Adolfo Suárez Madrid-Barajas Airport City.
Logistics Area 1

ADOLFO SUÁREZ MADRID-BARAJAS AIRPORT

WHITE PAPER ON DESIGN

IDOM

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1.1 GENERAL NATURE OF THE WHITE PAPER

Introduction

This White Paper has been proposed as a series of design criteria and standards to be followed by the parties involved in the project through the setting of some basic lines that allow the maximum degree of urban and building quality to be attained in accordance with the objectives determined for development, assisting each of the actors involved in the development of the Adolfo Suárez Madrid-Barajas Airport City, to identify those requirements to identify those requirements that concern their performance in the field and on the basis of which they must configure and adapt their intervention.

AENA assumes no commitment or liability arising out of the content of this White Paper. By virtue of this document, the application of its content by the investor must be based on the acceptance of its character as a White Paper and on the acceptance of the absence of responsibility for Aena with respect to the application of its standards and guidelines, consequently none of its contents confers or intends to confer on the Investor the right to claim against Aena for the terms, conclusions or strategies included in it.

The strategies contained in chapters 1.3 and 2, corresponding to the strategic commitments and elements of integration and cohesion, are not of obligatory compliance, as they describe objectives and goals that can potentially be achieved after compliance with the criteria set forth in chapter 4 of this White Paper.

The White Paper is proposed as a series of design criteria and standards to follow

The White Paper in a global intervention strategy

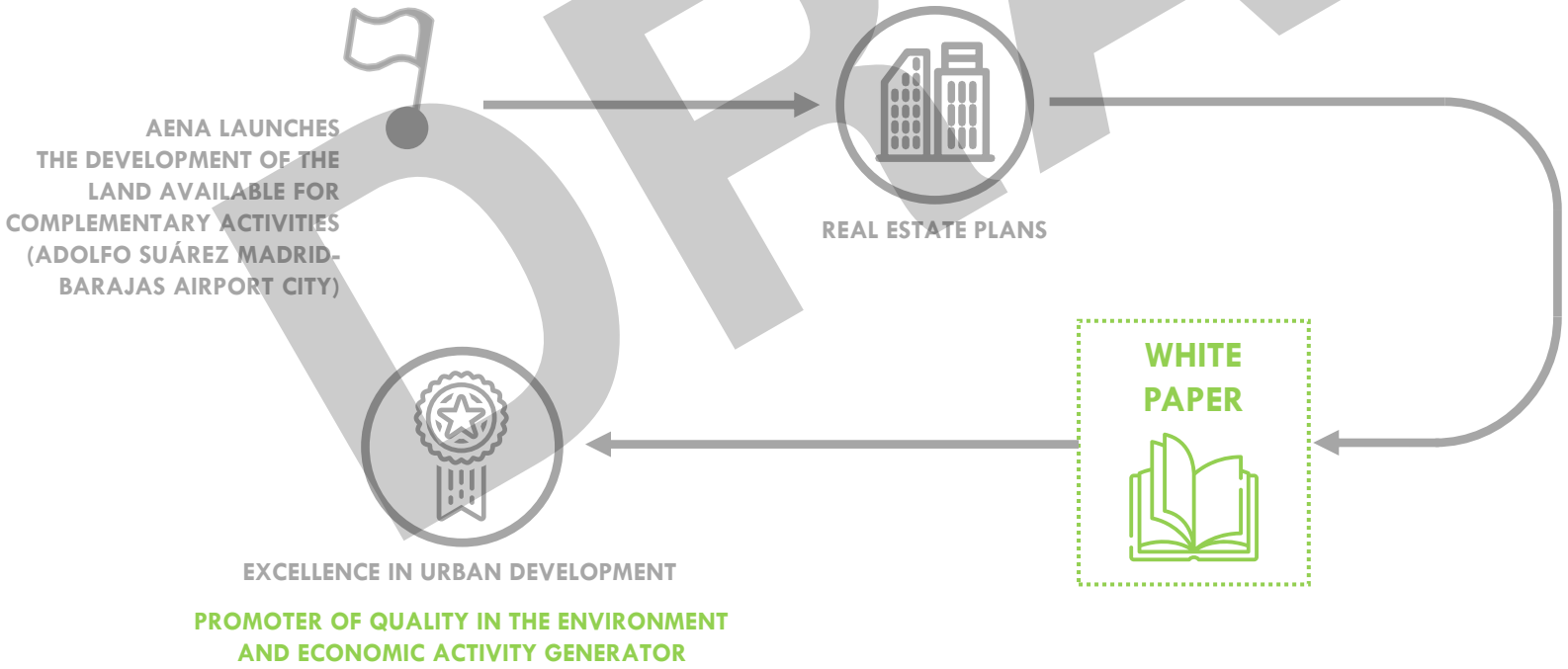
Aena is immersed in the progressive development of the different areas designated to the Airport City of its main airports, with the objective of converting them into dynamic focal points of different activities linked to the airport activity. They are areas of a hybrid nature, where the greatest synergies between the city and the airport take place, and intermediary urban developments are produced in the form of airport cities, logistics hubs associated to cargo and highly attractive mixed uses.

The environment of Adolfo Suárez Madrid-Barajas Airport has to be converted into a benchmark area of best practices, able to attract innovative activities for the Community of Madrid, complementary to those of the airport, located in an environment with optimum access, high added value and high performance, developed taking into consideration sustainability and the circular economy.

After the drafting of the Real Estate Plans for this land (Master Plan of marketable land in the Adolfo Suárez Madrid-Barajas Airport 2017), Aena drafted the White Paper, accompanying the process of cooperation with the administrations, and as an instrument to achieve a quality reference development.

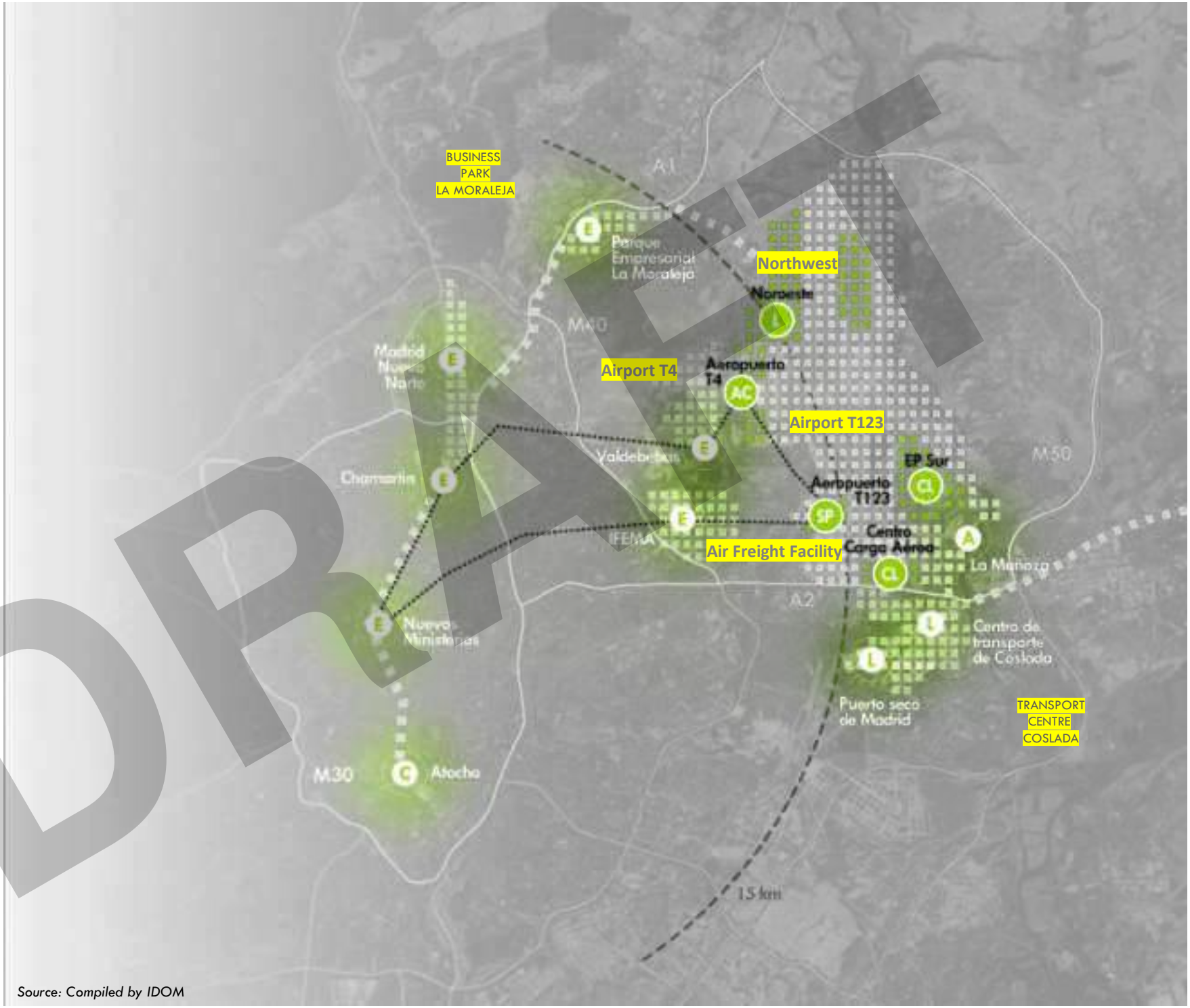
The White Paper is the guide that directs these future developments, establishing the framework for the design of new spaces. The most effective measures and criteria have been analysed and selected in order to comply with the ambitious parameters of Aena's global strategy in terms of environmental and spatial quality, sustainability, innovation and integration into the environment and the city.

The White Paper is also a tool to orientate technicians and developers towards a design that promotes the best urban and architectural solutions, in their planning and implementation process of the new areas of activity. It is intended as a specifically technical document, aimed at providing evidence for compliance with indicators and criteria, with clear, measurable and parametrizable principles, which can be followed.



"A design manual to achieve a benchmark, quality and successful development in the surrounding area of Adolfo Suárez Madrid-Barajas Airport

The global intervention strategy includes a development that is committed, connected and integrated with the city.



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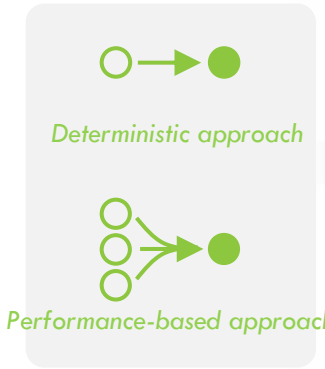
A flexible paper with performance-based criteria

The White Paper is presented as a flexible and performance-based document in terms of meeting objectives and design criteria.

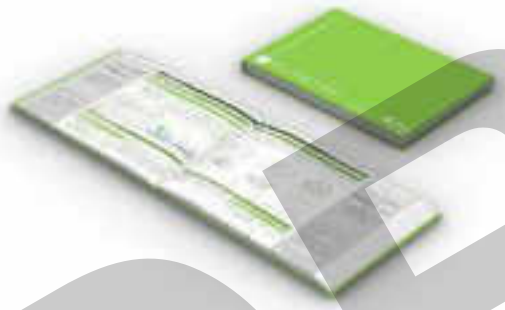
In the face of a deterministic or prescriptive approach (very typical of urban planning standards, municipal ordinances, building codes, etc.) that obliges the use of the solutions indicated in the document itself, the White Paper approach has been developed with a more performance-based approach. The objectives have been set with a focus on the end results, without defining a specific path, design or technology to achieve them.

This approach fosters innovation and the use of new techniques, as well as placing value on the high level of flexibility already present in the governing standards of the General Airport System Special Plans, as a differentiating element and attractor of a great investor dynamism.



Deterministic approach

Performance-based approach



A white paper?

The term white paper originates from the practice of more than a century of government information in the United Kingdom. When the governmental agencies provided data to the Parliament to help with decision-making, they offered three types of documents: very long, complex documents with a blue cover, opened-ended consultation reports with a green cover, and brief reports, focussed on just one subject with a white cover, which contained concise information to help resolve just one issue. The white paper takes its name and format from the latter and the term has proliferated in recent years to be understood as a guide to practical content aimed at decision-making within, as in this case, the field of design.

Temporary consideration

The White Paper has been envisaged for a development of 40 years for which AENA will set which criteria therein will remain as basic, relevant or good practices based on excellence, as well as how their requirements are increased.

The White Paper is a rational instrument, that regulates that expected for each area and moment, and sets quality standards that are easily adaptable over time, as they will condition the requirements applicable t each stage of the development of the land.

The White Paper has a mandatory and binding nature throughout the life of the contract, meeting the challenge of its survival and adapting the specific criteria and standards contained therein throughout the life of the contract so that its validity does not compromise the process of bidding, awarding, drafting and executing the project that has already been carried out.

For these purposes and in anticipation of possible future amendments of the same, either as the standards advance for Architecture, Landscaping, Sustainability and Innovation regulated by the White paper, or for any circumstances whereby AENA seeks a greater requirement or modifications to them, either by applying the existing rules of application in the field of urbanisation, associated infrastructures or buildings to which the White Paper is subordinate, the corresponding mechanisms must be enabled for updating them.

For these purposes, the impossibility both in the unilateral modification by AENA of the White Paper as well as in the enforcement in contracts already signed of a White Paper content other than that which was incorporated when the award of the right to surface area was made, implies that both the aforementioned and any future amendments to the White Paper standards and the mechanisms for their updating and revision are made by mutual agreement and provided that this does not substantially alter the bases taken into account for the award of the contract.

A flexible and performance-based document in the form of complying with your design objectives and criteria.

Document applicability

The White Paper gives priority to the objectives and achievements, allowing the different actors involved to find the most efficient way of complying with them. All the interested parties can work jointly on innovative proposals, to achieve the best result, and with the goal of doing business in an inspiring environment where sustainability and innovation come together.

The need to establish common lines for the developments make this White Paper a guide to specific applicability at all scales, from the series of holdings to the details of the lot and building, and for all actors involved in the development process.

In Chapter 2 Integration and cohesion objectives, some general guidelines are established that must be followed by the developments, with illustrative examples of compliance that must be fixed according to the design criteria set forth in Chapter 4. In this Chapter 4, Design criteria, the quantitative indicators to be complied with have been set for the different design elements considered, with mandatory parameters in each one and voluntary measures.

QUANTIFICATION AND ASSESSMENT

The criteria are specified as quantitative or qualitative indicators The qualitative indicators will require a justification by way of a project document to be delivered.

LEVEL OF COMPLIANCE OF GOOD PRACTICE INDICATORS:

- **Basic // - Mandatory compliance criteria** that ensure attaining the high quality urban and building objectives, beyond the Spanish and EU regulations, which Aena establishes for the development of its land.
- **Relevant // - Non-mandatory compliance criteria**, in search of a quality that is superior to the basic good practice, which incorporate additional requirements, to be applied according to Aena's guidelines.
- **Excellence-based // - Non-mandatory compliance criteria**, aimed at the highest quality and excellence in the design, which make the development a spearhead and cutting edge in each field, to be applied according to Aena's guidelines.

SUBSTITUTE MEASURES:

Considered measures that permit a high quality of the development at the same time as maximising the flexibility and adaptation to the specific constraints of the activity to be developed or needs of the operator. Their attainment replaces the need to comply with the quantitative parameter of the basic good practice.

COMPLEMENTARY MEASURES:

Considered measures that perfect or complement the good practices and high objectives in terms of quality, with the intention of also permitting the attainment of a higher urban and building quality in the area. They elevate the basic or relevant good practice a level.

