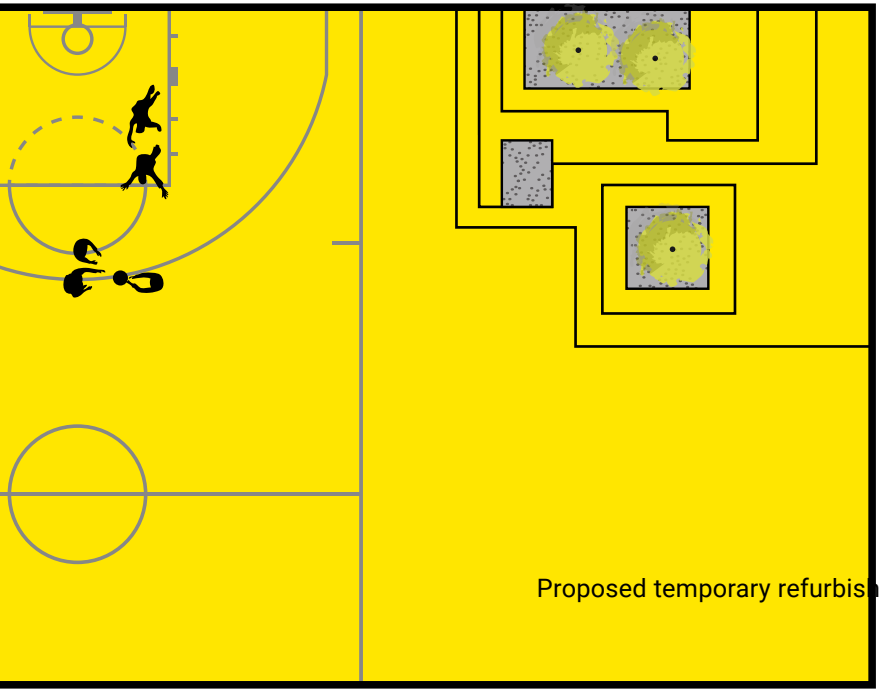
2m
1,5m
2,8m
20,4m

Combination of bicycle parking with outdoor sports and play facilities in gaps between buildings.







Proposed temporary refurbishment

Mock-up

Bicycle sharing/ renting mock-up

Bicycle rental schemes can be an important incentive to increase the modal share of cycling in towns with a low ownership rate of bicycles and specific user groups like students or tourists. Cycling becomes visible as a serious mode of transport and available for a large group of potential users.

There are various forms of bicycle sharing and renting schemes. There are free-floating, dockless systems operated by different commercial parties and systems with fixed docking stations operated by private partners in more or less close cooperation with public partners (municipalities).

Both systems have their advantages and disadvantages. Nevertheless, public sector involvement and regulation of private rental initiatives have proven to be essential for the good functioning and acceptance of rental systems. Local bicycle repair shops and public transport companies can be involved in the establishment and operation of a bike rental system, thereby strengthening the local economy and employment. Schools and employers can also be a relevant catalyst for a bicycle renting scheme. They can activate specific target groups and become a starting point for a scheme that is subsequently opened up to the general public.

Including electric and transport bikes within a rental scheme further enlarges the transport options and target group. Rental of sharing systems with a social component makes cycling also available to weaker groups of the population that could not otherwise afford cycling, hence reducing transport poverty.

Free-floating, dockless bicycle rental © JUMP

Self-service bike rental with docking stations, Brussels © Villo! JCDecaux

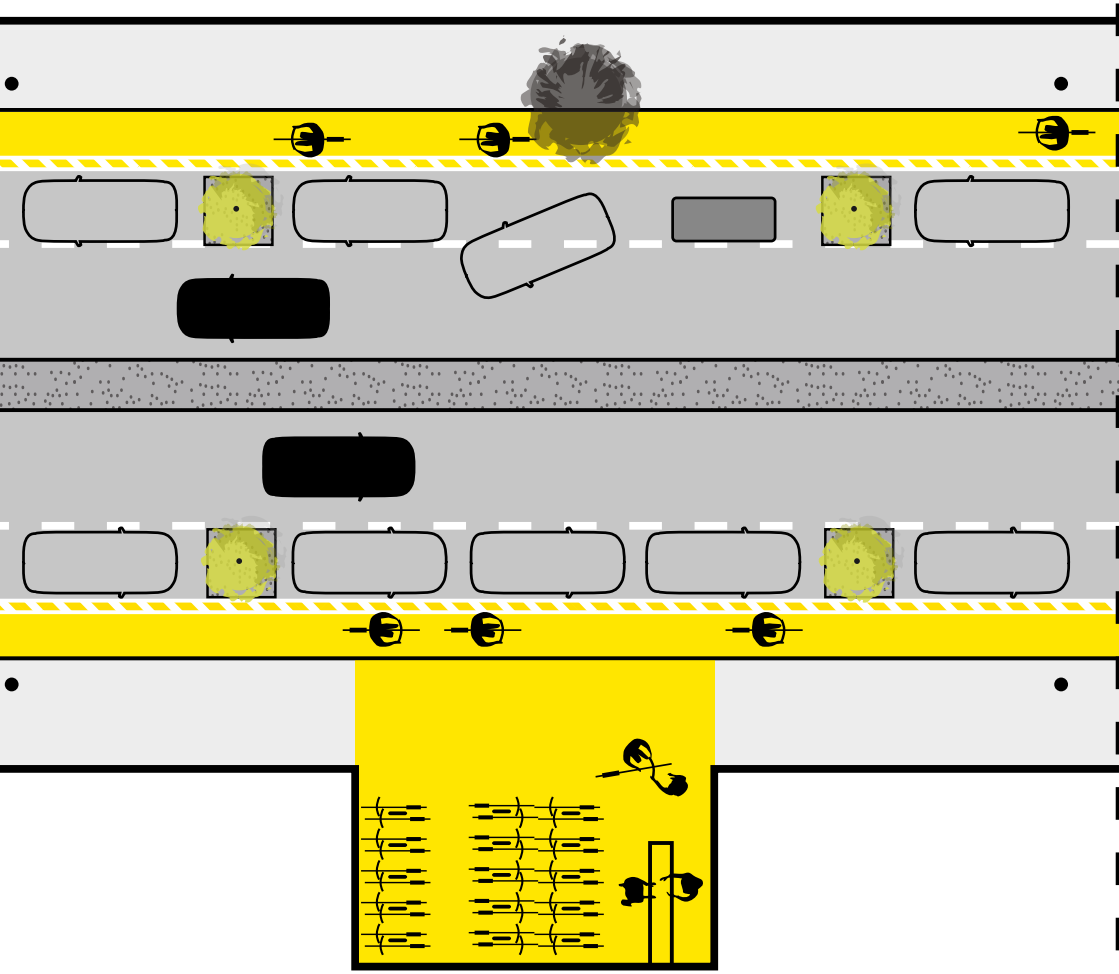
Public transport related bicycle rental in the Netherlands © OV-fiets

Long term bike rental with maintenance service in the Netherlands © Swapfiets

Cargo bike sharing system in Seestadt Aspern, Vienna © Fahrrad Wien

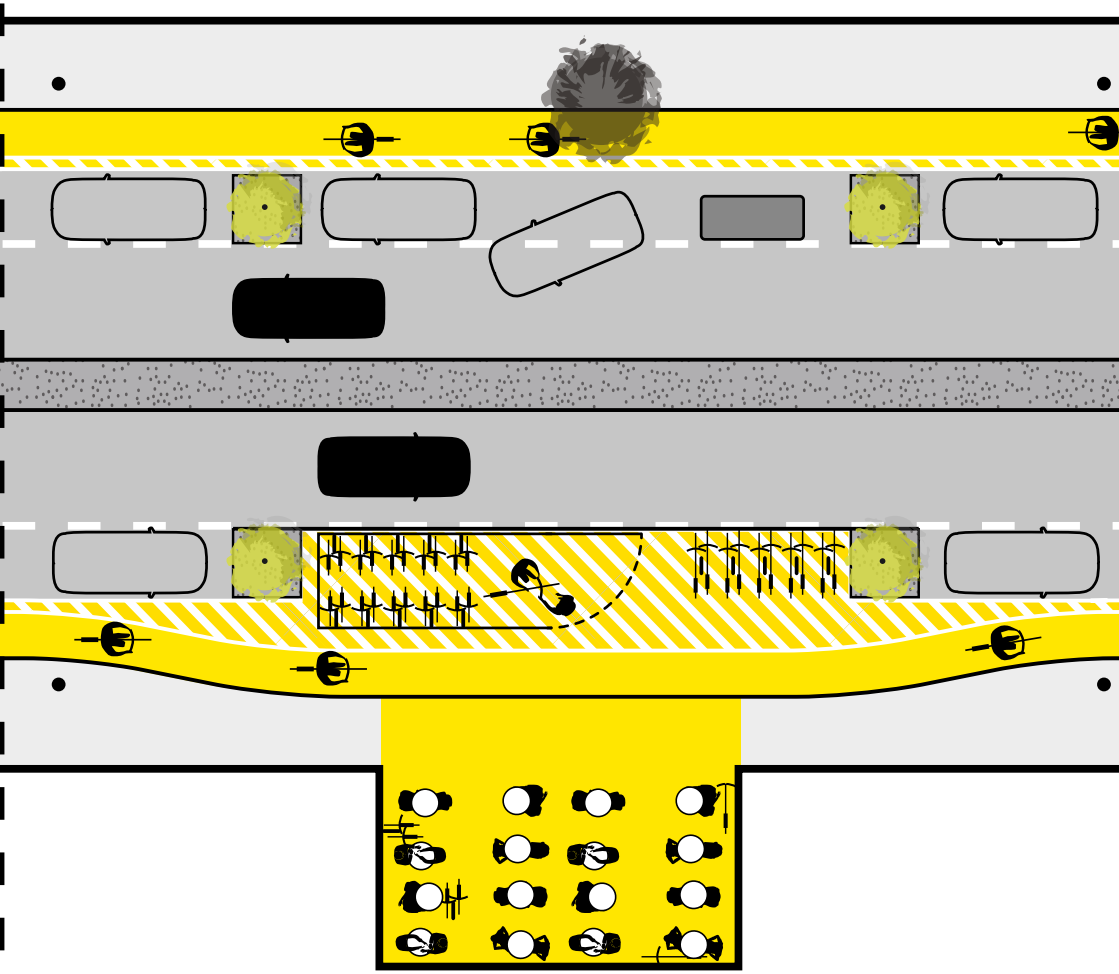
Pop-up rental station for electric bikes in Helsinki © ebike shack

