

- 1. INTRODUCTION
 - 2. RESEARCH
 - 3. DESIGN BRIEF
 - 4. CONCEPT
- 5. IMPLEMENTATION
 - 6. DEVELOPMENT
 - 7. CONCLUSION

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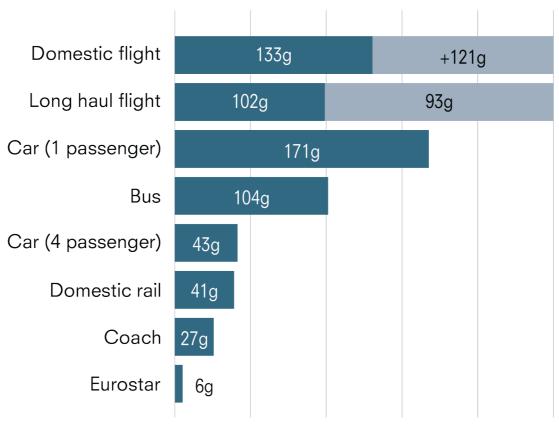
ANGELA MERKEL



https://www.railtech.com/policy/2021/01/11/angela-merkel-only-with-rail-we-will-achieve-our-climate-goals/

TRAIN MOST SUSTAINABLE

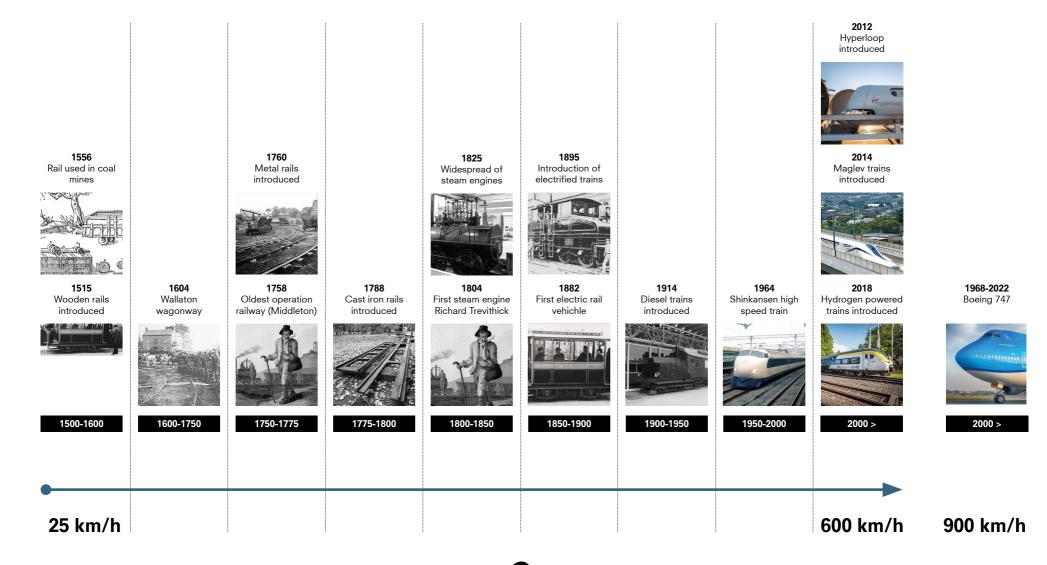




■ CO2 emissions ■ Secondary effects from high altitude, non-CO2 emissions

Chanes, Milena & Moroz, Ivan & Cesarino, Ivana & Leao, Alcides & Jawaid, Mohammad & Dias, Otavio. (2022). A Review of Natural Fibers Reinforced Composites for Railroad Applications. Applied Science and Engineering Progress. 15. 10.14416/j.asep.2022.03.001.

CLOSING THE SPEED GAP





EURASIA



SILK RAILROAD CONNECTION



BERLIN IN CENTRAL EUROPE



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research

RESEARCH QUESTION

IF INTERCONTINENTAL TRAVELING BY TRAIN BECOMES THE STANDARD, WHAT ARE THE REQUIREMENTS TO DESIGN AN INTERCONTINENTAL STATION?

research

RESEARCH SUB QUESTIONS

WHAT IS THE REQUIRED PROGRAM TO FACILITATE INTERCONTINENTAL TRAVELING BY TRAIN?

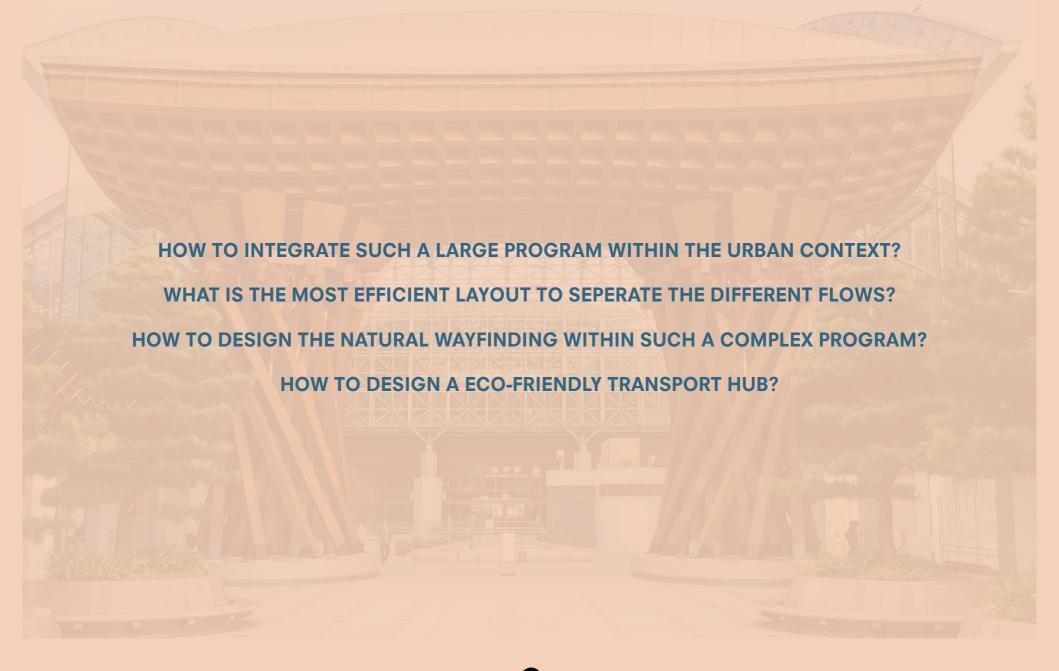
WHAT IS THE BEST LOCATION FOR AN INTERCONTINENTAL STATION WITHIN EUROPE?

WHAT ARE THE CLIENT'S AMBITIONS?

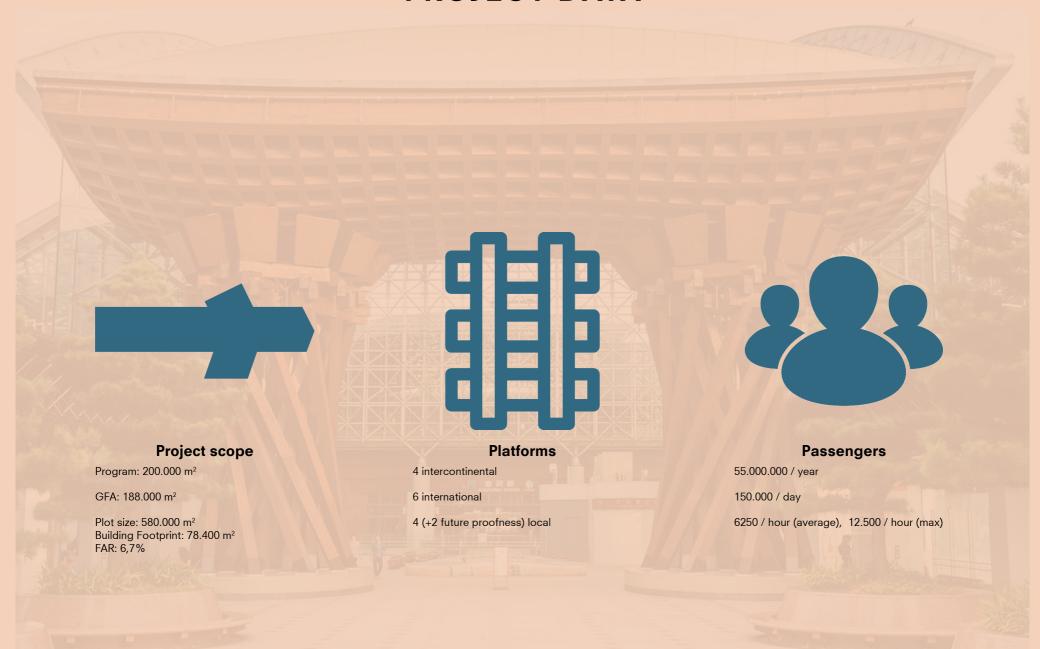
DESIGN PROPOSAL



DESIGN QUESTIONS



PROJECT DATA



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CLIENT

DEUTSCHE BAHN



DEUTSCHE BAHN GROUP









DB Cargo



DB Netze Track



DB Netze Stations

CLIENT AMBITIONS





for the climate

- 100% share in renewable energy
- EU's climate targets



for the people

- by 2050, 85% of population will live in metropolitan areas
- preserving individual mobility



for the economy

- demand for freight transport
- work related mobility



for Europe

- heart of the continent (European network)
- pioneer for advancing European objectives

https://ibir.deutschebahn.com/2020/en/group-management-report/strong-rail/our-inner-ambition

INITIATERS





ASIA

WHY DO WE NEED BETTER CONNECTIVITY?



€1.6 TRILLION IN ANNUAL TRADEBETWEEN EUROPE AND ASIA



EUROPE AND ASIA ACCOUNT FOR OVER **60% OF THE WORLD'S GDP**



SINCE 2014, **OVER 32,000 STUDENTS AND ACADEMIC STAFF** HAVE TRAVELLED
BETWEEN OUR TWO REGIONS



WE HAVE A JOINT RESPONSIBILITY TO PROTECT OUR ENVIRONMENT



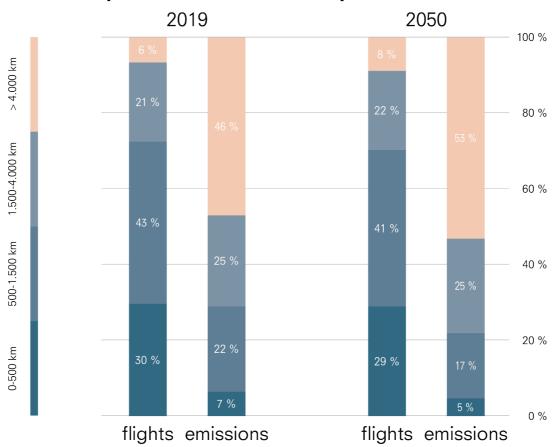
CROSS-BORDER RULES AND
REGULATIONS MEAN FAIR
COMPETITION FOR BUSINESSES



FISCAL AND FINANCIAL STABILITYREQUIRES LONG-TERM PLANNING

REPLACING PASSENGER LONG HAUL FLIGHTS

Airplane CO2 emissions by distance flown



STAKEHOLDERS AMBITIONS



sustainable transport + station

'The Paris Agreement'

First continent to be climate-neutral in 2050

net-zero station as symbol



safe, efficient & comfortable travel experience

- ticketless traveling
- biometric security check
- high speed railway system



strengthen cultural & economic relations

gateway to:

- cultural encounter
- new economy (freight delivery; packages)

25

STATION USER GROUPS

for leisure





the solo traveler



the family tourists



the worker

STATION AS A DESTINATION



start cultural journey

- exhibition
- station library



shops, drinks & food

shopping mall:

- retail
- hairdresser
- gym



support services

- money exchange
- information services
- telephone provider

CLIENT CONCLUSION



PROGRAM

design brief | program

PROGNOSED CAPACITY 2050

14 tracks

150.000 passengers/day (arrivals & departures)

75 intercontinental trains/day 100 international trains/day



intercontinental

- 1.000 passengers/train
- trains 500 m long
- arriving from 1 route

4 platforms



international

- 800 passengers/train
- trains 400m long
- arriving from 6 routes

6 platforms



local (S+R)

- 200-400 passengers/train
- trains 100-200 m long
- arriving from 2 routes

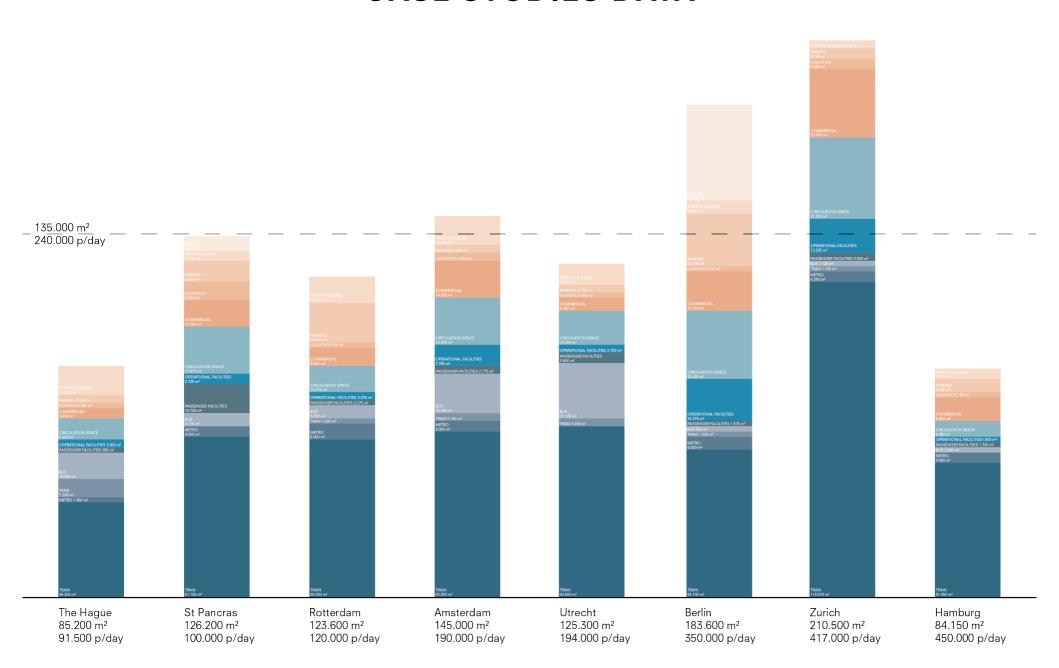
4 platforms (+2 future proofness)

30

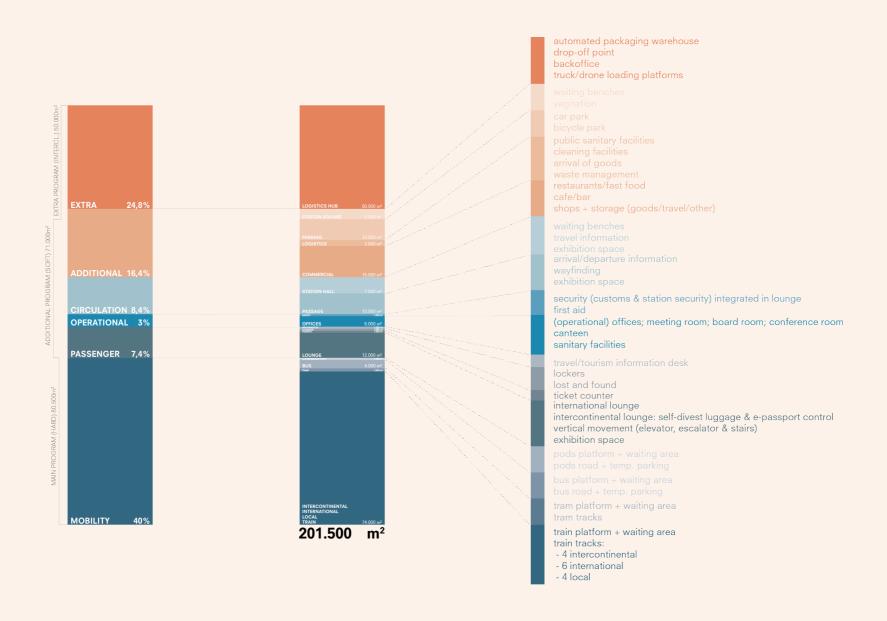
CASE STUDIES LOCATION



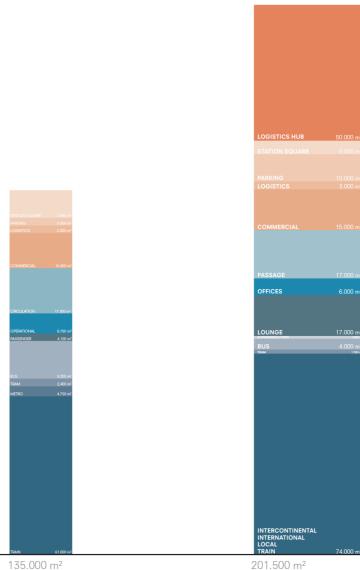
CASE STUDIES DATA



EDUCATED GUESS



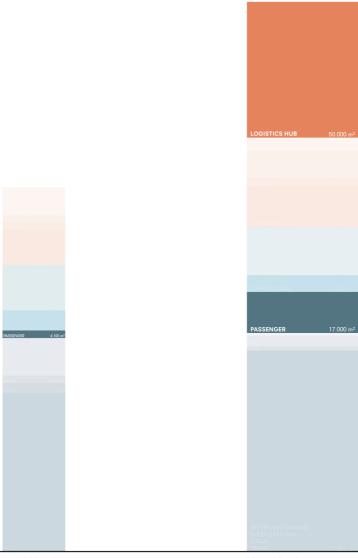
COMPARE TO CASE STUDY AVERAGES



135.000 m² 240.000 p/day 201.500 m² 150.000 p/day

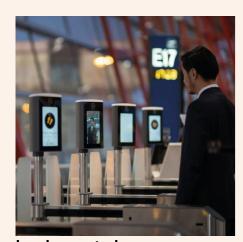
design brief | program

MAIN DIFFERENCES



135.000 m² 240.000 p/day 201.500 m² 150.000 p/day

EXTRA PROGRAM



border control

1.900 m²

- e-passport control
- security check
- support accomodation



Lounges

12.000 m²

- arrival lounges
- departure lounges
- checked baggage services
- retail





exhibition space

4.000 m²

- on platform & in passage
- in lounge
- in station hall



logistics hub

50.000 m²

- automatic warehouse
- freight tubes
- drone delivery

EXTRA PROGRAM FOCUS



border control

1.900 m²

- e-passport control
- security check
- support accomodation



Lounges

12.000 m²

- arrival lounges
- departure lounges
- checked baggage services
- retail
- facilities