SELF-EVALUATION FORMAT

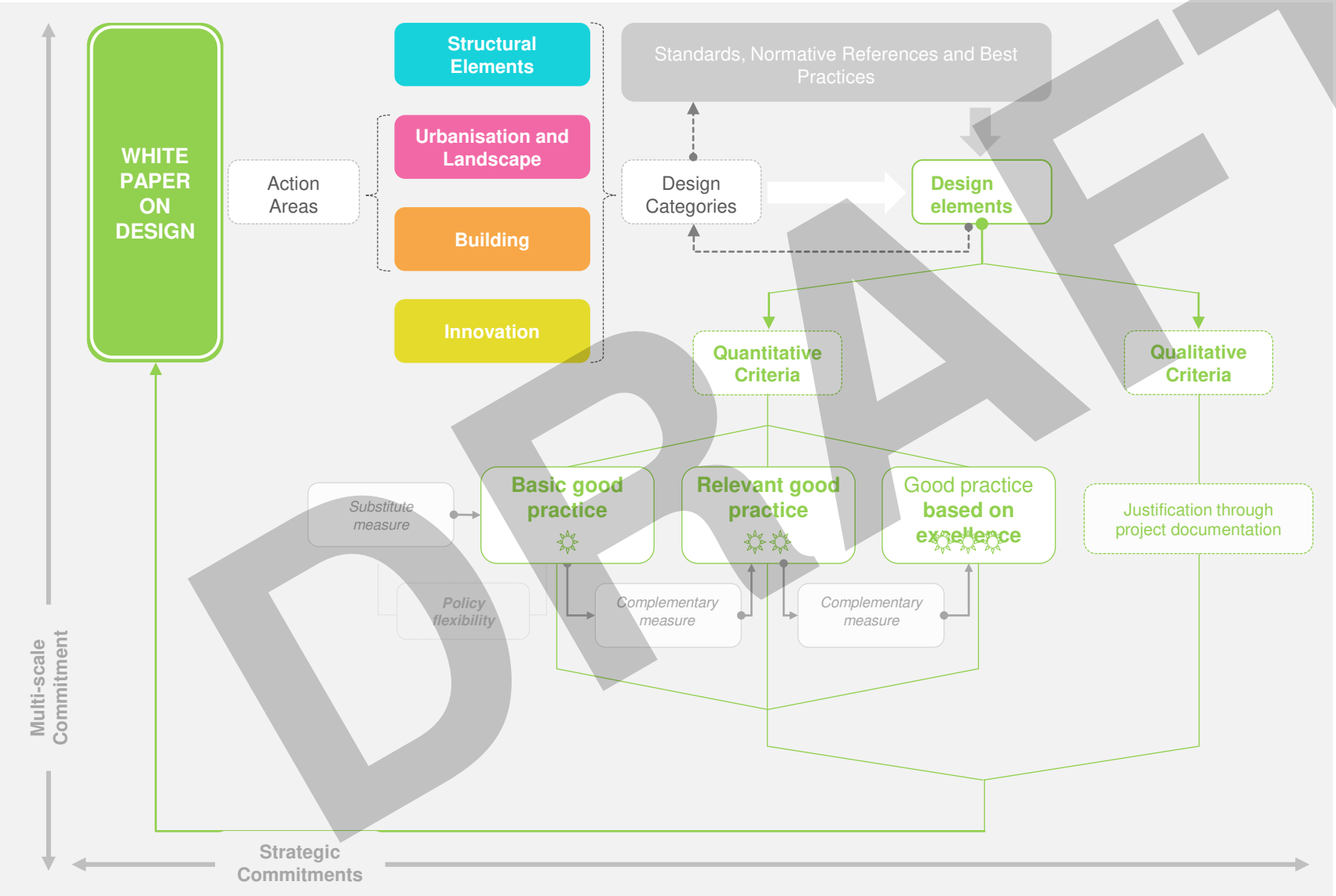
The format facilitates the review of indicators by the developers, which will mark the level of compliance in each file, justifying it with data and proposals specific to the project.

The traffic light rating of the compliance level of the criteria allows the developer to be flexible in selecting where to place the accent within their quality proposal.

"The interested parties will work as partners on innovative proposals to attain the best result and the best integration of the complementary activities to the airport use.

Document applicability

The White Paper contemplates four areas of design. Each one of these area is in turn subdivided into categories within which the design elements are identified. The design elements are the unit on which the criteria are regulated, which can be quantitative if based on compliance indicators using quantifiable parameters, or qualitative if based on qualitative justifications to be made through project documentation when designing the projects.



The design elements are the unit on which the criteria are regulated, which can be quantitative if based on compliance indicators, or qualitative.

Document structure

The White Paper on Design is structured into a series of introductory sections (chapters 1, 2 and 3) where the why, what and how of the document are analysed, as well as the general commitments and criteria for cohesion and integration of development. Chapter four specifies the Design criteria which are applicable to the present area.

Chapter one introduces the context and overview framing the White Paper on Design, its performance-based approach and the mechanism for its updating and review. In the sections on applicability and structure of the document, the contents of same are explained, with a specific focus on the explanation of the Design criteria. Lastly, those strategic commitments are defined on which the subsequent Design Criteria are based.

In the first chapter, the structural objectives and criteria for integration and cohesion are defined, which must follow the developments in the short, medium, and long term Specific guidelines are included that must be developed in accordance with the design criteria set forth in the last chapter. The objective is to achieve the internal coherence of the development, as well as its integration with the metropolitan and airport context.

The third chapter, introduces the regulatory framework of the General Airport System and its innovative component in order to provide regulatory flexibility to the development. This chapter is completed with an annex with the synthesis of reference standards and best practices.

Lastly, the fourth chapter sets forth the Design Criteria for the structural elements throughout the ASM-B Airport City, the urbanisation and landscape criteria, building criteria, inside the lots, as well as criteria for matters of Smart innovation.

The organisation of chapter 4 is shown below, structuring the main areas into four, each one of which is concentrated into categories.

CG GENERAL CRITERIA / STRUCTURAL ELEMENTS
- A. SUSTAINABILITY
- B. GREEN SPACES
- C. DIFFERENTIAL ASPECTS

UP URBANISATION AND LANDSCAPE
- A. URBAN EXPERIENCE
- B. FREE ZONES
- C. SUSTAINABILITY, HEALTH AND WELL-BEING
- D. URBAN NETWORKS

ED BUILDING
- A. ARCHITECTONIC EXPERIENCE
- B. FREE ZONES, GREEN SPACES
- C. SUSTAINABILITY, HEALTH AND WELL-BEING

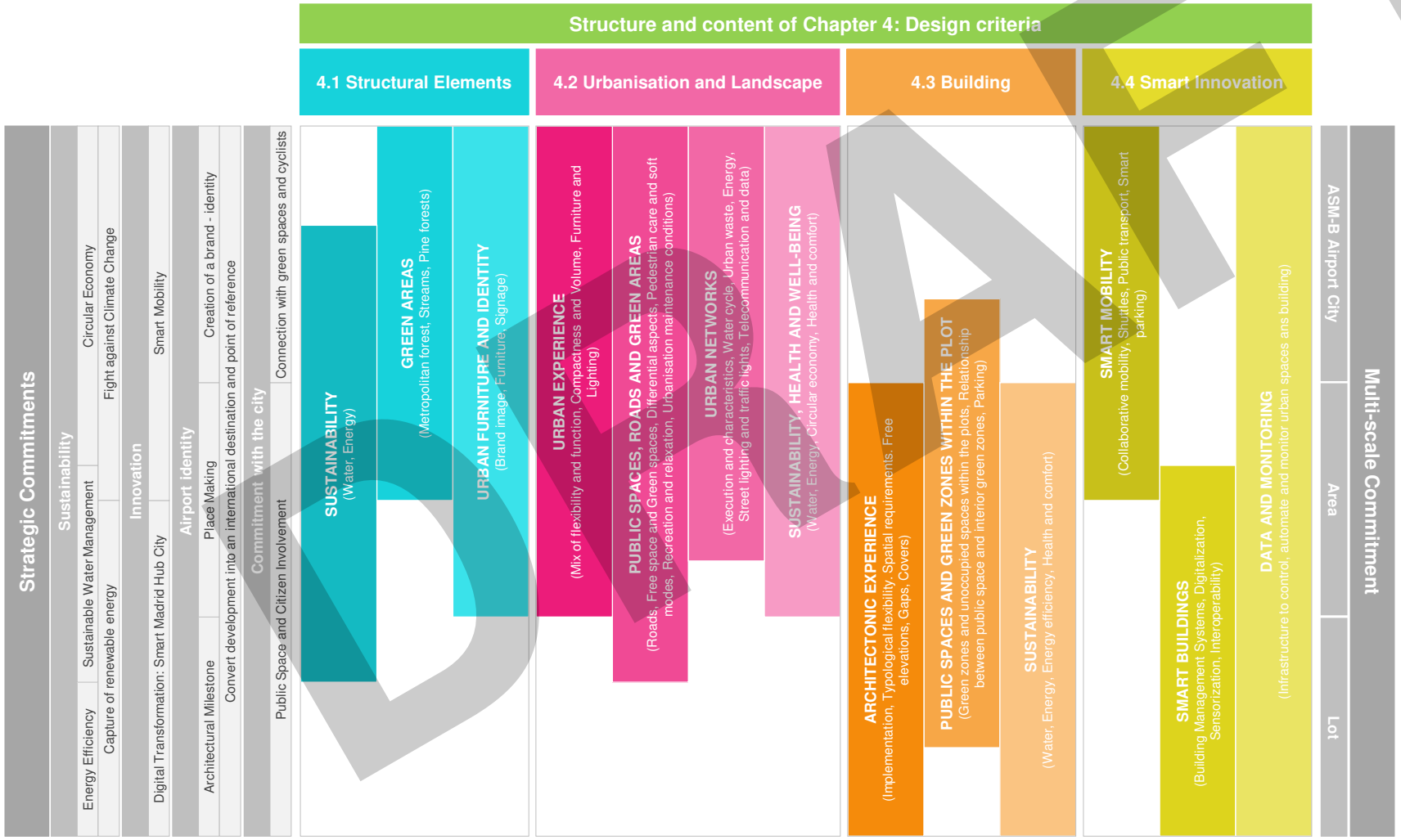
IN INNOVATION
- A. SMART MOBILITY
- B. SMART BUILDINGS
- C. DATA AND MONITORING

“The fourth chapter sets forth the Design Criteria applicable to the entire development of the Adolfo Suárez Madrid-Barajas Airport City

Document structure

The fourth chapter, Design Criteria, is the chapter that sets forth the design elements for which a series of quantitative criteria have been defined, which muse comply with parametric indicators and qualitative criteria, for the justification of compliance with performance-based requirements through project documentation.

The Design Criteria are structured at three levels of criteria compliance: (1) Basic good practice; (2) Relevant good practice, and (3) Good practice based on excellence. The traffic light rating of the compliance level of the criteria allows the developer to be flexible in selecting where to place the accent within their urban and building quality project, but always complying with the minimum levels of the basic good practice.



> "The consideration of the applicability of objectives and criteria approaches the multi-dimensionality and multi-scalability of the airport.

Document structure

WHITE PAPER APPLICATION AREAS:

CG + UP + ED + IN

DESIGN CATEGORIES

A. B. C. D. / required in each area

Design elements:

I. II. III. Specific regulation aspects

CG GENERAL CRITERIA

A. SUSTAINABILITY
- I. Water
- II. Electric Vehicle

B. GREEN SPACES
- I. Green Space strategy

C. DIFFERENTIAL ASPECTS
- I. Identity design

UP URBANISATION AND LANDSCAPE

A. URBAN EXPERIENCE
- I. Flexibility and Functional Mix
- II. Compactness and Volume
- III. Furniture and Lighting
- IV. Urbanisation Maintenance Conditions

B. FREE ZONES
- I. Road Urbanisation Conditions
- II. Conditions for Urbanisation of free zones (non-road)
- III. Differential aspects
- IV. Pedestrian care and soft modes
- V. Recreation and leisure

C. SUSTAINABILITY, HEALTH AND WELL-
- I. Energy
- II. Health and Comfort
- III. Water
- IV. Circular Economy

D.
- I. Characteristics of service infrastructure networks
- II. Water cycle: supply, sanitation, purification, regenerated water
- III. Storage, collection and treatment of urban waste
- IV. Energy supply and production
- V. Lighting and traffic lights
- VI. Telecommunications and data

"The design criteria consider four areas: structural elements, urbanisation and landscape, building and innovation.

Document structure

ED BUILDING

A. ARCHITECTONIC EXPERIENCE

- I. Implementation
- II. Typological flexibility
- III. Headroom
- IV. Openings
- V. Enclosures

B. FREE ZONES

- I. Green Spaces inside the lots
- II. Free zones inside the lots
- III. Parking inside the lots

C. SUSTAINABILITY, HEALTH AND WELL-BEING

- I. Energy
- II. Health and Comfort
- III. Water

IN INNOVATION

A. SMART MOBILITY

- I. Collaborative mobility
- II. Transport shuttles
- III. Public transport
- IV. Smart parking

B. SMART BUILDINGS

- I. Building Management system
- II. Digital Twin
- III. Sensorisation
- IV. Promotion of Smart Buildings

C. DATA AND MONITORING

- I. Urban control, automation and monitoring infrastructure
- II. Building control, automation and monitoring infrastructure

“The criteria are applied to the different development scales (multi-scale commitment) and the four design areas (multi-dimensional commitment).

Glossary of terms

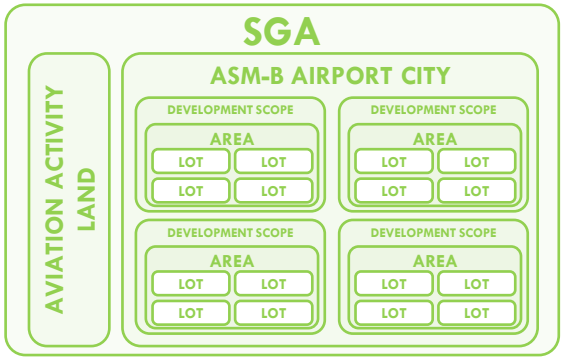
- **Complementary and compatible activities:** all activity relating to the qualified or global use of the General Airport System that it is admissible for compatibility with this use in the field in question and complies with article 2 of RD 2591/1998. These activities contribute to its correct functioning or complement this qualified use of the areas or the total field of the SGA. That activity that can substitute that initially considered as compatible activity will be known as alternative activity, by not distorting the general characteristics of the scope (lot or area).
- **Waste water:** water deriving from the municipal sewage network and that requires treatment at a plant for reuse or release.
- **Regenerated water:** purified waste water that has been subjected to a complementary treatment process in a waste water regeneration station or RWWS, and can be reused in non-potable water requirements.
- **Grey water:** water originating mainly from wash basins, showers and baths in buildings, and that can potentially by used without treatment at a plant for non-potable water requirements.
- **Net building intensity:** relation between the surface of the existing and envisaged buildings in a lot, and the total surface of said lot.
- **Public property:** public ownership domain, these are considered both those owned by any Public Administration, or property owned by Public Business Entities attached to them. This document encompasses the total of land that is considered to be public property.
- **Gross surface:** total surface area of a Development Area, including the surface of lots, roads, green spaces and any other surface area within the perimeter of the area.
- **Net surface:** surface area included within the perimeter of a lot or series of lots.
- **Use of land:** any type of use of land including the corresponding sub-soil and soil, and in particular, its urbanisation and building. In this document the qualified or global use is that of the General Airport System.

Glossary of instruments for the development

- **Enabling actions:** projects and works aimed at the integration of infrastructures included in the Areas of development of the Airport City object of the PO or ED organisation, connections to existing networks and main structures.
- **Project documentation:** document or series of documents that explicitly and identifiably demonstrate compliance with the design criteria (good practices, complementary and/or substitute measures).
- **Detailed study (ED):** development instrument to complement the determinations of the Spatial Plan in the area object of the concession, to obtain the degree of accuracy necessary to draft the Urbanisation and Building Projects, when the PESGA planning terms are modified. It will be processed in accordance with the applicable legislation.
- **Development Projects (PO)**: according to article 2.2.4 of the PESGA, the development instrument employed by Aena to complete the determinations of the Spatial Plan in the area object of concession, to obtain the necessary degree of accuracy for drafting the Urbanisation and Building Projects.

Glossary of intervention scales

- **SGA:** series of ASM-B Airport plots organised in the TRPESGA and defined by the Director Plan.
- **Adolfo Suárez Madrid-Barajas Airport City:** area within the SGA destined to complementary and compatible activities with respect to the aeronautical activity and that corresponds to the scope of action of this White Paper.
- **Development Scope:** *area within the Adolfo Suárez Madrid-Barajas Airport City* that constitutes a single area of development through urban development planning.
- **Area:** area within the *Development Scope*, that is subject to tender offer by the investor.
- **Lot:** area within the Area that is delimited to be the object of a lease or use concession, appropriately formalised and whose delimitation does not imply eventual urban fragmentation.