Bike rental in an empty business premises next to the bicycle path.



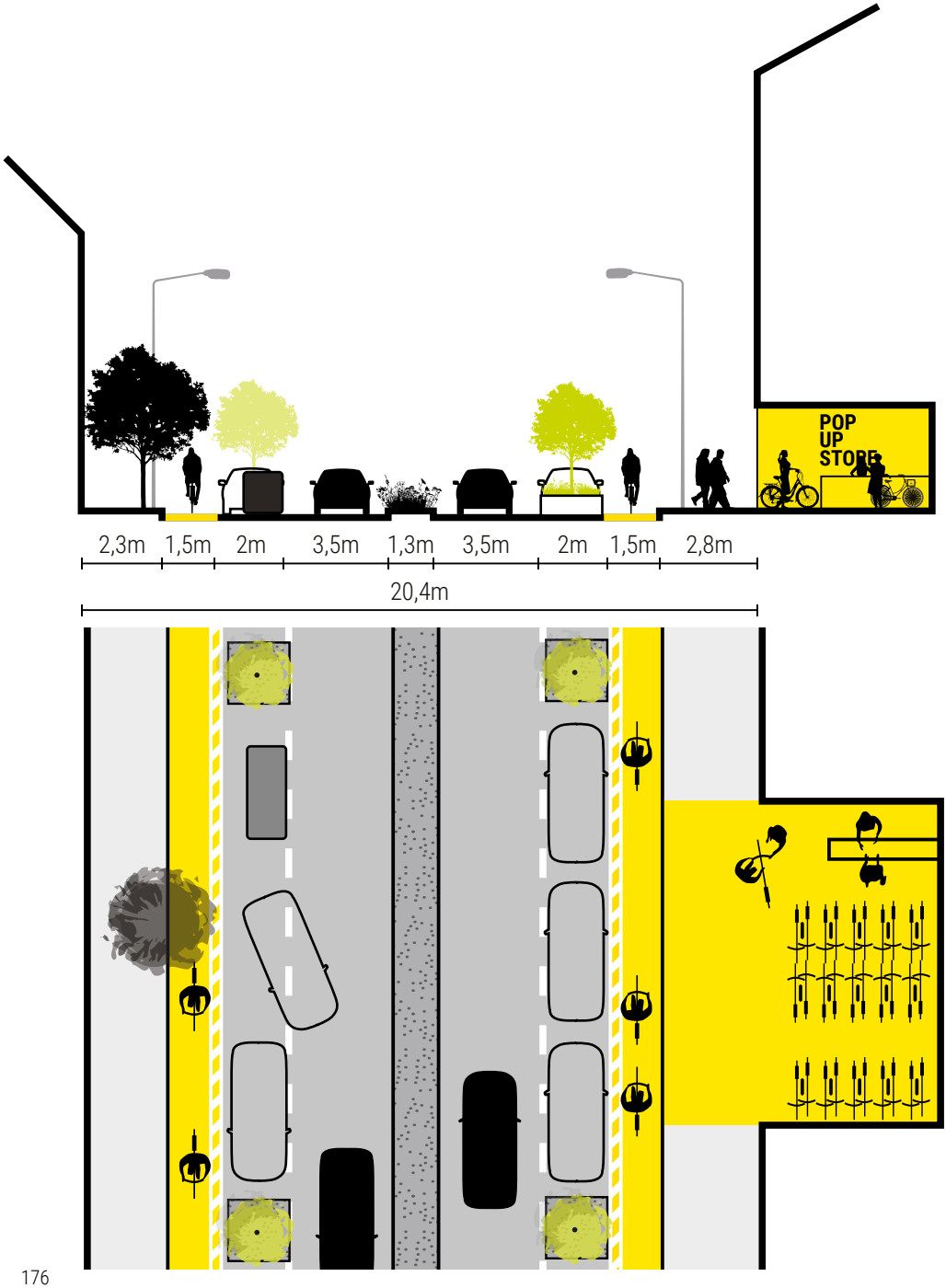
Proposed temporary mockup situation

Pop-up bike rental in a container next to a café or shop.



Proposed temporary mockup situation

0 1 2 5m


POP
UP
STORE
2,3m
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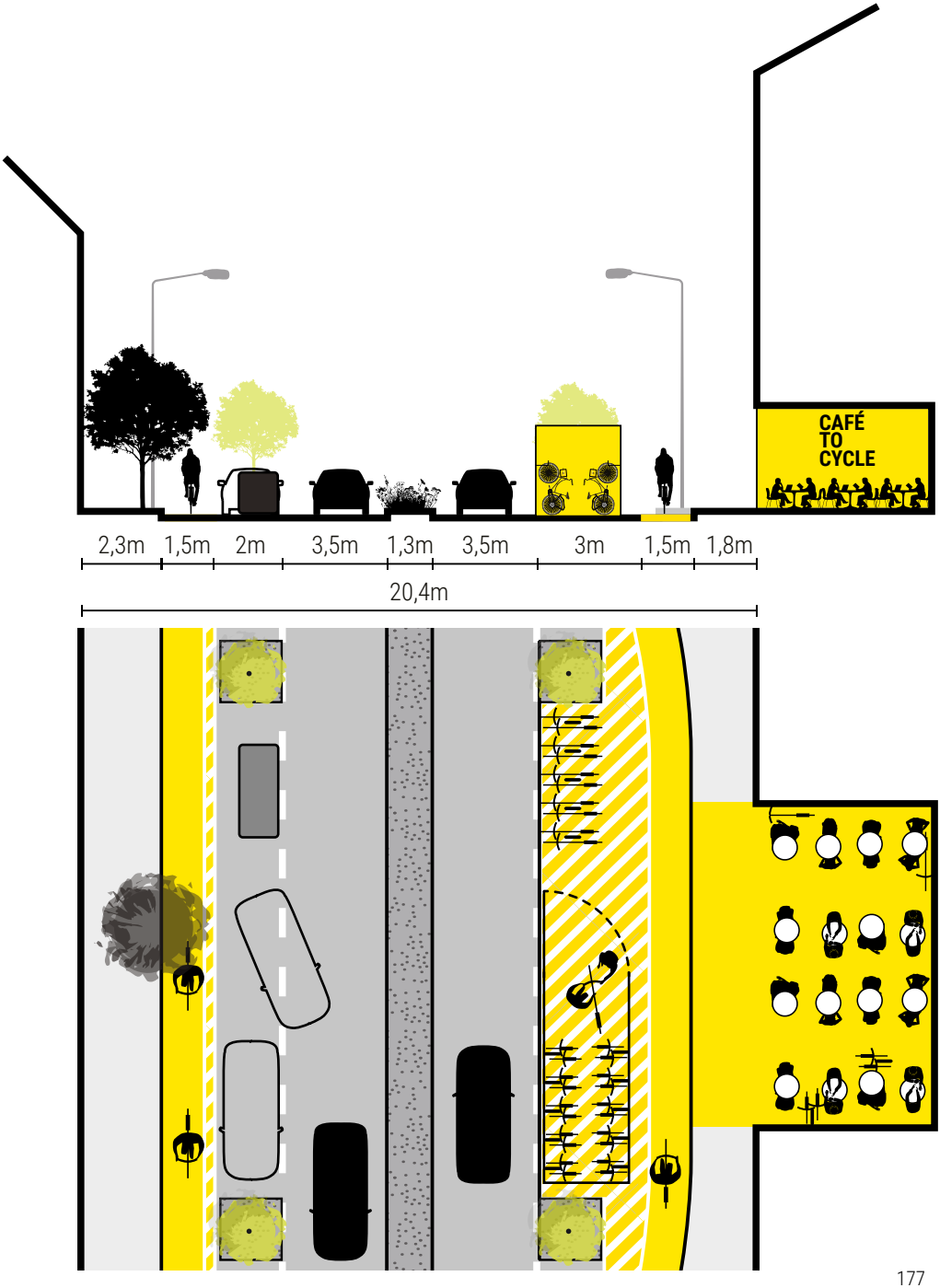
3,5m
2m
1,5m
2,8m
20,4m


CAFÉ
TO
CYCLE
2,3m
1,5m
2m
3,5m
1,3m
3,5m
3m
1,5m
1,8m
20,4m

Mock-up

Proof of Concept for rental bicycles in Lüleburgaz

As part of the project for Lüleburgaz, a POC (Proof of Concept) for a bicycle rental scheme was developed. With the help of Istanbul based FARplus, a dockless rental system based on a smart lock was developed, which is operated via the municipal service card. The Turkish bicycle producer Accell produced a number of specific bikes based on the specifications developed together with the participants of the workshops: a solid 'Dutch-style' bicycle with a simple, robust mechanical system, no gears, but a front cargo rack "strong enough to hold a large watermelon".