exhibition space

4.000 m²

- on platform & in passage
- in lounge
- in station ha

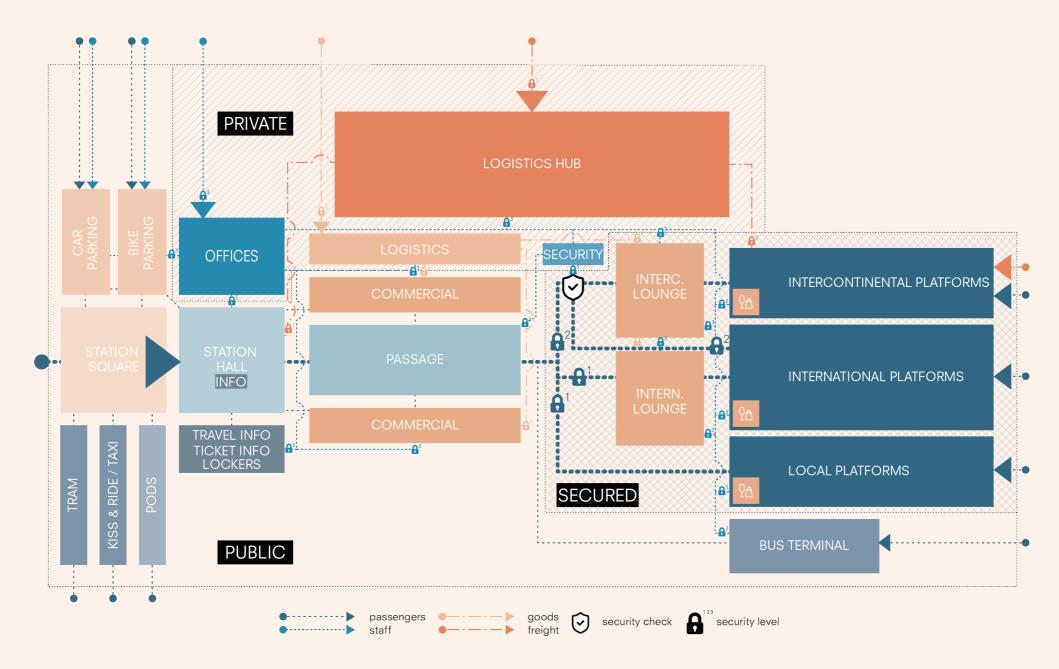


logistics hub

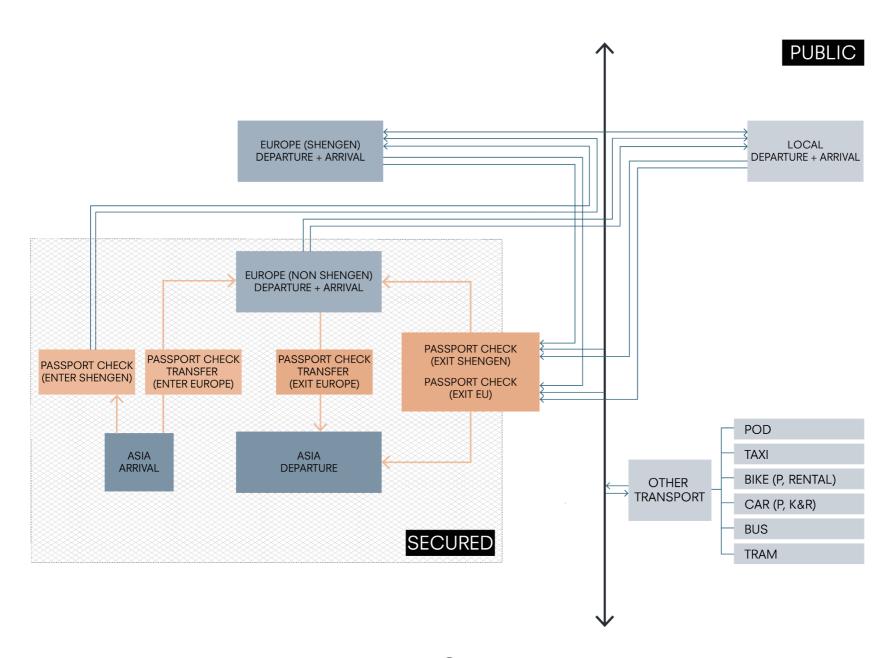
50.000 m²

- automatic warehouse
- treight tubes
- drone delivery

PROGRAM RELATIONS



PASSENGER FLOWS

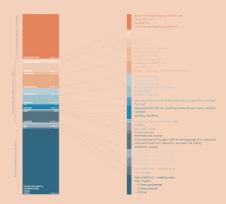


PROGRAM CONCLUSION



Extra intercontinental program

- border control
- arrival & departure halls
- cultural encounter



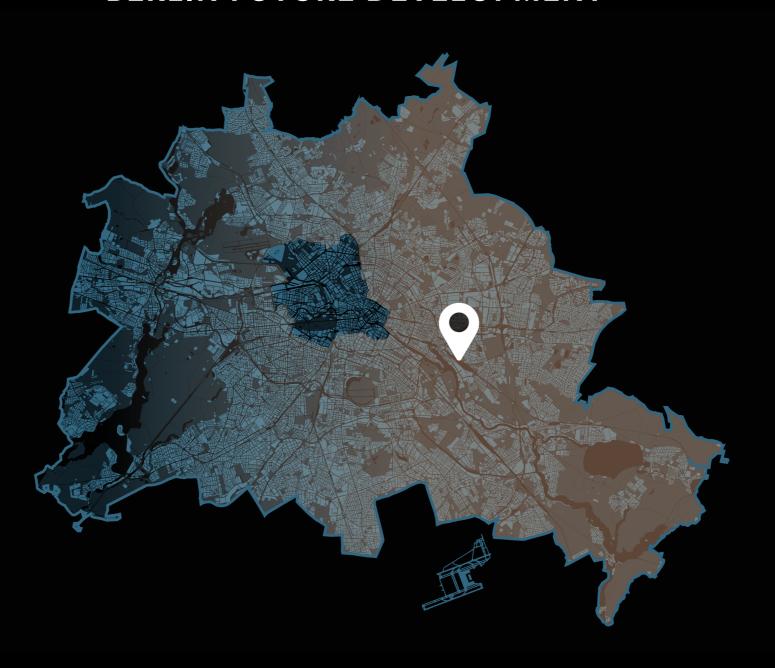
Program breakdown

150.000 pass./day 200.000 m²

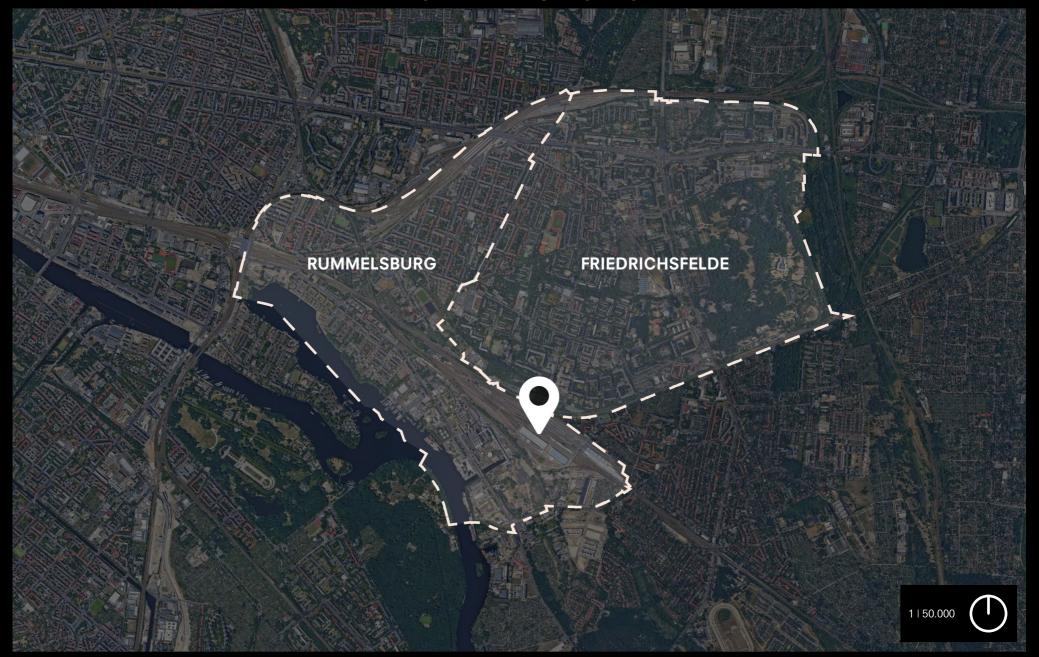
- hard program 80.500 m²
- soft program 71.000 m²
- extra program 50.000 m²

SITE

BERLIN FUTURE DEVELOPMENT



RUMMELSBURG



EXISTING STATION





BETRIEBSBAHNHOF RUMMELSBURG



SHUNTING YARD (POTENTIAL)



design brief | site PARK (POTENTIAL)



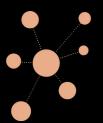
HOW IS THIS LOCATION CHOSEN?

LOCATION REQUIREMENTS

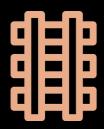
XL

M

XS



interc. & intern. connections



on railway corridor local connections



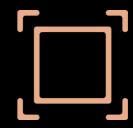
central location important connections



removing barriers



potential city development



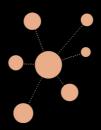
enough space for program



accessible intermodality

projects

design brief | site CONNECTIONS

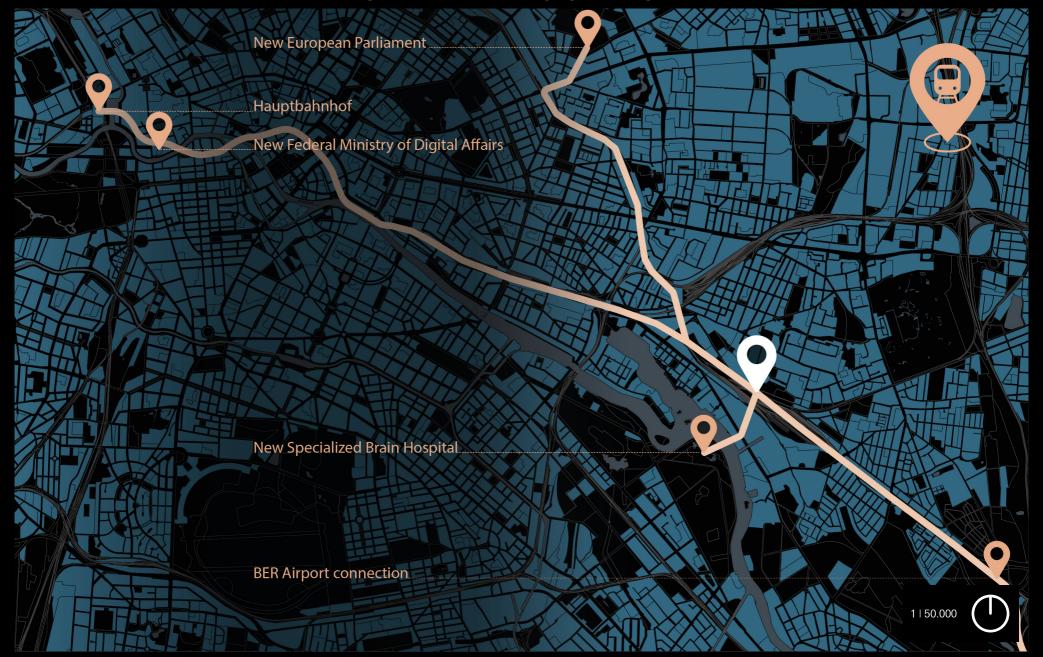




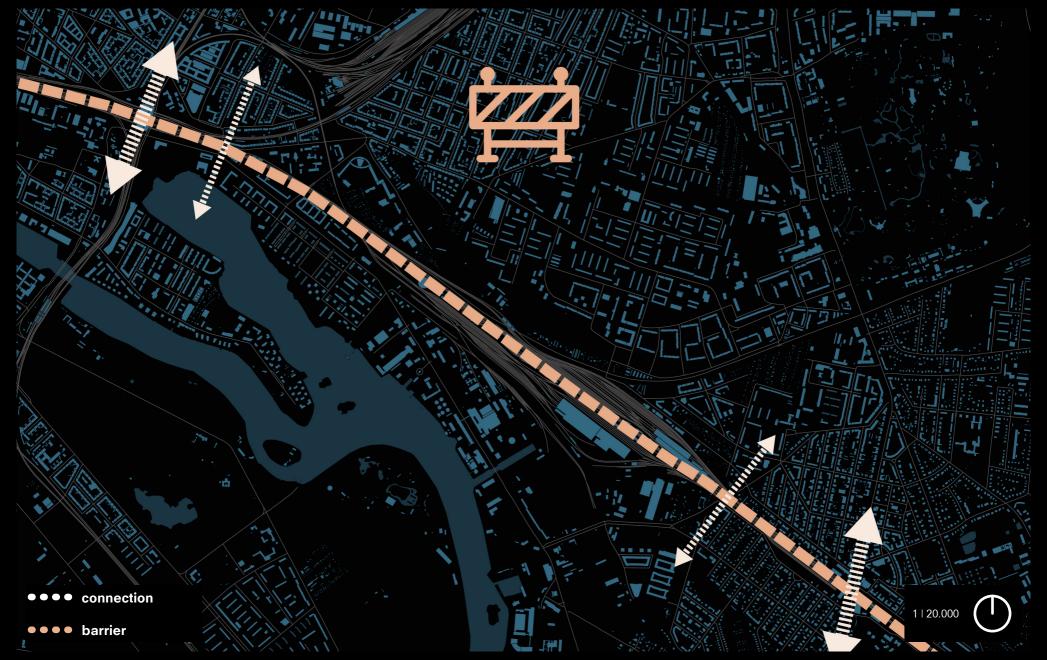




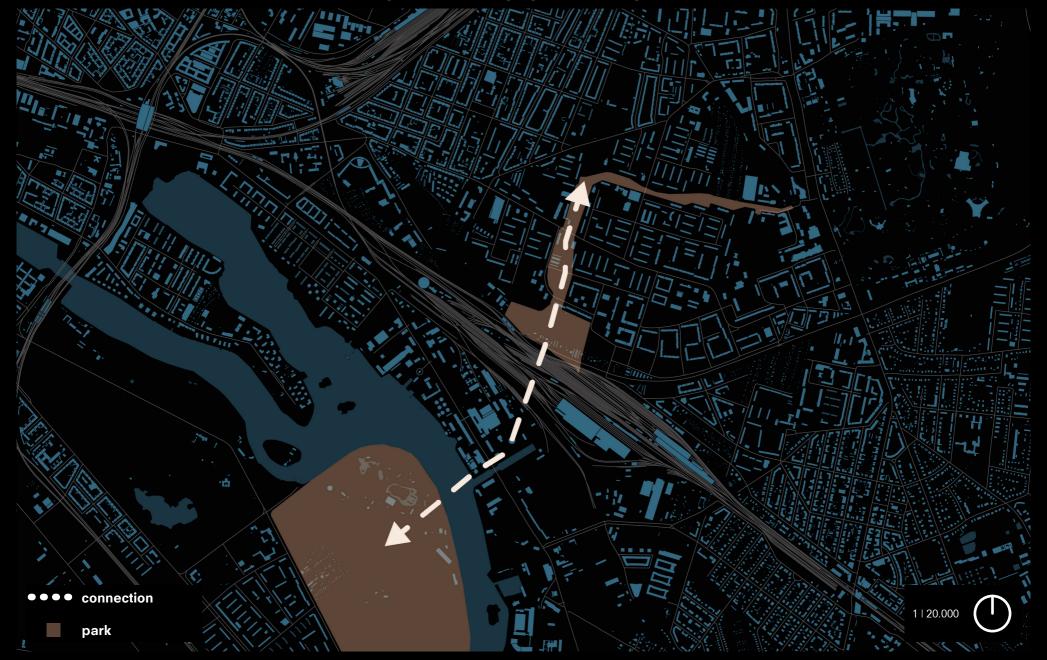
CENTRAL LOCATION



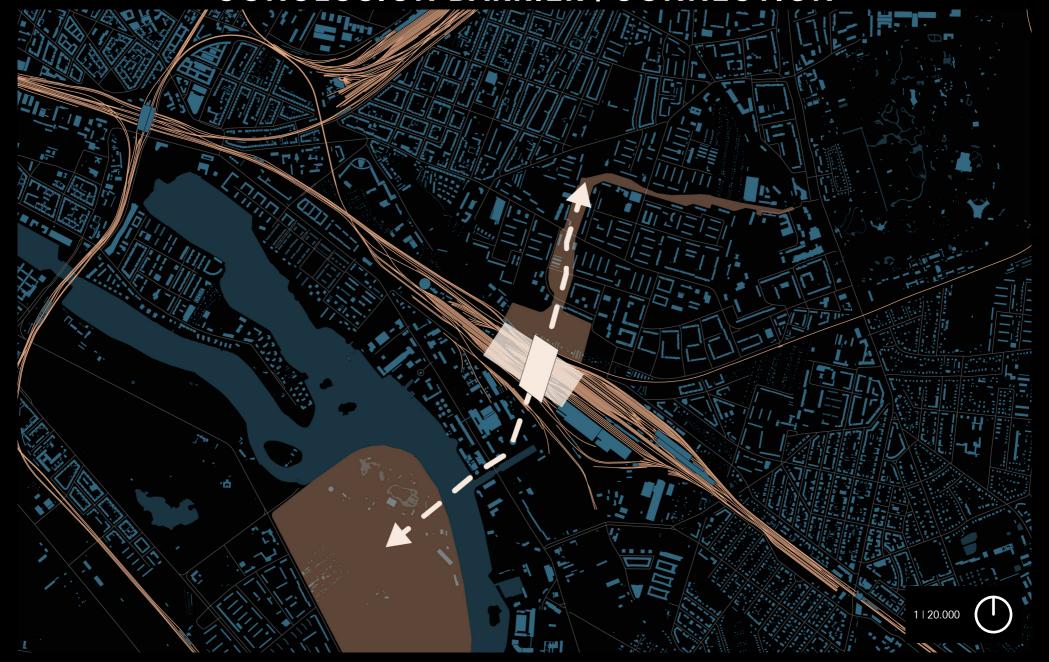
RAILWAY BARRIER



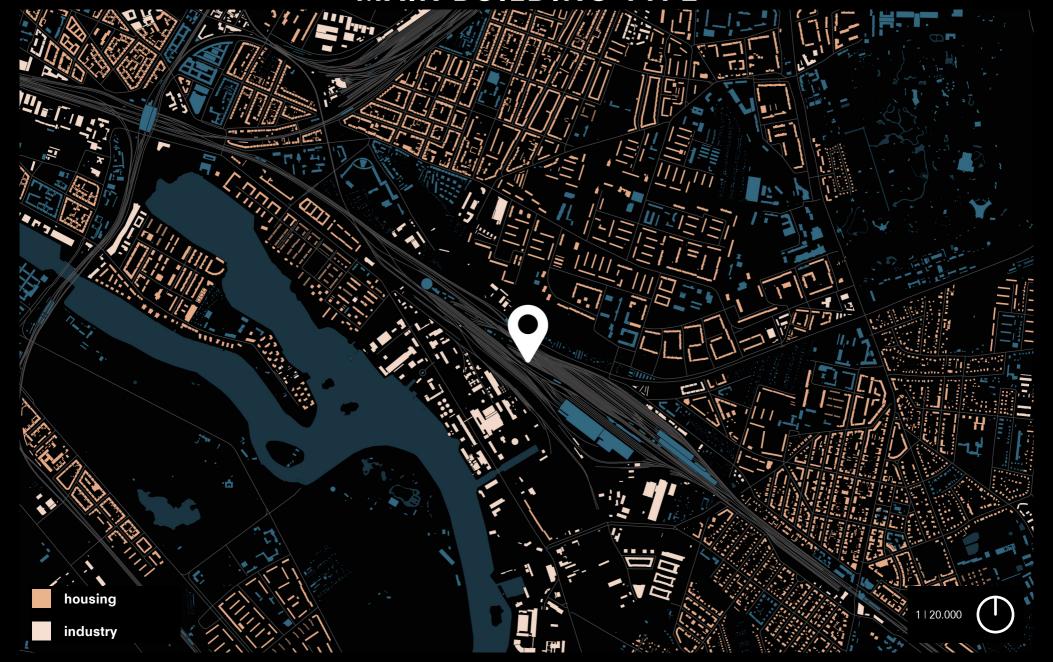
GREEN CORRIDOR



CONCLUSION BARRIER | CONNECTION



MAIN BUILDING TYPE



INDUSTRY



INTERCONTINENTAL BUSINESS DISTRICT



https://zuidas.nl/en/thema/zuidas-is-developing/

VATTENFALL POWERPLANT



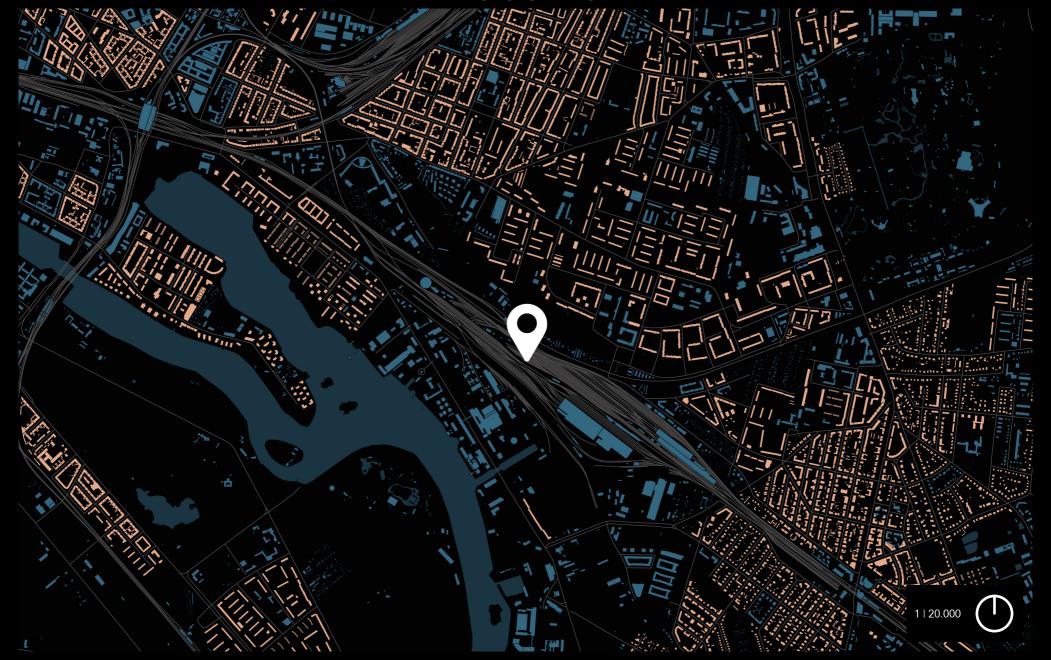
Afbeelding: Staatsmonumentenbureau Berlijn

CONCLUSION INDUSTRY | REDEVELOP

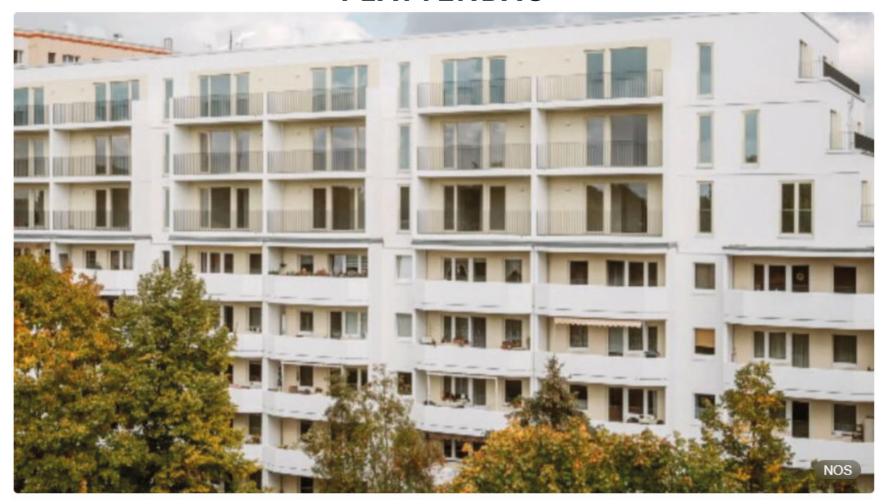


https://www.archdaily.com/902986/chinas-mega-industrial-regeneration-project-has-lessons-for-the-world/5bb5f9baf197ccab3c000f41-chinas-mega-industrial-regeneration-project-has-lessons-for-the-world-image?next_project=no

HOUSING



PLATTENBAU



NOS Nieuws • Vandaag, 20:00



'Optoppen' in plaats van nieuwbouw: DDR-flats tegen de woningnood

LOW DENSITY

Mitte





250-450 inhabitants/ha (max 550 or more)

0,6 to < 0,7 land to building ratio

71-250 inhabitants/ha

0,1 to < 0,2 land to building ratio

1 | 5000



CONCLUSION HOUSING | DENSIFY



Rummelsburg



250-450 inhabitants/ha (max 550 or more)