Glossary of criteria compliance levels

- **Basic good practice:** mandatory compliance indicators that ensure attaining the high quality urban and building objectives, beyond the Spanish and EU regulations, which Aena establishes for the development of its holdings.
- **Relevant good practice:** Indicators of a superior level to basic good practice, which incorporate additional requirements, to be applied according to Aena's guidelines.
- **Good practice based on excellence:** indicators of maximum quality and excellence in design which make the development a spearhead and cutting edge in each field, to be applied according to Aena's guidelines.
- **Substitute measure:** measures that permit a high quality of the development at the same time as maximising the flexibility and adaptation to the specific constraints of the activity to be developed or needs of the operator. Their attainment replaces the need to comply with the quantitative or qualitative parameter of the basic good practice.
- **Complementary measure:** measures that perfect or complement the good practices and high objectives in terms of quality, with the intention of also permitting the attainment of a higher urban and building quality in the area. They elevate the basic or relevant good practice a level.

FAQ

Who is this White Paper on Design intended for?

The White Paper on Design is intended for each of the actors involved in the development of the land at Adolfo Suárez Madrid-Barajas Airport City, as a guide to the requirements concerning their action on the land and on the basis of which they shall configure and adapt their involvement.

What is the focus of this White Paper on Design?

The aim of the White Paper is to optimise the flexibility of the stakeholders (Aena, developers, users, etc.) ensuring urban and building quality through a focus that is more performance-based that prescriptive-based. The objective is to ensure that quality without the need to restrict the technology or solution to be employed. To not restrict the design flexibility or options.

What is this White Paper on Design applied to?

The White Paper on Design ensures a high quality for the development of land at the Adolfo Suárez Madrid-Barajas Airport City, destined for the airport's complementary activities, being applicable to the development area.

Which criteria are mandatory and which are not?

Those criteria established as basic good practices are of mandatory compliance, whereas compliance with the relevant and excellence-based good practices shall be applied in accordance with Aena's guidelines.

Are there any flexible mechanisms to be able to meet the requirements of the White Paper?

The quantitative criteria contain a series of additional measures that provide regulatory flexibility for compliance. These measures are: Substitute measures, which enable another option for the performance-based compliance of the quantitative indicator; Complementary measures, which enable compliance of the next level of compliance without the need to reach the following quantitative indicator, simply meeting the previous level plus an additional measure that ensures better quality good practice.

Is the White Paper for application in the medium and long term?

Given that it is a development envisaged for 40 years, it will be Aena's decision for the areas of the medium and long term the establishment of which criteria remain as good basic, relevant or excellence-based practices, as well as whether their demand is increased. In the section on temporary Consideration, medium and long term review mechanisms have been established for the actual White Paper.

Do the design elements have any additional information or help for their application?

In addition to the setting of traffic light rating for the three compliance levels, for each design element their corresponding (*1*) Objectives (*2*) Reference Standards and Best Practices have been defined to set the context in which they have been defined, the (3) Strategic Commitments that they impact on, the (*4*) Stage at which each of the established criteria affects (Urban planning; Design; Construction; Use and maintenance; End of life), lastly, if these criteria represent a significant increase of (*5*) Relevant Investment.

"The objective is to ensure that quality without the need to restrict the technology or solution to be employed. Maximise the design flexibility and options

Index of acronyms

- **ACS:** Hot Water for Sanitary use
- **Aena:** Aena, S.M.E., S.A.
- **AESA:** Spanish Aviation Safety and Security Agency
- **Aprox.:** Approximately
- **ASM-B:** Adolfo Suárez Madrid Barajas
- **Ayto.:** City council
- **BIM:** Building Information Modeling
- **BMS:** Building Management system
- **BREEAM:** Building Research Establishment Environmental Assessment Method. Assessment method for the sustainability of master planning, infrastructure and building projects
- **CAD:** Computer Aided Design
- **CAM:** Autonomous Community of Madrid
- **CASBEE:** Comprehensive Assessment System for Built Environment Efficiency. Method for assessing and rating the environmental performance of buildings and the built environment.
- **CCAA:** Autonomous Communities
- **CEEQUAL:** evidence-based sustainability assessment, rating and awards scheme for civil engineering, infrastructure, landscaping and public realm projects
- **CFC:** Chlorofluorocarbons
- **COP:** Energy Efficiency Coefficient
- **CTE:** Technical Building Code
- **DB-HR:** Basic Noise Protection Document
- **DB-HS:** Basic Document of Health
- **DB-SE:** Basic Structural Safety Document
- **EER:** Energy Efficiency Ratio
- **EHE:** Structural Concrete Instruction
- **Ej.:** Example
- **EMS:** Environmental Monitoring System
- **ENAIRE:** Public Business Entity that manages air navigation in Spain and the Western Sahara
- **FAQ:** Frequently Asked Questions
- **GSAS:** Global Sustainability Assessment System. Performance-based system for rating green buildings and infrastructures.
- **GWP:** Global Warming Potential
- **ha:** Hectares
- **HVAC:** Heating, ventilation and air-conditioning
- **IDOM:** IDOM Consulting, Engineering, Architecture
- **IFC:** Industry Foundation Classes
- **IoT:** Internet of Things
- **L:** Lot
- **LEED:** Leadership in Energy and Environmental Design. Green building rating system
- **LOE:** Organic Law on Building
- **M.O.E.:** Methodology, Organisation and Exploration
- **M^2:** square metres
- **m^2c/m^2c:** Building intensity
- **m^2c:** Square metres built
- **MAD:** Madrid
- **OACI:** International Civil Aviation Organisation (ICAO)
- **ODS:** United Nations Sustainable Development Goals (SDGs)
- **OFZ:** Obstacle Free Zone
- **PD:** Director Plan
- **PE:** Special Plan
- **PESGAM:** Special Plan of the General Airport System of Madrid
- **PGOU:** General urban Planning Plan
- **PNIR:** National Waste Research Plan
- **RD:** Royal Decree
- **RITE:** The Regulation of Thermal Installations in Buildings
- **SCADA:** Supervisory Control and Data Acquisition
- **SGA:** General Airport System
- **SIG:** Geographic Information System (GIS)
- **TIC:** Information and Communication Technologies (ICTs)
- **TOD:** Transit Oriented Development
- **TRPESGA:** Consolidated Text of the Special Plan of the General Airport System
- **VERDE:** Sustainability assessment tool for building developed by Green Building Council Spain.

1.3 WHITE PAPER COMMITMENTS

Strategic commitments

The General Airport System is a complex and dynamic ecosystem that brings together a multitude of components (internal and external) in continuous interaction. Aena's global strategic commitments, collected through the specific objectives in this white paper, will be applicable to the development of land destined to the Adolfo Suárez Madrid-Barajas Airport City.

To understand and meet the challenges, as well as maximise the development potential of this land, it is necessary to comply with the strategic components at each scale and through urban development criteria which also guarantees a quality, sustainable and resilient space.

The consideration for objectives and criteria according to the different strategic objectives and the different scales of action addresses the multi-dimensionality and multi-scalability of the airport. Different needs and commitments emerge at the different levels of functionality and for the different actors that participate in the airport development.

The following strategic commitments are considered:

1) Sustainability (carbon neutrality).

2) Innovation (Smart component).

3) Airport identity (identitarian design).

4) Commitment with the city (integration and cohesion).

Depending on the needs and vision for each of the strategic commitments and scales, the framework for the application of each criterion will be configured.

"The White paper gathers the guidelines and criteria with regard to the design of the planning and landscaping, building, integration, connectivity and cohesion, both inside the development as well as with the city.

How do the strategic commitments affect the development?

The four big strategic commitments aligned with Aena's global development policies are the basis for this guide.

The drafting of the design criteria of the white paper are structured around them, which are presented, not only as a series of measures to be fulfilled, but also as a manual and guide to assist the designer, favouring the attainment of the quality and sustainability standards sought.

The four strategic commitments are the basis to achieve a quality, sustainable and resilient development, and also to lead to an added value development for the investor, where the initial investment appreciates with a high quality result.

The design elements and criteria, which are explained in the white paper, attempt to introduce each project into this cycle of quality and added value.

A virtuous cycle of quality and added value

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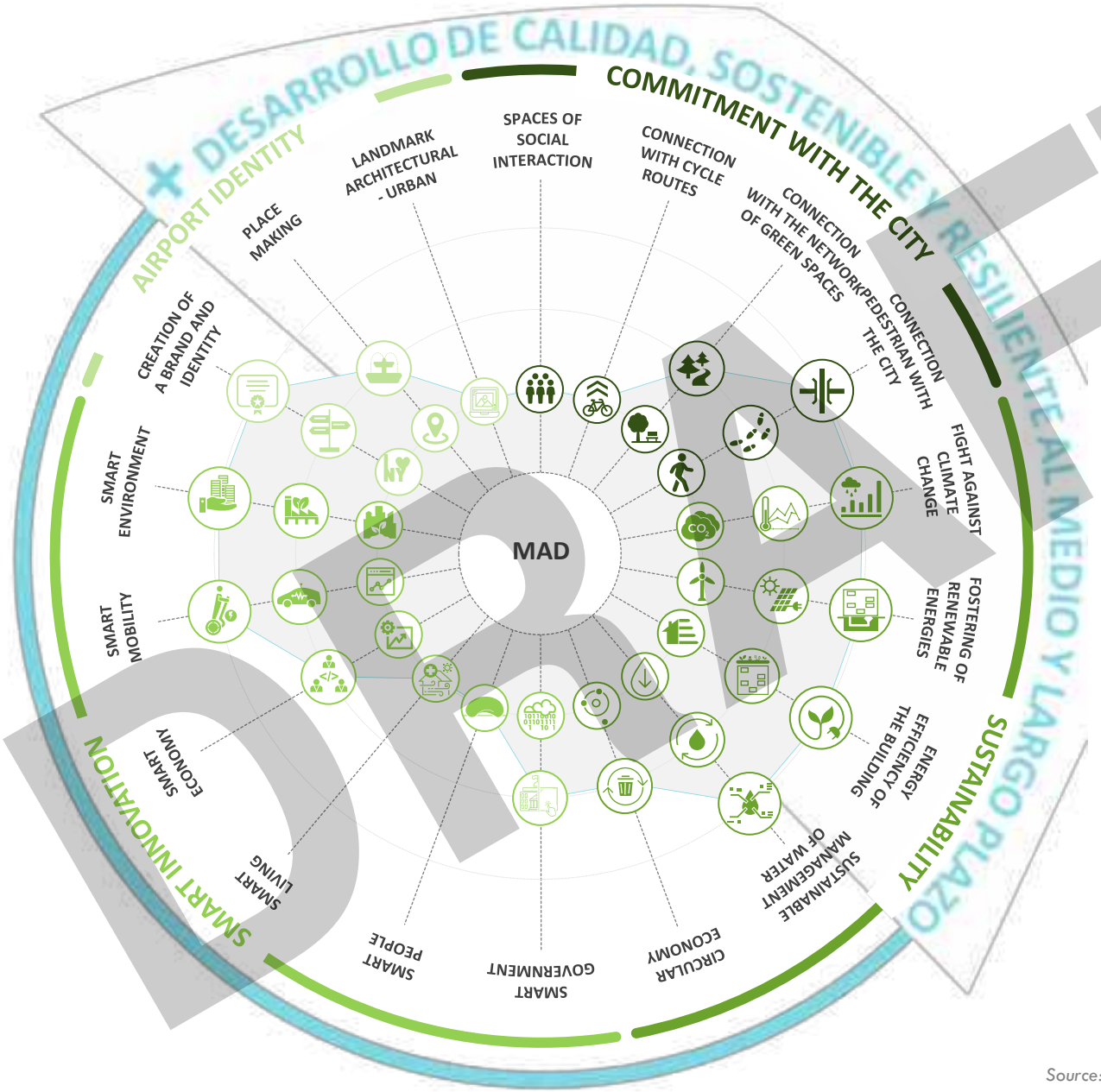

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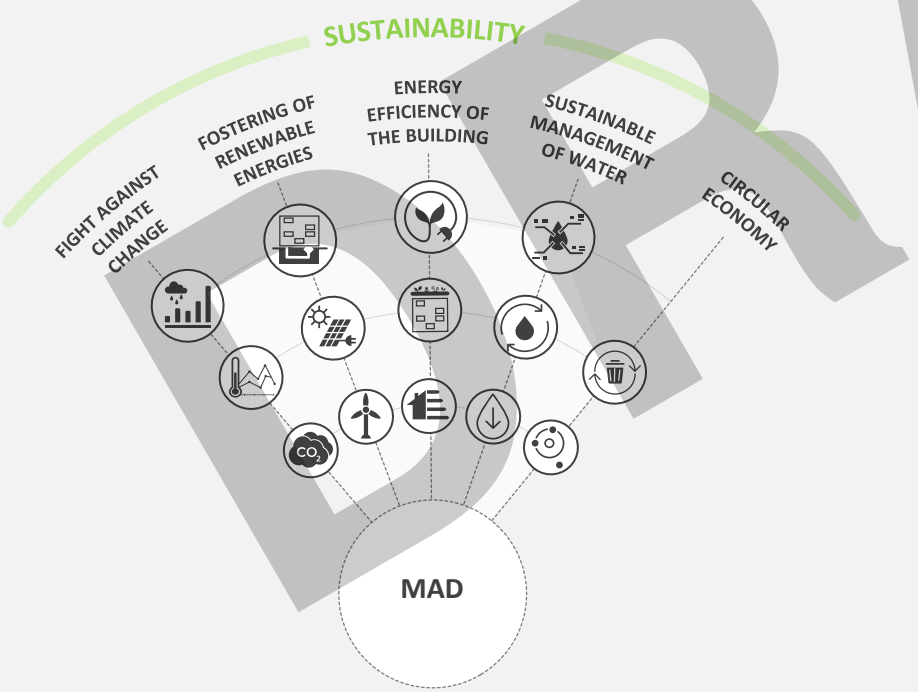
WHITE PAPER PRESENTATION

These guidelines shall be applied by Aena and the land developers, in the progressive construction of the activity hub.

Alignment with Aena's sustainability policies and the SDGs.

Sustainability is positioned as a strategy based on the values of Aena. Satisfy the needs of the present without compromising the future, achieving a balance between economic growth, the environment and social well-being.

- Fight against climate change and commit to reaching carbon neutrality for the year 2026 as well as the goal of zero carbon by 2040, as outlined in AENA's Climate Action Plan.
- Alignment with the UN Sustainable Development Goals, including those related to climate change (SDG 13), water (SDG 6), energy (SDG 7) and sustainable cities (SDG 11).
- Harnessing the potential for renewable energy capture within the development and integration with AENA's Photovoltaic Plan in the airport.
- Fostering measures aimed at energy efficiency – active and passive measures, efficient management of water resources and promoting measures aimed at the circular economy.

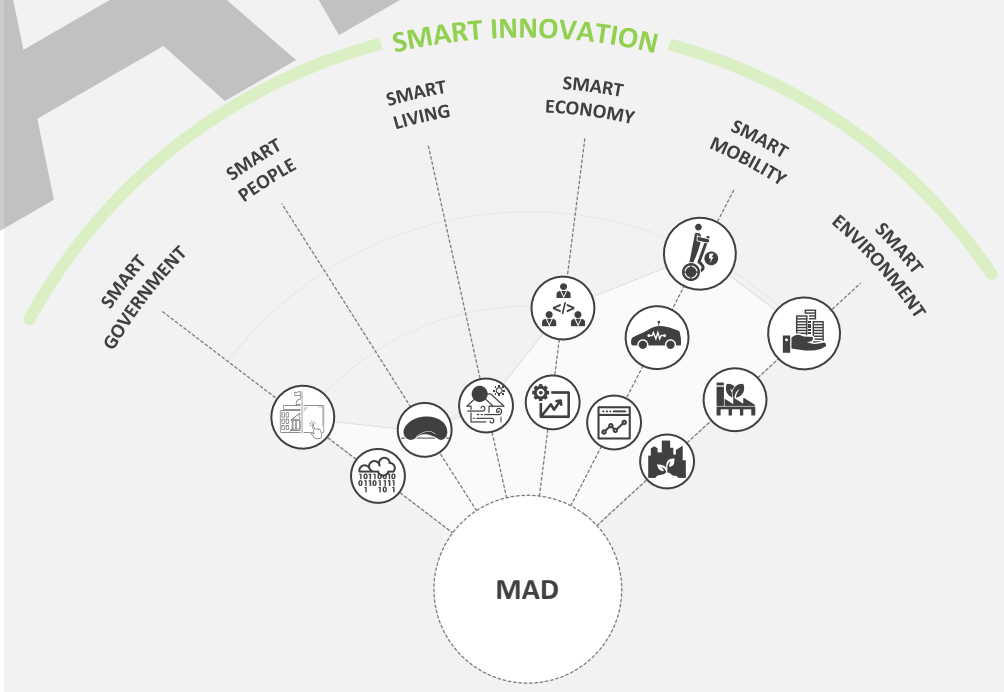


Source: Compiled by IDOM

Commitment of innovation as an enabler of new opportunities.

