

# Flusso e Profitto

Efficiency at Linate Airport

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CP

Bodies and Building

2026

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**Bodies and Building Milan**  
**AR4CP020**

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## **Preface**

This graduation report, titled “Flusso e Profitto: Efficiency at Linate Airport,” contains the research and design for the final project of my Master’s degree in Architecture at Delft University of Technology. It was developed within the Complex Projects graduation studio as part of the “Bodies and Building Milan” framework.

The project focuses on a challenge for city airports: the balance between speed and commercial profit. Using Milan Linate Airport as a case study, I explored the tension between the fast flow of business travelers (Flusso) and the financial need for commercial income (Profitto). Instead of forcing passengers through long, winding retail zones, this design introduces a hybrid solution. It proves that fast travel and strategic positioned retail can work together efficiently. Translating data and future airport scenarios, such as flexible aircraft wingspans, into a flexible spatial design turned out to be a challenge, but also a very rewarding process.

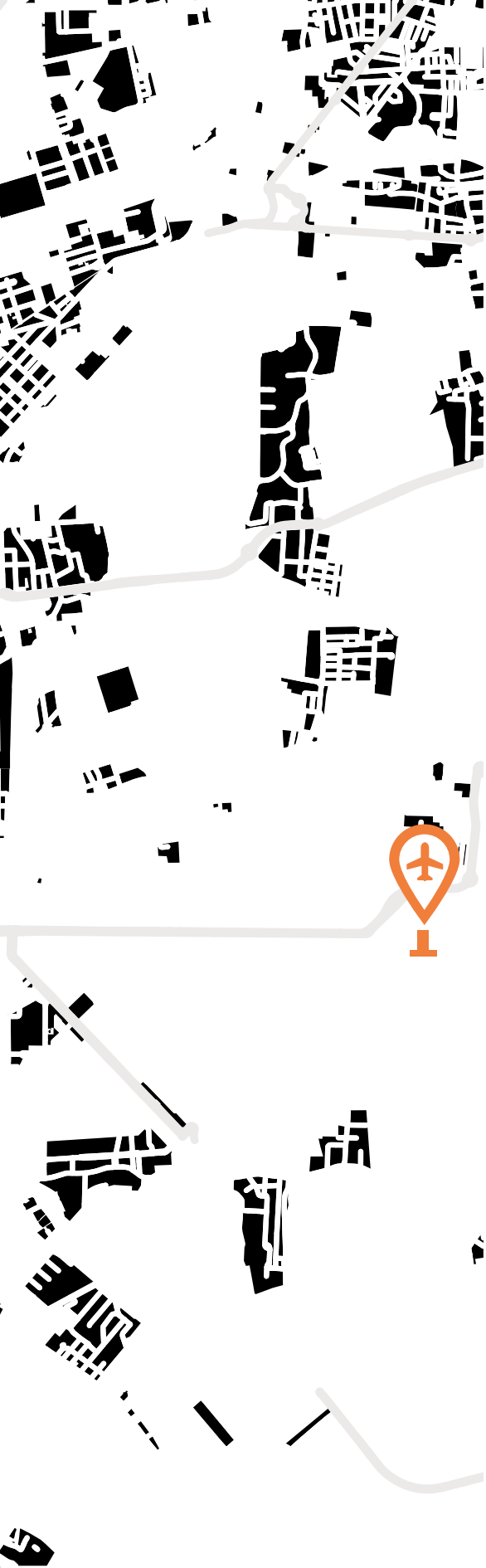
I would like to express my gratitude to the people who guided me during this project. I want to thank Olindo Caso, Jelmer van Zalingen, and Maria Finagina for their continuous support and guidance throughout both the research and design phases. Finally, I want to thank my fellow studio peers for the great collaboration and feedback throughout the year.

Stefan Vuijst

Delft, 2026

**Bodies and Building Milan**  
Cortile dei Dieci





## The Graduation Assignment

### Reimagining One of Milan

The Complex Projects Graduation Studio focuses on the “Building” as a highly integrated entity that responds to contemporary body requirements. The core task is to create a complete redesign of a large-scale, functionally specific building in Milan, operating under the premise that the original structure was never built. This approach allows for a deep research into how modern data science and digitalization can optimize architectural performance from the ground up.

Students select one of ten specific typologies to serve as their “One of Milan” case study:

- Airport
- School
- Museum
- Swimming Pool
- Stadium
- Train Station
- Library
- Hospital
- Courthouse
- Opera

The first semester (MSc3) is dedicated to multi-scale research and data collection to formulate a unique Design Question and Design Brief. The second semester (MSc4) focuses on providing a comprehensive spatial answer through an elaborate Design Proposal. The final goal is to develop a methodological approach that transforms vast amounts of data into a clear, integrated architectural narrative.

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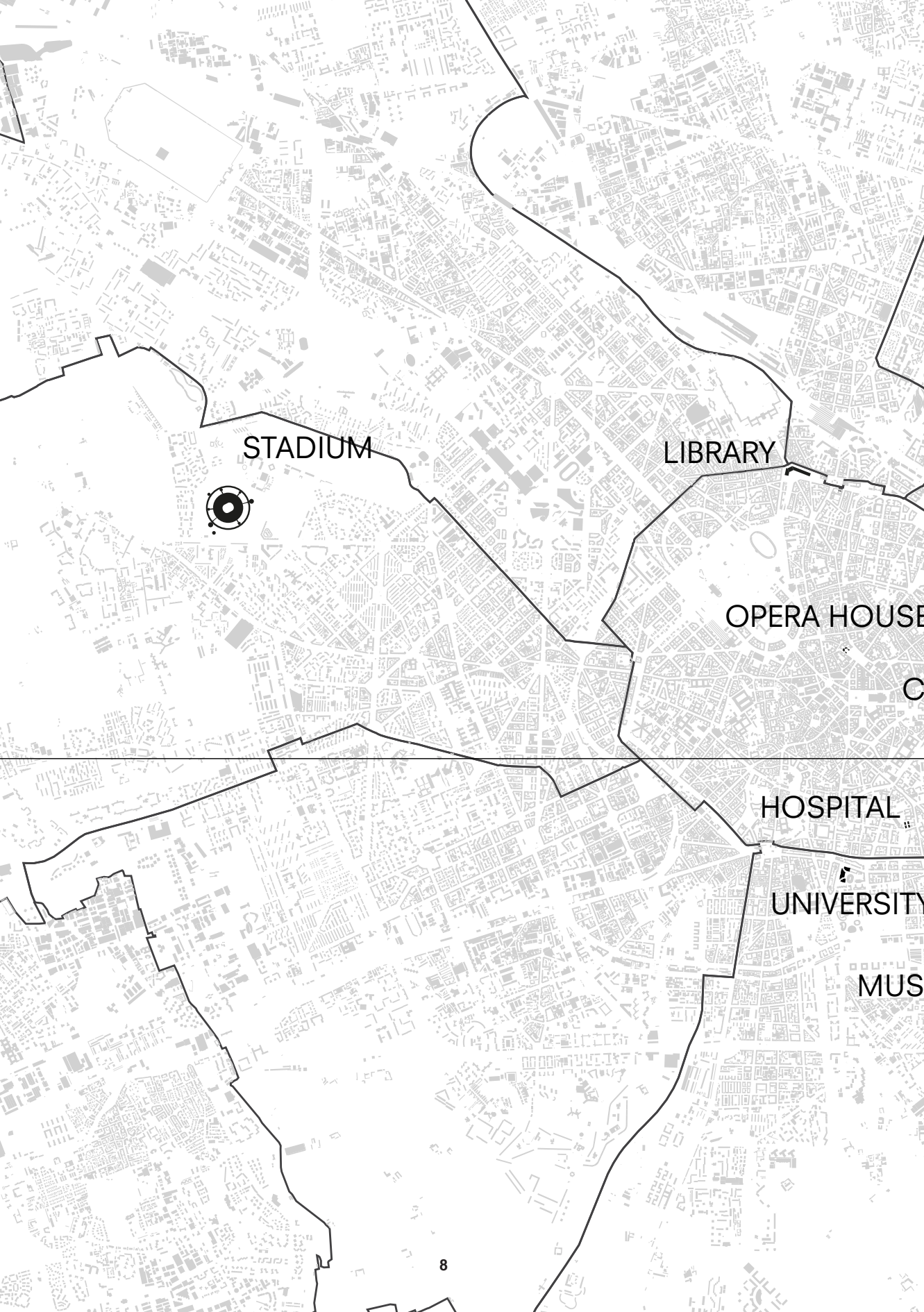
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STADIUM



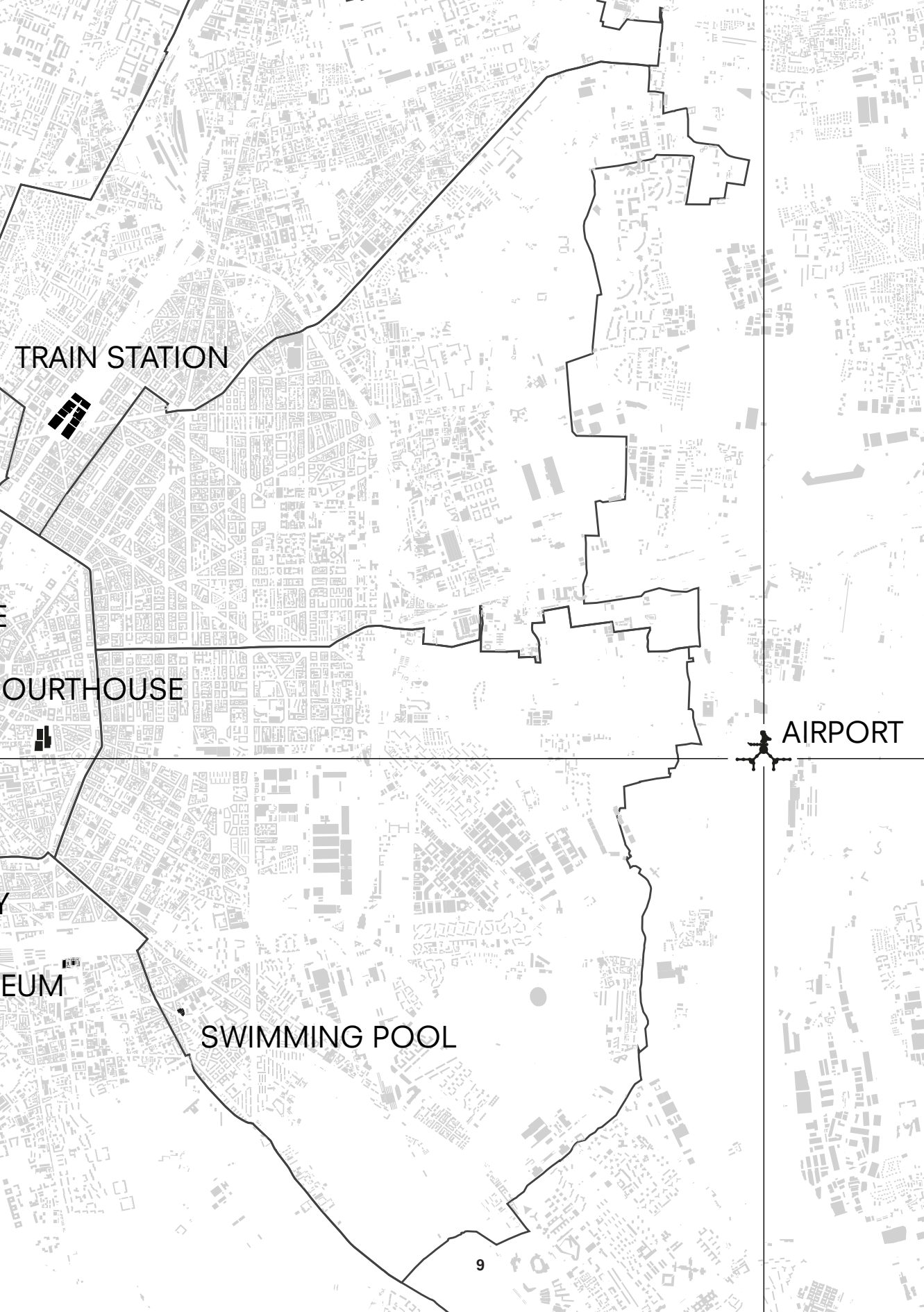
LIBRARY

OPERA HOUSE

HOSPITAL

UNIVERSITY

MUS



TRAIN STATION



COURTHOUSE



MUSEUM



SWIMMING POOL



AIRPORT



# INTRODUCTION

A black and white photograph of a modern grocery store interior. In the foreground, a large, curved, bright orange counter or display structure dominates the lower half of the frame. The background shows a well-lit store with various product displays, including shelves of goods and signs for 'LOCAL FOOD', 'ITALIAN SWEETS', 'TOBACCO', and 'PLEASE PAY HERE'. The ceiling features a grid of recessed lighting and a security camera. The overall atmosphere is clean and contemporary.

01



# PART 1

# THESIS TOPIC

This graduation report investigates the spatial redesign of Milan Linate Airport, focusing on the architectural tension between operational efficiency and commercial vitality.

Titled “Flusso e Profitto” (Flow and Profit), the project explores how a compact city airport can be reorganized to serve two divergent goals: providing a high-velocity, frictionless journey for its primary user group of business travelers (Speed), while simultaneously maximizing non-aviation income for the airport operator (Profitto). By focusing on the passenger as a consumer whose time is valuable, the research seeks to balance the necessity of rapid transit with the strategic opportunity for commercial engagement.

Instead of proposing a radical new invention, the research evaluates existing terminal typologies to determine which spatial organization is most suitable for the specific constraints of Milan Linate. By analyzing these spatial models, the project seeks to define the optimal layout for a redesigned terminal where passenger flow and commercial revenue are mutually reinforcing rather than conflicting.





## PROBLEM STATEMENT

### The City Airport Paradox

Milan Linate is a “City Airport.” Unlike major hub airports, its primary value lies in its strategic location and operational speed. For Milan’s business community, Linate is a vital tool. It must function as a “Frictionless Gateway” where travelers can reach their gate as quickly as possible. In this high-velocity environment, time is the passenger’s most precious commodity (Flusso).

However, airports must generate significant revenue from non-aviation sources, such as shops and restaurants (Profitto). To maximize this income, many terminals utilize a “forced-retail” layout. This design intentionally directs passengers through winding commercial paths, creating friction and delays for the traveler.

A natural conflict exists between the operator’s desire for “Dwell

Time” and the business traveler’s requirement for “Flow.” If the terminal is designed solely as a commercial corridor, it fails its primary user group. Conversely, if it ignores commerce, it becomes financially unsustainable. The challenge lies in selecting a spatial typology that resolves this conflict from the outset.

This Graduation Report proposes a new architectural vision for Milan Linate. Instead of following the traditional “Shopping-Mall” model, this project seeks a typology that serves both objectives simultaneously. It aims to create a smart hub that respects the traveler’s time while ensuring the airport’s commercial vitality. By selecting the optimal spatial organization, the outcome of this research might demonstrate that high-velocity transit (Flusso) and strategic commercial engagement (Profitto) can be mutually reinforcing.



**“Built for the flow,  
not just for the dwell”**

# RELEVANCE

The relevance of this research is to find a better way to design a city airport like Milan Linate, where space is limited and time is important.

## Academic Relevance

In architecture, many airport terminal designs follow a standardized “shopping-mall” model that directs passengers through extensive, winding retail zones. This research is relevant because it questions whether this model is appropriate for a compact city airport. By studying various terminal typologies, this study seeks a more balanced approach. It explores how architectural choices can resolve the spatial conflict between the requirement for a fast passenger journey and the operator’s need for commercial income.

## Practical Relevance:

For Milan, Linate is a vital link to the European business network. As the airport primarily serves business travelers, its design must reflect their specific requirements for speed and seamless transitions. This research provides a framework for organizing the terminal more efficiently, demonstrating that a terminal can remain a high-performance transit tool while remaining commercially viable. Ultimately, the goal is to develop a design that transforms Linate into a more effective and modern gateway for the city.

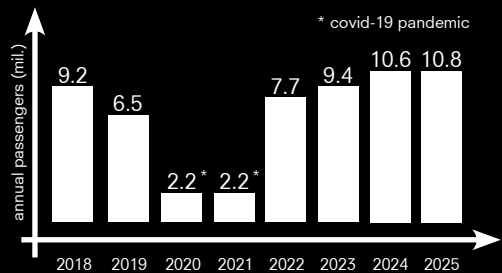


Diagram 1 - passenger numbers in the past years

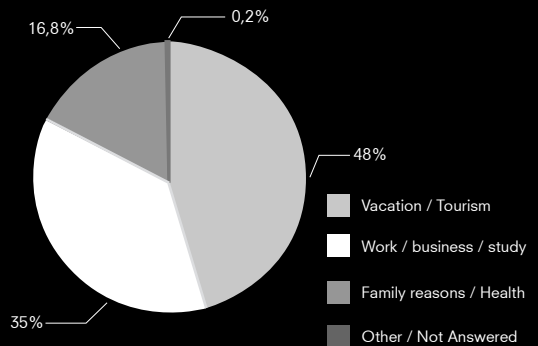


Diagram 2 - travel purposes

## RESEARCH QUESTION

To find a solution for the Frictionless Gateway this research focuses on one research questions subdivided

by four important sub-questions that help find the best typology for the new airport. The main research question for this design project is:

**“What typology of spatial configurations**

**minimizes the transit time for business travelers**

**while maintaining dwell time for the other passengers**

**at Milan Linate Airport”**

### **1. Stakeholders**

- “Who are the key decision-makers and stakeholders involved in Linate’s terminal design and what are their requirements regarding passenger flow and commercial space?”

### **2. Walking and Waiting times**

- “What are the maximum acceptable walking and waiting times a for the time-sensitive business traveler during critical stages such as security, border control, and gate access?”

### **3. Reference City Airports**

- “Which spatial configurations do comparable city airports use to process high passenger volumes in a compact area?”

### **4. Advantages and Disadvantages**

- “How do different terminal typologies perform when comparing passenger speed versus the required commercial visibility?”

## SCOPE

This research focuses on the architectural design of the passenger terminal at Milan Linate Airport, specifically targeting the “airside” area. This is the critical zone between the security checkpoints and the boarding gates where the tension between passenger flow and commercial revenue is most prominent.

The primary user group for this study is the business traveler, whose demand for velocity and efficiency is the main driver for the spatial organization. From a commercial perspective, the study focuses on “Non-Aviation Revenue,” specifically looking at how the strategic placement of retail, lounges, duty-free, and Food & Beverage (F&B) can maximize passenger revenue without compromising transit speed.

To maintain a clear focus, landside elements (such as parking facilities, metro stations, the check-in hall, and baggage handling systems) are considered only as necessary context. The core of this project remains the architectural optimization of the airside environment that excels in both operational speed and commercial vitality.

## ASSIGNMENT

The assignment (Project Statement) is to design the airside circulation of the new Milan Linate terminal, transforming it into a Frictionless Gateway. The project focuses on a fundamental rethink of the passenger journey between security and the boarding gates. Moving away from the traditional, winding “forced-retail” path, the task is to develop a spatial organization that prioritizes high-frequency flow and eliminates movement bottlenecks.

The design challenge lies in creating a layout where commercial functions are strategically integrated without impeding the primary path of the time-sensitive passenger. By focusing on airside circulation, the project aims to demonstrate how a specific spatial typology can facilitate a rapid, intuitive journey for business travelers while still accommodating the necessary commercial square footage.

## OBJECTIVE

The objective of this thesis is to explore how operational flow and commercial revenue can coexist within a single terminal environment. The project aims to develop a typology: a smart spatial hub that offers a fast, direct route for the business traveler while providing accessible retail and lounge environments for those with more dwell time. By optimizing the revenue per passenger through strategic spatial placement rather than forced detours, the design seeks to balance high-speed transit with commercial vitality.

## AMBITION

The ambition is to establish a new benchmark for city airports. By resolving the conflict between Dwell Time and Flow through a refined spatial typology, this project seeks to secure the airport's financial future (Revenue) without compromising the passenger's schedule (Speed). The final result will be a terminal that functions as a high-performance transit machine, the most efficient and modern gateway for Milan, demonstrating that an airport can be both a frictionless gateway and a profitable urban node.

### The Future of City Airports

# Milan

FIRST CLASS LOUNGE



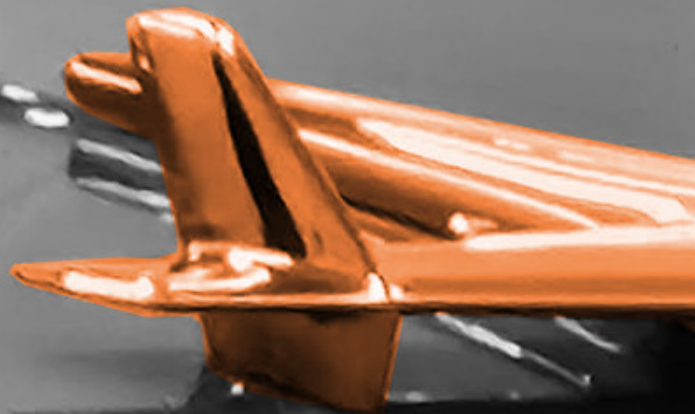
Speed & Comfort



## NOMENCLATURE

ATM	Aircraft Traffic Management
ATM/hr	Aircraft Movements per hour
BGY	Airport Bergamo
EASA	European Union Aviation Safety Agency
ENAC	Ente Nazionale per l'Aviazione Civile
F&B	Food & Beverage
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
LoS	Level of Service
MPX	Milan Malpens Airport
SEA	Società Esercizi Aeroportuali (Managing company for Linate and Malpensa)
PHPT	Peak Hour Passenger Throughput

**APPROACH**



**02**



**PART 2**

# METHODOLOGY

To develop an architectural response that effectively addresses the 'Speed vs Profit' paradox at Milan Linate, this research follows a structured, multi-scalar methodology. The process is organized into five distinct phases:

**Literature Analysis**  
 Establishing of the theoretical foundation, focusing on airport Level of Service (LoS) and the specific needs of the high-frequency traveler.

**Site Analysis**  
 Both on macro and meso scales, the urban, regulatory, and geotechnical constraints of the Linate location will be identified.

**Scenario Analysis**  
 The potential future technology and design to be researched.

	year	2025	
Description	month	Dec	Jan

**Graduation phase**

- 1. - Initiate
- 2. - Approach
- 3. - Results
- 4. - Closure



christmas break

Analysis  
The impact of aviation regulations will be analyzed for a resilient

Case Study  
Researching international city airports to provide benchmarks for program distribution and passenger flows.

Research by Design  
In this stage, the act of designing serves as a tool to test how complex logistical flows can be integrated into a new, coherent architectural typology.

2026

Feb

Mar

Apr

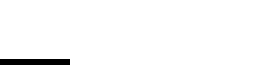
May

Jun

spring break



2.



3.



4.

# THEORETICAL FRAMEWORK

Airport terminals are spatially divided into landside and airside zones. Landside includes all publicly accessible areas such as access from the city, check-in and pre-security circulation. Airside begins after the security checkpoint and contains the controlled environment leading to the boarding gates. For city airports like Milan Linate, the airside zone is critical, as it is where passenger flow, comfort and commercial interests intersect.

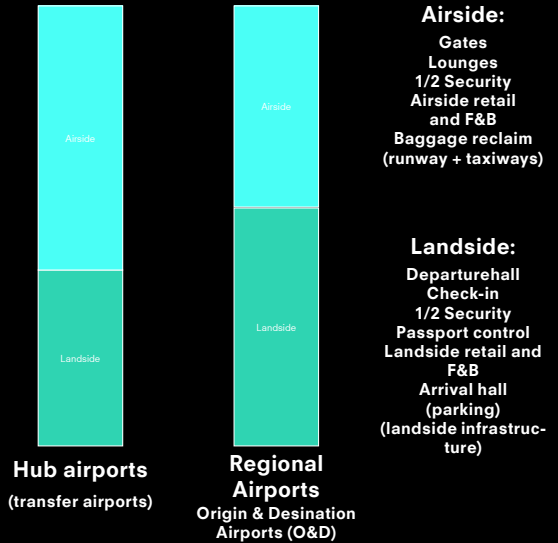


Diagram 3 - landside vs airside

## The Business Traveler

The business traveler is primarily driven by time efficiency, predictability and productivity. Literature on airport Level of Service (LoS) describes this passenger as a frequent flyer who arrives relatively late, travels with limited baggage and seeks to minimize time spent on mandatory processing activities. Spatial design therefore plays a key role in reducing friction. Effective configurations for business travelers are characterized by:

- Short and direct walking distances, ideally supported by linear or pier-based layouts.
- Process differentiation, including fast-track security, self-service bag drop and biometric "single-token" screening, allowing premium passengers to bypass standard queues.
- Clear spatial alignment between security, main circulation routes and gates, avoiding forced detours through commercial zones.

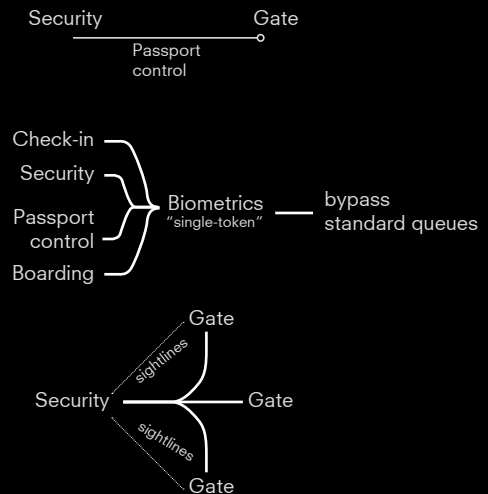


Diagram 4 - business travelers requirements

### The Airside Lounge

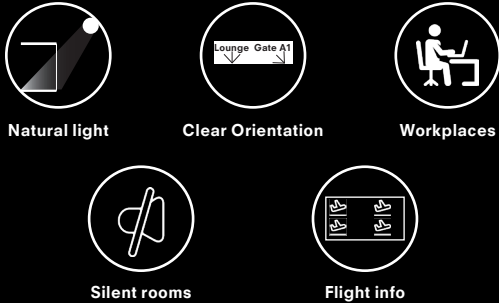


Diagram 5 - the airside lounge

Once airside, the focus of the business traveler shifts from speed to productive waiting. High-quality CIP lounges are essential and should be located airside, beyond security and immigration, and directly adjacent to or above primary passenger routes. Proximity between lounges and gates allows travelers to use their remaining time efficiently, supported by reliable Wi-Fi, power supply and quiet working environments.

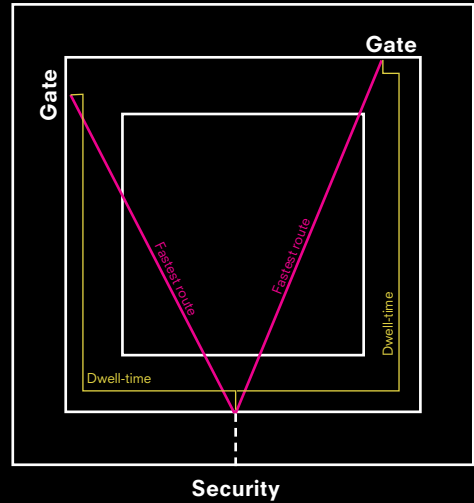


Diagram 6 - walking routes projected in the Milanese courtyard

While leisure travelers generally arrive earlier and generate longer dwell times, their needs are secondary within a business-oriented city airport. Centralized airside spaces and compact commercial clusters can accommodate this group without interfering with fast routes.

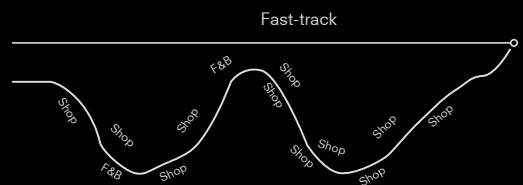


Diagram 7 - routing business traveler vs leisure traveler

The literature therefore supports a hybrid terminal typology: a spatially segregated, fast circulation layer tailored to business travelers, combined with a central commercial core for other passengers. This “dual-track” model enables Milan Linate to function as a frictionless gateway for its primary users while remaining commercially viable.

# DESIGN BRIEF

To transform Linate into a Frictionless Gateway, this brief translates research into architectural parameters across four pillars:

- **Site Requirements:**  
Spatial and technical constraints derived from the Milanese context, such as vertical height limits and urban connectivity.
- **Typology Requirements:**  
Functional needs for the terminal's gate organization, focusing on flexible configurations

- **Stakeholder Ambitions:**  
The strategic goals of key actors, balancing operational speed for the traveler with commercial growth for the operator.
- **Program Requirements:**  
Definition of the spatial and functional layout of the terminal based on the analysis of program and flows.

This integrated approach forms the foundation for a terminal that functions as both an efficient transit machine and a viable urban hub.