0,4 to < 0,7 land to building ratio

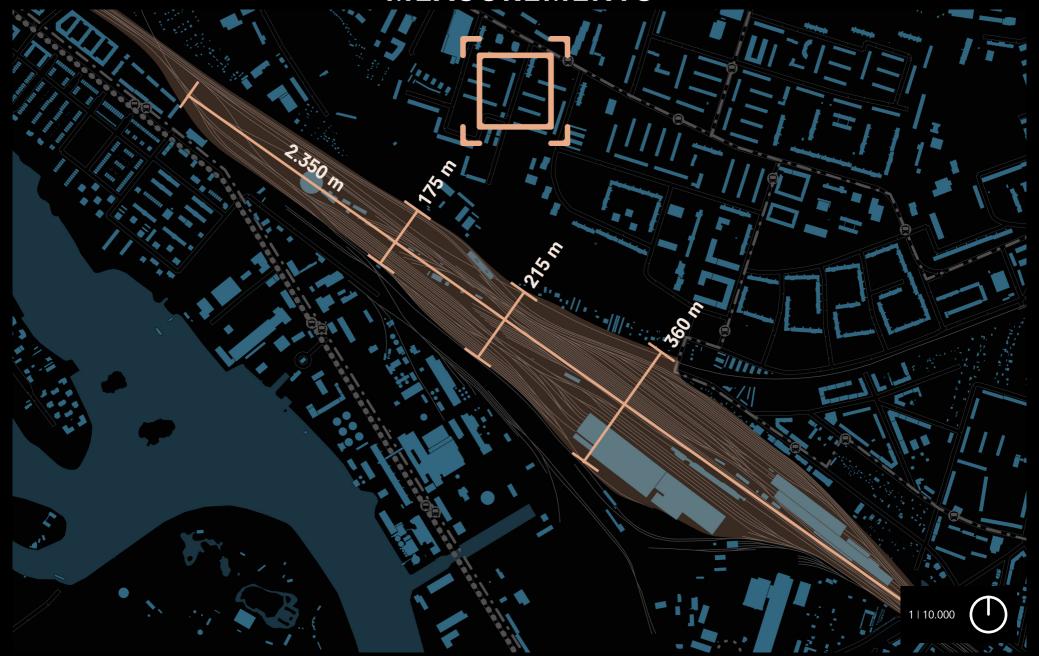
250-450 inhabitants/ha

0,4 to < 0,7 land to building ratio

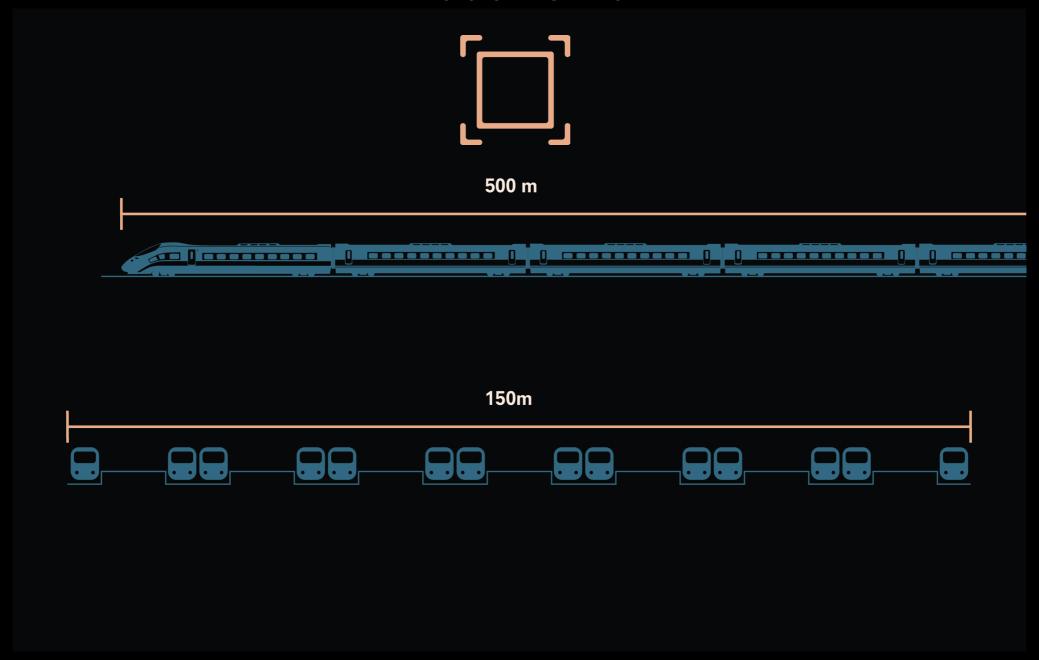
1 | 5000



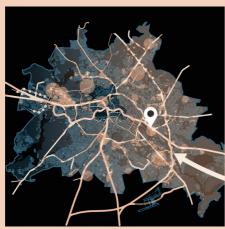
MEASUREMENTS



ENOUGH SPACE



SITE CONCLUSION



Smart location requirements

Rummelsburg



Urban Vision 2050

station as green connector

station as urban catalyst

ESSENCE PROJECT



Sustainable Transport Hub

gateway to green transport eco-friendly building



Intercontinental Transport

4 Intercontinental platforms

6 International platforms

Arrival & Departure Lounges

Border control

Cultural spaces



Station as catalyst for urban development

Residential area north side with a park as buffer

Potential business district south side

Connecting green spaces

Removing railway barrier

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PROJECT AMBITIONS



Efficient intercontinental transport

hierarchy in program; international vs local

efficient transport flows

comfortable spaces



Community & Eco-Friendly focused building

remove barriers | connecting neighbourhoods

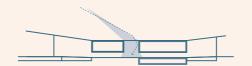
respond to local physical identity

- residential north side
- potential redevelopment south side

ARCHITECTURAL DESIGN THEMES







Flows of passangers

intercontinental passengers top priority efficient, safe & comfortable flows

Transparancy

for inclusiveness + legibility of a train station open, accessible and inviting

Use of daylight

for comfortable spaces (lounges) for natural wayfinding

Green urban integration

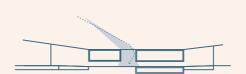
connecting green areas

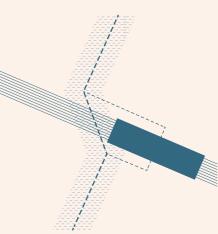
barrier free

DESIGN PRINCIPLES









Efficient flows + hierarchy

clear & efficient passenger flows + sightlines

- spatial relations
- seperate flows between local and intercontinental transport

efficient (other) transport flows

- tram, bus, taxi, car, pods, bike

inclusive (accessible + barrier free)

- flat design
- elevators + escalators
- gatefree passage

Transparent building

- for natural wayfinding
- legibility of train station

Skylight deep into building

- for natural wayfinding
- comfortable spaces

Barrier free connections

station as a catalyst for urban development

gesture to potential south business district - large station hall on south side

modest to north residential neighbourhood

- park used as buffer on north side

green facades, roof & passages

STRATEGIES | HIERARCHY





- + barrier free ground level
- + south intercontinental -> north local
- + accessible
- huge (visual) barrier
- large station footprint
- long passage
- two levels

on ground

- + lower building
- + south intercontinental -> north local
- huge (visual) barrier
- underground passage
- long passage
- two levels

underground

- + barrier free ground level
- + south intercontinental -> north local
- + small station footprint
- + one level
- + accessible
- long passage
- difficutl legibility of a station

split

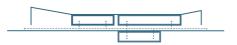
- + barrier free ground level
- + high intercontinental -> low local
- + small station footprint
- + short passage
- + accessible
- two levels
- visual barrier

stacked

- + barrier free ground level
- + high intercontinental -> low local
- + small station footprint
- + very short passage
- multiple levels
- many passages
- not very accessible

STRATEGIES | EFFICIENT FLOWS







one level

- + one main passage
- mixed flows
- not a clear division

multiple levels

- + seperate flows
- + clear division
- + hierarchy in flows

STRATEGIES | TRANSPARENT BUILDING







inside

natural wayfinding

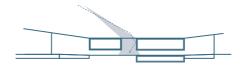
human scale

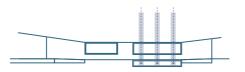
outside

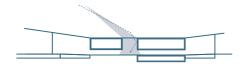
legibility of station

urban connection

STRATEGIES | USE OF DAYLIGHT







deep in building

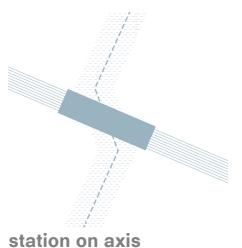
natural daylight

for wayfinding

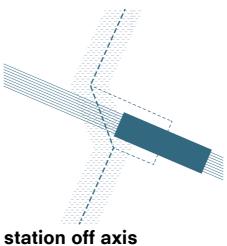
highlighting important spaces

STRATEGIES | GREEN URBAN INTEGRATION

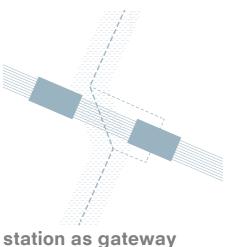




- + legibility of station entrance (landmark)
- station can be closed
- interrupted green space

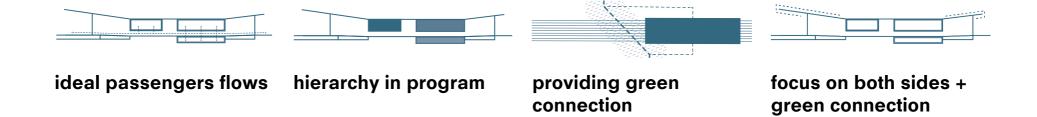


- + continuous green space
- + separate flows
- + clear layout
- less cohesive design



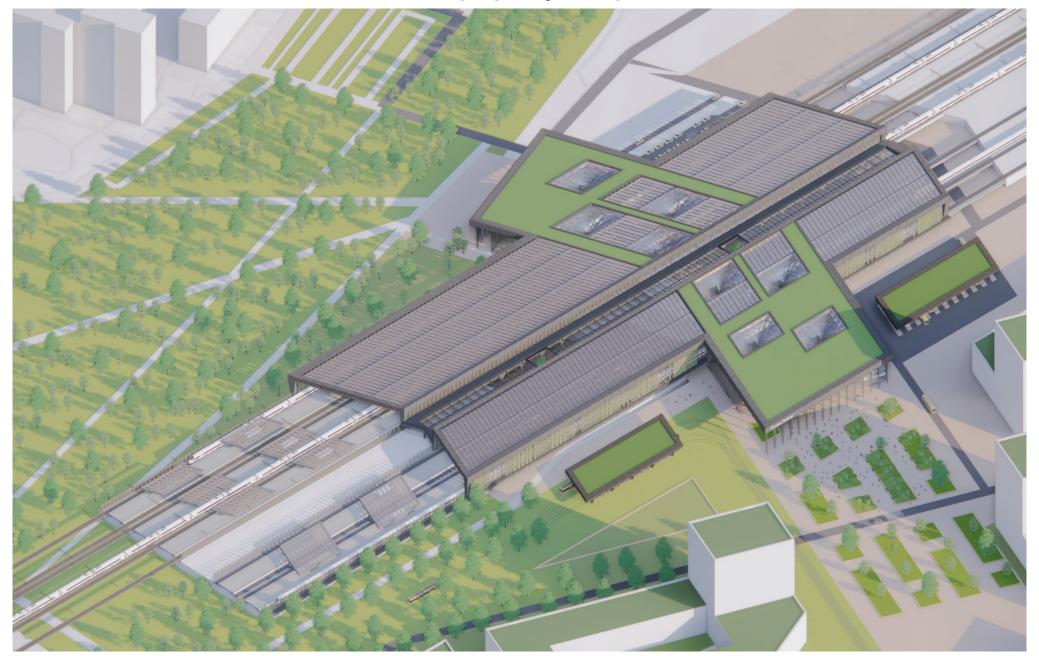
- + continuous green space
- + split of program; passengers vs. packeges
- + cohesive design

MASSING CRITERIA



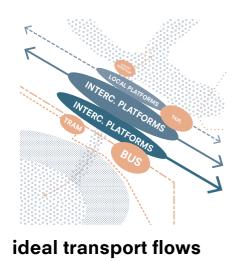
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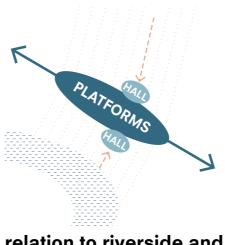
DESIGN I AXO

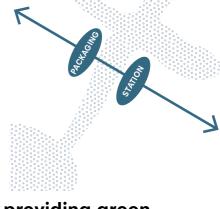


HOW TO POSITION THE STATION WITHIN THE URBAN CONTEXT?

ANCHORING IN LOCATION



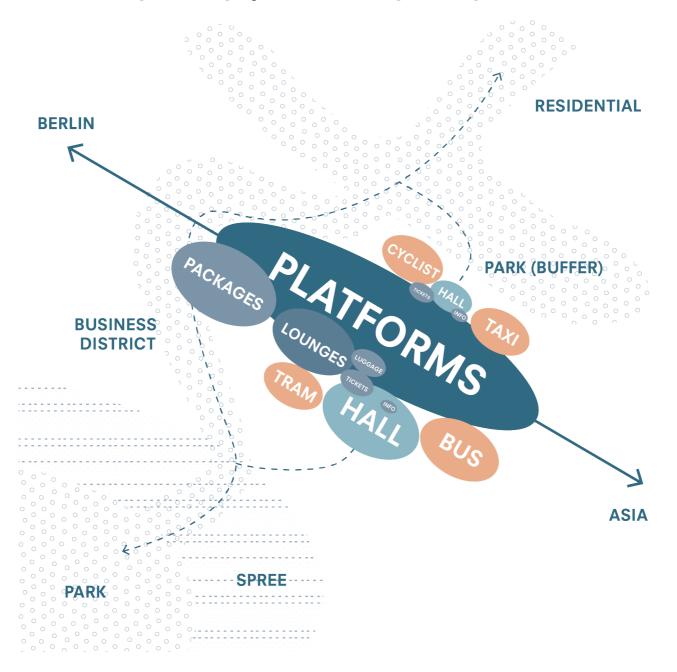




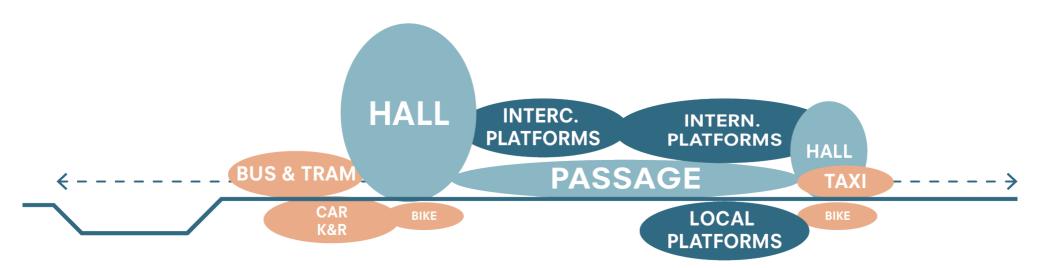
relation to riverside and parkside

providing green connection

ZONING I PLAN HORIZONTAL



ZONING PLAN I VERTICAL



ICONIC LANDMARK









Focus on south

- + related interc. program on south
- + modest to residential program on north
- + relation to waterside
- north side will also be developed (catalyst)

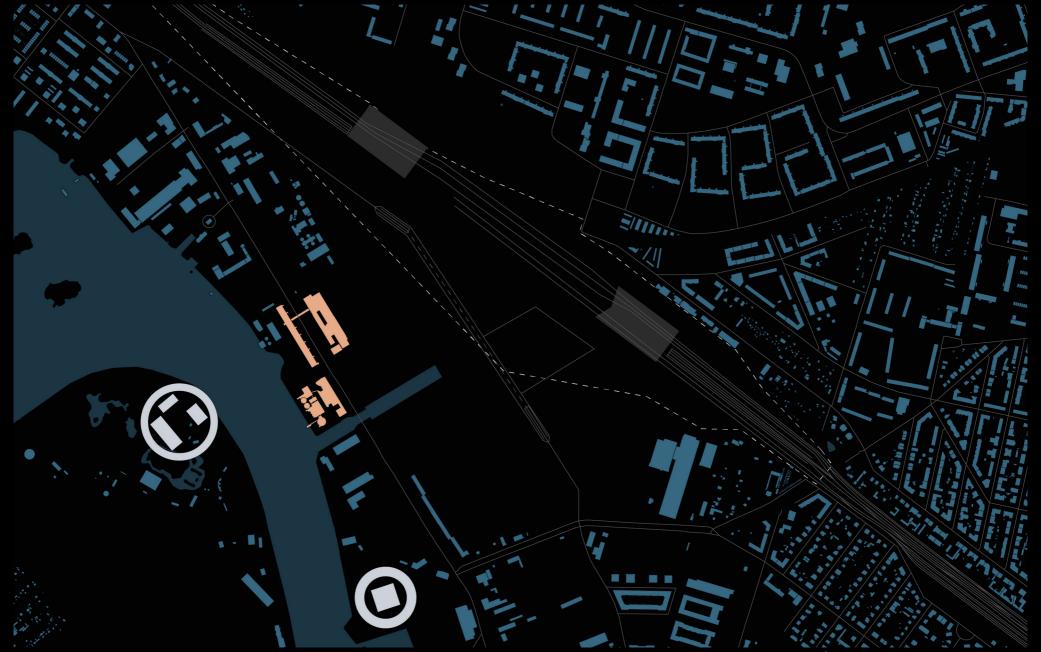
Focus on north

- + takes development on the north side in consideration
- not related to interc. program south
- not modest to residential program on north
- not related to waterside

Focus on both

- + related interc. program on south
- + relation to waterside
- + takes development on the north side in consideration
- north side could be slightly more modest