Smart development aimed at improving mobility, efficiency, safety and services, while providing facilities for the development of private initiatives for citizen/user services.

- *Smart Mobility*: Promote collaborative transport, non-polluting mobility systems and smart transport applications.
- *Smart Environment*: Foster the capturing of renewable energies and sustainability in planning and building.
- *Smart Government*: Promote the use of technological communication devices to provide public services.
- *Smart Economy*: Promote measures aimed at increasing productivity and global and local interconnection - Urban Labs and Smart Clusters
- *Smart People*: Foster creativity and innovation in public spaces through creative placemaking
- *Smart Living*: Promote the development of measures aimed at creating safe work spaces

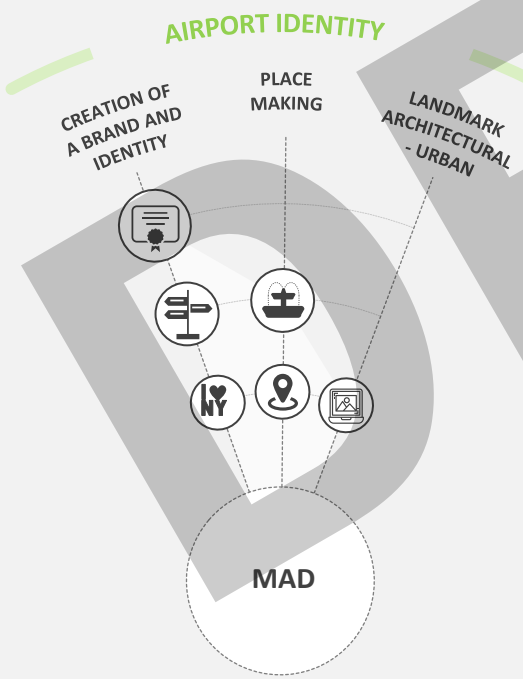


Source: Compiled by IDOM

A development committed to maximising the airport's identity

The design criteria aimed at maximising the recognition of the Adolfo Suárez Madrid-Barajas Airport City land intend to create value and position the development with its own brand identity.

- Creation of a brand identity for each area of the Adolfo Suárez Madrid-Barajas Airport City according to its function
- Creation of Aena's own standards relating to urban experience
- Creation of places with an identifying nature for their users – placemaking
- Creation of urban or architectural landmarks that foster the establishment of certain areas of development

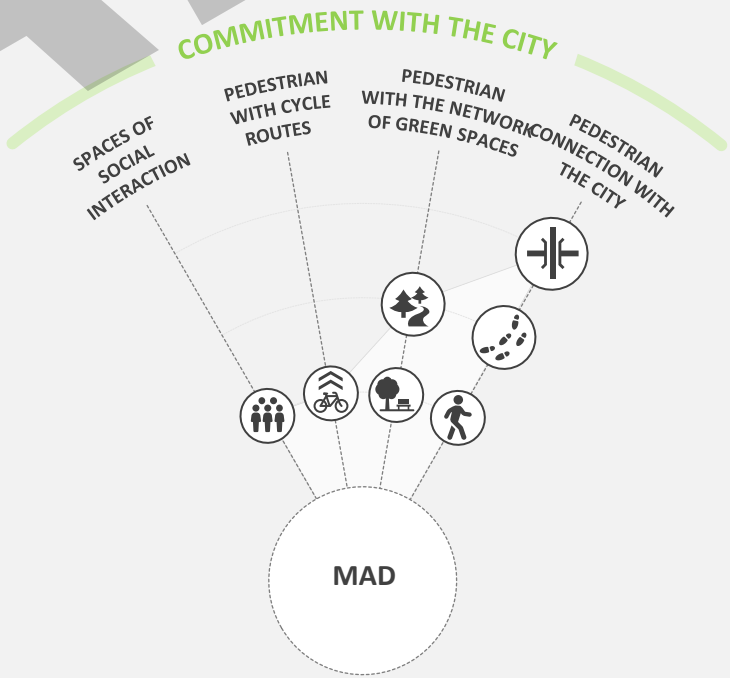


Source: Compiled by IDOM

A committed development, connected and integrated into the city.

The commitment to the city is an objective aimed at offering the city a new space for opportunity, an integrated, complementary and accessible development and interconnected with its green space network.

- Promote pedestrian connectivity both in the city and new developments as well as in the existing ones
- Connection to the city's network of green spaces and corridors
- Enable free zones of opportunity for the citizens, squares and places destined for public events
- Connection to the city's cycling network to enable the connectivity of cyclists to the development with Madrid and Alcobendas



Source: Compiled by IDOM

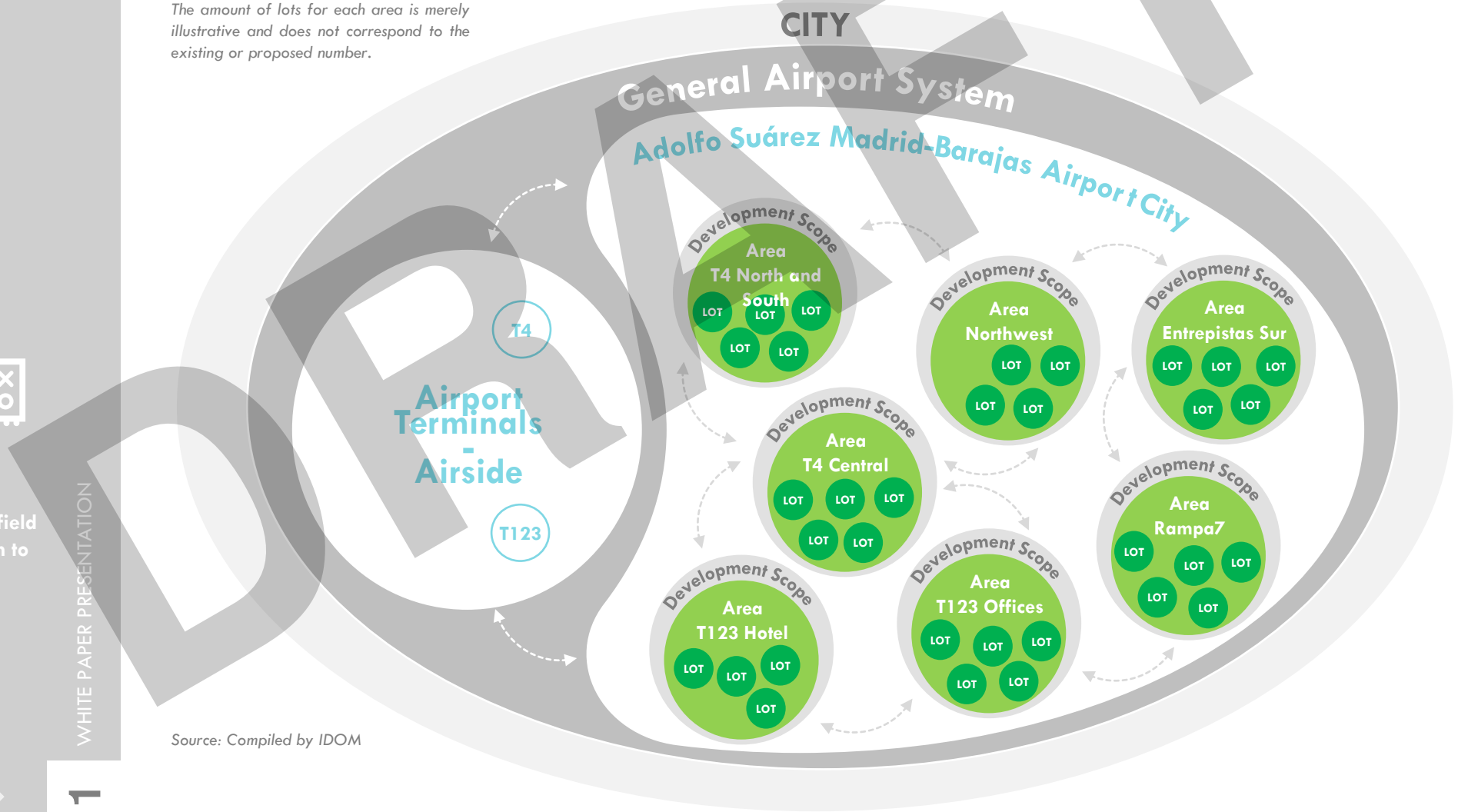
Multi-scale commitment

The White Paper is conceived from the viewpoint of the airport's multi-scalability, based on the strategic commitments for the overall scale of the airport and responding to the different needs, objectives and criteria of the different scales of action.

The framework for the application of each criterion will be configured according to the needs and vision for each one of the scales. Some criteria may be applied at several scales.

The criteria contained in this White Paper are to be complied with for each of the following scales considered: (1) Adolfo Suárez Madrid-Barajas Airport City, (2) the development area, (3) the area and (4) the lot.

The amount of lots for each area is merely illustrative and does not correspond to the existing or proposed number.



Source: Compiled by IDOM

From this white paper, manuals specific to each field of action or even to each strategic objective can be compiled.

MULTI-SCALE COMMITMENT

GENERAL AIRPORT SYSTEM (SGA)

The series of ASM-B Airport plots defined in the TRPESGA constituted in the SGA.

Compliance with the criteria permits the protection of the airport activity in the SGA and the assimilation of the complementary activities with a correct functioning of the global scope.

ADOLFO SUÁREZ MADRID-BARAJAS AIRPORT CITY

Scope within the SGA destined to complementary and compatible activities with respect to the airport activity.

The actions applicable to this area are related to infrastructures, mobility, improvement of the plots (topography and structural capacities) and opening of the first airside cargo line.

Structural guidelines are established to ensure overall consistency and proper functioning between the different areas, as well as with the airport infrastructures and the city.

DEVELOPMENT SCOPE

Scope within the Adolfo Suárez Madrid-Barajas Airport City that constitutes a single area of development through urban development planning.

The actions required on this scale mainly include general and standard urbanisation works to make the operation of the area viable.

The compliance of the criteria at the development area level shall be the competence of Aena.

AREA

Area within the development scope that is subject to offer of tender by the investor.

The actions required at this scale mainly include the general and standard urbanisation works to make the functioning of the lots within the area viable. Applicable guidelines are established to this scope in order to ensure coherence and smooth functioning within the area.

The compliance of the criteria at the area level shall be the competence of the investor group awarded the development.

LOT (*L*)

Scope within the Area that is delimited to be the object of a lease or use concession, appropriately formalised and whose delimitation does not imply eventual urban fragmentation. Each area may be divided into one or several lots, to house specific activity.

The actions on this scale mainly include the internal urbanisation of the lot and the building, which will depend to a large extent on the type of activity to which the lot is destined. The design of the spaces outside the lot must also form part of the urbanisation project, and shall also be subject to execution and subsequent maintenance, which have expressly been attached/considered as part of the commitments to carry out and maintain the lot.

The compliance of these criteria at lot scale will be the competence of the investor group awarded the development as well as the end user, in the case of leasing.

The applicability of each of the general criteria at the area scale will depend largely on the principal activity of the area, with the compliance criteria should be valid according to that activity.

“Structural guidelines are established that will ensure overall consistency and proper functioning between the different areas

Key

- SGA limit
- Planning scope limit
- Area limit

Location on the SGA

1.4 DESCRIPTION OF THE AREA

This white paper is centred on Area 1 of Sur Rampa 7 Logistics in the south area of the airport and which envisages logistics as the principal activity and with that of offices, commercial and hotel activities as compatible activities, being regulated through the criteria in chapter 4 of this white paper.

There is currently a Development Project approved, the Extension Development Project for the South Air Cargo Centre, Plot 6 at Adolfo Suárez Madrid-Barajas Airport, which was favourably reported by the Sub-Directorate-General of Urban Planning of Madrid City Council on 17 December 2010 (Registry Entry No. 2010/1342480), permitting the advancement of the implementation of said lot, by being able to request a direct licence.

Sur Rampa 7 Logistics Area
Source: Compiled by IDOM

The investor can suggest and assume actions to improve the current situation in the scope of planning, which are outside the area, justification for such actions must be presented with authorisation and approval by Aena required. In addition, it will be necessary to attach additional studies to the supporting documents, such as a mobility study if the existing road is affected.

The planning of the area contemplates logistics as the principal activity.

	Net building intensity (m^2c/m^2s)
Logistics, e-commerce, cargo,...	0.6
Green space	0.1

The perimeters of the proposed activities and roads inside the boundary of the area correspond to indicative basic schemes, which are subject to change, and the data in the tables are estimates of the building intensity of the Adolfo Suárez Madrid-Barajas Airport City and will be defined in greater detail in later planning instruments.

The illustrations are of an expository nature of the philosophy of the scope and not indicative of the urban and/or architectural image to be developed.

Infographics of the Master Plan of the marketable land at Adolfo Suárez Madrid-Barajas Airport 2017. Source: Compiled by IDOM

"The area is located in the south of the General Airport System, with direct connection to the M-22, which in turn connects to the A-2.

CONTENTS

2.1 METROPOLITAN AND URBAN INTEGRATION

The ASM-B Airport, in its metropolitan context and through the Adolfo Suárez Madrid-Barajas Airport City it offers an integration and opening with the surrounding municipalities, generating wealth.

Proximity between the municipalities and the ASM-B Airport.

- 5 km — *Coslada* — *South Area (Rampa 7)*
- 6 km — *Alcobendas* — *Northwest Area*
- 11 km — *Madrid – Avenida de América Interchange Station* — *AirCity T123 Area*
- 12 km — *Torrejón de Ardoz* — *Area Entrepistas Sur*
- 12 km — *Madrid – Chamartín Station* — *AirCity T4 Area*

Source: Compiled by IDOM

CITY

- E — Business innovation and mixed use
- C — Art and Culture
- L — Logistics
- A — Aircraft maintenance

AIRPORT

- AC — Airport City
- SP — Passenger service
- CL — Cargo and Logistics
- L — Logistics 4.0

Key

"The White Book is a tool for the relationship with the immediate vicinity, and the integration of the individual values of the metropolitan and natural context in which the ASM-B airport are confined to.

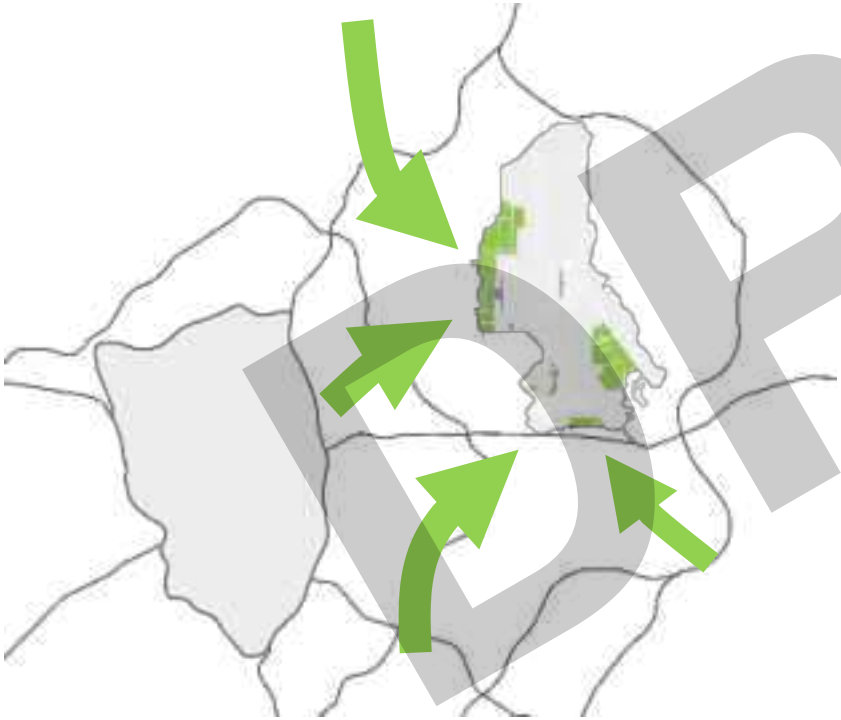
Environment of opportunities and the driving force of economic activity

The development of land at the Adolfo Suárez Madrid-Barajas Airport City facilitates the attraction of new opportunities and new business models.