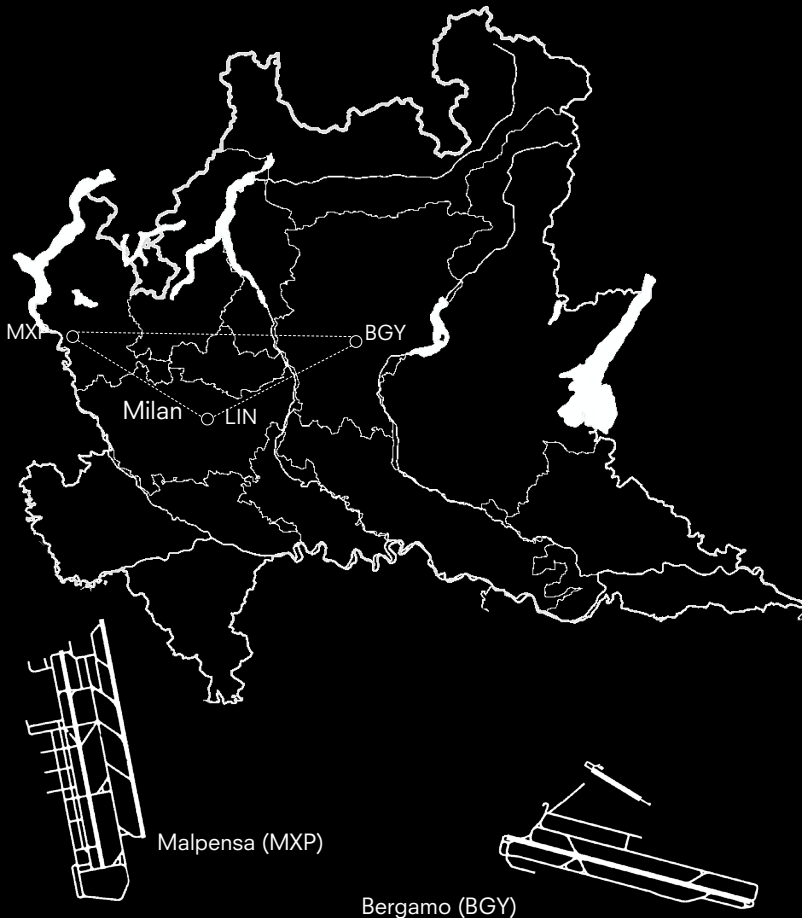


Figure 1 - the two existing airports

# CONTEXT & SITE



Figure 2 - location for the third airport (main user - business traveler)

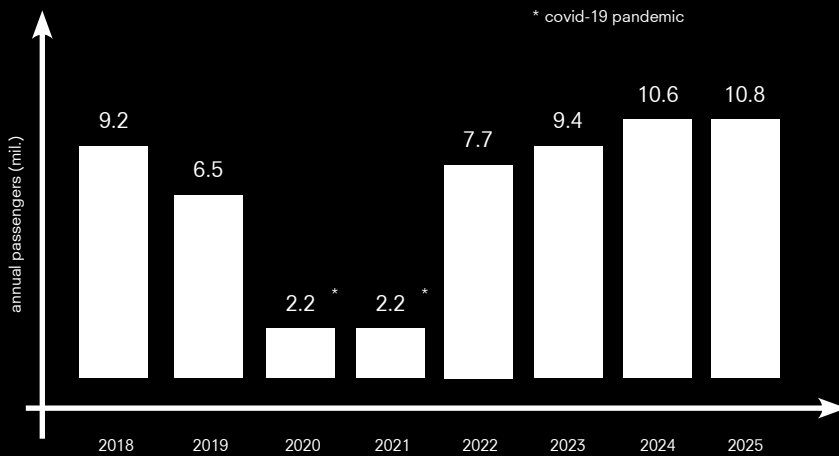


Figure 3 - passenger numbers (according to ICAO approximately 20 million in 2040)

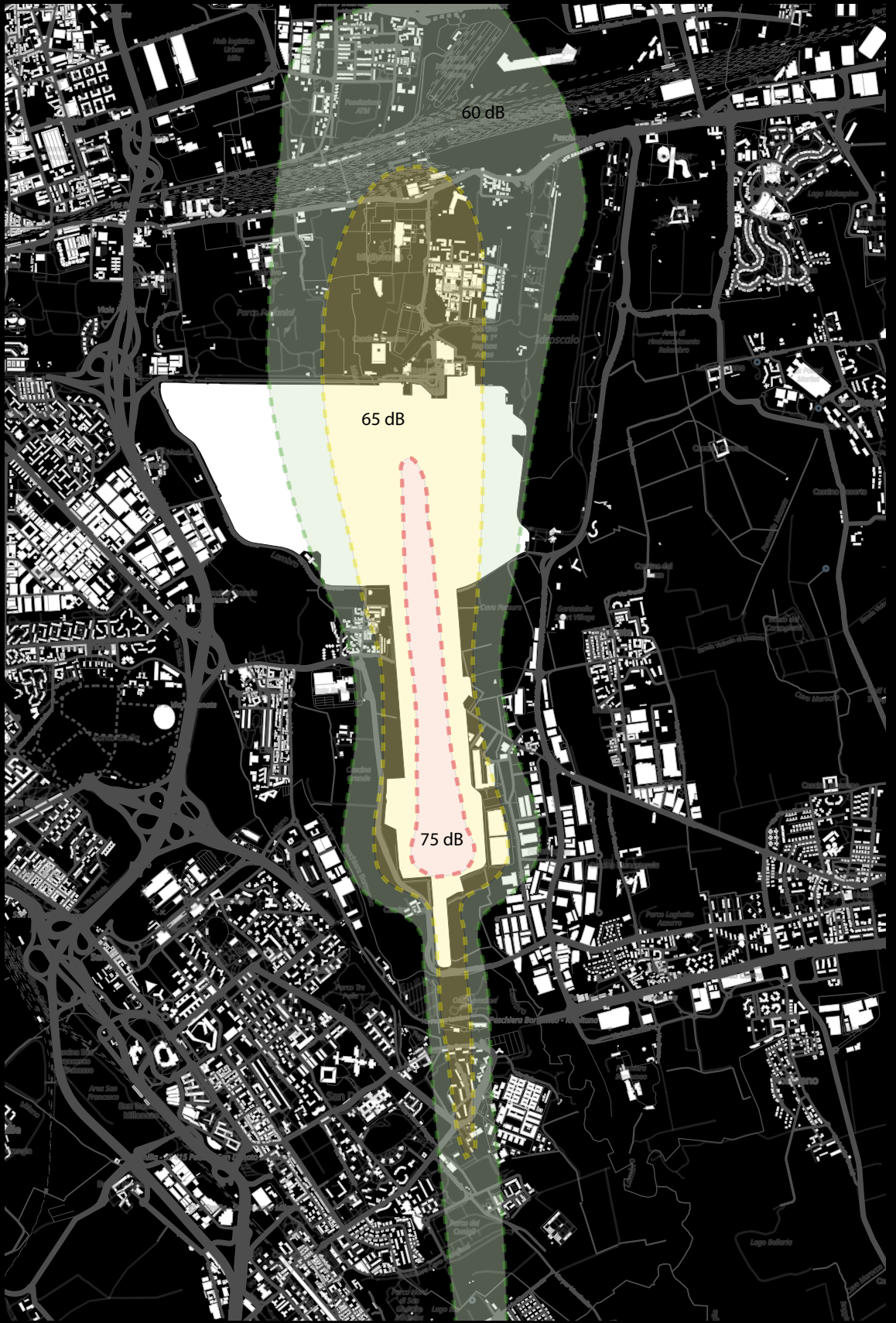


Figure 4 - noise pollution (in dB)

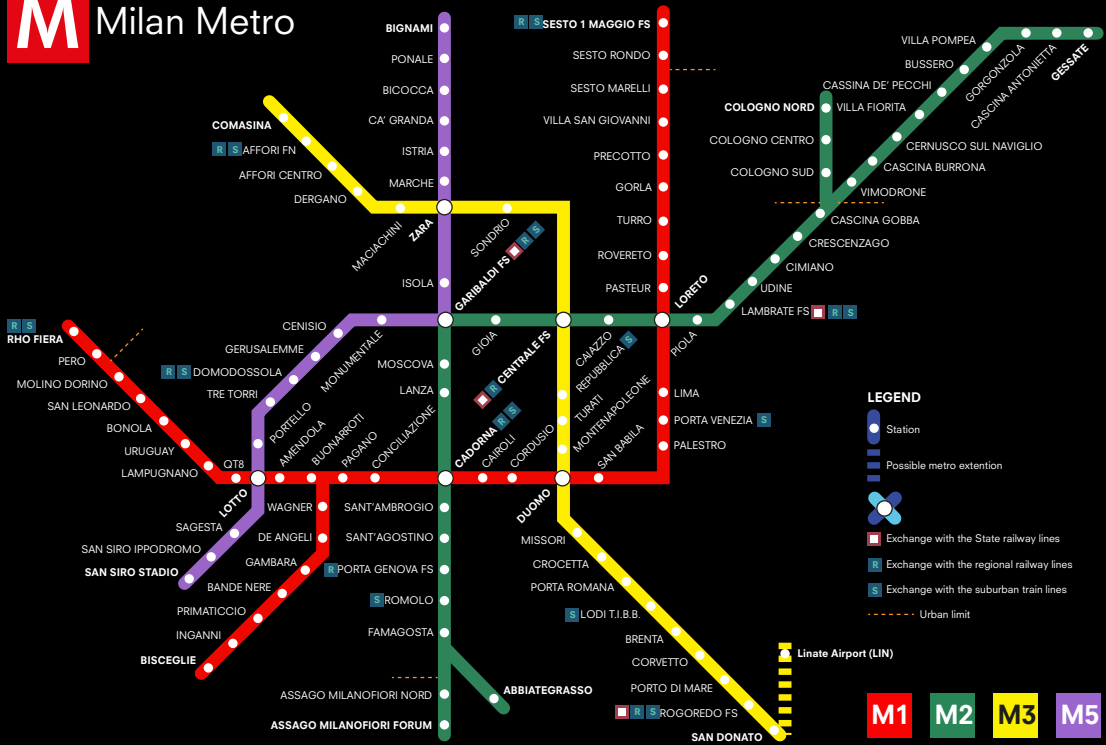
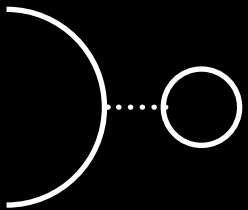


Figure 5 - metronetwork Milan

\* Metro4 was created to connect the airport, in the case of this research the airport was never built

**Site Requirements L-scale**



**Urban Connectivity:**  
The terminal must facilitate a direct and high-speed connection to the Milan city center (7km)



**Environmental Buffering:**  
A green buffer zone is required on the city-facing side of the plot to mitigate noise pollution for the surrounding residential areas.

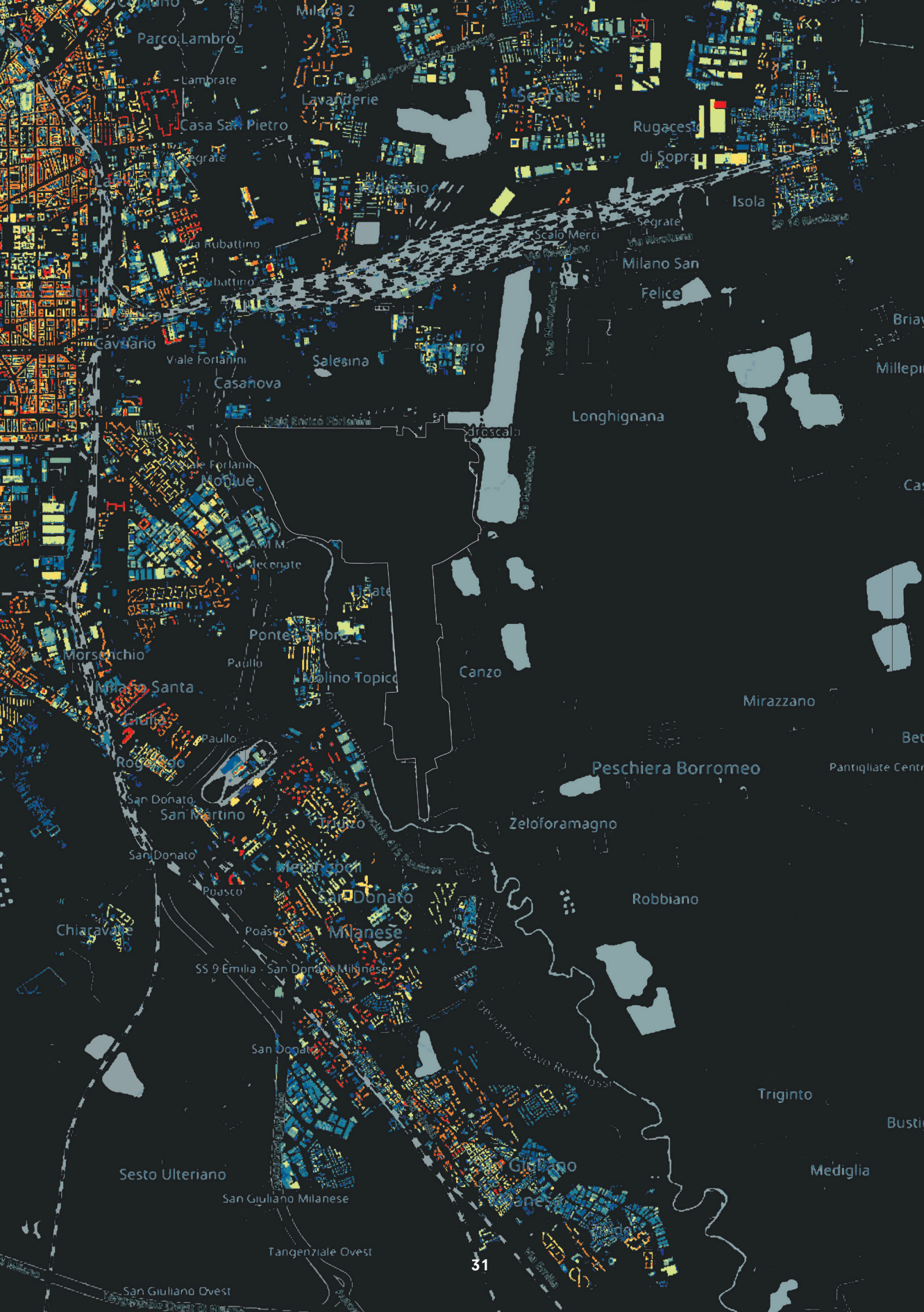


**Scalable Flexibility:**  
The site layout must allow for future scalability in terms of Air Traffic Movements (ATM/h) and adapt to changing aviation regulations beyond the current caps.



Gambaredo

Figure 6 - building heights



Parco Lambro

Lambrate

Casa San Pietro

Segrate

Via Rubattino

Rubattino

Cavariano

Viale Fortalini

Casanova

Viale Forlani

Monluè

Mezenate

Ponte Lambro

Paullo

Morsenchio

Santa

Grutto

Paullo

Roggiano

San Donato

San Martino

San Donato

Poasco

Chiaravalle

SS 9 Emilia - San Donato Milanese

San Donato

Sesto Ulteriano

San Giuliano Milanese

San Giuliano Ovest

Milano 2

Lavanderie

Segrate

Salesina

Truscate

Truscate

Ponte Lambro

Molino Topico

Truzzo

Mezzobion

San Donato

Milane

San Donato

Tangenziale Ovest

Segrate

Segrate

Scalo Merli

Milano San

Felice

Truscate

Truscate

Truscate

Truscate

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Rugacesse

di Sopra

Segrate

Via Broletto

Milano San

Felice

Longhignana

Peschiera Borromeo

Zelofoamagno

Robbiano

Triginto

Gliano

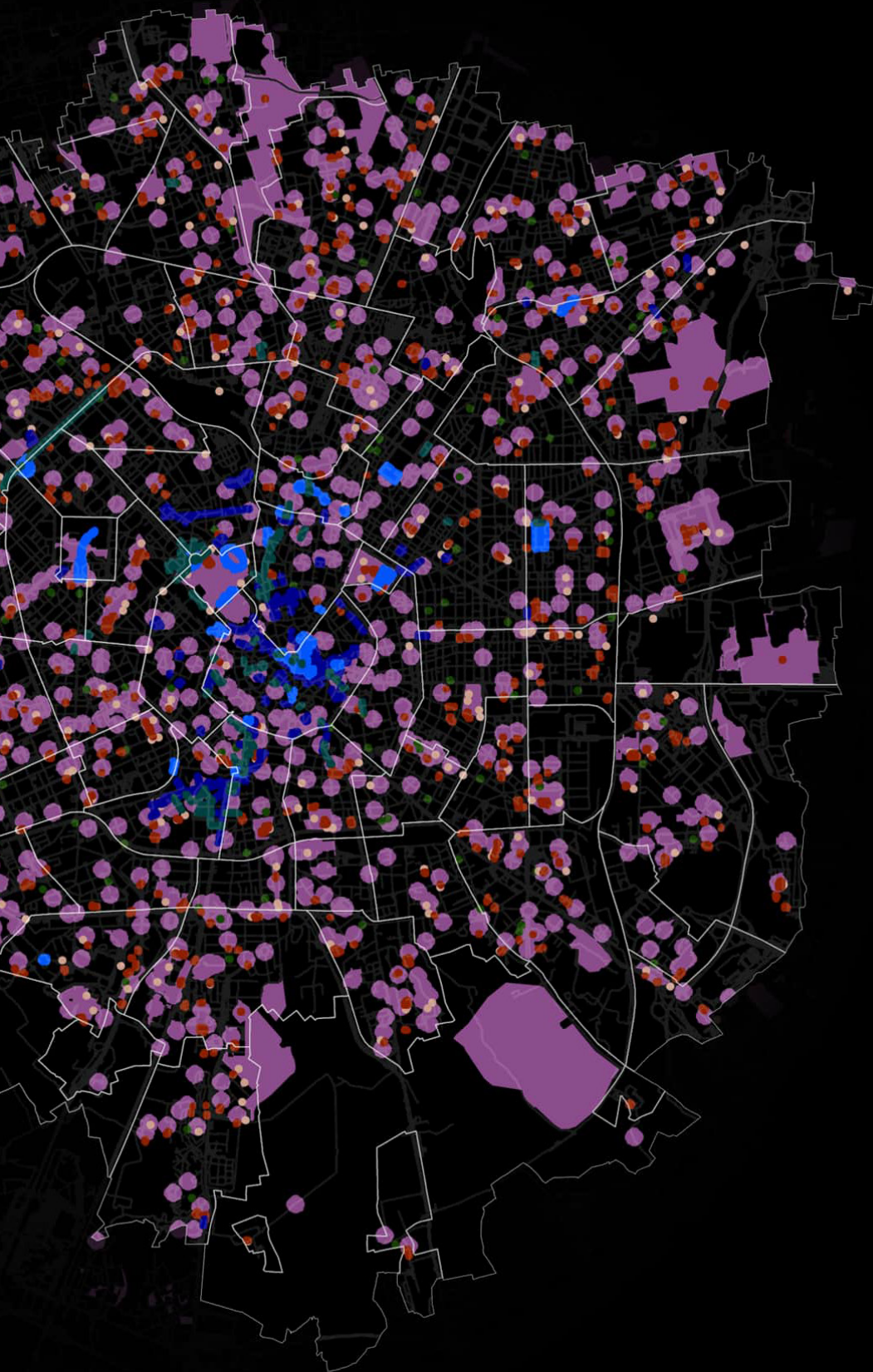
Mediglia



Public realm categories

*Categorie di spazio pubblico*

- Parks / *Parchi*
- Plazas / *Piazze*
- Pedestrian areas / *Aree pedonali*
- LEZ / *ZTL*
- Playgrounds / *Aree gioco*
- Oratories / *Oratori*
- Dogs areas / *Aree cani*



# Buildings

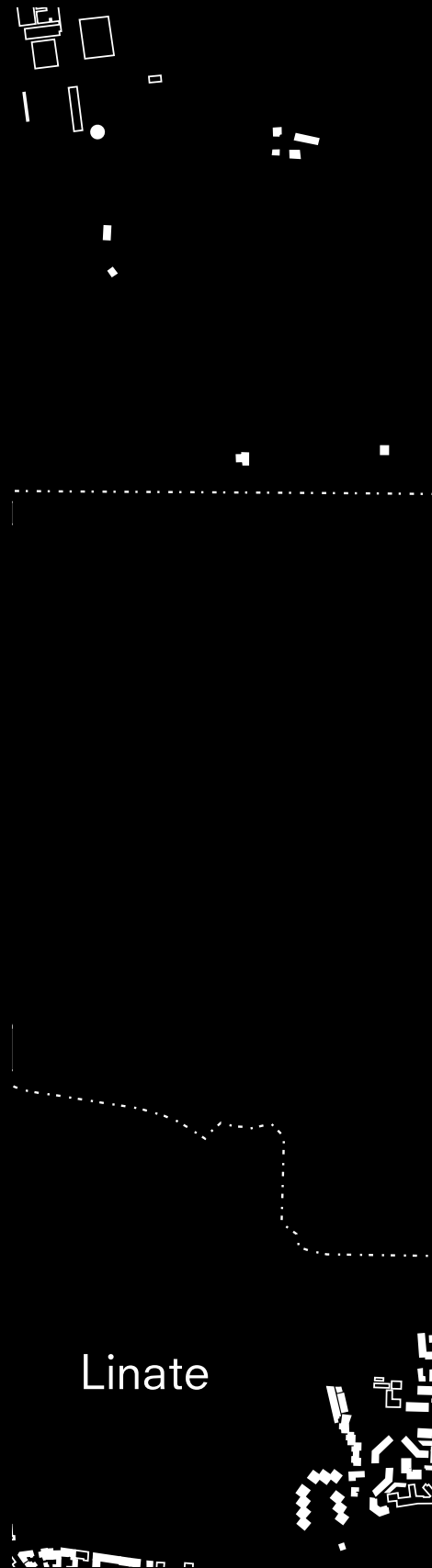


Figure 8 - surrounding buildings

Nevogro

Mezzate

# Networks

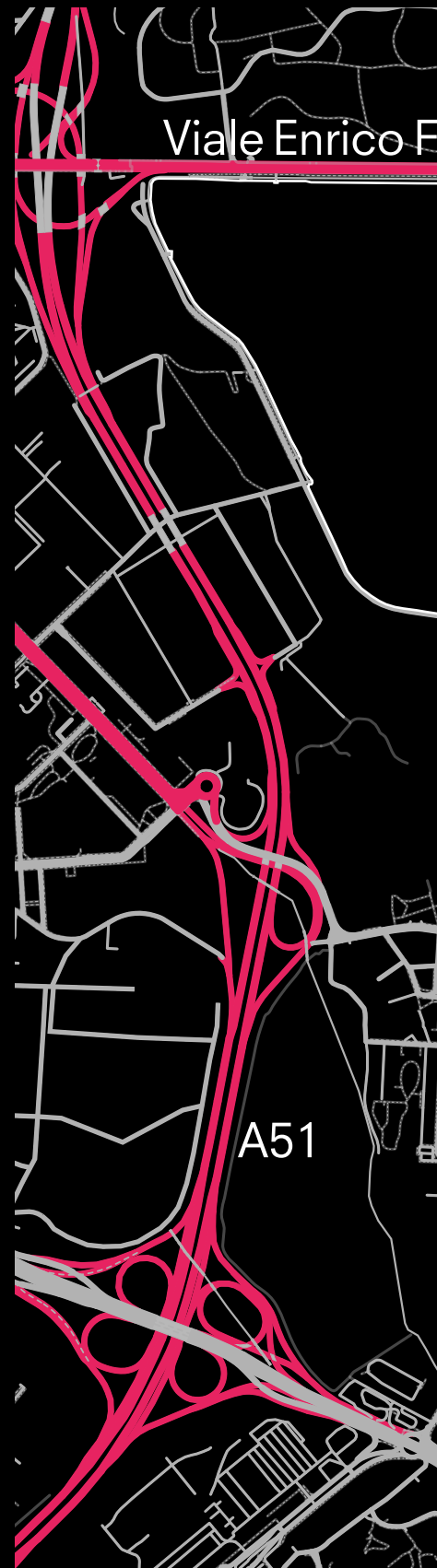
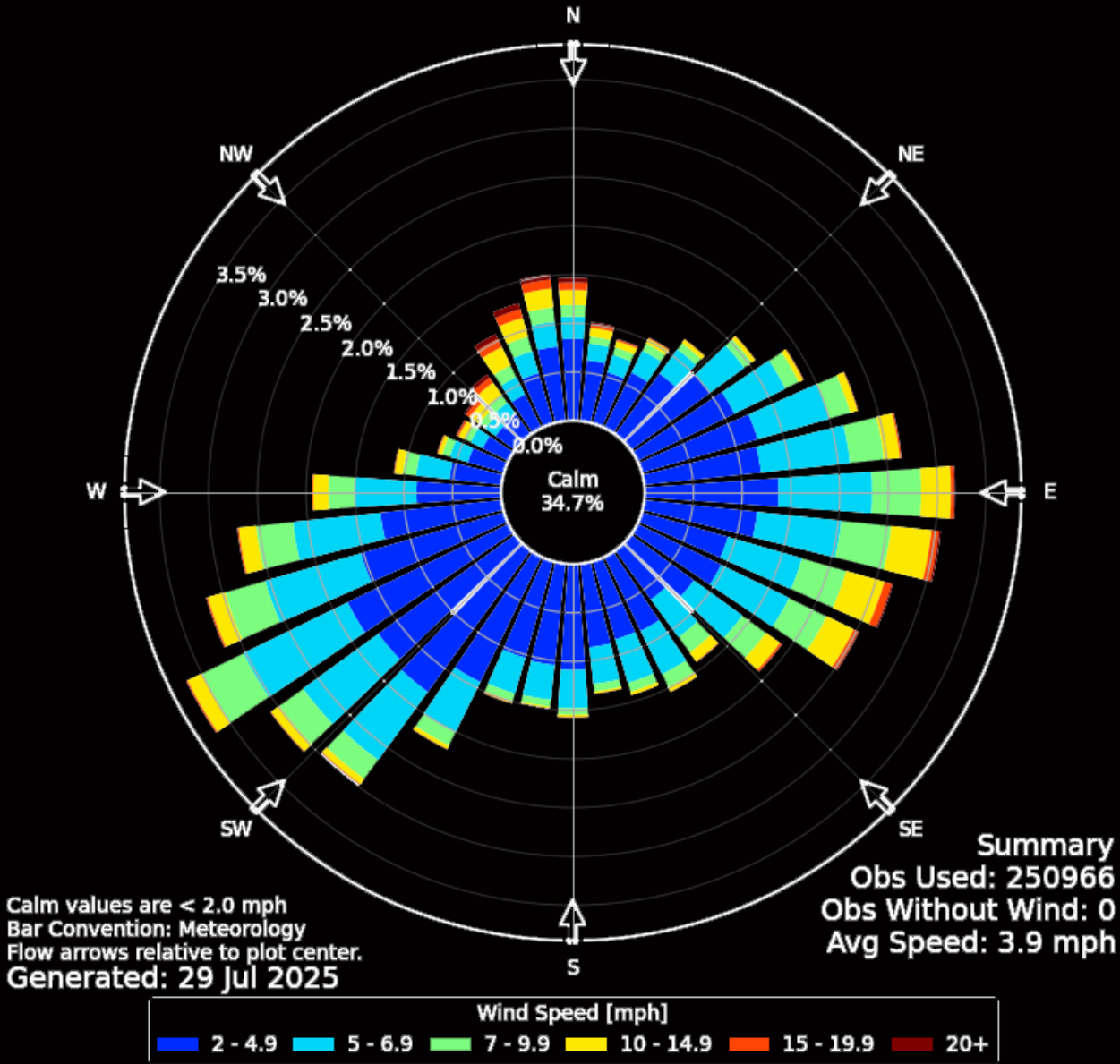


Figure 9 - surrounding networks





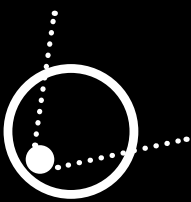
# Wind

Figure 10 - wind directions and speed



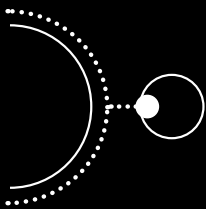
Figure 11 - facilities

### Site Requirements M-scale



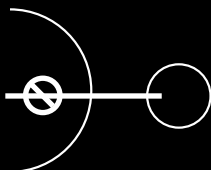
#### Visual Orientation:

The terminal layout should prioritize “view-lines” towards the North-East and North-West to capitalize on the aesthetic quality of the Idroscalo lake and surrounding parks.



#### Strategic Positioning:

The passenger terminal must be positioned in close proximity to the main highway infrastructure to ensure efficient landside accessibility.



#### Aeronautical Orientation:

Runway positioning must be strictly managed to ensure flight paths avoid overflying the high-density urban areas of Milan.

TYPOLOGIES

Aircrafts main  
Fuel type  
Hydrogen

Design Year  
2050

Annual  
Passengers  
15 million

Type of Airport  
Regional /  
national

Peak Hour  
Passenger Throughput  
(PHPT)

5.000

Type of  
Aircraft  
Code B & C



Main Aircraft  
Type  
Airbus ZeroE

Passenger  
Terminal Size

100.000 sqm

Main User

Business  
Travelers

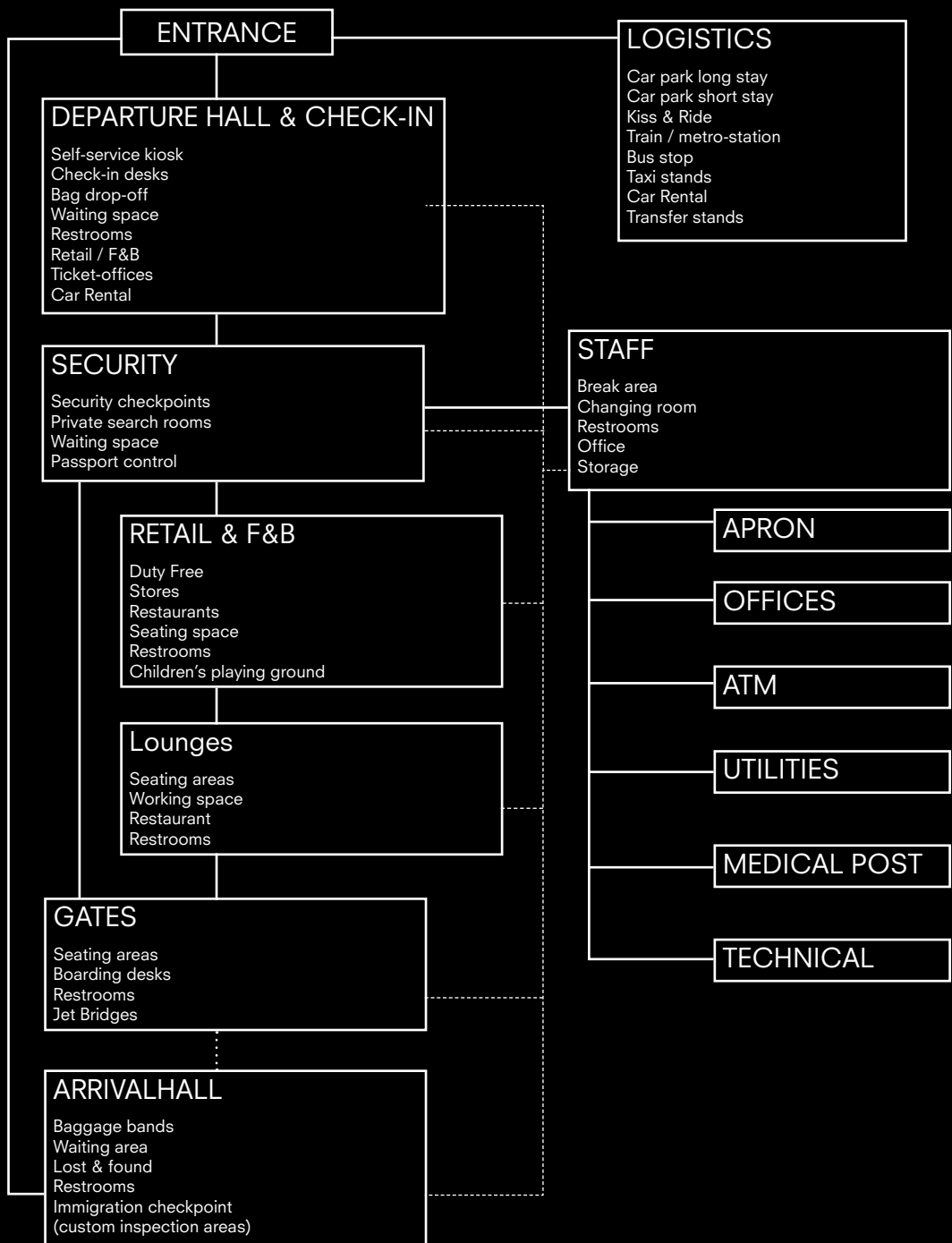


Figure 13 - Terminal Adjacency Diagram

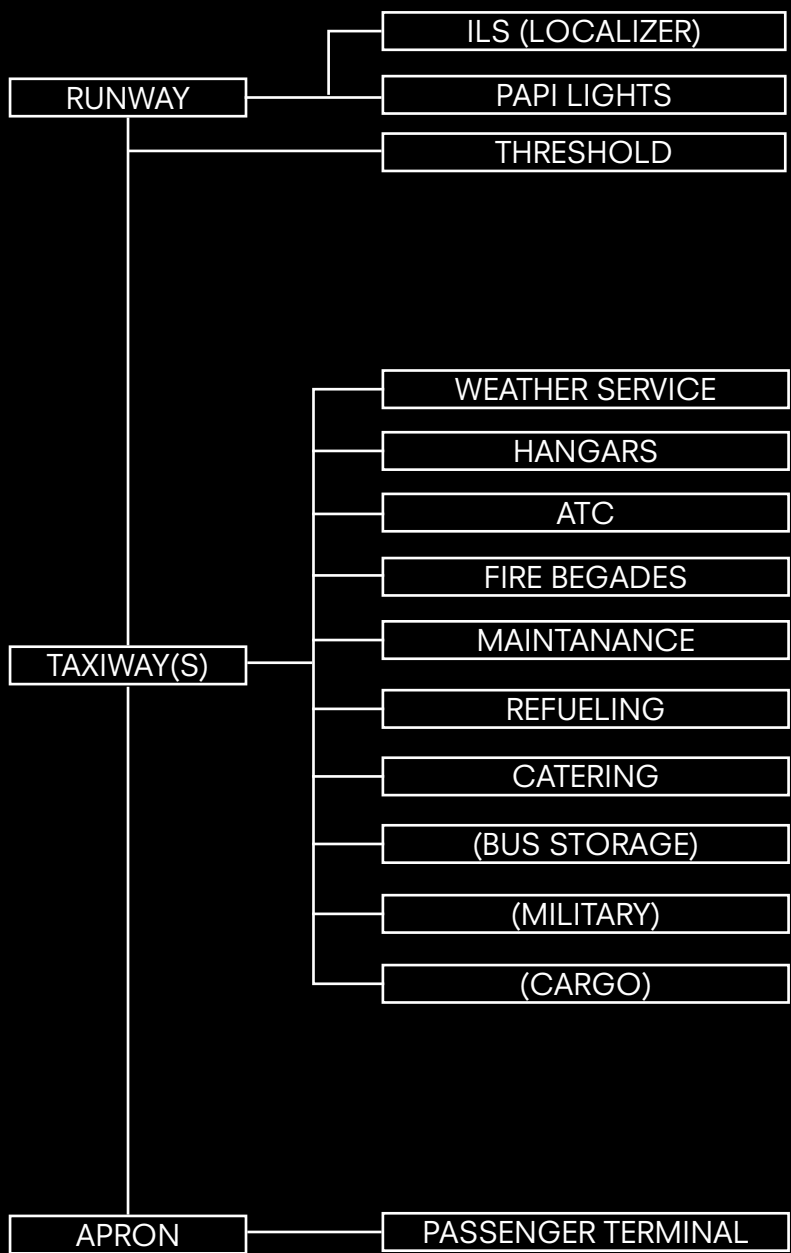


Figure 13 - Airport Adjacency Diagram

**Future Scenarios and Hypothesis**

To ensure long-term resilience, this research evaluates four development scenarios for Linate:

1. Stability: Current aircraft and movement limits remain.
2. Upscaling: Shift to larger aircraft within fixed slots.
3. High-Frequency: Small, sustainable aircraft with increased movements.
4. Hybrid Adaptive Model: A flexible system anticipating radical industry shifts.

