PROJECT BOOK
MULTIMODALITY FORUM JUNGFERNHEIDE

Encouraging motorists to use green mobility

2022/2023

COMPLEX PROJECTS
Bodies & Building Berlin
AR3CP100

Steven ter Schure
5483794

complex projects

TUDelft

Project book

2022/2023
07-07-2023

COMPLEX PROJECTS
Bodies & Building Berlin
AR3CP100

Student
Steven ter Schure
5483794

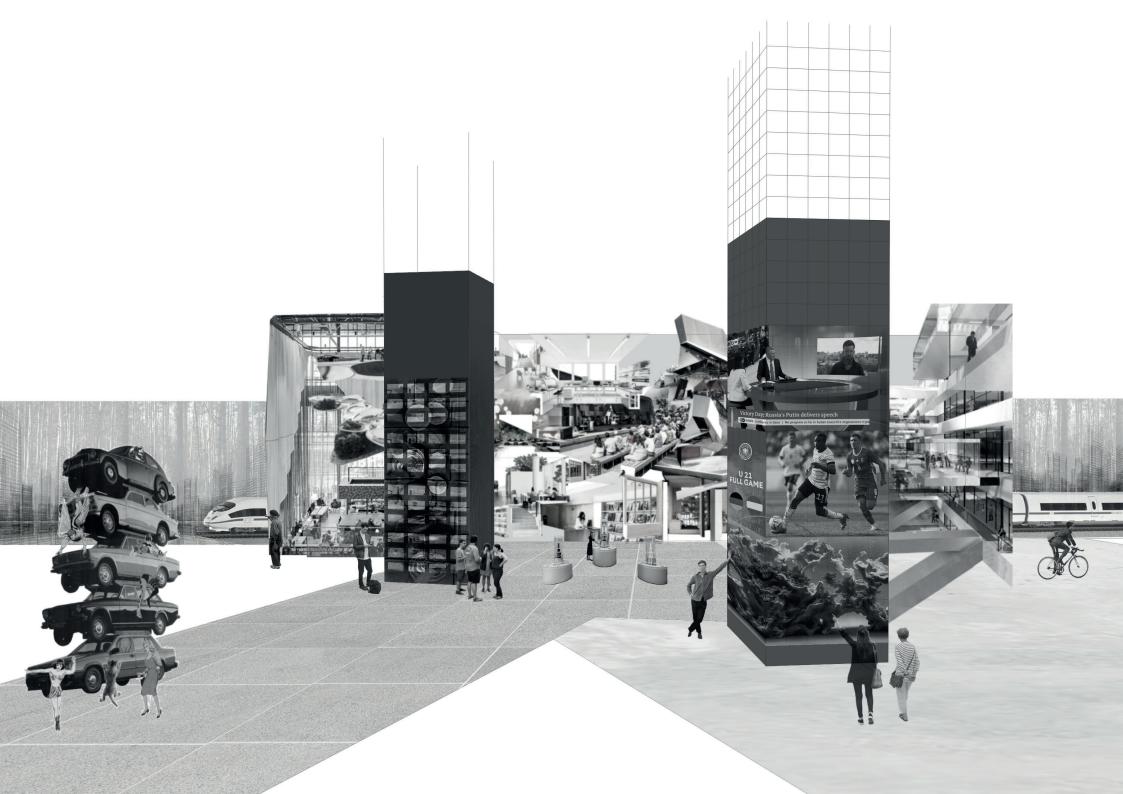**Chair**
Kees Kaan

CP coordinator
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Lab coordinator
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Tutors
Marija Mateljan
Yagiz Söylev
Arie Bergsma

Victory Day: Russia's Putin delivers speech

NEWS militants in Gaza | No progress so far in Sudan cease-fire negotiations in Je

U 21
FULL GAME

Train stations are becoming an increasingly important part of urban life. They are the connection between different transport hubs, a social interaction platform, and part of a culture or daily routine. However, many train stations are designed to meet only the first demand, "transporting people and making the city accessible". Many stations in Berlin are designed with these thoughts and are therefore unattractive to many passengers travelling to and from the city, leaving other modes of transportation dominant.

The design for a new train station in Berlin will primarily respond to creating a unique traveller experience to enhance the user experience. Digital media and automation technologies play an essential role in this, allowing the station user to configure their own experience at the station according to their needs. The station within which these technologies can serve the user will also have to change its character.

Adding features related to service and experience should ensure that a new platform is created that encourages travellers to use the public transport network. Moreover, adding these themes in a station reduces travel time and enhances the user experience.

The design extends the standard train station by integrating automation technologies that allow travellers to perform daily actions at the station faster. For instance, car and bicycle parking in the station is automated, eliminating parking operations. Moreover, the station will also feature service cores. Integrated into these cores are automated food and package services and digital media that can provide users with necessary travel information, daily news and weather, exhibition display and events.

Besides the addition of automation technologies, the building will also have various functions related to the traveller's daily routine,
facilitating social activities and providing work and study places. Through interactive screens in the station or the telephone, travellers can pre-select the desired functions they will use at the station. The station configures its layout using this data to make the required space available.

Finally, in addition to classifying their travel experience at the station, users can configure their space in terms of spaciousness and climate. By applying these new functions and techniques, the station will no longer be a monotonous building for the user but will be able to react to needs and adapt to current and future use.

00

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01

PROBLEM STATEMENT
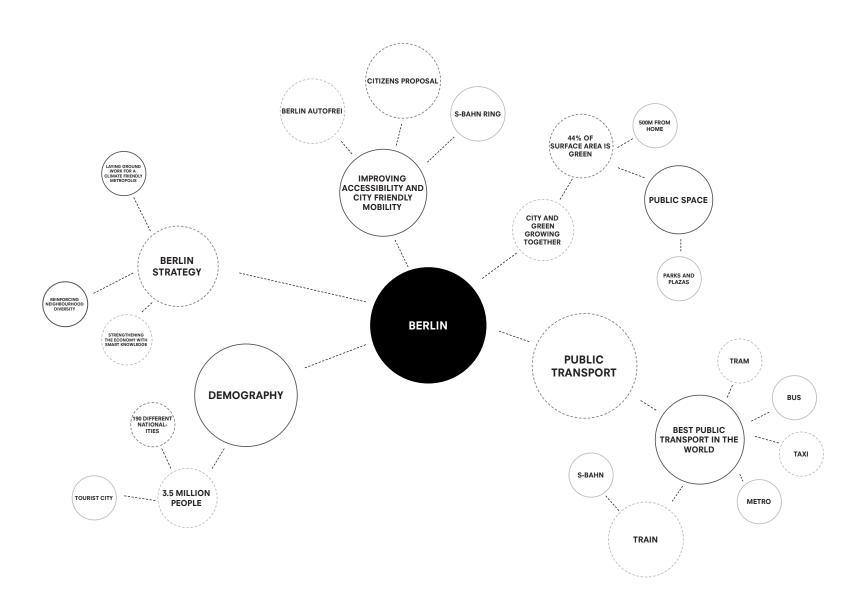
BERLIN
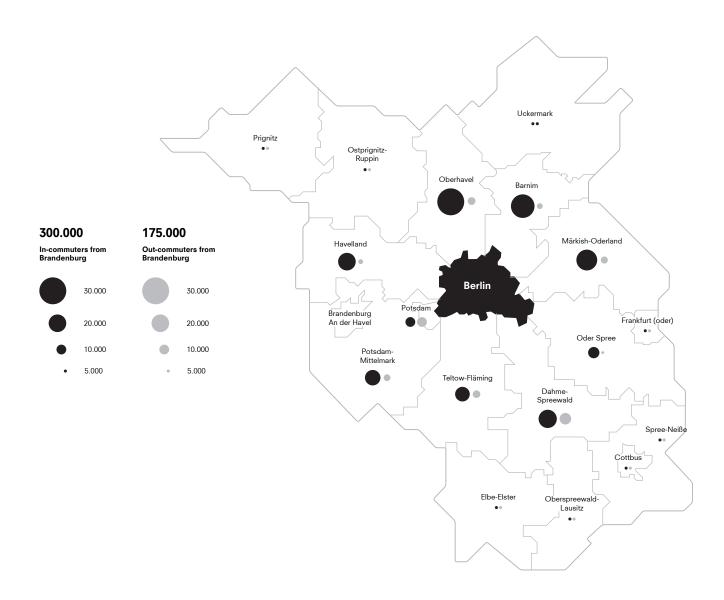
3.5 MILLION PEOPLE
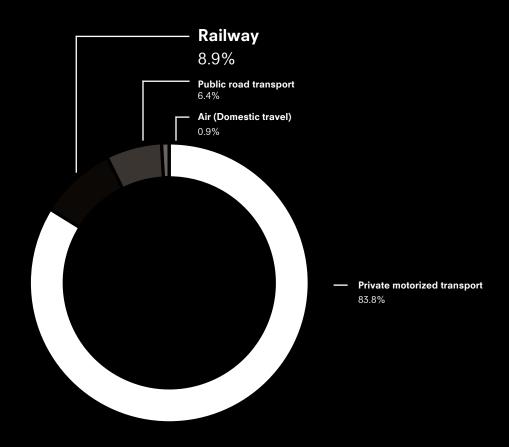
A DEVELOPED EUROPEAN CAPITAL

BERLIN

IMPROVING ACCESSIBILITY AND CITY FRIENDLY MOBILITY
- BERLIN AUTOFREI
- CITIZENS PROPOSAL
- S-BAHN RING

PUBLIC SPACE
- 44% OF SURFACE AREA IS GREEN
- 500M FROM HOME
- CITY AND GREEN GROWING TOGETHER
- PARKS AND PLAZAS

BERLIN STRATEGY
- LAYING GROUND WORK FOR A CLIMATE FRIENDLY METROPOLIS
- REINFORCING NEIGHBOURHOOD DIVERSITY
- STRENGTHENING THE ECONOMY WITH SMART KNOWLEDGE

DEMOGRAPHY
- 190 DIFFERENT NATIONALITIES
- 3.5 MILLION PEOPLE
- TOURIST CITY

PUBLIC TRANSPORT
- BEST PUBLIC TRANSPORT IN THE WORLD
- TRAM
- BUS
- TAXI
- METRO
- TRAIN
- S-BAHN

COMMUTING PATTERNS

300.000

In-commuters from Brandenburg

175.000

Out-commuters from Brandenburg

- 30.000
- 20.000
- 10.000
- 5.000

Prignitz

Uckermark

Ostprignitz-Ruppin

Oberhavel

Barnim

Havelland

Märkish-Oderland

Berlin

Brandenburg An der Havel

Potsdam

Frankfurt (oder)

Potsdam-Mittelmark

Oder Spree

Teltow-Fläming

Dahme-Spreewald

Spree-Neiße

Cottbus

Elbe-Elster

Oberspreewald-Lausitz

COMMUTING DATA

Railway
8.9%

Public road transport
6.4%

Air (Domestic travel)
0.9%

Private motorized transport
83.8%

© Courtesy of Senate Department for
the Environment, Transport and Climate
Protection

CONGESTION

CAUSING CONGESTION IN THE METROPOLITAN AREA.

© Courtesy of Berlin Autofrei

UNHEALTHY CONDITIONS

UNHEALTHY CONDITIONS IN THE CITY CENTRE.

© Courtesy of Nello Giambi

STREET OCCUPANCY

LESS CARS

MORE

PUBLIC TRANSPORT!

© Courtesy of Ansgar Scheffold

THE BERLIN PUBLIC TRANSPORTATION SYSTEM CAN POTENTIALLY SIGNIFICANTLY REDUCE THE STRAIN ON THE CITY'S ROAD SYSTEM.

© Courtesy of Stephen Fierce
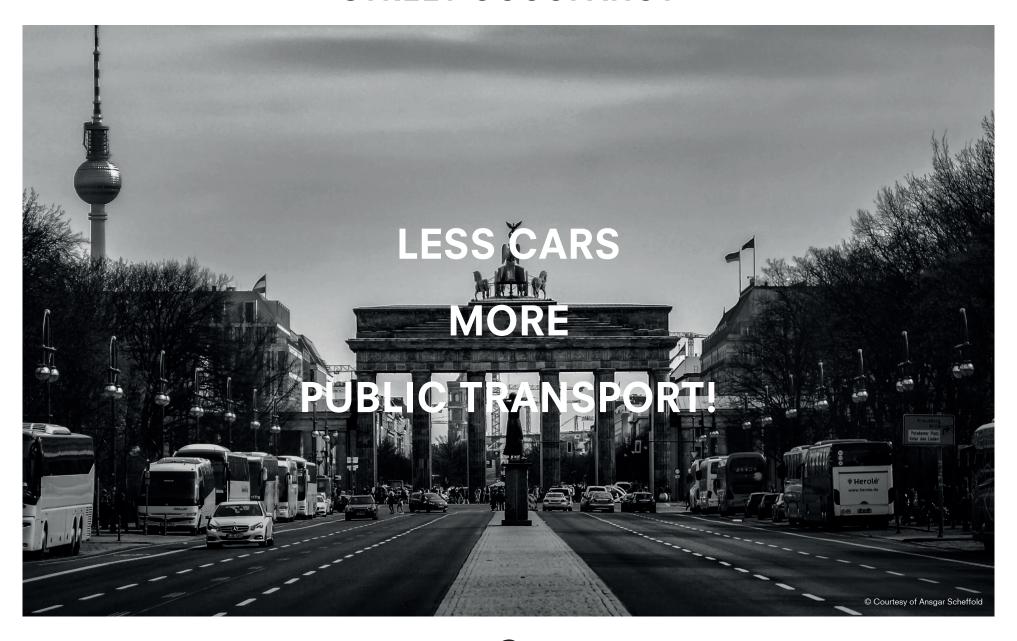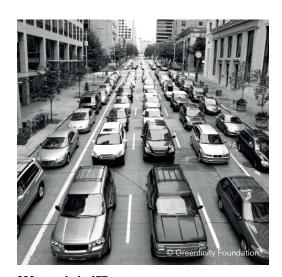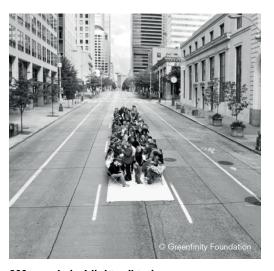
COMPACTING TRANSPORT

200 people in 177 cars

200 people in 3 buses
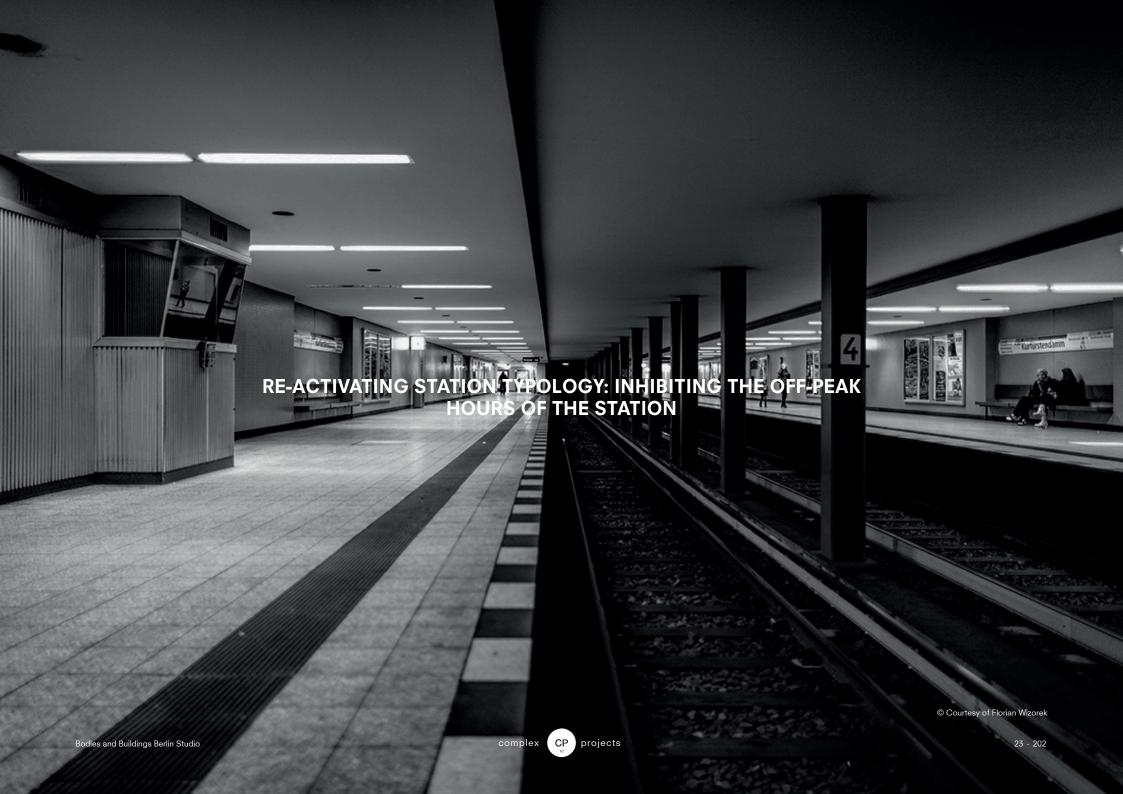
200 people in 1 light rail train

UNATTRACTIVE SYSTEM

PARK

WAIT

GO

© Courtesy of ParkMe

PROVIDE A WELL-FUNCTIONING PARK-AND-RIDE SYSTEM

© Courtesy of Berling Autofrei

TO ESTABLISH A MORE HEALTHY CITY

© Courtesy of Berlin Autofrei

RE-ACTIVATING STATION TYPOLOGY: INHIBITING THE OFF-PEAK
HOURS OF THE STATION

© Courtesy of Florian Wizorek
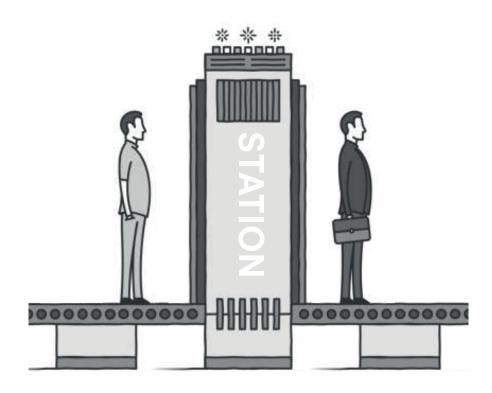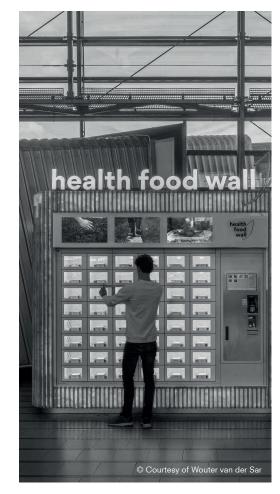
A NEW PARK-AND-RIDE SYSTEM
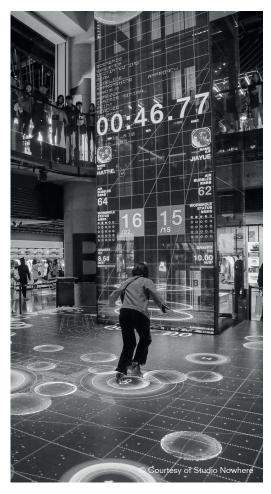
ADDING USER-BENEFICIAL SERVICES IN THE STATION

© Courtesy of IStock

A NEW PARK-AND-RIDE SYSTEM

© Courtesy of Wouter van der Sar

Serving

© Courtesy of Studio Nowhere

Experience

© Courtesy of Petra Blaisse

Adaptability

RESEARCH QUESTION

HOW CAN AUTOMATION TECHNOLOGIES BE INTEGRATED IN ARCHITECTURAL DESIGN TO POSITIVELY INFLUENCE USER EXPERIENCE AND OPTIMIZE THE USE OF SPACE?

© Courtesy of Nowhere
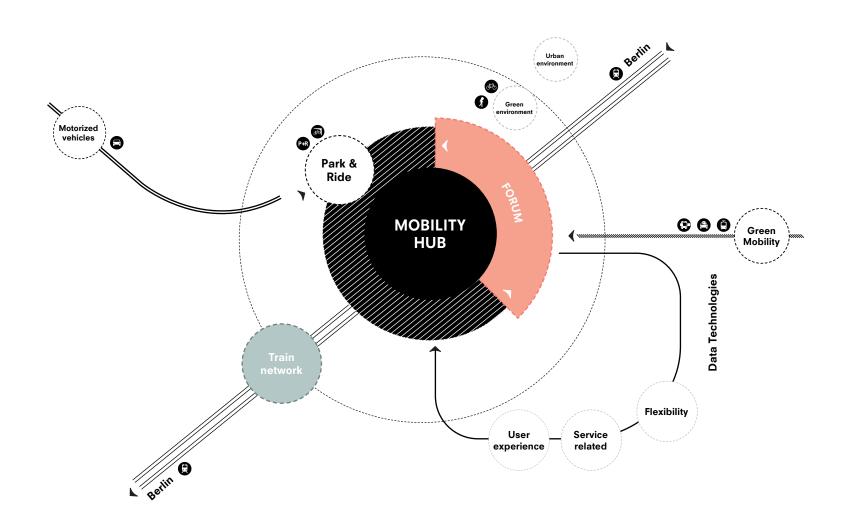
DESIGN AMBITION

02

CLIENT

CLIENT

Berlin Hauptbahnhof

© Courtesy of Deutsche Bahn

CITIZENS' PROPOSAL

LIMIT CARS WITHIN BERLIN'S RINGBAHN, A LONG CIRCULAR
ROUTE AROUND THE INNER CITY.

MAIN INITIATOR

Bundesministerium für Digitales und Verkehr

▶

be Berlin

Senatsverwaltung für Umwelt, Verkehr und Klimaschutz

Funding transport and infrastructure in Berlin.