SITE



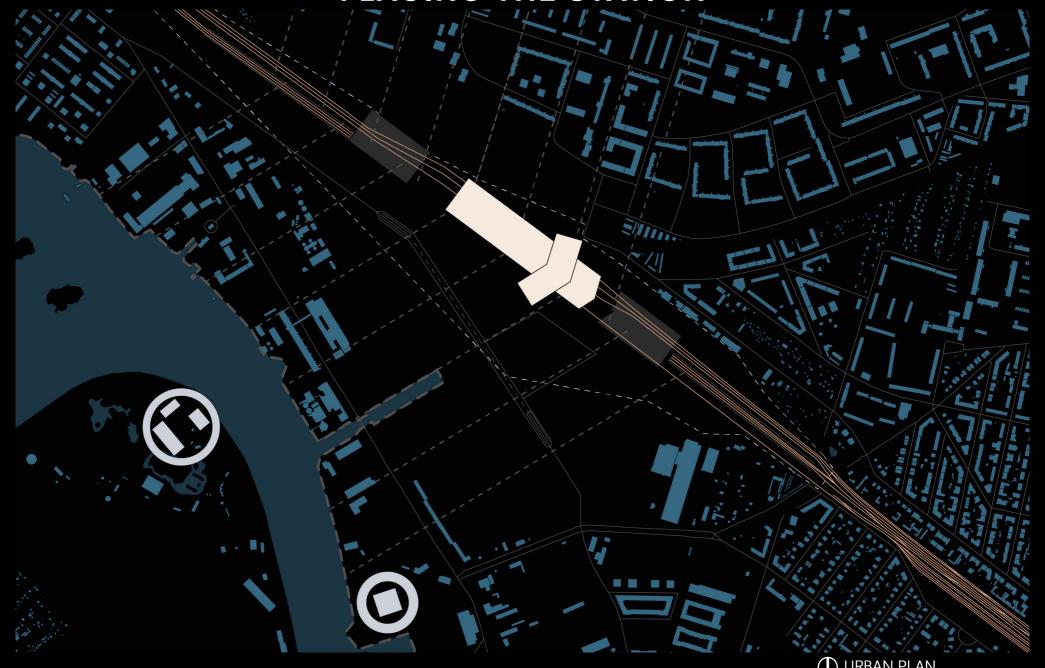
ASIA CONNECTION



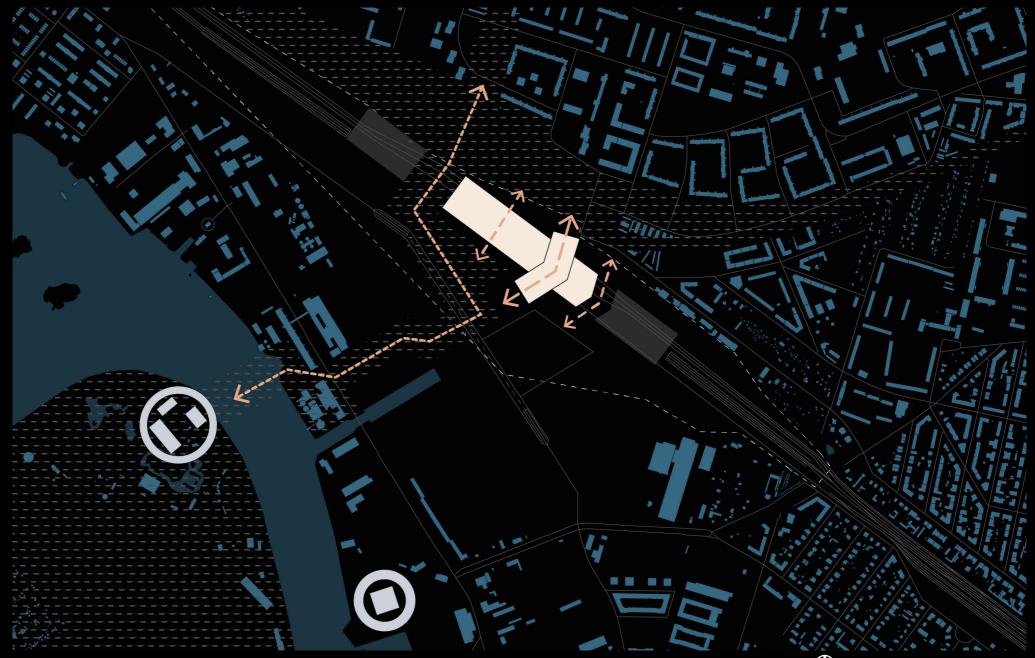
URBAN ORIENTATION



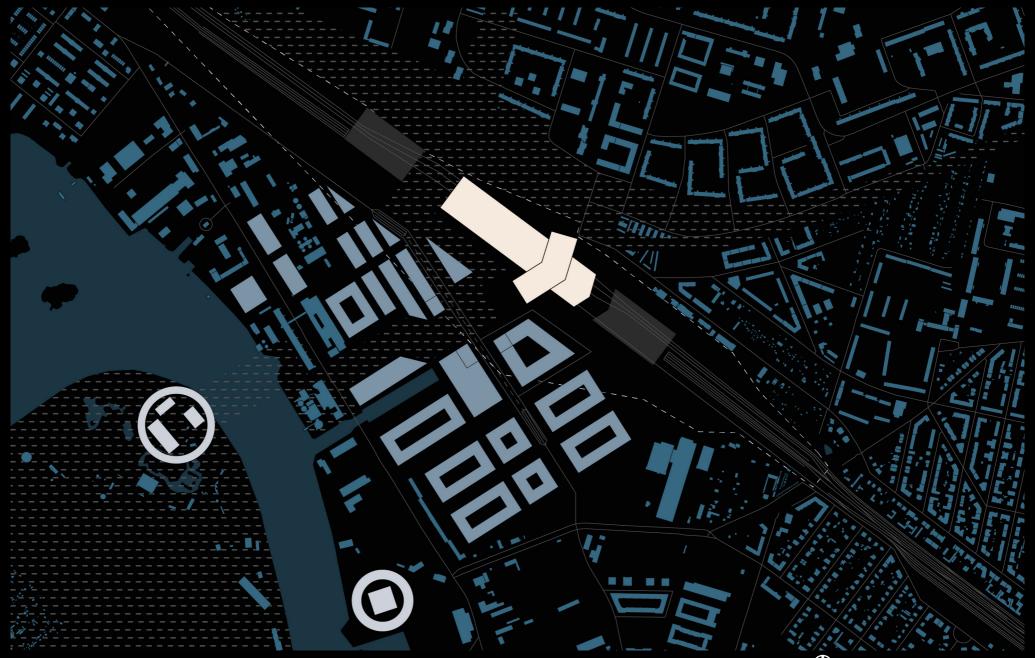
PLACING THE STATION



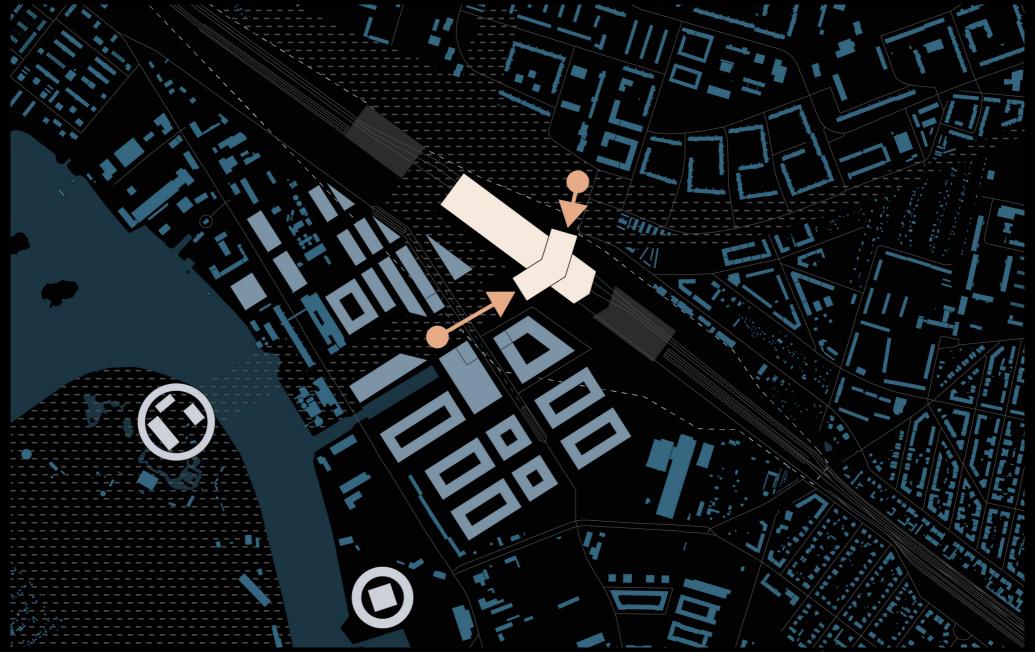
CONNECTING GREEN AREAS



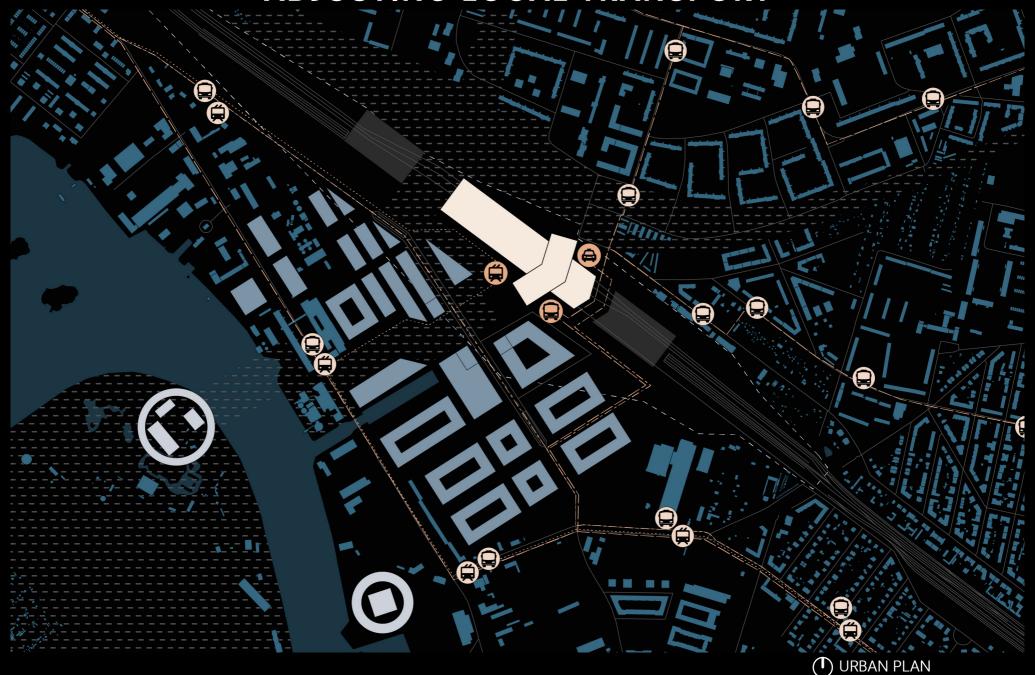
STATION AS CATALYST



ENTRANCES



ADJUSTING LOCAL TRANSPORT

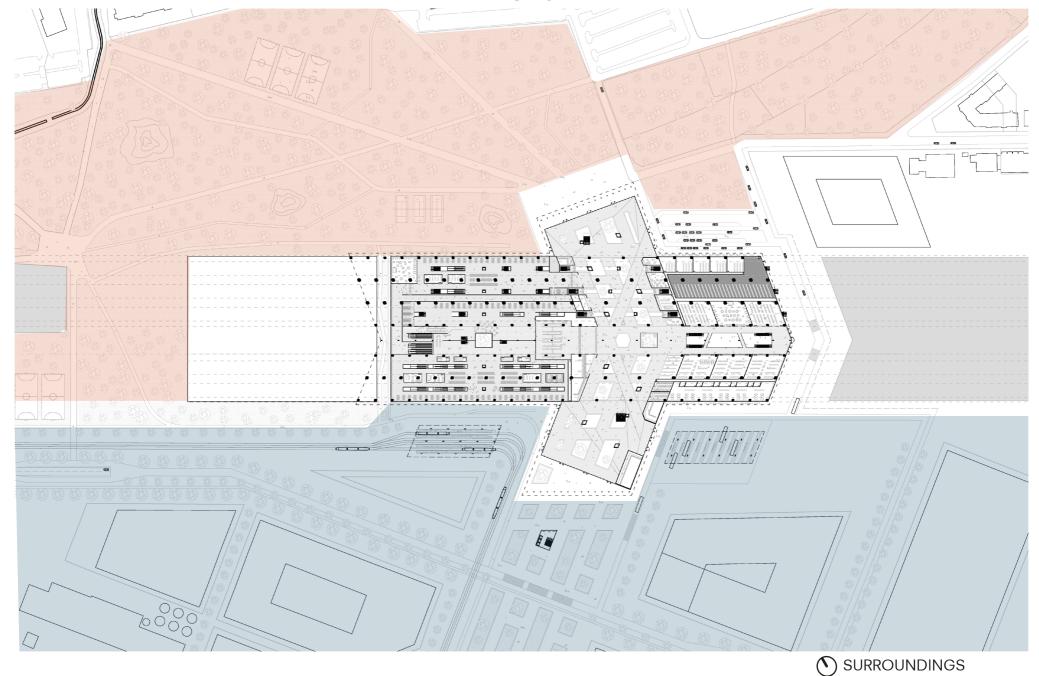


URBAN PLAN I TOP VIEW

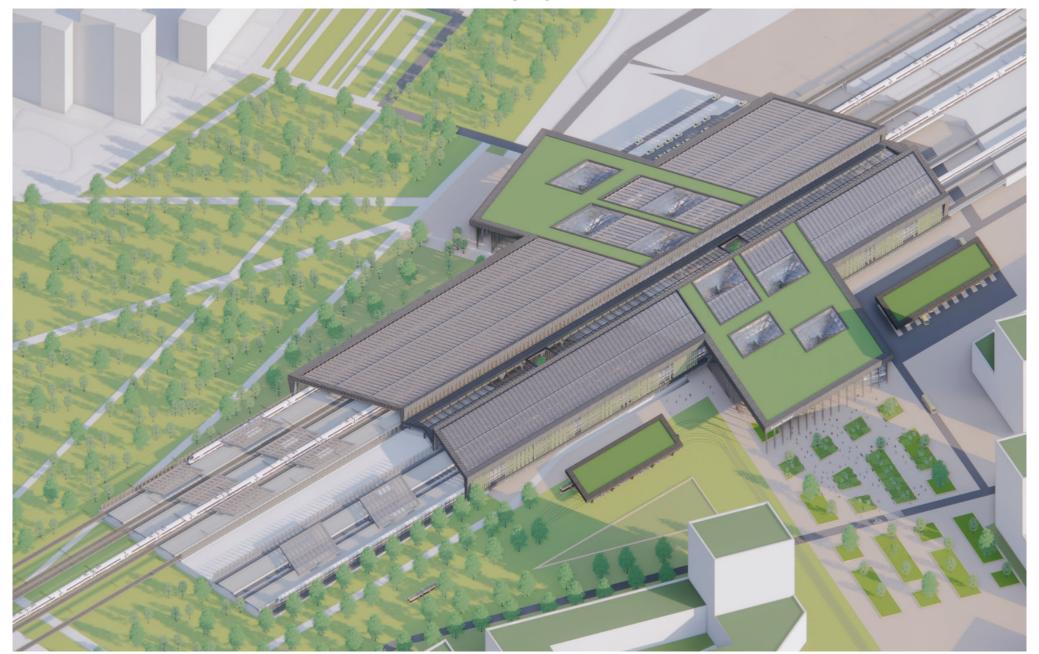


(T) URBAN PLAN

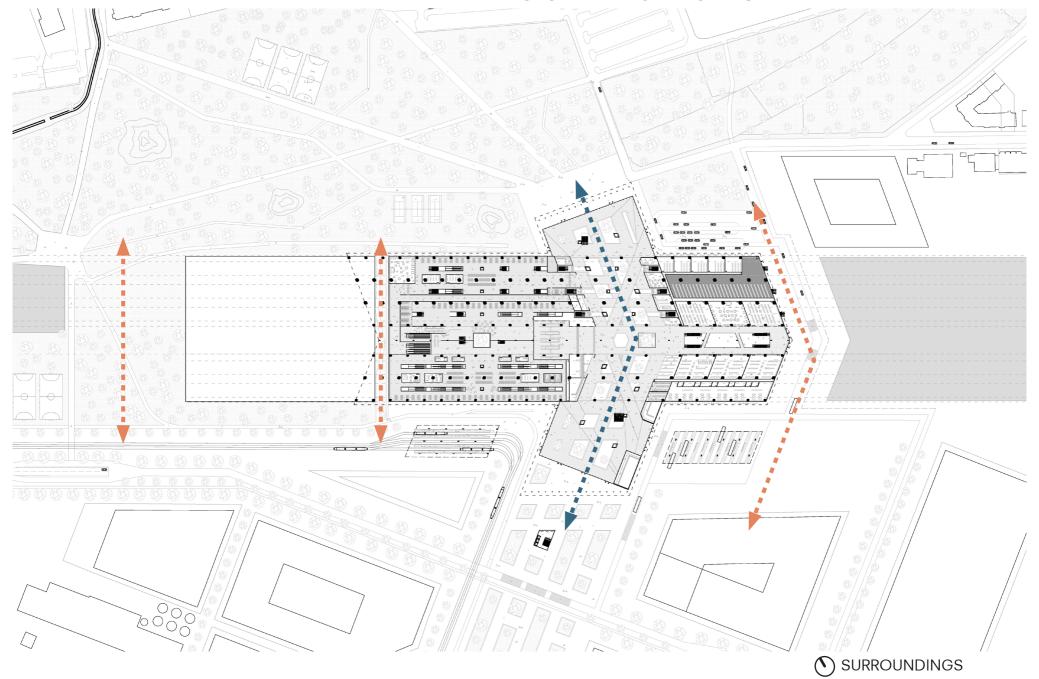
PARK VS URBAN



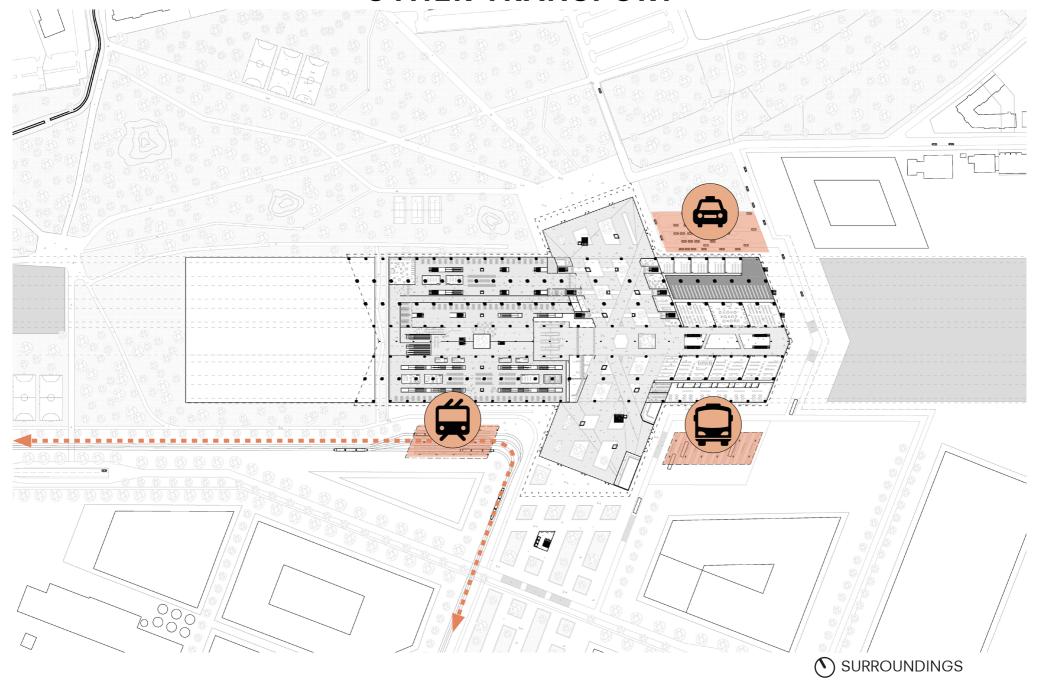
PARK VS URBAN



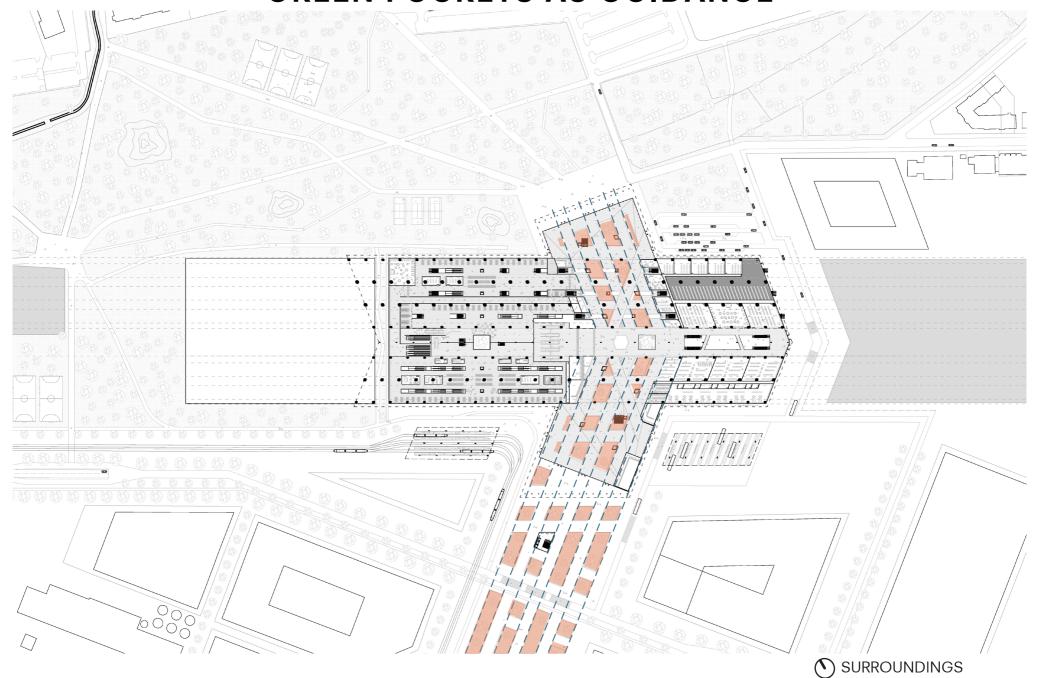
BARRIER FREE CONNECTIONS



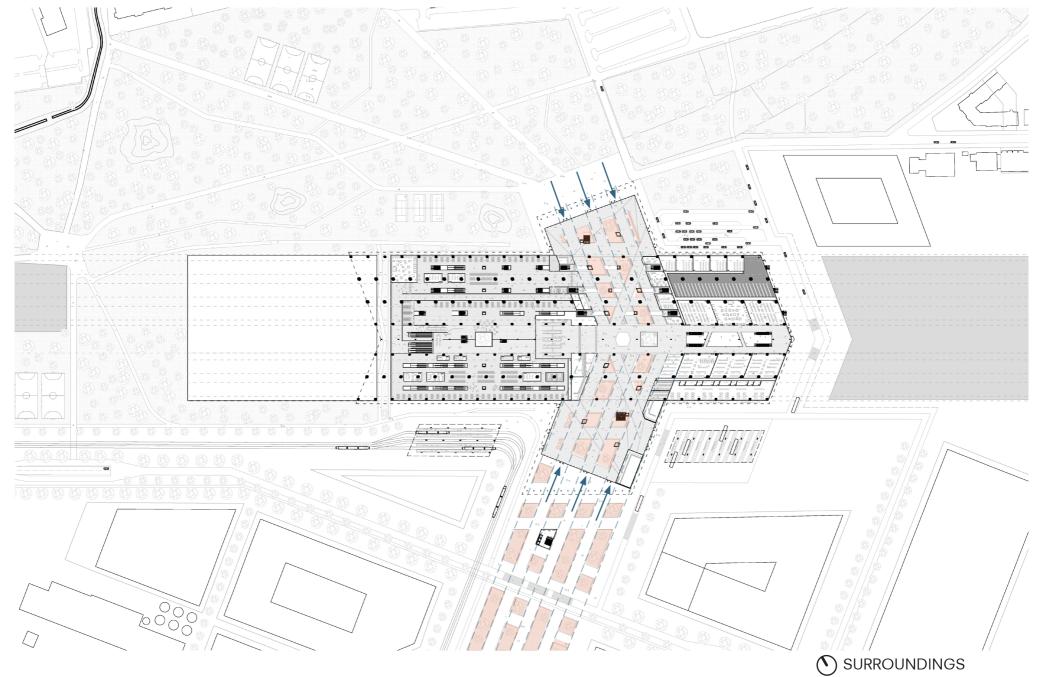
OTHER TRANSPORT



GREEN POCKETS AS GUIDANCE



ENTRANCES



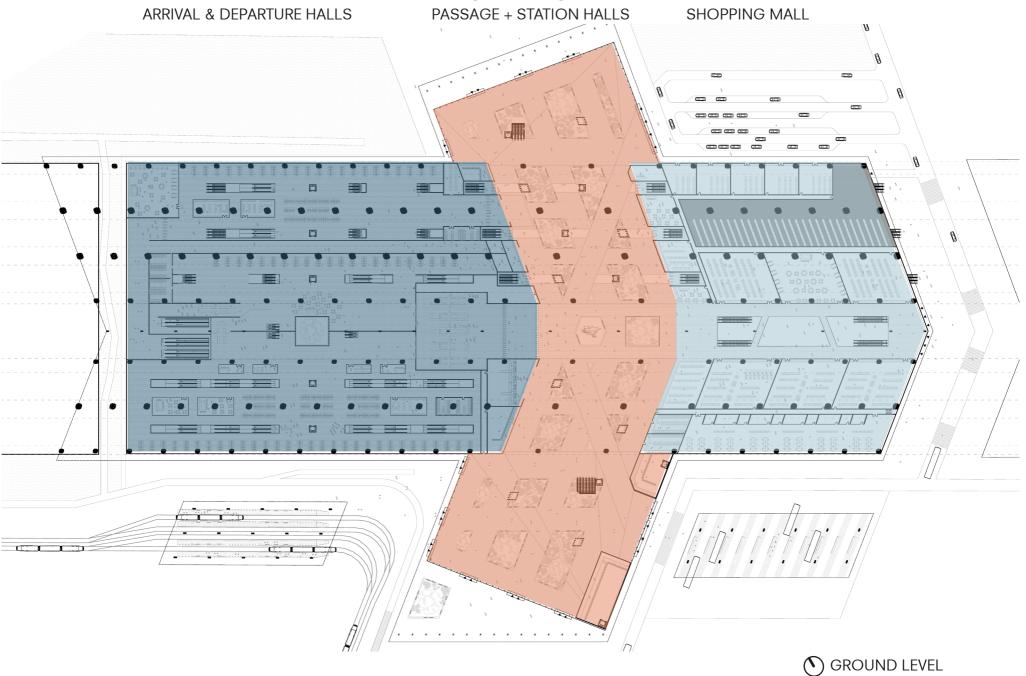
SOUTH ENTRANCE



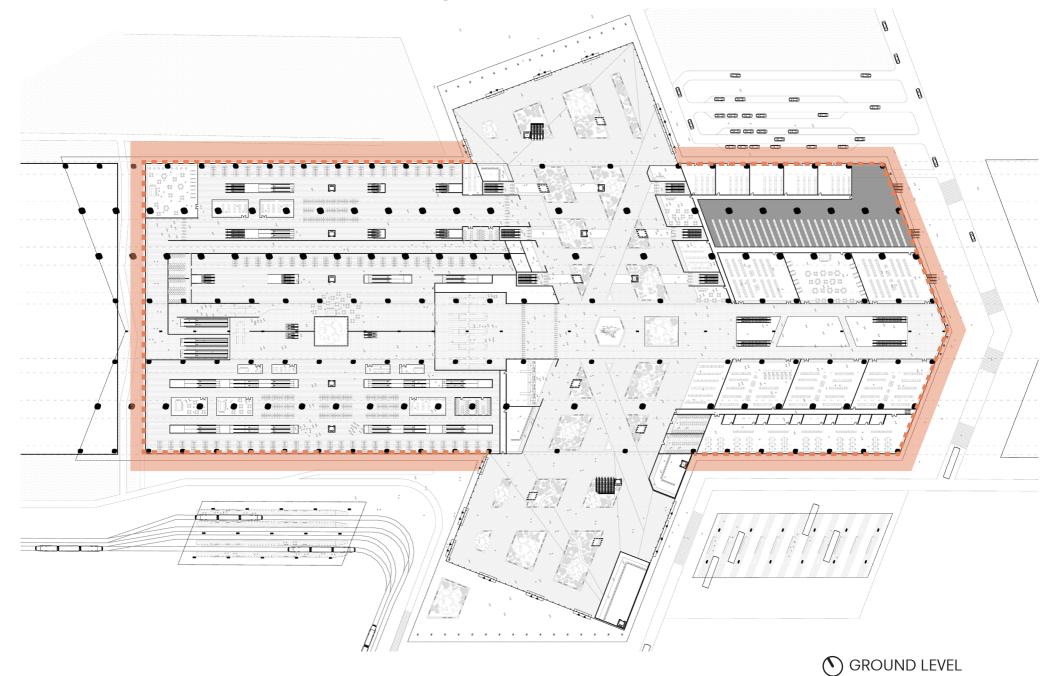
NORTH ENTRANCE



ZONING



TRANSPARENT PLINTH

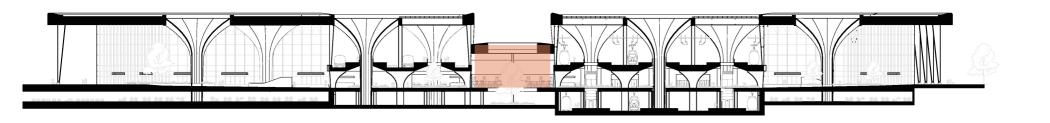


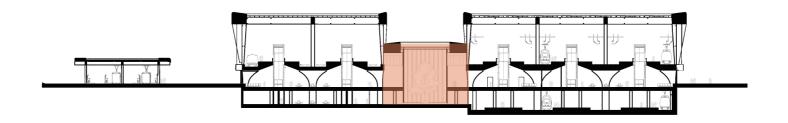
INNER STREET



INNER STREET





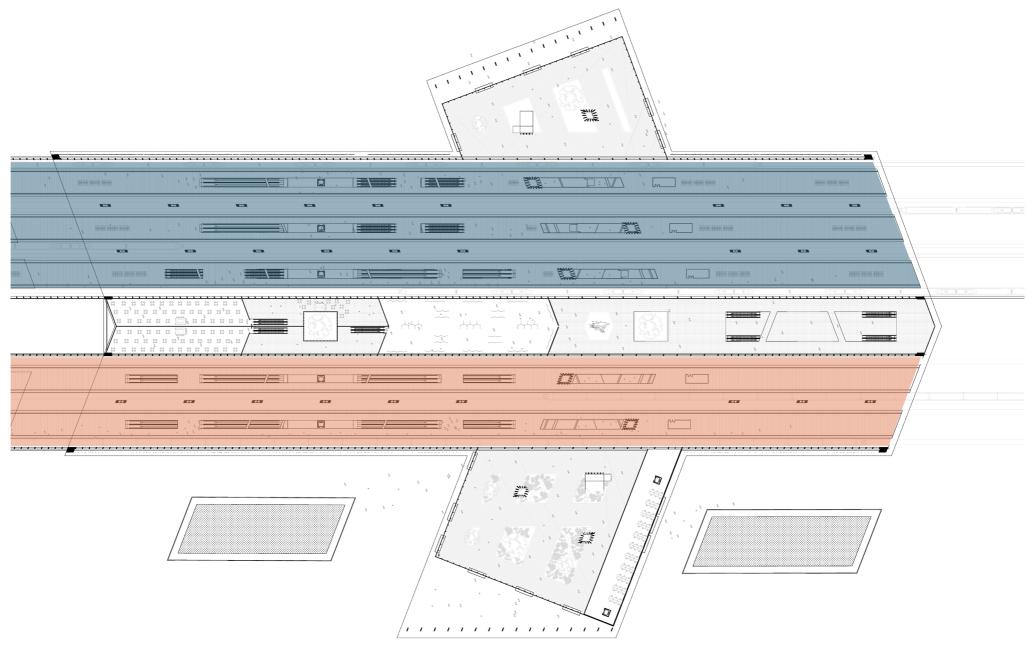


INTERCONTINENTAL

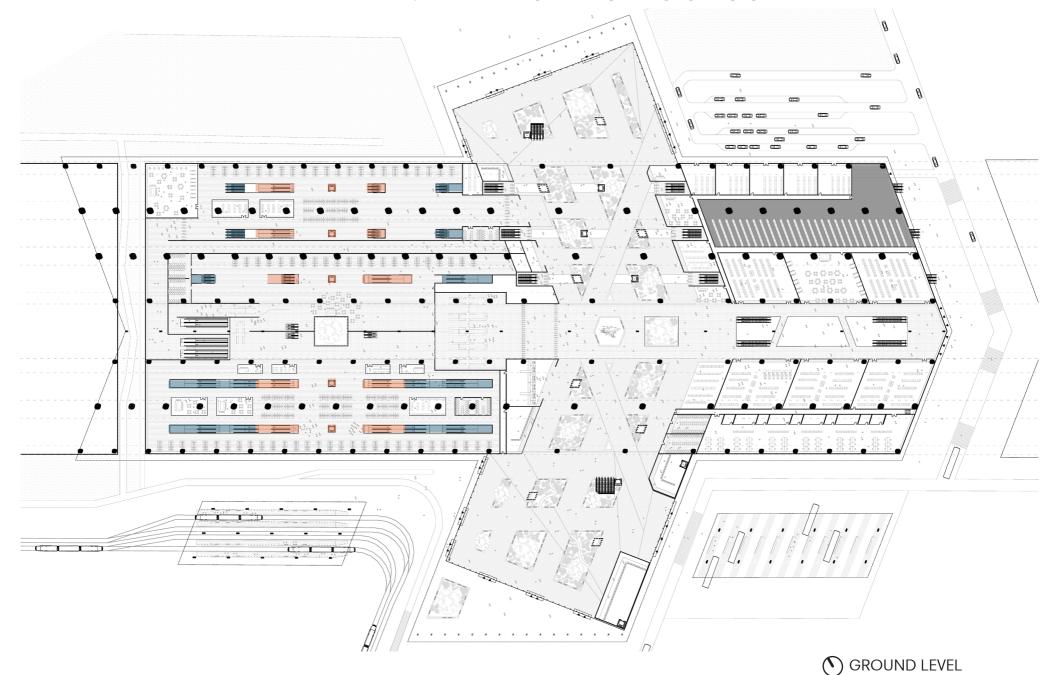
INTERNATIONAL & LOCAL

CROSS SECTIONS

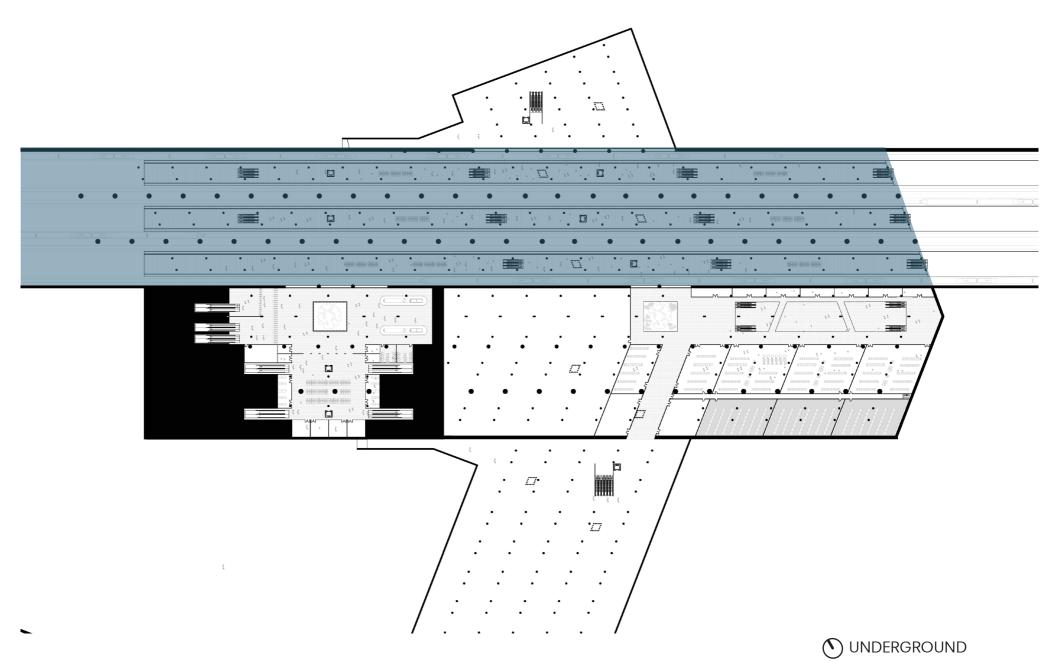
INTERC. & INTERN. PLATFORMS



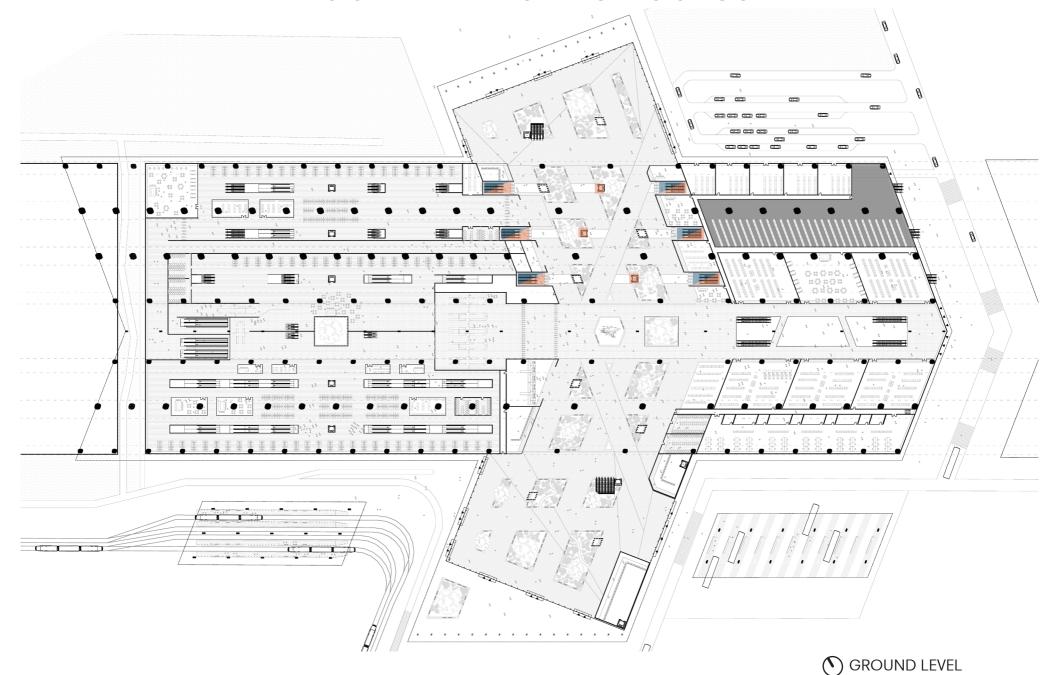
INTERN. PLATFORMS ACCESS