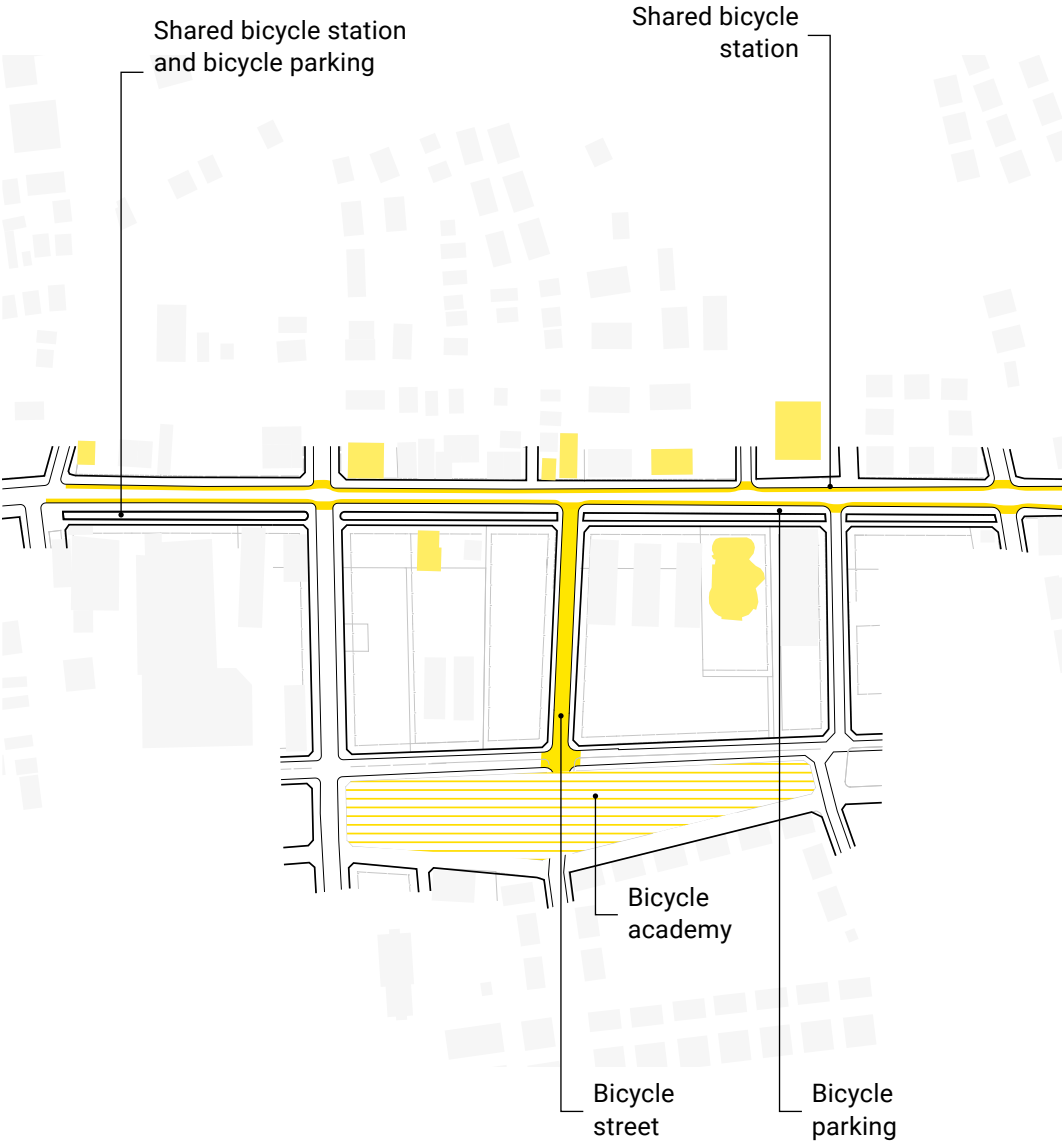
Optional colour schemes and branding for the Lüleburgaz rental bicycles.

Final design for the Lüleburgaz rental bicycles.

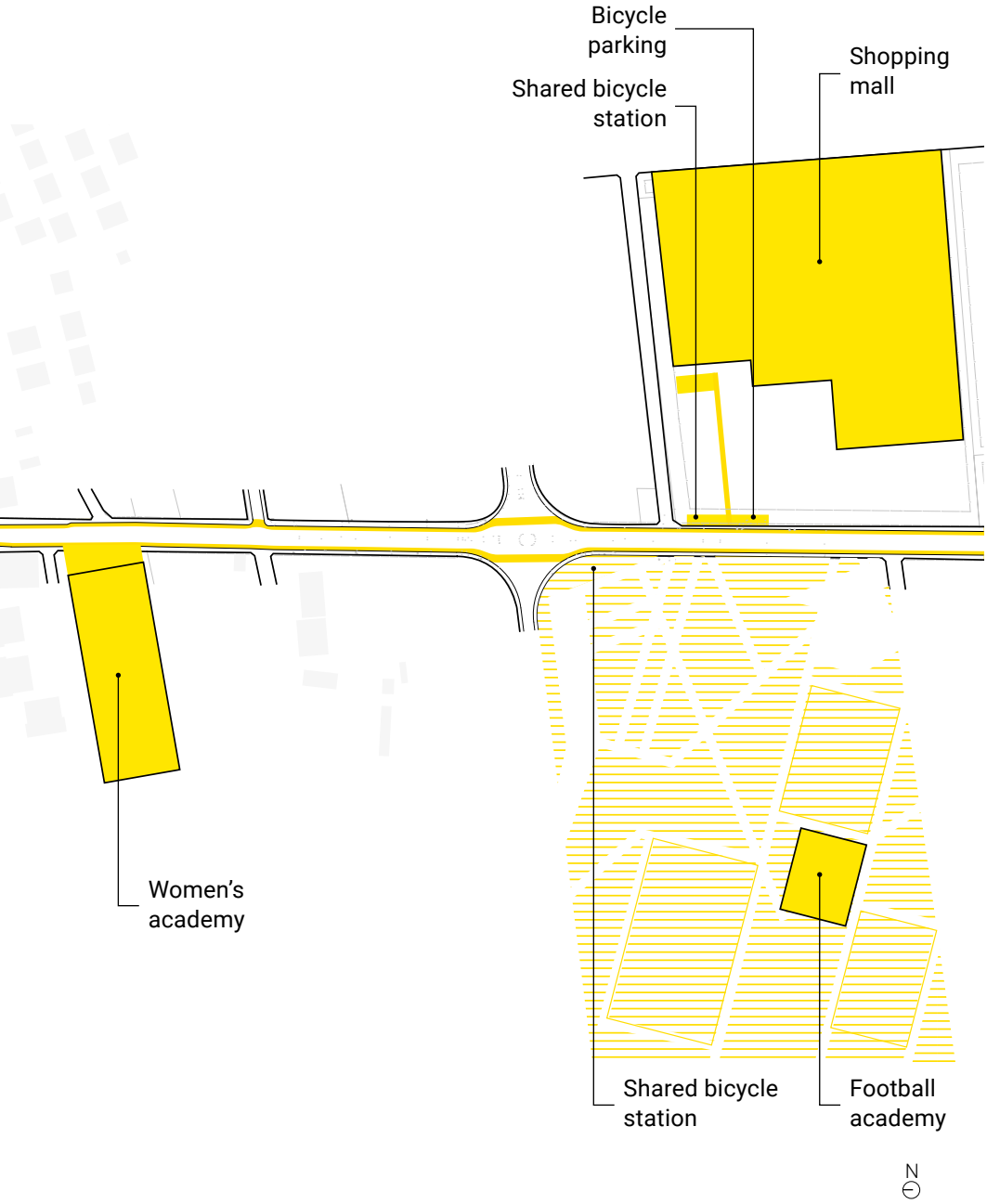

Lüleburgaz
Lüleburgaz n.bike


Lüleburgaz
Lüleburgaz on bike

Proposed organisation of bicycle rental at Istasyon street.



Mock-up of overall view


Bicycle parking
Shopping mall
Shared bicycle station
Women's academy
Shared bicycle station
Football academy
N

Annex

Annex

Postcards

Through the different project activities, an enormous amount of relevant content was developed. The most interesting content was translated into a visual format that was used for different communication purposes. The chosen format was that of postcards with clear and simple text-image combinations that highlight one specific aspect of the work: an easy to understand statement put on top of an image. This was combined with a second layer of information where the topic was further elaborated on the back of the postcard.