Development as an opportunity for urban quality

The White Paper on Design represents an opportunity to achieve excellence in architectural and urban quality, sustainability and innovation.

This aspiration is deployed in the different sectors object of the development: passenger services, logistics and business HUB. They all offer a unique opportunity with an important return to society: fostering generation of employment and becoming a local and regional driving force of the economic.



Source: Compiled by IDOM

Strategies as a generator of economic activity

The key factors that maximise the development opportunities of the land at the Adolfo Suárez Madrid-Barajas Airport City are the following:

1. Corridors of economic activity.
2. Communication infrastructure.

On this basis, strategies are deployed to generate economic activity:

1. Intercontinental transport HUB (passengers and cargo) between Latin America, the Middle East and Asia.
2. Complementary activities hub to boost the municipalities within the global economic circuit.
3. Infrastructure to foster the knowledge, financial and business city economy.
4. Basis for the attraction of companies and activities both technological and research.

Source: Compiled by IDOM with an Aena stock photograph (top), aerial photograph of the logistics hub at the airport (left) and images from the 2017 Master Plan (right).

"The White Paper and the development of the land offer an opportunity for boosting urban quality and economic activity.

Integration of economic activity corridors and the communication infrastructure

The Airport in its entirety can be considered the leading company in the Region of Madrid, contributing more than 9% to the regional GDP. The development of the land at Adolfo Suárez Madrid-Barajas Airport City offers a return to society through the generation of employment and consolidates it as a preferential driving force of local and regional economies.

Terminals

Business corridor

Logistics corridor

Hotel area next to the south area

1 Castellana Norte

2 Valdebebas

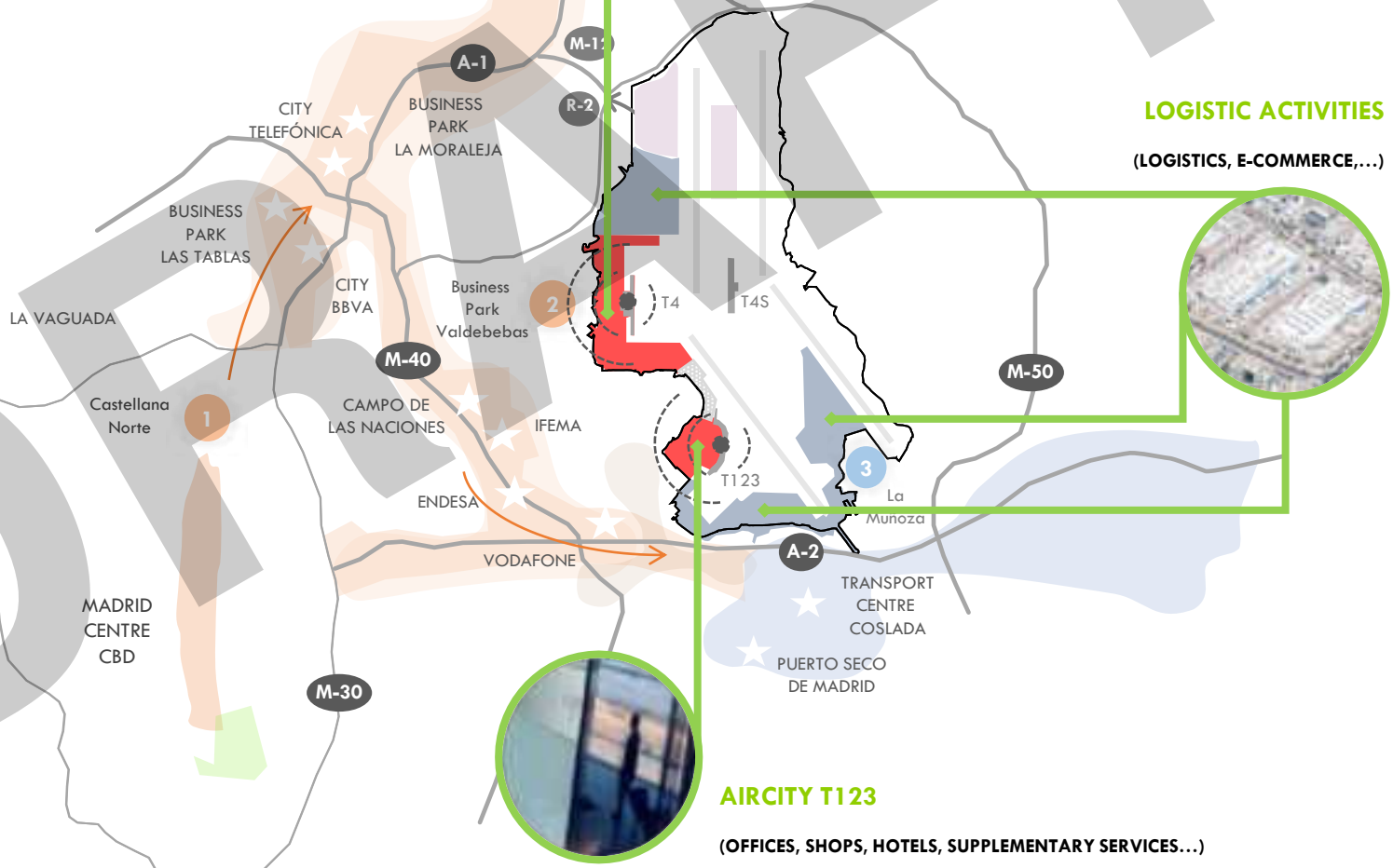
3 La Muñoza

Key

AIRCITY T4

(OFFICES, SHOPS, HOTELS)

The illustrations are of an expository nature of the philosophy of the scope and not indicative of the urban and/or architectural image to be developed.



LOGISTIC ACTIVITIES

(LOGISTICS, E-COMMERCE,…)

AIRCITY T123

(OFFICES, SHOPS, HOTELS, SUPPLEMENTARY SERVICES…)

Source: Compiled by IDOM based on the Master Plan for the development of the Adolfo Suárez Madrid-Barajas Airport City 2017. Aena stock photograph (top), aerial photograph of the logistics hub at the airport (left) and images from the 2017 Master Plan (right).

"The integration of the Adolfo Suárez Madrid-Barajas Airport City with the economic corridors offer a return to society.

Spatial planning and activities programme

The lands at the Adolfo Suárez Madrid-Barajas Airport City constitute the space between the city and the airport. The strategies established for the development of complementary airport activities are implemented on these, which also enhance the airport as a generator of economic activity: Logistics, Offices, Commercial and Hotels.

The implementation scheme focuses on the development of logistics in the south area, taking advantage of the existing demand and the privileged location next to the Henares Logistics Corridor, backboned by the A-2 motorway.

The logistics corridor backboned by the A-2 motorway to the south of the General Airport System, enables the generation of synergies with the development of the cargo and logistics at the airport, concentrating mainly on its vicinity.

The development of the Airport City at T4 is integrated as a new urban area of mixed activities linked to the airport, taking advantage of the appeal of the available land opposite Terminal 4 and its privileged position: proximity to Valdebebas and to a lesser extent to La Moraleja and Barajas and the business corridor defined between the A-1, the M-11, the M-40 and the A-2 that tend to grow towards the west boundaries of the General Airport System enabling the leap towards the R2 and the integration of the Airport City in the metropolitan system as an area of mixed business activities.

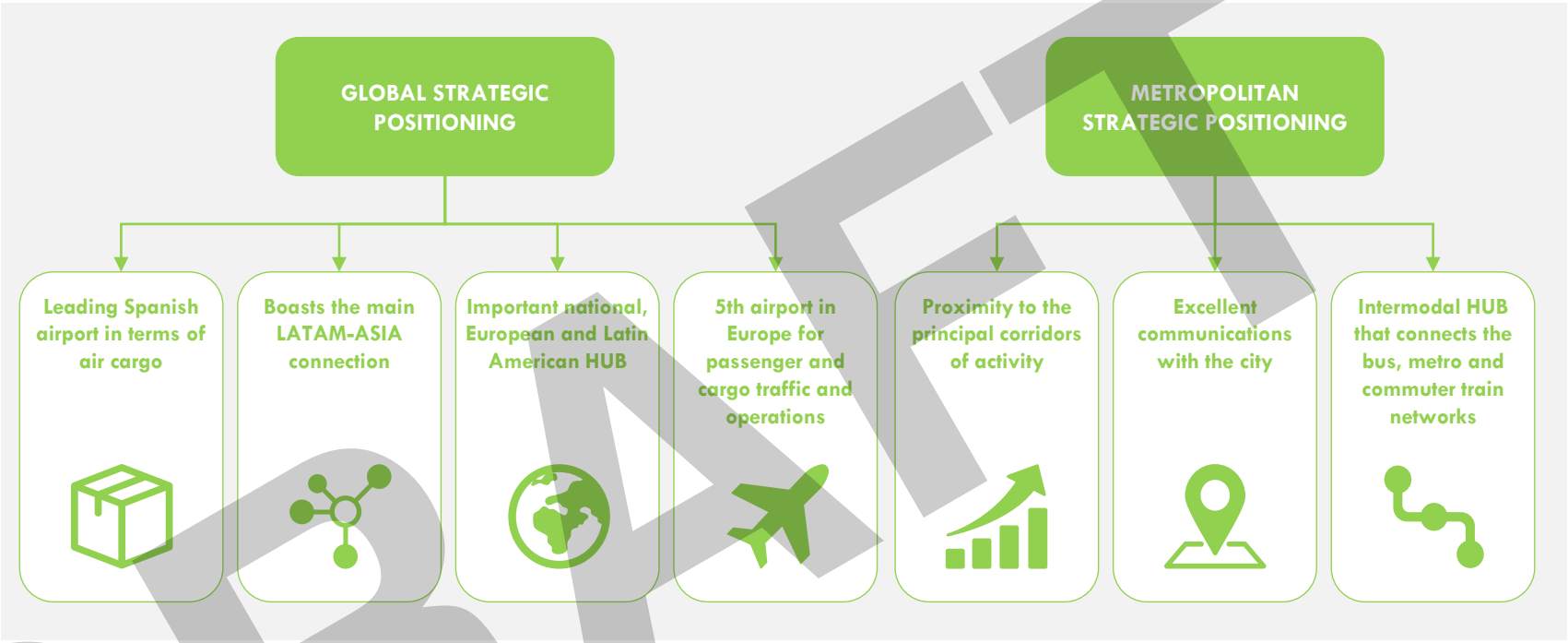
It boasts excellent connectivity, as well as road and intermodal infrastructures thanks to the integration of commuter trains, the metro and buses.

Image of ASM-B airport with the city of Madrid in the background.
Source: Javier Rosano. Copyright-free stock image

“ The planning of the airport scope contemplates the activities of logistics, offices, commercial and hotels.

Global and metropolitan strategic positioning of the ASM-B Airport

The ASM-B Airport enjoys a preferential location and a pronounced gateway character with a double strategic positioning: GLOBAL AND METROPOLITAN:



"The land possesses a key strategic positioning at both international and metropolitan level

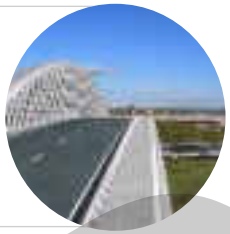
Image of ASM-B airport with the city of Madrid in the background. Source: Copyright-free stock image

Commitment to the surrounding area and to society

The development of the land at Adolfo Suárez Madrid-Barajas Airport City is also sensitive to social, environmental and economic sustainability, being a cross-sectional vector to the proposed development.

COMMITMENT WITH THE TERRITORY AND THE ENVIRONMENT

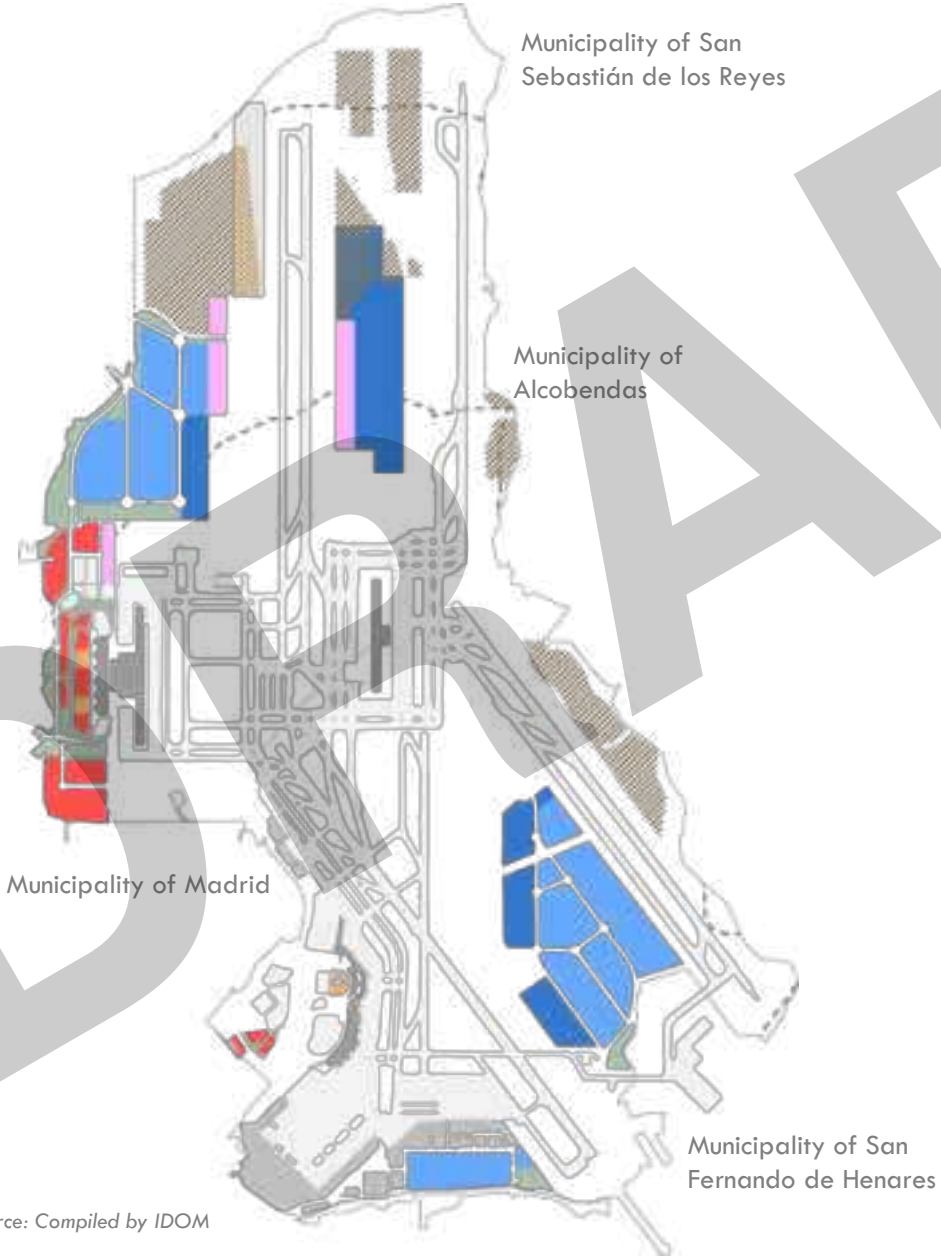
COMMITMENT WITH SOCIETY

URBAN	ENVIRONMENTAL	SUSTAINABILITY
Connectivity with the city's gateway via quality public transport. 	*Connection with the airport's green spaces with the territory's environmental systems.* 	*Integration of renewable energies* 
Connection with adjacent communities 	*Preservation and integration of the natural spaces in the SGA* 	*Reduction of demand and control of consumption* 
Coordination with territorial coordination 	*Integration of indigenous species* 	*Sustainable water cycles* 
Urban quality and spatial coherence in the urban and architectural design 	*Reduction of light and noise pollution* 	*Circular economy and responsible construction* 

"Social, environmental and economic sustainability is a cross-sectional vector to the development, through its commitment to the surrounding area, the territory and society.