DEUTSCHE BAHN

RAILWAY OPERATOR > A NEW TESTING PLATFORM
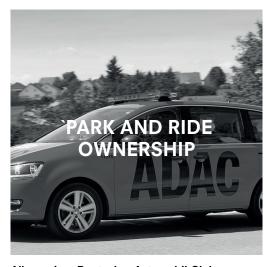
© Courtesy of Deutsche Bahn

STAKEHOLDERS

STATION OWNERSHIP

DB Netze

PARK AND RIDE OWNERSHIP

Allgemeiner Deutscher Automobil-Club

PUBLIC TRANSPORT IN BERLIN

Berliner Verkehrsbetriebe

FORUM INITIATOR

HUMBOLDT FORUM

INTEGRATING FORUM AND STATION

© Courtesy of Humboldt Forum

STAKEHOLDERS

HUMBOLDT FORUM
IM BERLINER SCHLOSS

KULTUR PROJEKTE BERLIN

ZUKUNFTSORT
Siemensstadt

HOSTING ACTIVITIES

HOSTING EXHIBITIONS

SMART CITY

03

PROGRAM

USERS

TOURIST

DAILY ROUTINE

PASS THROUGH

DESTINATION

NON-TRAVELLER

USER NEEDS

SERVICE

EXPERIENCE

TOURIST

First interaction with the city

DAILY ROUTINE

Service/daily routine

PASS THROUGH

A in between space

DESTINATION

A meeting point/starting point

NON-TRAVELLER

A community building

USER NEEDS

SERVICE

EXPERIENCE

TOURIST

First interaction with the city

DAILY ROUTINE

Service/daily routine

PASS THROUGH

A in between space

DESTINATION

A meeting point/starting point

NON-TRAVELLER

A community building

DESIGN GOAL

ENCOURAGING COMMUTERS TO USE GREEN MOBILITY
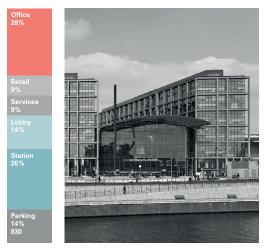
© Courtesy of Martin U Waltz

TRAIN STATION

A PLACE WITH PLATFORMS WHERE TRAINS
STOP FOR PEOPLE TO GET ON AND OFF
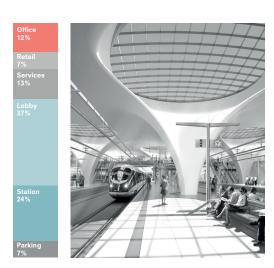
© Courtesy of Deutsche Bahn
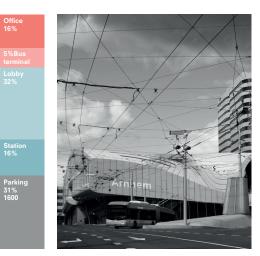
TRAIN STATION TYPOLOGY PROGRAM

Office 28%
Retail 9%
Services 9%
Lobby 14%
Station 26%
Parking 14% 830
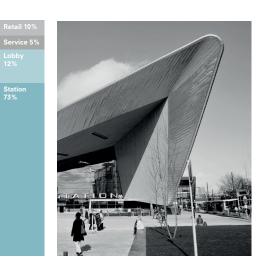
Hauptbahnhof (Berlin)
175.000 m²

Office 16%
5%Bus terminal
Lobby 32%
Station 16%
Parking 31% 1600

Arnhem Central
140.000 m²

Lobby 44%
Station 24%
Parking 32% 1200

Koge Nord Station
100.000 m²

Office 12%
Retail 7%
Services 13%
Lobby 37%
Station 24%
Parking 7%

Stuttgart Central Station
121.500 m²

Retail 10%
Service 5%
Lobby 12%
Station 73%

Rotterdam Central Station
73.500 m²

Office 13%
Theatre 4%
Exhibition 14%
Retail 3%
Services 8%
Lobby 19%
Station 36%
Bike parking 3%

Flinders Street Station
110.000 m²
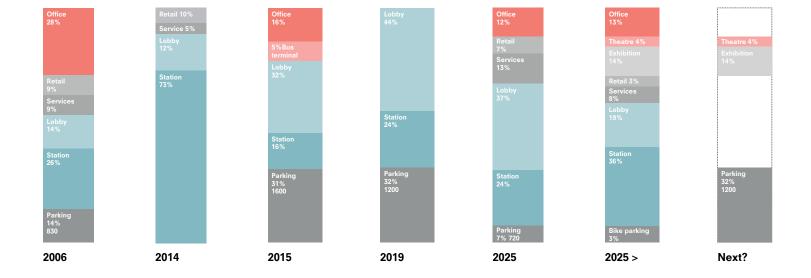
EVOLVING TYPOLOGY
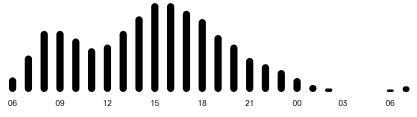
A **train station** is no longer a place where people go on and off the train. It becomes a **city centre.**

© Courtesy of Louis Hellman

PROGRAM CONCLUSIONS

2006
- Office 28%
- Retail 9%
- Services 9%
- Lobby 14%
- Station 26%
- Parking 14% 830

2014
- Retail 10%
- Service 5%
- Lobby 12%
- Station 73%

2015
- Office 16%
- 5% Bus terminal
- Lobby 32%
- Station 16%
- Parking 31% 1600

2019
- Lobby 44%
- Station 24%
- Parking 32% 1200

2025
- Office 12%
- Retail 7%
- Services 13%
- Lobby 37%
- Station 24%
- Parking 7% 720

2025 >
- Office 13%
- Theatre 4%
- Exhibition 14%
- Retail 3%
- Services 8%
- Lobby 19%
- Station 36%
- Bike parking 3%

Next?
- Theatre 4%
- Exhibition 14%
- Parking 32% 1200

BUILDING USAGE PATTERN

Weekday commuting
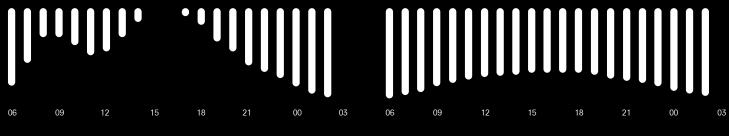
Weekend commuting

Designed to withstand peak moments.

UNUSED SPACE

INHIBITING THE STATIONS OF
PEAK HOURS

© Courtesy of Robert Kleinfeld

DESIGN GOAL

06   09   12   15   18   21   00   03

Weekday commuting

06   09   12   15   18   21   00   03

Weekend commuting
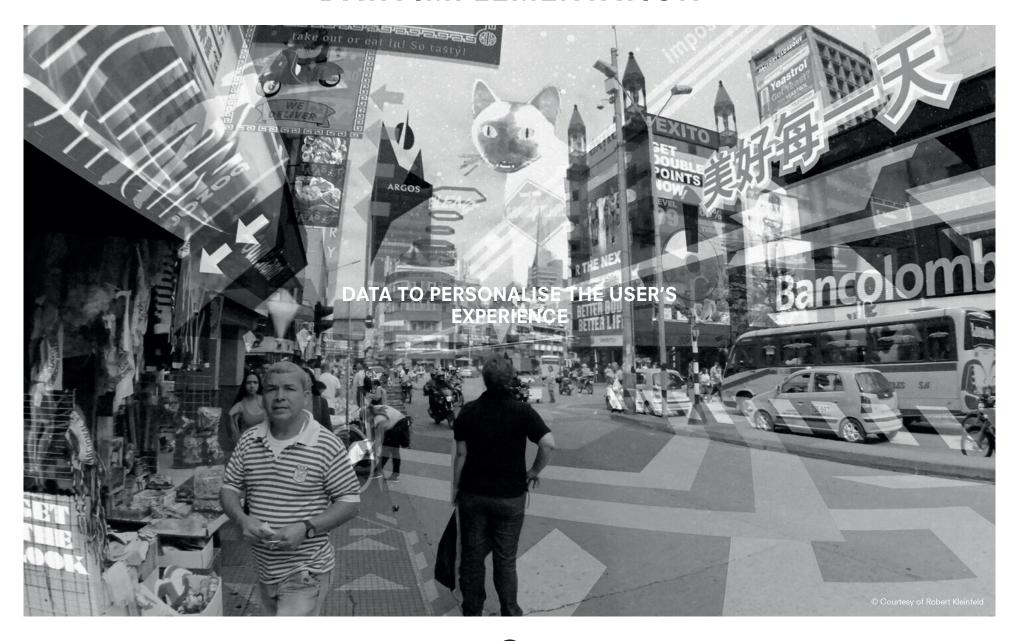
MAIN DESIGN CHALLENGE

DESIGNING A P+R STATION WHICH ENCOURAGES COMMUTERS TO LEAVE THEIR CAR OUTSIDE THE CITY BY SHORTENING TRANSITION TIME BETWEEN TRANSPORT MODES (CAR TO TRAIN) AND ADDING OTHER BENEFITS (FUNCTIONAL COMMUTER SERVICES) WHEN COMMUTING TOWARDS BERLIN.

DATA IMPLEMENTATION

DATA TO PERSONALISE THE USER'S EXPERIENCE

© Courtesy of Robert Kleinfeld

A PERSONALISED EXPERIENCE

Service-related
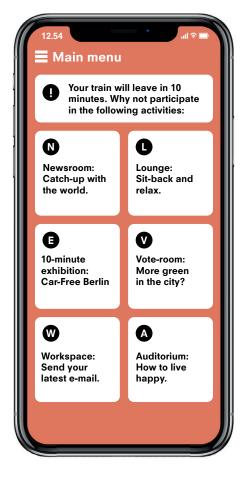
User experience

Building flexibility

PHONE TO COMMUNICATE

Service related

12.54

≡ **Main menu**

! Your parking spot is reserved for your arrival time at 08:15 tomorrow!

! Your breakfast is ready to be picked up at the foodcourt at 08.30.

! While you are away, your car tyres will be replaced. #readyforwinter. (10:00)

User experience

12.54

≡ **Main menu**

! Your train will leave in 10 minutes. Why not participate in the following activities:

N Newsroom: Catch-up with the world.

L Lounge: Sit-back and relax.

E 10-minute exhibition: Car-Free Berlin

V Vote-room: More green in the city?

W Workspace: Send your latest e-mail.

A Auditorium: How to live happy.

Building flexibility

12.54

≡ **Main menu**

! Do you feel comfortable? Here are some options to configure your space:

C Close or open the curtain.

W Heat up my space.

L Adjust the light intensity.

S Connect to the sound system.

A NEW FORUM

A PERSONALISED EXPERIENCE PLATFORM

© Courtesy of NL Architects

BUILDING ZONES

Play / Active

Service / Routine

Inform / Catch-up

Discuss / Reflect

Watch / Present

Work / Inspire

Relax / dream
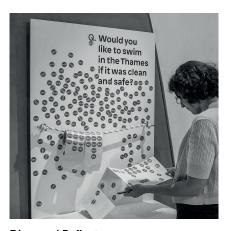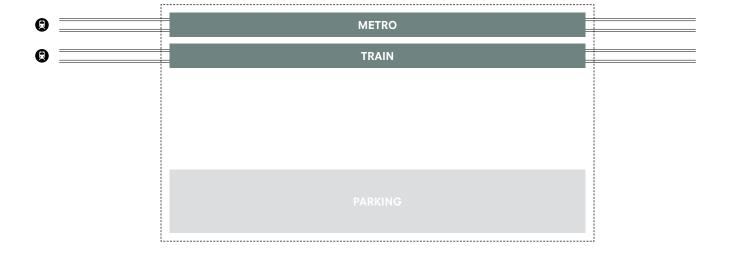
Mobility / Maintanence

PROGRAM CHALLENGE

A FORUM FOR CONNECTING THE STATION AND ITS USERS, AS WELL AS FACILITATING THE BUILDING'S OFF-PEAK HOURS.

© Courtesy of Joerg Nicht

PROGRAM ORGANISATION

METRO

TRAIN

PARKING
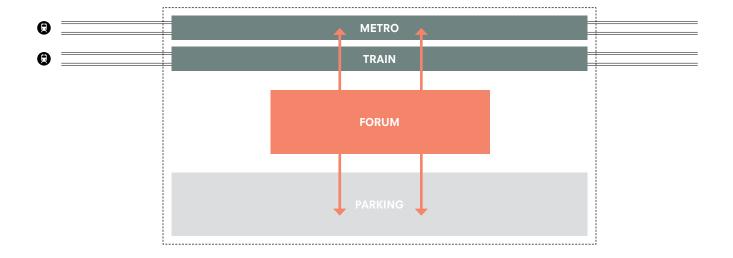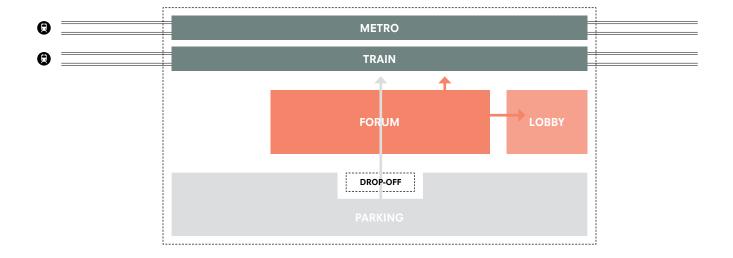
Regular typology = Parking and station.

PROGRAM ORGANISATION

METRO

TRAIN

FORUM

PARKING
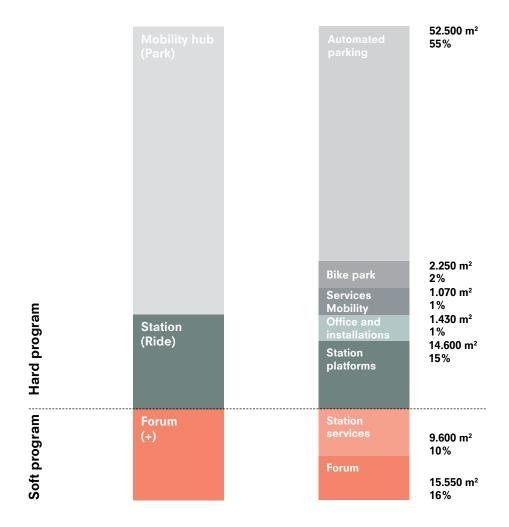
Forum = main connecting element.

PROGRAM ORGANISATION

Car drop-off area = next to the forum.

PROGRAM IN PERCENTAGE

Mobility hub (Park)

Automated parking — 52.500 m² / 55%

Bike park — 2.250 m² / 2%

Services Mobility — 1.070 m² / 1%

Office and installations — 1.430 m² / 1%

Station (Ride)

Station platforms — 14.600 m² / 15%

Hard program

Soft program

Forum (+)

Station services — 9.600 m² / 10%

Forum — 15.550 m² / 16%

Program total:
96.800 m²

HARD PROGRAM
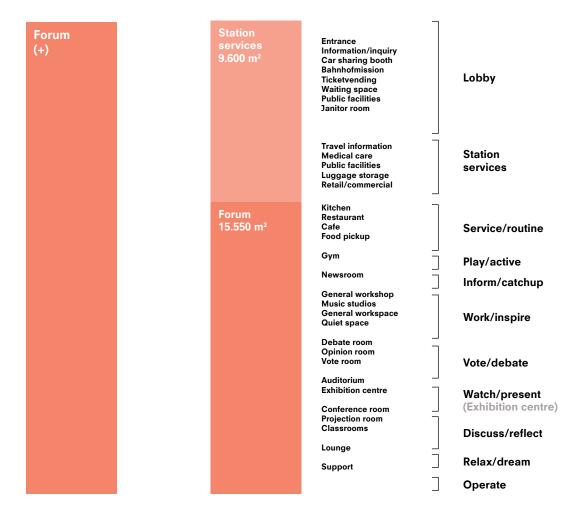
Mobility hub (Park)	**Automated parking 15.000 m²**	**1.7500 parking spots** (underground)
	Bike park	**4.000 parking spots**
	Services Mobility 1.070 m²	**Car wash Car mechanic Car glass Kiss and ride Parking staff office**
Station (Ride)	**Office and installations 1.430 m²**	**Railway police IC kurierdienst Office space guard and train drivers Admin offices Maintenance**
	Station platforms 14.600 m²	**S-bahn tracks** (4) **Tracks DB** (4) **Tram platform** (outside) **Bus platform** (outside) **Taxi stand** (outside) **Water taxi** (outside)

Program total:
71.850 m²

SOFT PROGRAM

Forum (+)

Station services 9.600 m²

Forum 15.550 m²

Entrance		
Information/inquiry		
Car sharing booth		
Bahnhofmission		**Lobby**
Ticketvending		
Waiting space		
Public facilities		
Janitor room		

Travel information
Medical care
Public facilities — **Station services**
Luggage storage
Retail/commercial

Kitchen
Restaurant
Cafe — **Service/routine**
Food pickup

Gym — **Play/active**

Newsroom — **Inform/catchup**

General workshop
Music studios
General workspace — **Work/inspire**
Quiet space

Debate room
Opinion room — **Vote/debate**
Vote room

Auditorium
Exhibition centre — **Watch/present**
(Exhibition centre)

Conference room
Projection room — **Discuss/reflect**
Classrooms

Lounge — **Relax/dream**

Support — **Operate**

Program total:
25.150 m²

PROGRAMMATIC RELATIONS

Automated parking

Bike park

Services Mobility

Office and installation

Station platforms

Vote / debate

Service / routine

Work / inspire

Inform / catchup

Play / Active

Lobby

Watch /present

Station services

Discuss / reflect

Relax / dream

Mobility hub
(Park)

Station
(Ride)

Forum
(+)

PROGRAM CONCEPT

Forum as connecting element.

PROGRAM CONCEPT

PARKING

FORUM = BRIDGE

STATION

© Courtesy of NL Architects

SERVICE RELATED

Automated parking

Bike park

Services
Mobility

Office and
installation

Station
platforms

Vote /
debate

Service /
routine

Work /
inspire

Inform /
catchup

Play /
Active

Lobby

Watch /present

Station
services

Discuss /
reflect

Relax /
dream

Mobility hub
(Park)

Station
(Ride)

Forum
(+)

SERVICE RELATED

Inform / Catch-up
Newsroom -
Social-media café -

Play / Active
Gym -

Service / Routine
Cafe -
Food pickup -
Goods pickup -

Mobility services
- Tire center
- Car glass
- Bike service

EXPERIENCE RELATED

Automated parking

Bike park

Services Mobility

Office and installation

Station platforms

Vote / debate

Service / routine

Work / inspire

Inform / catchup

Play / Active

Lobby

Watch /present

Station services

Discuss / reflect

Relax / dream

Mobility hub (Park)

Station (Ride)

Forum (+)

EXPERIENCE RELATED

Work / Inspire
Workshop -
Workspace -
Quiet space -
Touch-down space -

Watch
- Exhibition center
- General exhibition

Discuss / Reflect
- Conference room
- Projection room
- Multi-purpose rooms

Present
- Auditorium

Relax / dream
Lounge -
Sleeping pods -

Vote / debate
Debate room -
Vote room -

FLEXIBILITY

Automated parking

Bike park

Services Mobility

Office and installation

Station platforms

Vote / debate

Service / routine

Work / inspire

Inform / catchup

Play / Active

Lobby

Watch /present

Station services

Discuss / reflect

Relax / dream

Mobility hub (Park)

Station (Ride)

Forum (+)

SMART PARKING

Controlled parking and off-peak usage.

SMART PARKING

UTILISING PARKING IN THE STATION
OFF-PEAK HOURS

© Courtesy of Frederik Deschuytter

PROGRAMMATIC RELATIONS

Play /
Active

Work /inspire

Office and
installation

Automated parking

Services
Mobility /
Drop-off

Watch /present

Station
platforms

Bike park

Lobby

Service /
routine

Discuss /
reflect

Vote /
debate

Station
services

Inform /
catchup

Relax /
dream

Mobility hub
(Park)

Station
(Ride)

Forum
(+)

complex CP projects

PROGRAMMATIC RELATIONS

Play /
Active

Work /inspire

Office and
installation

Long stay parking

P+R

Services
Mobility /
Drop-off

Watch /
present

Station
platforms

Bike park

Lobby

Service /
routine

Discuss /
reflect

Vote /
debate

Station
services

Inform /
catchup

Relax /
dream

Mobility hub
(Park)

Station
(Ride)

Forum
(+)

PROGRAM RELATIONS

The program is organised on time spent at the station.

FORUM

BUILDING USAGE PATTERN

FOOD

© Courtesy of Mecanoo

DAILY TRIP

Using the service aspect of the building.

PARK AND RIDE

Utilising the parking facility.

IN-BETWEEN SPACE

A space to work.

04

SITE

BUT WHERE?

© Courtesy of Martin U Waltz

SITE AMBITIONS

Integration of car free berlin

A masterplan that fully integrates the vision of a car-free Berlin to make the building on site able to serve a car-free city.

Operational site

The site should be 24/7 accessible and operational. Incorporating leisure on the site or strengthening existing activities.

Activating green corridor

Activating green spaces in Berlin. By re-connecting them through the buildings with Berlin's green corridor network.

Eliminating borders

The building site should eliminate borders created by Berlin's infrastructure network

BUILDING SPECIFIC

BUILDING ON THE INTERSECTION
BETWEEN TRAIN AND CAR

© Courtesy of Claudiodiv

BUILDING SPECIFIC

Road network

Mapping the road network to develop potential locations for a new train station for Berlin.

Rail network
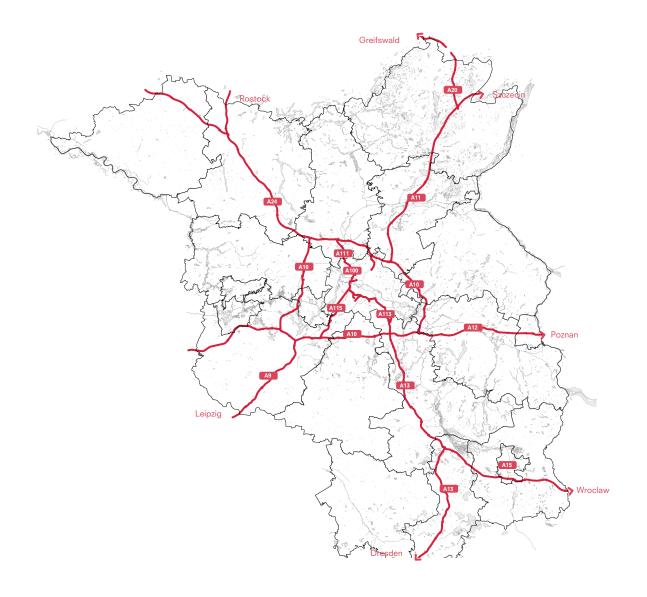
Mapping the rail network to develop potential locations for a new train station for Berlin.

Car free border

Mapping the intersection between road, rail and the car-free border to identify possible locations for a park-and-ride station.