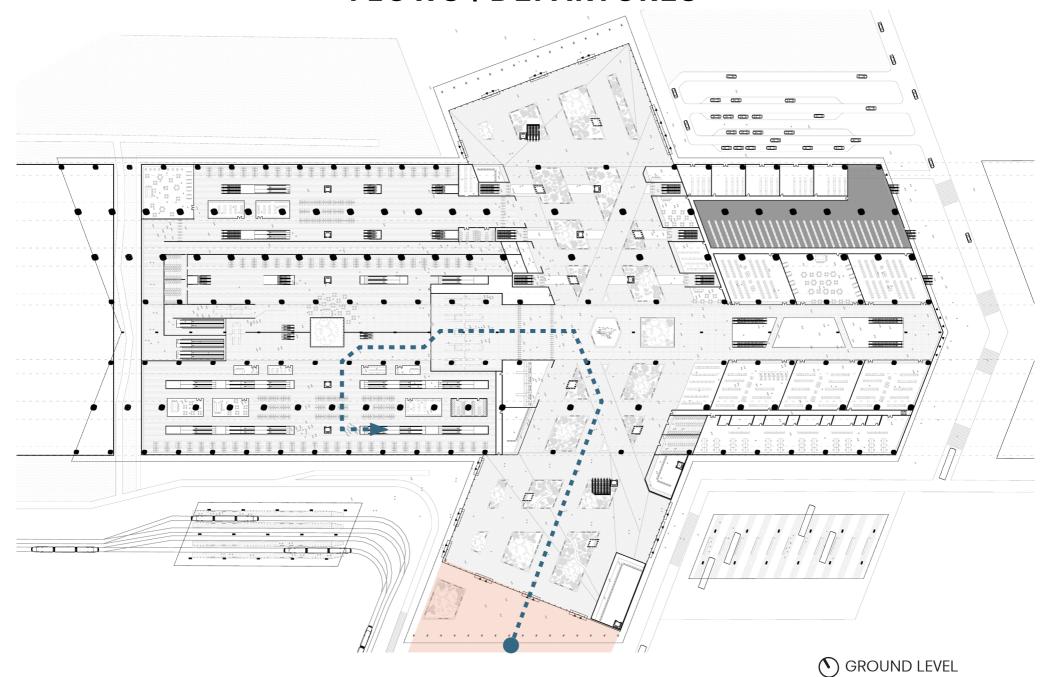
LOCAL PLATFORMS



LOCAL PLATFORMS ACCESS

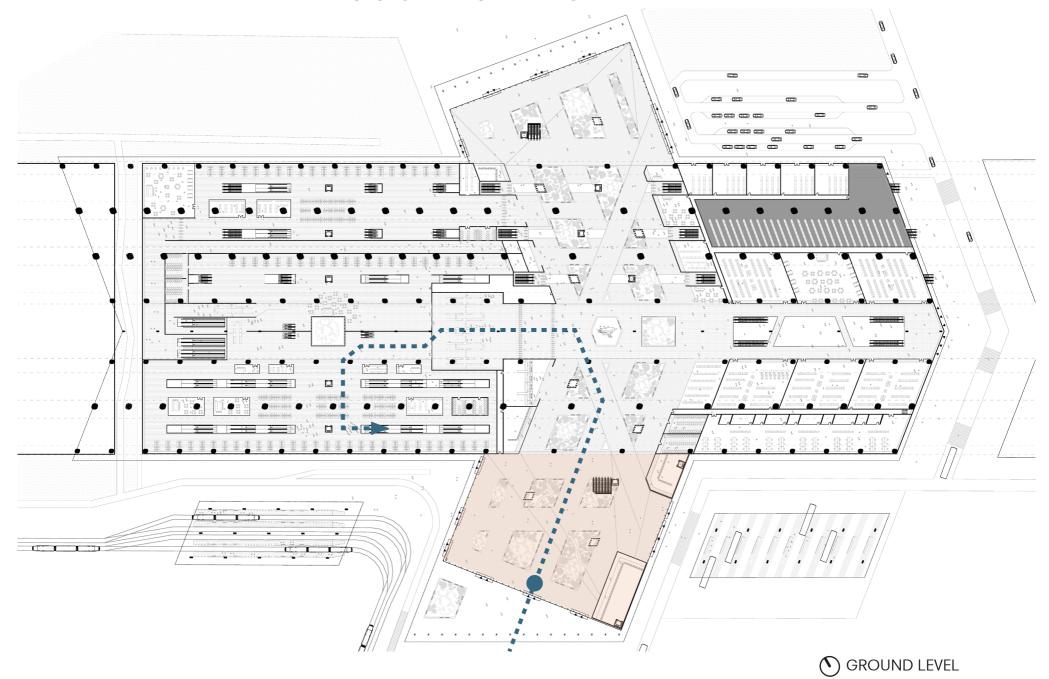


FLOWS | DEPARTURES



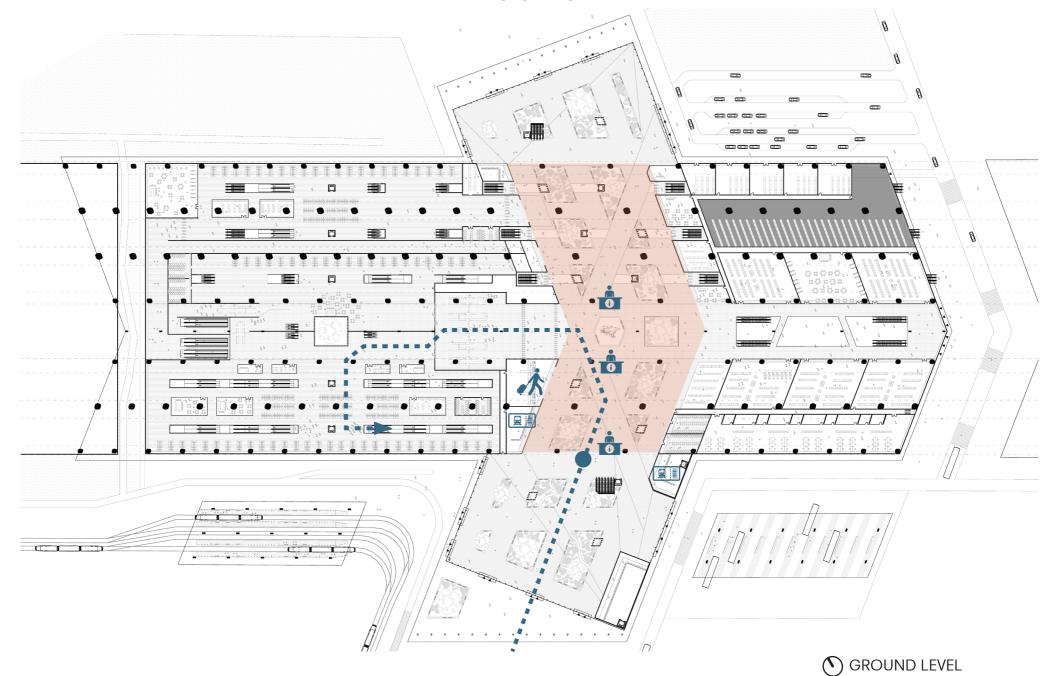


SOUTH STATION HALL





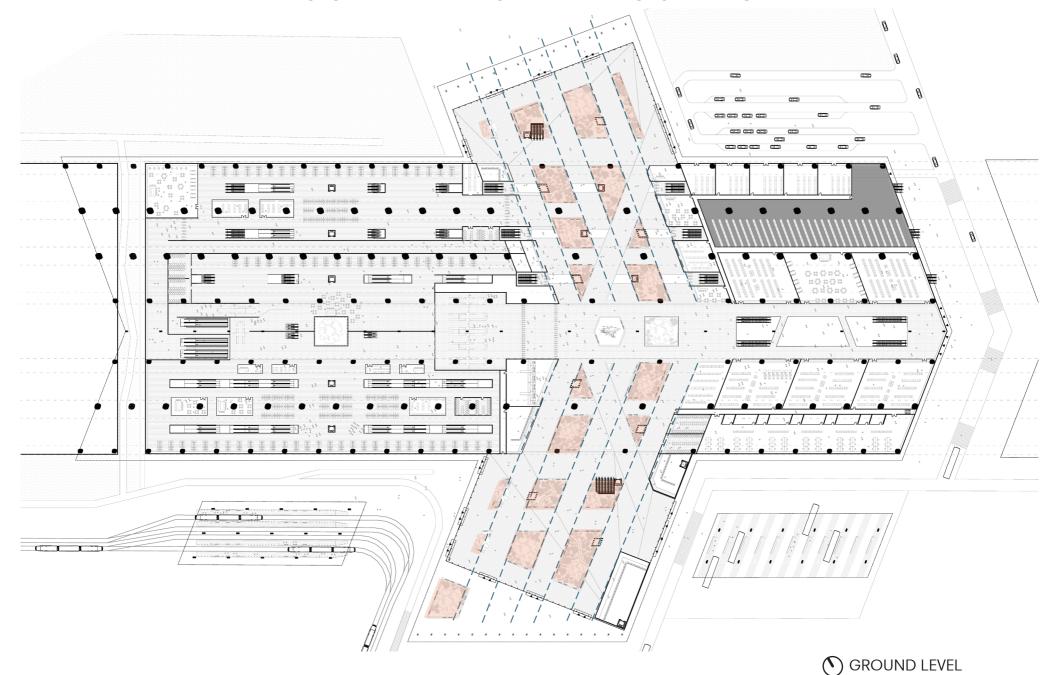
PASSAGE



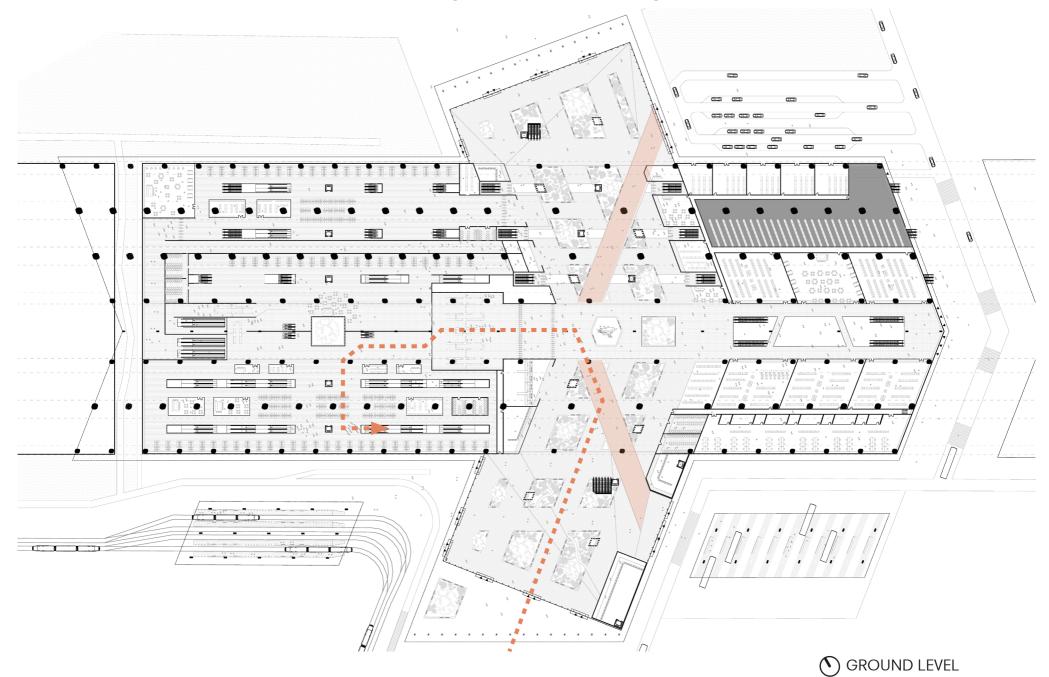
PASSAGE



GUIDED BY GREEN POCKETS



IMPORTANT AXES



PASSAGE I DIRECTION MATERIALS

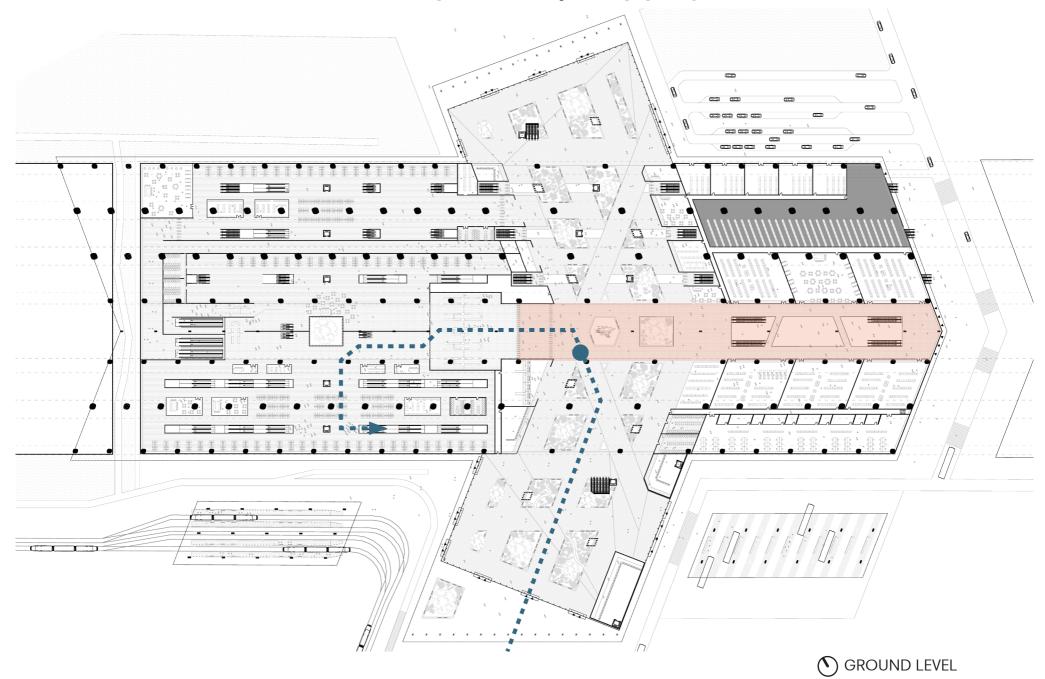


STONE PAVERS | RED

PASSAGE

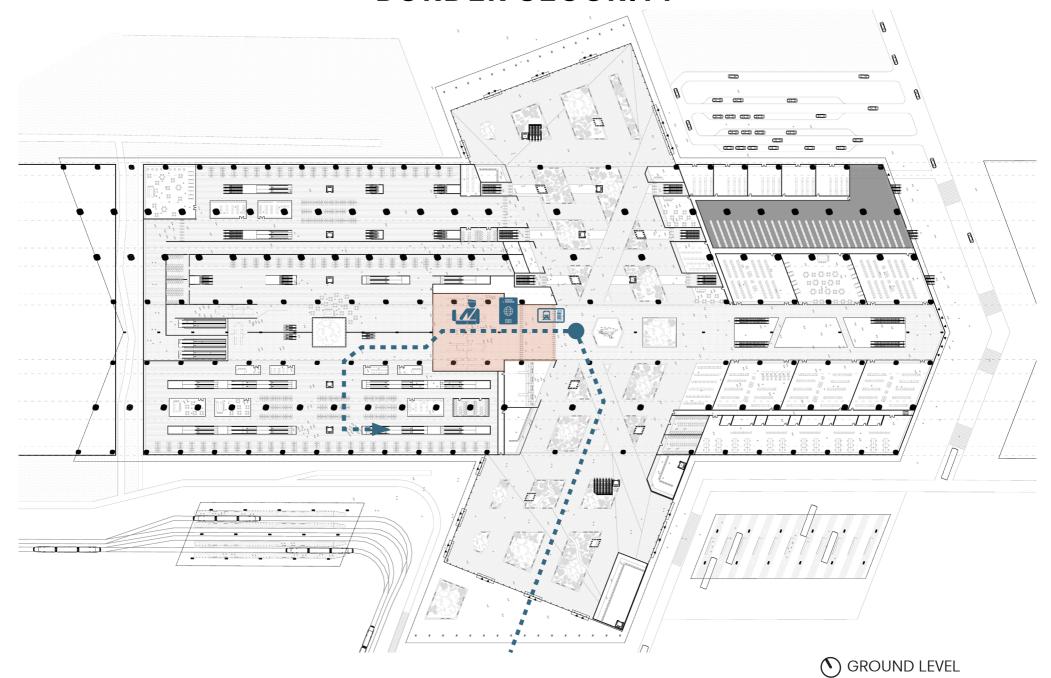


INNER STREET | PASSAGE





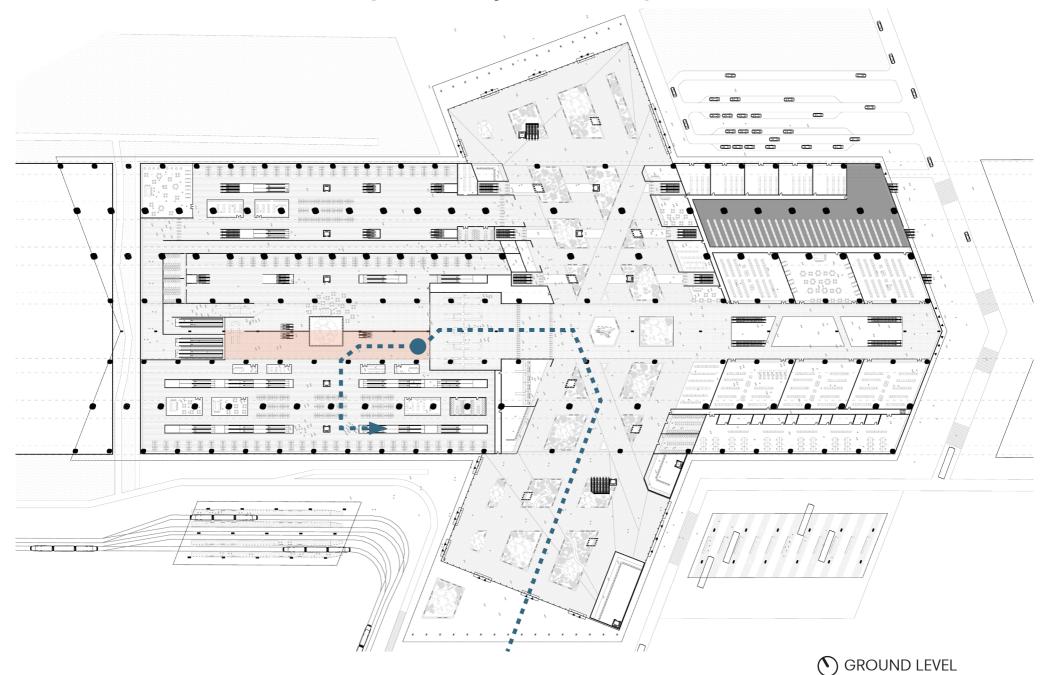
BORDER SECURITY



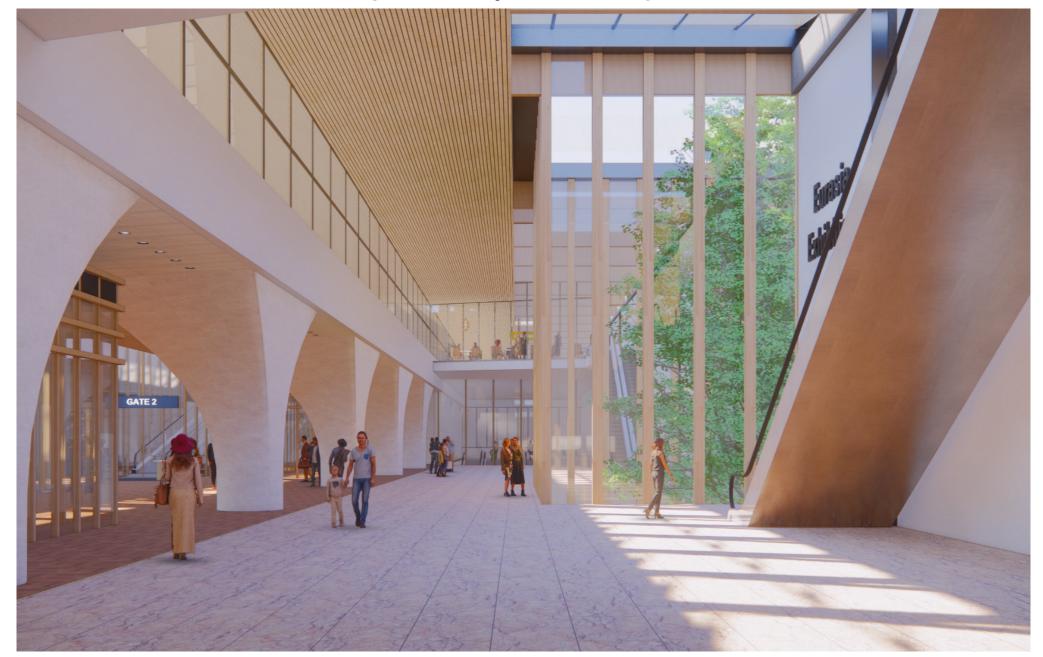
BORDER SECURITY



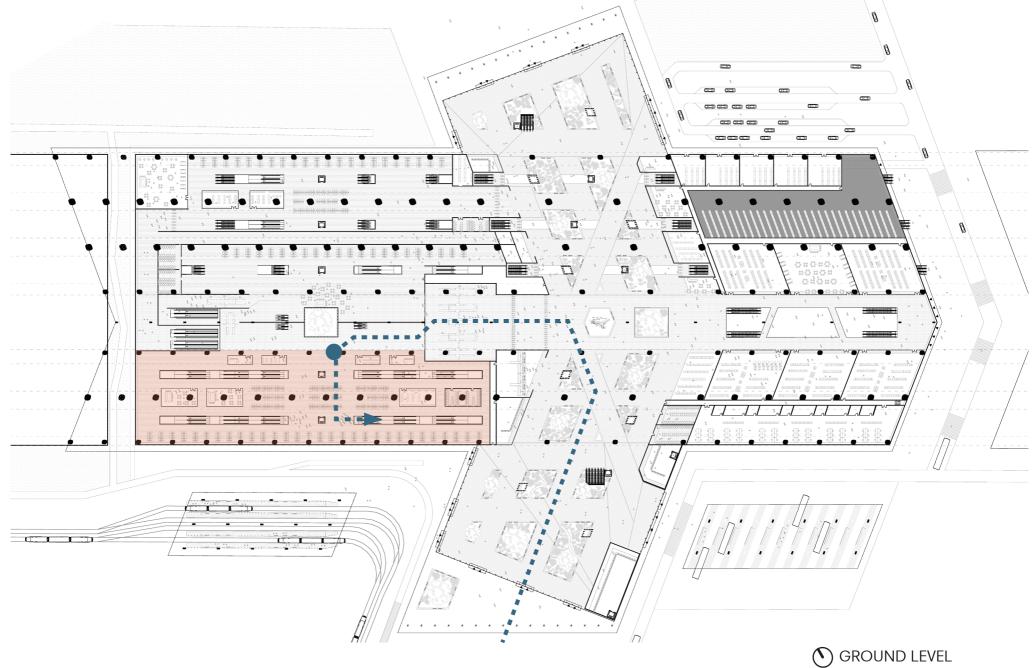
INNER STREET | DEPARTURE HALL



INNER STREET | DEPARTURE HALL



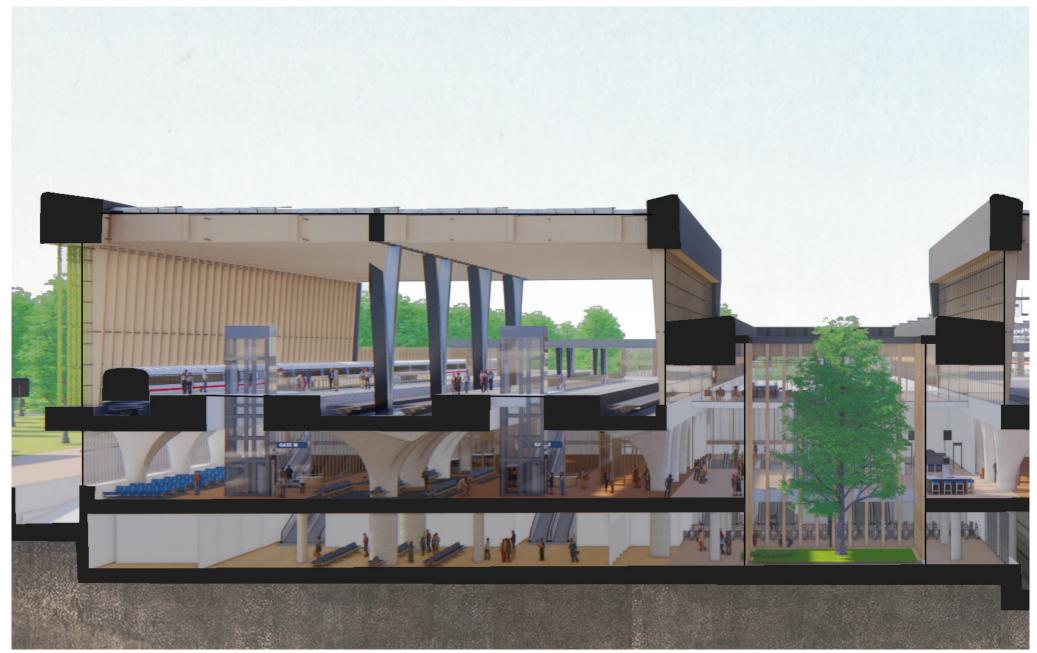
ENTER LOUNGES



CP projects

complex

SITUATED UNDERNEATH PLATFORMS



PASSAGE I DIRECTION MATERIALS



WOOD FLOORING

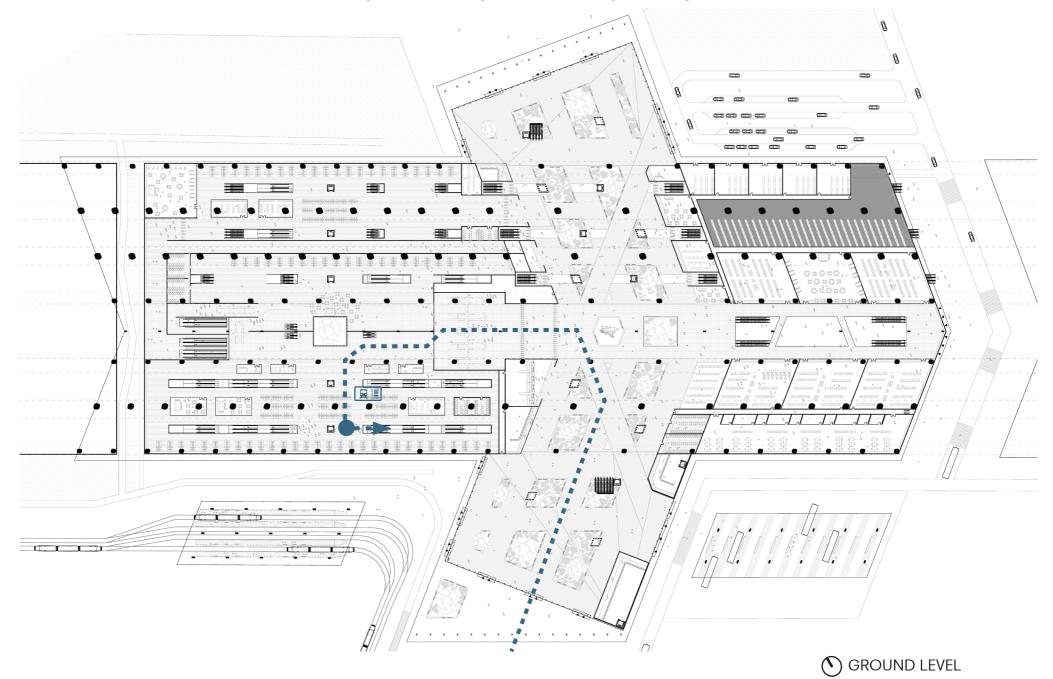


CARPET

WAITING AREA



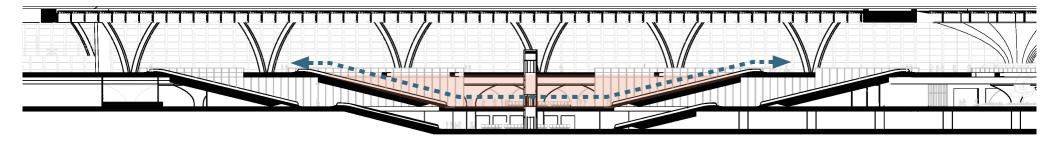
GATE TO PLATFORMS





FLOWS | DEPARTURES

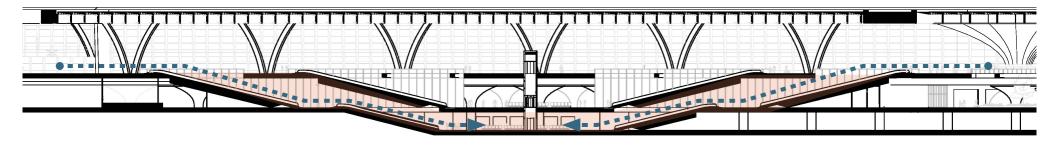




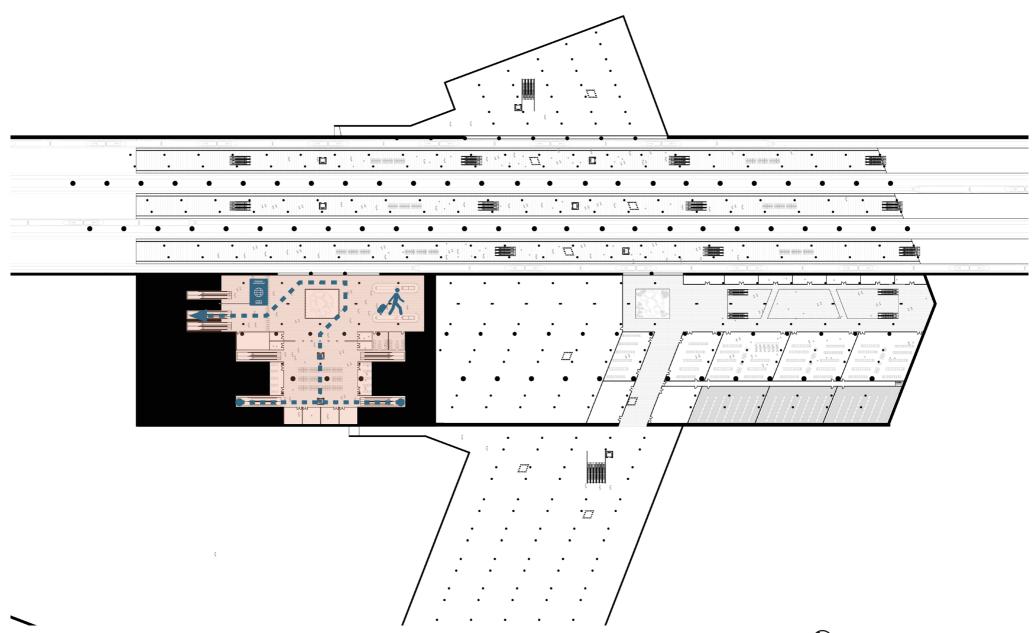


FLOWS | ARRIVALS



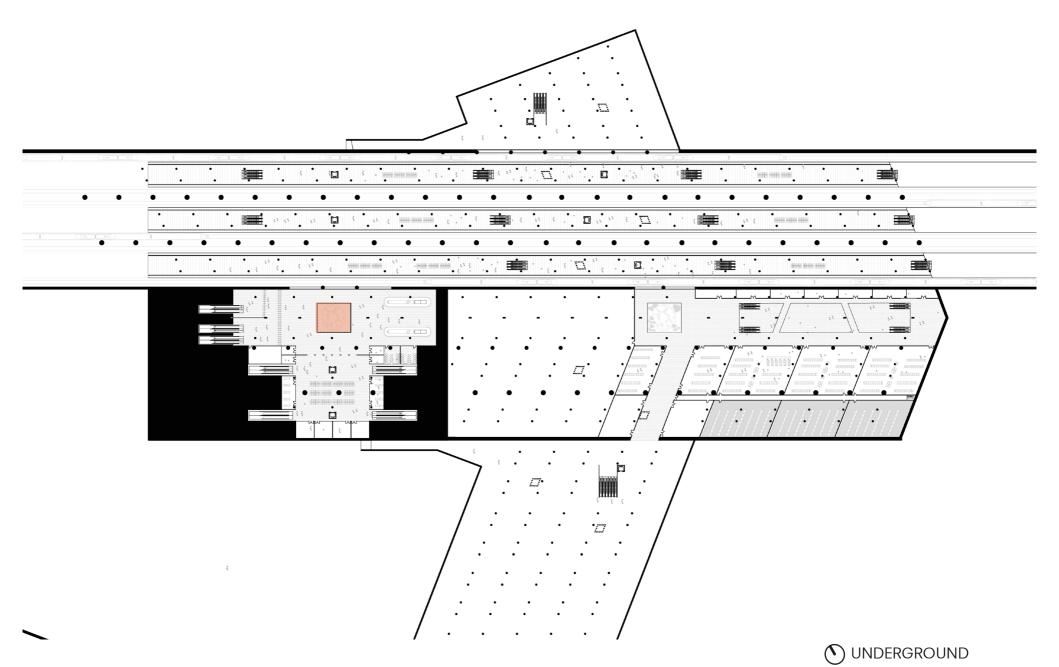


FLOWS | ARRIVALS

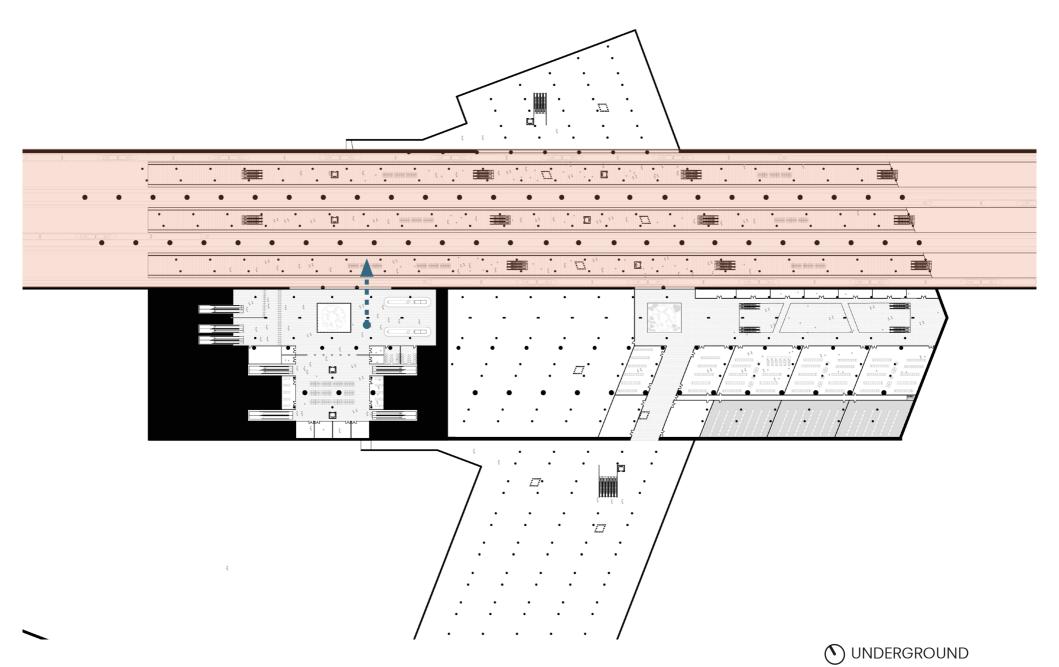


() UNDERGROUND