This resulted in a series of images/text combinations that were used in an old-school way as postcards, but also as tweets and Instagram posts or for public presentations on the project. The idea behind this is to spread and 'democratise' the rather abstract (and let us face it: for outsiders, quiet often cryptic) content of the project report and to make it understandable and attractive for the general public too.

TESTING THE PROPOSED BICYCLE-FRIENDLY ROAD PROFILE!

Önerilen bisiklet dostu yolun test edilmesi!

Existing situation - Istasyon Caddesi Guney Aksi
Mevcut durum - İstasyon Caddesi Güney Aksi

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Cycling for a better city

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15/26

The basics of the inclusive bicycle master plan for Luleburgaz
Lüleburgaz'a yönelik kapsayıcı bisiklet master planın temel prensipleri

Photo/ Fotoğraf: Artgineering

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7/26

FOR WHOM ONE SHOULD DESIGN CYCLE INFRASTRUCTURE?

Bir bisiklet altyapısı kimin için tasarlanmalıdır?

60%	**“Interested but concerned”** “İlgili ama endişeli”	
33%	**“No way. No how.”** “Kesinlikle hayır”	
6,5%	**“Enthused and confident”** “Heyecanlı ve kendine güvenen”	
0,5%	**“Strong and fearless.”** “Güçlü ve korkusuz”	

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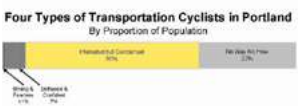
According to Roger Geller, bicycle coordinator for the city of Portland, USA, there are four types of cyclists: the ‘interested but concerned’, the ‘no way, no how’, the ‘enthused and confident’ and the ‘strong and fearless’. When designing bicycle infrastructure, one should not (only) focus on the people already cycling, but also on the ones who do not cycle yet. Hence the ‘interested but concerned’ is the primary target group that has to be addressed and provided with adequate bicycle infrastructure. The ‘enthused and confident’ and the ‘strong and fearless’ who cycle already or the ‘no way, no how’ that are difficult to get out of their cars come second.

ABD’nin Portland şehrinde bisiklet koordinatörü olan Roger Geller’e göre, dört tür bisikletçi vardır: ‘İlgili ama endişe duyan’, ‘asla olmaz diyen’, ‘heyecanlı ve kendine güvenen’ ve ‘güçlü ve korkusuz’. Bisiklet altyapısı tasarlanırken, sadece bisiklet kullanan insanlara değil, henüz bisiklete binmeyenlere de odaklanılmalıdır. Dolayısıyla ‘İlgili ama endişe duyan’ grup, ele alınması ve yeterli bisiklet altyapısı sağlanması gereken birincil hedef gruptur. “Heyecanlı ve kendine güvenen” ile zaten bisiklet süren “güçlü ve korkusuz” gruplar ya da arabalarından inmeleri zor olan ‘asla olmaz’ grubu ikinci sırada gelmelidir.



Source: Roger Geller, Bicycle Coordinator, Portland Office of Transportation, Four Types of Cyclists
Kaynak: Portland’taki dört tür ulaşım bisikletçisi

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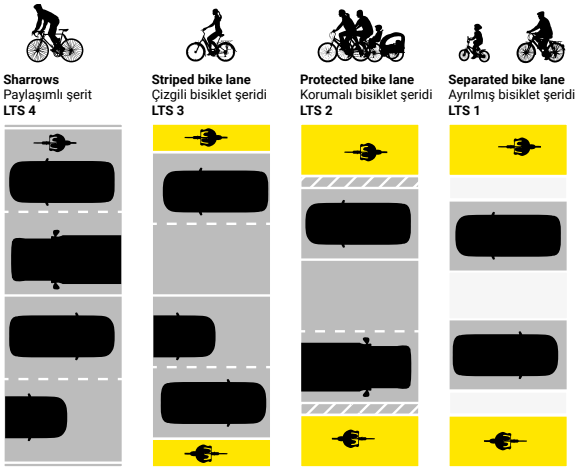
WHAT TYPE OF CYCLE INFRASTRUCTURES ONE SHOULD DESIGN?

Ne tür bir bisiklet altyapısı tasarlanmalı?



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Different types of cyclists require different types of infrastructure to experience a safe, comfortable and stress-free ride. Level of Traffic Stress (LTS) is a rating given to a road segment or crossing indicating the traffic stress that it imposes on cyclists.
LTS 1: Robust separation from all except low speed, low volume traffic. Simple crossings. Suitable for children.
LTS 2: Cyclists have their own place to ride that keeps them from having to interact with traffic except at formal crossings. Physical separation from higher speed and multilane traffic. Crossings that are easy for an adult to negotiate. A level of traffic stress that people classified as 'interested but concerned' can tolerate.
LTS 3: Involves interaction with moderate speed or multilane traffic or close proximity to higher speed traffic. A level of traffic stress acceptable to those classified as 'enthused and confident'.
LTS 4: Involves interaction with higher speed traffic or close proximity to high speed traffic. A level of stress acceptable only to those classified as 'strong and fearless'.

Trafik Stres Düzeyi (LTS), bir yol segmentine veya kavşağa verilen ve bisikletlilere uyguladığı trafik stresini gösteren bir derecelendirmedir.
LTS 1: Düşük hızlı ve düşük hacimli trafikten keskin bir şekilde ayırma. Basit geçişler, Çocuklar için uygun.
LTS 2: Bisikletliler, resmi geçişler dışında trafikle etkileşime girmek zorunda kalmamaları için kendi sürüş yerlerine sahiptir. Yüksek hızlı ve çok şeritli trafikten fiziksel ayırma. Bir yetişkinin üstesinden gelebileceği kolay geçişler. "İlgili ama endişe duyan" olarak sınıflandırılan insanların müsamaha edebileceği bir trafik stres düzeyi.
LTS 3: Orta hızda veya daha yüksek hızlı trafiğe yakın, veya çok şeritli trafikle etkileşimi içerir. "Heyecanlı ve kendine güvenen" olarak sınıflandırılanlar için kabul edilebilir bir trafik stres düzeyi.
LTS 4: Daha yüksek hıza sahip trafikle ile etkileşim ya da yüksek hızlı trafiğe yakınlığı içerir. "Güçlü ve korkusuz" olarak sınıflandırılan kullanıcılar için kabul edilebilir bir trafik stres düzeyi.
Peter Furth, Northeastern Üniversitesi İnşaat Mühendisliği Profesörü, Boston, Massachusetts

Source: Peter Furth, Professor of Civil Engineering at Northeastern University, Boston, Massachusetts
Kaynak: Peter Furth, Northeastern Üniversitesi İnşaat Mühendisliği Profesörü, Boston, Massachusetts

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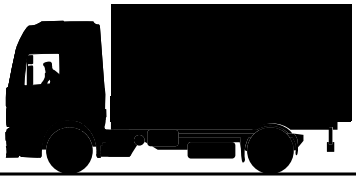
SEPARATE MODES OF TRANSPORT ACCORDING TO:

Aşağıdakilere göre ayrıştırılmış yollar:

WEIGHT
Ağırlık



DIRECTION
Yön

SPEED
Hız

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The question of whether different modes of transport can be combined or should be separated can be answered by applying common sense. Mixing different modes of transport in the same road space will only work if there are no major differences in weight, direction and speed. For example, heavy trucks and children on bicycles do not coexist well in the same narrow road profile. Cycling on or directly next to a road where cars can travel at 50km/h or faster is not safe. And, except at low speeds, traffic coming in opposite directions should be kept apart.

Farklı ulaşım yöntemlerinin birleştirilip birleştirilemeyeceği sorusuna sağduyumuzu kullanarak cevaplayabiliriz. Farklı ulaşım yöntemlerini aynı yol alanında karıştırmak, yalnızca ağırlık, yön ve hızda büyük farklılıklar olmadığı takdirde işe yarayacaktır. Örneğin, ağır kamyonlar ve bisikletli çocuklar aynı dar yol profilinde aynı anda var olamazlar. Araçların 50km/s veya daha hızlı gidebileceği bir yolda veya hemen yanında bisiklet sürmek güvenli değildir. Düşük hızlar hariç olmak üzere, zıt yönlerden gelen trafik ayrı tutulmalıdır.

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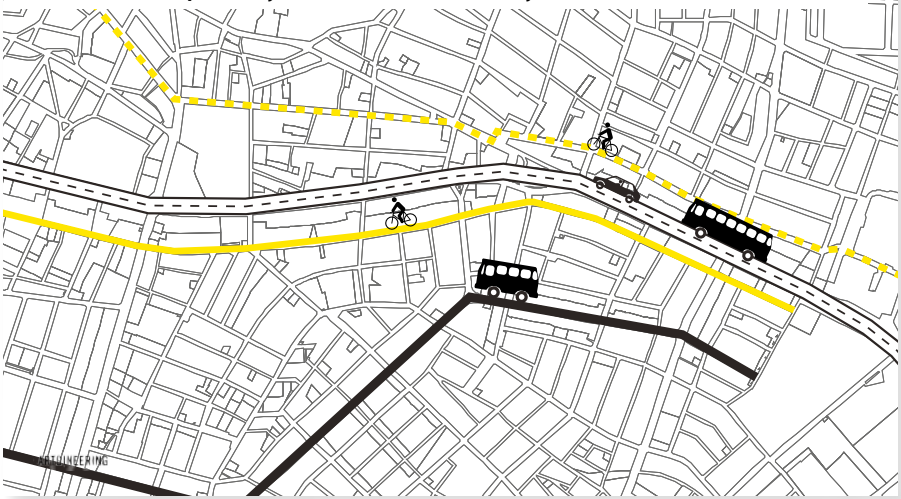
OFFER SPECIFIC CORRIDORS FOR CARS, PUBLIC TRANSPORT AND CYCLING!