ROAD CONNECTIONS

Bundesautobahn:
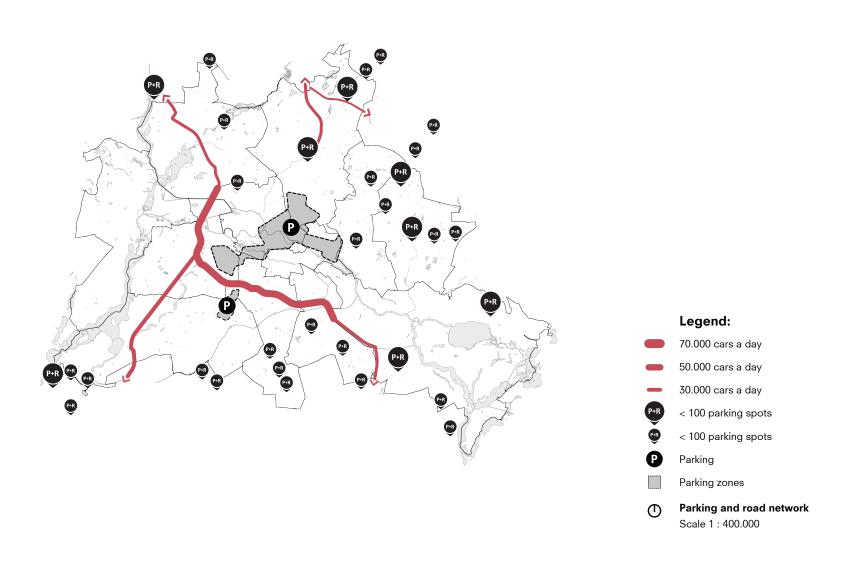
A9	Bundesautobahn 9 45.000 - 60.000
A10	Bundesautobahn 10 60.000 - 75.000
A11	Bundesautobahn 11 < 30.000
A12	Bundesautobahn 12 30.000 - 45.000
A13	Bundesautobahn 13 45.000 - 60.000
A15	Bundesautobahn 15 < 30.000
A19	Bundesautobahn 19 < 30.000
A20	Bundesautobahn 20 < 30.000
A24	Bundesautobahn 24 30.000 - 45.000

Legend:

— Motorway

Brandenburg road network
Scale 1 : 400.000

PARKING LOCATIONS

Legend:

▬	70.000 cars a day
▬	50.000 cars a day
▬	30.000 cars a day
P+R	< 100 parking spots
P+R	< 100 parking spots
P	Parking
▨	Parking zones
◷	**Parking and road network** Scale 1 : 400.000

CAR FREE CITY

REPOSITION P+R STATIONS TO REDUCE
CARS IN THE CITIES CENTRE

© Courtesy of Berlin Autofrei
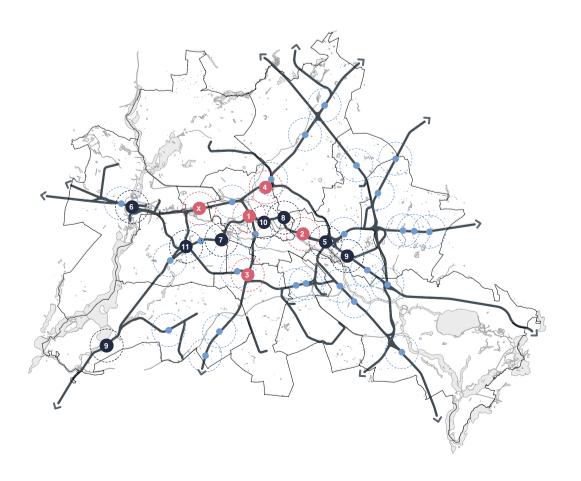
TRAIN STATIONS

Berlin main stations:

1 Berlin Hauptbahnhof
330.000
Categorie 1
ICE, IC, RE, RB, S

2 Station Berlin Ostbanhof
100.000
Categorie 1
ICE, IC, RE, RB, S

3 Station Berlin Südkreuz
110.000
Categorie 1
ICE, IC, RE, RB, S

4 Station Berlin Gesundbrunnen
140.000
Categorie 1
ICE, IC, RE, S

Others:

● S-Bahn stations
n/a
Categorie 4
RE, RB, S

◯ Possible site location
100.000
Categorie 1
IC, RE, RB, S

◔ **Station surface area**
Scale 1 : 400.000

A100 HIGHWAY

BUILDING ON THE CITIES MAIN ARTERY

© Courtesy of Shutterstock

POTENTIAL SITES

Legend:

- ⬤ Train network
- ▬ Road network
- ▬ Road network
- ▬ U-Bahn network
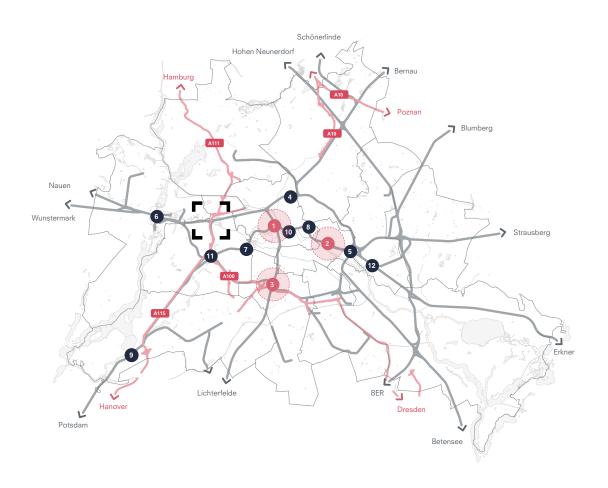
⊘ **Inter modality locations**
Scale 1 : 400.000

TRAIN AND CAR NETWORK

Schönerlinde

Hohen Neunerdorf

Bernau

Hamburg

Poznan

A10

A10

Blumberg

A111

Nauen

Wunstermark

4

Strausberg

1

10

8

6

2

7

5

12

11

A100

3

A115

Erkner

9

Lichterfelde

BER

Hanover

Dresden

Potsdam

Betensee
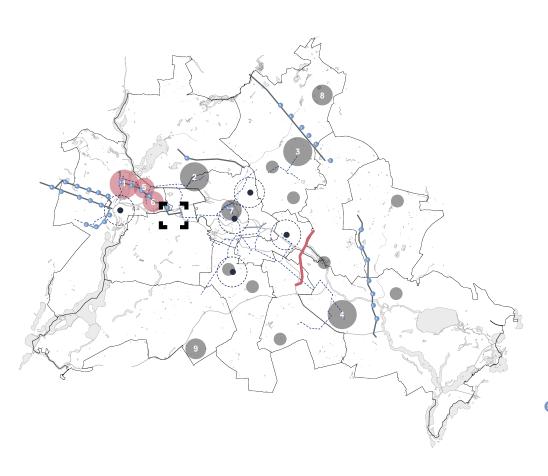
Legend:

- ◌ Park and ride stations
- ● Railway stations
- — Road network
- — Road network
- — U-Bahn network

🕐 **Inter modality locations**
Scale 1 : 400.000

FUTURE DEVELOPMENTS

New city quarters

1 Wasserstadt oberhavel
12.750 Dwellings
1995 - 2017

2 Schumacher Quartier
5.000 Dwellings
2022-2030

3 Blankenburger Suden
6.000 Dwellings
2022-2030

4 Johannisthal / Adlershof
5.000 Dwellings
2023-2025
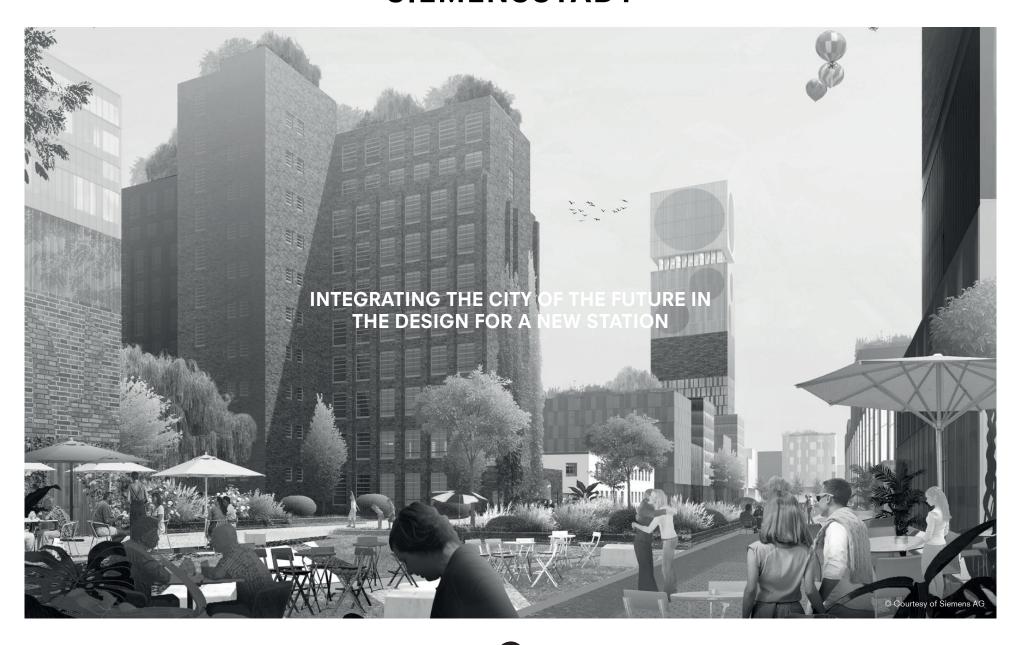
5 Insel Gartenfeld
3.700 Dwellings
2022

6 Siemenstadt 2.0
3.000 Dwellings
2022 - 2030

7 Europacity
3.000 Dwellings
2022 - 2030

8 Buch
3.100 Dwellings
2013 - 2020

9 Lichterfelde-Süd
2.500 Dwellings
2019 - 2022

Legend:
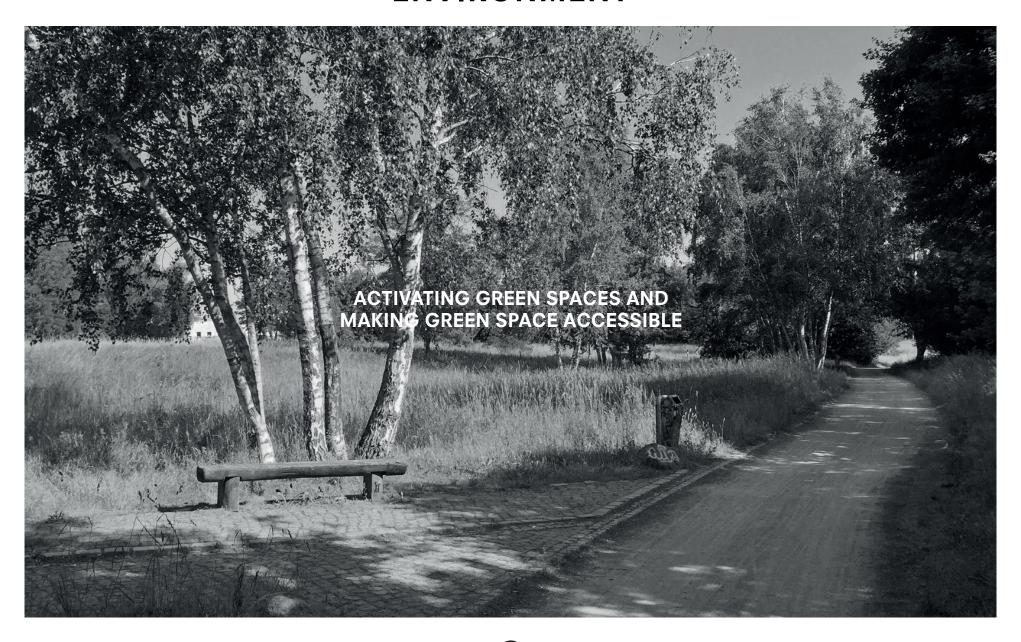
— New U-bahn route

— New S-bahn route

— New motorway

-- New tram routes

S ● Main train stations

U Possible new sub stations

● City development, 2000 dwellings

● Site location

Brandenburg rail network
Scale 1 : 400.000

SIEMENSSTADT

INTEGRATING THE CITY OF THE FUTURE IN
THE DESIGN FOR A NEW STATION

© Courtesy of Siemens AG

ENVIRONMENT

ACTIVATING GREEN SPACES AND
MAKING GREEN SPACE ACCESSIBLE

ENVIRONMENT SPECIFIC

In or next to environment

Mapping out environment to come up with locations where the building can act as a gateway to nature.

Connect to green corridor
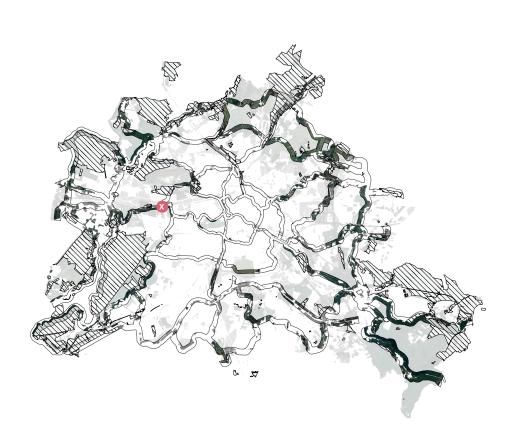
Strengthen Berlin's network of green corridors and encourage their use by creating destinations for the network.

Protected areas

Excluding protected areas such as nature reserves to preserve valuable environment.

ENVIRONMENT

Valuable environment

Neglected urban spaces
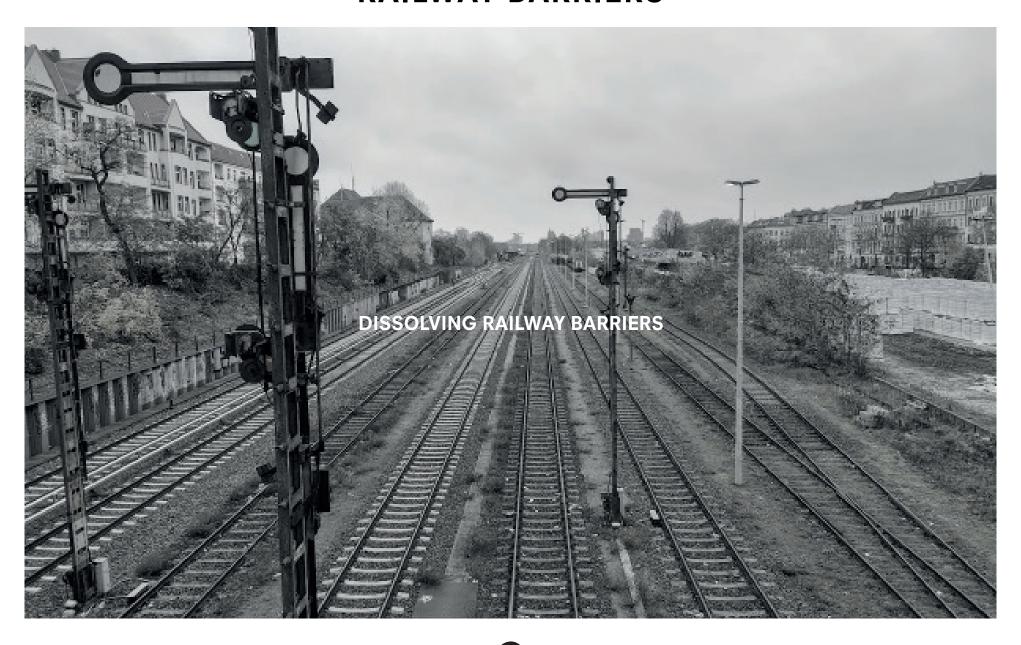
Restricted areas

Legend:

ⓧ Possible location of intermodal train station.
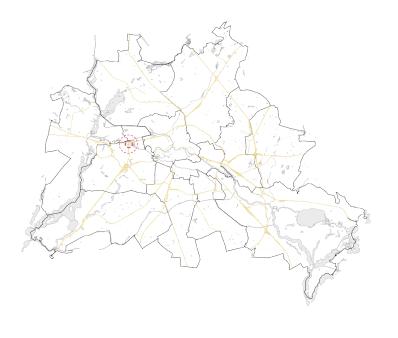
🕐 **Buildable environment**
Scale 1 : 400.000

RAILWAY BARRIERS

DISSOLVING RAILWAY BARRIERS

RAILWAY BARRIERS

Legend:

- Site location
- Existing railway station
- Railway barrier
- Railway barrier

Legend top:

- Site location
- Railway corridor

Railway barriers
Scale 1 : 400.000

SITE LOCATION

INDUSTRY

X

PARK

HOUSING

© Courtesy of Google Earth

PUBLIC TRANSPORT

Legend:

- **T**   S-Bahn-, U-Bahn-, Train station
- **X**   Site location
-     Motorway
-     Primary- and secondary roads
-     U-Bahn network
-     S-Bahn network
-     Railway

Public transportation network
Scale 1 : 50.000

CAR FREE BORDER

Legend:
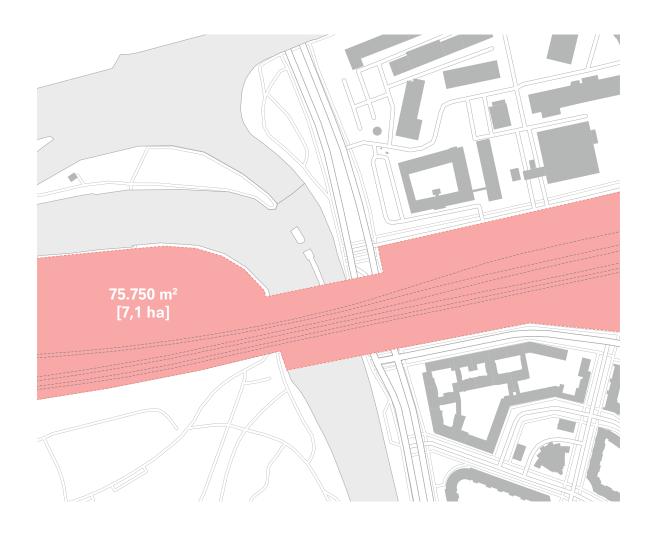
- (T) S-Bahn-, U-Bahn-, Train station
- (X) Site location
- Motorway
- Primary- and secondary roads
- U-Bahn network
- S-Bahn network
- Railway

Public transportation network
Scale 1 : 50.000

05

SCHEMATIC DESIGN

BUILDABLE AREA

75.750 m²
[7,1 ha]
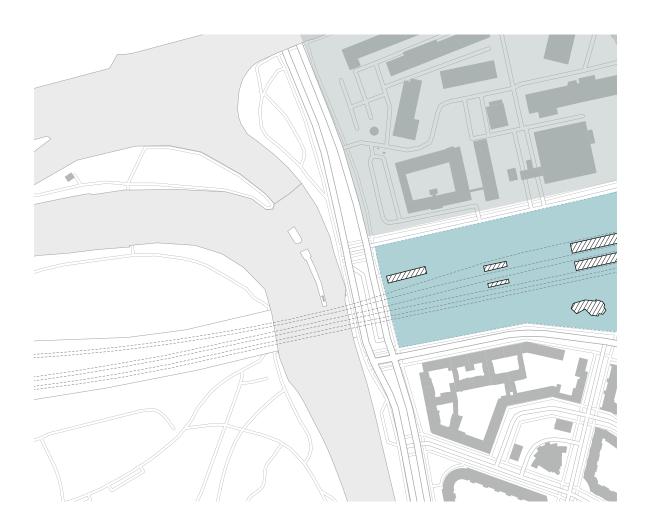
Building on the existing railway corridor.

STATION BRIDGE

© Courtesy of Andreas Michel
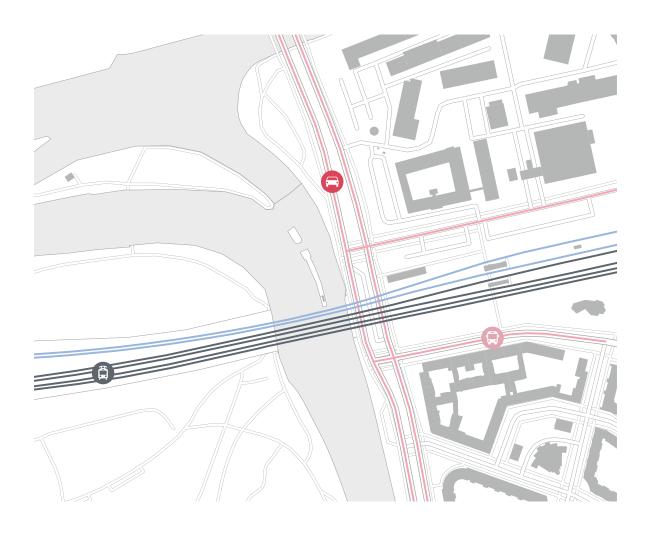
EXISTING STATION
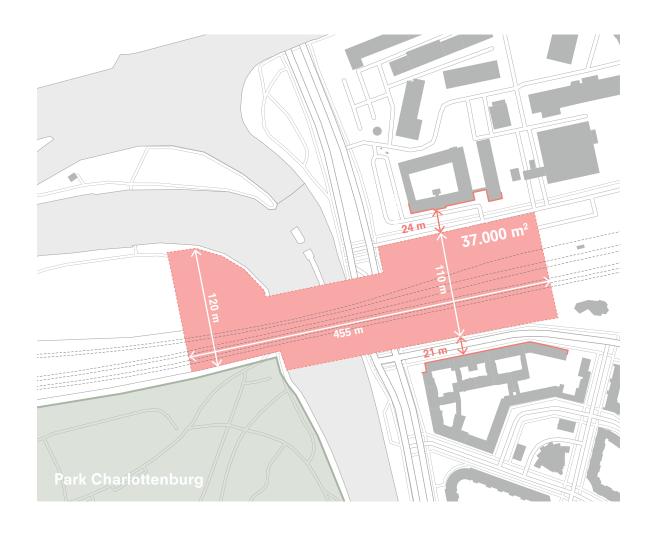
Re-using and repositioning the existing railway station.

INFRASTRUCTURE
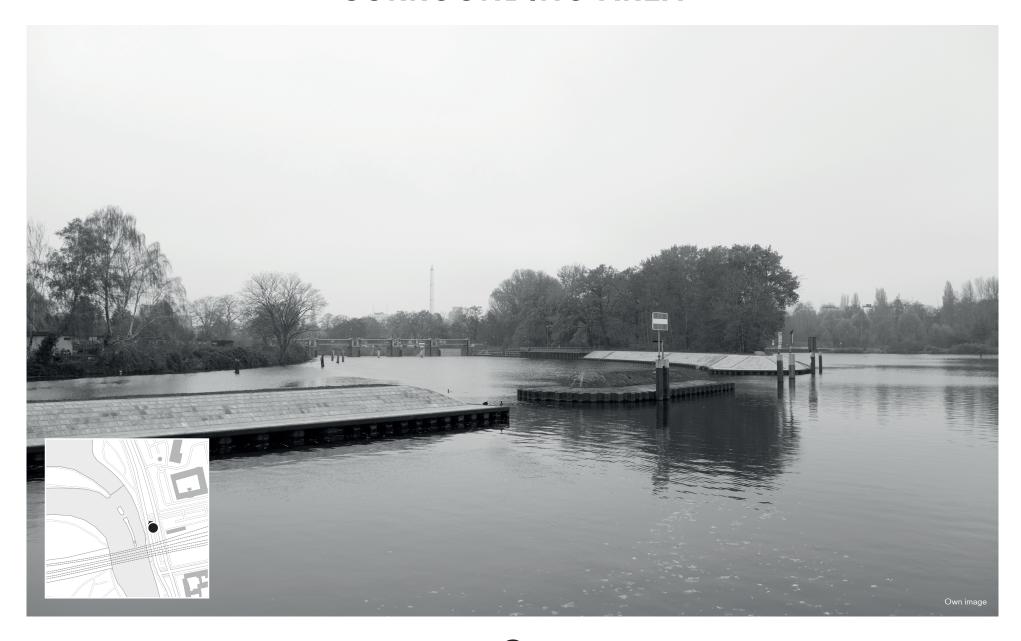
Existing infrastructure connections.

SITE CONDITIONS

24 m

37.000 m²

110 m

120 m

455 m

21 m

Park Charlottenburg
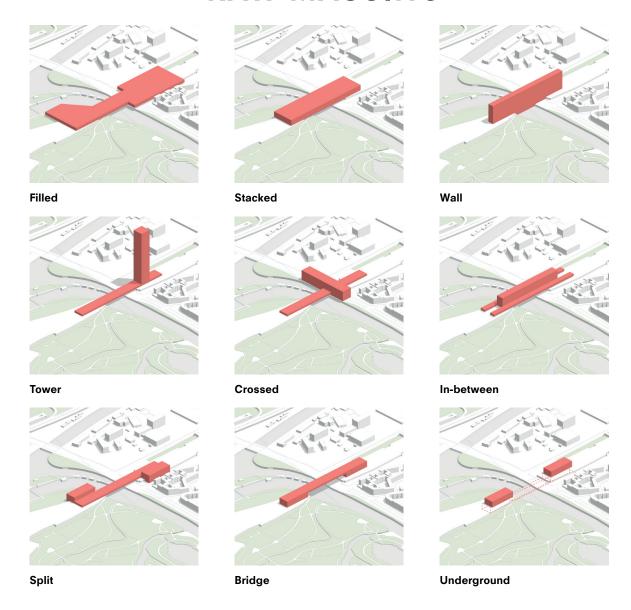
Station boundaries.