This thesis adopts Scenario 4, positioning Linate as a specialized hub for zero-emission aviation, specifically the Airbus ZeroE (ICAO Code C).

The future terminal must be designed as 'Living Infrastructure'. Since the exact trajectory of aviation is uncertain, the design proposes a modular framework. While optimized for Code C hydrogen aircraft, the spatial organization allows gates and core processes to be seamlessly reconfigured for Code B through Code E. This 'Terminal Granularity' ensures Linate remains a resilient gateway, capable of pivoting between high-frequency regional flows and consolidated capacity regardless of technological evolutions.

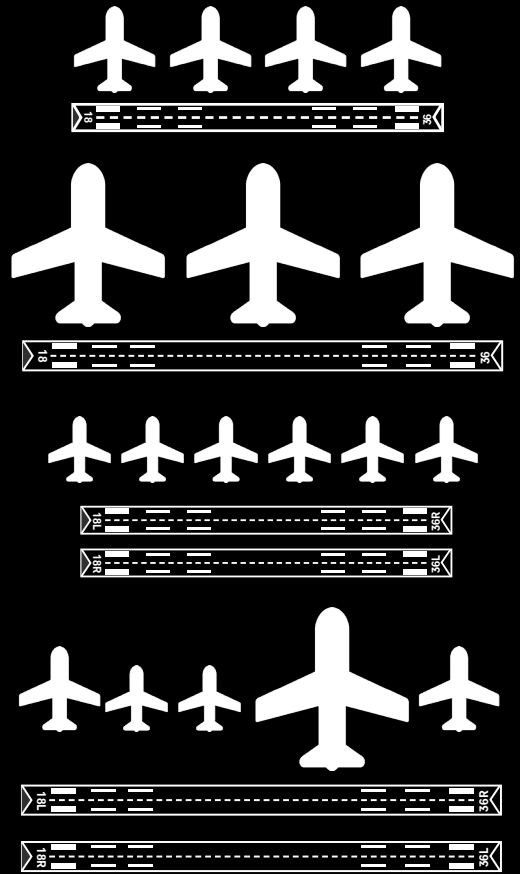


Figure 15 - different scenario's

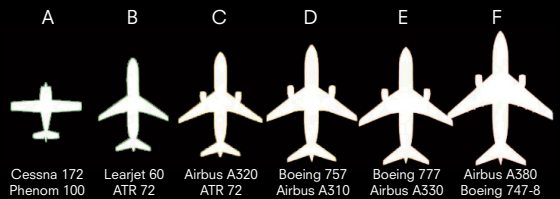
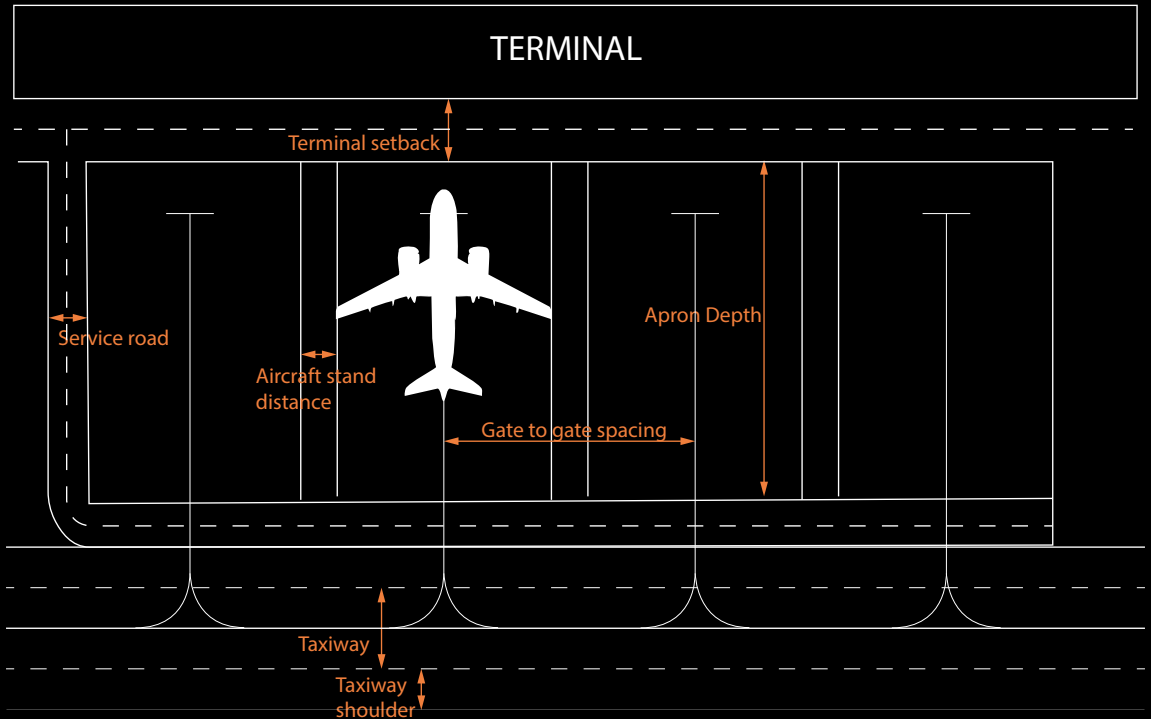


Figure 16 - ICAO aircraft types



### Wingspan

Aircraft Code	Wingspan (in m)
B	15-24
C	24-36
D	36-52
E	52-65

### Gate-to-Gate Spacing

Aircraft Code	Apron Depth (in m)
C	70-80
D	80-90
E	90-105

### Runway Measurements

Aircraft Code	Runway Width (in m)
C	45
D	45
E	45

### Apron Depth

Aircraft Code	Apron Depth (in m)
C	70-80
D	80-90
E	90-105

### Taxiway to Taxiway (centerline)

Aircraft Code	Centerline to Centerline (in m)
C	44-47
D	60-65
E	80-90

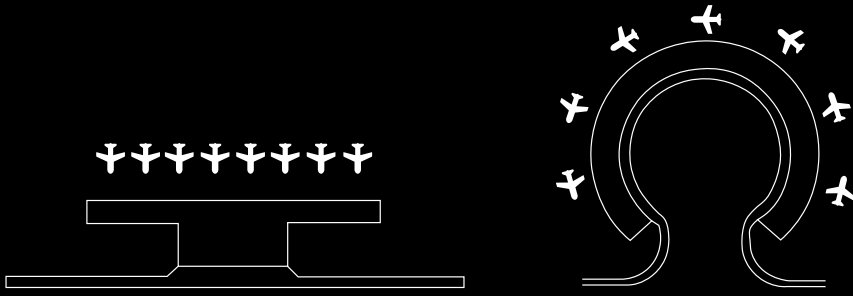
### Taxiway Measurements

Aircraft Code	Taxiway Width (in m)
C	18
D	23
E	23-25

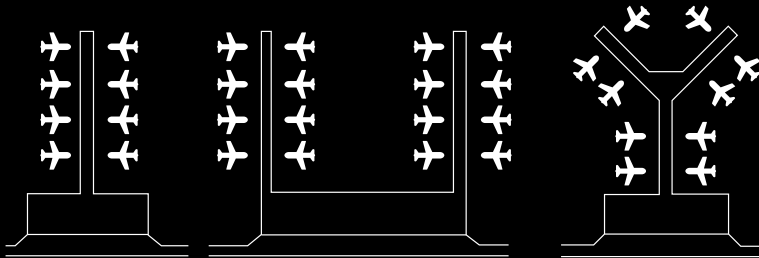
### Runway to Taxiway (centerline)

Aircraft Code	Centerline to Centerline (in m)
C	168
D	176
E	190

Figure 17 - ICAO measurements apron by aircraft types



Linear concepts and its variations



Pier (finger) concept

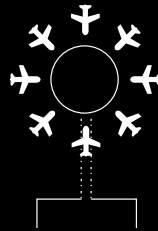
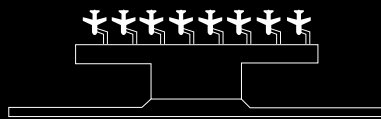
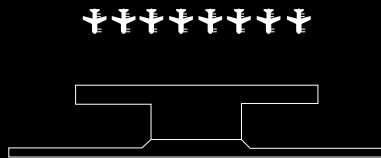


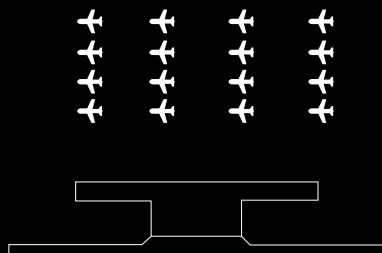
Figure 18 - Terminal Typologies



Contact gates



Semi-contact gates



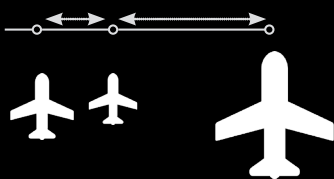
Remote stands

Figure 19 - Stand Type Typologies

Typology	Advantages	Disadvantages
Linear	Fast & Direct Short walking distances	Hard to expand Congestion
Pier / Finger	More gates Central Retail	Longer walking Slower transit
Satellite	Efficient for aircraft Modular	Needs trains Many level changes

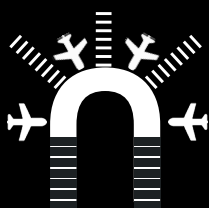
Stand Type	Advantages	Disadvantages
Contact	Max comfort No bus, needed	Expensive Uses prime space
Semi-Contact	Fast turnaround Lower costs	Less comfort Exposed to weather
Remote	Flexible Cheap capacity	Slow bus transfers High friction

### Typology Requirements



#### Flexible Gate Configuration:

The aprons and gates must be able to accommodate either large (wide-body) or smaller aircraft (narrow body). This allows the terminal to adapt instantly to different airline fleets without structural changes.



#### Easy extendable

The terminal must be based on a modular structural grid. This means that the building components (columns, floor plates, and facade) are standardized, allowing the terminal to be easily extended or reduced in size. This ensures that the building can grow or shrink in line with the aviation growth or decline described in the scenarios.

STAKEHOLDERS



Milan  
Airports





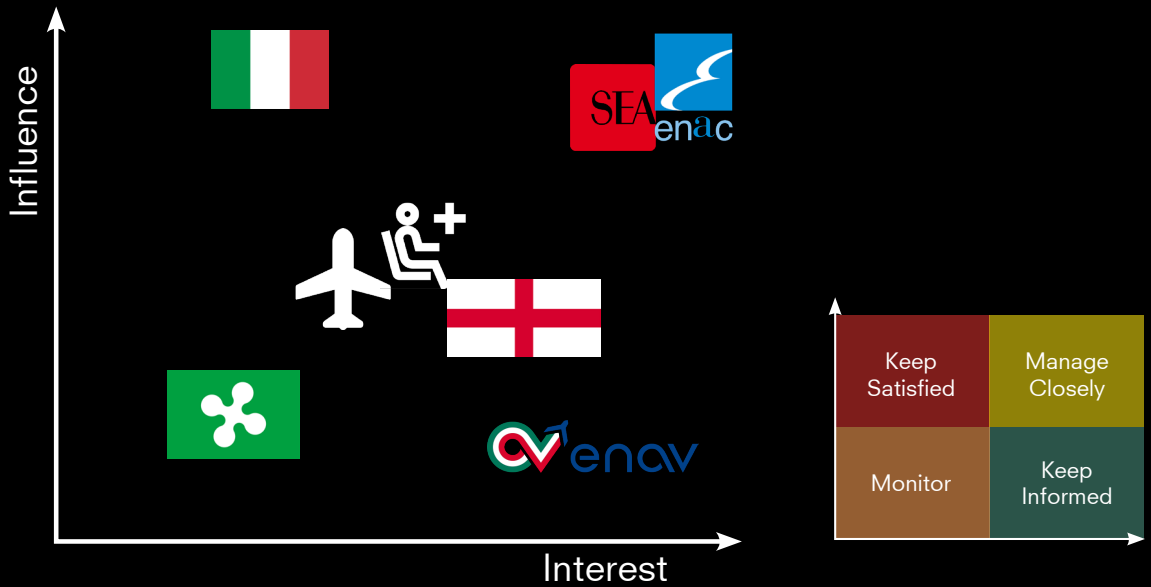


Figure 19 - Interests Diagram



Figure 20 - Airlines

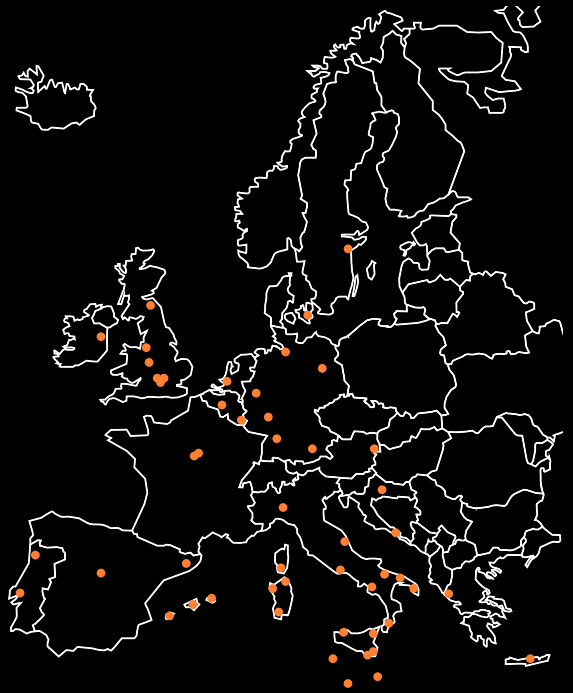


Figure 21 - Destinations

## Stakeholder Ambitions

### Optimized Commercial Conversion (Operators Ambition):

The terminal configuration must maximize non-aeronautical revenue by ensuring high accessibility to commercial zones. Whether located landside or airside, the retail program must be positioned to capture maximum revenue from both departing passengers and visitors.



### Ultra-Fast Track for Business Travelers (Business Travelers Ambition)

The design must guarantee a "frictionless" path for time-sensitive business travelers. This requires a layout where the distance and processing time between the terminal entrance, security, and the gates are minimized, allowing frequent flyers to bypass non-essential terminal functions.



### Operational Slot Efficiency (Airlines Ambition)

The terminal-to-apron interface must be designed for maximum turnaround efficiency. All landside and airside processes must be synchronized to ensure that aircraft can be processed and boarded with zero delay, maximizing the economic yield of every available slot.



**PROGRAM & FLOWS**

**TXL - Berlin Tegel (closed)**



**SDU - Rio de Janeiro**



**CGH - Sao Paulo Congonhas**



**DCA - Washington**



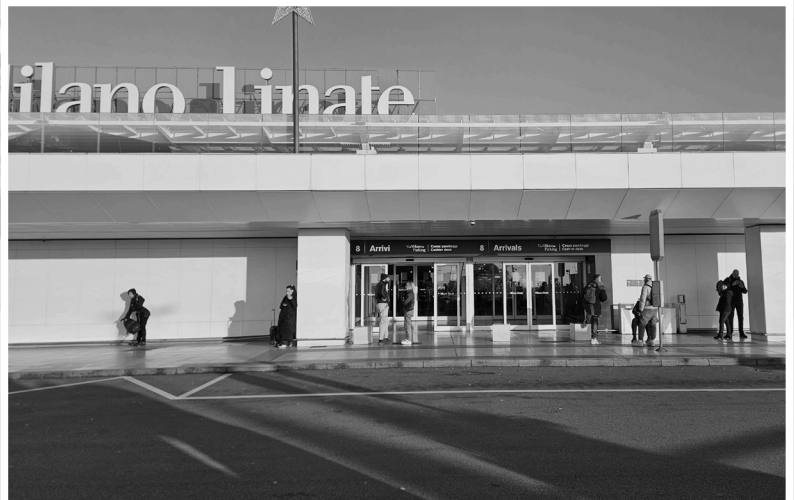
ro Santos Dumont



n Ronald Reagan



LIN - Milano Linate (not existing)





**BERLIN-TEGEL**  
OTTO LILIENTHAL

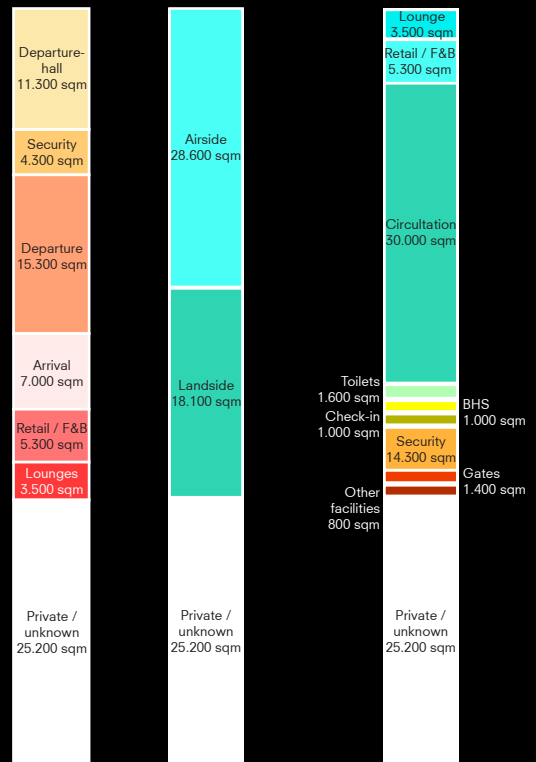
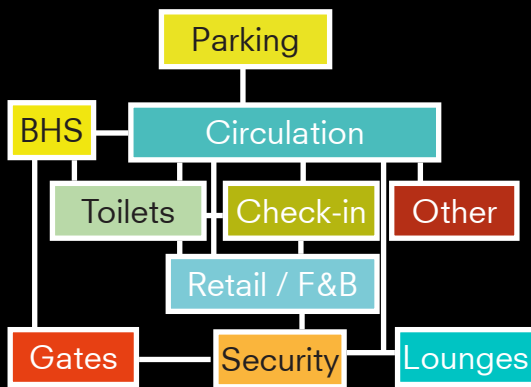
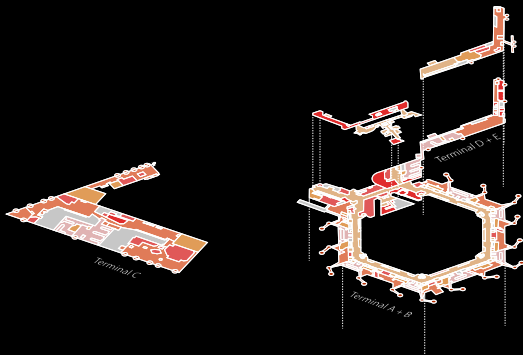
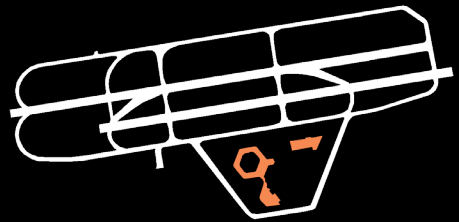
VIELEN DANK AN ALLE, DIE SICH DIE MÜHE MACHEN, DIESE LANGE WERBEBOTSCHAFT ZU LESEN. IHR HABT EUCH JETZT ECHT URLAUB VERDIENT. ÜBRIGENS: MIT ... ZU FLIEGEN ZU ÜBER...

**TXL - Berlin Tegel**

# TXL - Berlin Tegel

## Data

- Architect: Meinhard von Gerkan, Volkwin Marg, and Klaus Nickels (gmp Architekten)
- Year: 1974 (closed in 2020)
- Terminal Size: 75.000 sqm
- Traffic: 24 milion passengers per year
- Gates: 40

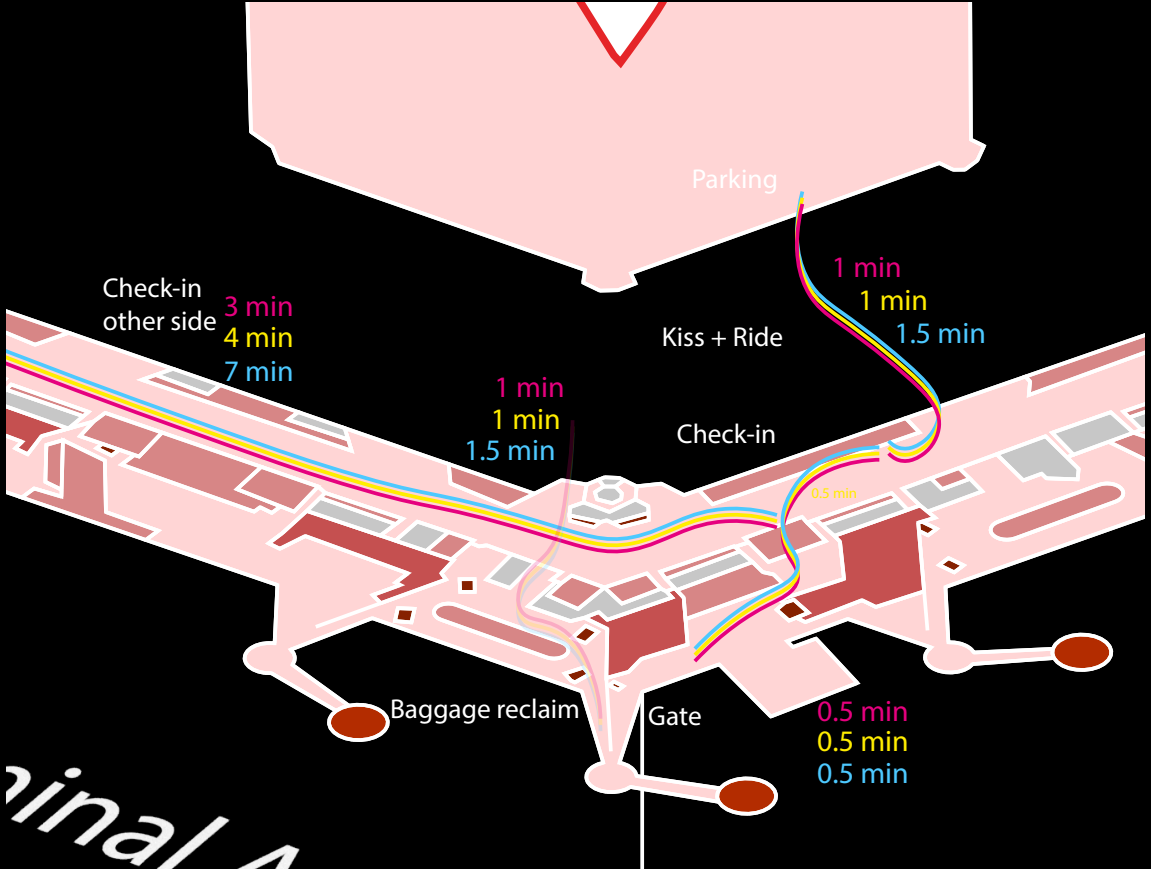


Courtyard



Hexagon

# TXL - Berlin Tegel



Process / Segment	Business Traveler	Holiday Traveler	Reduced Mobility (PRM)
Parking to Check-in	1 min	1 min	1.5 min
Kiss & Ride to Check-in	0.5 min	0.5 min	1 min
Check-in to Security	0.5 min	1 min (excl. retail)	1.5 min (excl. retail)
Kiss & Ride to Security	0.5 min	1 min	1.5 min
Security to Gate	0.5 min	0.5 min	0.5 min
Gate to Aircraft	0.5 min	0.5 min	0.5 min
Gate to Baggage Claim	0.5 min	0.5 min	0.5 min
Baggage to Kiss & Ride	1 min	1 min	1.5 min
Baggage to Train/Metro/Parking	1.5 min	2 min	3 min

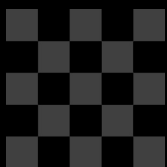
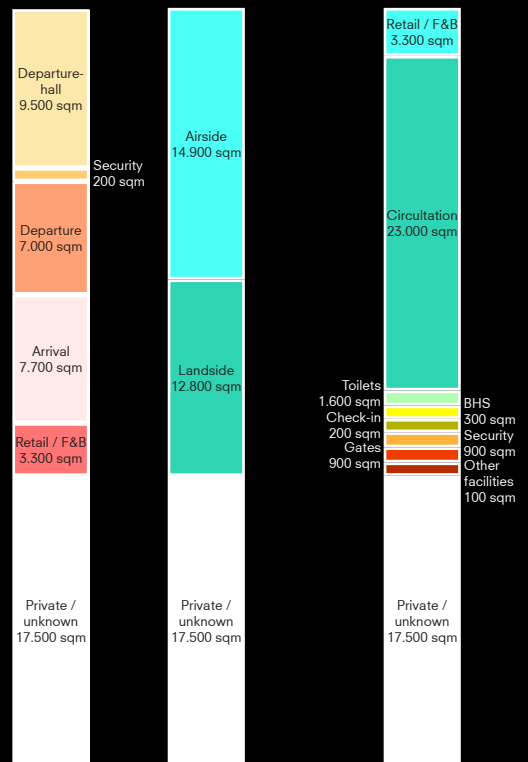
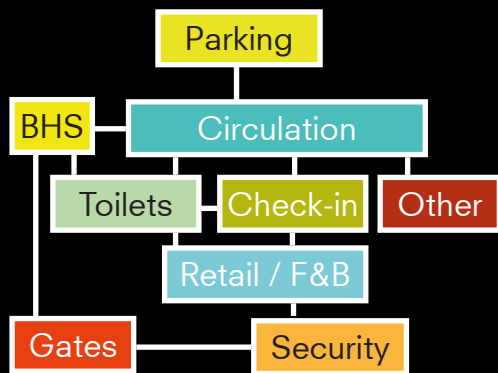
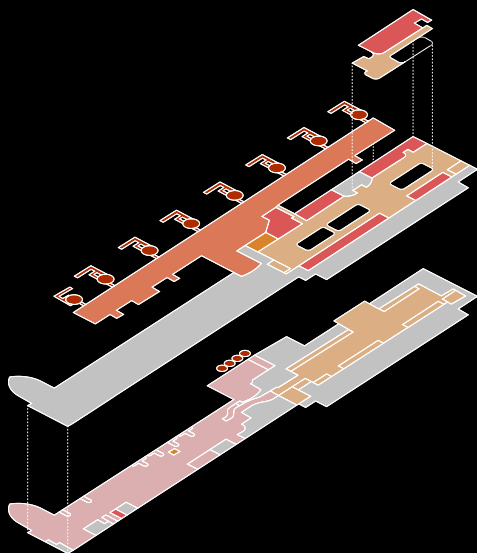
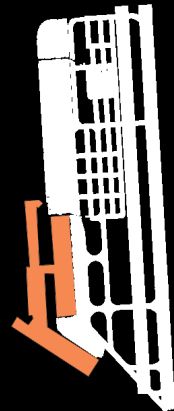


**SDU - Rio de Janeiro Santos Dumont**

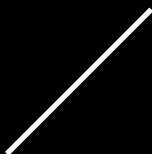
# SDU - Rio de Janeiro Santos Dumont

## Data

- Architect: MMM Roberto
- Year: 1944 (modernization in 2007)
- Terminal Size: 85.000 sqm
- Traffic: 9,8 milion passengers per year
- Gates: 12

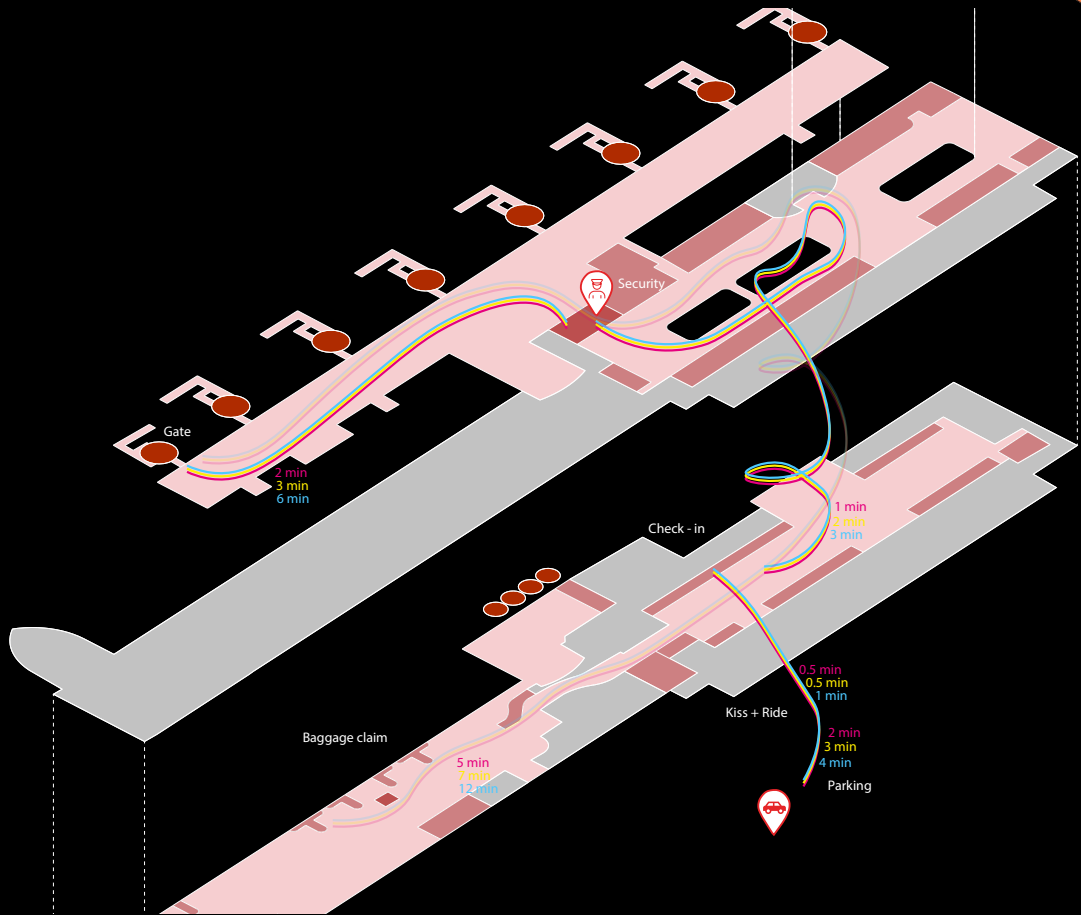


Transparency



Linear

# SDU - Rio de Janeiro Santos Dumont



Process / Segment	Business Traveler	Holiday Traveler	Reduced Mobility (PRM)
Parking to Check-in	2 min	3 min	4 min
Kiss & Ride to Check-in	0.5 min	0.5 min	1 min
Check-in to Security	1 min	2 min (excl. retail)	3 min (excl. retail)
Kiss & Ride to Security	2.5 min	3 min	4 min
Security to Gate	2 min	3 min	6 min
Gate to Aircraft	0.5 min	0.5 min	0.5 min
Gate to Baggage Claim	4 min	7 min	12 min
Baggage to Kiss & Ride	1 min	1 min	2 min
Baggage to Train/Metro/Parking	2 min	4 min	6 min