2.2 GENERAL PLANNING CRITERIA AND DEVELOPMENT PHASES

The perimeters of the proposed activities correspond to indicative basic schemes and the data on the tables are estimates of the building intensity of the Plan for the development of the Adolfo Suárez Madrid-Barajas Airport City and they will be defined in greater detail in later planning instruments.



Source: Compiled by IDOM

40-YEAR VISION

>300 ha
NET SURFACE TO DEVELOP

>2 mill. m²c
DEVELOPABLE

AirCity

Main activities:
- Offices
- Hotels
- Supplementary services

Logistics Hub

Main activities:
- Logistics
- E-commerce
- Cargo

Air Cargo, 1st Aeronautical Line

Main activities:
- Cargo
- First line logistics

Hangars

Main activities:
- Hangars
- Cargo and industrial area

Photovoltaic Plan

"The planning of the airport scope contemplates the activities of logistics, offices, commercial and hotels.

AirCity Areas

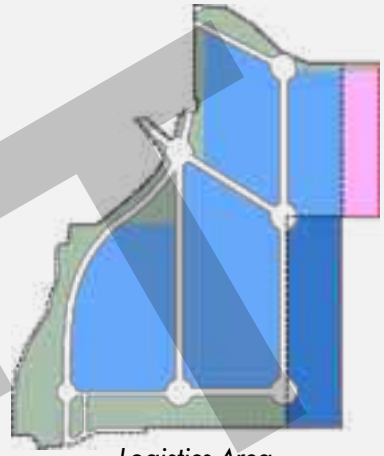
AirCity Area
T4 Central

AirCity Area
T4 North and South

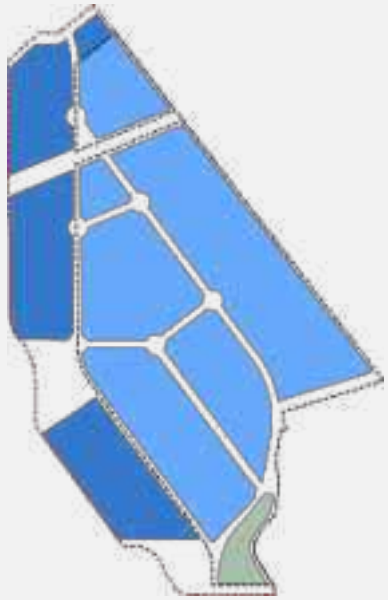
AirCity Area
T123 Hotel

AirCity Area
T123 Offices

Logistics Areas



Logistics Area
Northwest



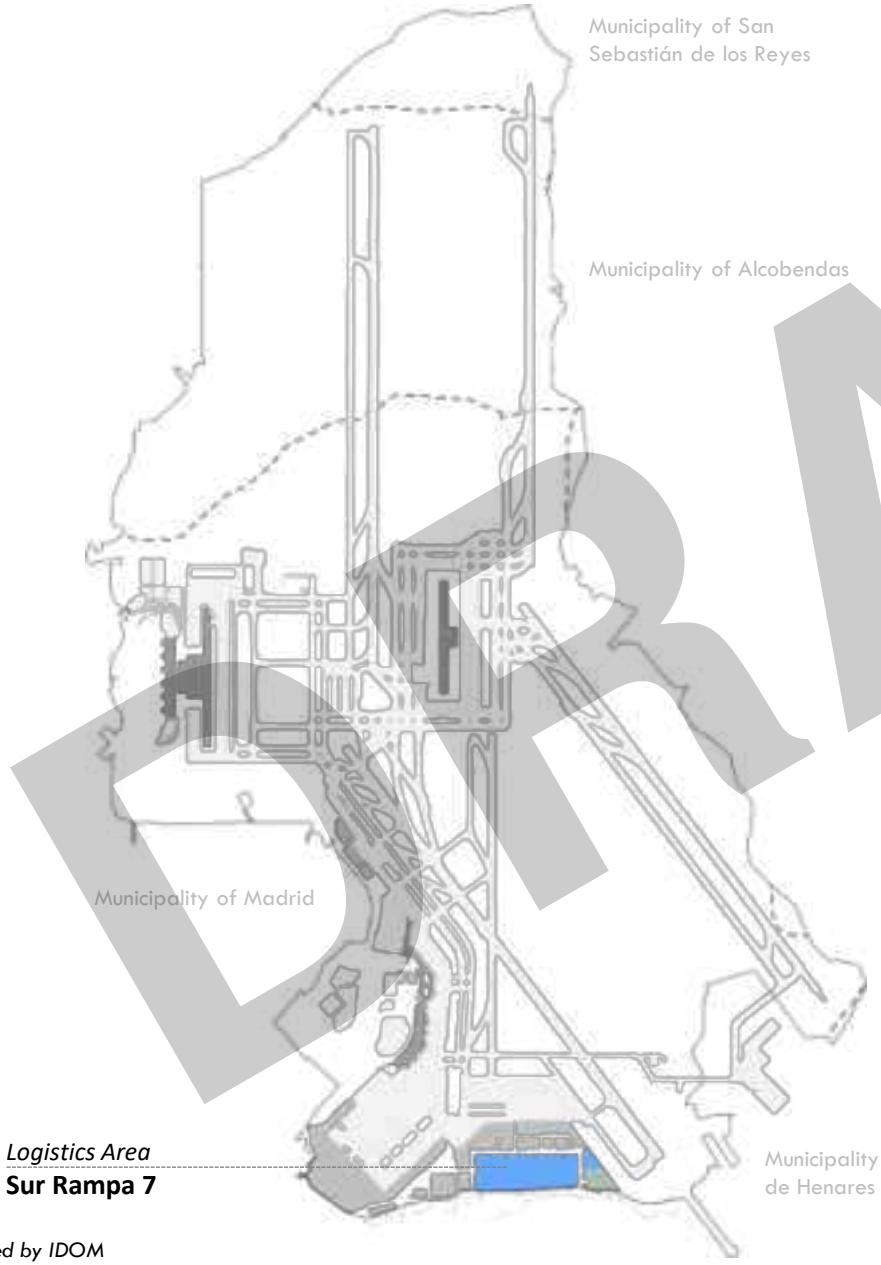
Logistics Area
Entrepistas Sur

Logistics Area 1
Sur Rampa 7

Source: Compiled by IDOM

Immediate development phase

The perimeters of the proposed activities correspond to indicative basic schemes and the data on the tables are estimates of the building intensity of the Plan for the development of the Adolfo Suárez Madrid-Barajas Airport City and they will be defined in greater detail in later planning instruments.

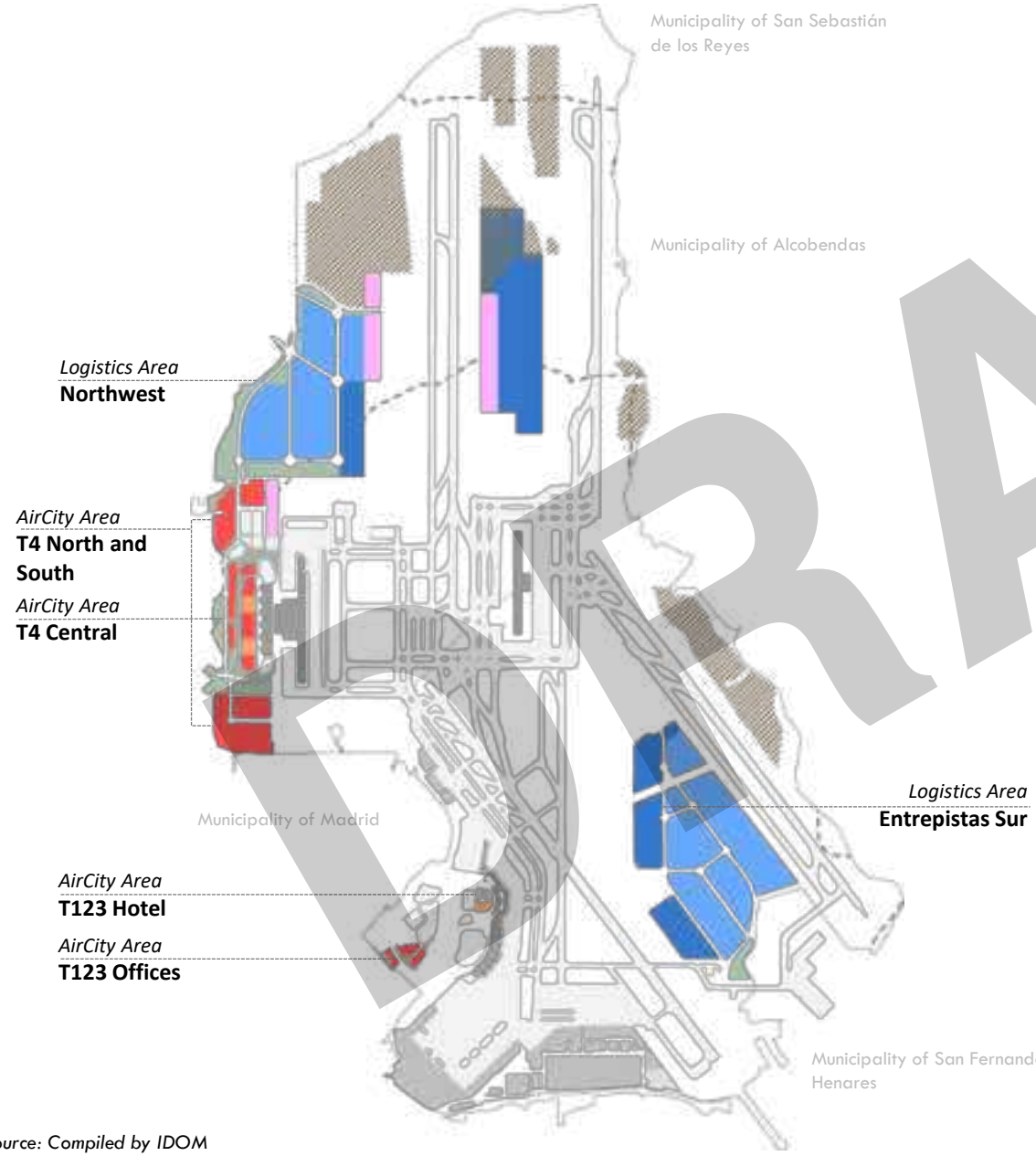


	Net building intensity (m^2c/m^2s)
SUR RAMPA 7 LOGISTICS AREA	
Logistics, e-commerce, cargo,...	0.6
Green space	0.1

Source: Compiled by IDOM

Future developments

The perimeters of the proposed activities correspond to indicative basic schemes and the data on the tables are estimates of the building intensity of the Plan for the development of the Adolfo Suárez Madrid-Barajas Airport City and they will be defined in greater detail in later planning instruments.



	Net building intensity (m^2c/m^2s)
LOGISTICS AREAS	
Logistics, e-commerce, cargo	0.6
1st line aeronautical activities	0.8
Hangars	0.8
Green spaces	0.1
AIRCITY T123 AREAS	
Offices, Supplementary Services	1.0
Hotel	1.0
Green spaces	0.1
AIRCITY T4 AREAS	
Offices, Supplementary Services (Central)	1.6
Offices, Supplementary Services (North-South)	1.0
Hotel	1.4
Hangars	0.8
Green spaces	0.1

Source: Compiled by IDOM

2.3 CONNECTIVITY STRATEGIES AND CRITERIA

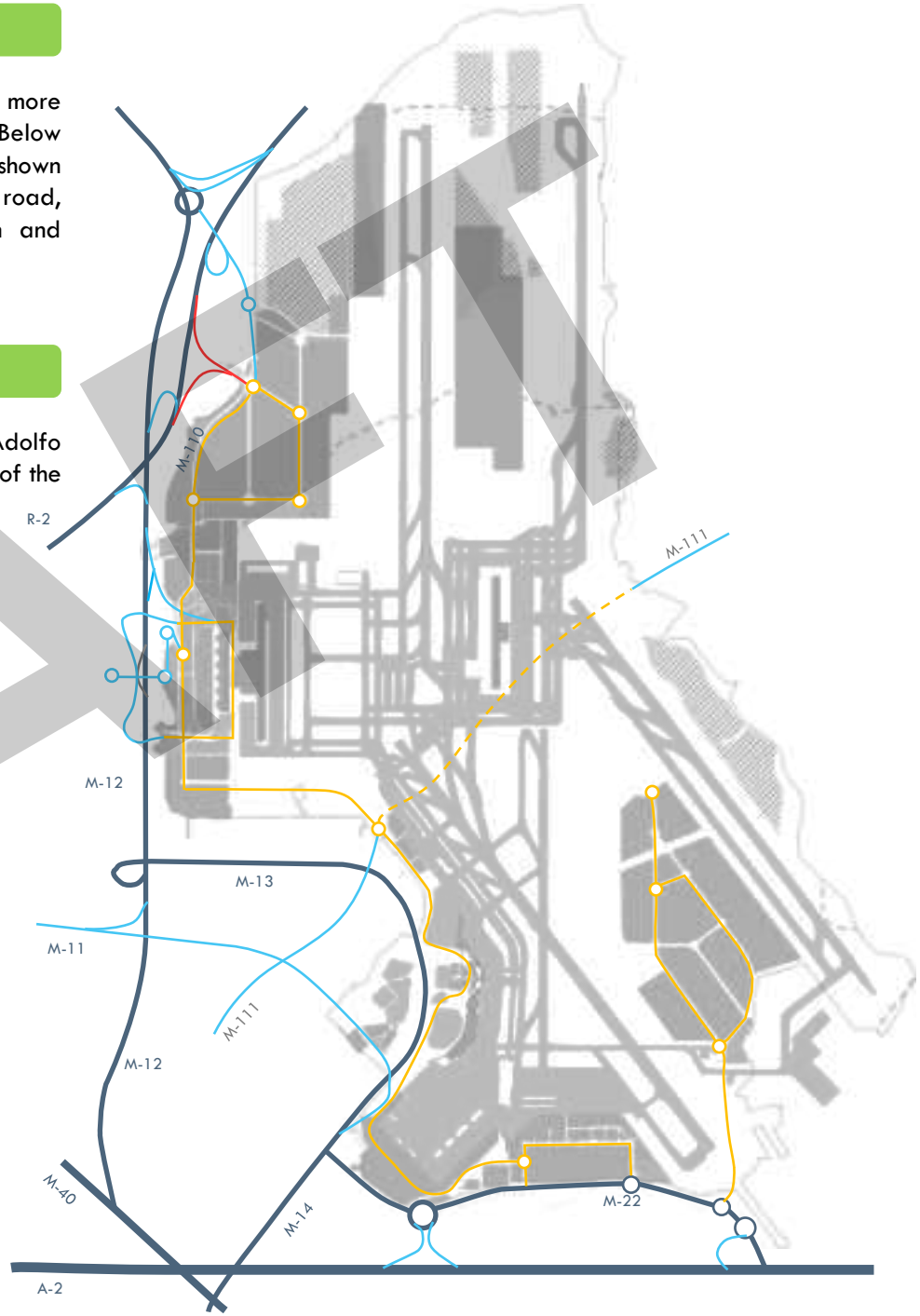
The connectivity of the development and the impetus of its more sustainable version is one of the pillars of the white paper. Below the general connectivity and mobility strategies are shown illustratively, which will guide the development in matters of road, public transport, cyclists, non-polluting mobility, pedestrian and green spaces, as well as their involvement in the area.

Road connectivity

Below the road integration of the different developments at Adolfo Suárez Madrid-Barajas is shown in relation to its nearest part of the city.

Key

- Structure road layout in the vicinity of the SGA
- Secondary road layout in the vicinity of the SGA
- Illustrative road layout inside the SGA
- Illustrative road layout of SGA connection with the surrounding area



Tentative illustrative road plan proposed, subject to coordination with the competent Authority.
Source: Compiled by IDOM

"The physical multimodal connectivity between the areas will improve substantially, helping the existing transport hubs.