SURROUNDING AREA

Own image

RAW MASSING

Filled

Stacked

Wall

Tower

Crossed

In-between

Split

Bridge

Underground
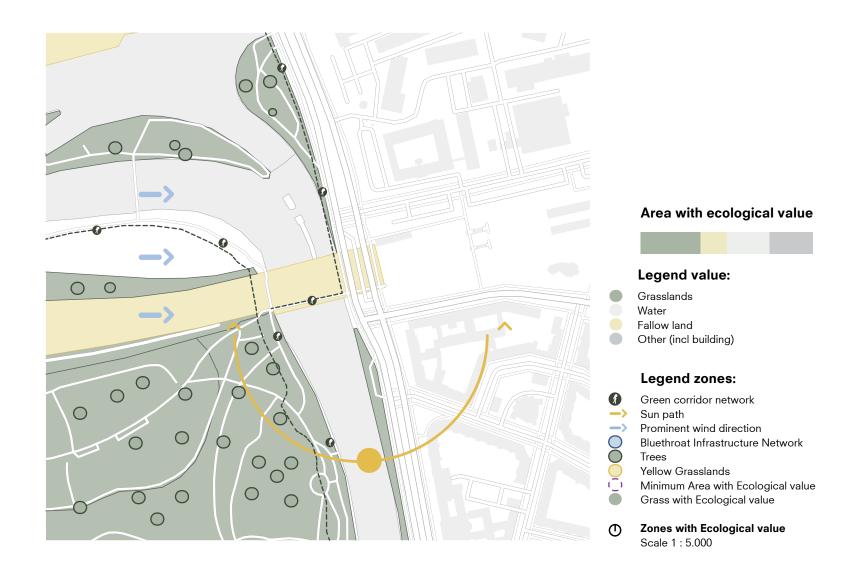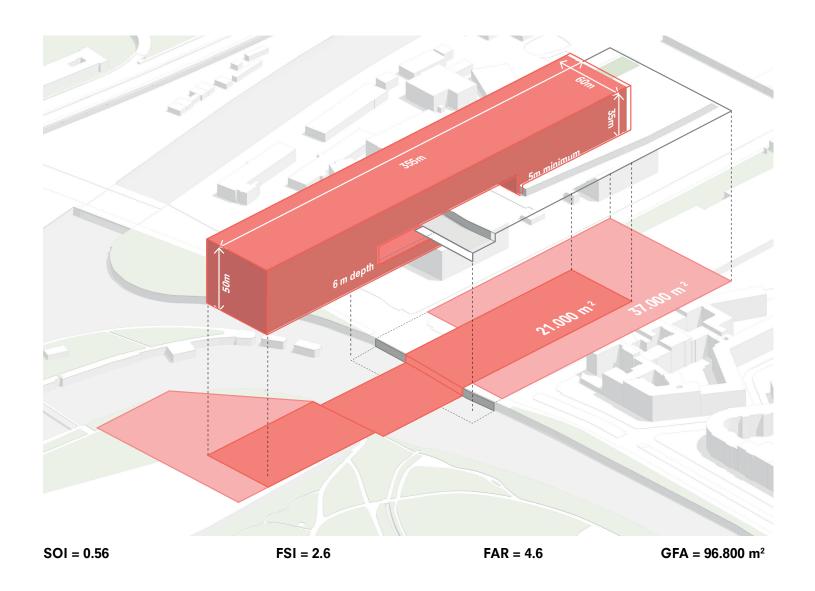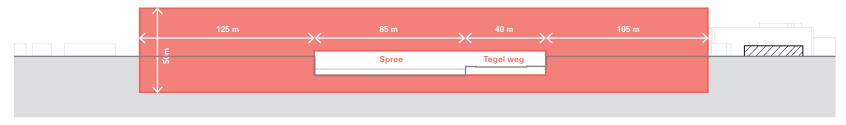
CLIMATE AND ECOLOGICAL VALUE

Area with ecological value

Legend value:

- Grasslands
- Water
- Fallow land
- Other (incl building)

Legend zones:

- Green corridor network
- Sun path
- Prominent wind direction
- Bluethroat Infrastructure Network
- Trees
- Yellow Grasslands
- Minimum Area with Ecological value
- Grass with Ecological value

Zones with Ecological value
Scale 1 : 5.000

CONSTRAINTS

355m
60m
35m
5m minimum
6 m depth
50m
21.000 m²
37.000 m²

SOI = 0.56   FSI = 2.6   FAR = 4.6   GFA = 96.800 m²

CONSTRAINTS

Section AA

125 m · 85 m · 40 m · 105 m

50 m

Spree · Tegel weg

Section BB

60m

50m

Max 35m

Section CC

30 m

11 m no build zone

9 m

RAW MASSING

Filled

Stacked

Wall

Tower

Crossed

In-between

Split

Bridge

Underground

PROGRAM OPTIONS

Stacked

Sideways

Bridge

STATION BRIDGE

URBAN

NATURE

© Courtesy of Mehmet Güney

06

REVISED SCHEMATIC DESIGN

RELOCATION

MIX-USE DEVELOPMENT

TRAIN STATION RECONSTRUCTION
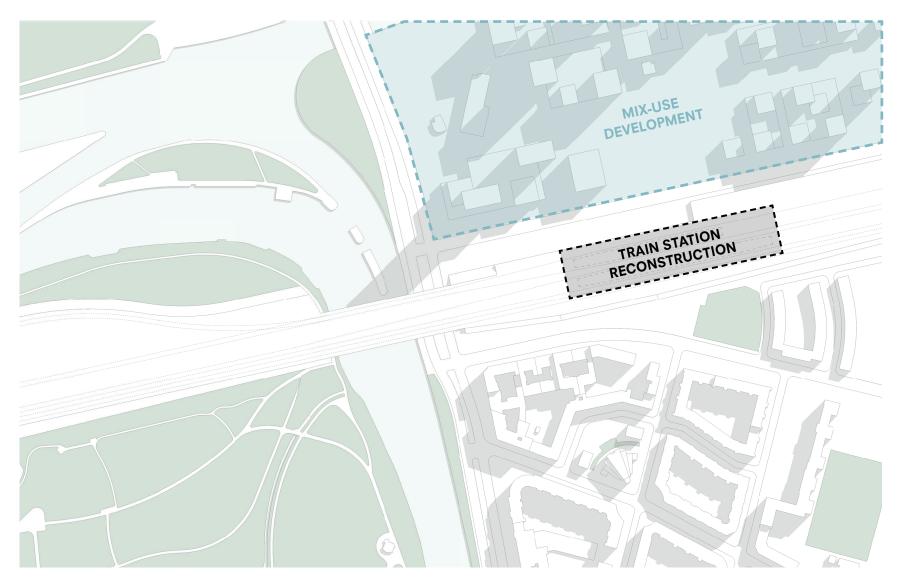
Reconstruction of the station area.

EXISTING INFRASTRUCTURE
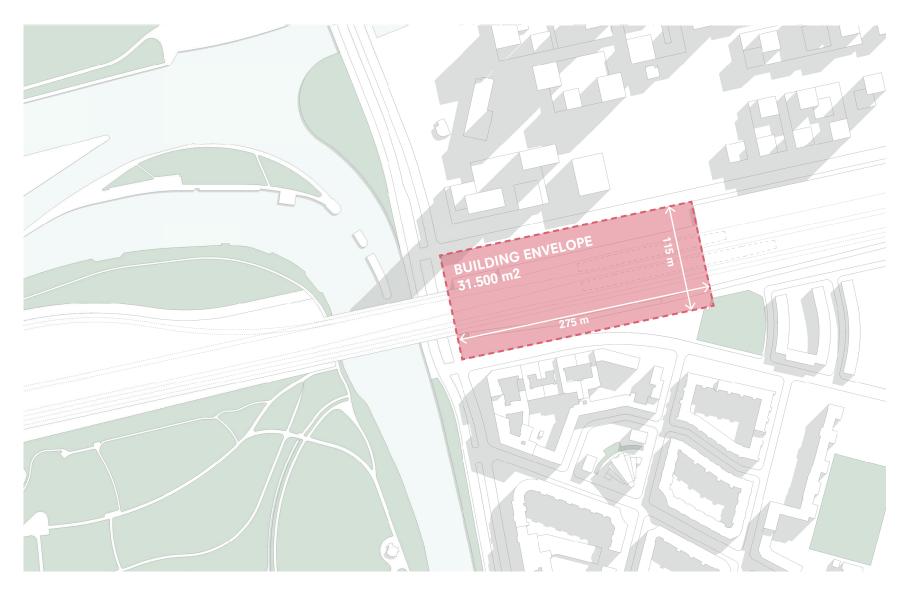
Existing infrastructure connections.

REDEVELOPMENT

MIX-USE
DEVELOPMENT

TRAIN STATION
RECONSTRUCTION
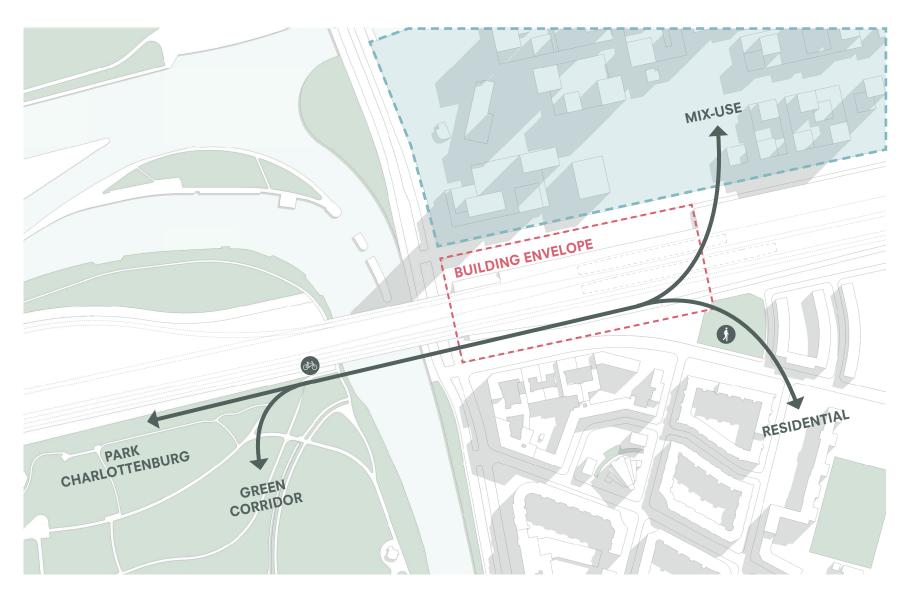
Reconstruction of the station area.

BUILDING ENVELOPE

BUILDING ENVELOPE
31.500 m2

115 m

275 m

A plot on the interconnection between urban, mobility and environment.

URBAN IMPLEMENTATION

MIX-USE

BUILDING ENVELOPE

RESIDENTIAL

PARK CHARLOTTENBURG

GREEN CORRIDOR

Strengthening urban relationships.

SITE CONDITIONS

Park Charlottenburg

© Own image

Jungfernheide

© Courtesy of Kostiantyn Vysotskyi

Redevelopment

© Courtesy of Unvolded Metropole
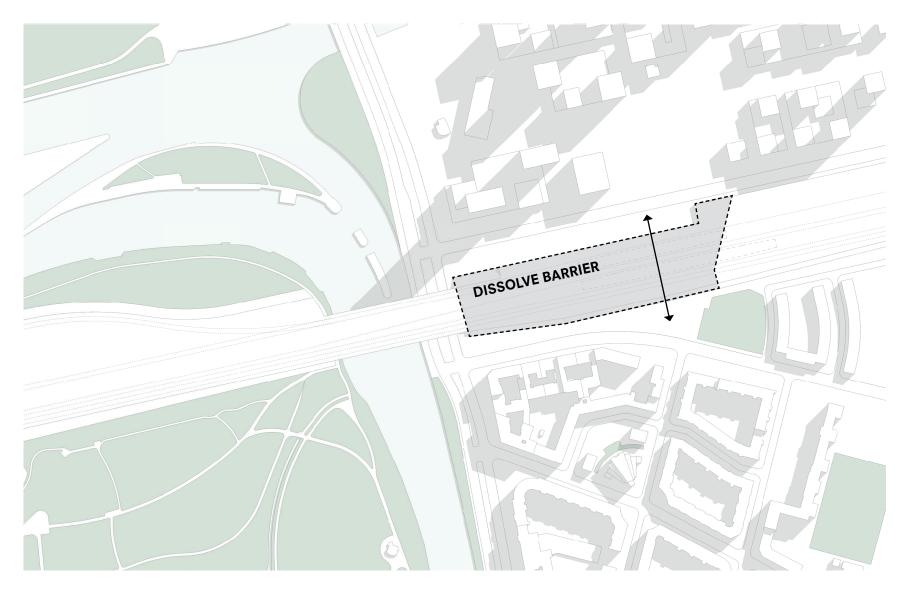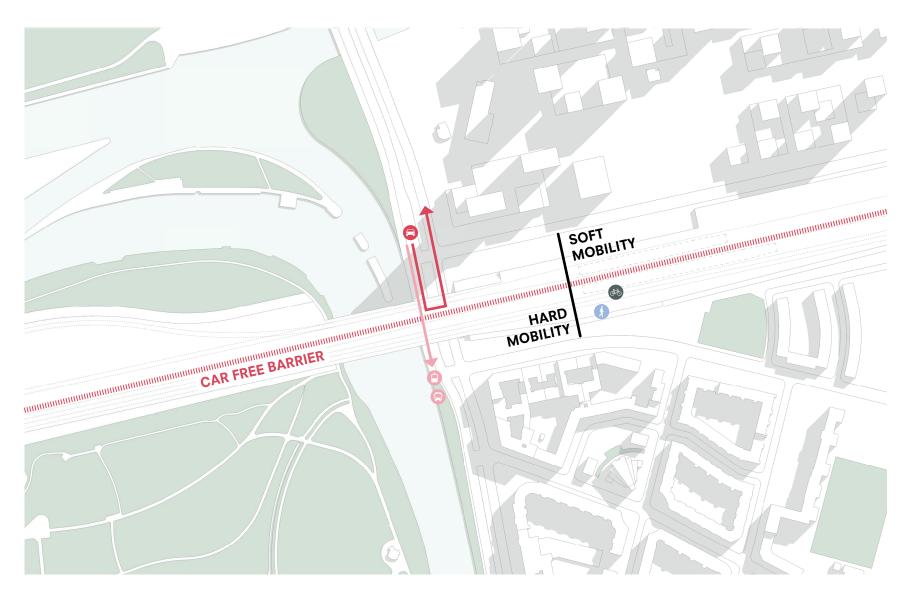
SITE AMBITION

DISSOLVE BARRIER
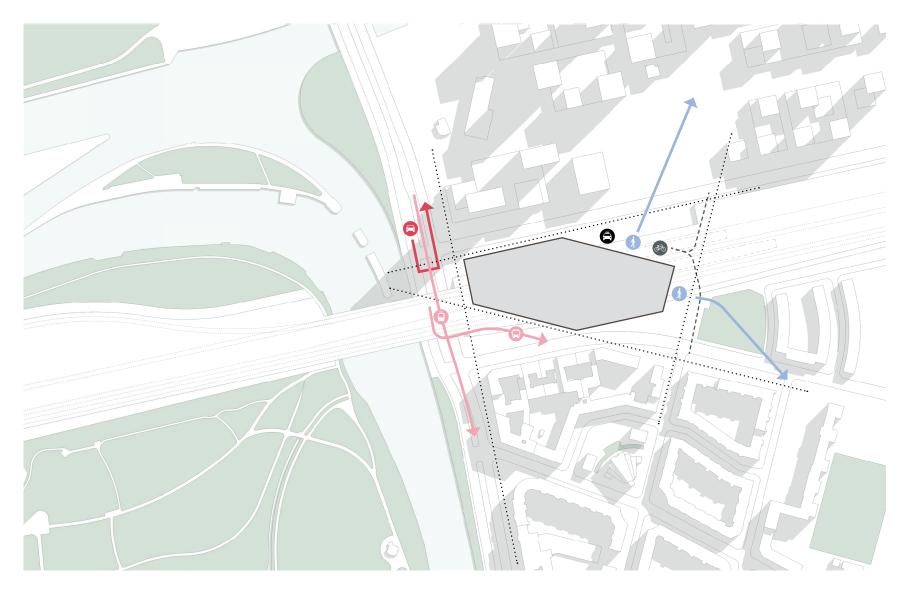
Dissolving the railway barrier.

SITE AMBITIONS

SOFT MOBILITY

HARD MOBILITY

CAR FREE BARRIER
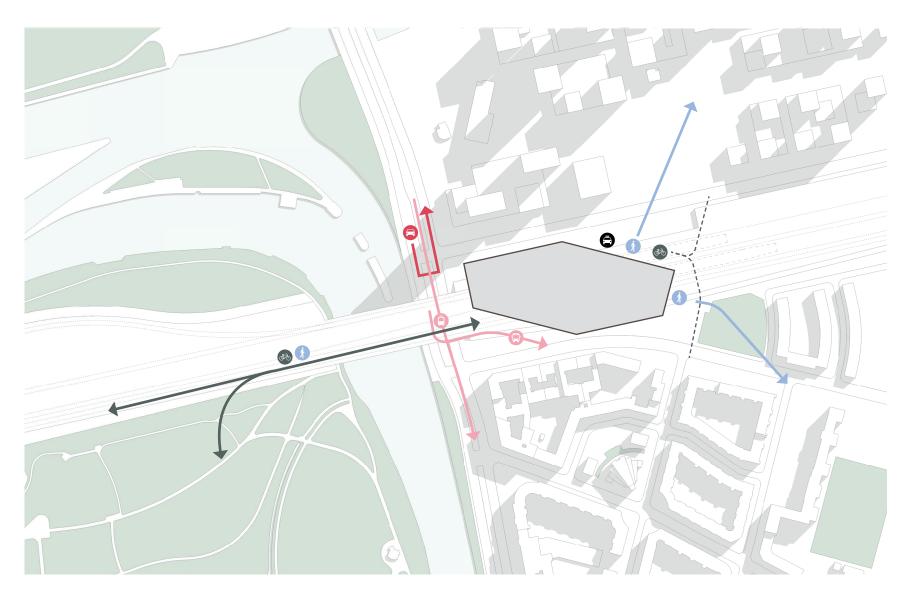
Using the station building as a separator.

SITE AMBITIONS

Organised and shaped by surroundings.
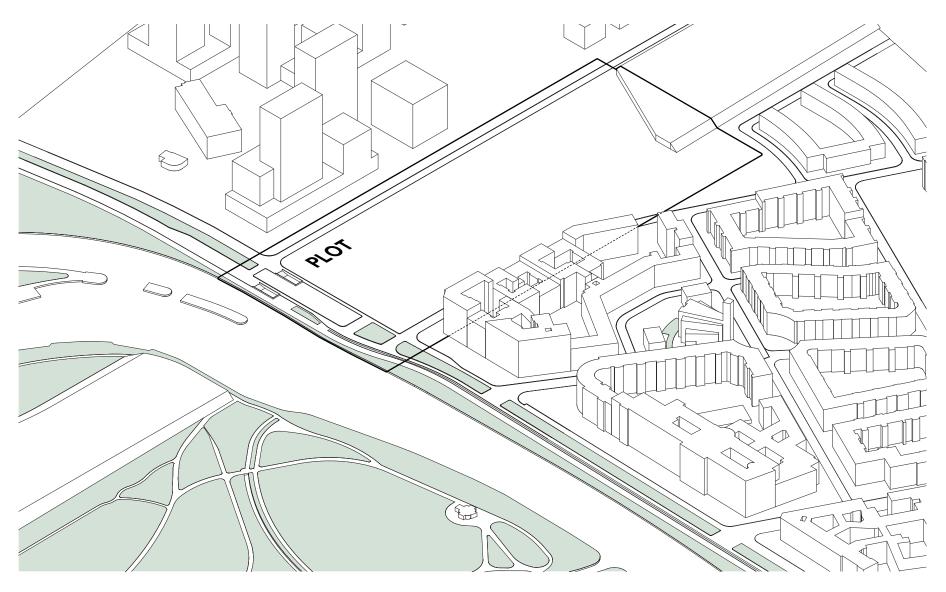
SITE AMBITIONS
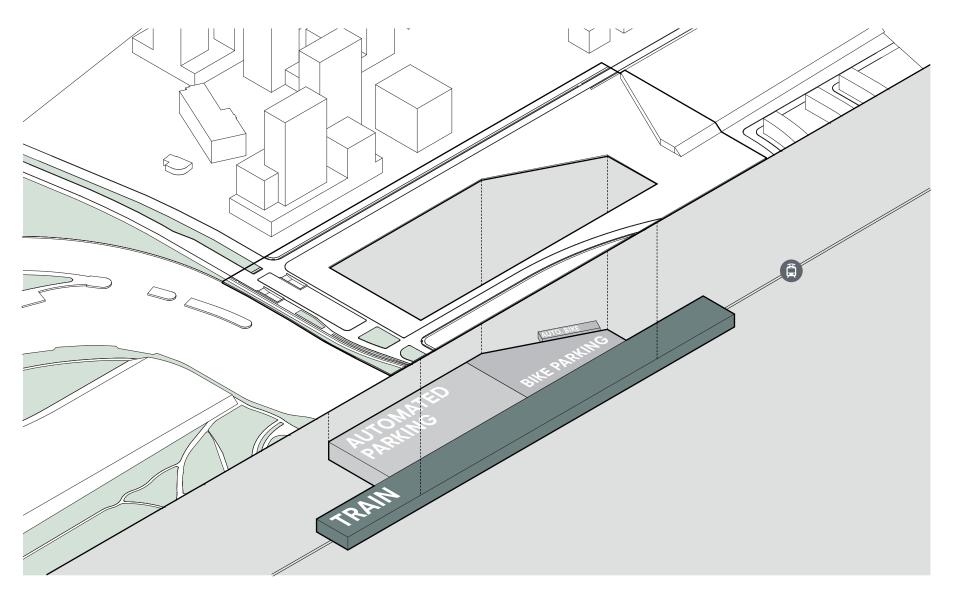
Underground rail and existing bridge as a green corridor.

07
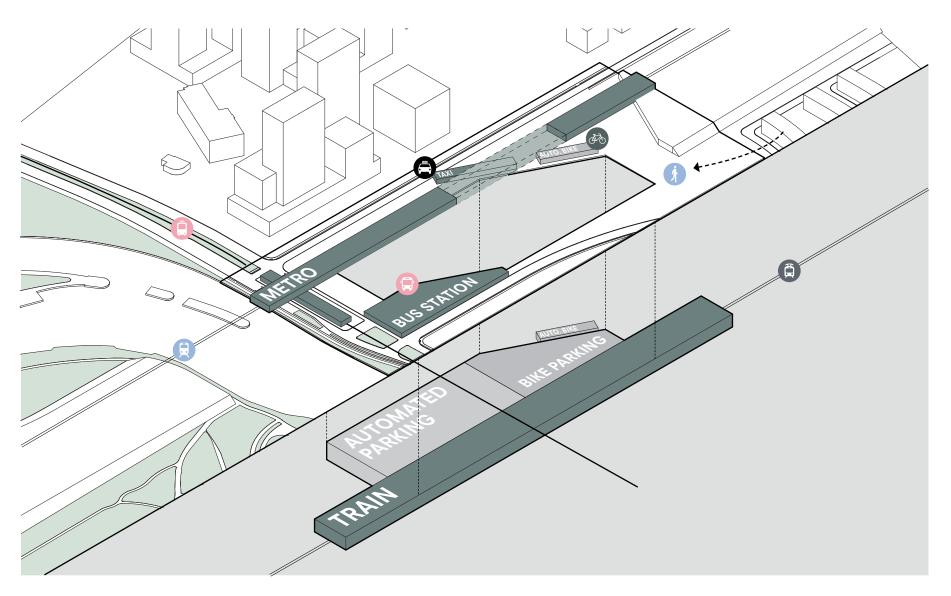
BUILDING ORGANISATION

BUILDING CONCEPT

PLOT

Building plot.
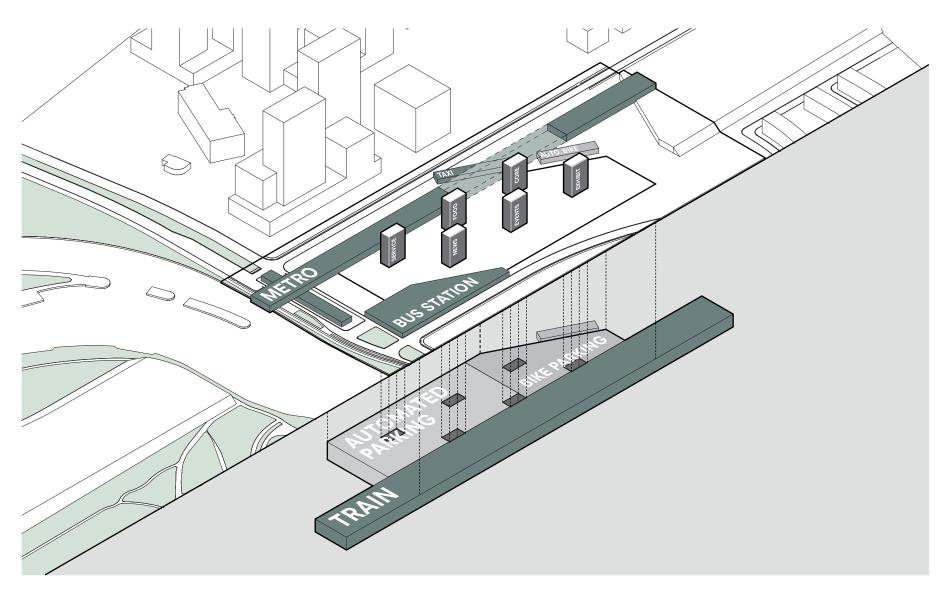
BUILDING CONCEPT

Hiding the hard infrastructure on site.