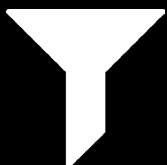
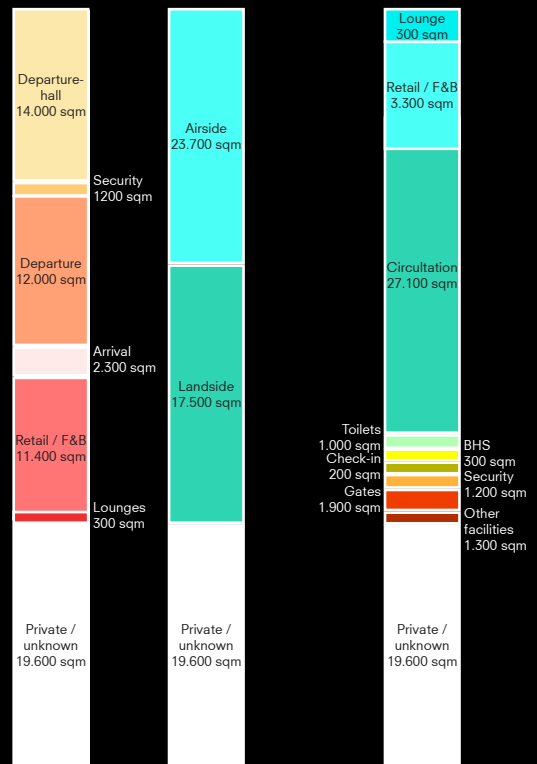
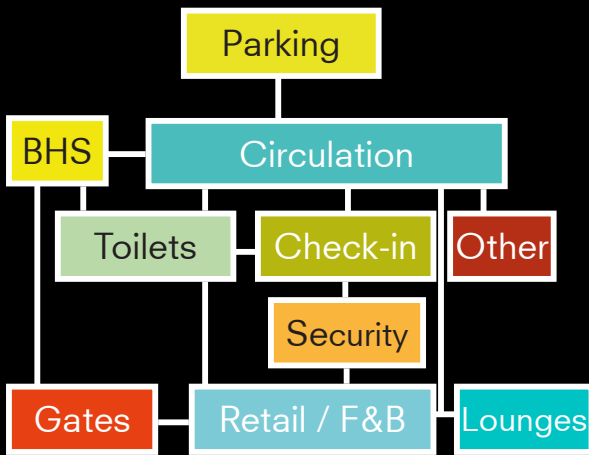
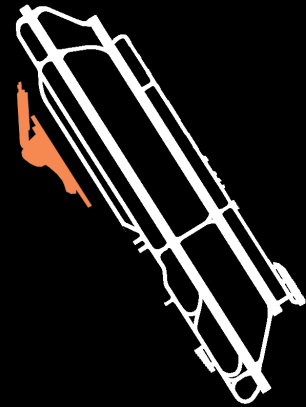


CGH - São Paulo Congonhas

# CGH - São Paulo Congonhas

## Data

- Architect: Hernani do Val Penteadó
- Year: 1936 (major expansion in 2004)
- Terminal Size: 64.500 sqm
- Traffic: 18,1 milion passengers per year
- Gates: 22

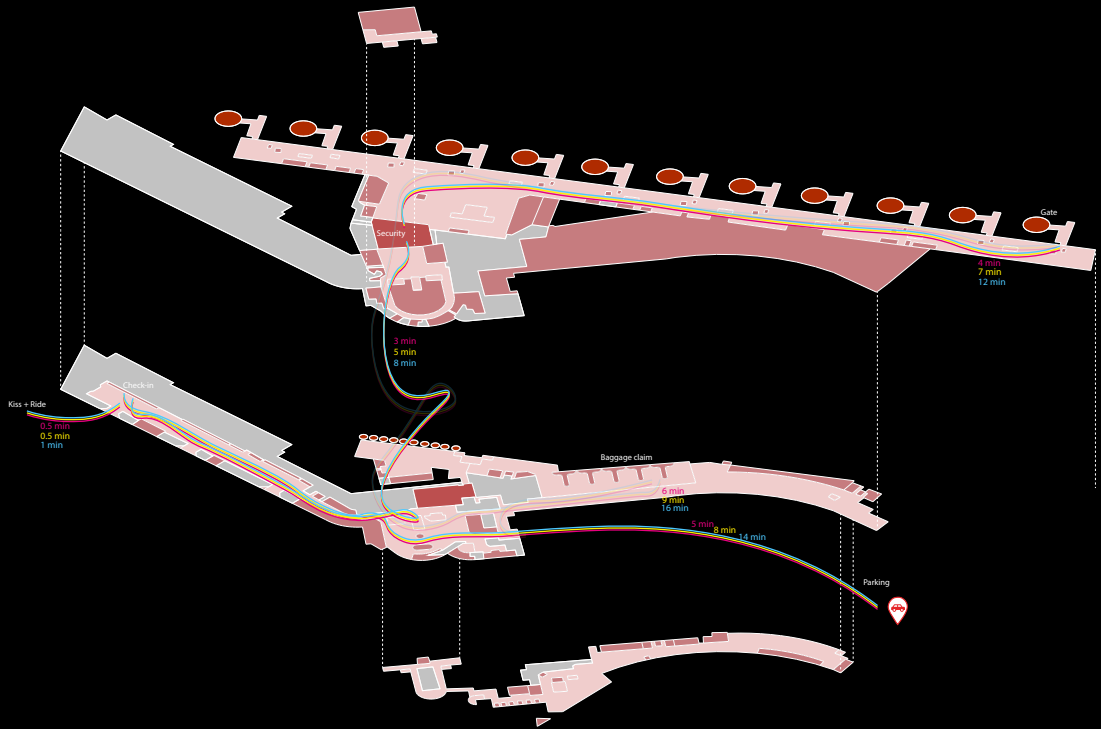


Density



Linear

# CGH - São Paulo Congonhas



Process / Segment	Business Traveler	Holiday Traveler	Reduced Mobility (PRM)
Parking to Check-in	5 min	8 min	14 min
Kiss & Ride to Check-in	0.5 min	0.5 min	1 min
Check-in to Security	3 min	5 min	8 min
Kiss & Ride to Security	1 min	2 min	4 min
Security to Gate	4 min	7 min	12 min
Gate to Aircraft	0.5 min	0.5 min	0.5 min
Gate to Baggage Claim	6 min	9 min	16 min
Baggage to Kiss & Ride	1.5 min	2 min	4 min
Baggage to Train/Metro/Parking	3 min	5 min	9 min



**FACE COVERINGS  
REQUIRED**



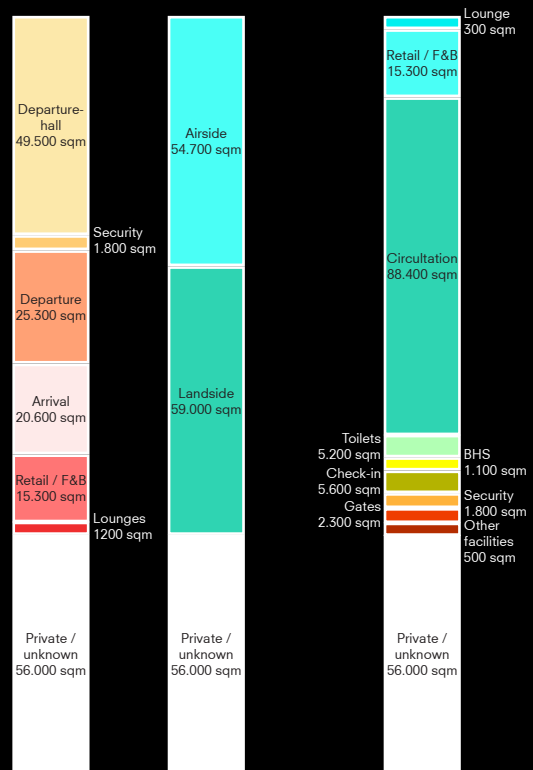
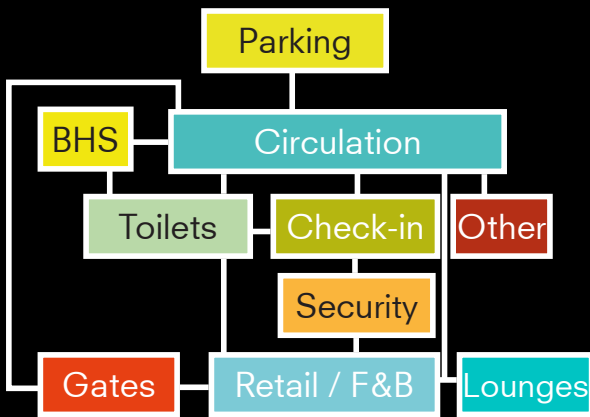
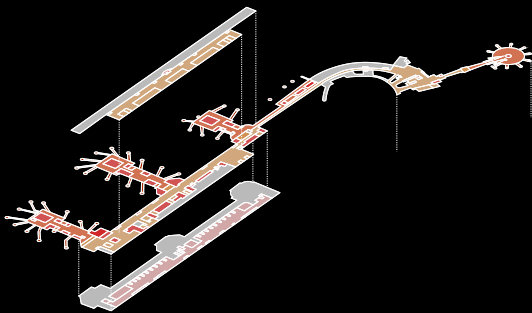
**REAGAN  
NATIONAL**  
Thanks for doing your part.

**DCA - Washington Ronald Reagan**

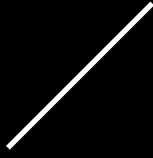
# DCA - Washington Ronald Reagan

## Data

- Architect: César Pelli in collaboration with Leo A. Daly and PGAL
- Year: 1997 (expansion in 2021)
- Terminal Size: 177.400 sqm
- Traffic: 26,3 milion passengers per year
- Gates: 58

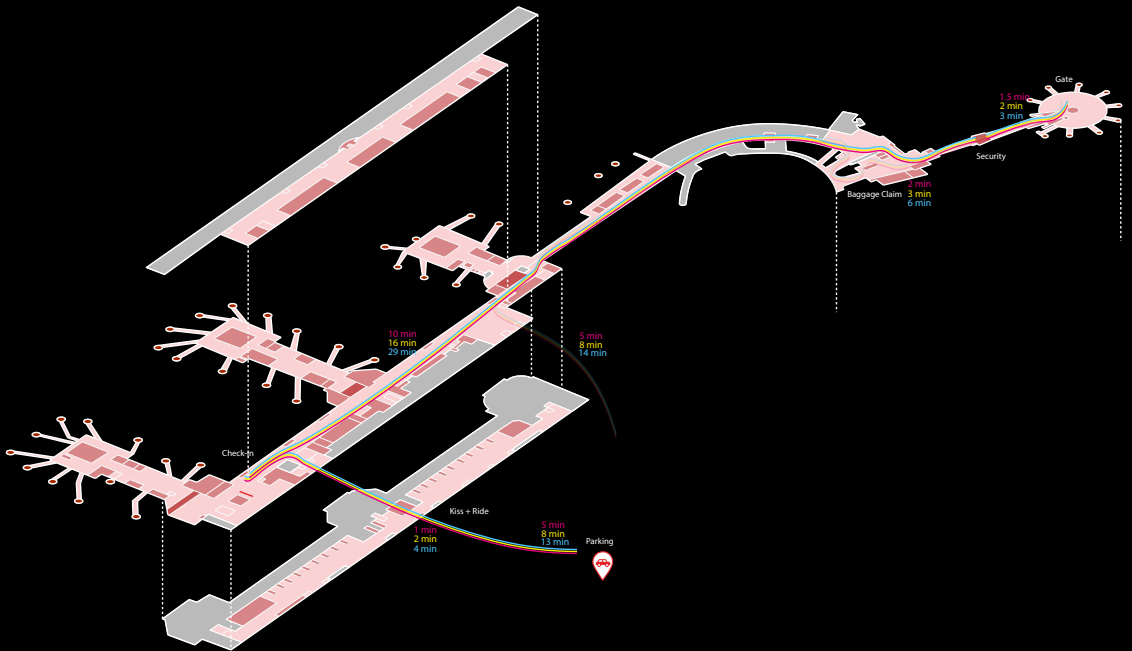


Spine



Linear

# DCA - Washington Ronald Reagan



Process / Segment	Business Traveler	Holiday Traveler	Reduced Mobility (PRM)
Parking to Check-in	5 min	8 min	13 min
Kiss & Ride to Check-in	1.5 min	2 min	4 min
Check-in to Security	10 min	16 min (excl. retail)	29 min (excl. retail)
Kiss & Ride to Security	7 min	10 min	18 min
Security to Gate	1.5 min	2 min	3 min
Gate to Aircraft	0.5 min	0.5 min	0.5 min
Gate to Baggage Claim	2 min	3 min	6 min
Baggage to Kiss & Ride	2 min	3 min	5 min
Baggage to Train/Metro/Parking	5 min	8 min	14 min

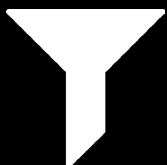
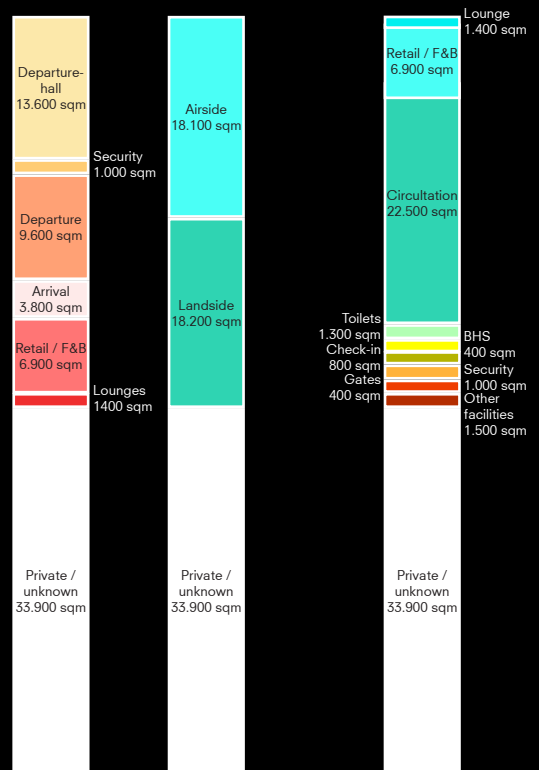
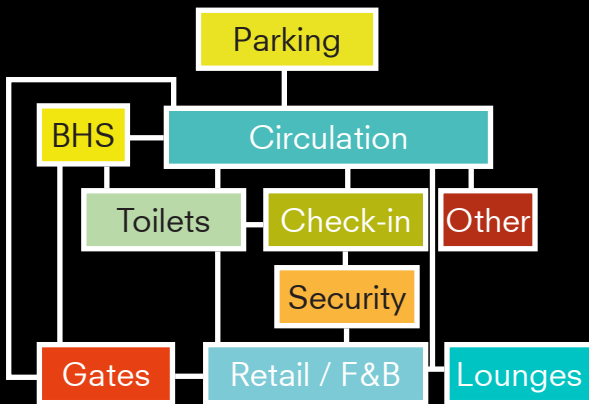
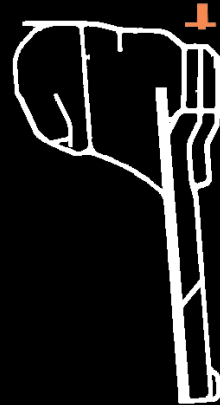
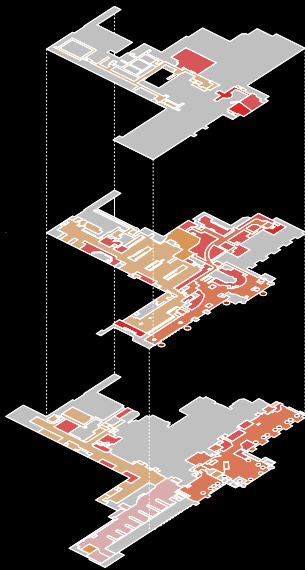


LIN - Milan Linate

# LIN - Milan Linate

## Data

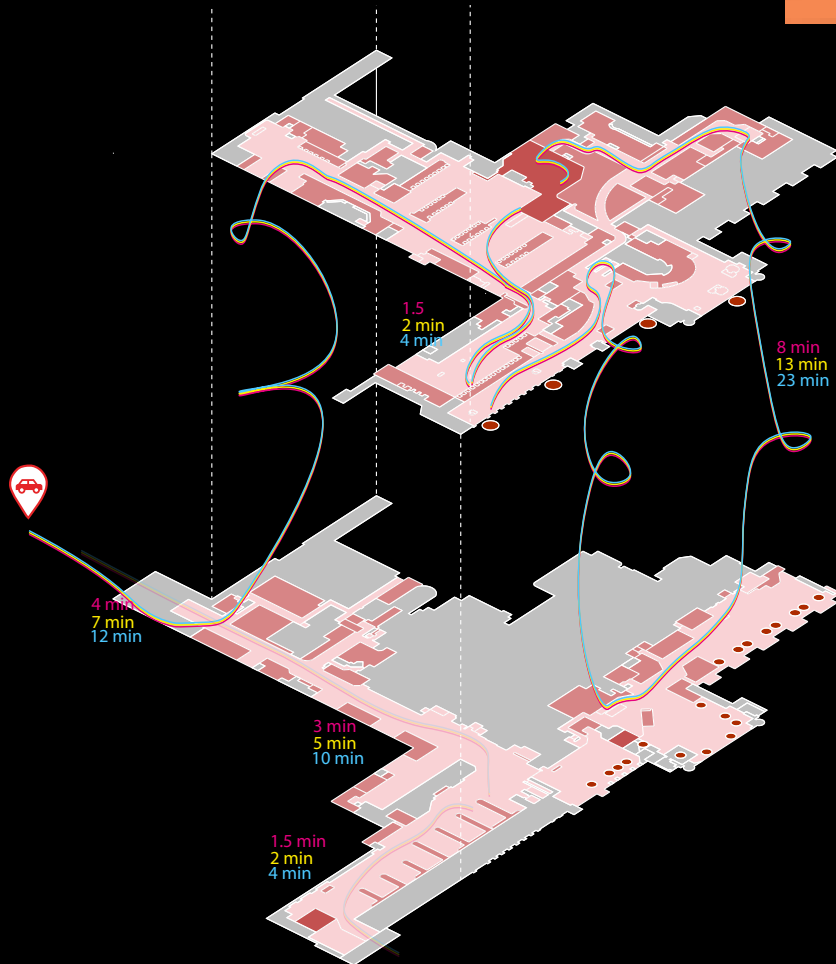
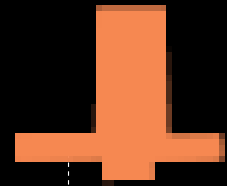
- Architect: Gianluigi Ponzio (original) / Recent renovations by Cinzia Bozzellini
- Year: 1930s (expansion in 2021)
- Terminal Size: 70.000 sqm
- Traffic: 10,6 milion passengers per year
- Gates: 24



Compact

Busses

# LIN - Milan Linate



Process / Segment	Business Traveler	Holiday Traveler	Reduced Mobility (PRM)
Parking to Check-in	4 min	7 min	12 min
Kiss & Ride to Check-in	0.5 min	0.5 min	0.5 min
Check-in to Security	1.5 min	2 min	4 min
Kiss & Ride to Security	1 min	1 min	2 min
Security to Gate	8 min	13 min (excl. retail)	23 min (excl. retail)
Gate to Aircraft	0.5 min (bridge)	0.5 min (bridge)	0.5 min (bridge)
Gate to Baggage Claim	1.5 min	2 min	4 min
Baggage to Kiss & Ride	1 min	1 min	2 min
Baggage to Train/Metro/Parking	3 min	5 min	10 min

# BENCHMARKING LANDSIDE VS AIRSIDE

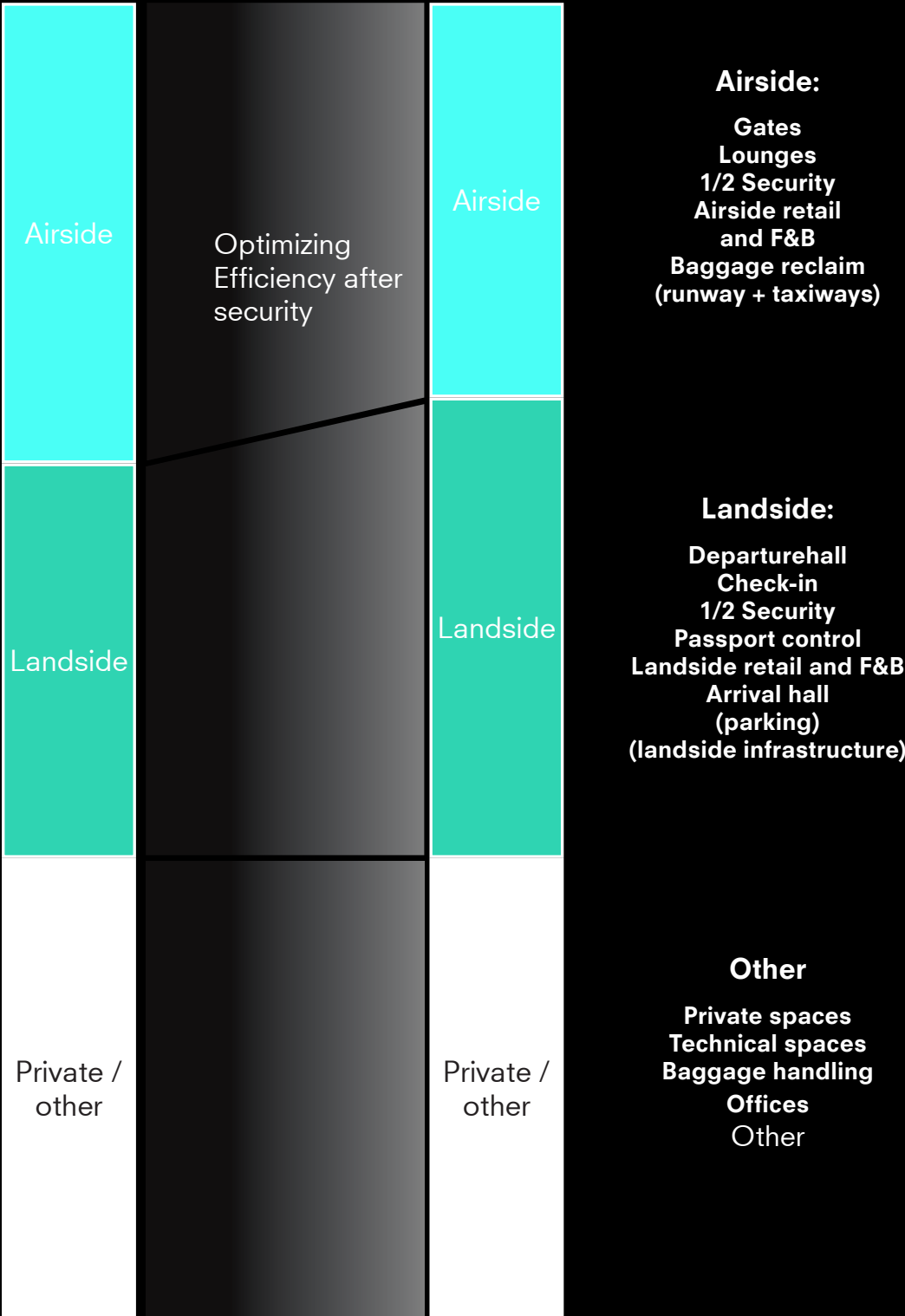


Figure 22 - Benchmark Landside vs Airside

# BENCHMARKING PROGRAM

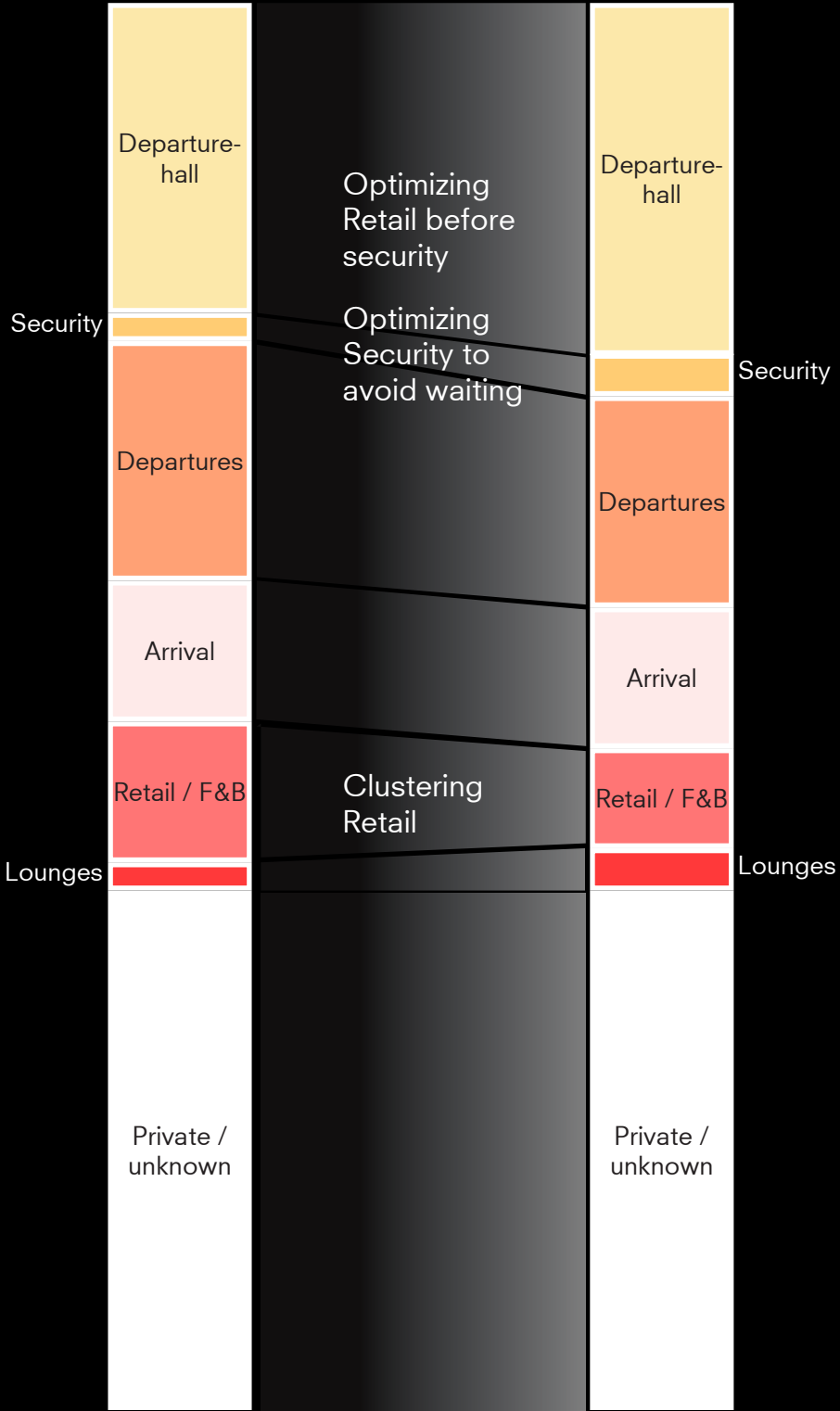


Figure 23 - Benchmark Program

# BENCHMARKING FACILITIES

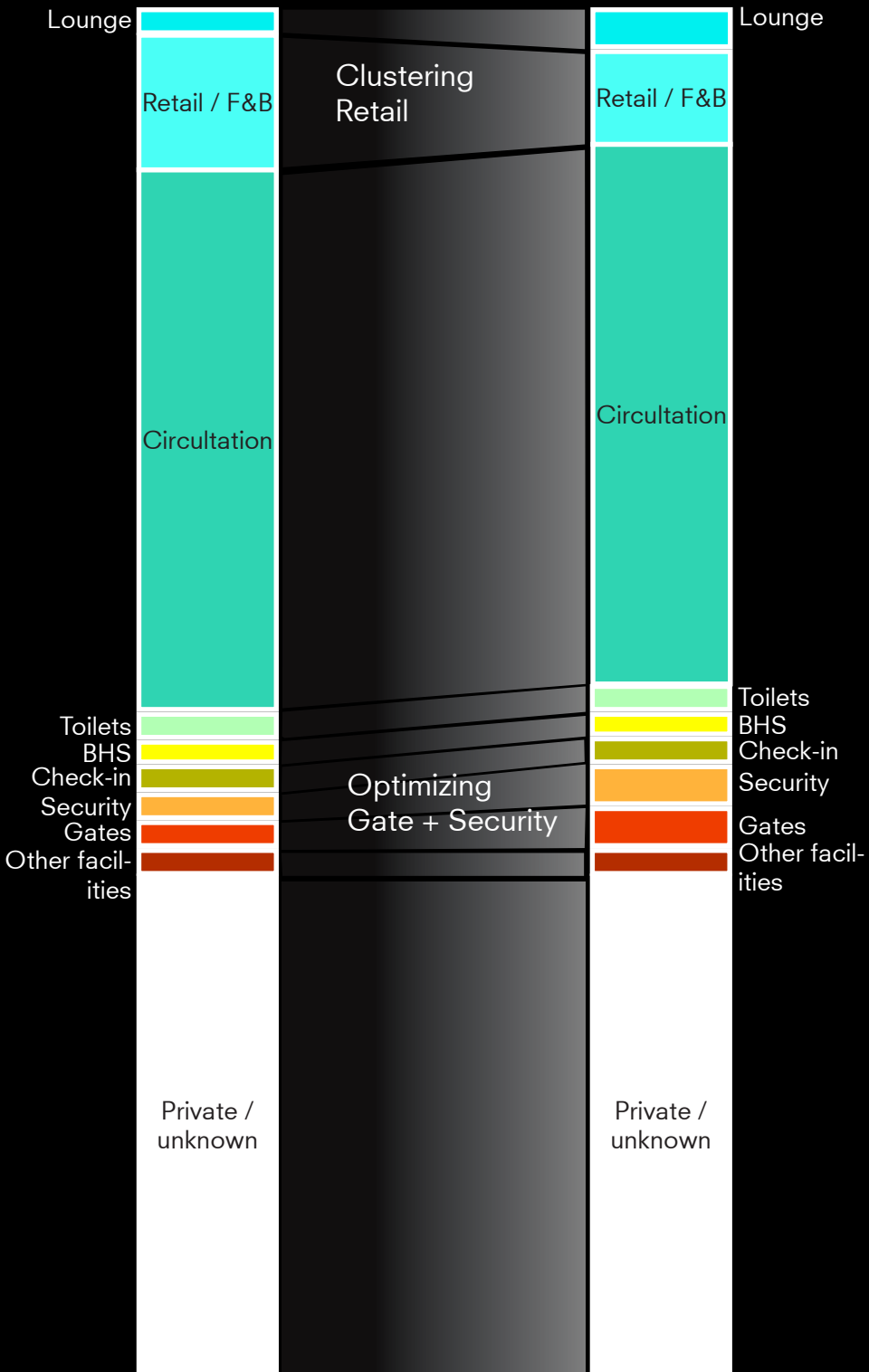


Figure 24 - Benchmark Facilities

# WALKING & WAITING TIME BENCHMARK

Passenger type	Walking speed (avg)	Check-in / Bag Drop	Security Clearance	Commercial Dwell	Total Curb-to-Gate Time
Business Traveler	Fast (5,5 km/h)	1 - 2 min (Digital)	3 min (Fast Track)	Minimal (0 - 2 min)	5 - 10 min
Holiday Traveler	Moderate (3.5 km/h)	5 - 10 min (Staffed)	5 - 10 min (Regular)	High (20 - 40 min)	40 - 70 min
Reduced Mobility	Slow (2.0 km/h)	3 - 5 min (Assisted)	3 - 5 min (Priority)	Moderate (10 - 15 min)	25 - 40 min