Arabalar, toplu taşıma ve bisikletler için özel koridorlar sunun!



In most existing cities, there is simply not enough road space available to meet the needs of all modes of transport in all streets at the same time. It is therefore necessary to make choices per corridor as to which modalities should be given priority. In practice, this often means that, in some streets, space for driving and parking cars is limited in order to make room for public transport and/or cycling infrastructure. For main car corridors, parallel roads may be dedicated primarily to public transport, cycling or a combination of both.

Mevcut şehirlerin çoğunda, aynı anda tüm sokaklardaki tüm ulaşım yöntemlerinin ihtiyaçlarını karşılamak için yeterli yol alanı yoktur. Bu nedenle, hangi yöntemlere öncelik verilmesi gerektiği konusunda koridor başına seçimler yapılması gerekmektedir. Pratikte bu, genellikle bazı sokaklarda, toplu taşıma ve/veya bisiklet altyapısına yer açmak için araba ve park yerlerinin ait alanın sınırlandırıldığı anlamına gelir. Ana araba koridorları için, paralel yollar öncelikle toplu taşıma, bisiklet veya her ikisinin bir kombinasyonuna ayrılabilir.

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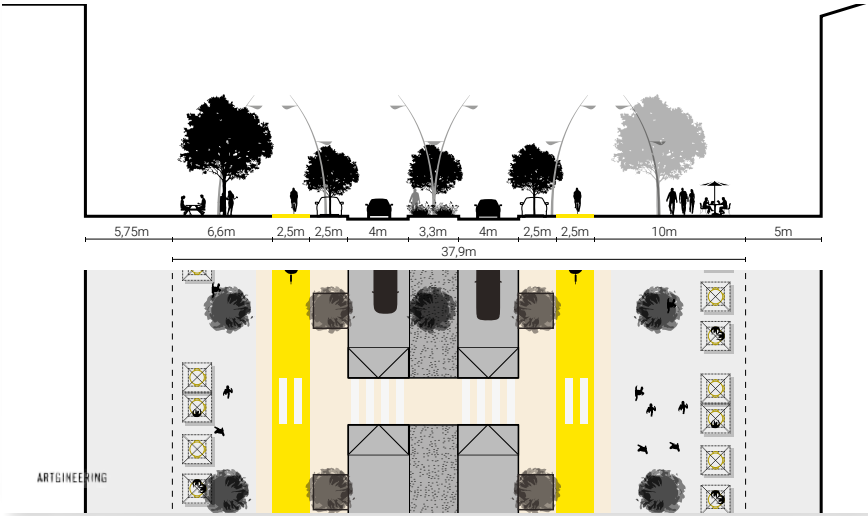
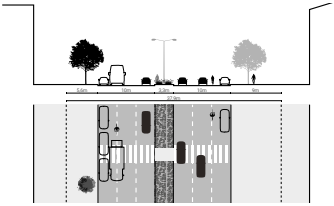
WHAT A FORMER URBAN HIGHWAY COULD LOOK LIKE IN THE FUTURE

Gelecekte eski bir kentsel otoyol nasıl görünebilir



Existing situation - D-100 Karayolu- Murat Hüdavendigar Caddesi
Mevcut durum - D-100 Karayolu- Murat Hüdavendigar Caddesi



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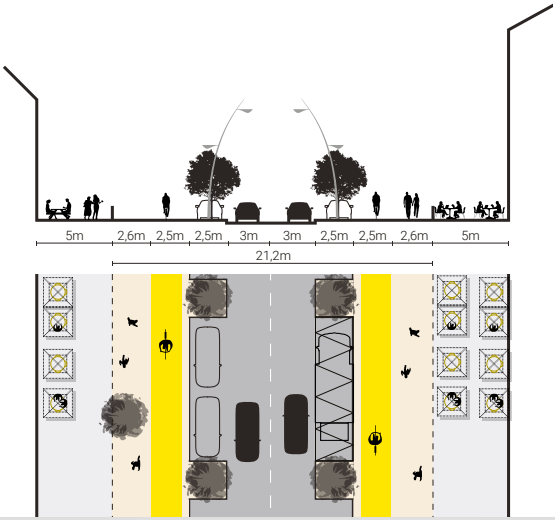
WHAT A LARGE MAIN ROAD COULD LOOK LIKE

Geniş bir ana yol nasıl görünebilir



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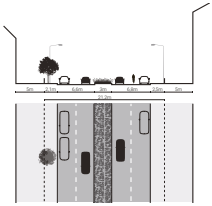
Existing situation - Istasyon Caddesi Guney Aksi
Mevcut durum - İstasyon Caddesi Güney Aksi



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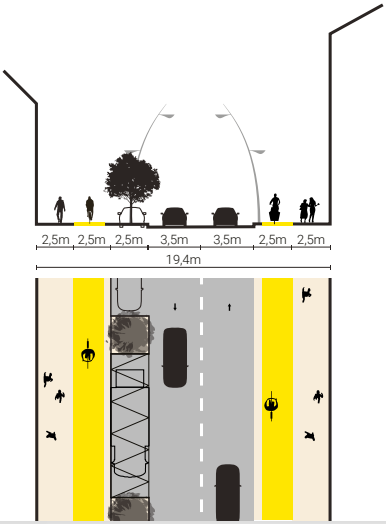
WHAT A NARROW MAIN ROAD COULD LOOK LIKE

Dar bir ana yol nasıl görünebilir



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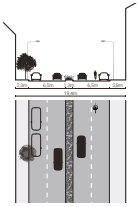
Existing situation - Istasyon Caddesi Guney Aksi
Mevcut durum - İstasyon Caddesi Güney Aksi



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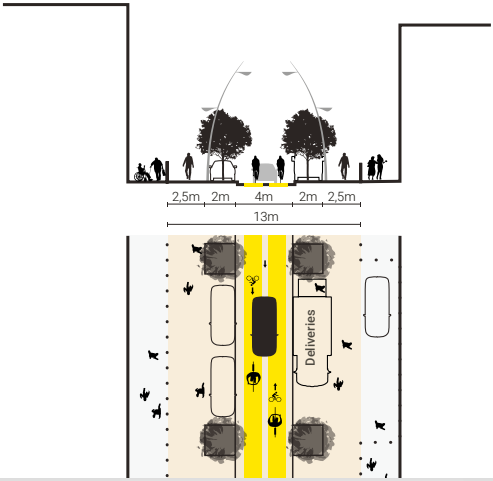
WHAT A NEIGHBOURHOOD ROAD COULD LOOK LIKE

Bir mahalle yolu nasıl görünebilir



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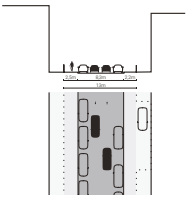
Existing situation - İbrahim Gerçek Caddesi
Mevcut durum - İbrahim Gerçek Caddesi



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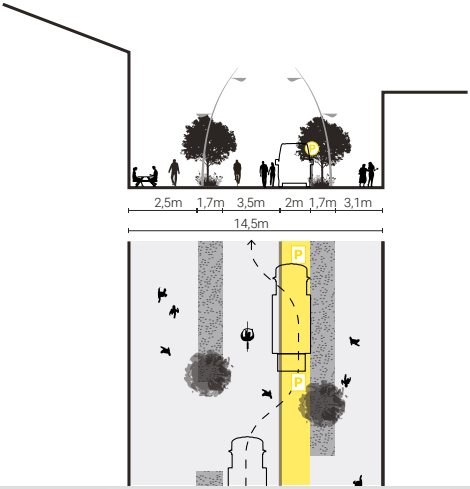
HOW TO ORGANISE DELIVERIES IN THE PEDESTRIAN AREA

Yaya bölgesinde teslimatlar nasıl organize edilir



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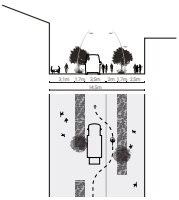
Existing situation - İstanbul Caddesi
Mevcut durum - İstanbul Caddesi