BUILDING CONCEPT
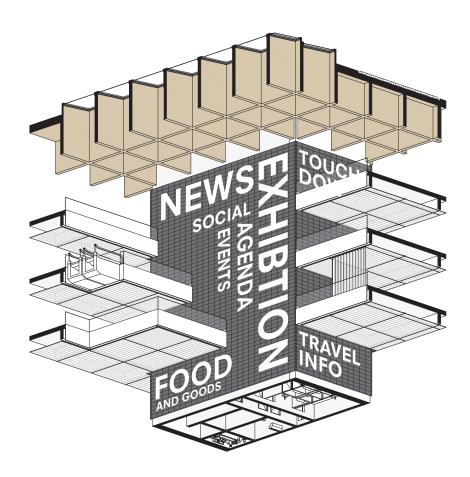
Modes of transportation are placed around the central building zone.

BUILDING CONCEPT
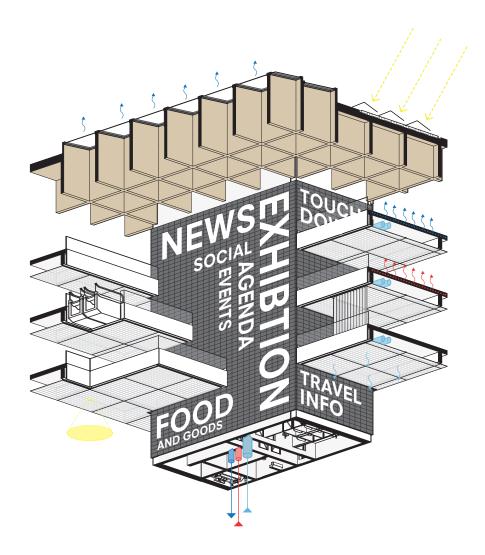
Building service cores are placed in the middle of the plot.

SERVICE CORE

Service core is a way of showing and serving the user throughout their journey...
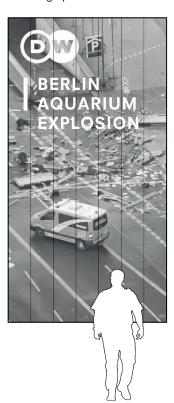
CLIMATE SYSTEM

But also integrates most climate and technical systems in one system.

LED SCREEN INTERACTION

Catch-up
Catching-up with news
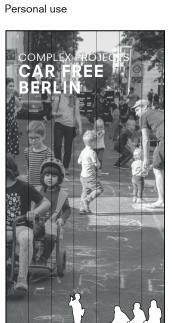
Service
Daily-routine
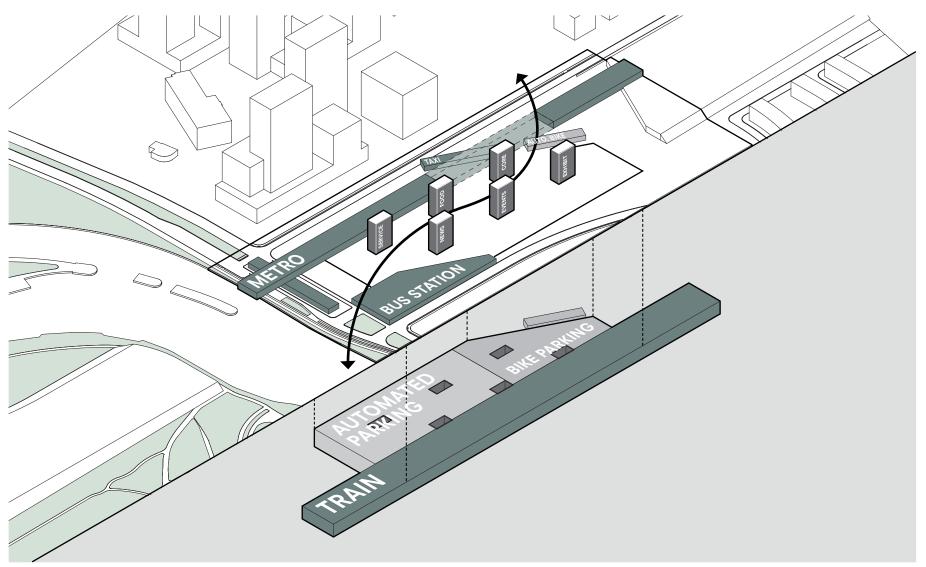
Event
Display events

Presentation
Personal use
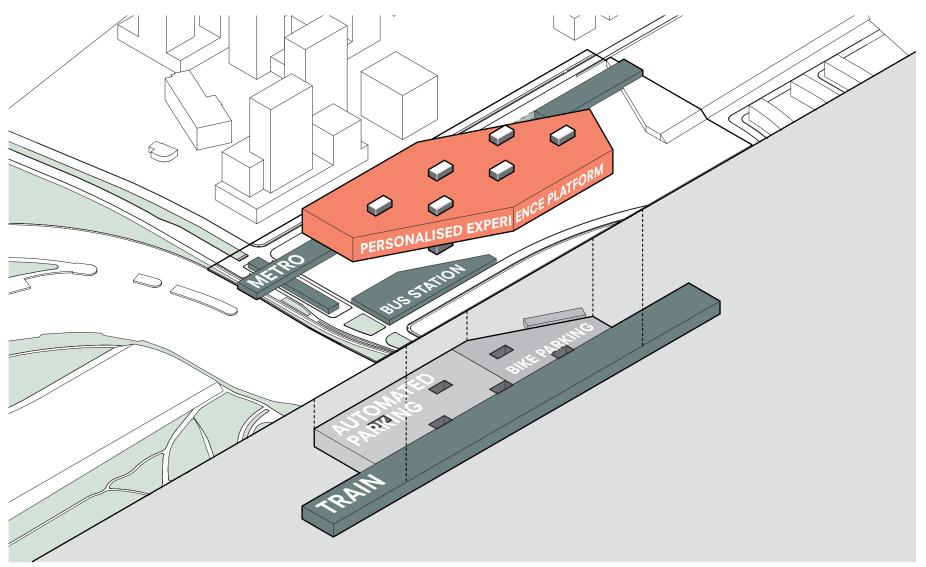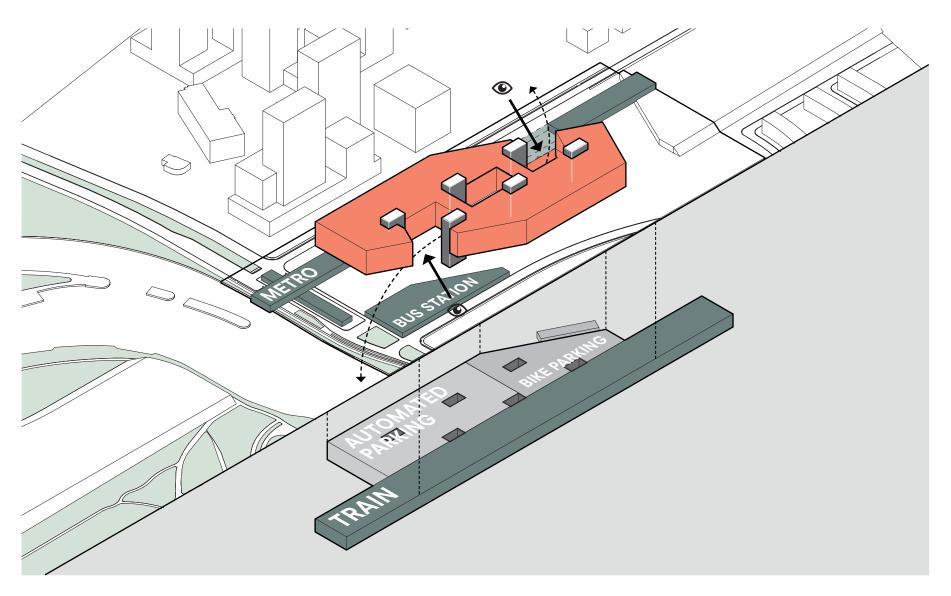
The core can serve the user by catching up, personal use, events and daily routine service.

BUILDING CONCEPT
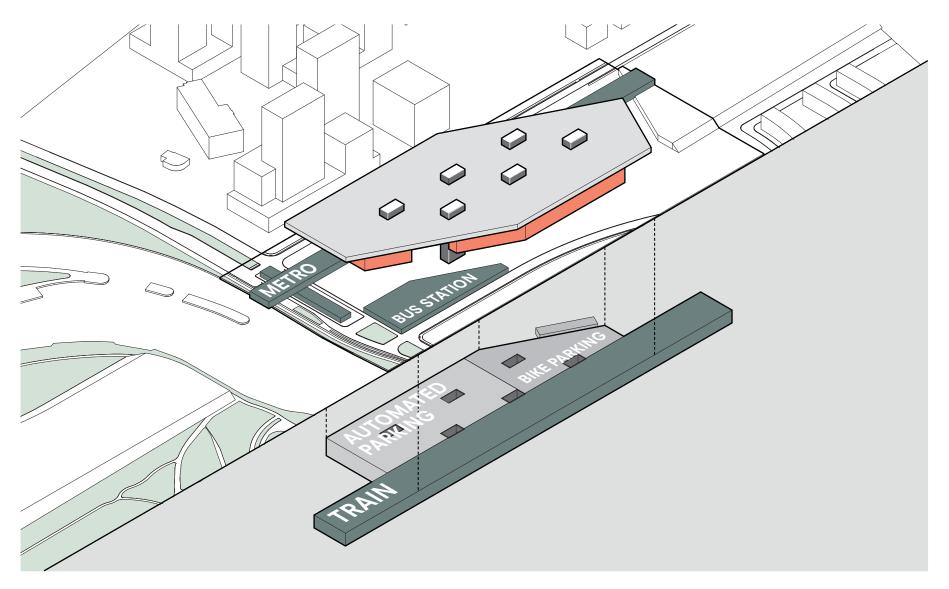
The main circulation flow in the building goes through the central zone between the service cores.

BUILDING CONCEPT

PERSONALISED EXPERIENCE PLATFORM

METRO

BUS STATION

BIKE PARKING

AUTOMATED PARKING

TRAIN

The personalised experience platform (forum) is attached to the
service cores.

BUILDING CONCEPT

METRO

BUS STATION

AUTOMATED PARKING

BIKE PARKING

TRAIN
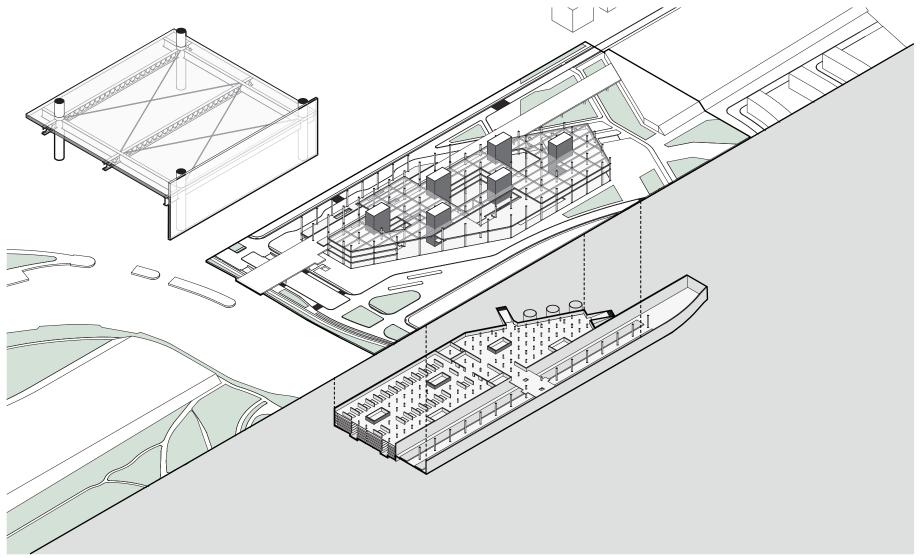
The forum is cut open to have a view of the service cores.

BUILDING CONCEPT

METRO

BUS STATION

TRAIN

AUTOMATED PARKING

BIKE PARKING
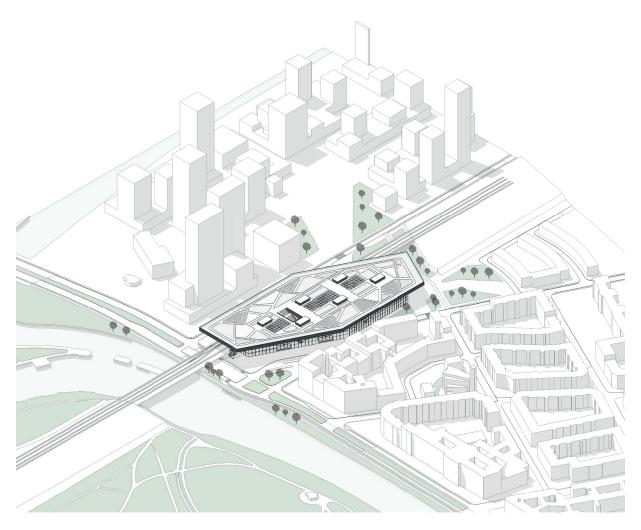
All is covered underneath one roof.

STRUCTURAL CONCEPT

The structural concept is based on a 14.4 by 14.4 grid. Allowing maximum flexibility and making the service cores standalone.

DESIGN OVERVIEW
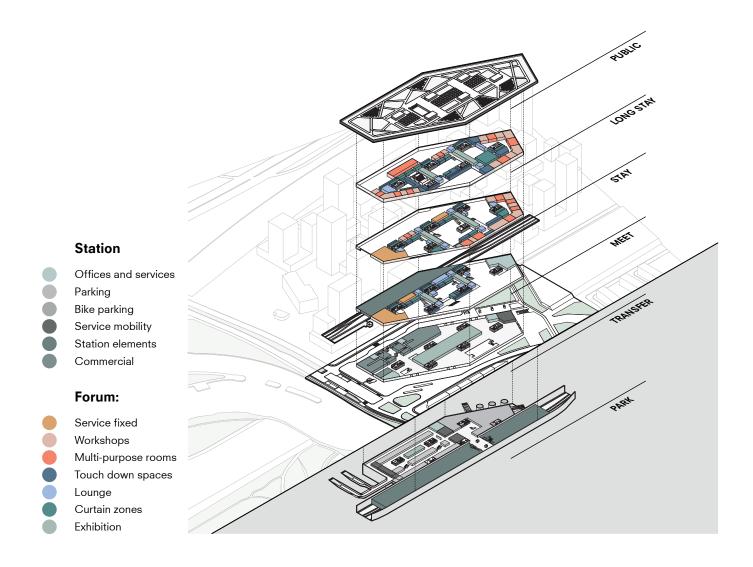
Which resulted in this building...

08
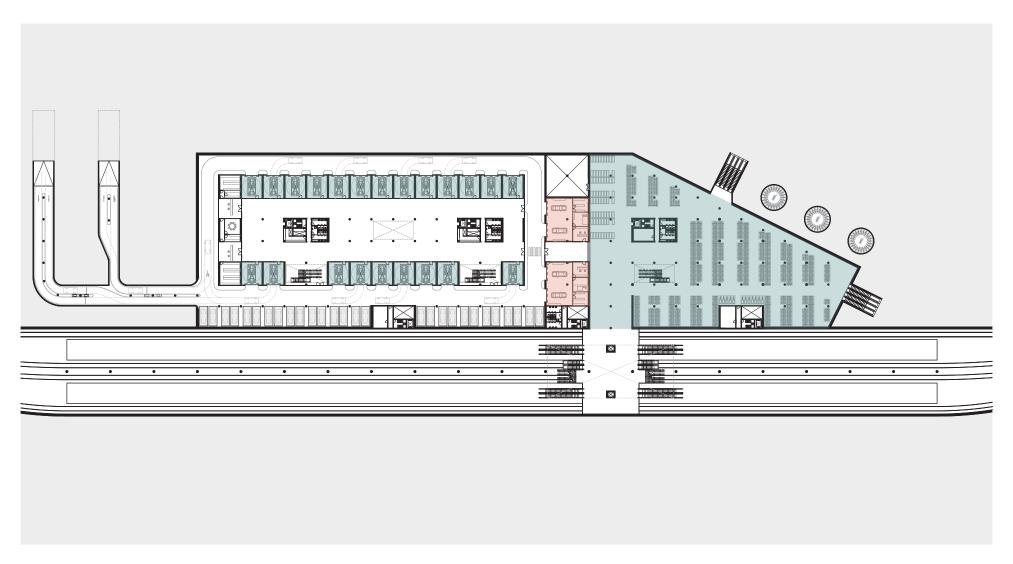
ARCHITECTURAL DESIGN

BUILDING ORGANISATION

Station

- Offices and services
- Parking
- Bike parking
- Service mobility
- Station elements
- Commercial

Forum:

- Service fixed
- Workshops
- Multi-purpose rooms
- Touch down spaces
- Lounge
- Curtain zones
- Exhibition

PUBLIC

LONG STAY

STAY

MEET

TRANSFER

PARK

Program placement based on time spent in the building.

BASEMENT
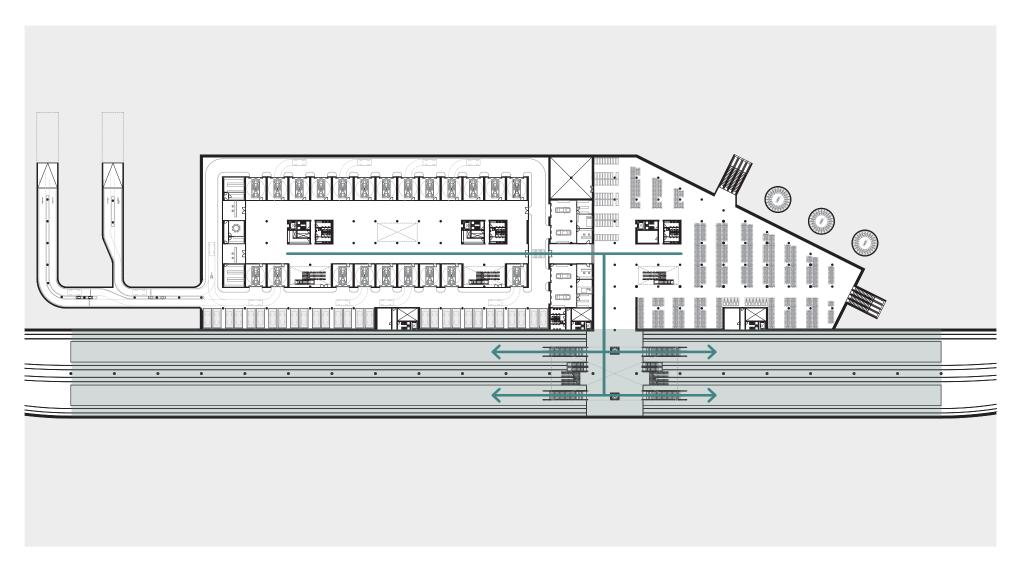
Bike and car oriented services.

complex **CP** projects

CAR DROP-OFF
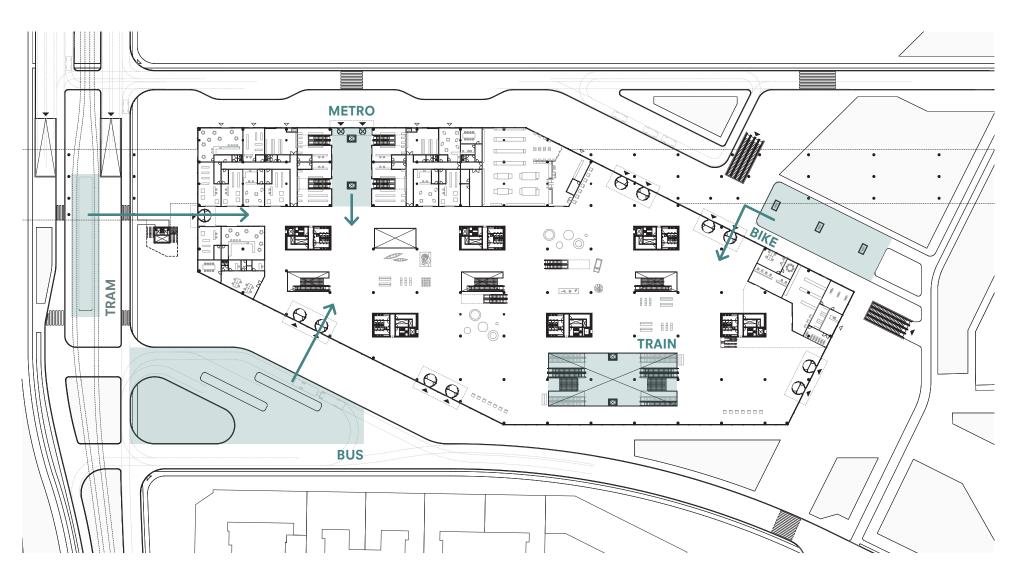
BASEMENT
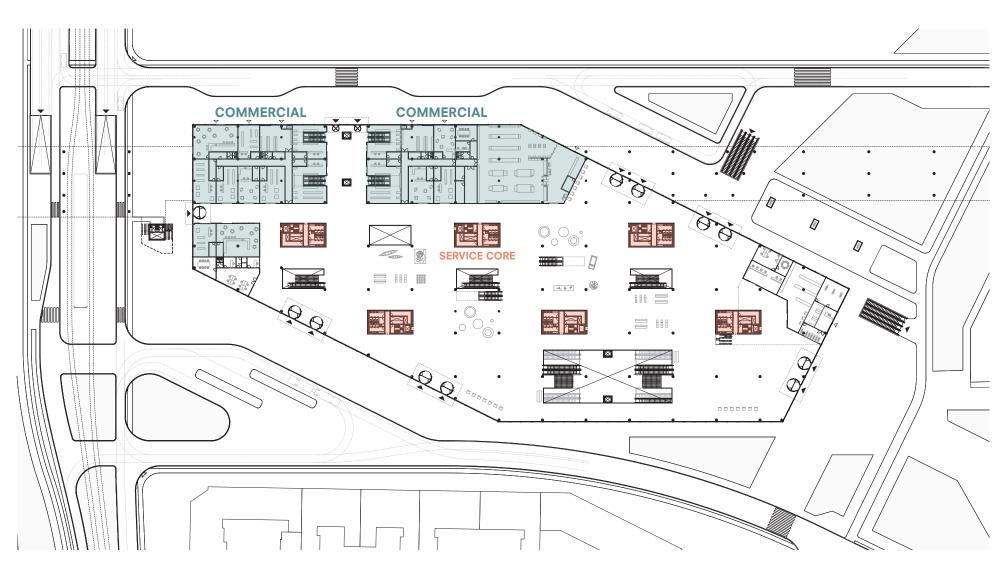
Directly connected to train station.

GROUND FLOW

METRO

TRAM

BIKE

BUS

TRAIN

Oriented on switching modes of transportation.