Figure 25 - Benchmarking waiting times

Process / Segment	Business Traveler 	Holiday Traveler 	Reduced Mobility (PRM) 
Walk: Metro/Train/Parking to Check-in	1.5 min	2.5 min	4 min
Walk: Kiss & Ride to Check-in	0.5 min	1 min	1.5 min
Wait: Check-in / Bag-drop	1 min (Digital)	5-10 min (Desk)	3-5 min (Assisted)
Walk: Check-in to Security	0.5 min	1 min (excl. retail)	1.5 min (excl. retail)
Walk: Kiss & Ride to Security	1 min	2 min	3 min
Wait: Security Clearance	3 min (Fast Track)	5-10 min (Regular)	6 min (Priority)
Walk: Security to Gate	2-3 min	3-5 min	5-8 min
Wait: Gate (Pre-boarding)	5 min	5-30 min	10-30 min
Walk: Gate to Aircraft	1 min	2 min	4 min
Walk: Gate to Baggage Claim	4 min	7 min	10 min
Wait: Baggage Reclaim	0 min (Hand luggage)	15 min	10 min (Priority)
Walk: Baggage to Kiss & Ride	1 min	2 min	3 min
Walk: Baggage to Train/Metro/Parking	2 min	3 min	5 min

Figure 26 - Benchmarking walking times

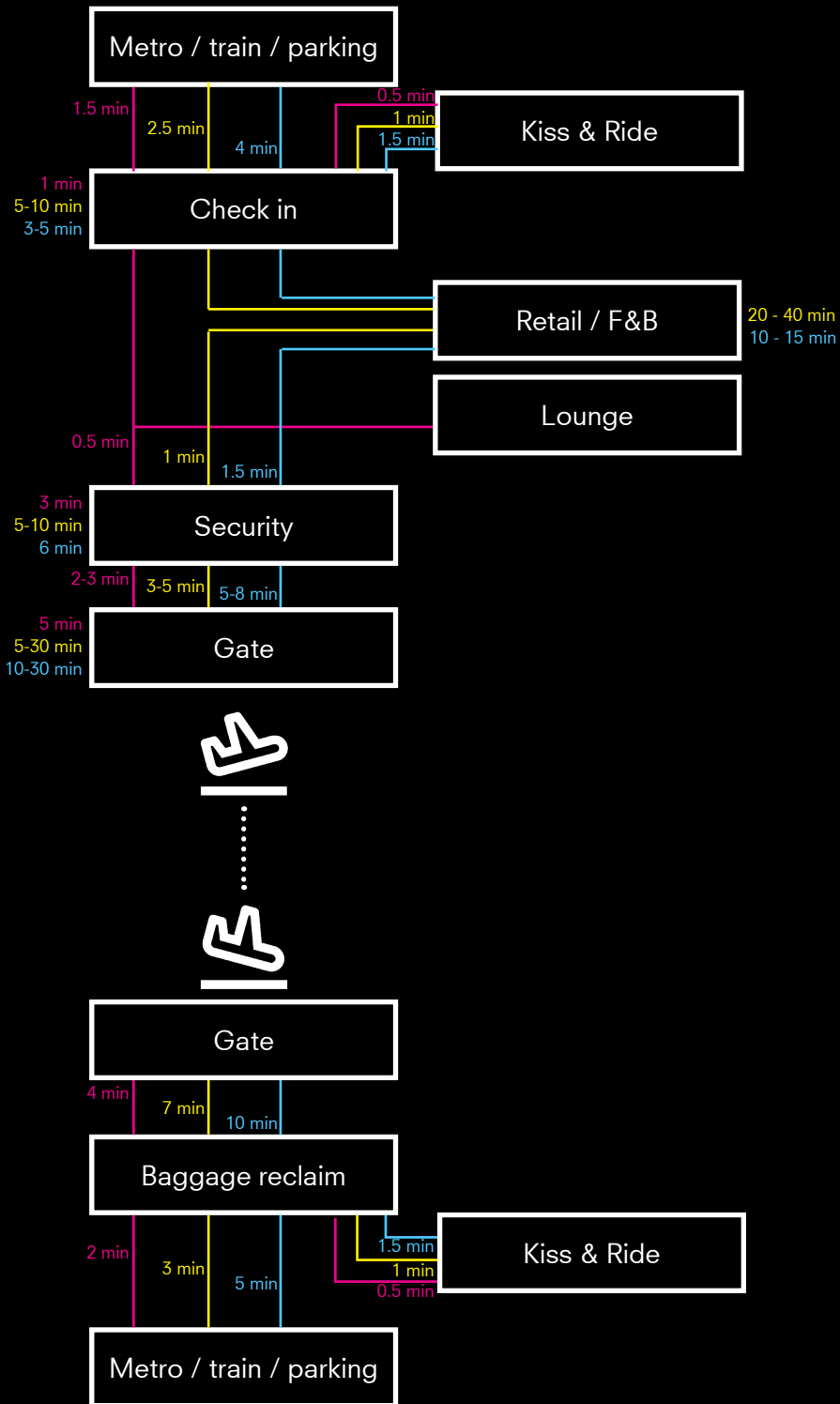
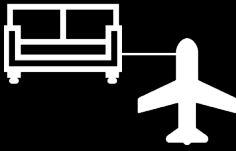


Figure 22 - Benchmark Walking & Waiting times

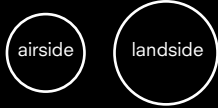


## Program Requirements



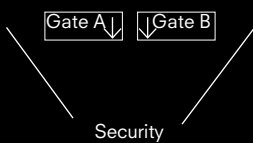
### Strategic Proximity of Lounges:

Lounges must be positioned directly adjacent to gate areas to facilitate 'productive waiting' and minimize the transition time between the lounge and boarding.



### Landside larger than airside

The landside of the terminal must be significantly larger than the airside to strengthen the airport's role as an O&D airport and provide ample space for public functions and parking.



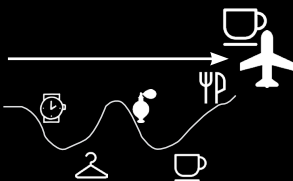
### Intuitive Wayfinding:

The design must prioritize visual clarity and direct sightlines, ensuring passengers can always identify their next procedural step (such as security or the gate).



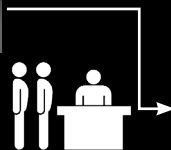
### Peak Capacity Management:

Spaces such as departure and arrival halls must be scalable to absorb the 'shocks' of simultaneous flight handlings without obstructing the continuous passenger flow.



### Optimized Commerce:

Commercial functions should be placed along the passenger's natural path (convenience retail and quick-service F&B) rather than via forced detours, maximizing revenue without compromising efficiency.



### Digital-first Processing:

The infrastructure must accommodate the integration of biometric "FaceBoarding" and self-service kiosks to reduce processing times at check-in and security to target values of less than 10-15 minutes.

# PROGRAM OF REQUIREMENTS

	Space	Required Area (sqm) (est.)	Area as % of Total	Required Units (Equipment)
Parking	Parking (Premium/Short-Stay)	30.000	30% of landside area	1.000 Parking Spots 100 EV Charging Points
	Parking (Long-Stay/Staff)	50.000	50% of landside area	2.500 Parking Spots 50 Shuttle Bus Stops
	Taxi/App-based Drop-Off & Pick-Up Curb	2.000		10 lanes (min.)
Metro	MM4 Metro Platform & Station	4.000 (Below Ground)		2 platforms Dedicated Metro Entrance Gates
	Metro Concourse / Integration Lobby	3.500	3.5%	Biometric Integration Gates (Optional Feature)
Departure Hall	Check-in Hall / Departures Concourse	17.500	25%	
	- Circulation & Buffer Space (Arrival and Departure Current)	7.700	11%	Wide Corridors, clear signage
	- Check-in / Bag Drop Zone	1.400	2%	18 Self-Service Bag Drop Units
	- Landside Retail & F&B (Kiosks, Cafés, Impulse Buy)	5.250	5-10%	approx. 8 Retail/F&B Units
	- Ancillary Services (Car Rentals, Bank/ ATM, Lost & Found, Pharmacy)	2.450	3-4%	8 Retail Service Desks
	General Information / Ticket Sales (Airline & Airport Service Desks)	350	0,5%	10 Flex Service Desks (Manual)
	- Public Toilets & Aminities	350	0,5%	
Security	Security	2.100	3%	
	- Security Screening (General Passenger Area)	1.050	1,5%	14 Smart Security Lanes
	- Border Control (Immigration)	350	0,5%	Biometric E-gates
	- BHS Screening Room	210	0,3%	Explosives Detection Systems (EDS)
	- Secondary Screening / Search Rooms (In Line with Security)	140	0,2%	Dedicated private search booths
	- Staff Control & Break Room (Security / Immigration Personnel)	210	0,3%	
	- Equipment Storage & Maintenance	140	0,2%	Storage racks, small workshops

Figure 29 - Program of Requirements part 1

Security Zoning	Vertical Circulation Strategy	Design KPI (Efficiency)	Flexibility / Modularity
Public	Elevator & Escalator (to Terminal Hall)	Max. Walking Distance to Terminal 150m	High
Public		Adequate access to Highway (A51)	High
Public	Horizontal access at Terminal Level		High
Public	Elevators & Escalators (High-capacity)	Max. Vertical Transit Time < 2 minutes (Platform to Terminal Floor)	Low
Public	Direct, linear connection to Check-in/Security	Max. Horizontal Walking Distance < 50 m to Check-in/Security	High
Public	Direct connection to metro	Overall Max. Queuing < 10 min	High
Public	Connects horizontally from metro and parking to check-in	Seamless separation of flows	
Public	Horizontal/Vertical link from metro core	Max. Queuing Time < 10 min	High
Public	Horizontal access		Medium
Public	Horizontal access		Medium
Public	Horizontal access, high visibility		High (Adaptable use)
Public	Fixed core location, accessible from circulation		Low (Fixed cores)
Semi-Public			
Public	Direct connection to Departure Hall	Max. Queuing Time <15 min; Processing Time < 5 min.	High
Public	Directly connected to Post-Security Retail	Max. waiting time < 5 minutes	High (Adaptable to different passport requirements)
Private	Dedicated service lift & stairs for staff/bags	System reliability, minimum manual intervention	Low
Private	Immediate privacy and service		Medium
Private	Direct access to control areas		Medium
Private			Low

Space	Required Area (sqm) (est.)	Area as % of Total	Required Units (Equipment)	
F&B (Food & Beverage) (after security)	F&B (Food & Beverage)	7.000	10%	
	Main Commercial Concourse (Duty-free, High-End Retail)	1.750	2-3%	Approx 20 shops
	Airside F&B (Restaurants & Cafés)	1.750	2-3%	Approx 10 Diverse Dining Units
	F&B Kitchens & Storage (Common Use/Shared)	700	1%	Centralized chilled storage, dedicated cooking areas
	Retail Storage & Logistics	350	0,5%	Secure cage storage, loading docks
	F&B Staff Facilities (Break rooms, Lockers, Toilets)	350	0,5%	
	Premium Lounges (Airlines/VIP)	2.100	3%	
Gates & Piers	Departure	11.900	17%	
	Public Gate Waiting Area	9.800	14%	Seating Capacity for 18 Gates * 180 Seats
	Gate Positions (Contact Gates)	1.400	2%	18 Contact Gates (Min.) (Code C/D Aircraft)
	Airside Toilets & Amenities (Gate Areas)	240	0.3%	
	Gate Operations Offices (Airline Staff/ Ground Handling)	460	0.7%	Workstations, secure storage
Arrivals	Arrivals	7.000	10%	
	- Arrivals Border Control / Customs	550	0,8%	Biometric E-Gates / Automated Border Control
	- Baggage Reclaim Hall	5000	7%	7 Baggage Carousels (Min.)
	- Baggage (Lost & Found / Damage Claims)	200	0.3%	Approx 5 service desks
	- Arrivals Public Lobby (Meet & Greet / Circulation)	300	0,4%	
	- Arrivals Car Rental / Hotel Desks	200	0,3%	Approx 10 Desks
	- Arrivals Toilets & Amenities	150	0,2%	
	- Baggage Handly System (BHS Main)	400	0,6%	Sorting equipment storage bays
- BHS Maintenance & Staff Facilities	200	0,3%	Lockers, service workshops	
Other	Other	24.600	35%	
	- Terminal Management Offices (SEA Group, ENAC, Airlines)	12.250	15-20%	
	- Technical Spaces (HVAC, Electrical Server/Data Rooms)	1.400	2%	
	- Personnel facilities (Central: Canteen, Fitness, Lockers)	700	1%	Central Kitchen, Lockers, Showers
	- Bagage Handling system (BHS)	2.800	4%	- All BHS equipment
	- Other	7.350	8-13%	

Figure 30 - Program of Requirements part 2

Security Zoning	Vertical Circulation Strategy	Design KPI (Efficiency)	Flexibility / Modularity
Public			
Public	Direct horizontal link from Border Control		High (Adaptable shop fronts and walls)
Public	Located strategically near Lounges and Gate Cores		Medium
Private	Dedicated service access (Service Lifts from ground level)	Efficient logistics for supply chain	Low
Private	Dedicated service		Medium
Private	Direct, private access to work areas	Functional layout, separation from public flow.	Medium
Semi-Private	Dedicated vertical access from main Commercial Level	Also possible before security	Medium
Public			
Public	Horizontal flow	Max. Waiting Time < 30 min	High (Adaptable to remote busing)
Public	Jetways/Bus gates	Max. Walking Distance (Gate) < 300m (from Immigration)	High (Ability to convert between Code C and Code D stands)
Public	Fixed core location		Low (Fixed cores)
Private	Dedicated access from secure staff corridor		Medium
Public			
Public	Horizontal flow from airside gate access		Medium
Public	Horizontal at arrival level		Medium
Public			Medium
Public	Direct connection to Metro / Parking lobby		Medium
Public			Medium
Public			Low
Private	Below the Reclaim level		Low
Private	Dedicated service access		Medium
Private			
Private	Own Elevator / Trap cores (separate from passengers)	Efficient map (open office)	High
Private	Vertical Shafts throughout the Terminal	Access for maintenance, separation of functions	Low
Private	Dedicated Personnel entrance	Good accessibility for all staff	Medium
Private	Dedicated service lift & stairs for staff		High

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# RESULTS

03





# PART 3

# Results

In the previous chapter (Approach), the research questions were answered through theoretical research. This chapter presents the results of the spatial translation through research by design.

Using Milan Linate Airport as a case study, the final architectural design serves as the tangible result of this research. It demonstrates how the theory surrounding passenger flow (Flusso) and commercial optimization (Profitto) has been translated into a more efficient airport terminal.

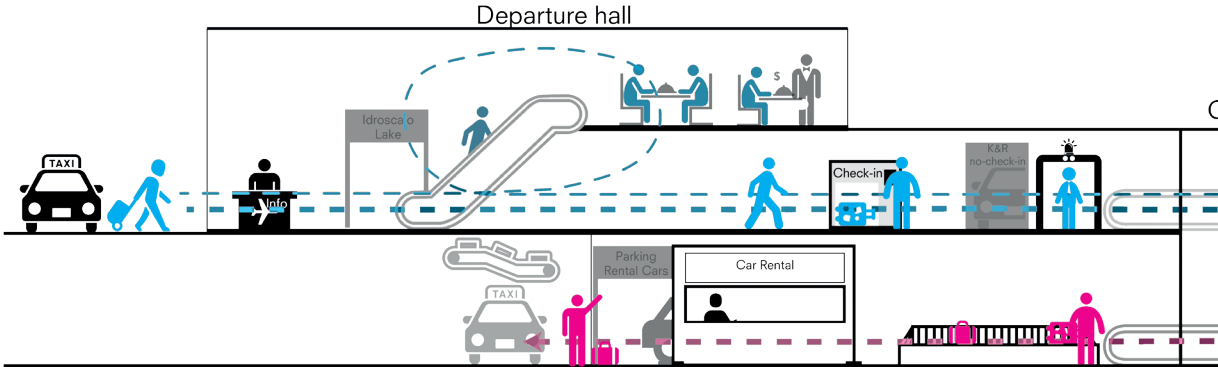
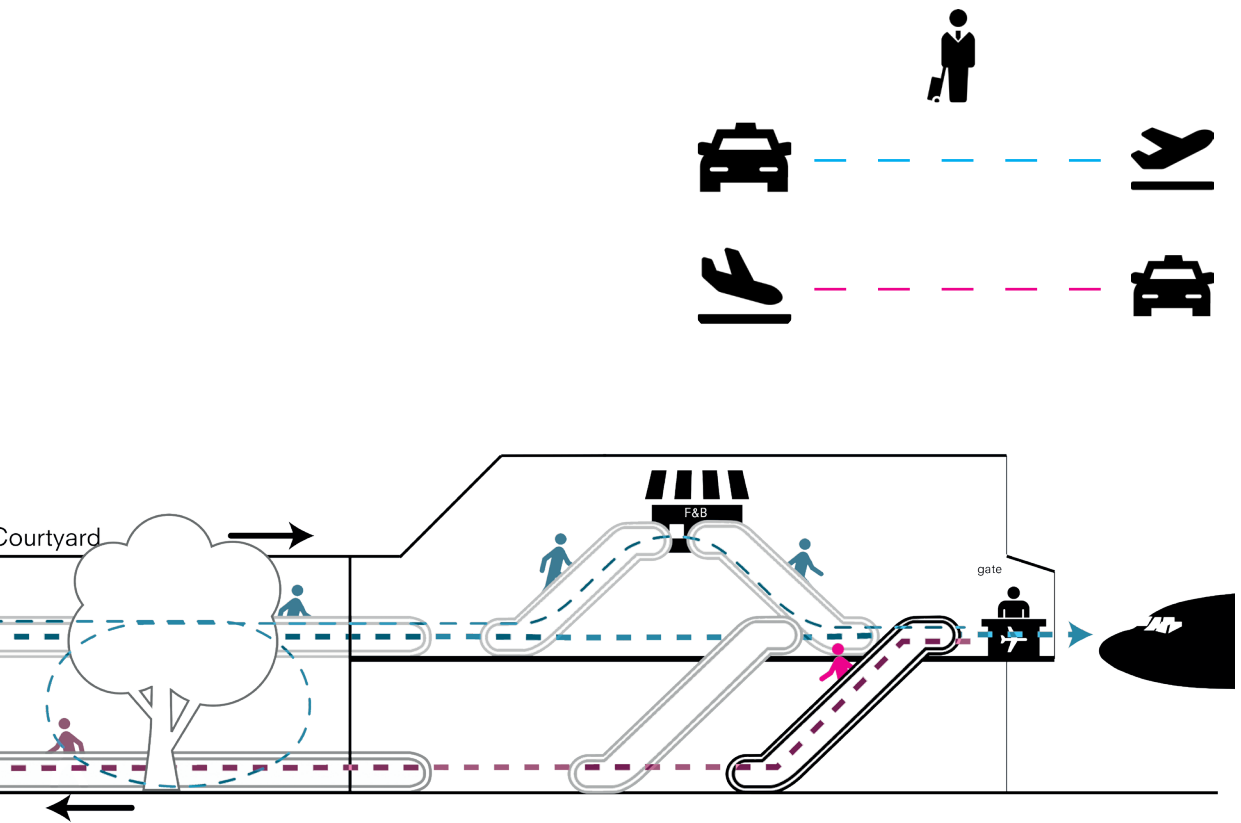


Figure 31 - Proposed flow diagram

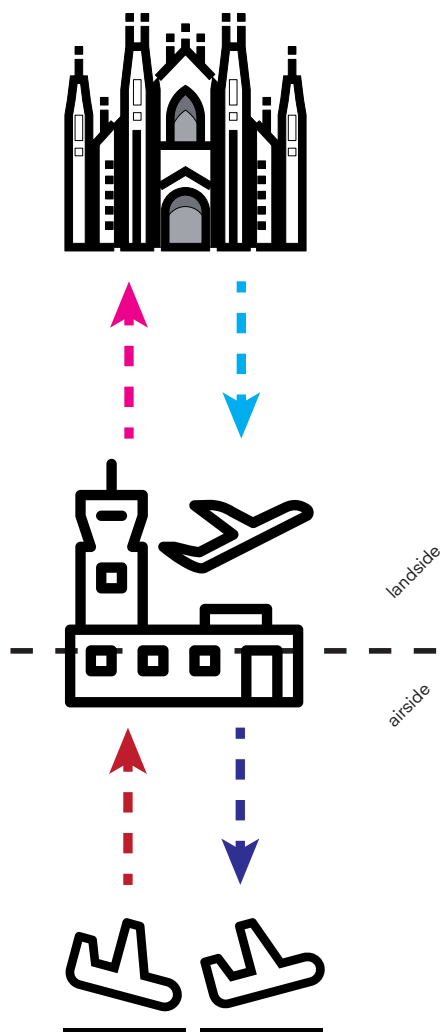
## Dual Track

To optimize passenger flow, a critical design parameter derived from the theoretical framework is the reduction of vertical movement. Since time-sensitive (business) travelers prefer to move in a single, direct line from the ground transportation to the

aircraft and vice versa, the design minimizes friction by keeping the main passenger processing steps on a single level. This spatial strategy directly dictates the urban positioning and the accessibility of the terminal.



As shown in the site plan, the new terminal is strategically positioned in the northern sector of the airport plot. It sits at the terminus of the Viale Enrico Forlanini, which acts as a vital, linear infrastructure artery directly connecting the airport with Milan's city center. This positioning ensures that the terminal is integrated seamlessly into the urban fabric, minimizing landside transit times.



45°27'34.7" N 9°16'45"

Figure 32 - Site (LOD 1:1000)



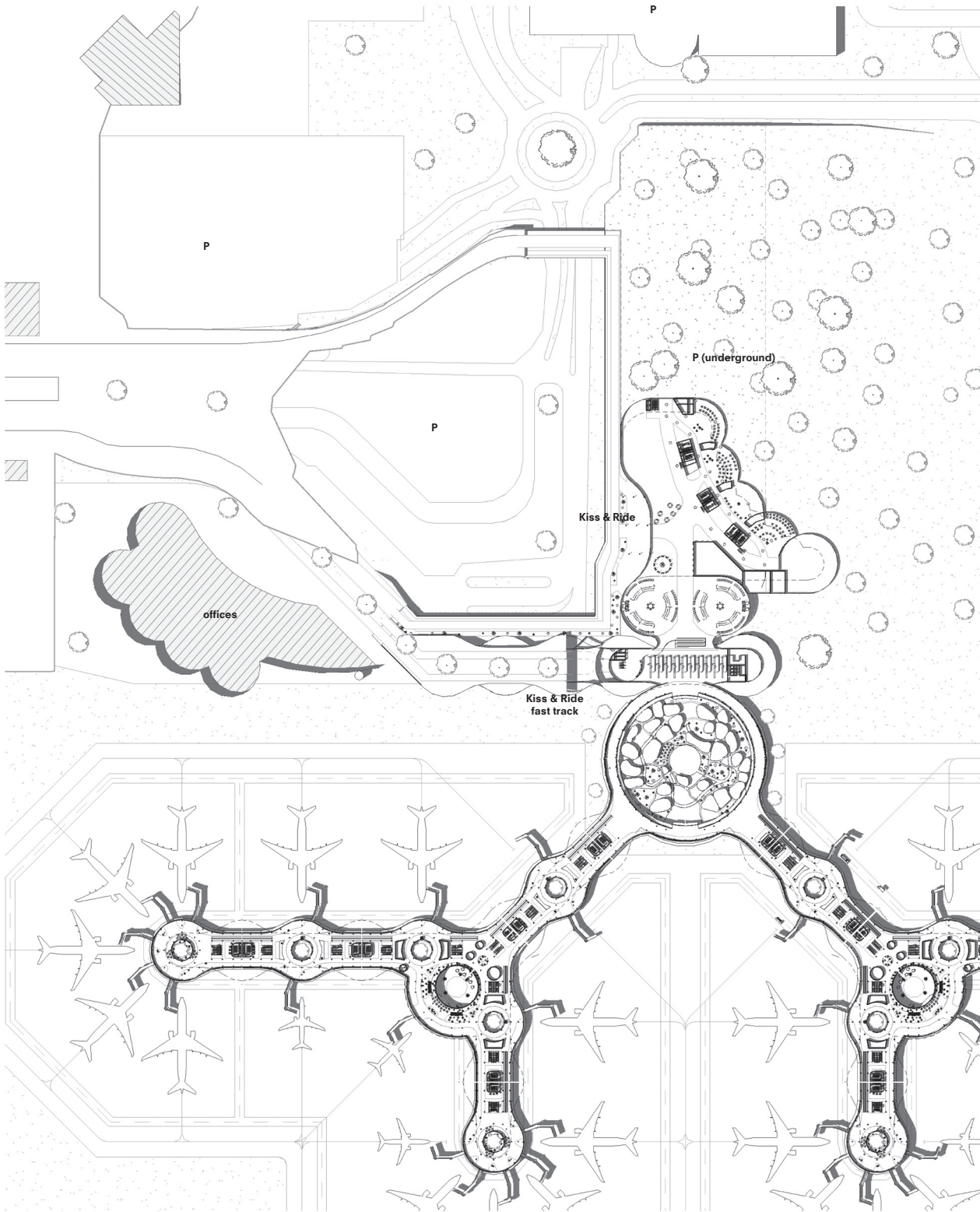
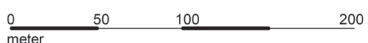
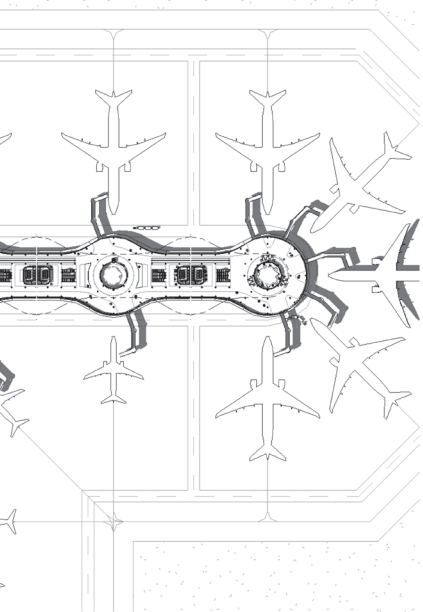
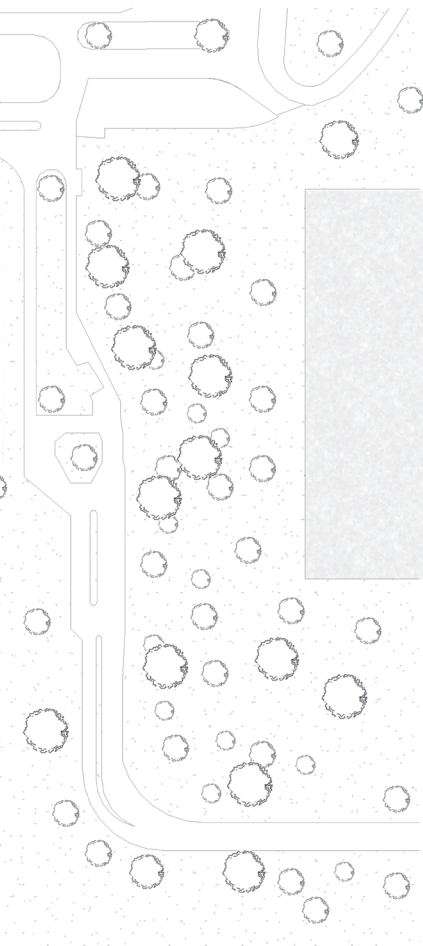
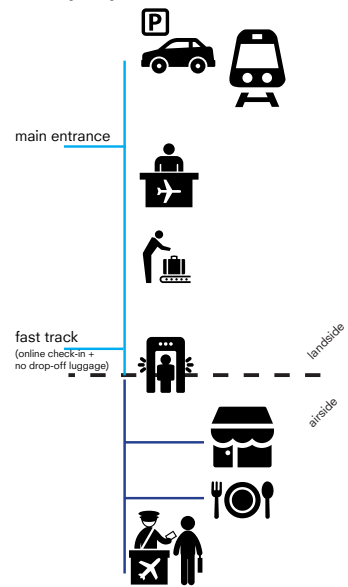


Figure 33 - Urban implementation (LOD 1:500)



floor plan first floor

This transition from urban connectivity to the terminal is detailed in the urban implementation drawing this drawing which illustrates how the infrastructure connects directly to the first-floor departure hall. Vehicles drop off passengers at the exact elevation of the processing functions, eliminating vertical level changes. To balance passenger speed and commercial exposure, the interface introduces a dual-track entry system:



**The Main Entrance (West side):**  
Serves the general passenger stream requiring the full sequence of landside services, such as check-in and baggage drop-off.

**The Fast-Track Entrance:** for (business) travelers who have checked in online and travel only with cabin luggage. The kiss & ride lane deposits these time-sensitive passengers directly at the security checkpoint threshold, allowing them to bypass the main departure hall entirely.

## Airside Configuration

To keep the passenger flow (Flusso) as efficient as possible after security, the layout of the airside must be logical. Business travelers want a fast and predictable walk from the terminal to the airplane. Because of this, the design only uses contact gates.

Other options, like remote stands or semi-contact gates, waste too much time because passengers have to take a shuttle bus or walk outside on the apron. This is especially frustrating for travelers. Once passengers reach their gate, they expect to board immediately without having to go outside into the rain or heat, or wait for a bus. Walking outside directly breaks the seamless comfort of the terminal.

By choosing only contact gates, every airplane position connects directly to the building with a boarding bridge (jetway). This keeps the route completely horizontal and inside the building, making the boarding process fast, comfortable, and reliable. This is very important for Linate Airport as a premium city-hub.