Public transport connectivity

The different developments will have a public transport strategy that facilitates their integration with the city. It includes the need to provide the Northwest area an alternative means of transport to road traffic through the extension of metro lines 8 or 11 (their future development is pending with the CAM).

The extension of line 5 is in project phase and line 11 is in project study phase by the competent Authority. In addition, there is a proposal for a future metro station in the Northwest area of the airport.

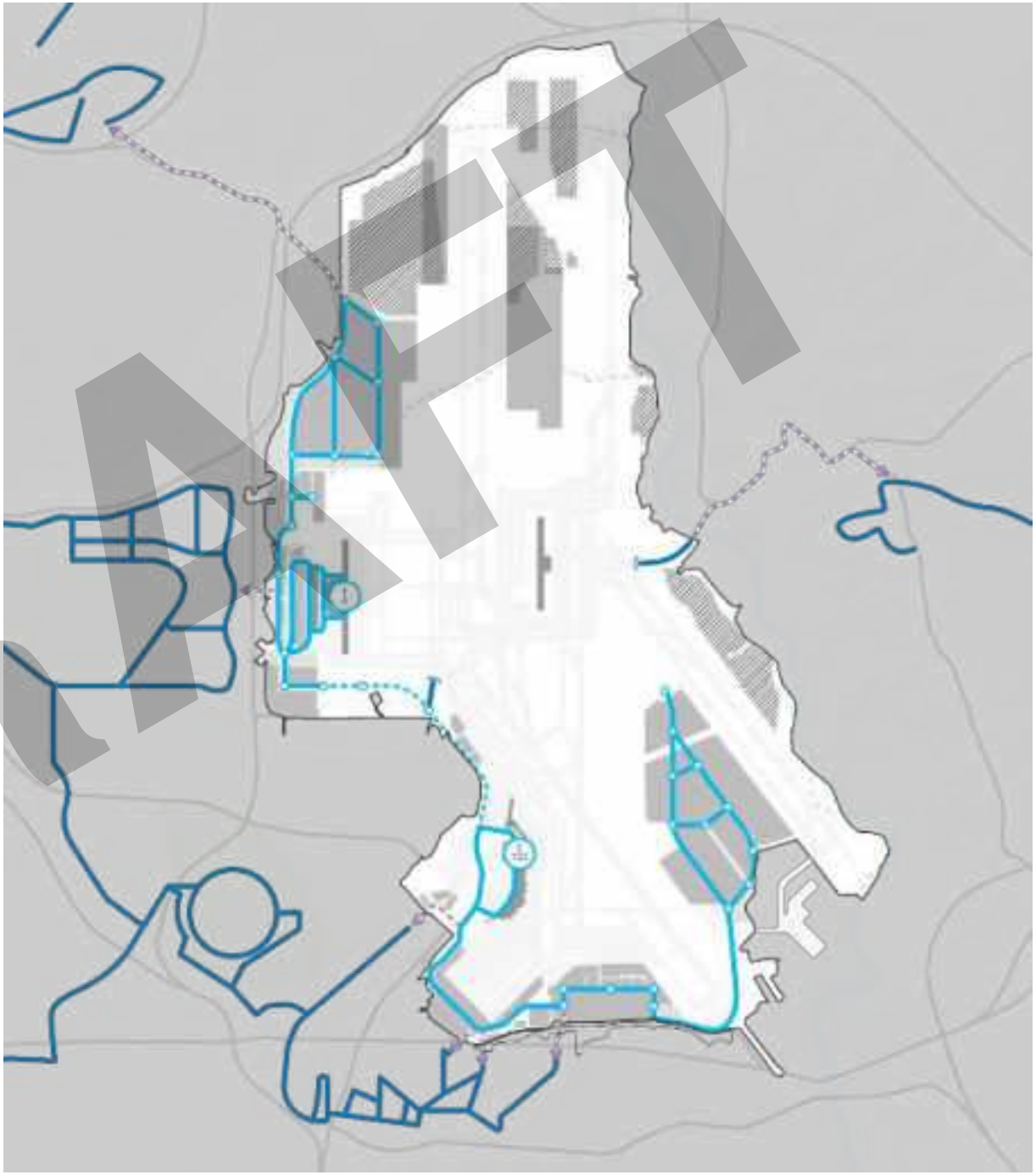
All the proposal relating to the provision of public transport are subject to coordination by the competent Authorities.

Tentative illustrative plan of proposed public transport, subject to coordination with the competent Authorities.
Source: Compiled by IDOM

"The connectivity through public transport will substantially improve the interconnection inside the airport.

General strategy for cycling continuity

The tentative strategy for cycling continuity of the attached scheme is merely illustrative and its final planning within the area is still to be defined. Its potential connections to the existing cycle lanes shown in the image are for illustrative purposes only, as their route does not represent a proposal for an eventual state and only aims to illustrate the strategy of integrating the cycle route between the different areas with the airport terminals and its nearest city environment.



Illustrative plan of cycle connectivity
Source: Compiled by IDOM based on the open data portal of Madrid City Council, Alcobendas City Council and cross-checked with public information from the Asociación Pedalibre cyclists' association and satellite images.

"The continuity of non-polluting modes of transport must be ensured, including airport land on both functional and recreational routes.

General strategy of pedestrian green areas and connectivity

Illustrative diagram of continuity of the green spaces, obtaining a natural integration between the General Airport System with the surrounding area, taking into account the most relevant natural areas, such as the Jarama River Park, Parque Felipe VI, Parque Juan Carlos I, and the Metropolitan Forest project and the different streams that run through the vicinity.

Illustrative plan of green connectivity
Source: Compiled by IDOM

Key

- Green spaces and continuities
- Jarama River
- Streams

"The green spaces adjacent to the area converge on these to achieve green connectivity.

Integration and connection of the areas' green spaces and the Metropolitan Forest

The integration of green spaces in the new areas of the Adolfo Suárez Madrid-Barajas Airport City will be designed and their integration defined together with the proposals and designs that materialise from the proposal from Madrid City Council for the Metropolitan Forest project.

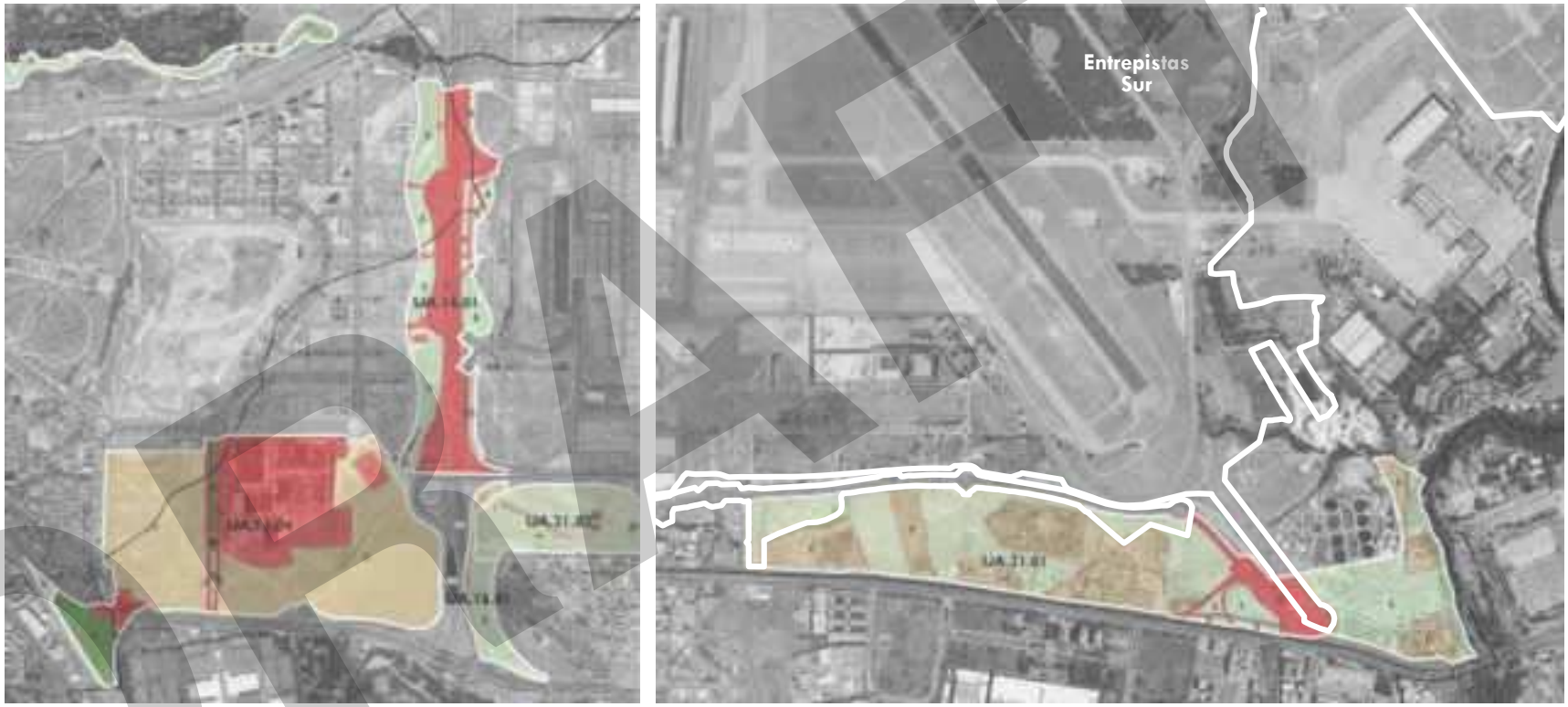
Pedestrian and cyclist continuity will be developed linked to the green space strategy, providing the Airport with metropolitan integration with the neighbouring developments in the east of Valdebebas, in the south with the Rejas area, and in the northwest with La Moraleja.

Key

Delimitation of the General Airport System of Madrid

Analysis units of the Metropolitan Forest

- A. Existing green spaces and protected areas
- B. Qualified green spaces pending execution or improvement
- C. Infrastructures and other non-transformable areas
- D. Infrastructures and other networks susceptible to transformation to green space
- I. Vacant undeveloped land

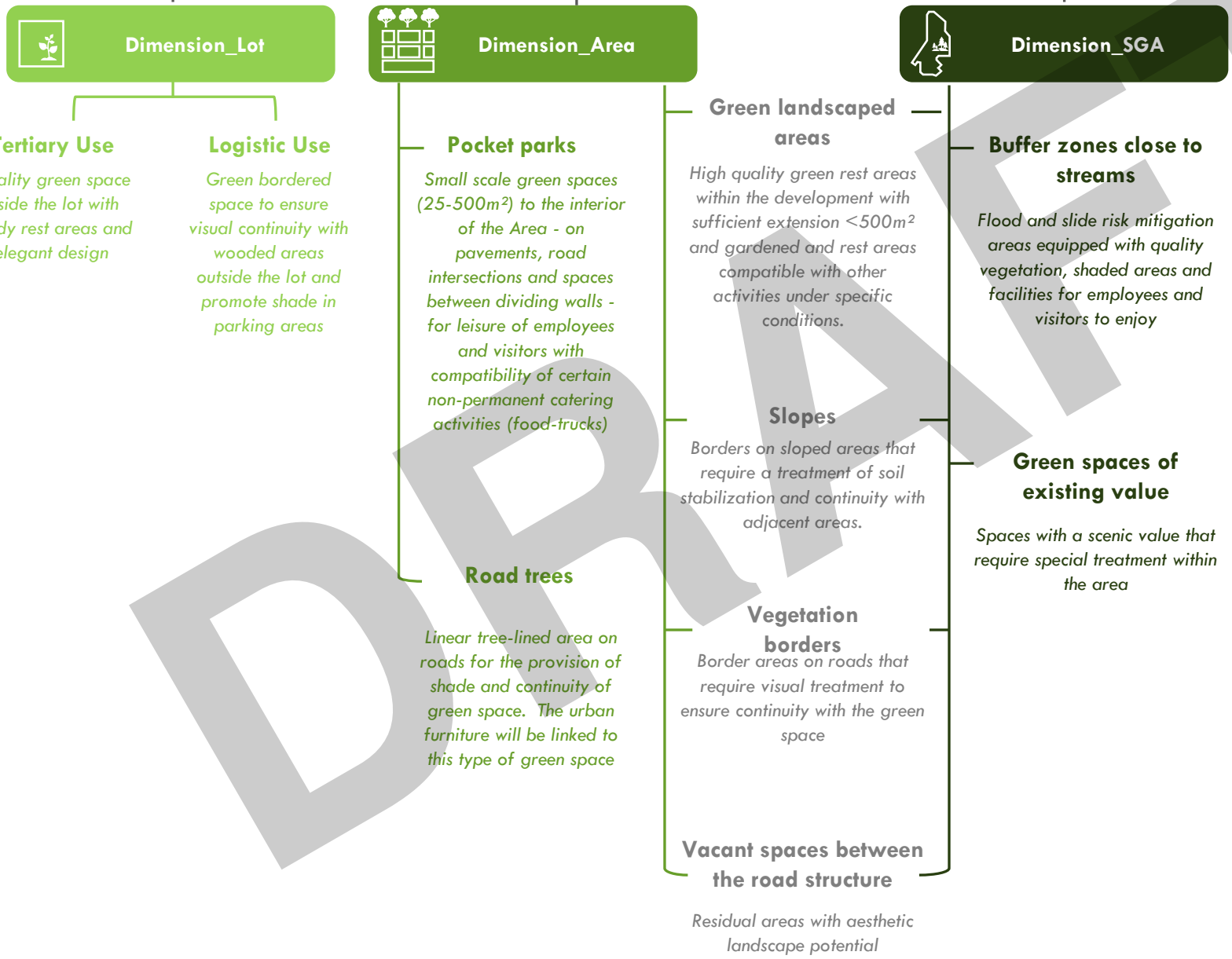


Source: Compiled by IDOM based on the Metropolitan Forest Project. Annex 3: Zoning of the Analysis Units: UA.18.04 Ciudad Deportiva Real Madrid-Trade Fair Halls (left). UA.21.01 Arroyo de Rejas stream recovery (right) Directorate-General for Strategic Planning of Madrid City Council

"The integration of the Airport's green spaces with the proposal of the Metropolitan Forest will be encouraged, developing the pedestrian and cyclist continuity with the city.