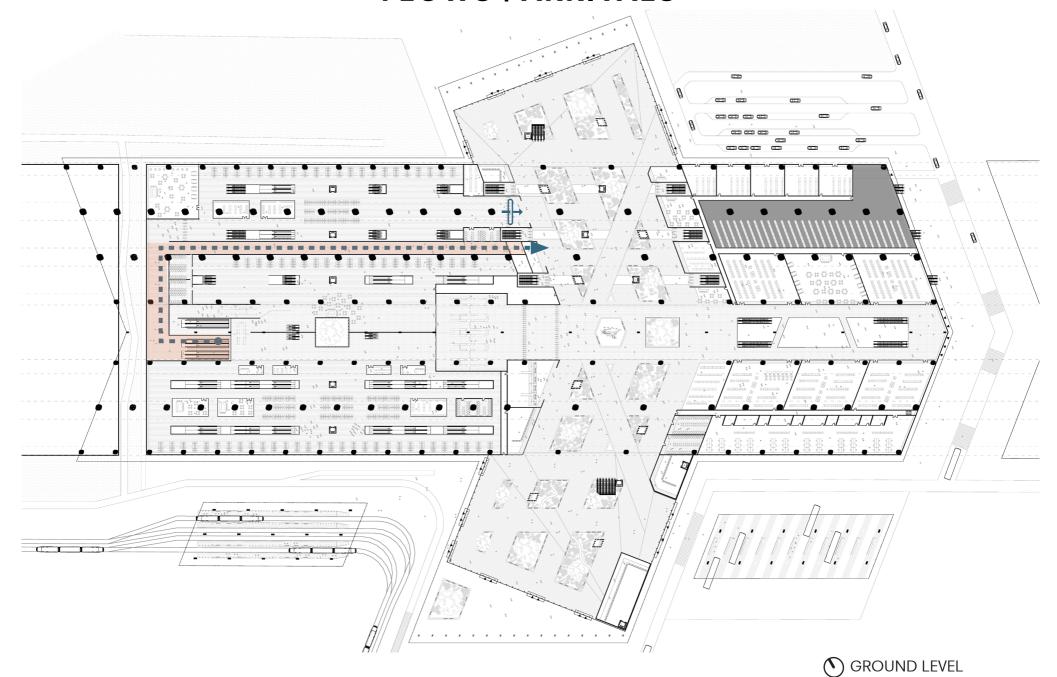
DAYLIGHT CONNECTION



SIGHTLINE TO LOCAL PLATFORMS



FLOWS | ARRIVALS



ARRIVALS



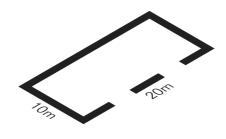
RETAIL I DEGREES

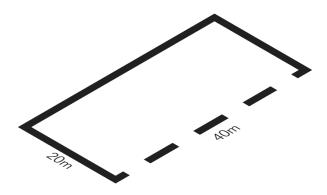












small: kiosk / money exchange

medium: cafe / shop

large: restaurant / store

RETAIL SMALL



CP projects

() GROUND LEVEL

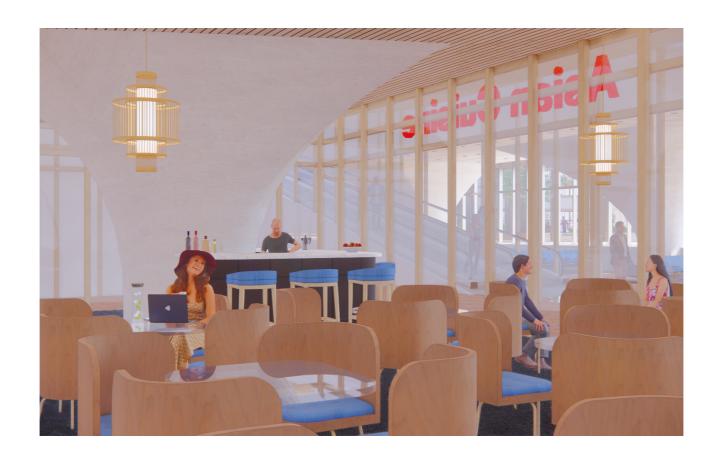
RETAIL MEDIUM



RETAIL LARGE



HIGH QUALITY RETAIL IN LOUNGES



- 1. INTRODUCTION
 - 2. RESEARCH
 - 3. DESIGN BRIEF
 - 4. CONCEPT
- 5. IMPLEMENTATION
 - 6. DEVELOPMENT
 - 7. CONCLUSION

NEUTRAL MATERIALS



25.000 M2 TRANSPARENT SOLAR ROOF PANELS | PLATFORMS



LIVING ROOF | STATION HALL & BUS + TRAM TERMINAL



STANDING SEAMLESS METAL | EDGE ROOF



ACOUSTIC WOOD CEILING PANELS | STATION HALL



PASSIVE GREEN FACADE SYSTEM | PLATFORMS



WOODEN FLOOR | LOUNGES



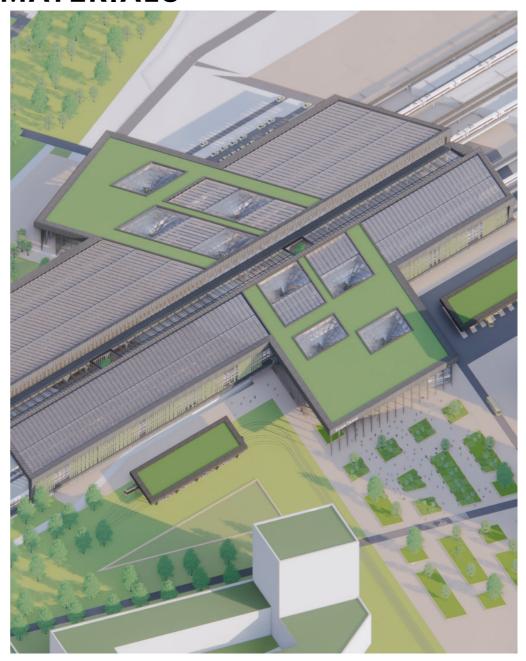
GREY PAVERS | PLATFORMS



RED PAVERS | PASSAGE



WHITE PLASTER



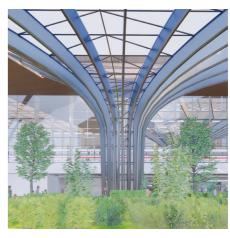
STRUCTURE



concrete columns I tracks



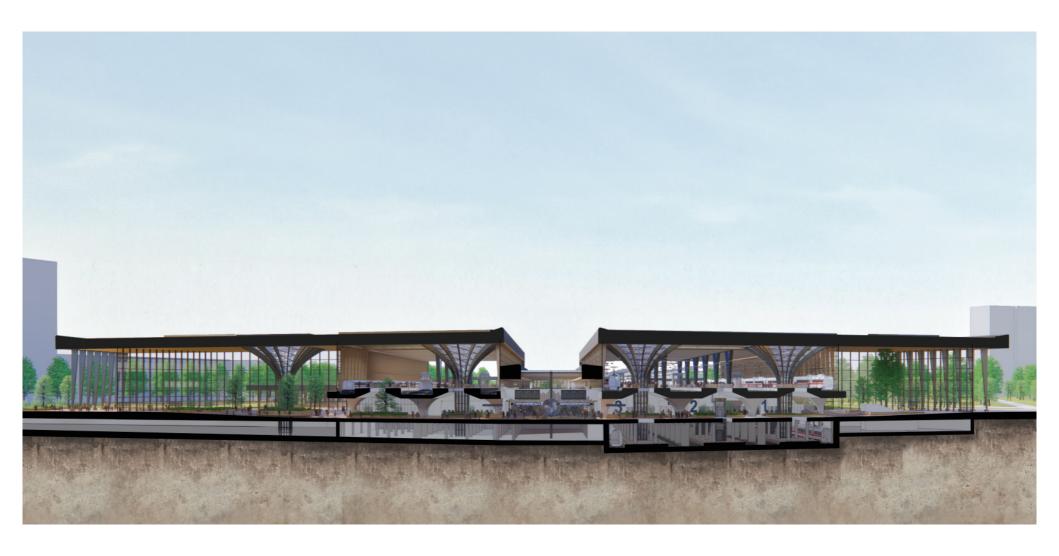
metal columns I train shed



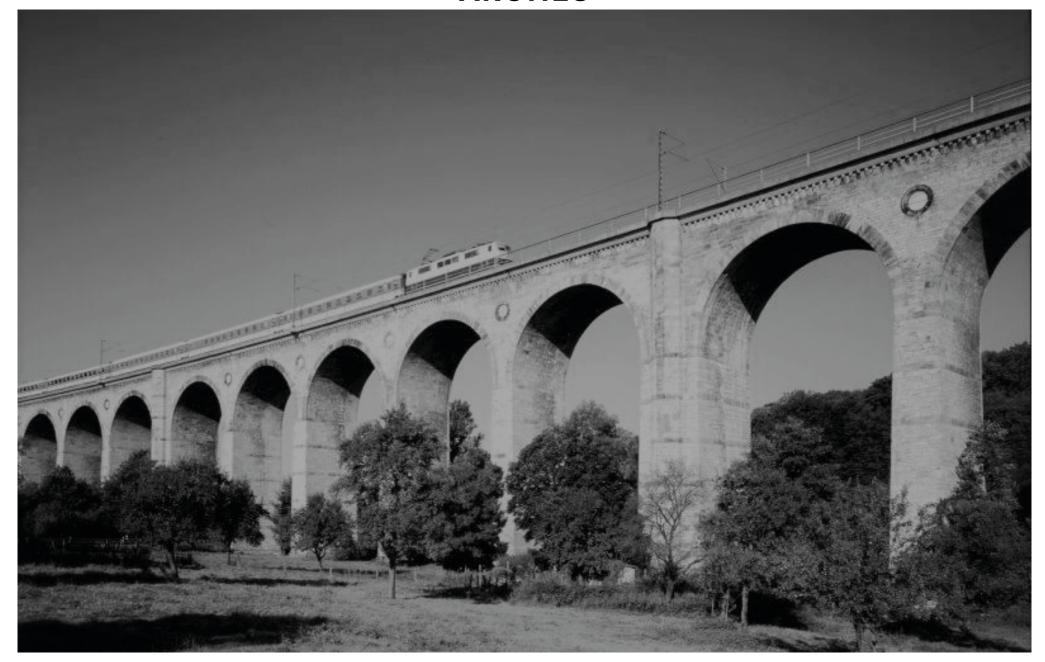
integrated light columns | passage

implementation

SPECIAL COLUMNS IN PASSAGE



ARCHES



SAME FORM LANGUAGE



SAME FORM LANGUAGE



SAME FORM LANGUAGE