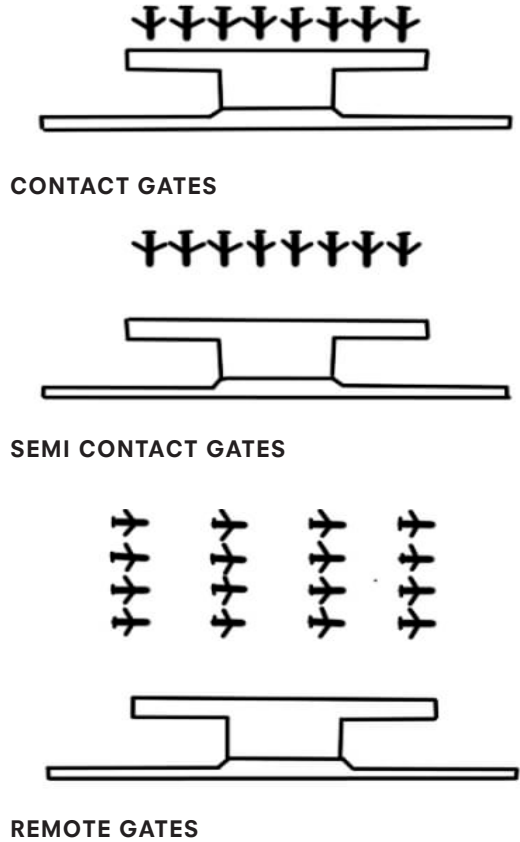
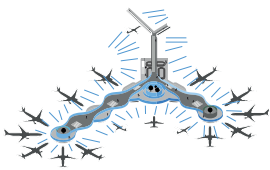
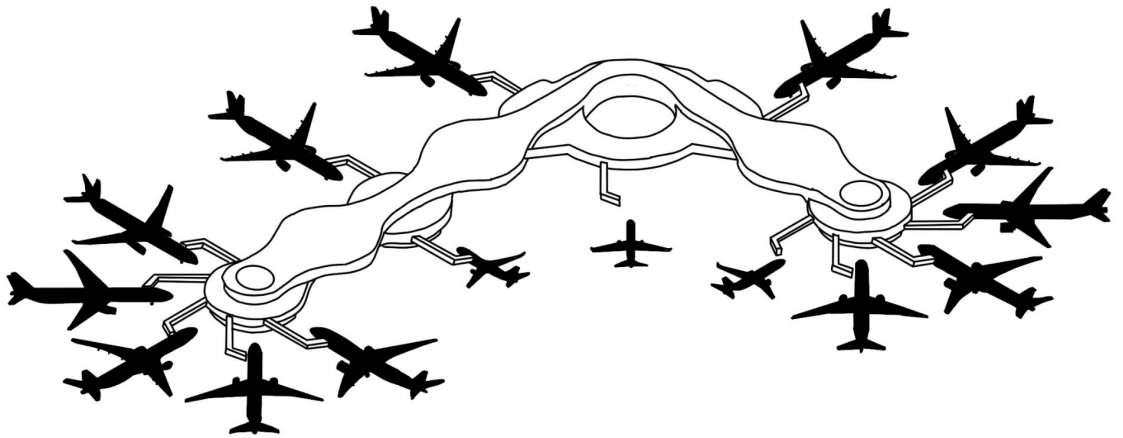
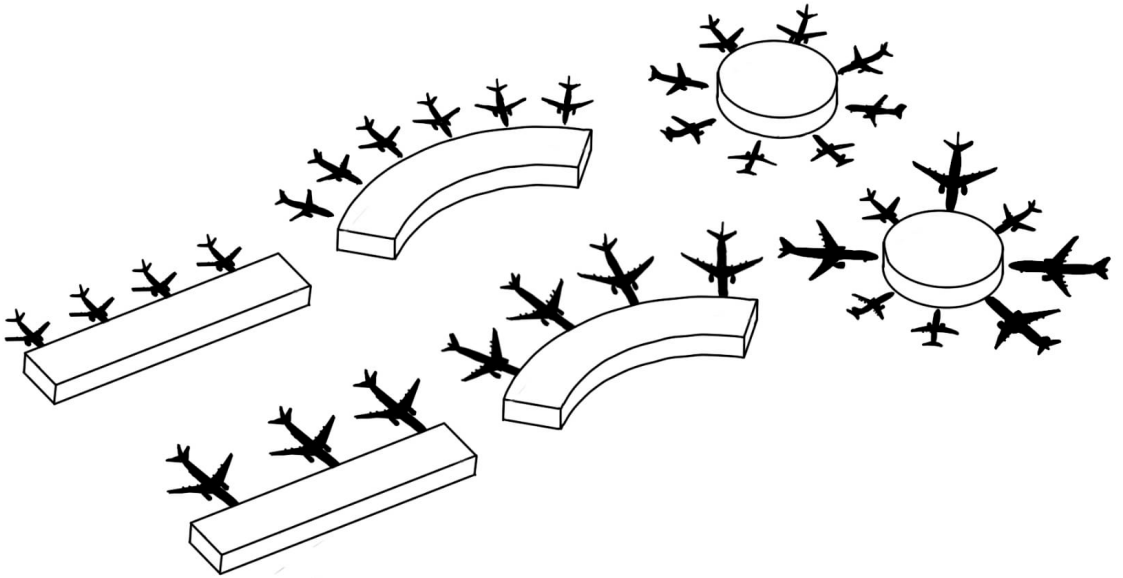


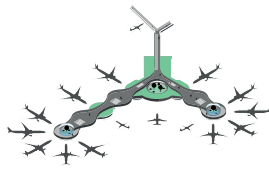
Figure 34 - gate configurations



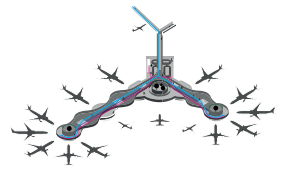
VIEW TOWARD  
PLANES



BOULEVARD



COURTYARDS

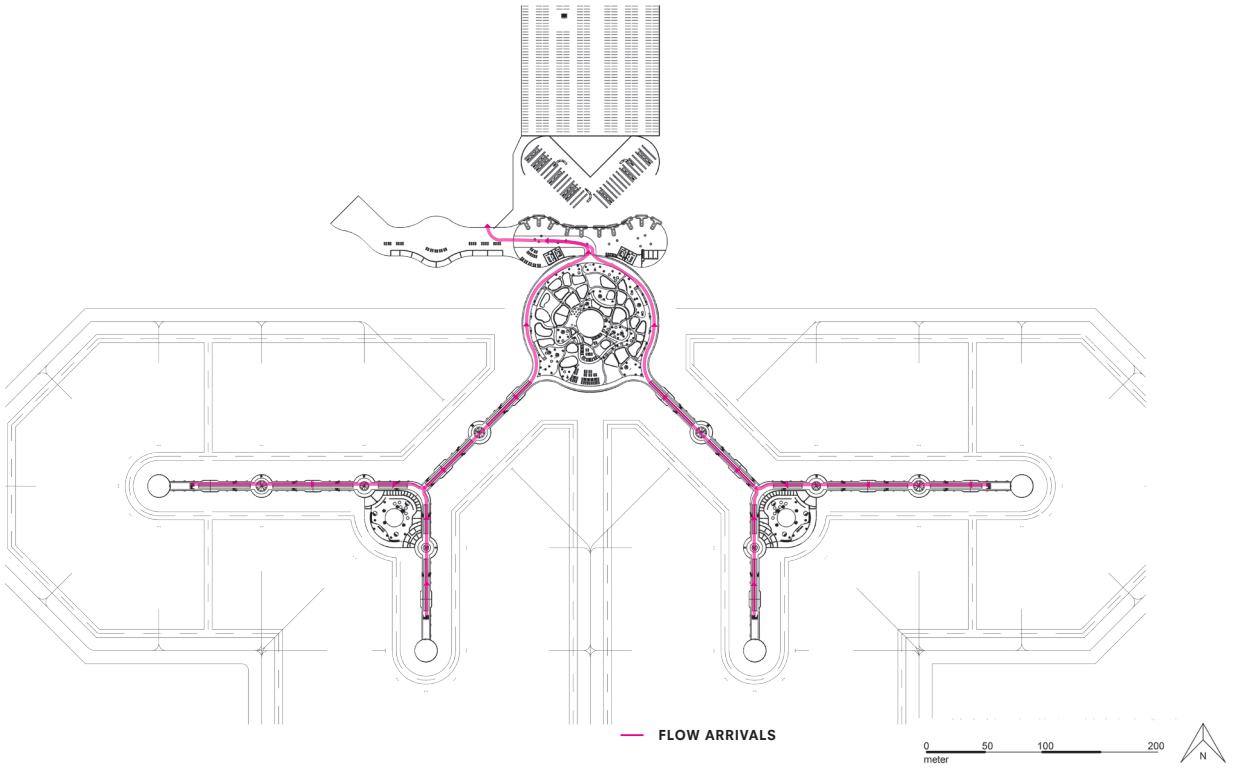


FLOWS

Figure 35 - airside ambition

# GROUND FLOOR

## ARRIVALS

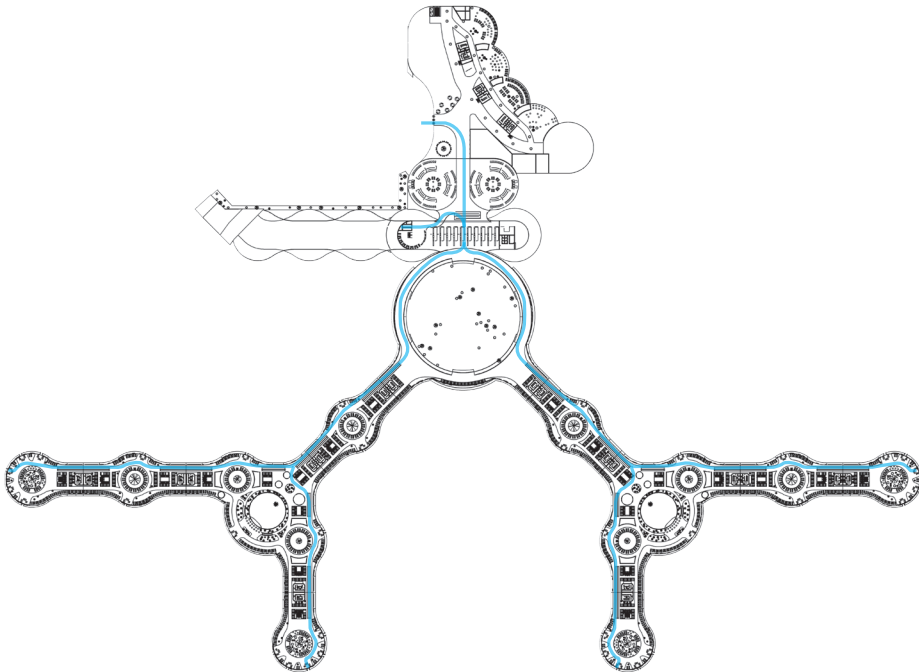


— FLOW ARRIVALS



# FIRST FLOOR

## DEPARTURES



— FLOW DEPARTURES

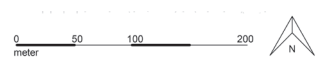


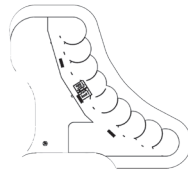
Figure 36 - Floor plans (LOD 1:200)

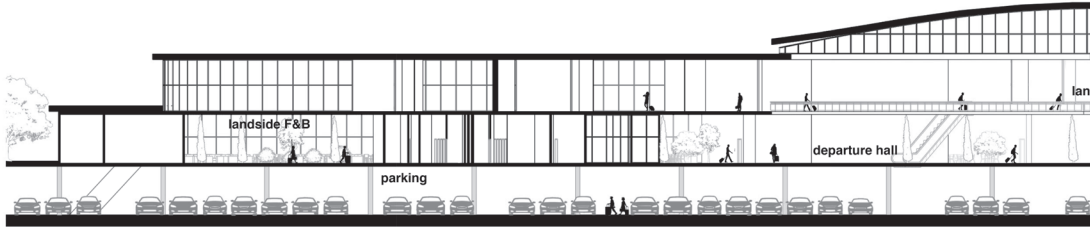
# Flow

The choice for contact gates results in radial shape for the terminal pier. To guide the passenger flows without creating crowds, the internal logic of the floor plans and sections focuses on horizontal efficiency. All important steps happen on the same floor level. This avoids vertical level changes, which usually slow passengers down and make them lose their way.

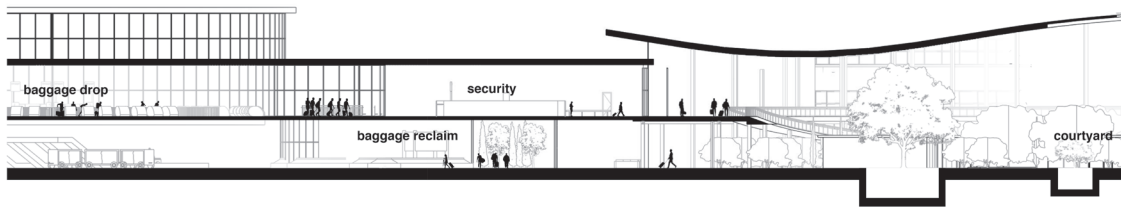
## SECOND FLOOR

F&B

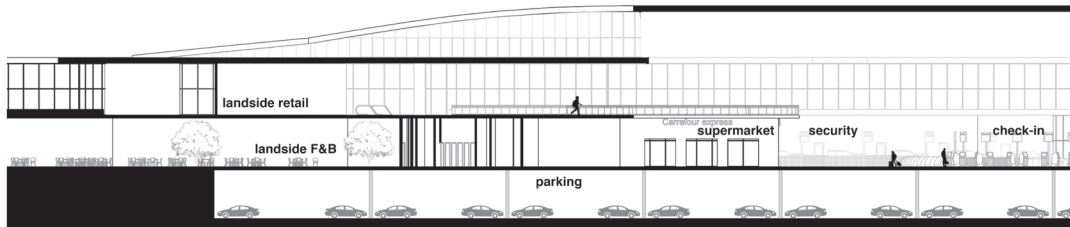




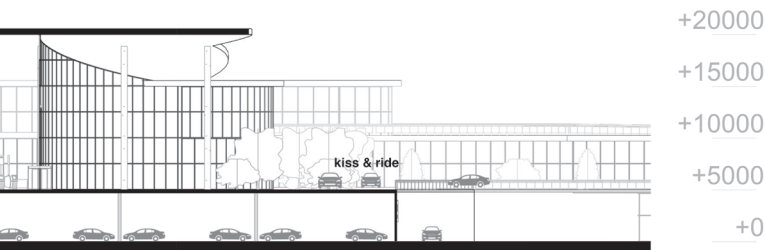
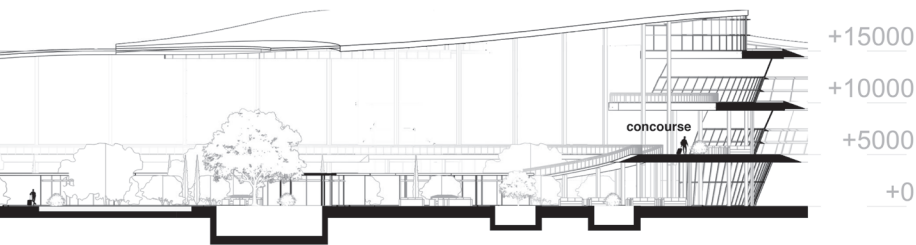
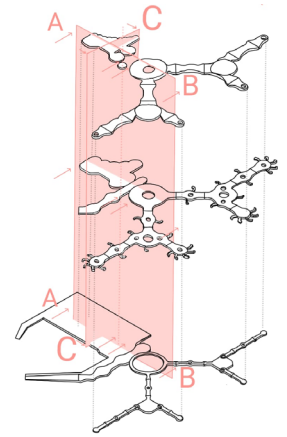
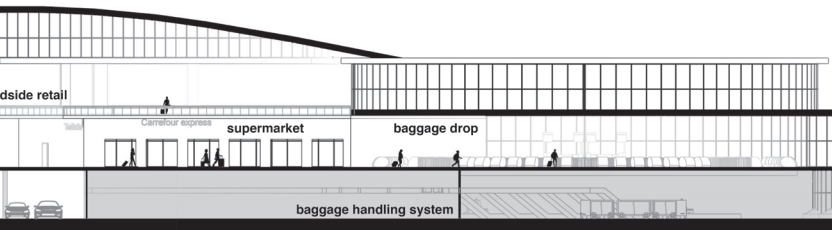
**SECTION A DEPARTURE HALL**



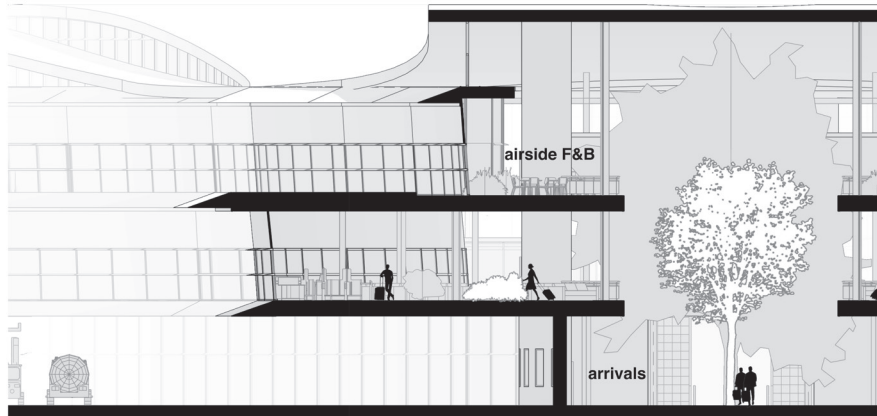
**SECTION B COURTYARD LARGE**



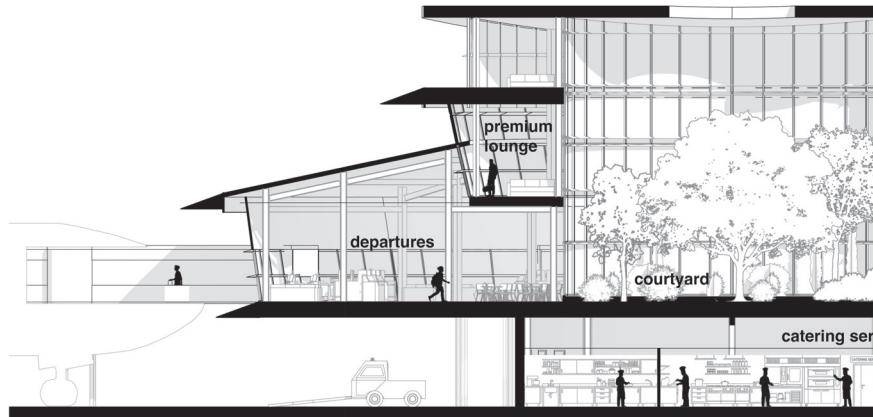
**SECTION C DEPARTURE HALL**



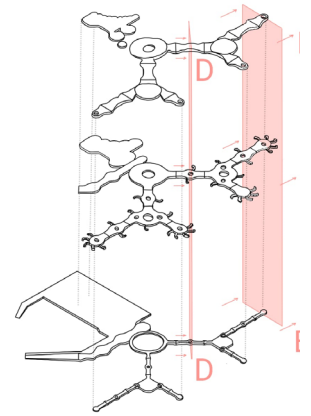
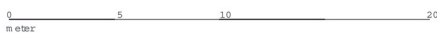
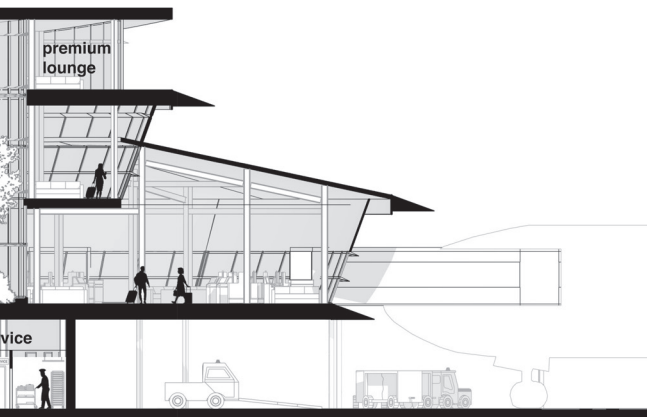
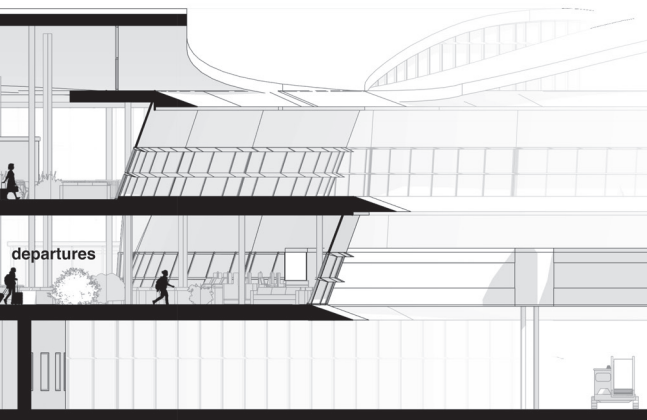
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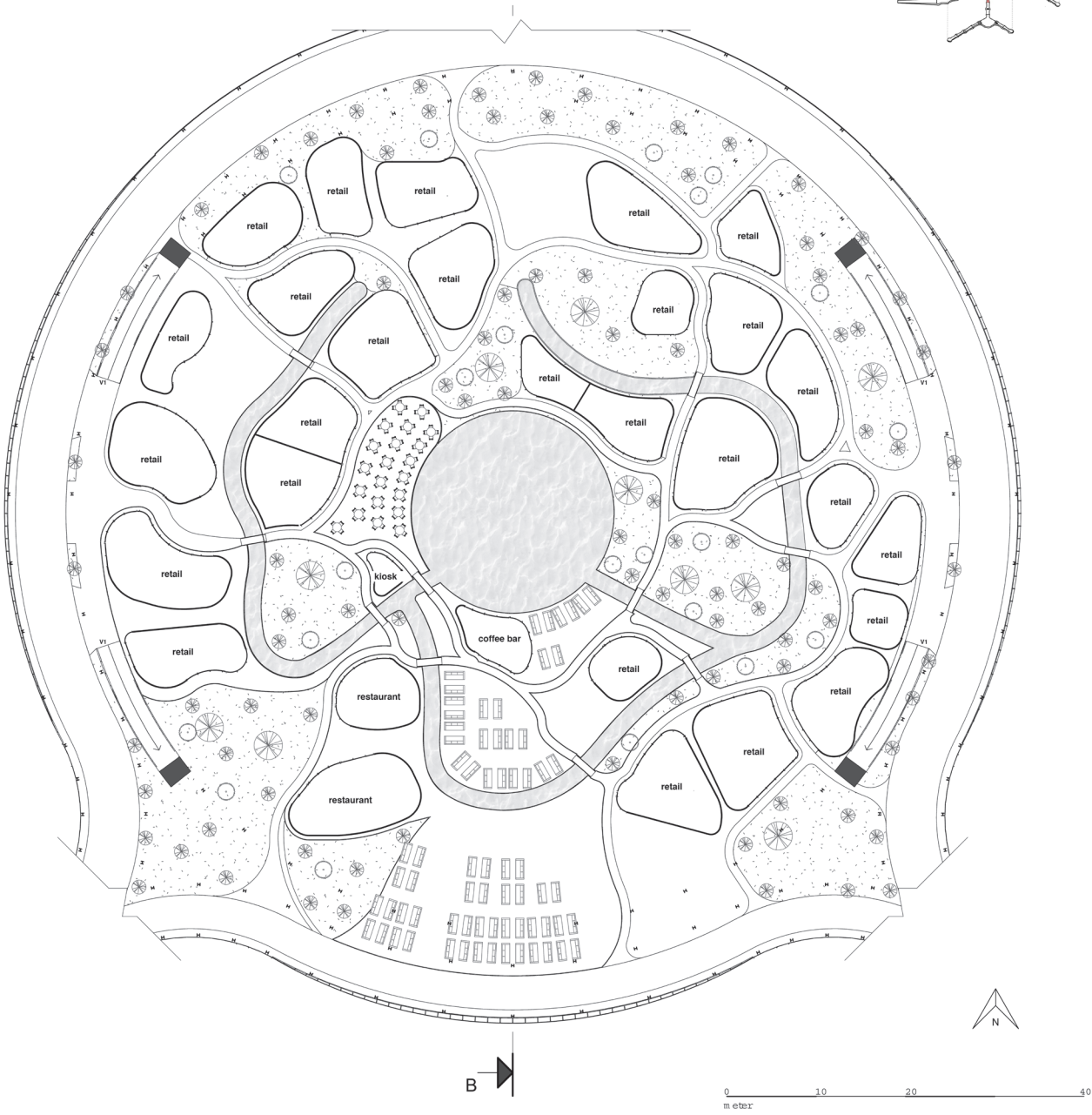
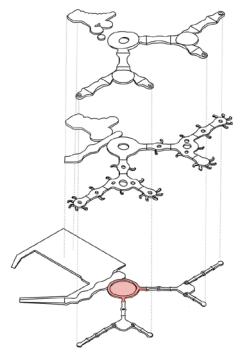
**SECTION D CONCOURSE**



**SECTION E CONCOURSE**

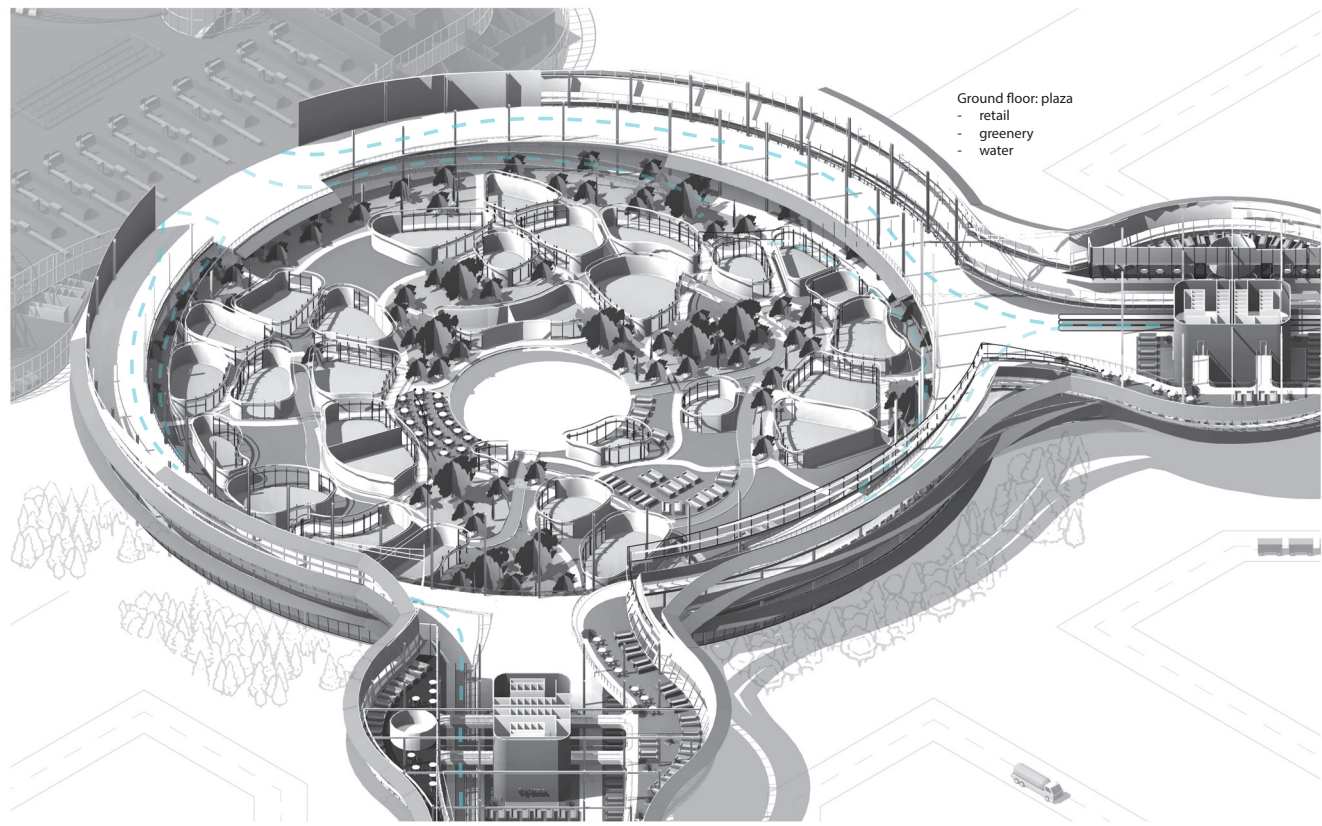


The design solves the conflict between Flusso (speed) and Profitto (shops and commercial exposure) right after the security check. This is done with three types of zones: the large, medium, and small courtyards.