GROUND FLOOR

COMMERCIAL

COMMERCIAL

SERVICE CORE
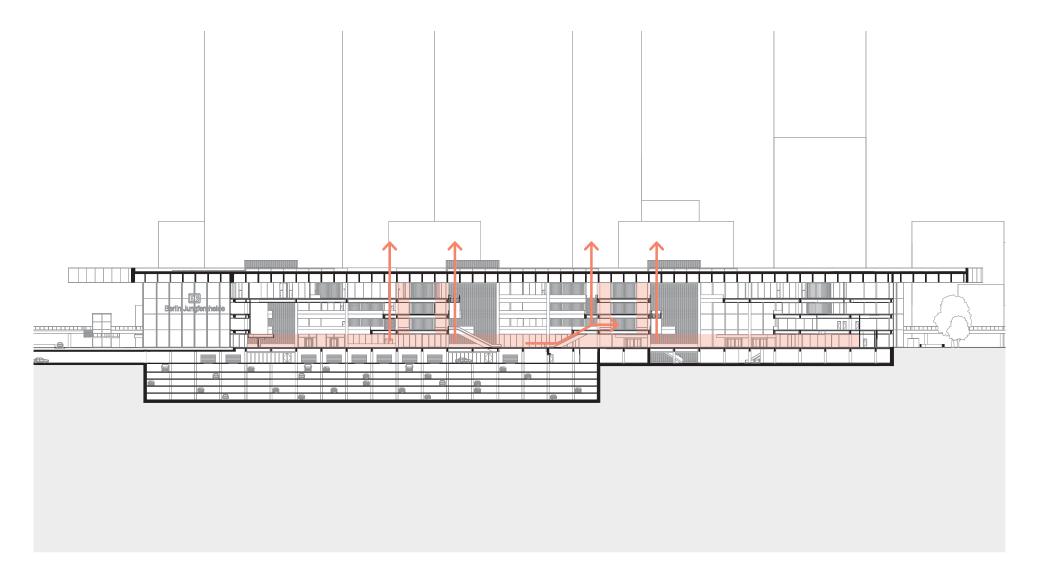
Big station hall with service related amenities.

SERVICE CORE
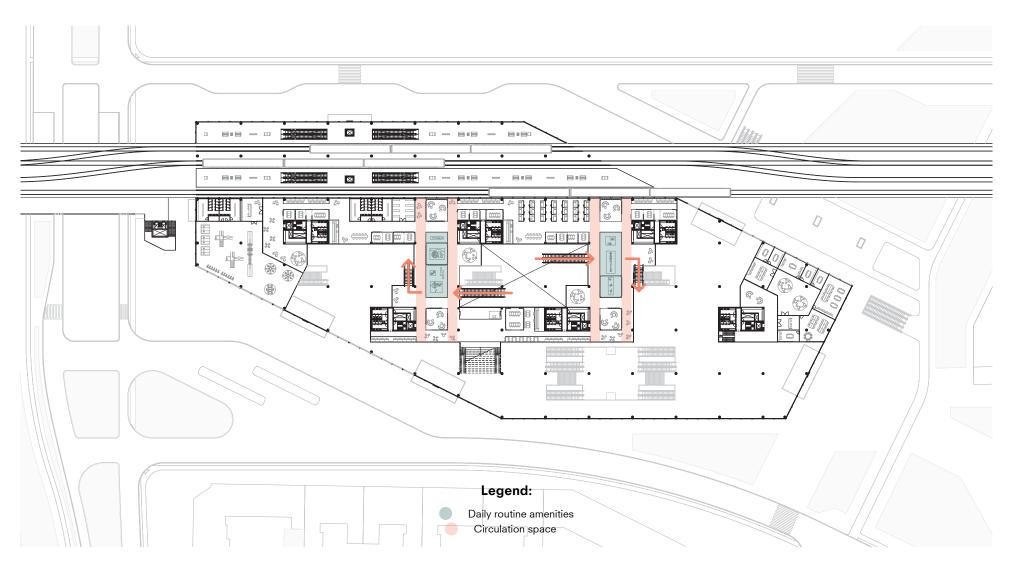
LONGITUDINAL SECTION

Main circulation space.

FIRST FLOOR

Legend:

● Daily routine amenities
● Circulation space
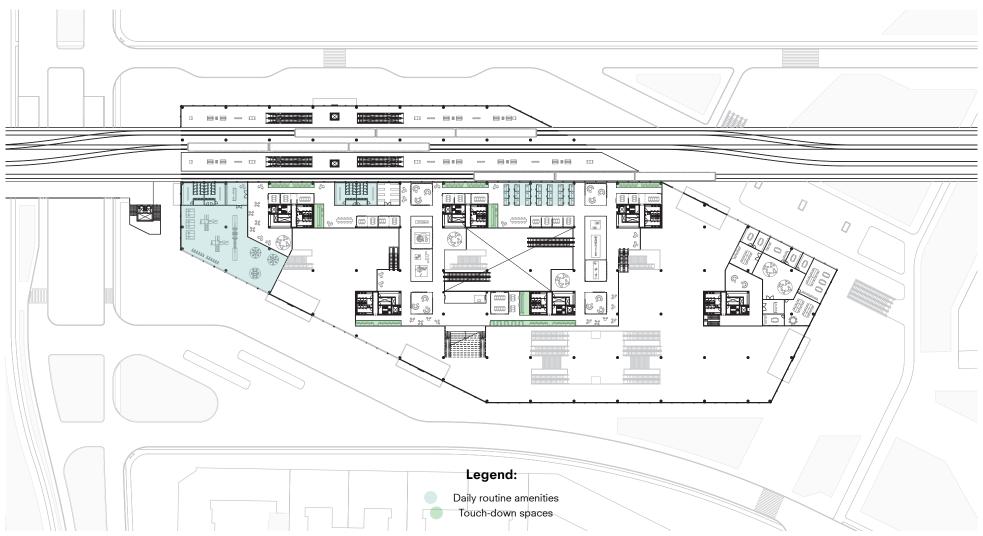
Exhibition zones adjacent to main circulation

EXHIBITION ZONE

FIRST FLOOR

Legend:

Daily routine amenities
Touch-down spaces
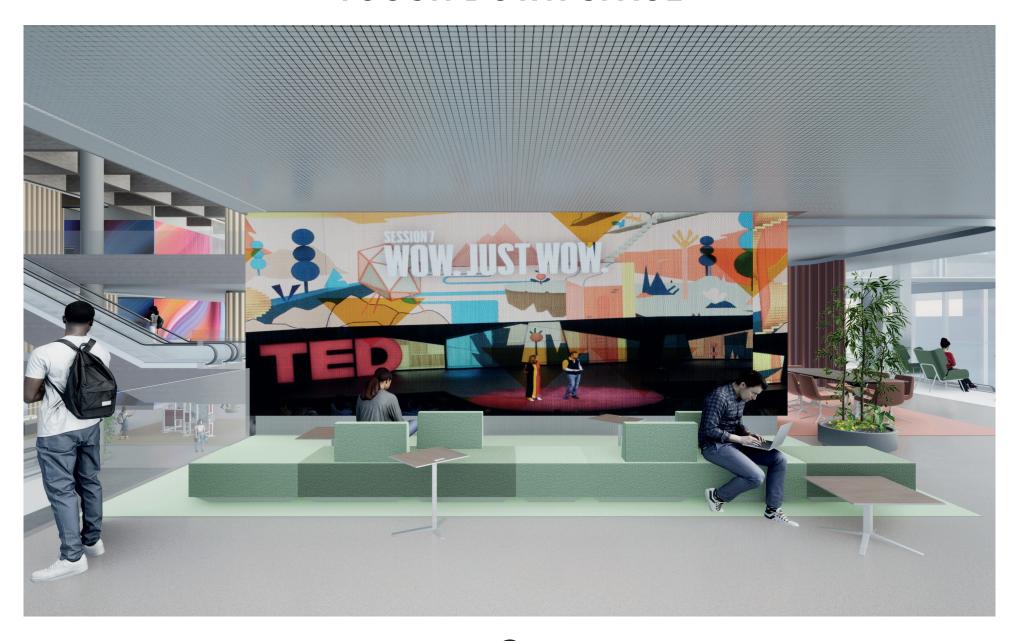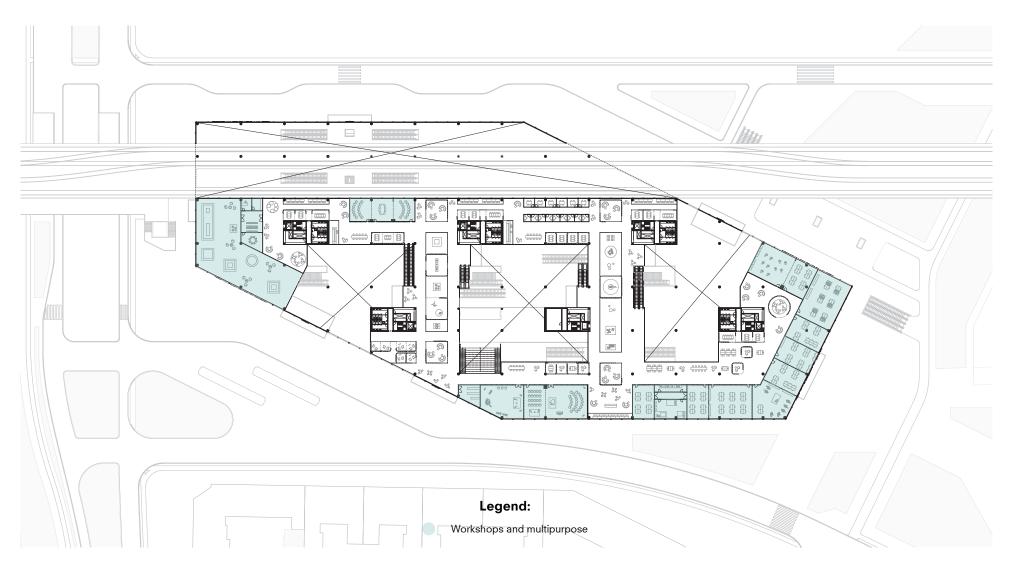
Short stay lounge and working spaces. Contains also daily routine amenities.

TOUCH DOWN SPACE

THIRD FLOOR

Legend:

Workshops and multipurpose
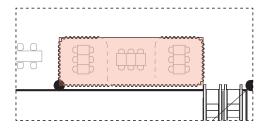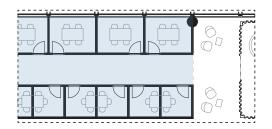
Fixed spaces

THIRD FLOOR
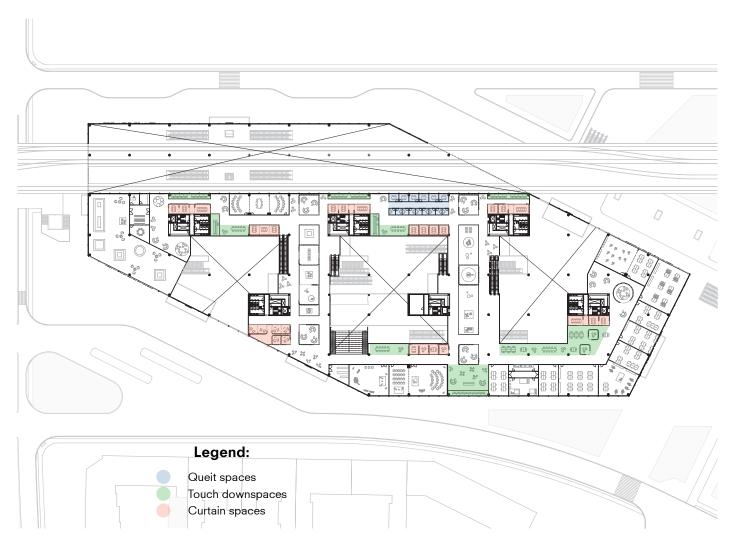
CURTAIN SPACE

QUIET SPACES

TOUCH DOWNSPACES

Legend:
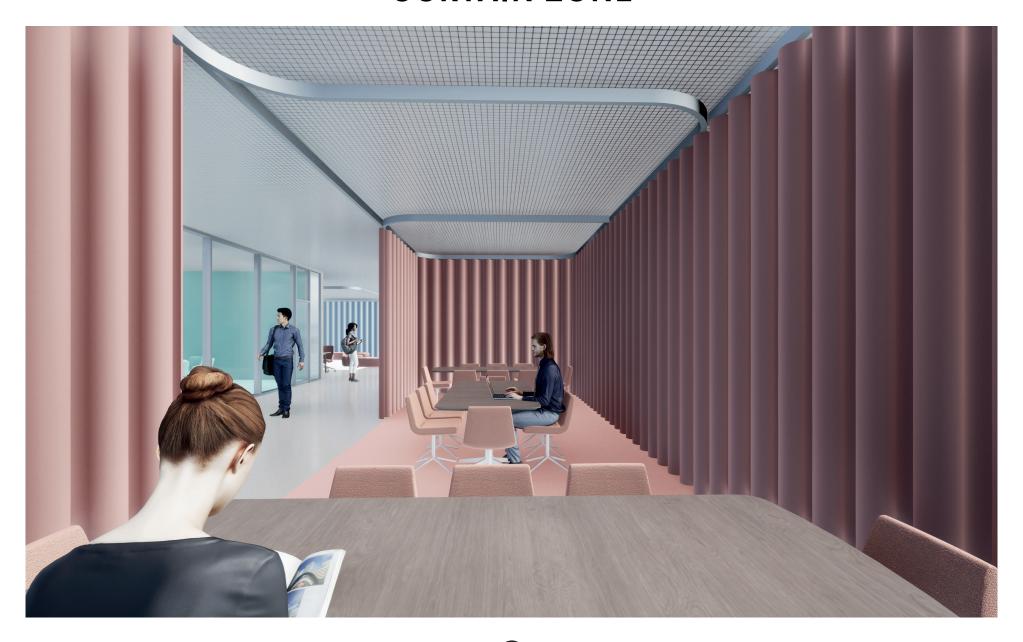
● Queit spaces
● Touch downspaces
● Curtain spaces
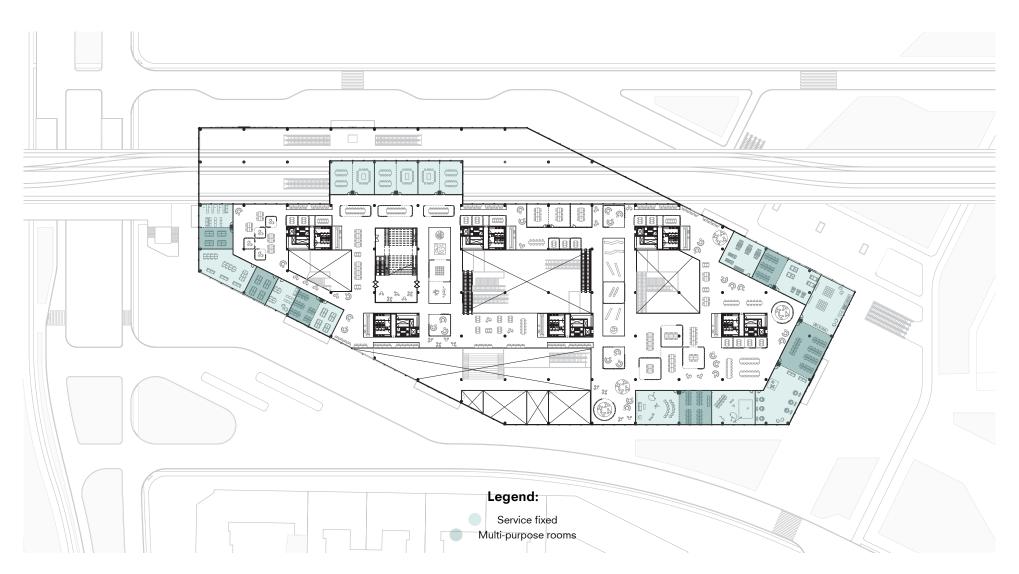
Workspaces

CURTAIN ZONE

THIRD FLOOR

Legend:

Service fixed

Multi-purpose rooms
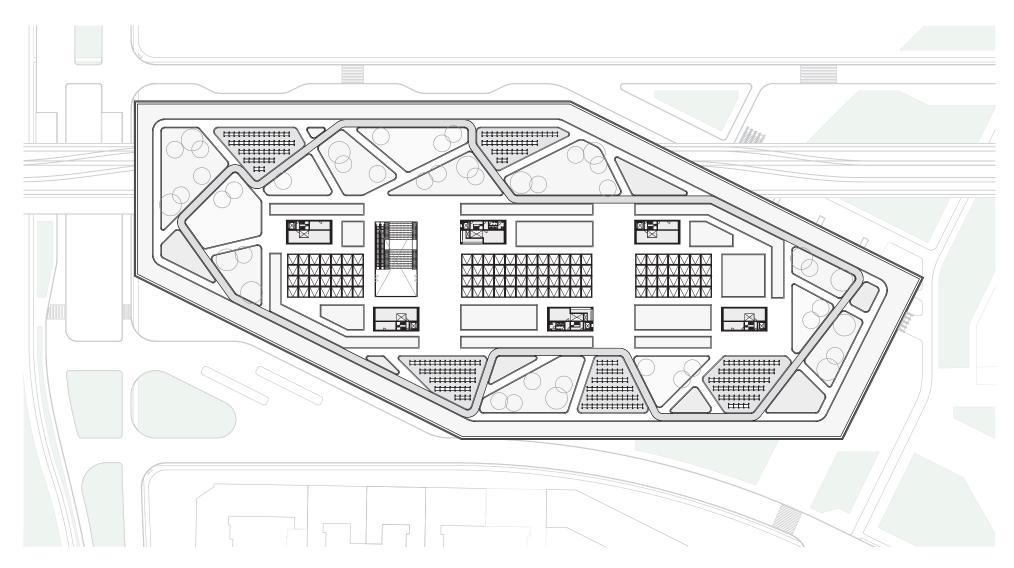
Workshop and long stay oriented formal character of actives.

WORKSHOP SPACE

ROOF
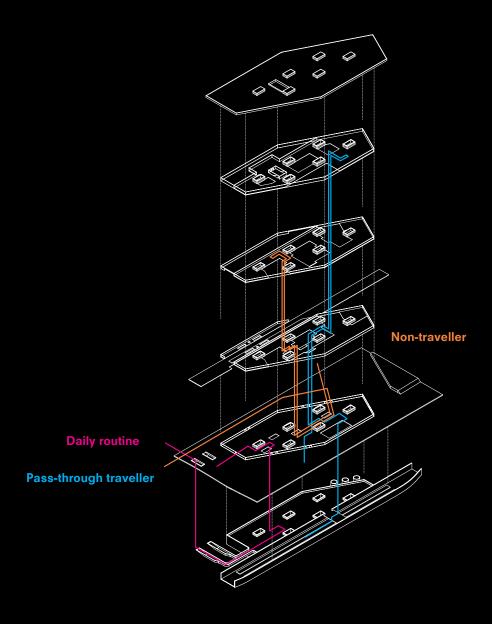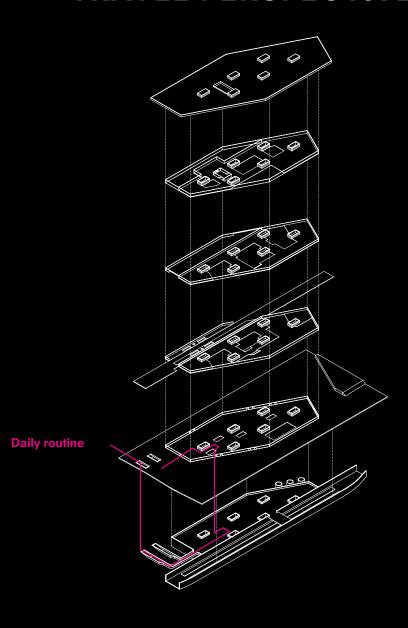
Public accessible roof for the neighbourhood or to relax during travel.

ROOF TERRACE

complex CP projects

09

TRAVEL PERSPECTIVES

TRAVEL PERSPECTIVES

Non-traveller

Daily routine

Pass-through traveller

TRAVEL PERSPECTIVES

Daily routine

DAILY ROUTINE TRAVELLER

A100
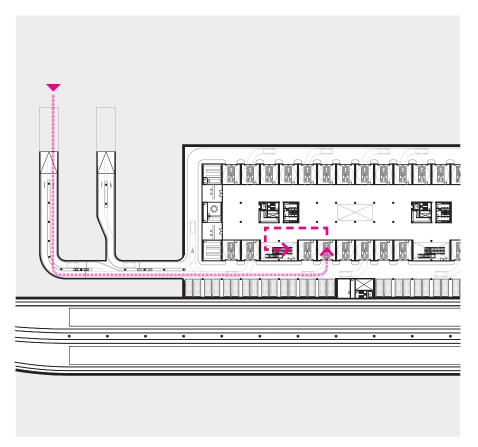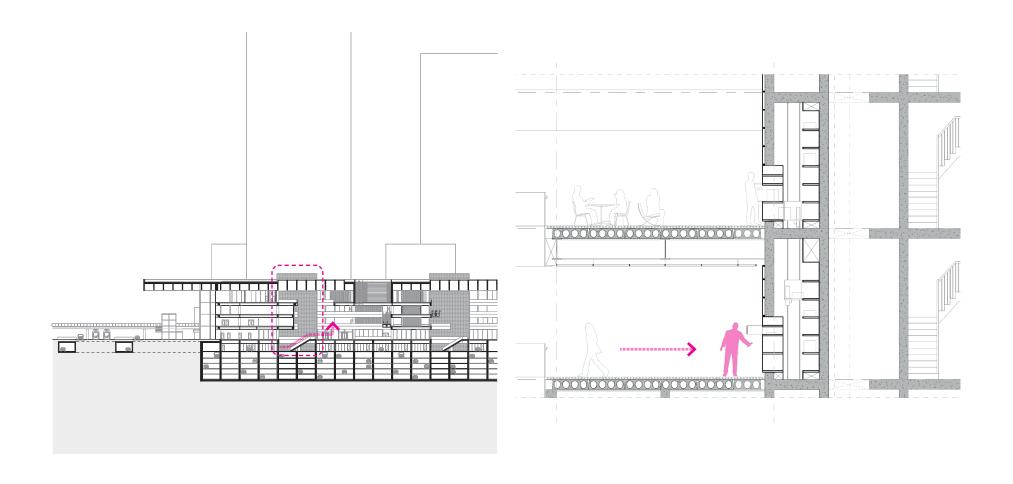
The car traveller arrives at the station after exiting the A100 highway...

DAILY ROUTINE TRAVELLER
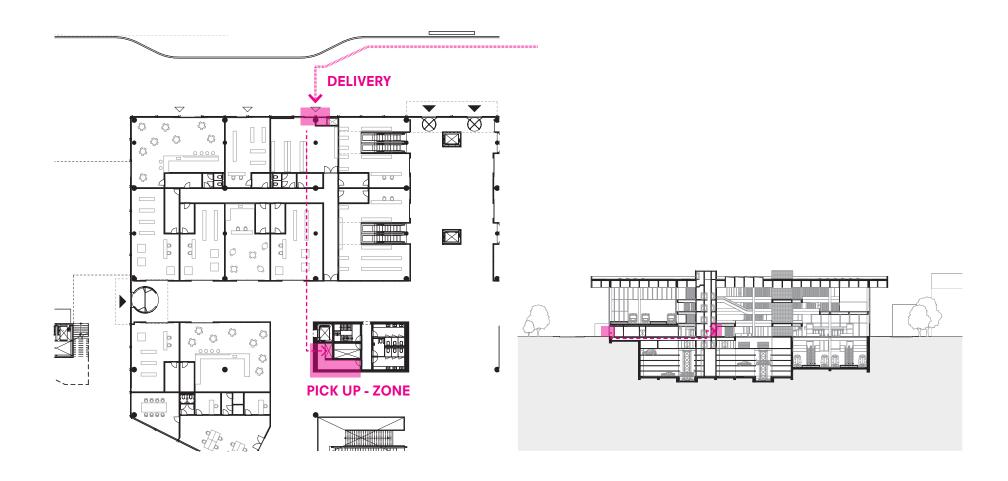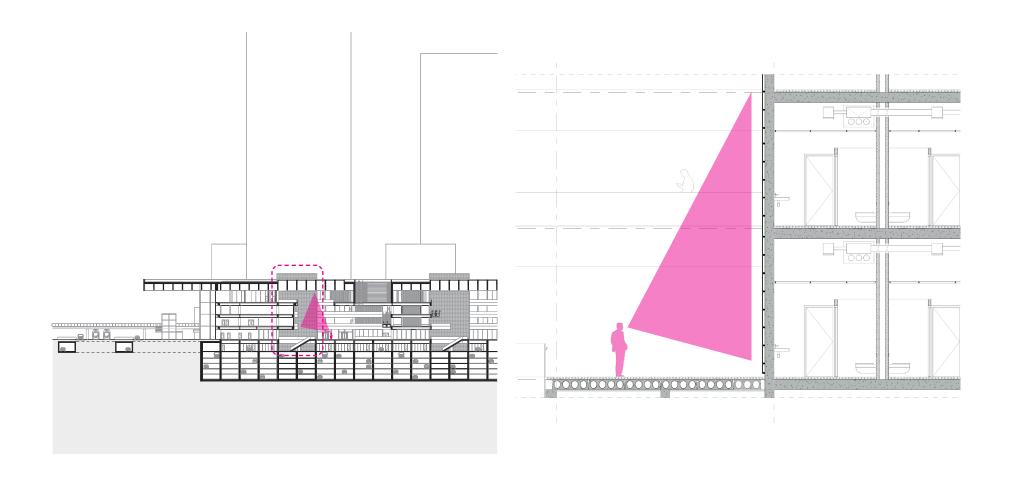
The automated parking facility takes over parking operations and allows cars to be used as a mode of transportation for other users...