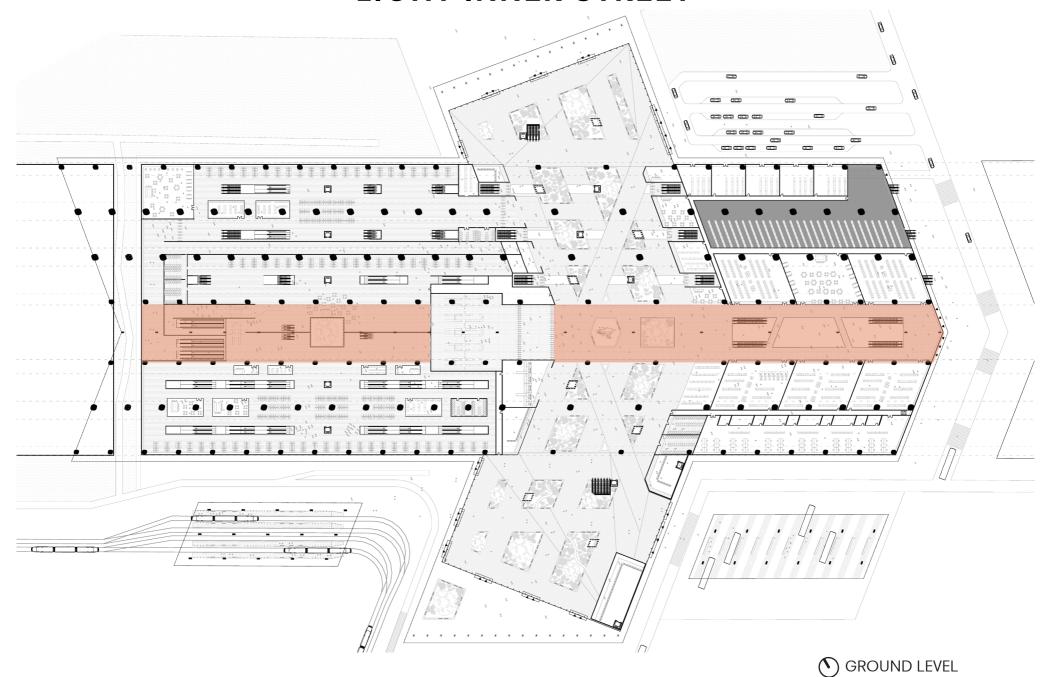
TRAM TERMINAL



BUS TERMINAL

implementation

LIGHT INNER STREET



implementation

LIGHT INNER STREET



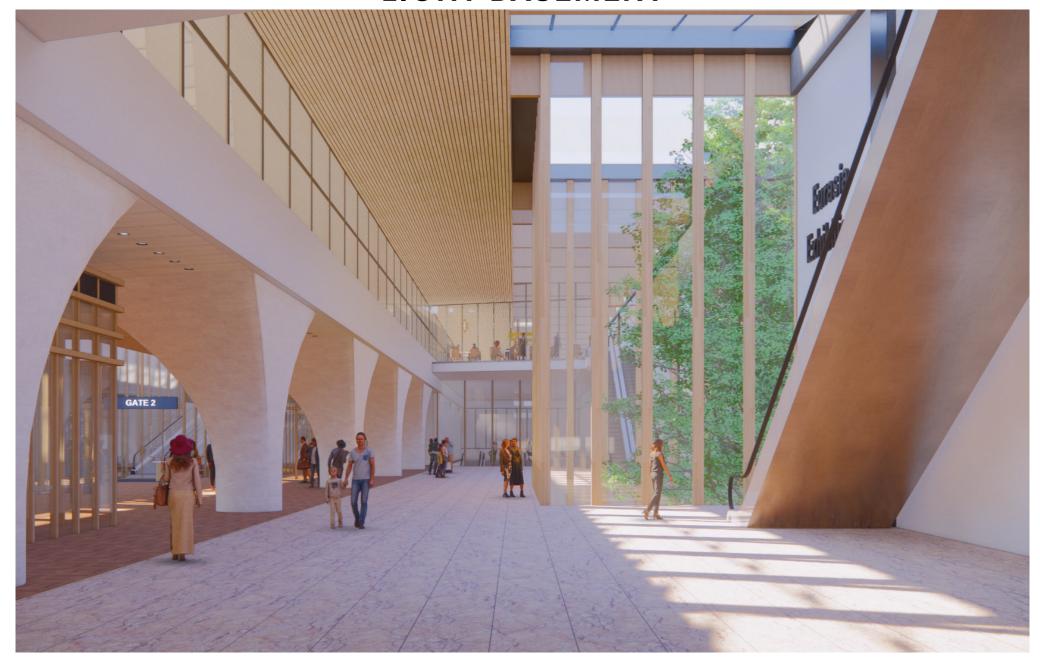
implementation

LIGHT BASEMENT



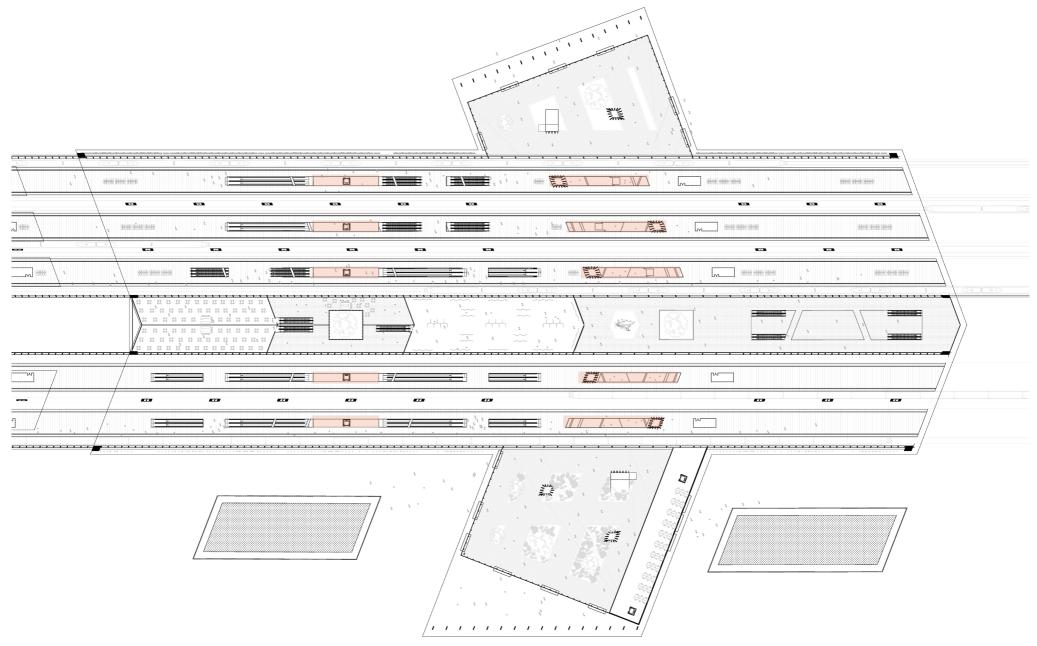
implementation

LIGHT BASEMENT



implementation

LIGHT THROUGH PLATFORMS



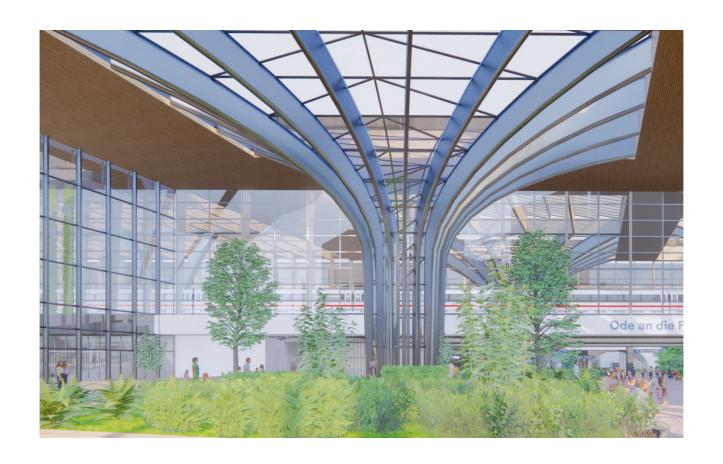


implementation

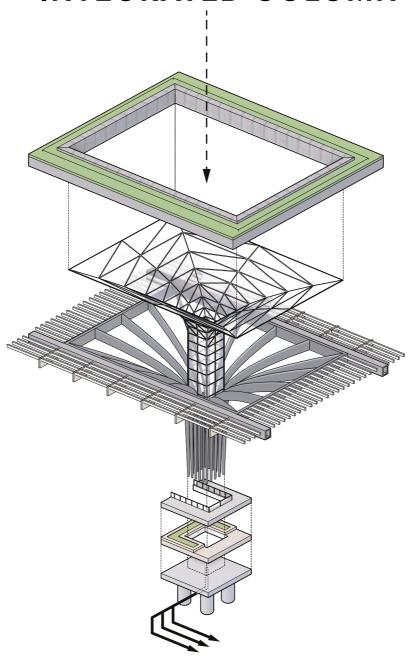
LIGHT THROUGH PLATFORMS



LIGHT COLUMN

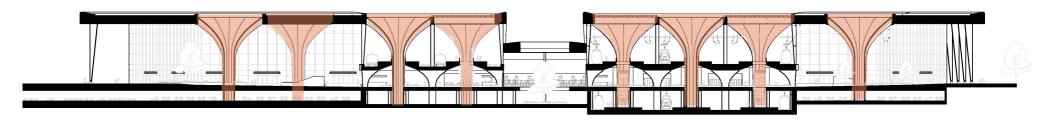


INTEGRATED COLUMN

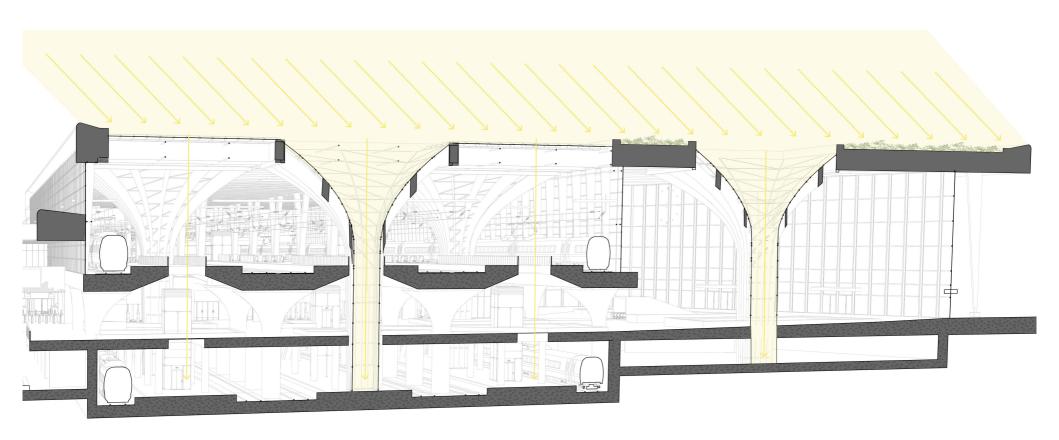


LIGHT DEEP INTO BUILDING | PASSAGE

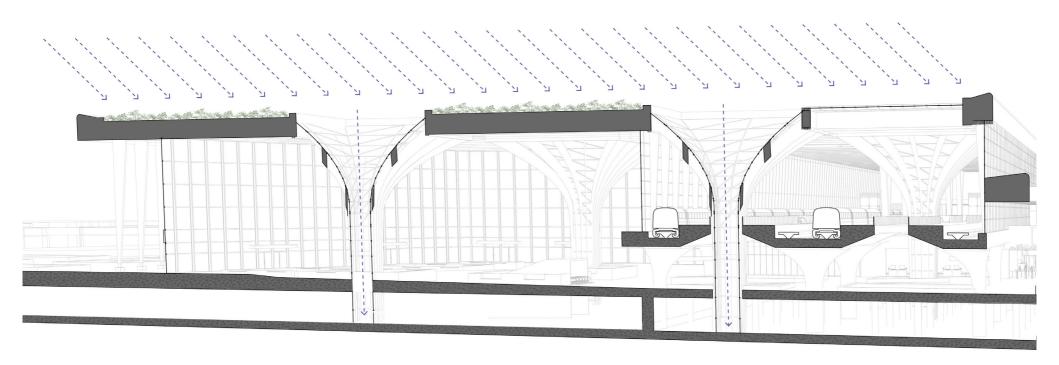




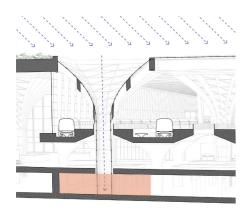
LIGHTING



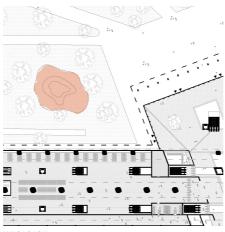
WATER MANAGEMENT



WATER MANAGEMENT



WATER STORAGE | GREY WATER SYSTEM



WADI PARK



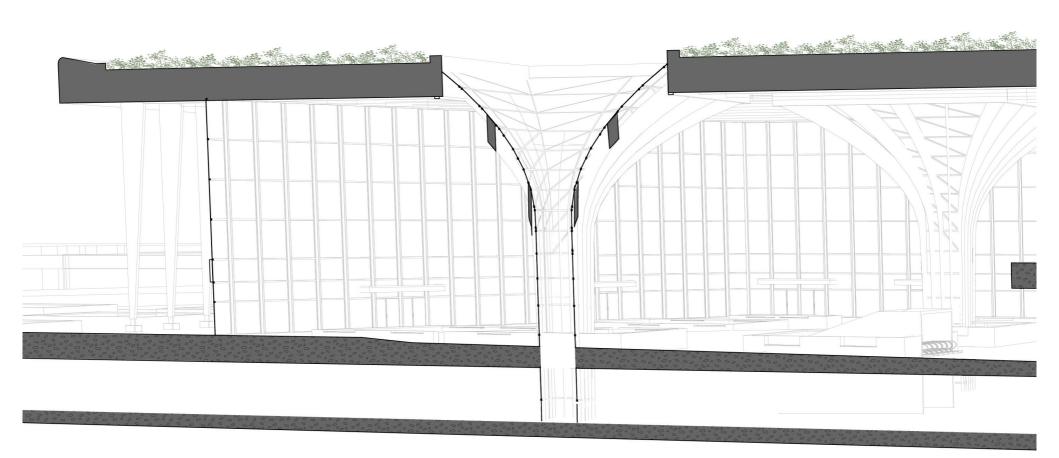
RIVER

GREEN ROOF

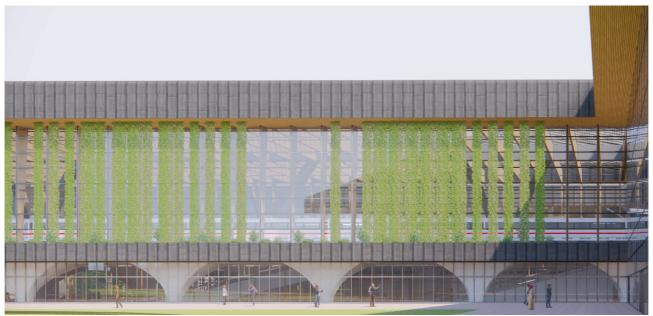
WATER MANAGEMENT

LOCAL COOLING

PART OF ECOSYSTEM



MATERIALS | FACADES

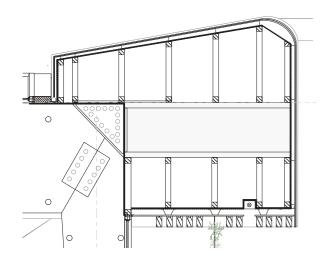


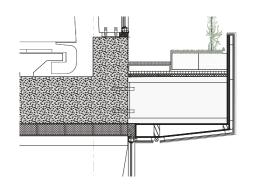
SOUTH FACADE

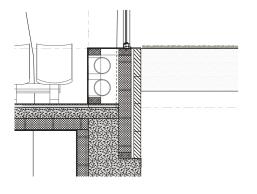


NORTH FACADE

MATERIALS I SOUTH FACADE









PASSIVE GREEN FACADE SYSTEM



STANDING SEAM METAL

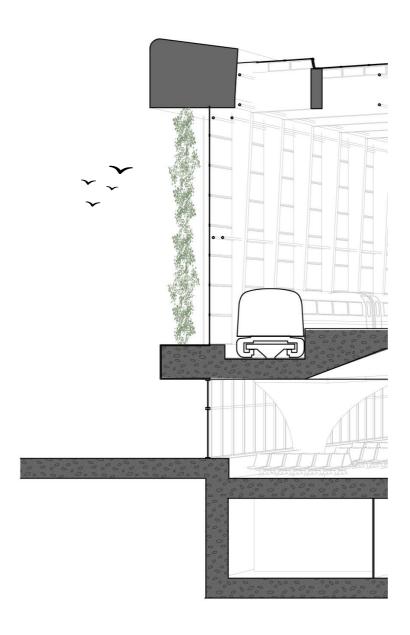


GREEN FACADE