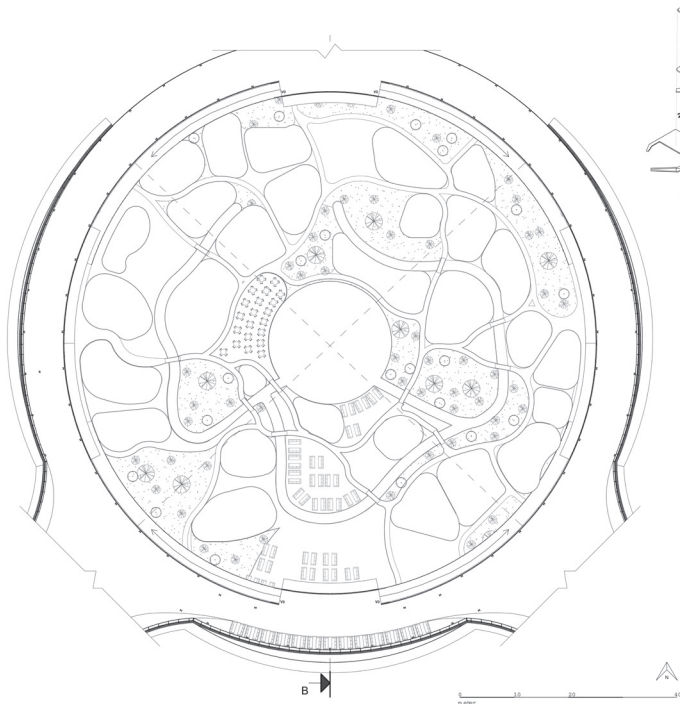


00 GROUND FLOOR

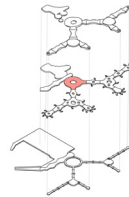
Figure 39 - Courtyard large (LOD 1:200)



- Ground floor: plaza
- retail
  - greenery
  - water

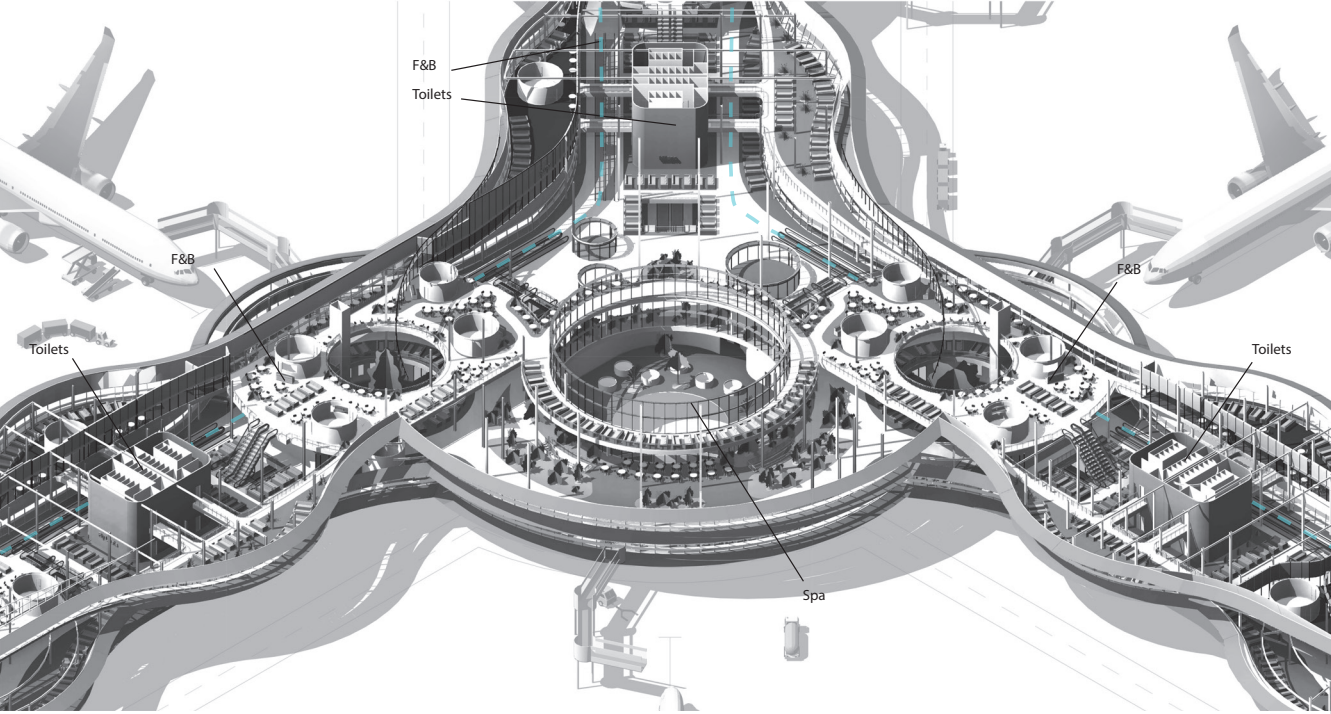


01 FIRST FLOOR



### Large Courtyard (Retail Bypass):

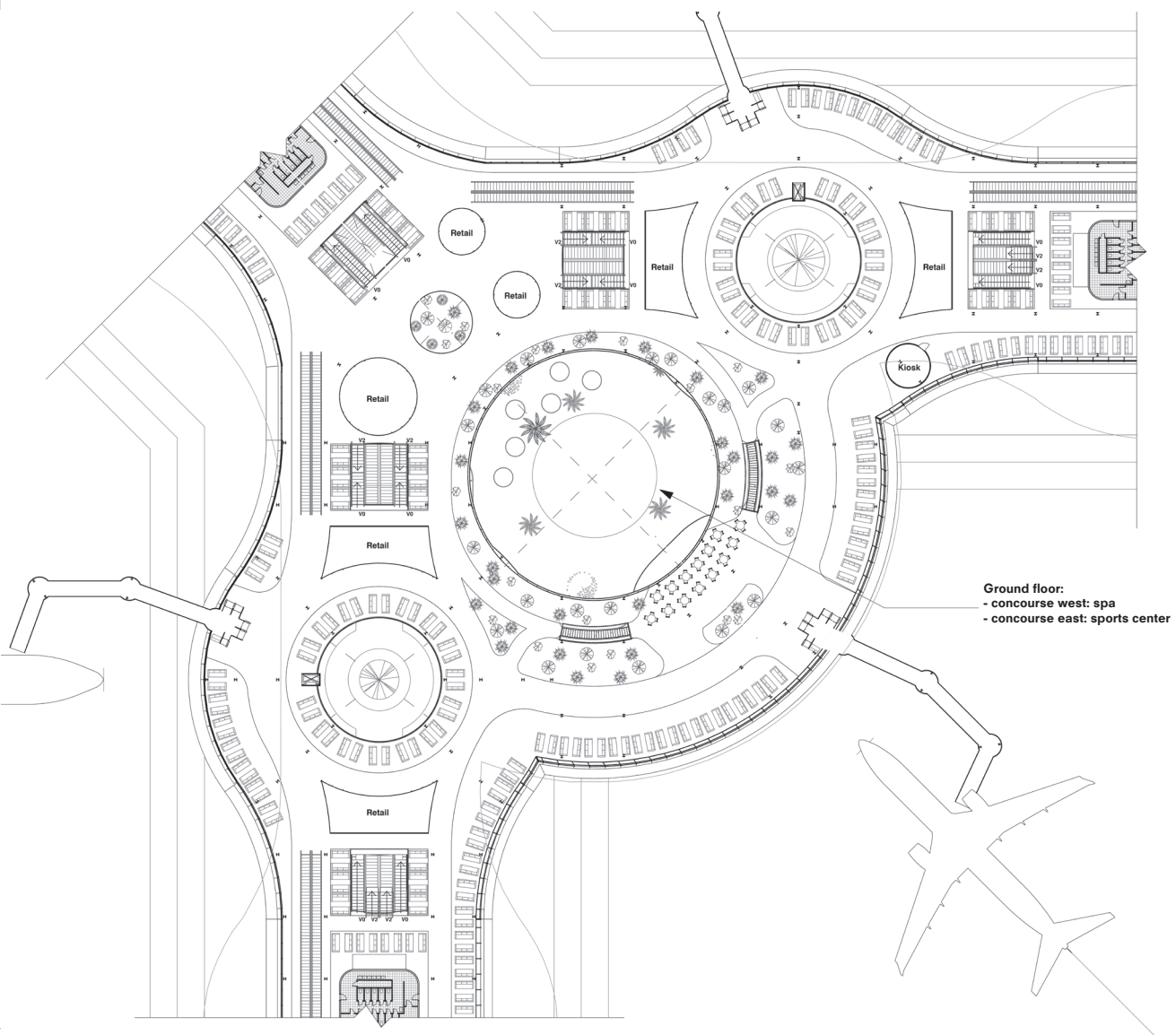
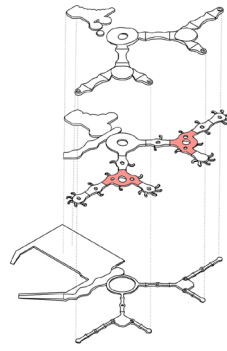
The biggest courtyard is located on the ground floor, connected by a long, gentle ramp. This area is the commercial heart of the terminal (Profitto) with most shops. But instead of forcing everyone to walk through a winding shopping route, the design uses a linear bypass. Business travelers with haste can walk straight along the open void of the courtyard. They keep a clear view of the gates, so the shops are very visible from above, but they do not physically block the fast passenger flow (Flusso).



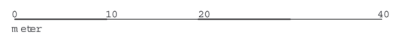
### Medium Courtyards (Gate Hubs):

When passengers walk further into the pier towards their gates, the focus changes from shopping to waiting and resting. The medium courtyards form the active hearts of the gate zones. On the main departure floor, these areas provide spacious seating and direct access to the aircraft boarding bridges. To keep the flow on this floor clear, the Food & Beverage (F&B) areas are placed on the second floor above, creating open balconies that overlook the gates.

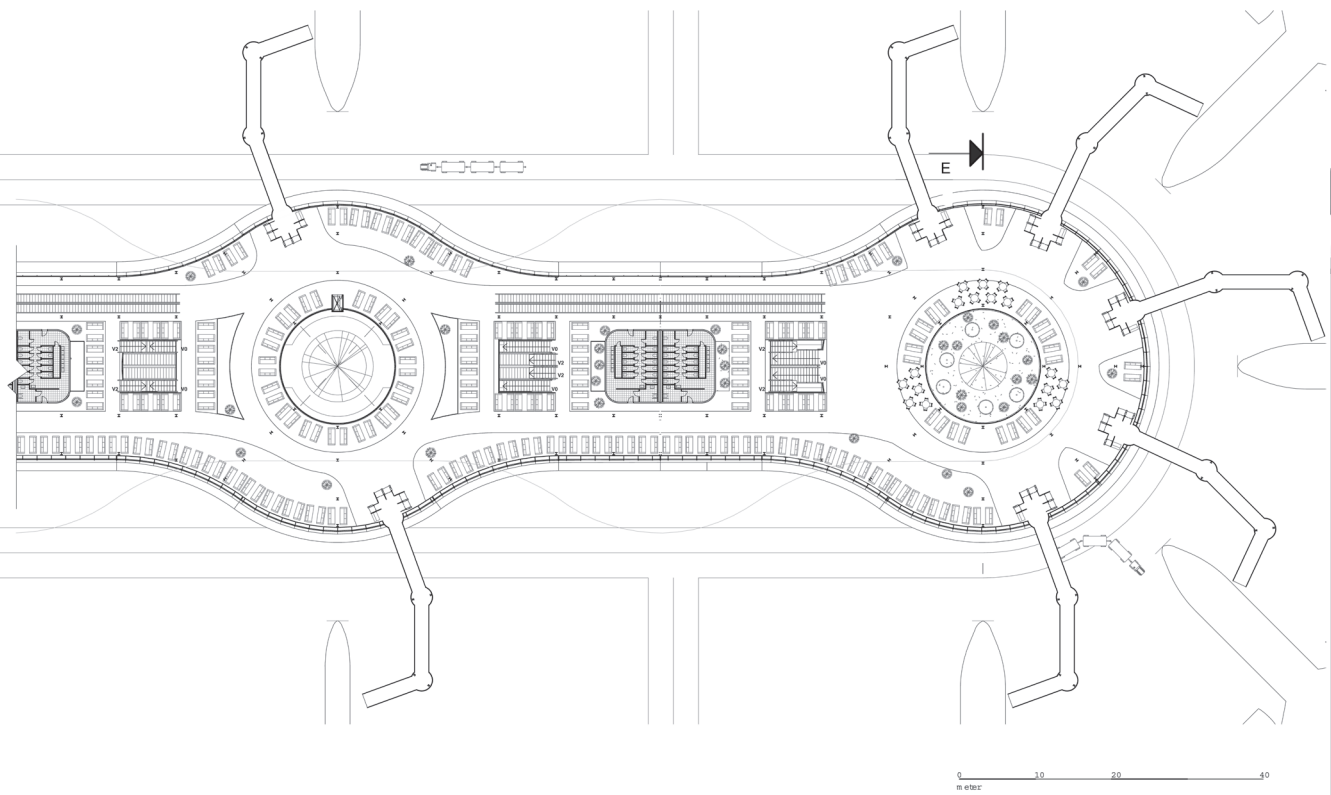
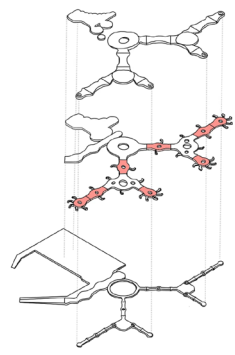
02 SECOND FLOOR



Ground floor:  
 - concourse west: spa  
 - concourse east: sports center

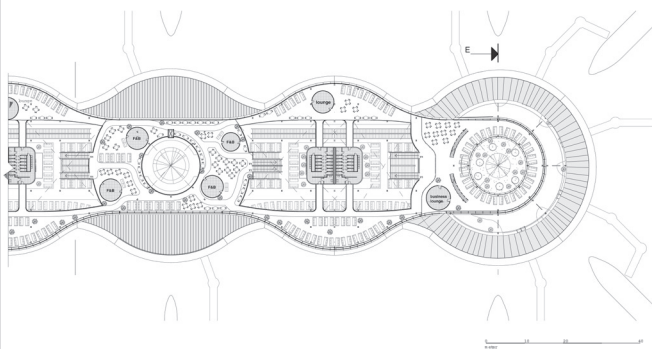
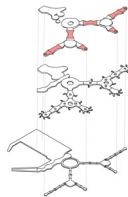
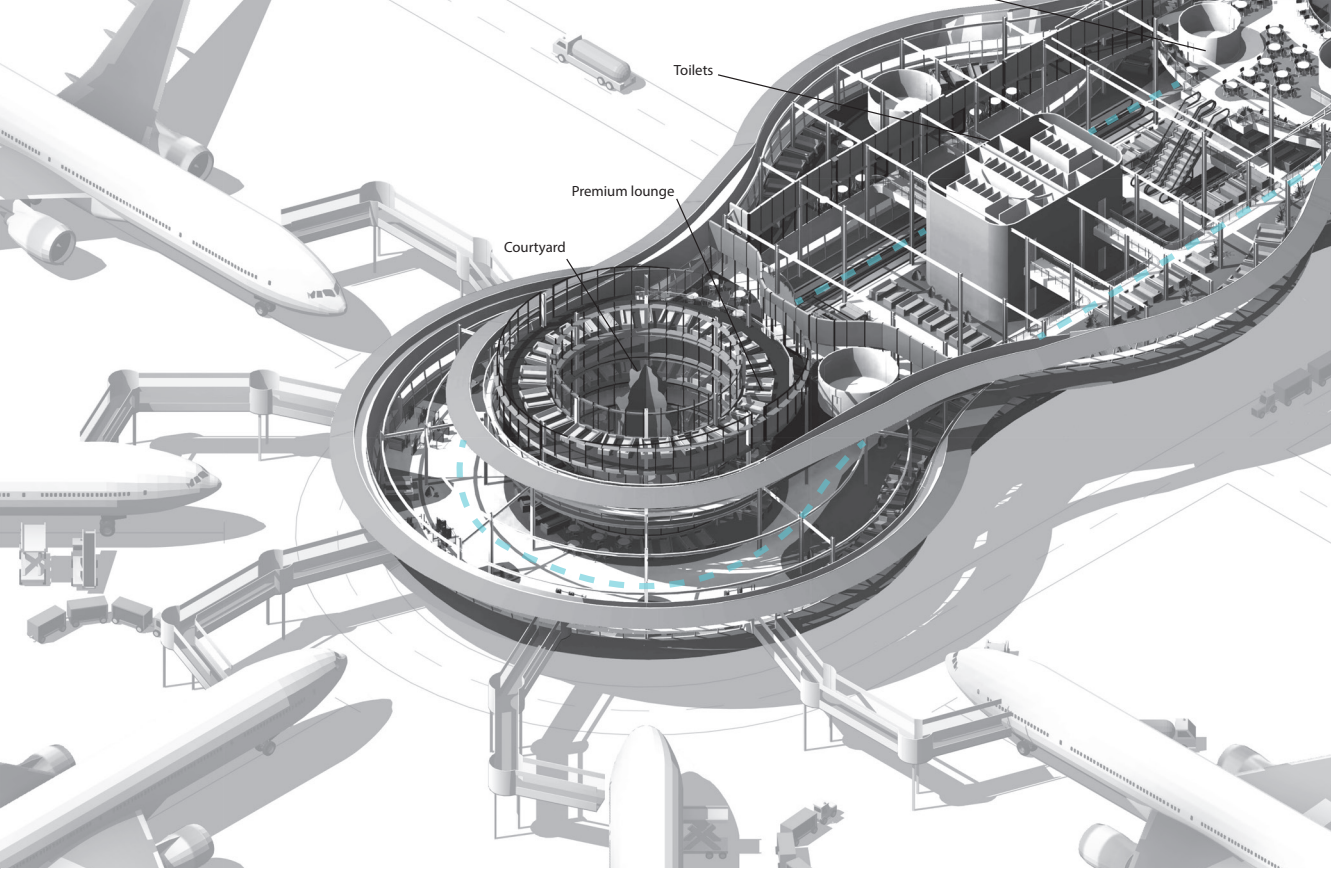


01 FIRST FLOOR



01 FIRST FLOOR

Figure 41 - Courtyard small (LOD 1:200)



02 SECOND FLOOR

**Small Courtyards (Premium Lounges):** At the far ends of the pier, the small courtyards offer the highest level of quiet and comfort. Here, the departure floor remains dedicated to boarding, but the second and third floors are used entirely for premium lounges. These spaces are designed specifically for business travelers who want to work or relax in a quiet environment. Because these lounges look down directly onto the gates below, passengers can easily see when their flight is ready to board without feeling any time-stress.

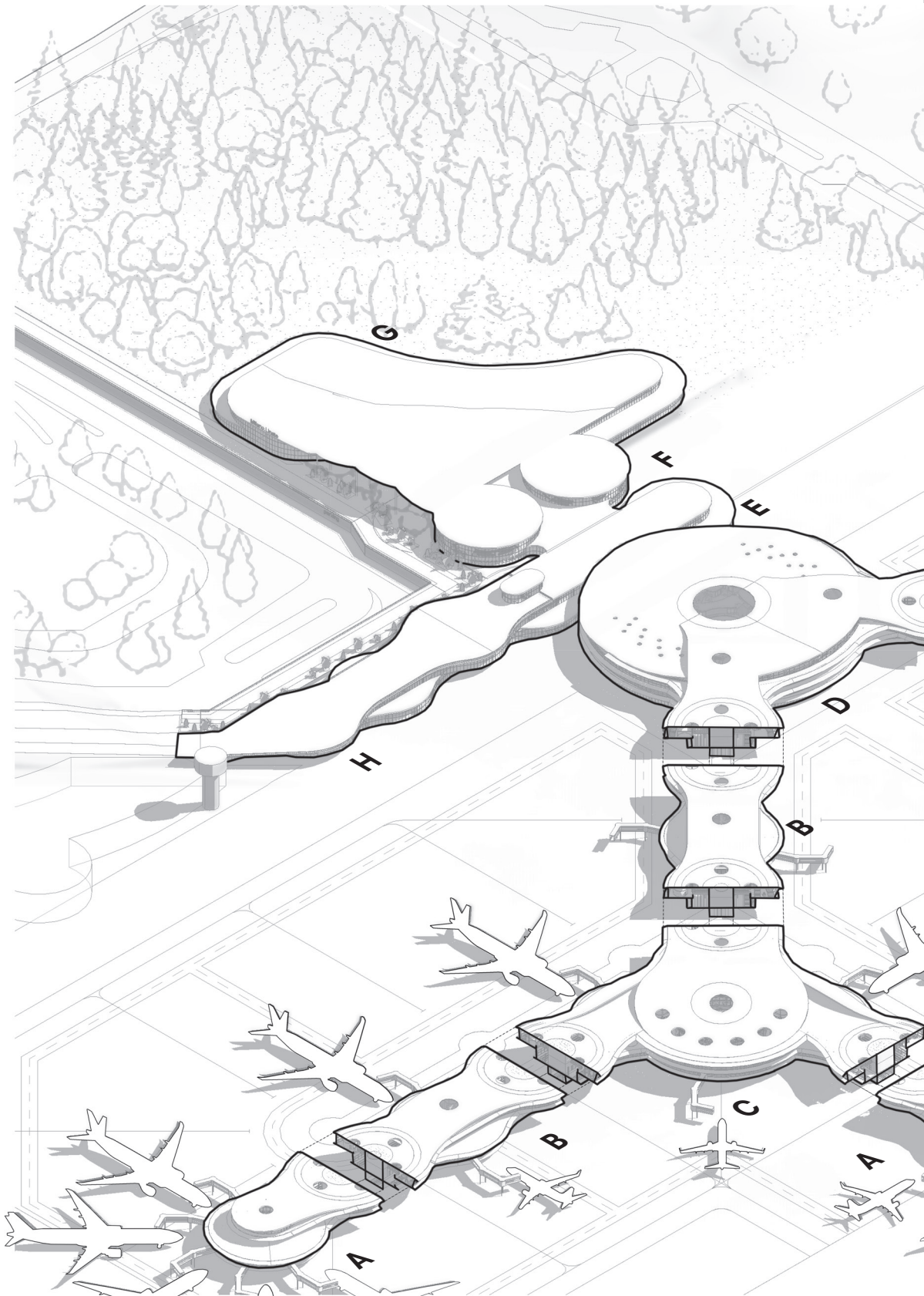
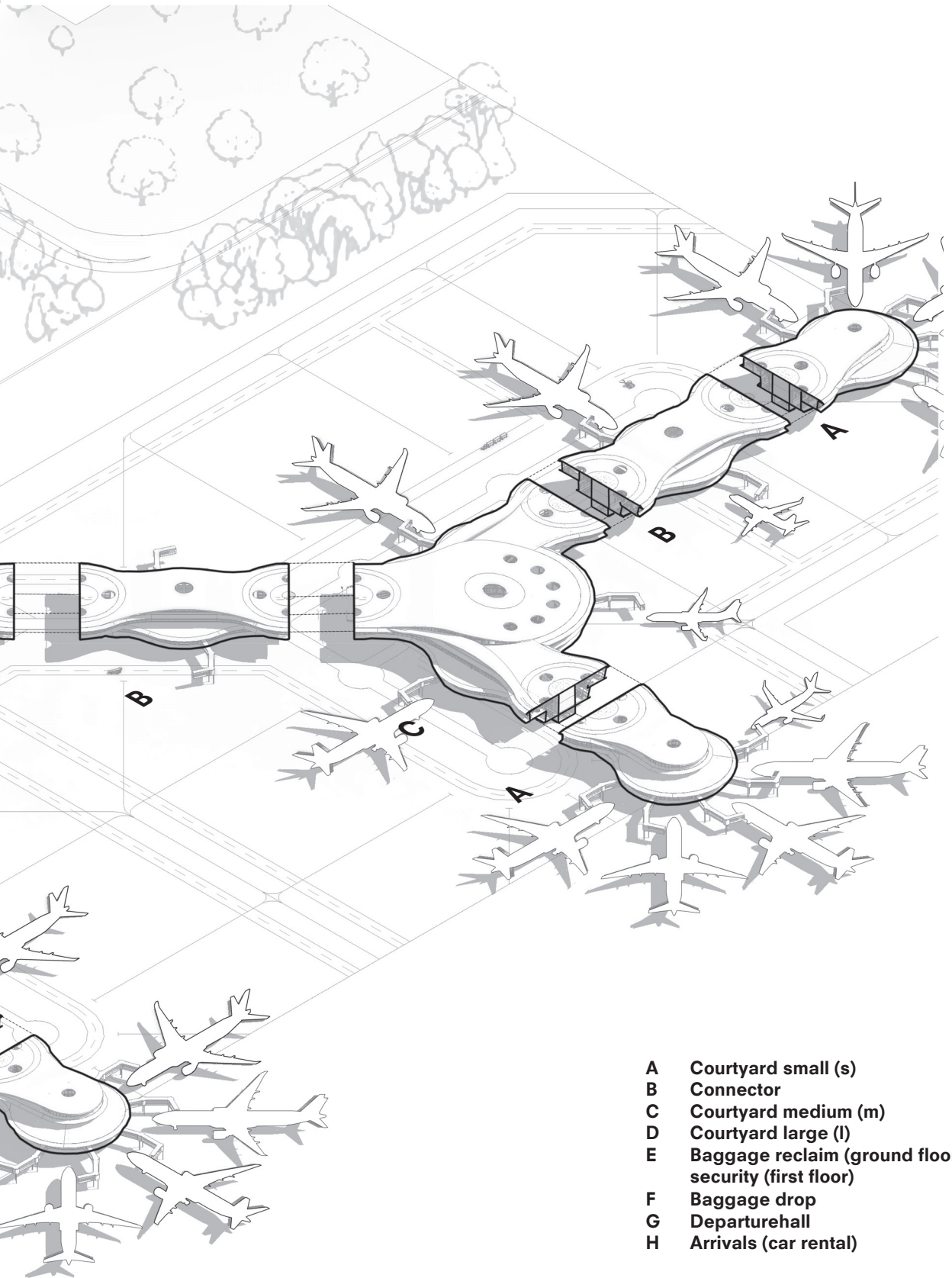


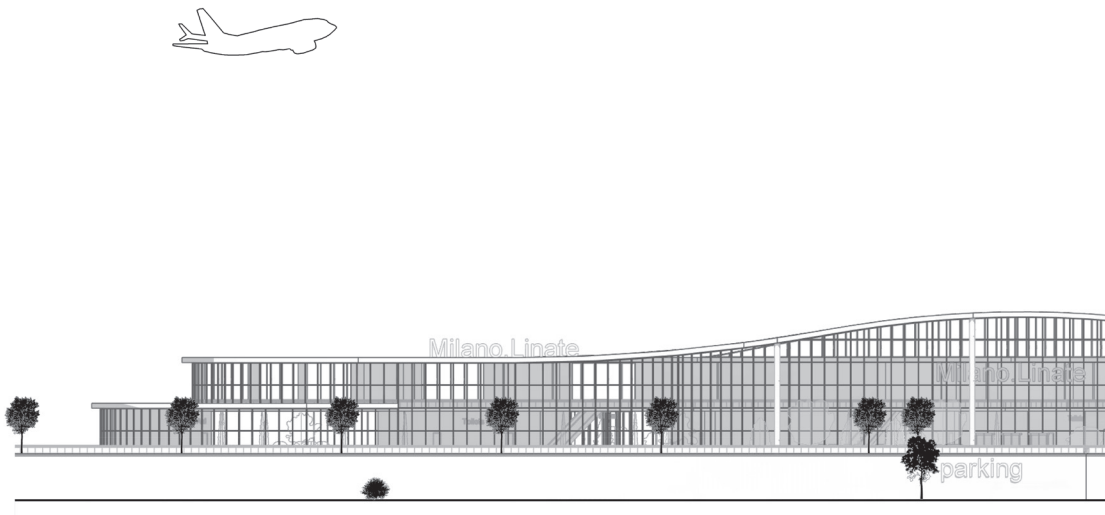
Figure 42 - Exploded view elements



- A** Courtyard small (s)
- B** Connector
- C** Courtyard medium (m)
- D** Courtyard large (l)
- E** Baggage reclaim (ground floor)  
security (first floor)
- F** Baggage drop
- G** Departurehall
- H** Arrivals (car rental)

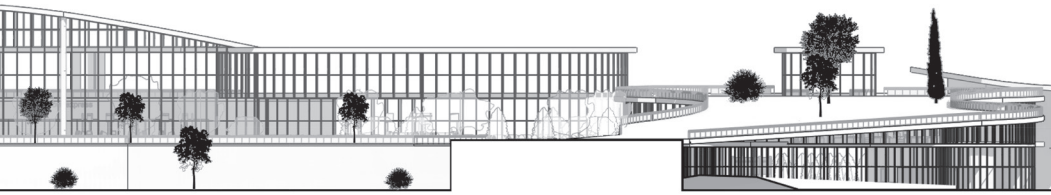
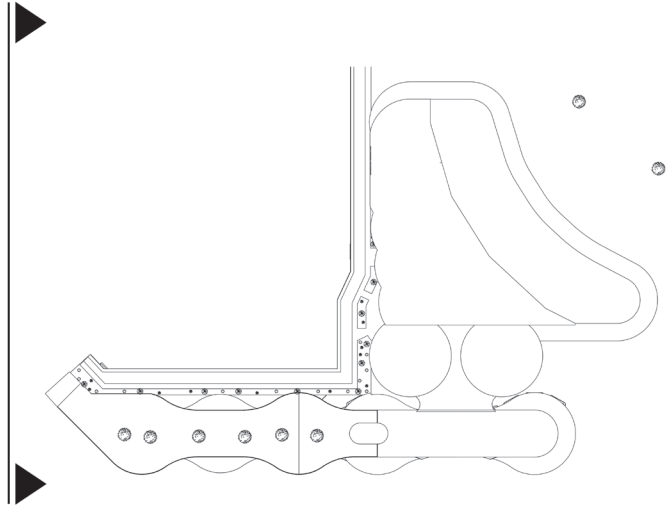
## Experience

The design focuses heavily on the mental experience of the passenger. Because airports can be stressful, the architecture uses glass, transparency, and nature to create a calm and quiet environment.



This experience starts outside the building, as shown in the elevations. The west facade on the landside has a large glass curtain wall and a roof line shaped like a wave to mark the main entrance. Because this facade is completely transparent, passengers can see what is happening inside the

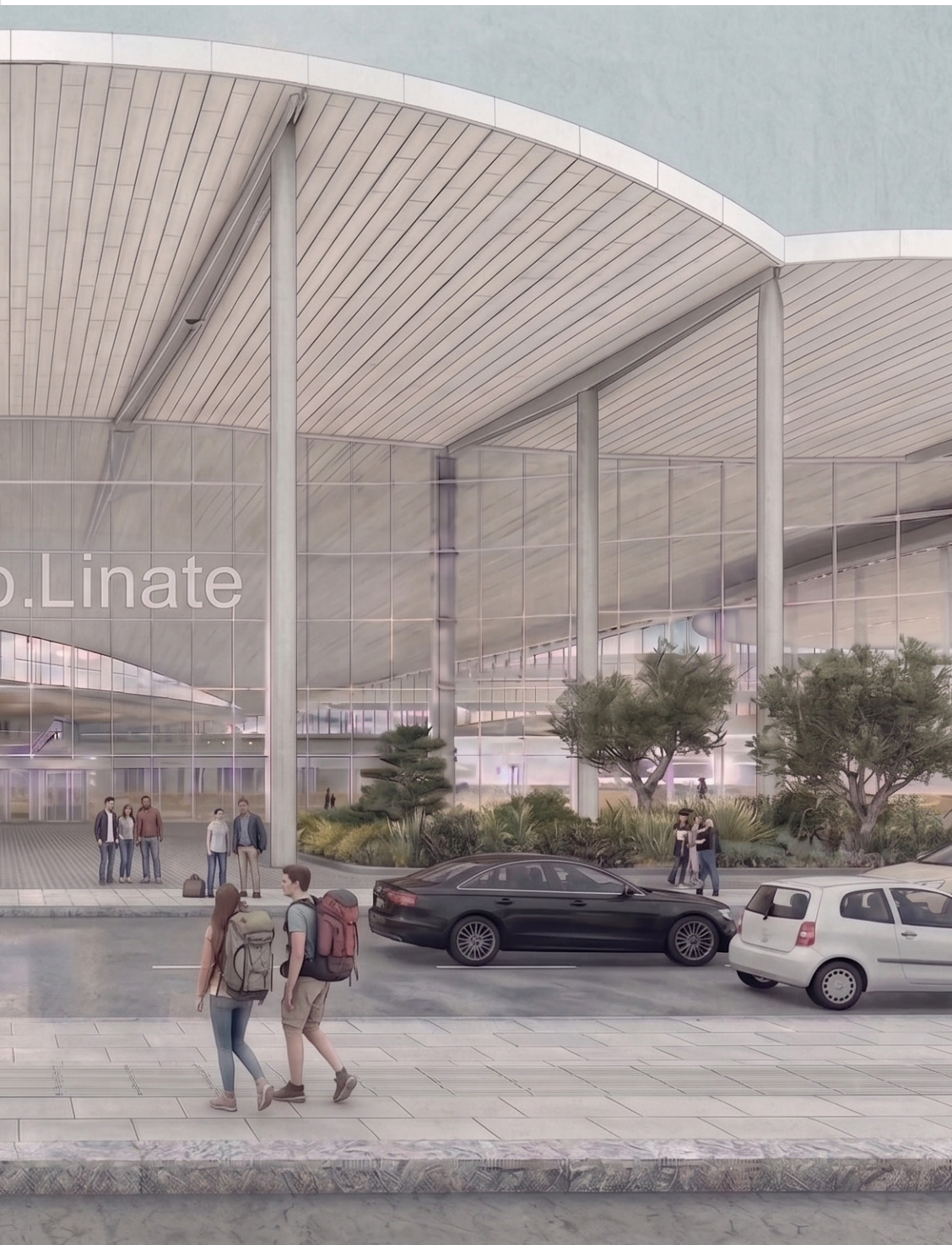
departure hall before they even enter. More importantly, they can already see right through the building towards the airplanes parked on the airside. This open view gives travelers an instant sense of direction and peace of mind when they arrive.