DAILY ROUTINE TRAVELLER

After leaving the parking level he walks towards one of the building service cores. Here he picks up his breakfast which was delivered based on his time of arrival...

DAILY ROUTINE TRAVELLER

DELIVERY

PICK UP - ZONE
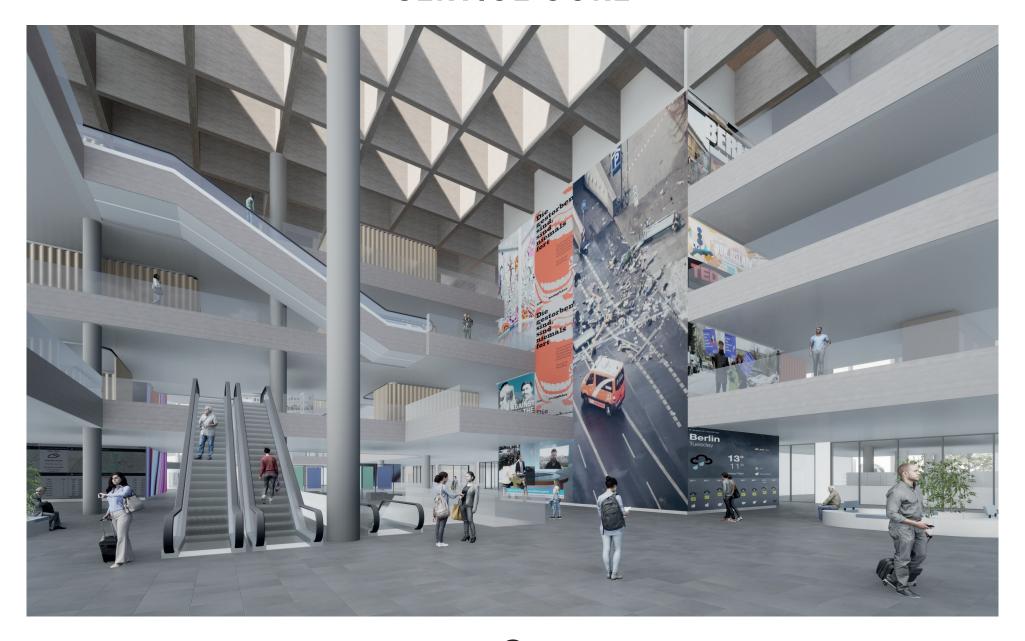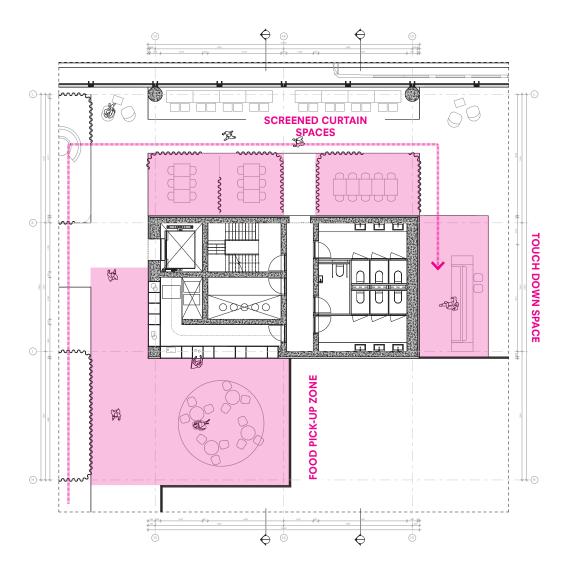
The breakfast was prepared in a café near the station, part of the
building's automated delivery programme...

DAILY ROUTINE TRAVELLER
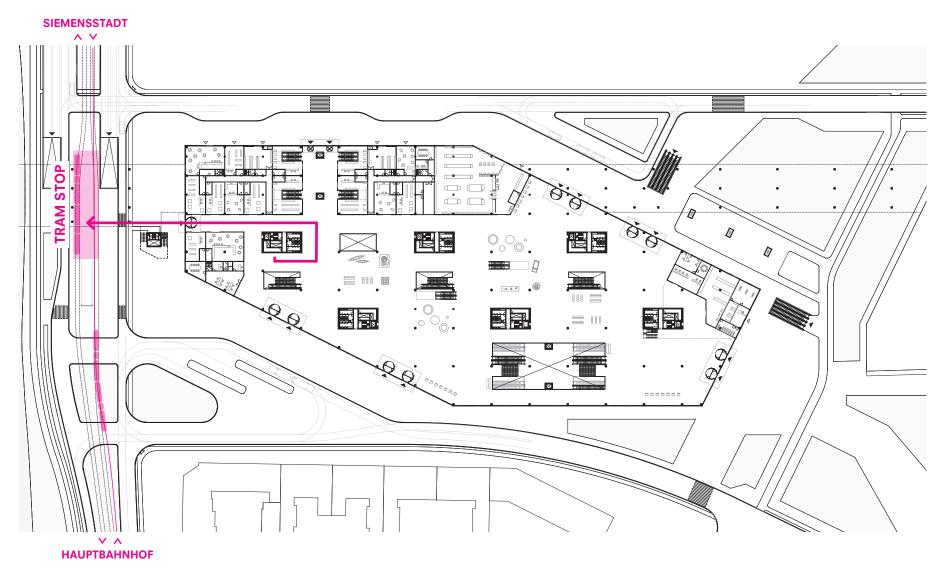
While at the core, the traveller uses the main screen to catch up with the daily news and weather report...

SERVICE CORE

DAILY ROUTINE TRAVELLER

SCREENED CURTAIN SPACES

TOUCH DOWN SPACE

FOOD PICK-UP ZONE
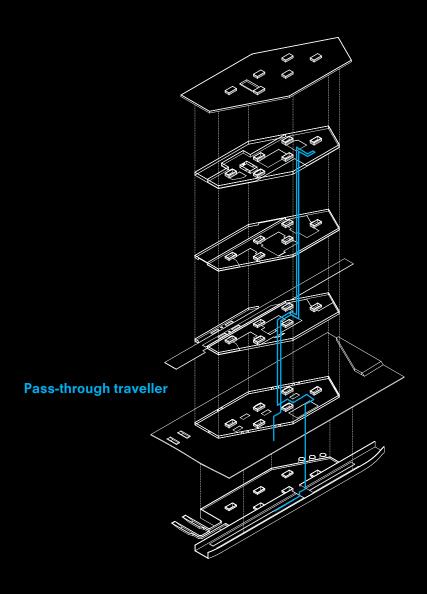
The traveller uses touch-down spaces at the core to connect their phone to the screen to watch his social media...

DAILY ROUTINE TRAVELLER

SIEMENSSTADT

TRAM STOP

HAUPTBAHNHOF
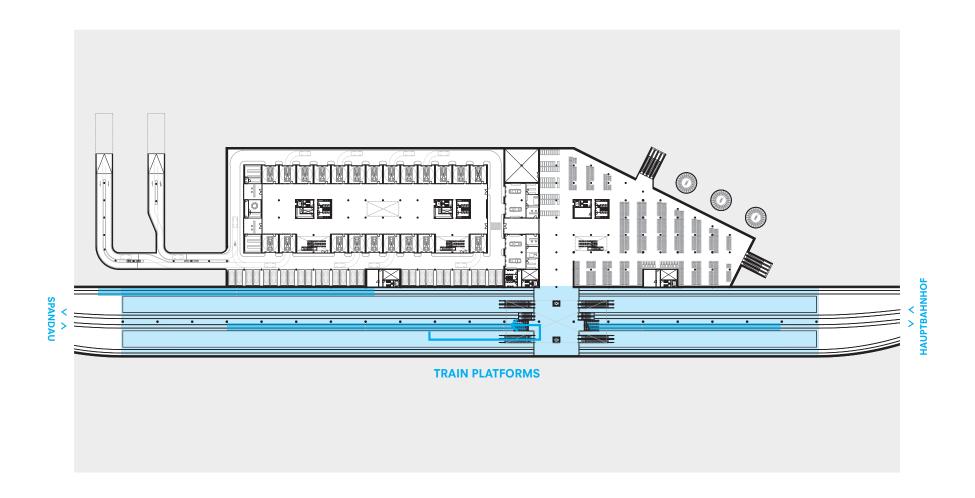
After breakfast, the traveller leaves the building to catch the tram, which rides precisely on time.

TRAVEL PERSPECTIVES

Pass-through traveller

PASS-THROUGH TRAVELLER

Today's activities at Jungfernheide station:

N Newsroom: Catch-up with the world.

L Lounge: Sit-back and relax.

E 10-minute exhibition: Car-Free Berlin

V Vote-room: More green in the city?

W Workspace: Send your latest e-mail.

A Auditorium: How to live happy.
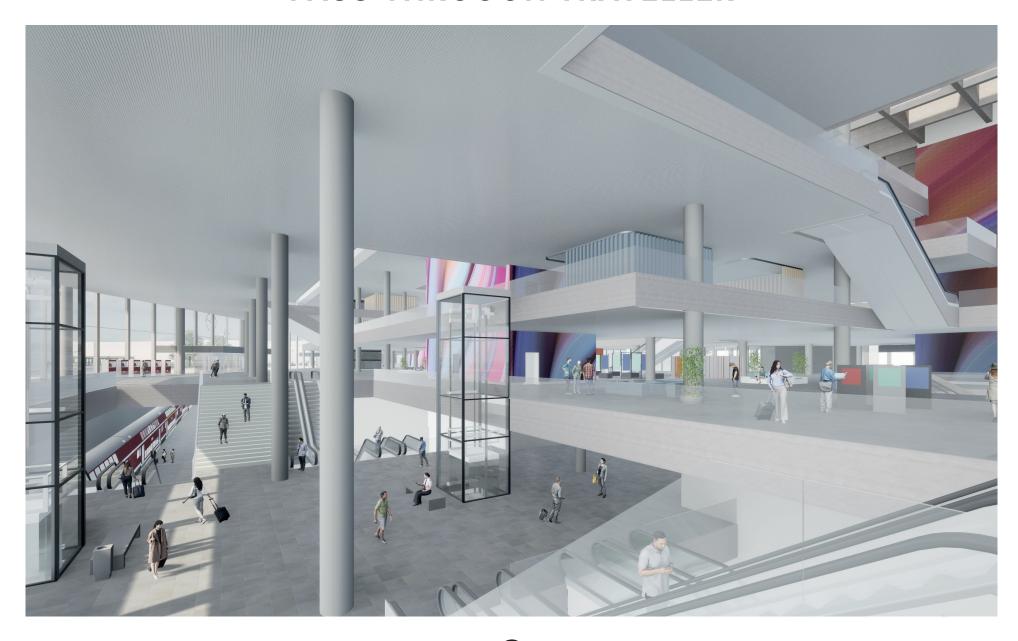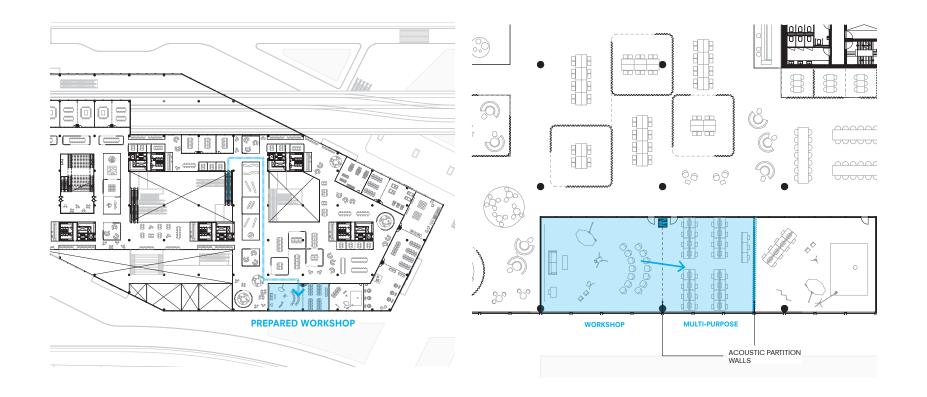
During his journey, the traveller was notified about the station's activities today. The traveller registered for a workshop following his arrival time...

PASS-THROUGH TRAVELLER

SPANDAU

HAUPTBAHNHOF

TRAIN PLATFORMS

The pass-through traveller arrives by train from outside Berlin...

PASS-THROUGH TRAVELLER

PASS-THROUGH TRAVELLER

PREPARED WORKSHOP

WORKSHOP **MULTI-PURPOSE**

ACOUSTIC PARTITION WALLS
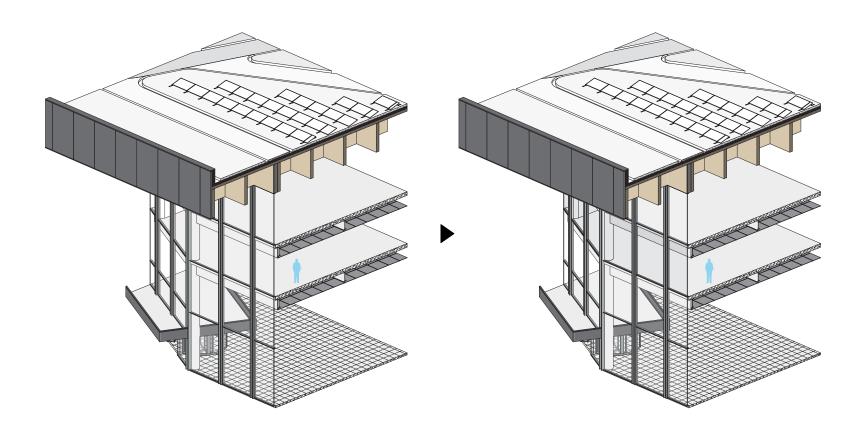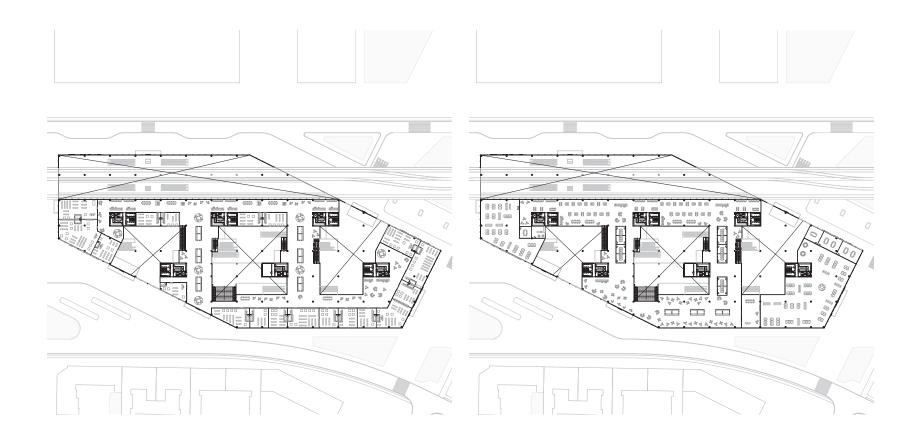
The building reconfigures its layout to provide enough space for the workshop by connecting the adjacent classroom by opening the partition wall...
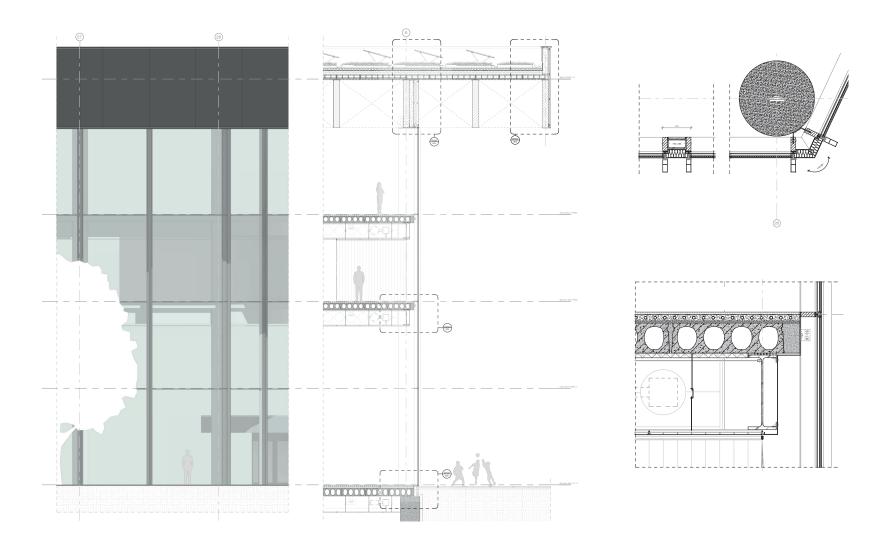
ADAPTABILITY

ADAPTABILITY

ADAPTABILITY

The facade can also be adapted to the use of the space behind it by adjusting the tint of the glass to the desired amount of daylight...

ADAPTABILITY

Through its flexible layout. The building can also facilitate other types of program...

FRAGMENT
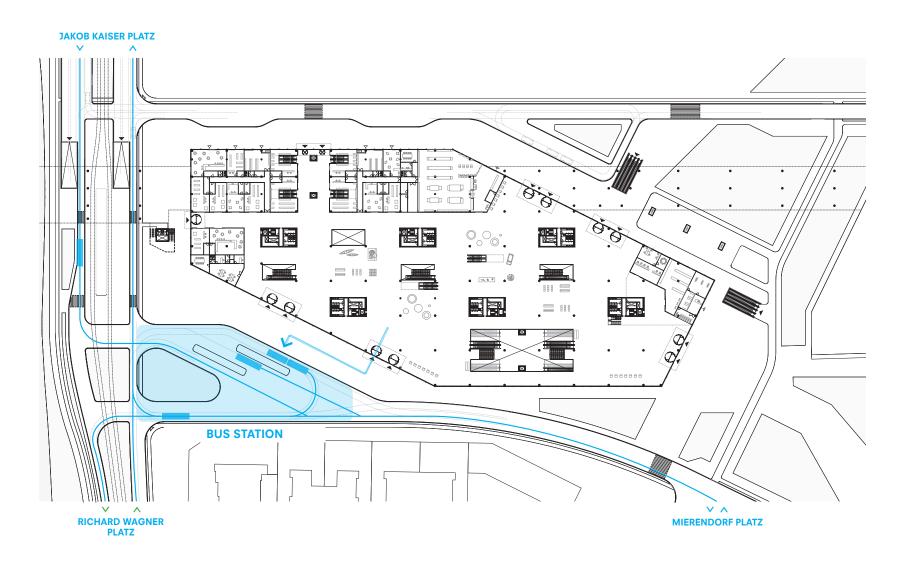
The curtain wall facade maximizes daylight in the building. Also
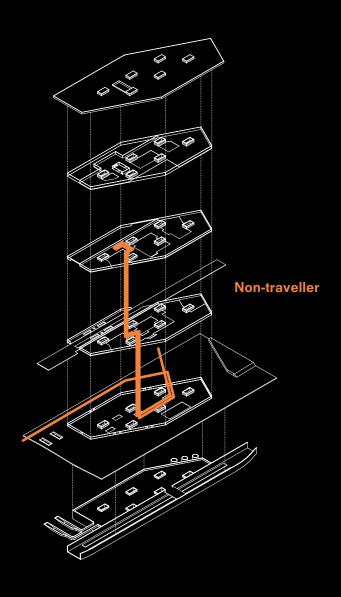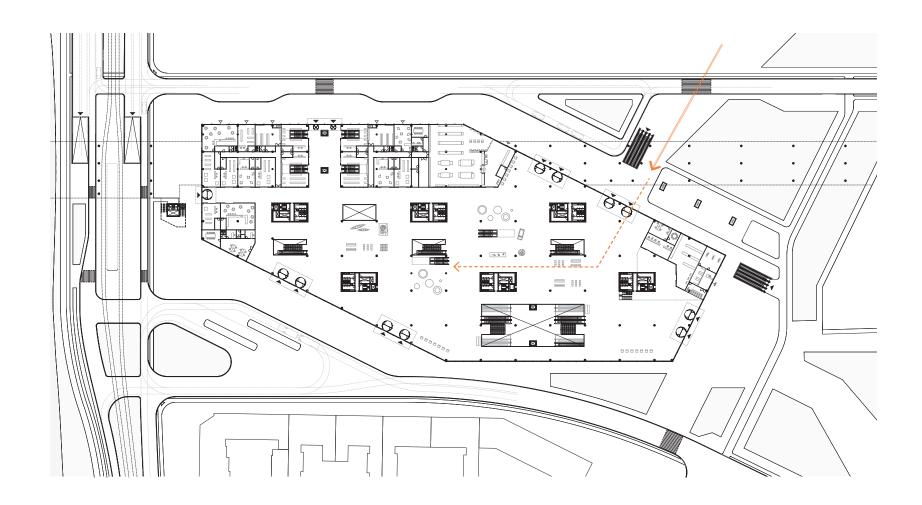provides configuration of the infill in the future...

CURTAIN WALL FACADE

PASS-THROUGH TRAVELLER

JAKOB KAISER PLATZ

BUS STATION

RICHARD WAGNER
PLATZ

MIERENDORF PLATZ

After the workshop the pass-trough traveller leaves the building by
bus.

TRAVEL PERSPECTIVES

Non-traveller

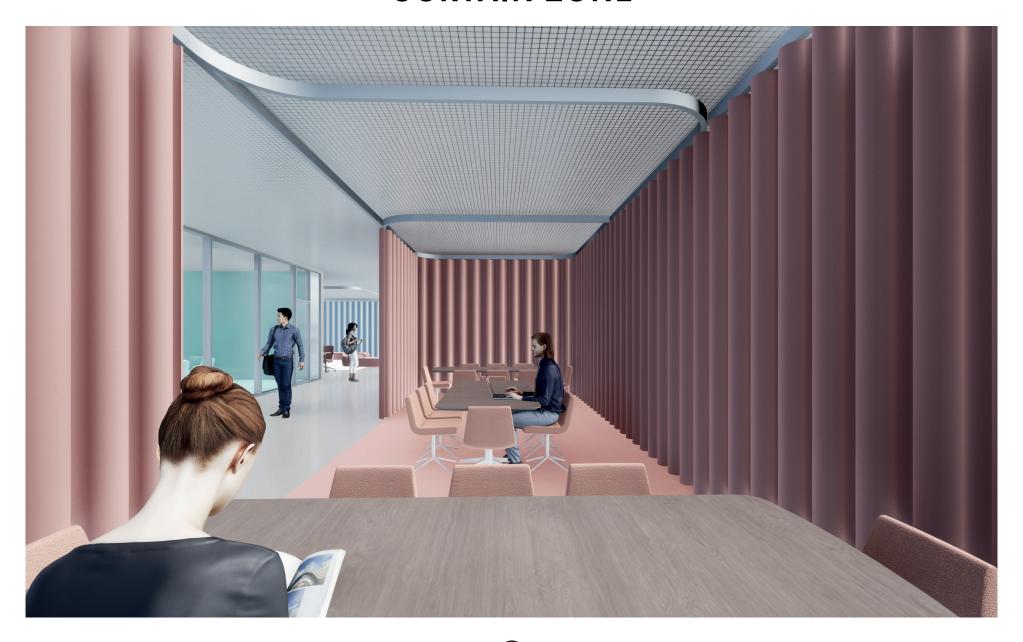# NON-TRAVELLER
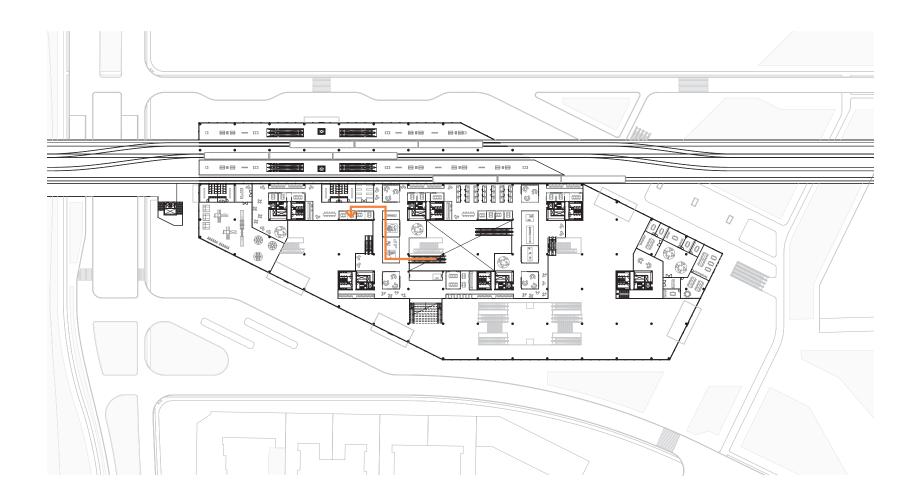
The non-traveller arrives on foot and uses the station during its off-peak hours. They arrive at the building's north entrance...