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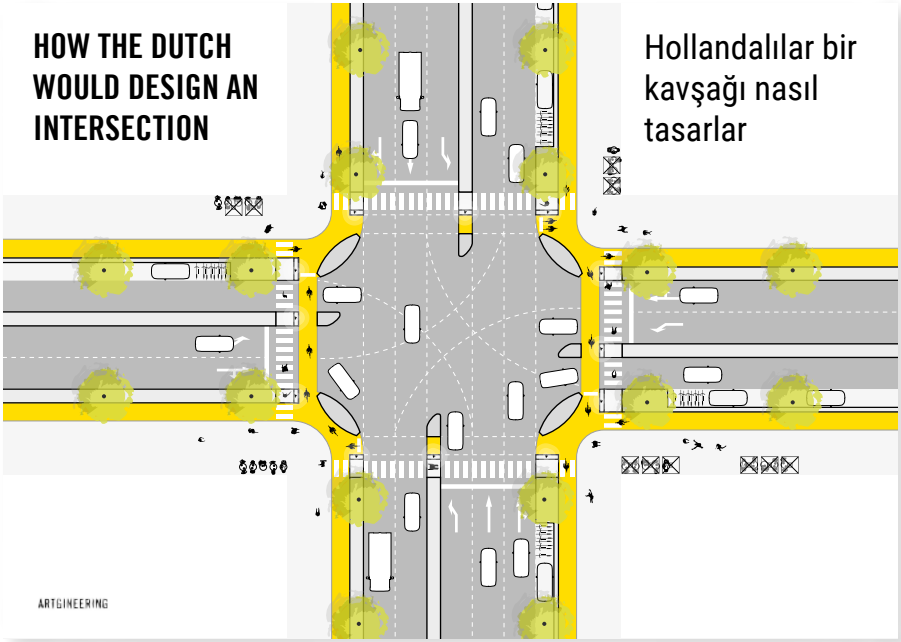
HOW THE DUTCH WOULD DESIGN AN INTERSECTION

Hollandalılar bir kavşağı nasıl tasarlar



This postcard shows some basic design principles from the Netherlands for the design of safe and stress-free crossings. The four most important elements are protective islands, waiting areas for cyclists, shifting the location of the cycle paths and advanced stop lines.

Bu kartpostalda güvenli ve stressiz geçişlerin tasarımı için Hollanda'dan bazı temel tasarım ilkeleri gösterilmektedir. En önemli dört unsur koruyucu refüjler, bisikletliler için bekleme alanları, bisiklet yollarının kaydırılması ve gelişmiş durma hatlarıdır.

Source/ Kaynak: ADFC "So geht Verkehrswende", 2018

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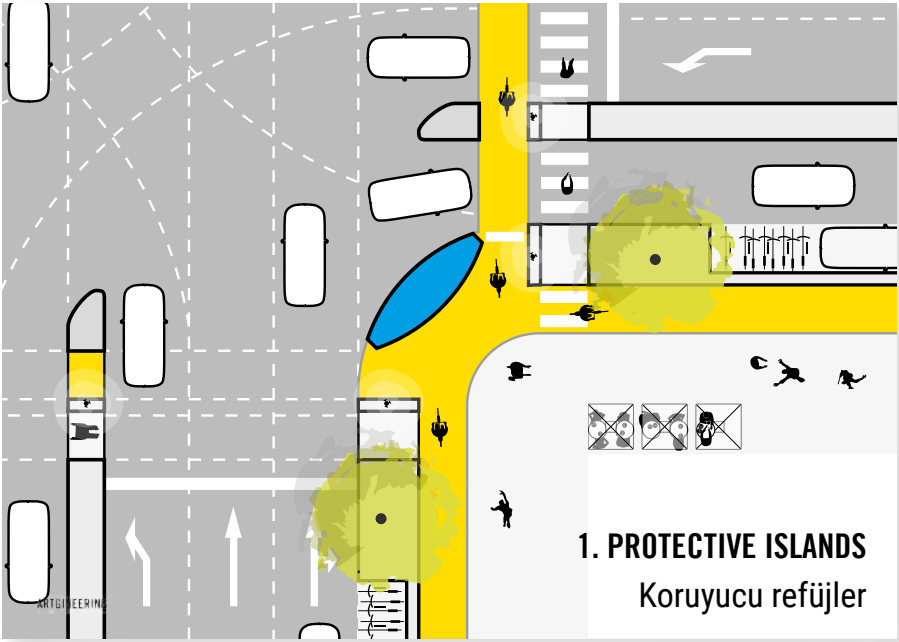

1. PROTECTIVE ISLANDS
Koruyucu refüjler

1. Protective islands
A typical element of Dutch crossings are crescent-shaped traffic islands, so-called protective islands. These islands have a small radius and thus reduce the speed at which motor vehicles approach them. They can be driven over by trucks as they require larger turning circles. Protective islands mark a clear boundary between motorised traffic and pedestrians and cyclists. They thus ensure that people who cycle or walk feel safe and are clearly visible.

Hollanda kavşaklarının tipik bir unsuru, koruyucu refüjler olarak adlandırılan hilal şeklinde trafik refüjleridir. Bu refüjler küçük bir yarıçapa sahiptir ve bu nedenle motorlu taşıtların yaklaşma hızını azaltır. Daha büyük dönüş yarıçapları gerektirdiklerinden kamyonlar üzerlerinden geçebilirler. Koruyucu refüjler motorlu trafik ile yayalar ve bisikletliler arasında açık bir sınır oluşturmaktadır. Böylece bisiklete binen veya yürüyen insanların kendilerini güvende hissetmelerini ve kolay bir şekilde fark edilmelerini sağlarlar.

Source/ Kaynak: ADFC "So geht Verkehrswende", 2018

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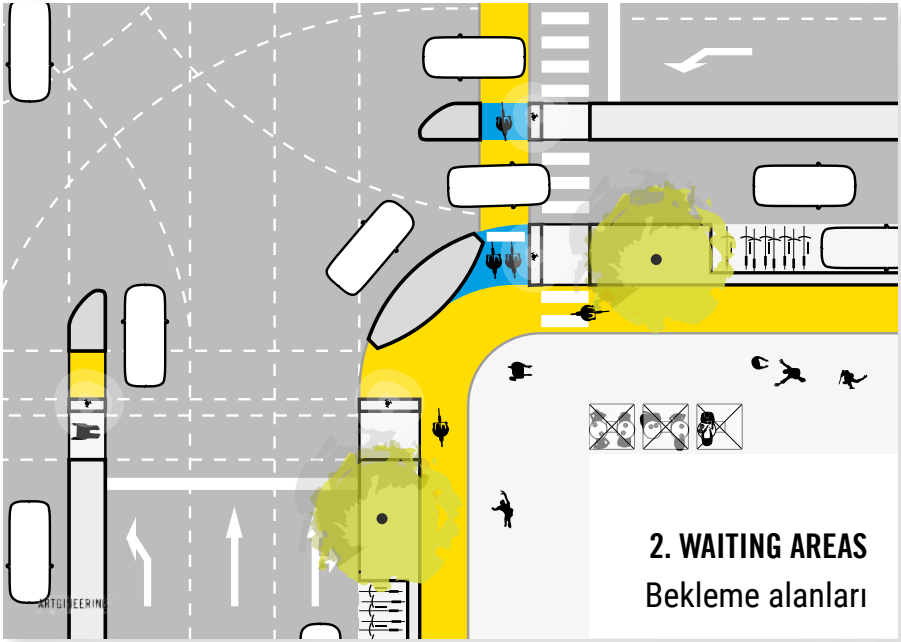

2. Waiting areas
The protective islands automatically create waiting areas in which cyclists can line up when the traffic lights are on red, while not obstructing cycle traffic crossing behind.

Koruyucu refüjler otomatik olarak, trafik ışığı kırmızı olduğunda bisikletlilerin sıraya girebileceği ve arkadan geçen bisiklet trafiğini engellemeyen bekleme alanları yaratır.

Source/ Kaynak: ADFC "So geht Verkehrswende", 2018

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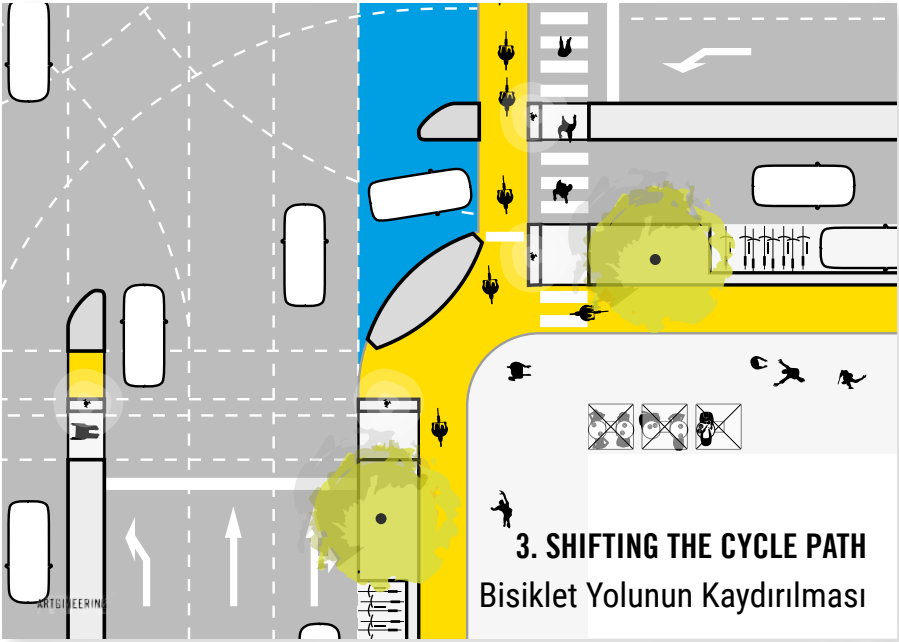

3. SHIFTING THE CYCLE PATH
Bisiklet Yolunun Kaydırılması

3. Shifting the cycle path
A slight shift in the axis of the cycle paths creates a waiting area for motor vehicles and ensures that motorists can concentrate on one thing at a time: first turning around the corner, then locating the cyclists approaching the crossing. As motor vehicles are positioned at a right angle to approaching cyclists, they can spot them more easily in their field of vision and the 'blind spot' is minimised. Consistently keeping cyclists at a distance from car traffic reduces the risk of collisions and the stress level to which cyclists are exposed.