0 10 20 40  
meter



**AIRPORT**



## ARRIVAL

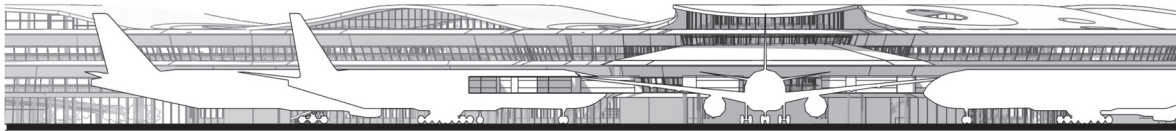
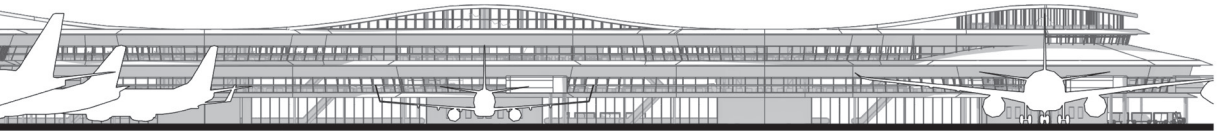
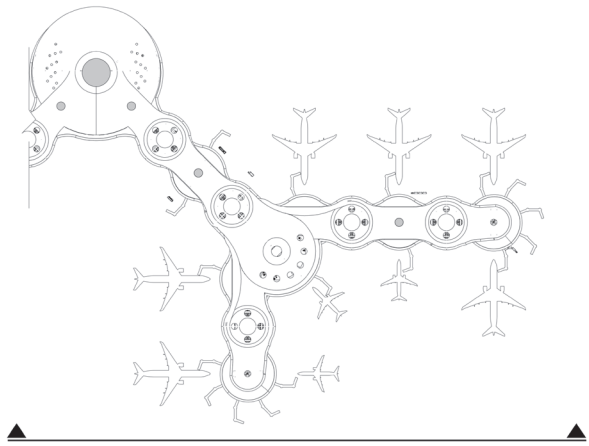
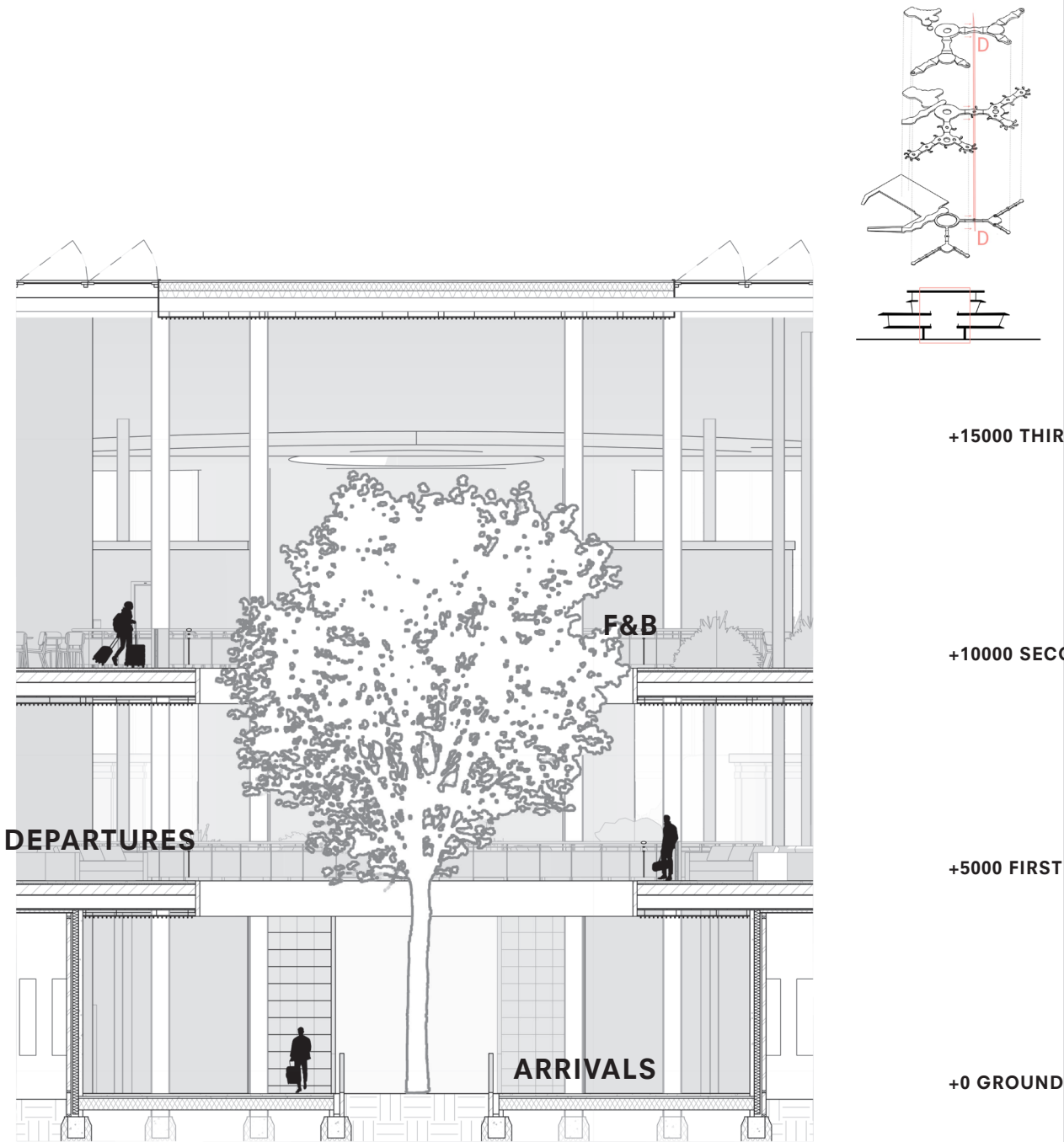


Figure 44 - south elevation (LOD 1:200)



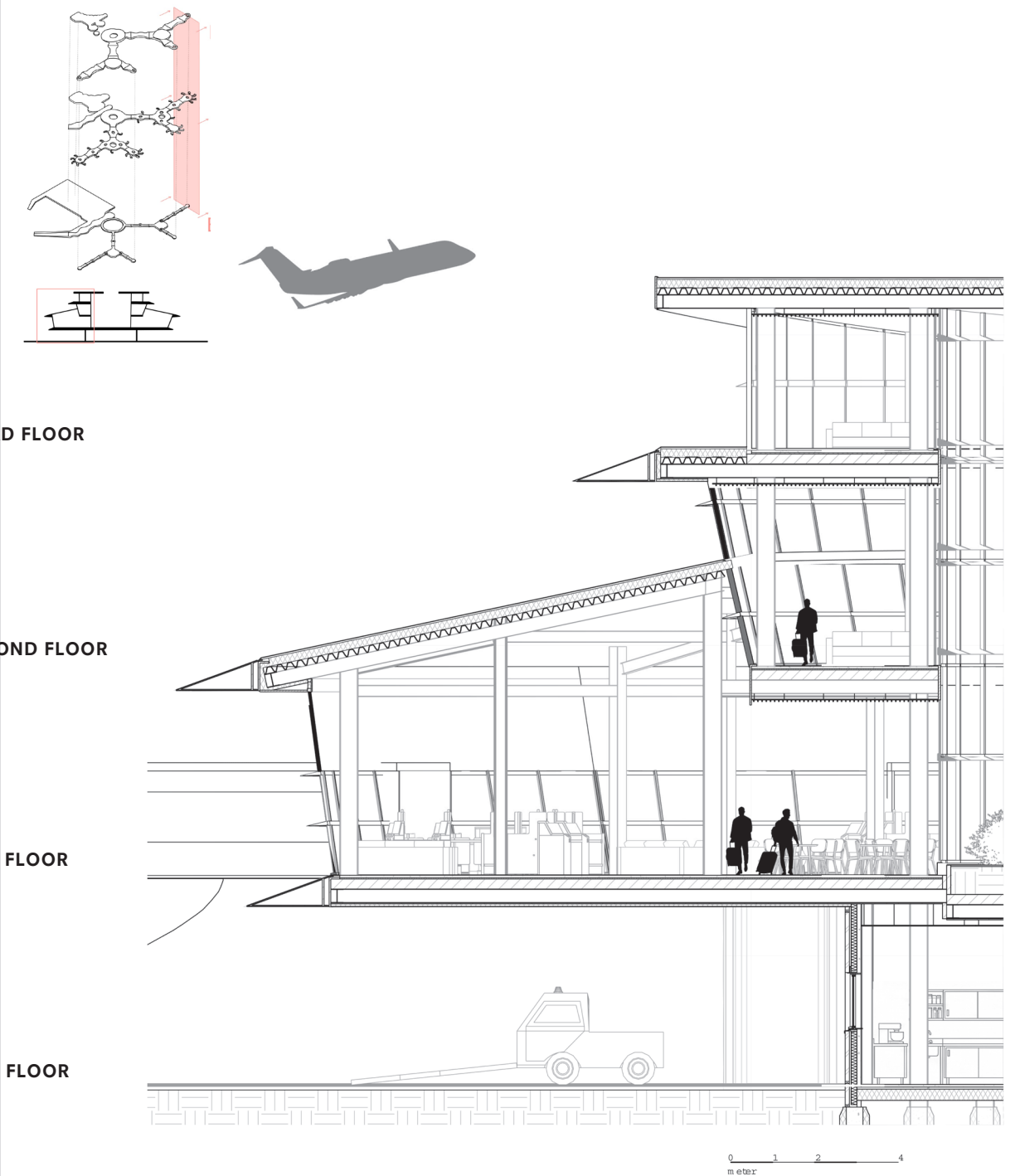
0 10 20 40  
meter



Inside the terminal, this natural experience continues to reduce stress. The interior fragment shows a cross-section of the concourse where a real tree grows through the different floor

levels. Passengers at the departure floor look straight into these treetops. Bringing nature inside the terminal helps people relax immediately before they continue their journey.

Figure 45 - fragments (LOD 1:50)



The airside facade contains out of transparent aluminum curtain walls. This ensures that passengers at the gates and in the premium lounges have a panoramic view of the aircraft

parked outside. By allowing travelers to see the boarding situation while they work or rest, the architecture naturally eliminates time-stress and enhances the overall comfort.



DEPARTU



## IRE HALL




SECU



SECURITY



← Concourse A  
(gates 1-15)



A modern airport terminal interior featuring a curved wooden slat ceiling with integrated lighting. A large blue arrow sign points towards the right, indicating the direction to Concourse B. The floor is a light-colored, polished material. In the background, there is a multi-story building with large windows and a glass facade. People are walking through the terminal, some carrying luggage. A sign on the wall reads "Concourse B (gates 15-30) →".

Concourse B  
(gates 15-30) →



CONCO



COURSE





L'ART DE VOYAGER

L'ART DE VOYAGER

L'ART DE VOYAGER

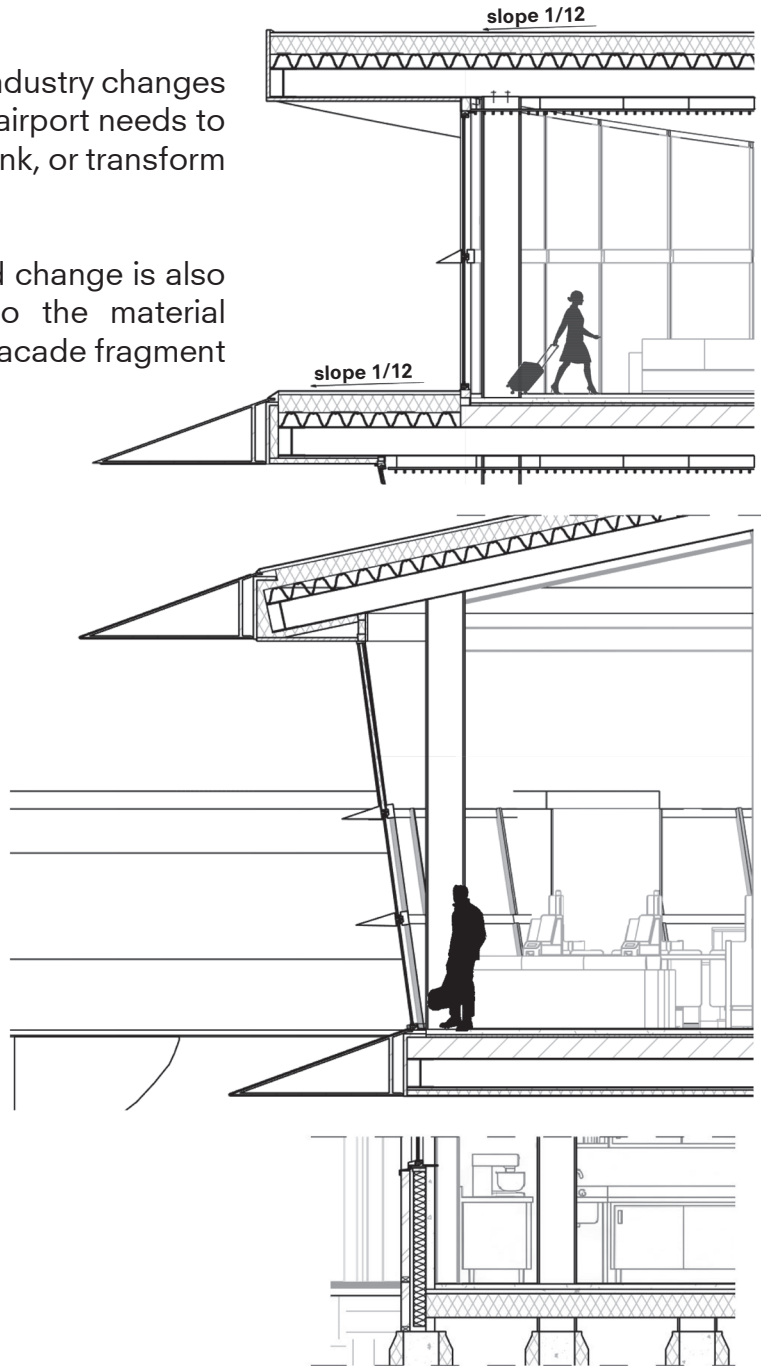
L'ART DE VOYAGER

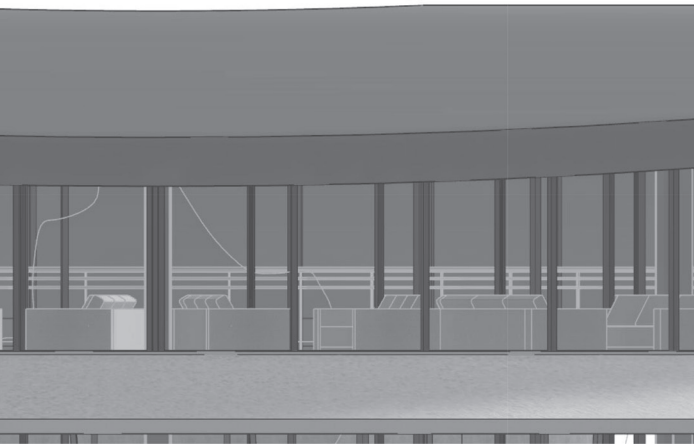
Passages et animations

## Longivity

Because the aviation industry changes rapidly, a modern city airport needs to be able to expand, shrink, or transform easily over time.

This factor of time and change is also deeply integrated into the material choices shown in the facade fragment and details.





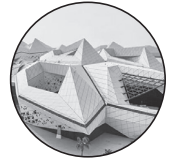
Gate A5



**Finishes:**

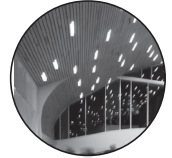
**Top roof (wave):**

- white coated aluminium



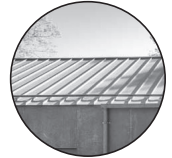
**Ceiling:**

- light wooden grid ceiling



**Roof:**

- profiled corten steel



**Construction:**

- steel profile construction



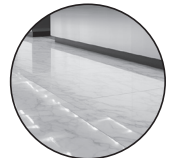
**Façade:**

- HR++(+) glass
- aluminium curtain mulions



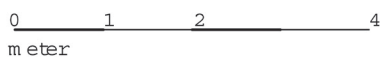
**Floors:**

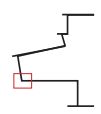
- white marble floor finish



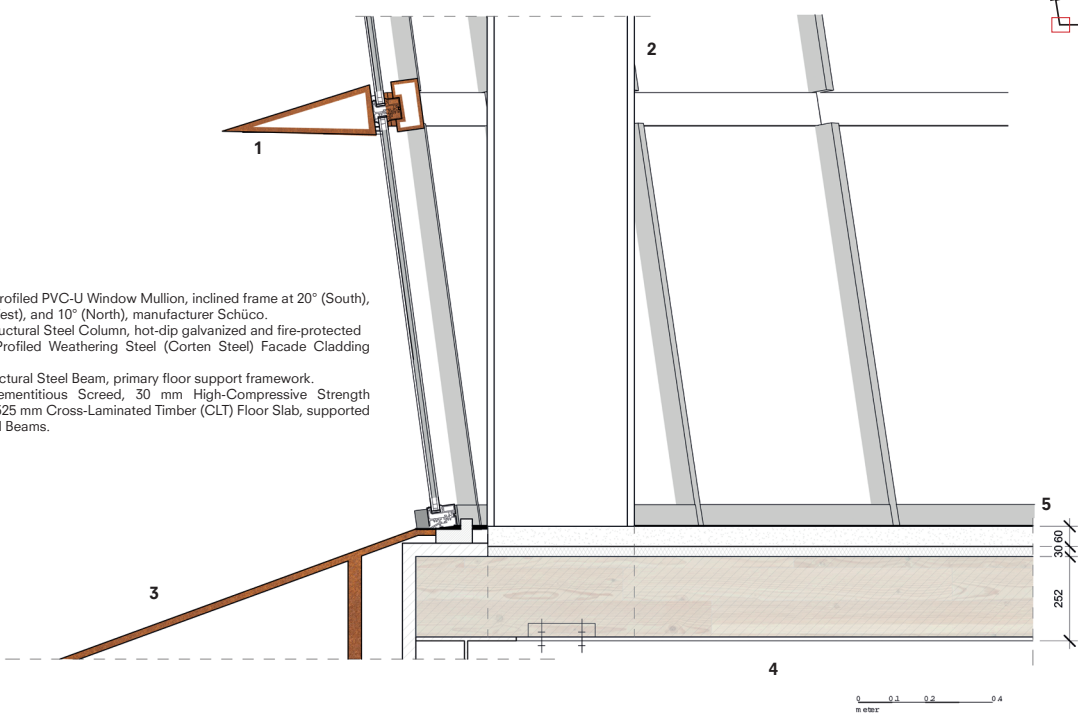
**Wall:**

- grey natural stone:  
Pietra di Ceppo





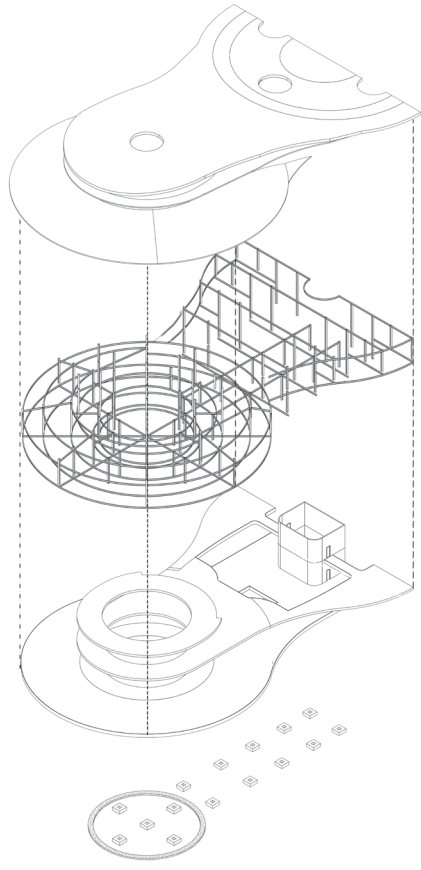
1. Triangular Profiled PVC-U Window Mullion, inclined frame at 20° (South), 15° (East/West), and 10° (North), manufacturer Schüco.
2. HE400A Structural Steel Column, hot-dip galvanized and fire-protected
3. Triangular Profiled Weathering Steel (Corten Steel) Facade Cladding Panels.
4. IPE300 Structural Steel Beam, primary floor support framework.
5. 60 mm Cementitious Screed, 30 mm High-Compressive Strength Insulation, 525 mm Cross-Laminated Timber (CLT) Floor Slab, supported on IPE Steel Beams.



**Roof**  
CLT slab with Corten Steel finish

**Bearing structure**  
Steel columns and beams  
(span max 8 meters)

**Foundation**  
Reinforced concrete foundation



**Ceiling**  
Grill ceiling wood

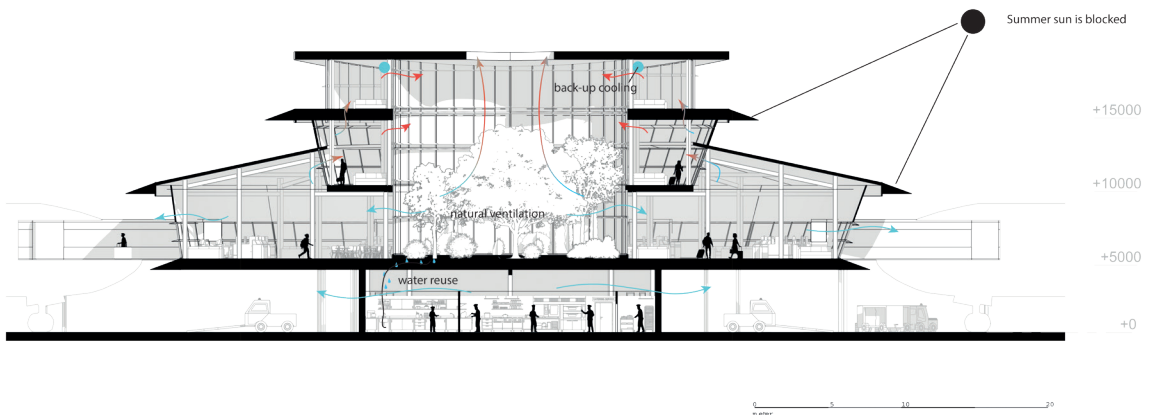
**Floor**  
Prefabricated CLT panels

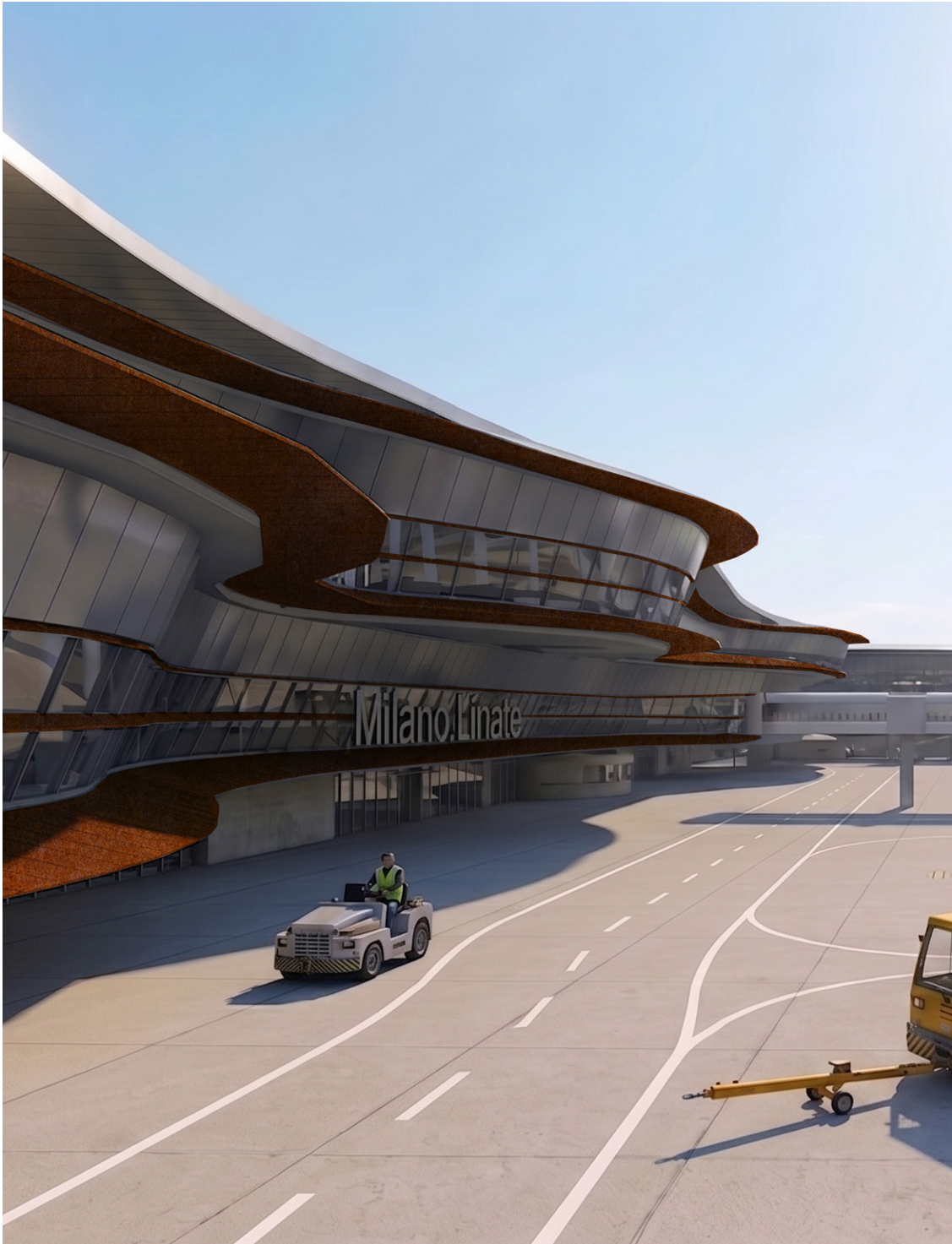
Stability core

Figure 47 - details (LOD 1:50), construction and climate

Above the solid brick ground floor, the building features large aluminum curtain walls. To accentuate the building's smooth curves, custom weathering steel (corten steel) panels are placed around the window frames. Corten steel is highly sustainable, lasts for decades, and changes its color naturally over time. This material choice serves as a metaphor for Linate Airport itself: as the aviation industry evolves and new types of sustainable aircraft arrive, the terminal building organically changes its look along with it.

Finally, the climate section brings this sustainable, modular concept together with the mechanical installations. The green courtyards do not just serve as resting areas for passengers, but they also function as the physical lungs of the terminal. The building targets natural ventilation by bringing fresh air inside through the open courtyards and venting the exhaust air out towards the airside. For extreme weather periods, back-up cooling and heating ducts are efficiently integrated and hidden above the wooden grill ceiling, keeping the public terminal spaces completely clean and uncluttered. This creates a sustainable and flexible terminal architecture that is fully prepared for the future of Milan Linate.





DEPART



RTURE

# CONCLUSION

A black and white photograph of a grand, multi-story classical building interior. The structure features two levels of arches supported by columns. A balcony with a decorative railing is visible on the upper level. In the center, a statue of a figure in a long robe stands on a pedestal. The lighting is dramatic, highlighting the architectural details. The overall atmosphere is one of historical grandeur and architectural complexity.

04



# PART 4

## Conclusion

This graduation report set out to answer the primary research question:

“What typology of spatial configurations minimizes the transit time for business travelers while maintaining dwell time for the other passengers at Milan Linate Airport?”

Through a Research by Design methodology, this study has demonstrated that these seemingly conflicting goals of passenger flow (Flusso) and commercial revenue (Profitto) do not have to compromise one another. Instead, they can be harmonized within a single architectural system.

The research concludes that the optimal spatial configuration is a modular, linear pier integrated with a dual-track landside access system and a retail bypass.

The main architectural intervention that minimizes transit time for the business traveler is the creation of a direct, uninterrupted line from security to the gates, maintained entirely on a single floor level. Because time-sensitive passengers strongly dislike vertical level changes, keeping this primary fast-lane strictly horizontal eliminates physical friction and cognitive delays. To maximize turnaround efficiency and ensure seamless transit at the final stage of the journey, the terminal relies exclusively on contact gates. By utilizing passenger boarding bridges, the design eliminates the time-consuming bus transfers of remote stands and the uncomfortable outdoor exposure of semi-contact gates. This ensures a fast, enclosed, and highly predictable transition from the gate directly into the aircraft cabin.

Simultaneously, the commercial vitality (Profitto) and the dwell time for holiday travelers are maintained through the spatial strategy of the Retail Bypass. Right after security, the largest courtyard is at the ground floor, housing the primary commercial and retail facilities. By utilizing a double-height void, the design creates high visual exposure, making the shops and amenities highly attractive and visible from the main path. However, entering this commercial zone is entirely optional. While holiday travelers can easily take a gentle ramp down into the green, welcoming retail courtyard, hurried business travelers can walk straight past it on the upper level, keeping a clear line of sight toward their gates.

Ultimately, this project proves the necessity of a Research by Design approach. While theoretical data can state the time-caps and requirements of different traveler types, only the physical act of architectural drawing and spatial modeling can synthesize these parameters into a working reality. By testing the boundaries of terminal geometry, this design demonstrates that a city airport can function as an ultra-fast processing tool for the business travelers, while still offering a high-quality, profitable, and serene commercial landscape for the lingering holiday traveler.

## Implications

While this terminal configuration was explicitly customized for the Milanese context, the underlying spatial logic is highly transferable to other compact, business-oriented city airports facing spatial constraints and contrasting passenger requirements. The integration of the courtyard was a direct result of the site visit conducted by the “Cortile dei Dieci” studio group, which identified the courtyard as a defining architectural typology of Milan. In this project, the courtyard was translated into three distinct sizes (Large, Medium, and Small) to solve the operational paradox between passenger speed and commercial revenue. When applying this project to other international contexts, the courtyard concept can be reprogrammed or adapted to reflect local architectural identities. However, the structural recommendation for airports with high volumes of business travelers remains universal: the implementation of a centralized, circular gate configuration utilizing only contact gates.

As demonstrated in the design, the geometry of the round gate hubs provides extreme flexibility, allowing the terminal to adapt to varying aircraft wingspans and changing fleet sizes over time without requiring heavy structural expansions.

From an ecological and ethical perspective, this project operates within the complex reality of a growing aviation sector. Despite the widespread awareness of the environmental impacts of air travel, passenger numbers continue to rise globally, requiring larger, more efficient, and safer terminal infrastructures. While the decarbonization of aviation is progressing slowly, the arrival of zero-emission and sustainable aircraft, such as hydrogen or electric propulsion systems, is highly certain within the next 20 to 50 years.

Because the exact sizes and technical specifications of these future aircraft are still uncertain, the architectural implications of this design focus on long-term flexibility and “Living Infrastructure”. By utilizing a standardized steel and 525 mm Cross-Laminated Timber (CLT) structure, the terminal can be easily reconfigured or expanded to adapt to new aircraft technologies. Furthermore, by incorporating natural ventilation through the courtyards and reducing energy loads, the design demonstrates how a modern transportation hub can actively mitigate its carbon footprint today, while structurally preparing for the cleaner aviation industry of tomorrow.

## Reflection

The graduation process of designing a new passenger terminal for Milan Linate Airport has been a challenging but also highly instructive period. Reflecting upon this three quarters long project requires looking back from a broader perspective to evaluate how the methodology worked, how the research influenced the design, and how this project relates to the wider discipline and studio context.

The initial desk research provided a strong foundation for understanding terminal logistics and passenger behaviors. However, a major obstacle was the lack of open-source data. Airports are highly secure facilities, meaning detailed floor plans and program distributions of reference airports are rarely public due to safety regulations. Navigating this forced me to use industry benchmarks and analytical deduction to determine the required spatial parameters.

The studio heavily emphasized exploring shapes through volumetric massing models. During the process, I discovered that abstract massing experiments do not align with my personal strengths. Instead, I achieved my best design breakthroughs through strict logical reasoning and functional analysis. Solving the Flusso versus Profitto paradox required an internal logic based on passenger choreography and line-of-sight analysis, rather than a guided exploration of external forms.

Working within the “Cortile dei Dieci” studio offered a great environment to brainstorm with fellow students. However, the airport typology introduced a major friction regarding building scale. While most peers designed compact urban buildings, the terminal required a massive infrastructural footprint. This vast difference made it difficult to compare programs and products with peers, as a terminal follows a completely different layout and rhythm.

Because an airport is incredibly complex, a strict limitation of scope was necessary to finish within the academic year. The project purposefully focused on the “airside” zone, where the tension between passenger flow and commerce is highest. While detailing the full landside infrastructure would have been interesting, there was simply not enough time for a building of this magnitude. Focusing on the airside circulation, the modular courtyards, and the technical envelope allowed me to deliver a thoroughly resolved and precise design proposal.