NATURAL SHADING

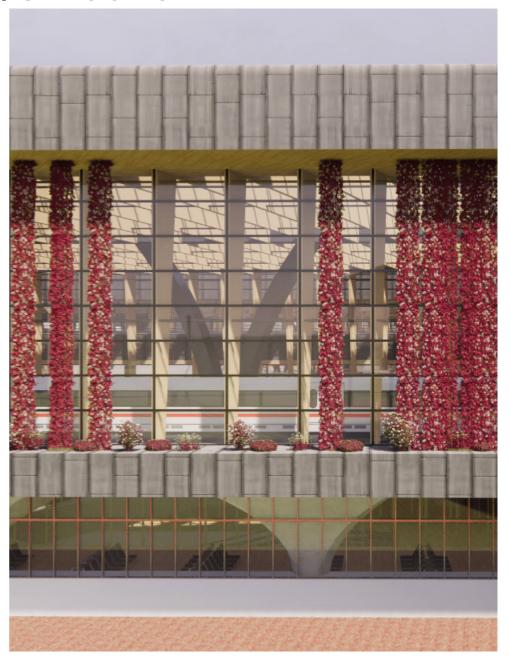
PART OF ECOSYSTEM

LOCAL COOLING

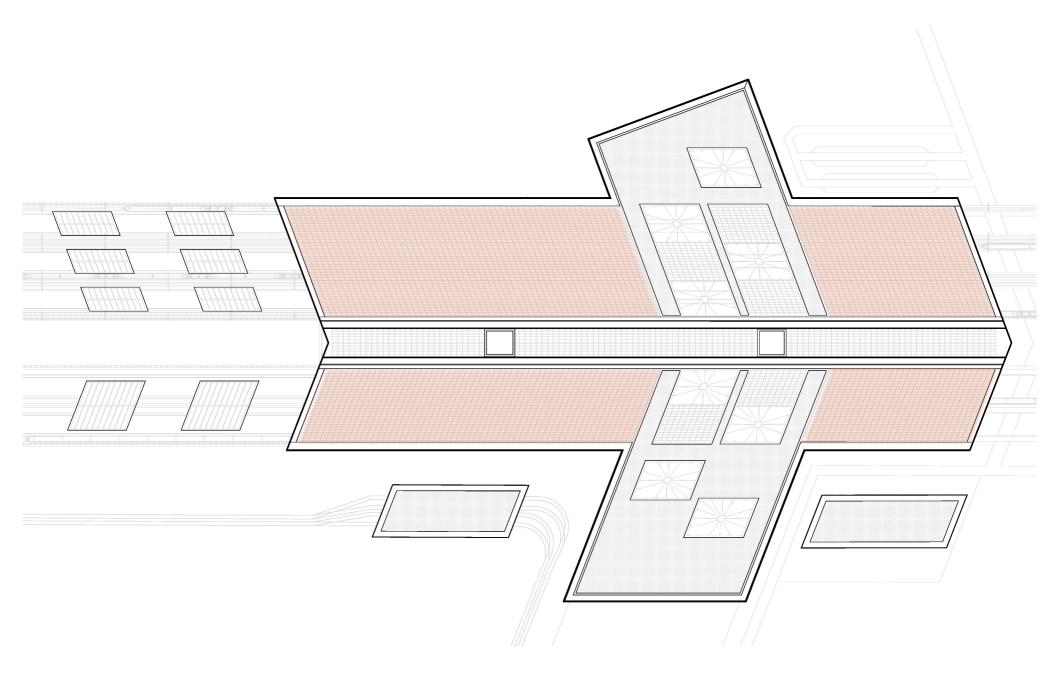


MATERIALS | SEASONS

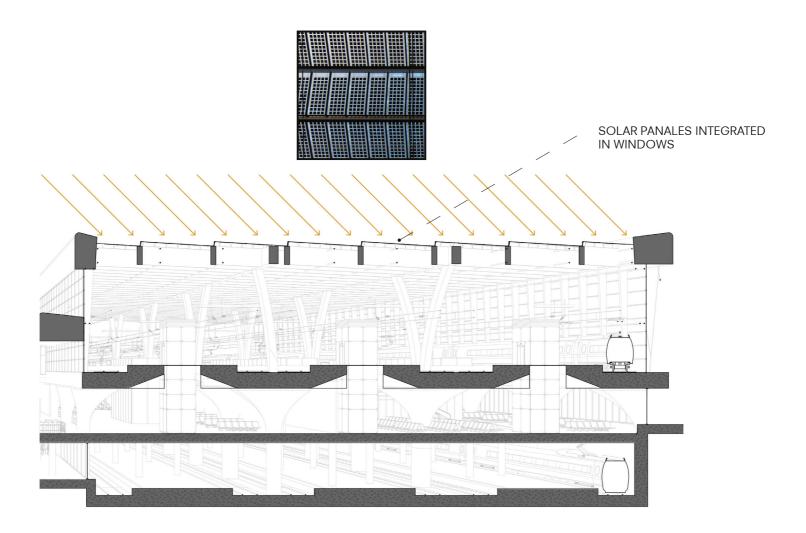




ENERGY PRODUCTION | SOLAR PANELS



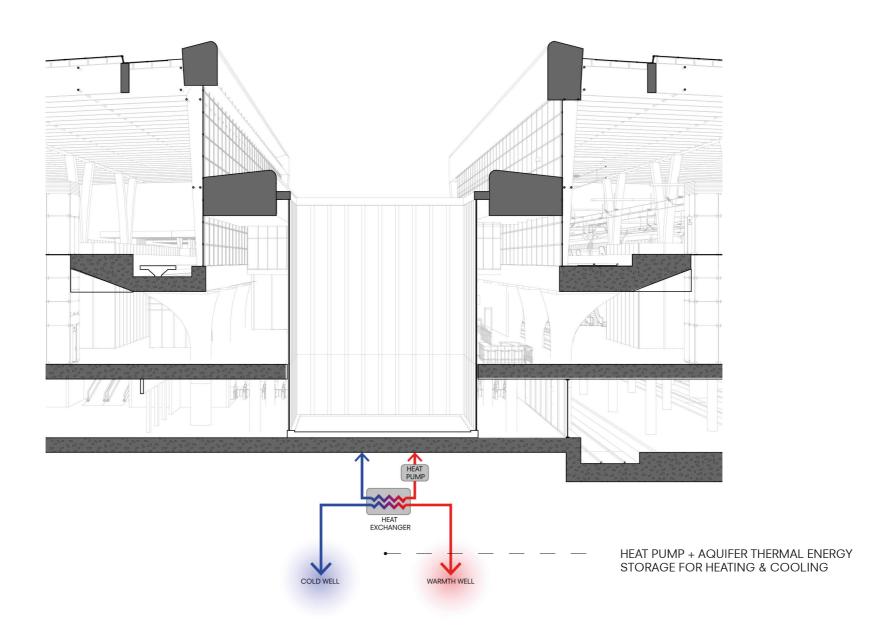
INTEGRATED SOLAR PANELS



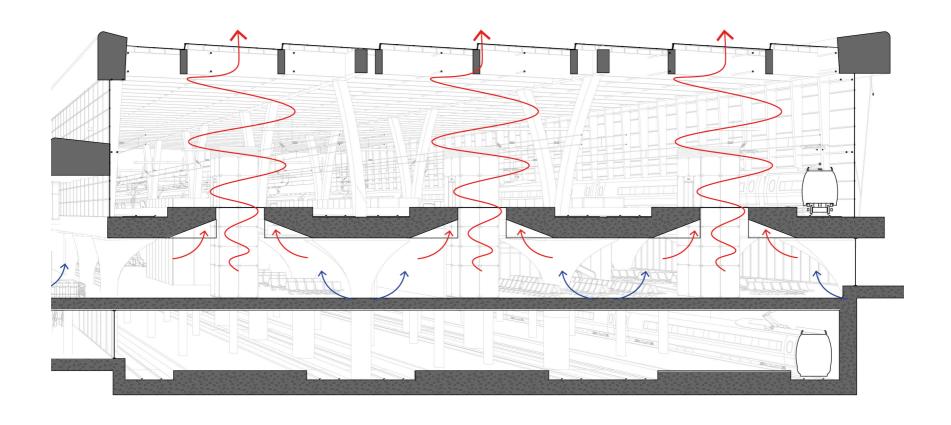
56.000 m²

3771 Households
2828 Households
1885 Households
943 Households

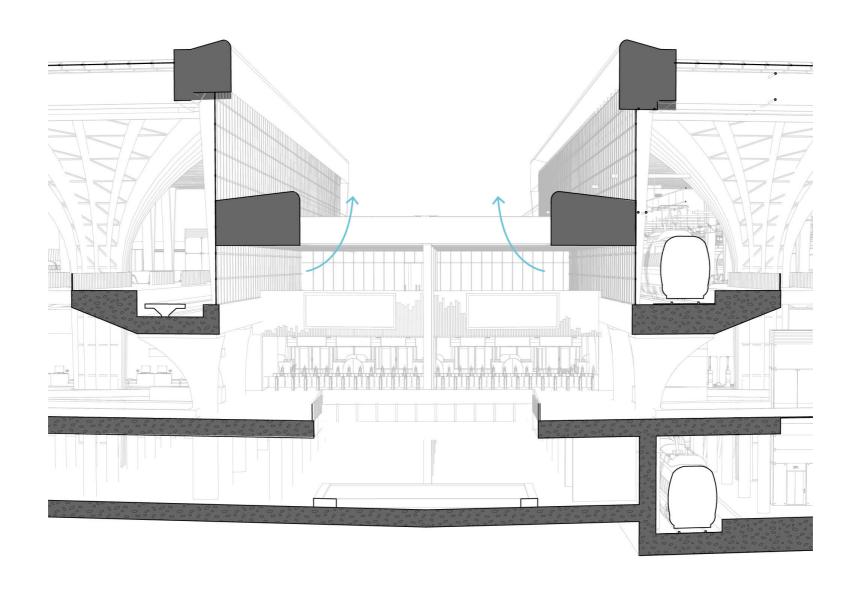
ENERGY



HEATING / COOLING



NATURAL VENTILATION



- 1. INTRODUCTION
 - 2. RESEARCH
- 3. DESIGN BRIEF
 - 4. CONCEPT
- 5. IMPLEMENTATION
 - 6. DEVELOPMENT
 - 7. CONCLUSION

conclusion

RESEARCH QUESTION

IF INTERCONTINENTAL TRAVELING BY TRAIN BECOMES THE STANDARD, WHAT ARE THE REQUIREMENTS TO DESIGN AN INTERCONTINENTAL STATION?

conclusion NEW PROGRAM

BORDER SECURITY DEPARTURE & ARRIVAL HALLS

conclusion

EFFICIENT LAYOUT

SPLITTING THE PROGRAM + CREATING AN HIERCHY WITHIN THE PROGRAM FOR A CLEAR OVERVIEW

CREATING SIGHTLINES BETWEEN SPACES FOR NATURAL WAYFINDING

CREATING A STRONG GRID FOR A CLEAR LAYOUT WITH EXCEPTIONS HELPS FOR ORIENTATION

conclusion

URBAN IMPLEMENTATION

USE THE FACADES AND ROOF TO GIVE SOMETHING BACK TO NATURE & COLLECT WATER + ENERGY PROVIDING BARRIER-FREE (GREEN) CONNECTIONS TO CONNECT NEIGHBOURHOODS & ECOSYSTEMS

THANK YOU!