Bisiklet yollarının ekseninde hafif bir kaydırma motorlu taşıtlar için bir bekleme alanı yaratır ve sürücülerin aynı anda tek bir şeye konsantre olmasını sağlar: öncelikle köşeyi dönmek ve ardından kavşağa yaklaşan bisikletlileri fark etmek. Motorlu taşıtlar yaklaşan bisikletlilere dik bir açıyla konumlandırıldıklarından, görüş alanlarında daha kolay tespit edebilirler ve böylece "kör nokta" minimize edilir. Bisiklet sürücülerini araç trafiğinden sürekli olarak belli bir mesafede tutmak, çarpışma riskini ve bisikletlilerin maruz kaldığı stres seviyesini azaltır.

Source/ Kaynak: ADFC "So geht Verkehrswende", 2018

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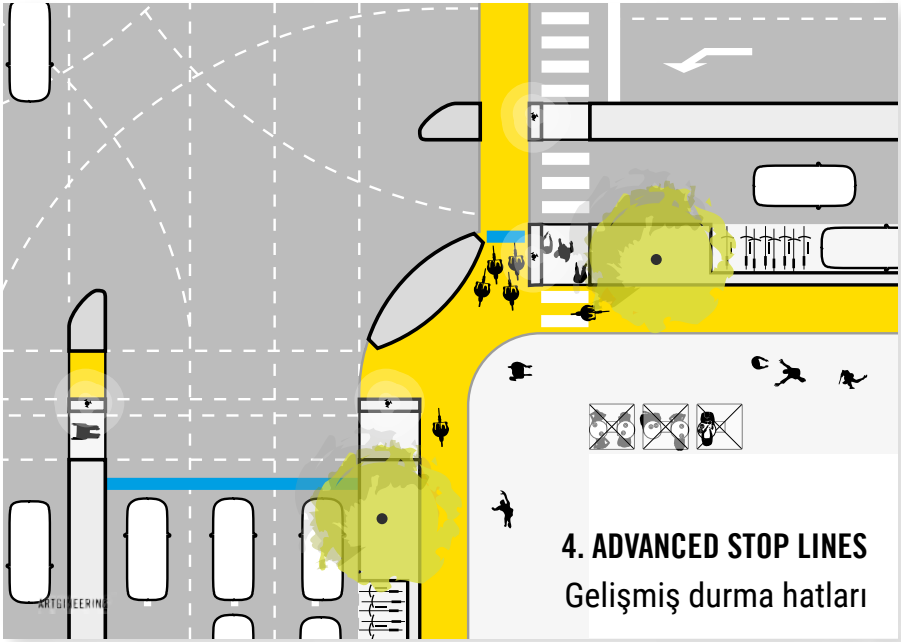

4. Advanced stop lines.
Consistently guiding cyclists to the side of the road automatically creates advanced stop lines for bicycle traffic, which helps to ensure that cyclists are more visible. In the best-case scenario, these stop lines ensure that the intersection is clear when the vehicle arrives as the cyclists are given a head start due to the advanced stop line.

4. Gelişmiş Durma Hatları
Bisikletlilerin sürekli olarak yolun kenarına yönlendirilmesi, bisiklet trafiği için otomatik olarak gelişmiş durma hatları oluşturur ve bu da bisikletçilerin daha iyi görülmesine yardımcı olur. En iyi durumda, bu hatlar bisikletlilere öncelik sağladığından araç geldiğinde kavşağın boş olmasını sağlarlar.

Source/ Kaynak: ADFC "So geht Verkehrswende", 2018

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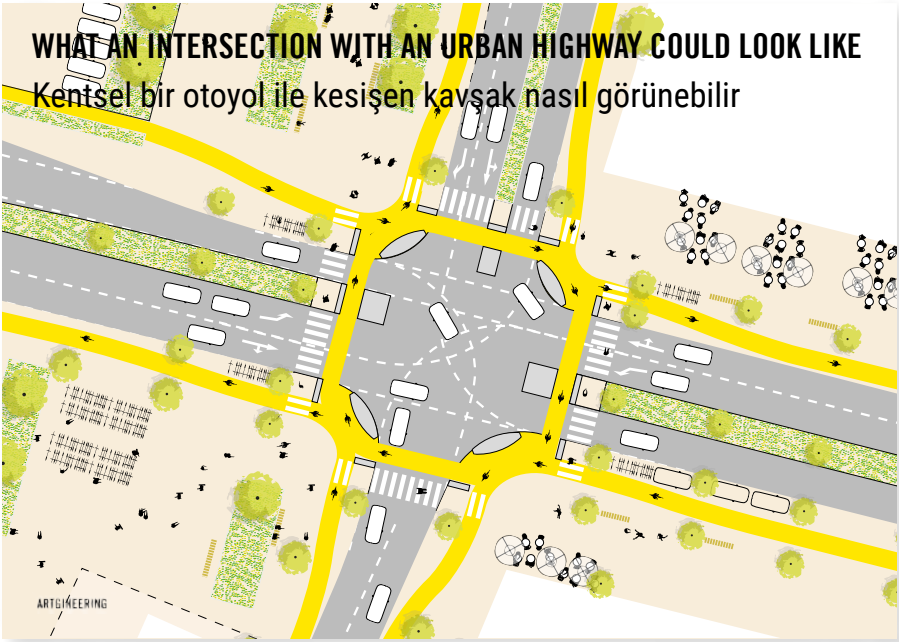
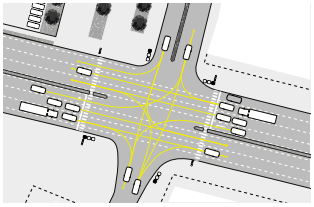
WHAT AN INTERSECTION WITH AN URBAN HIGHWAY COULD LOOK LIKE

Kentsel bir otoyol ile kesişen kavşak nasıl görünebilir



Existing situation - Luleburgaz Terminal Junction - Istiklal Caddesi / Murat Hüdavendigar Caddesi
Mevcut durum - Lüleburgaz Terminal Kavşağı -İstiklal Caddesi / Murat Hüdavendigar Caddesi



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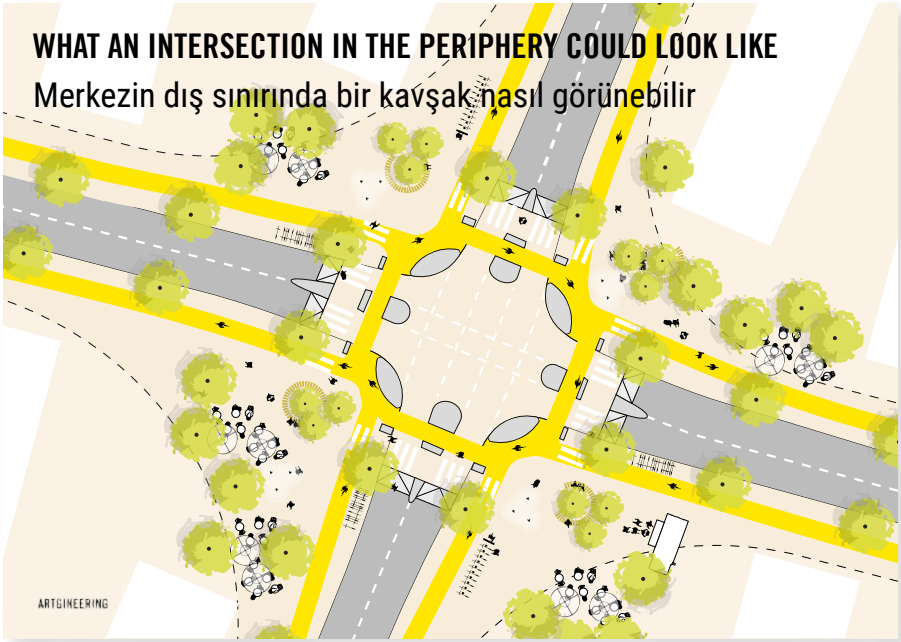
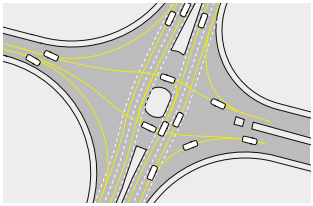
WHAT AN INTERSECTION IN THE PERIPHERY COULD LOOK LIKE

Merkezin dış sınırında bir kavşak nasıl görünebilir



Existing situation - Futbol Akademisi (LYFA) Önü-İstasyon Caddesi ve Millet Caddesi Kesişimi
Mevcut durum -Futbol Akademisi (LYFA) Önü-İstasyon Caddesi ve Millet Caddesi Kesişimi