NON-TRAVELLER
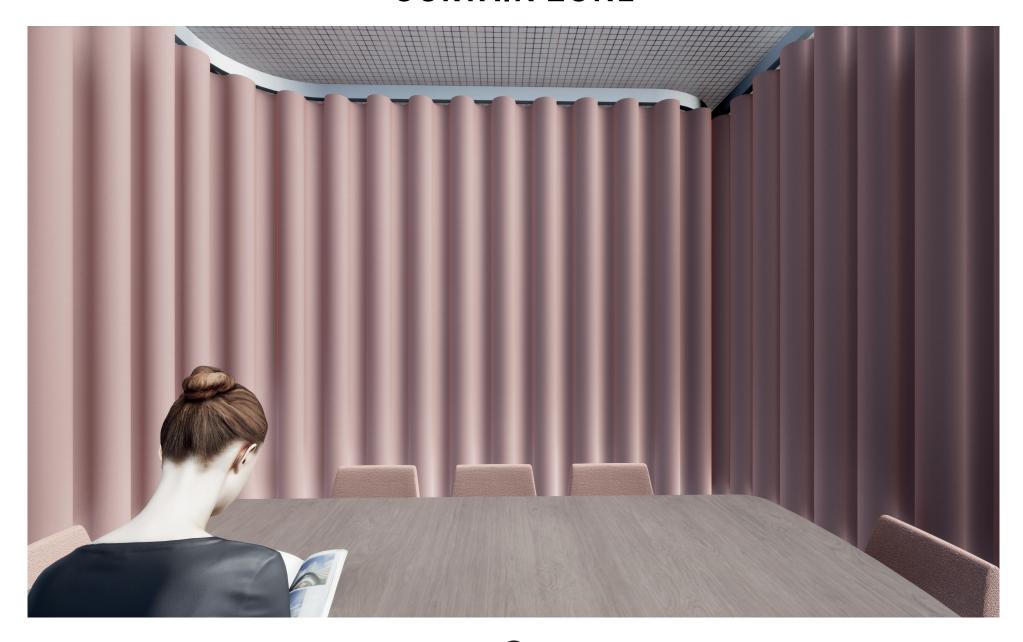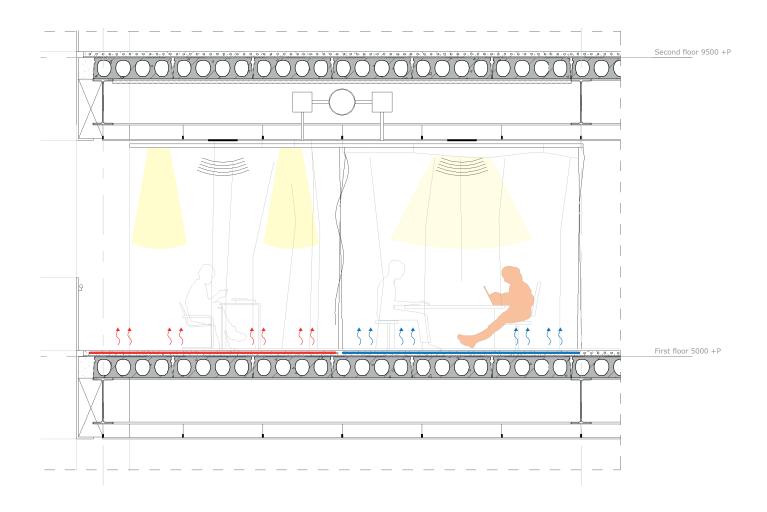
NON-TRAVELLER

The traveller has an online meeting which he can hold in three different types of workspaces in the building...
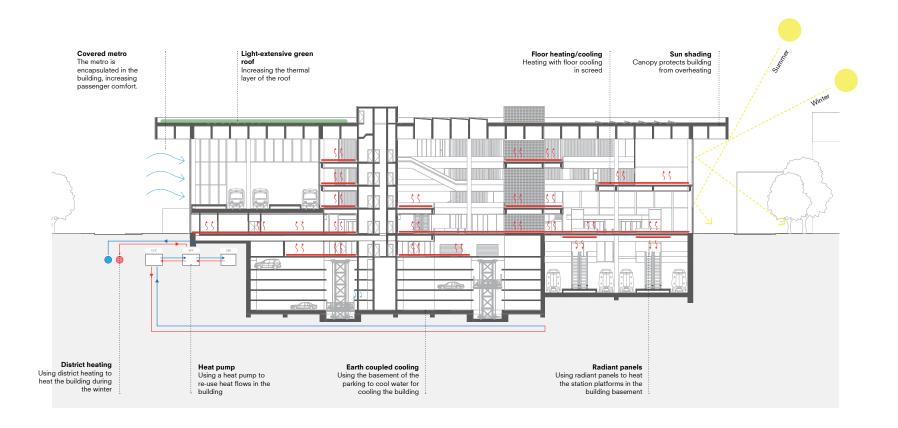
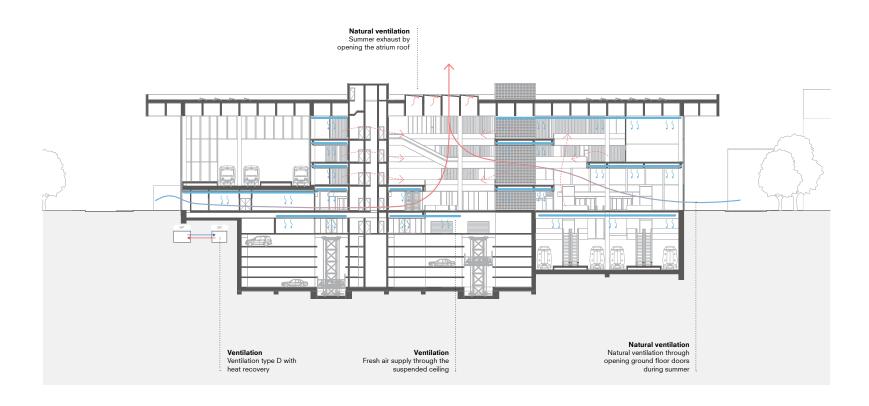# CURTAIN ZONE

CURTAIN ZONE

NON-TRAVELLER

Second floor 9500 +P

First floor 5000 +P

Spot heating and cooling of the space can be controlled, as light intensity, and he can use the sound system...

CLIMATE

Covered metro
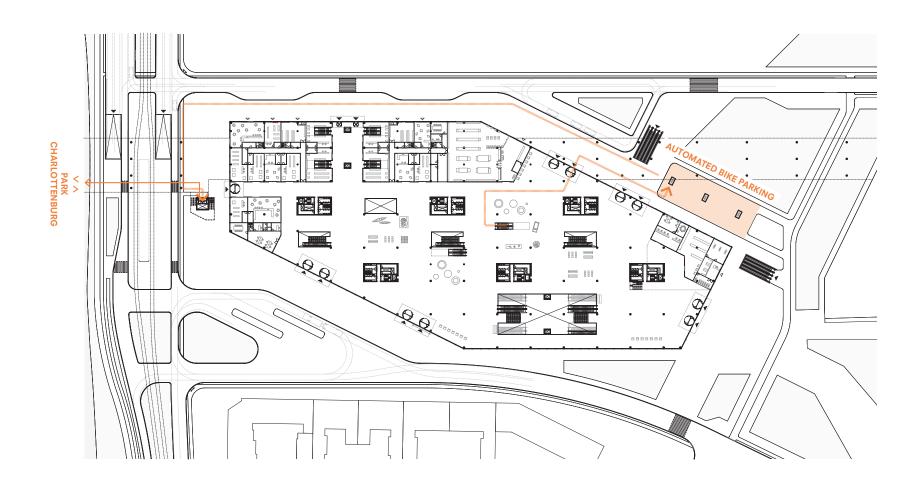The metro is encapsulated in the building, increasing passenger comfort.

Light-extensive green roof
Increasing the thermal layer of the roof

Floor heating/cooling
Heating with floor cooling in screed

Sun shading
Canopy protects building from overheating

Summer

Winter

District heating
Using district heating to heat the building during the winter

Heat pump
Using a heat pump to re-use heat flows in the building

Earth coupled cooling
Using the basement of the parking to cool water for cooling the building

Radiant panels
Using radiant panels to heat the station platforms in the building basement

ECK   WP   LBK

District heating and earth-coupled cooling. Sunshade protects the building from overheating...

VENTILATION

Natural ventilation
Summer exhaust by
opening the atrium roof

Ventilation
Ventilation type D with
heat recovery

Ventilation
Fresh air supply through the
suspended ceiling

Natural ventilation
Natural ventilation through
opening ground floor doors
during summer

**Ventilation from the ceiling of the building. In summer, natural
ventilation through the atrium roof...**

NON-TRAVELLER

PARK CHARLOTTENBURG

AUTOMATED BIKE PARKING
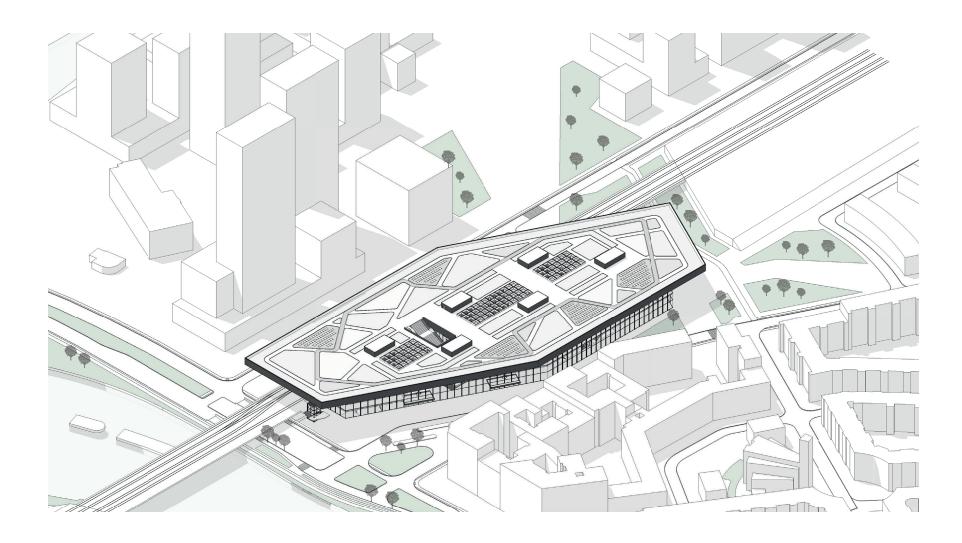
The traveller leaves the station by picking up their bike at the bike rejection pods, cycles towards the bike bridge, and leaves the station area through the adjacent park...

10
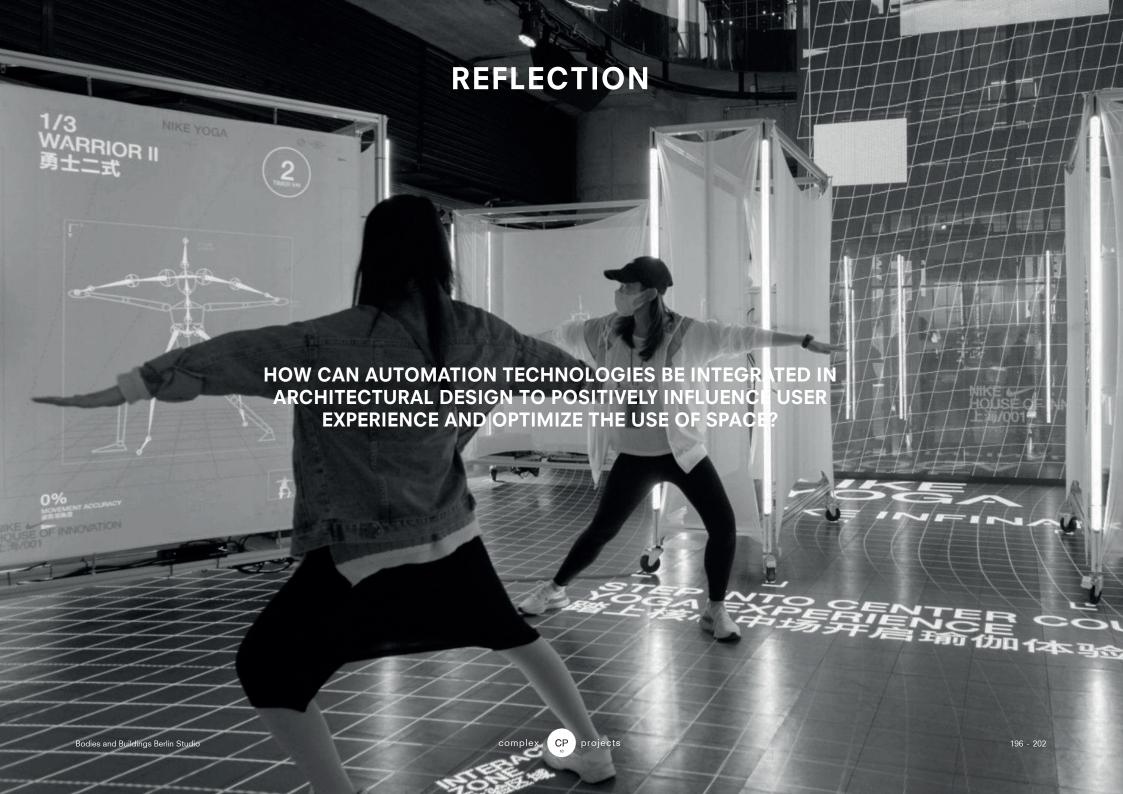
CONCLUSION

DESIGN OVERVIEW

Multimodality Forum
A more service and experience-related approach towards train stations.

REFLECTION

HOW CAN AUTOMATION TECHNOLOGIES BE INTEGRATED IN ARCHITECTURAL DESIGN TO POSITIVELY INFLUENCE USER EXPERIENCE AND OPTIMIZE THE USE OF SPACE?

REFLECTION

SHORTENING TRANSITION TIME
SERVICE CORES CENTRALISED IN THE DESIGN
USER BENEFICIAL SERVICES
CONFIGURABLE SPACE
A NEW TRAVELLERS EXPERIENCE

CONSULTED BIBLIOGRAPHY

A. Wagner. *Discover Berlin By Sustainable Transport.* Berlin , Germany: Deutsche Gesellschaft für Internationale Zusammenarbeit, 2014.

Anna Minton. *The Privatisation of Public Space.* London, United Kingdom: The Royal Institution of Chartered Surveyors, 2006.

Baggen, J.H, Hans van Ham, and A.J van Binsbergen. *Het Transportsysteem.* Delft, The Netherlands: Delft Academic Press/VSSD, 2019.

Bertolini, Luca, and Tejo Spit. Cities on Rails: *The Redevelopment of Railway Station Areas.* New York, NY: Lightning Source UK Ltd., 2010.

Boer, Hans de, Boomen Tijs van den, Paul Chorus, Jutta Hinterleitner, and D'Laine Camp. Onder Weg!: *Vijftien Ontwerpen Voor Transit Oriented Development (TOD) Aan De Zaancorridor. Amsterdam,* The Netherlands: BNAonderzoek, 2014.

Bruinsma, Frank. Railway Development: *Impacts on Urban Dynamics.* Heidelberg, Germany: Physica-Verlag, 2011.

Bureau Spoorbouwmeester, ProRail en NS Stations. Hartelijk Welkom, *Samenwerken Aan Een Prettige Ontvangst in De Stationsomgeving.* Utrecht, The Netherlands: Bureau Spoorbouwmeester, 2017.

Civic Architects, The Cloud Collective. *Het Openluchtstation, De Nieuwe Opgave: Het Vitale En Comfortabele Ontvangstdomein.* Utrecht, The Netherlands: Bureau Spoorbouwmeester, 2018.

Curtis, Carey, John L. Renne, and Luca Bertolini. *Transit Oriented Development: Making It Happen.* London, United Kingdom: Routledge, 2016.

Dewar, Anthony, Frank Anatole, and Trevor Wilson. *Station Design Guidance Design Manual.* London, United Kingdom: Network Rail, 2021.

Dingeste, A, and M de Boer. *"Landschap Als Organisatiestructuur."* Cement, 2008, 24–33.

Donselaar, P.M Wortelboer-van, P. Jorritsma, and Johan Visser. *Regie Op Knooppunten.* Den Haag, The Netherlands: Kennisinstituut voor Mobiliteitsbeleid, 2012.

Ersoy, Aksel, John Bryson, and Ellen Van Bueren. *"Unlocking Values through Infrastructure Interdependencies."* Infrastructure Asset Management 7, no. 2 (2020): 134–43. https://doi.org/10.1680/jinam.18.00029.

Follmer, Robbert. *Mobility in Germany.* Bonn, Germany: Bundesministerium für Verkehr und digitale Infrastruktur, 2019.

Greene, M, J Reyes, and A Castro. *"Degrees of Sustainable Location of Railway Stations: Integrating Space Syntax and Node Place Value Model on Railway Stations in the Province of North Holland's Strategic Plan for 2010–2040,"* 2012.

Guigon, Marc. *Railway Stations Boosting the City.* Paris, France: International Union of Railways (UIC), 2019.

Haque, A M, S Rezaei, C Brakewood, and A Khojandi. *"A Literature Review on Park-and-Rides."* The Journal of Transport and Land Use 14, no. 1 (October 1, 2021): 1039–60.

Het ministerie van Infrastructuur en Waterstaat. *Contouren Toekomstbeeld OV 2040.* Den Haag, The Netherlands: Het ministerie van Infrastructuur en Waterstaat, 2019.

International Association of Public Transport. *Design Excellence for Public Transport Excellence.* Brussel, Belgie: UITP, 2015.

Julies Menge. *Berlin´s Urban Transportation Development Plan 2025 - Sustainable Mobility.* Berlin, Germany: Senate Department for Urban Development and the Environment of the State of Berlin, 2014.

K, de Lange. *Ontwikkelagenda Toekomstbeeld OV, Nu Instappen Naar 2040.* Den Haag, The Netherlands: Het ministerie van Infrastructuur en Waterstaat, 2021.

M, Loos, E, Luiten. *Het Nieuwe Stationskwartier, Ruimtelijke Kwaliteit Op Het Grensvlak Van Knooppunt En Stad.* Utrecht, The Netherlands: Bureau Spoorbouwmeester, 2019.

M. van Hagen, M. Exel. *De Reiziger Centraal, De Reiziger Kiest De Weg Van De Minste Weerstand.* Utrecht, The Netherlands: Bureau Spoorbouwmeester, 2012.

Mark van Hagen, Menno de Bruyn. *Typisch NS Elk Station Zijn Eigen Rol.* Utrecht, The Netherlands: NS

Productmanagement, 2002.

Mecanoo architecture, Pro Rail, Springtime, Bureau Spoorbouwmeester. *Journey to the Future A Passenger Experience.* Utrecht, The Netherlands: Bureau Spoorbouwmeester, 2019.

P. Schaap. *Het Stationsconcept, Visie En Toepassing.* Utrecht, The Netherlands: Bureau Spoorbouwmeester, 2012.

Paul Gerretsen, Miriam Ram, Karishma Asarpota, Rien van de Wall, Jurgen de Haan. *Model Informatieprofiel Knooppunten.* Rotterdam, The Netherlands: Vereniging Delta Metrapool, 2019.

Petit, Max. *Spatial Integration of Newly Developed Train Stations in Mid-Sized Cities in the Netherlands.* Wageningen, The Netherlands: Wageningen University and Research, 2022.

Pro Rail. *Public Transport in 2040 Outlines of a Vision for the Future.* The Hague, The Netherlands: Ministry of Infrastructure and Water Management, 2019.

Rode, Philipp, Christian Hoffmann, Jens Kandt, Duncan Smith, and Andreas Graff. *Towards New Urban Mobility The Case of London and Berlin.* London, Untied Kingdom: London School of Economics and Political Science, 2015.

Senate Department for Urban Development and the Environment. *Berlin Strategy, Urban Development Concept Berlin 2030.* Berlin, Germany: Senate Department for Urban Development and the Environment, 2015

Siikonen, Marja-Liisa. *People Flow in Buildings.* Hoboken, NJ: Wiley-Blackwell, 2022.

Spoorbeeld. *Aandachtspuntenlijst Duurzame Stations.* Utrecht, The Netherlands: Bureau Spoorbouwmeester, 2019.

Thomas, Ren, and Bertolini Luca. *Transit-Oriented Development: Learning from International Case Studies.* Cham, Switzerland: Palgrave Macmillan, 2020.

Tork, Hossam Amir Mohammed. *The Development Of Train Stations' Design.* Cairo, Egypt: Ain Shams University, 2010.

Triggianese, M, and R Cavallo. *"The Station of the Future Amsterdam's Stations in Transition."* OverHolland – Architectonische studies voor de Hollandse stad 12, no. 20 (2019): 39–60.

Triggianese, M, and Y Soylev. *Inclusive Stations.* Delft, The Netherlands: Unspecified, 2021.

Triggianese, M. *"European High Speed Railway, Understanding Design Contractions For Long-Term Urban Architecture Strategy,"* 2014.

Triggianese, Manuela, and Fabrizia Berlingieri. *"Intermodal Nodes for the European Metropolis: Amsterdam Zuidas as Eurandstad's Gate."* Advanced Engineering Forum 11 (2014): 220–26. https://doi.org/10.4028/www.scientific.net/aef.11.220.

Triggianese, Manuela, Olindo Caso, and Yagiz Soylev. *Living Stations: The Design of Metro Stations in the (East Flank) Metropolitan Areas of Rotterdam.* Delft, The Netherlands: TU Delft, BK Bouwkunde, 2021.

Triggianese, Manuela, R. Cavallo, Nacima Baron, and Joran Kuijper. *Stations as Nodes: Exploring the Role of Stations in Future Metropolitan Areas from a French and Dutch Perspective.* Delft, The Netherlands: TU DElft Open, 2019.

Van Acker, Maarten, and Manuela Triggianese. *"The Spatial Impact of Train Stations on Small and Medium-Sized European Cities and Their Contemporary Urban Design Challenges."* Journal of Urban Design 26, no. 1 (2020): 38–58.

Zijlstra, Toon, Thomas Vanoutrive, and Ann Verhetsel. *"A Meta-Analysis of the Effectiveness of Park-and-Ride Facilities."* European Journal of Transport and Infrastructure Research, no. 15(4) (September 2015): 597–612.

FIGURE LIST