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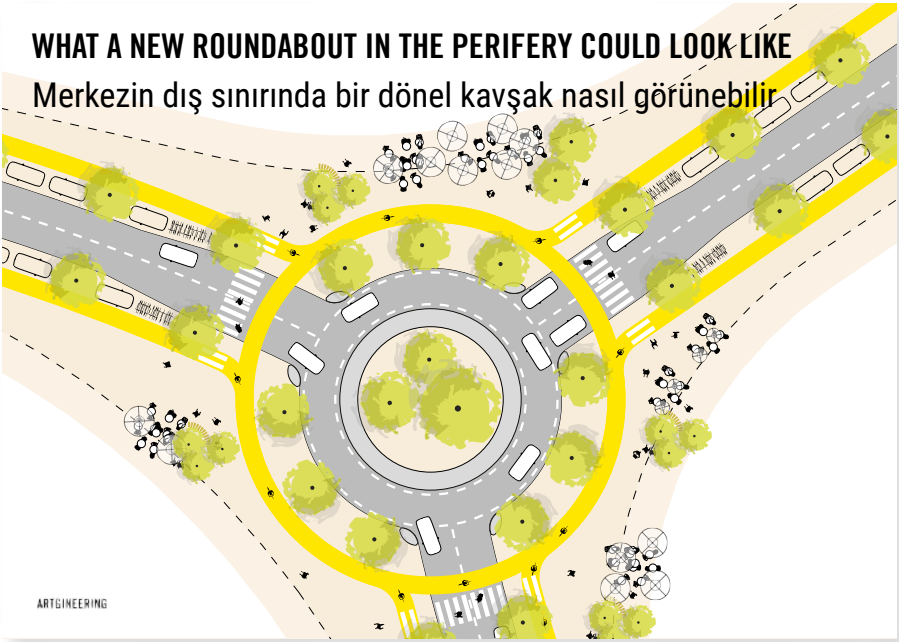
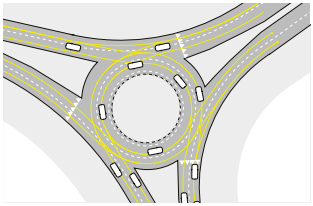
WHAT A NEW ROUNDABOUT IN THE PERIFERY COULD LOOK LIKE

Merkezin dış sınırında bir dönel kavşak nasıl görünebilir



Existing situation -Toki Bölgesi- Millet Caddesi ve Hükümet Caddesi kesişimi
Mevcut durum -Toki Bölgesi- Millet Caddesi ve Hükümet Caddesi kesişimi



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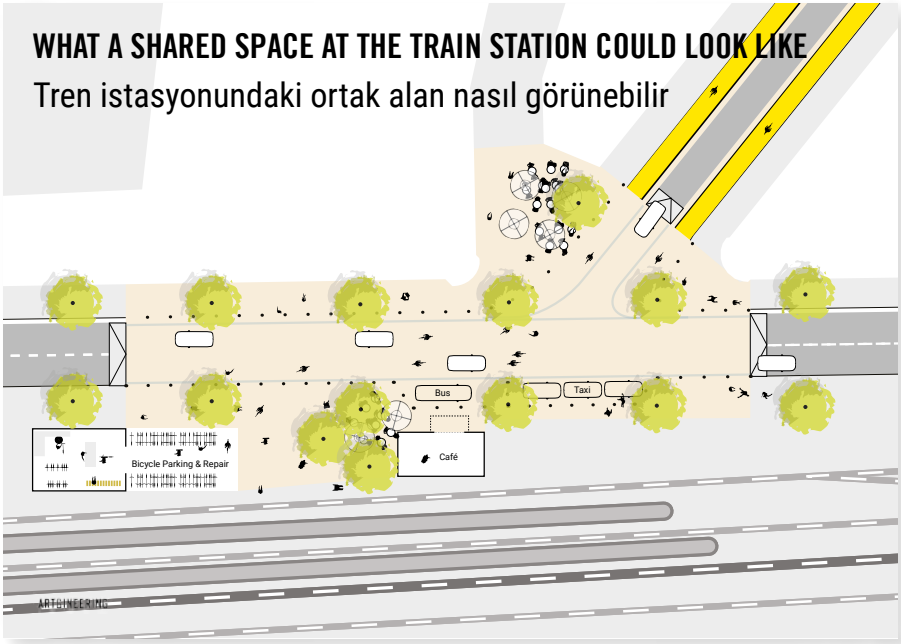
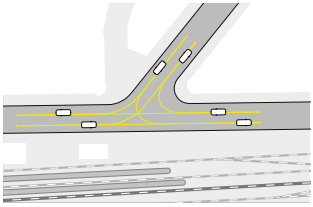
WHAT A SHARED SPACE AT THE TRAIN STATION COULD LOOK LIKE

Tren istasyonundaki ortak alan nasıl görünebilir



Durak Mahallesi- İstasyon Caddesi-Demir Hattı Caddesi kesişimi

Mevcut durum -Durak Mahallesi- İstasyon Caddesi-Demir Hattı kesişimi



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About the authors

Artgineering is an office for research and design at the border between urban planning and mobility. The office devises and implements strategies for complex urban conditions, with special attention to the role of cycle infrastructure. Artgineering reinterprets the relation between infrastructure, landscape and urban development. Starting with precise observations of the existing territorial realities, the office investigates the spatial, social and cultural production of space, whilst also addressing the communication and anchoring of designs through stakeholder involvement and coproduction: a holistic approach in which creativity and technology come together, art-gineering.

Artgineering recently realized a number of public spaces, where cycling is not only a mode of transport, but a powerful means to improve the city as a whole. The partners of Artgineering regularly research and publish on relevant topics of urban planning and mobility: 'Cycle Infrastructure', an inspirational handbook about how to fully explore the potential of bicycle routes; the policy study 'Fietsland' commissioned by the Dutch Ministry of Infrastructure & Environment; the research-by-design project 'More cycling-better cities', commissioned by the Dutch state advisor on infrastructure; and most recently 'Traffic Space is Public Space', an handbook for the transformation of traffic spaces.

Stefan Bendiks is an architect and urban planner. He has been teaching and lecturing on urban planning and mobility at various institutions across Europe. In 2013/14 he was professor at the Academy of fine Arts in Vienna. Stefan Bendiks is a member and expert of the Dutch Cycling Embassy (DCE). He advised, among others, the city of Groningen on its new cycling strategy.

Artgineering
Stefan Bendiks, Aglaée Degros, Clément Gay
www.artgineering.eu

Sustainable solutions is an internationally operating organization that facilitates sustainable mobility, clean energy and urban development in emerging economies and developing countries. The main focus is on projects that have a strong positive impact on local society.

There is a world to gain – literally and figuratively. By sharing knowledge with local partners, significant progress can be made in reducing carbon emissions and improving air quality, accessibility and overall quality of life. The local population will benefit Through better health and social emancipation. These changes also will have a global impact. Sharing our knowledge and know-how is both an opportunity and a responsibility for the western world.

Sustainable solutions acts as partner in all phases of a project: from problem analysis, to developing a solution, to implementation. Dirk de Jager actively seek collaboration with Dutch and international partners that complement each other, like including private parties, public institution (municipalities of Amsterdam and The Hague) in the field of sustainable mobility in large cities. Here the focus is on the bicycle as a relevant means of transport. Cycling will be developed in an integrated strategy that includes the three elements of hardware (infrastructure), software (social and cultural elements) and orgware (management preconditions). The aim is to transfer knowledge and experience through a capacity building approach.

Sustainable Solutions
Dirk de Jager
www.sustainable-solutions.nl

Novusens innovation & entrepreneurship institute is an ankara, turkey based, for-profit, independent "think tank" organization at the cutting edge of designing and implementing innovation policies and contributing to the advances in technology that are creating the new opportunities to increase economic growth, shaping the future to improve the quality of life. It is committed to deliver professional consultancy and training services in "innovation & entrepreneurship" field both in local and international markets. By its core values, business quality and excellence perspective, novusens aims to provide unparalled, unique, result-oriented, exemplary turnkey solutions to its customers and stakeholders.

Novusens was established in 2009 in ankara by berrin benli. It was funded by "ide consulting" and then co-founded by "designnobis" whose ceo is dr. Hakan gürsu. The unique know-how and experience and most importantly the "passion" of the co-founders of "novusens" dedicated to "innovation & entrepreneurship" has lept it ahead very rapidly and started to receive service requests even before officially established.

Novusens has adopted in principle of business development and implementation either with ppp approach, or by other business methodologies as it fully supports "collaboration" and "co-operation" business philosophy. The areas of research is mainly "technology and social innovation" through "science, technology and design".

Novusens has attracted many potential business partners at both local country and global level during the period of its establishment. The number of strategic partners has been increasing on a progressive manner to be able to provide enriched services in wide variety of portfolio to all of its potential customers and stakeholders in each and every segment of the chosen industries (ict, energy, education, health, defence, agriculture and creative industries).

Novusens develops technology strategies and şolicies for the short and longer term to shape the future to improve the lives of the people through designing and executing "best practice" applications both at the local country level and at international arena by its high profile team of experts.

NOVUSENS
Berrin Benli, Melih Gezer
www.novusens.com

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