Green space strategy according to the scale of application

TYPES OF GREEN SPACES



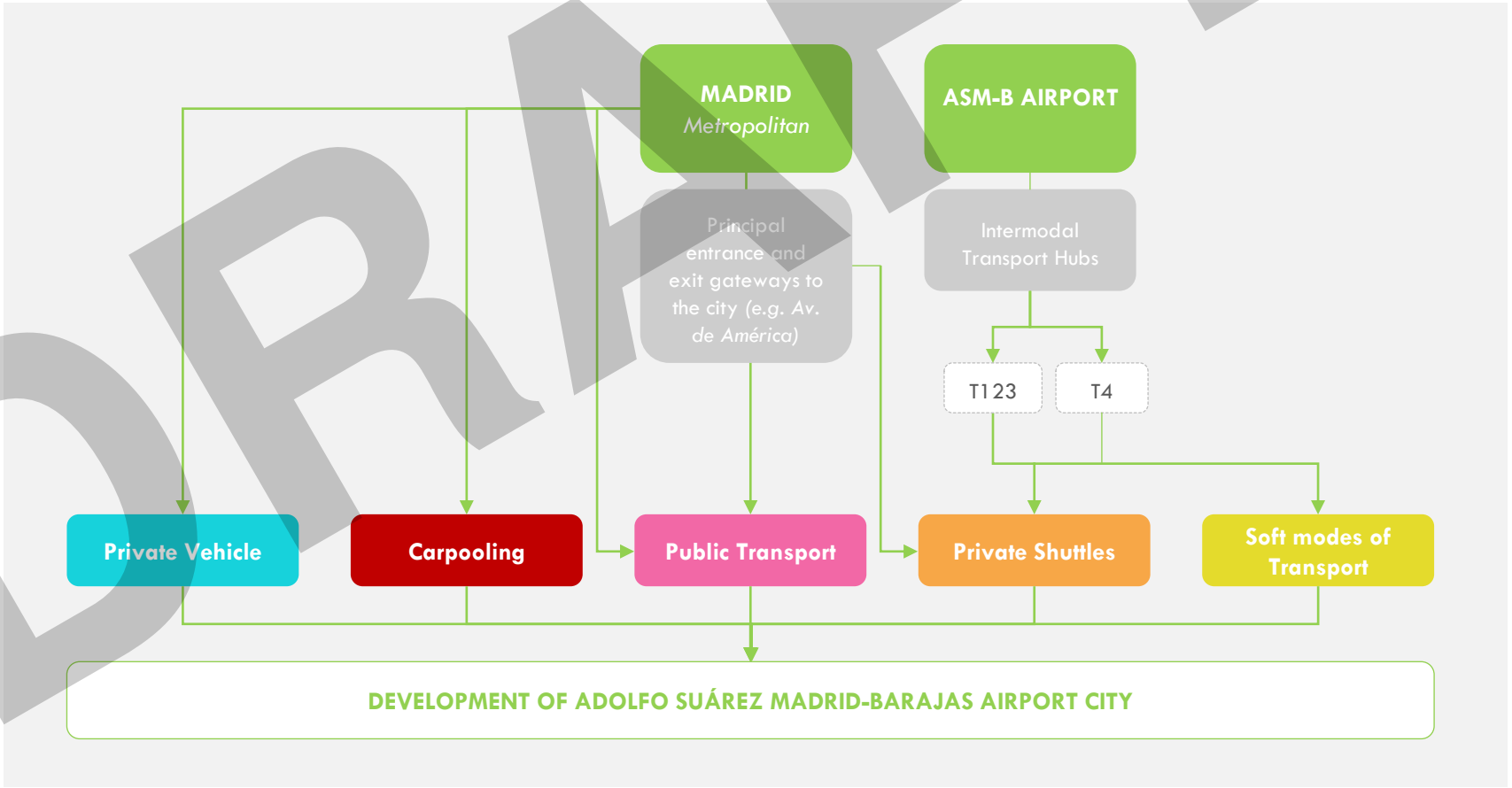
"A system of typologies of green spaces is established according to their scale of location and use, to cover the needs of the different fields.

General strategy for the promotion of non-polluting mobility

Some sustainable mobility strategies have been established based on general objectives for improving the environmental quality and the decarbonisation of the area, taking advantage of the magnificent transport infrastructure at Adolfo Suárez Madrid-Barajas Airport.

The general sustainable mobility strategy combines three factors: accessibility, that is, the capacity of being able to move around and access the new areas of the Airport; the density of activities (jobs, services, etc.); and their concentration in new centres with numerous and diverse activities, such as the new T4 centre or the new Northeast and Entrepistas Sur logistics hubs.

For this, a series of measures have been proposed aimed at fostering other non-polluting mobility means at the same time as promoting collaborative mobility.

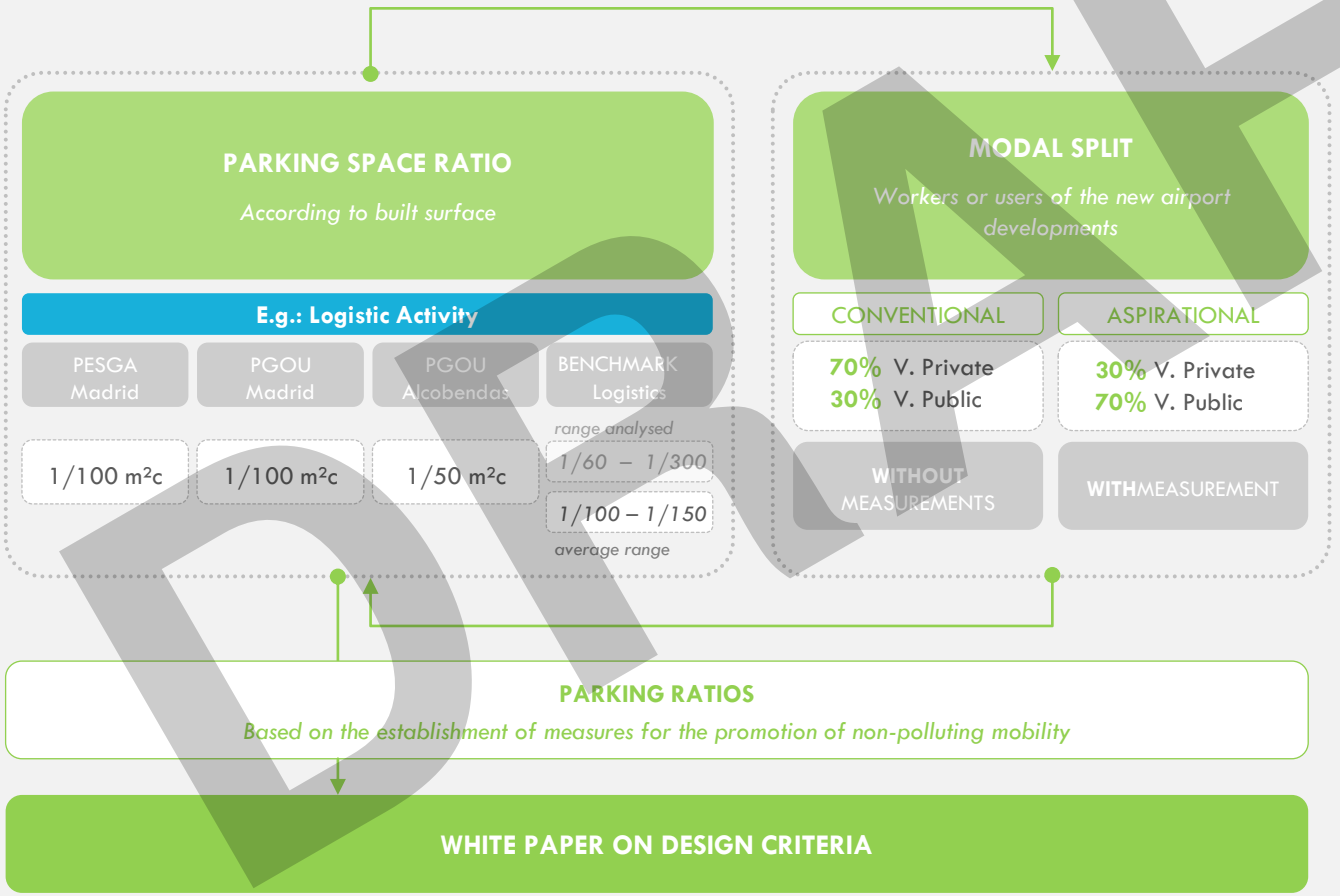


"Sustainable mobility plays a key role in the challenge of decarbonising new areas of the Adolfo Suárez Madrid-Barajas Airport City.

Quantification of private vehicle parking needs

A holistic strategy of parking spaces has been proposed through the analysis of a conventional scenario of the modal distribution of each area and another more aspirational one where, in exchange for reducing the number of minimum spaces required, a set of measures are implemented to provide mobility alternatives to the users of the work centres.

The objective of reducing the minimum spaces required is to reduce CO2 and other greenhouse gases associated with displacements in private vehicles, at the same time as promoting other means of transport such as collaborative mobility, public transport, private shuttles that connect the area both with the city as well as with the intermodal transport hubs of terminals T123 and T4, and the fostering of soft transport modes through the creation of cycling continuity.

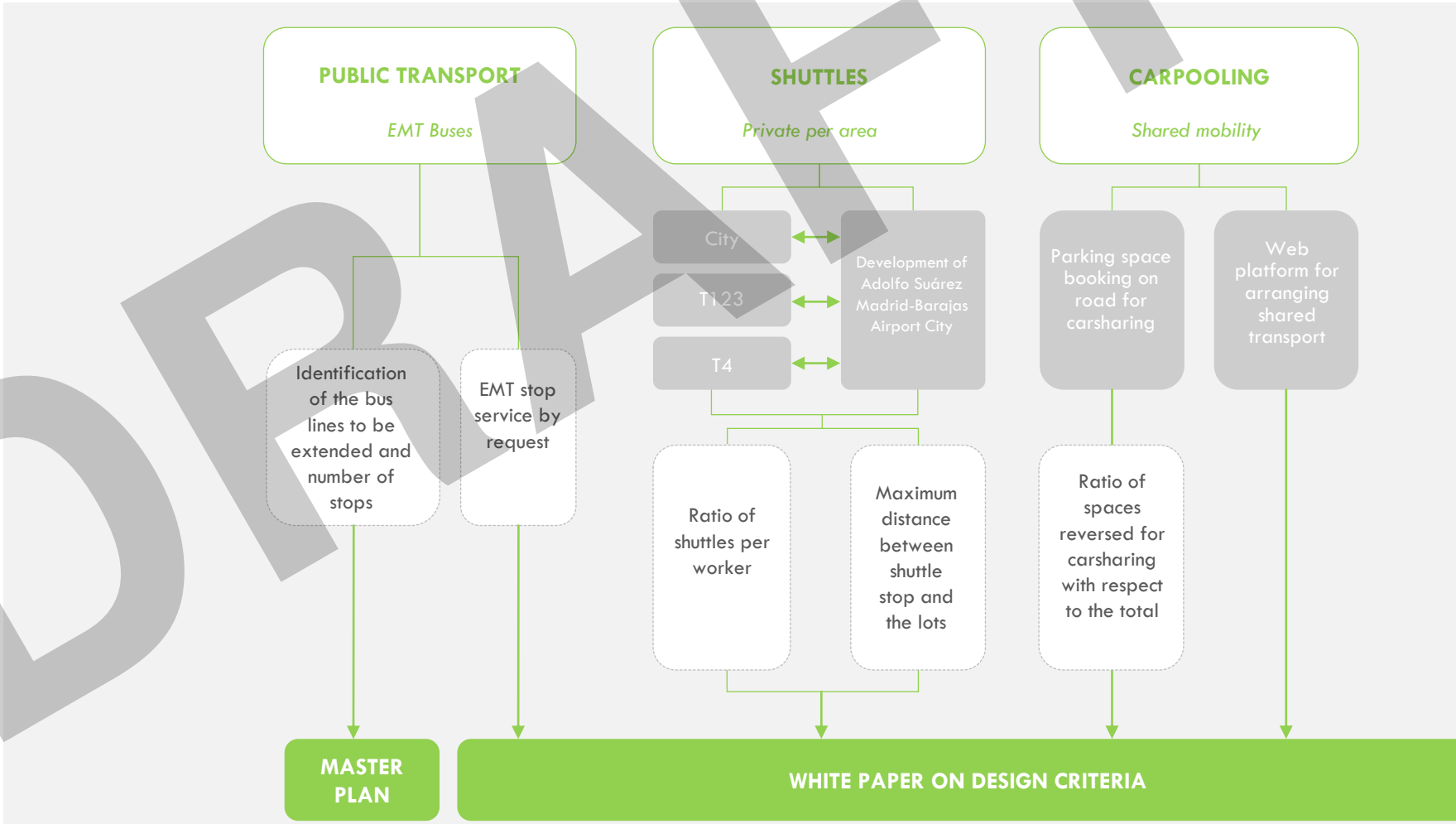


The objective of reducing the number of minimum spaces required is to reduce CO2 emissions and other greenhouse gases associated with private vehicle displacements.

Measures to foster less polluting transport means

The following are measures to promote non-polluting means of transport and to rationalise the use of private vehicles. They are divided into two categories: Those originating from the Master Plan or the Plan for the development of Airport Complementary Activities, such as the initial identification of bus lines to be extended and the possible location of stops, and the measures contained in the White Paper on Design Criteria.

The measures from the White Paper are structured into three sub-categories: Private shuttles, promoted by the actual developers of each area, that connect the area with the intermodal transport hubs as well as the airport terminals, and the main entrances and exits to the city (e.g. Avenida de América, Plaza Castilla, etc.). Carpooling is another measure aimed at reducing the number of private vehicle users through the promoting of collaborative mobility platforms and advantages for parking this type of vehicle.

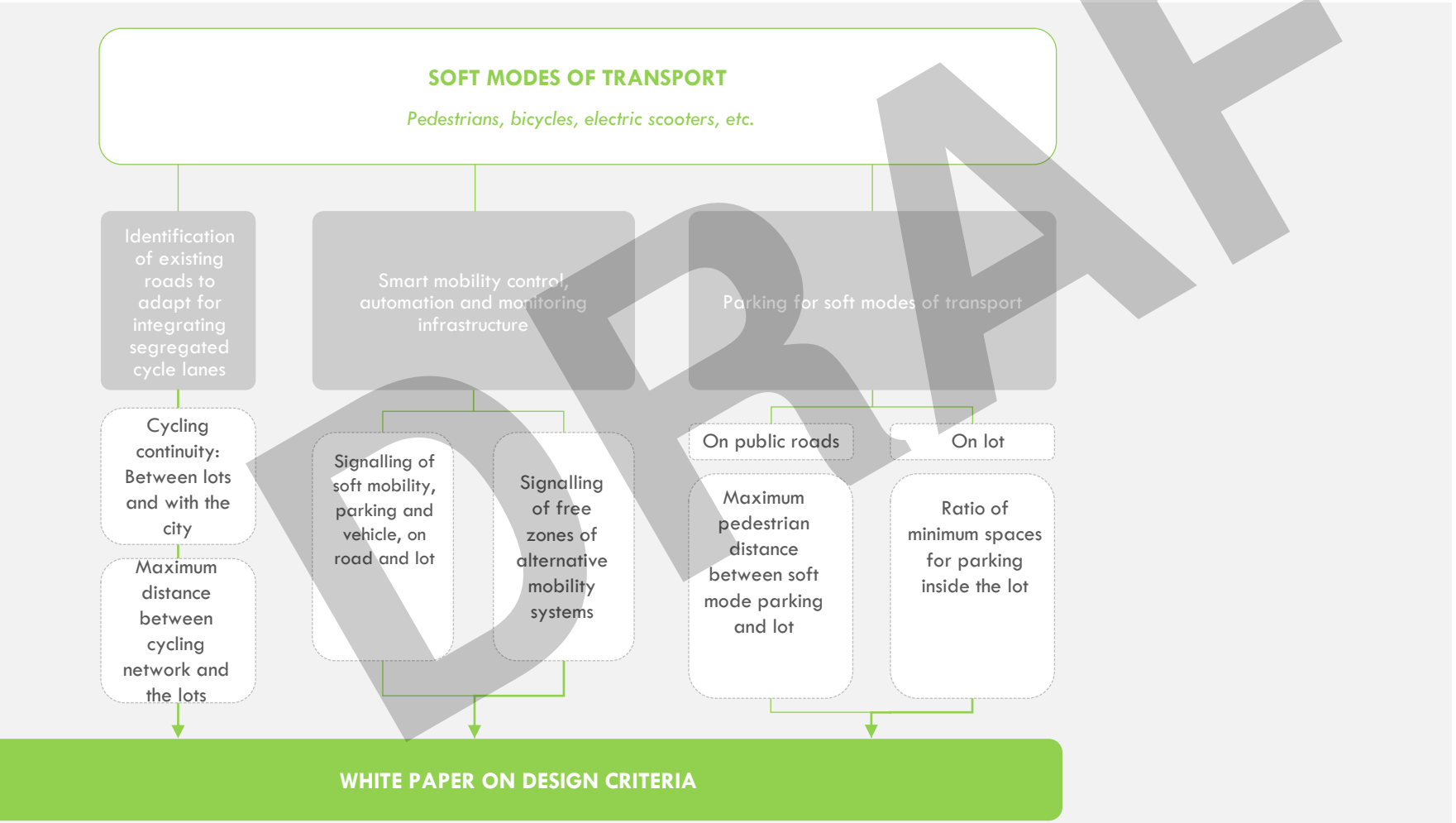


Public and shared means of transport will be enhanced with their connection between the areas and with the city, through a rationalisation of private vehicles

Measures to foster less polluting transport means

The third sub-category is promoting soft modes of transport For this, three strategies are followed:

- Ensure cycling continuity, preferably by segregated and safe cycle lanes for its users
- Promote smart mobility through sensorisation, monitoring and signalling in the free zones of alternative mobility systems (bicycles, electric scooters, etc.)
- Create parking spaces for these modes of transport both on public roads and inside lots. It is recommended to locate these soft transport mode parking spaces near the public transport stops to thus promote intermodality and good accessibility of the Airport.

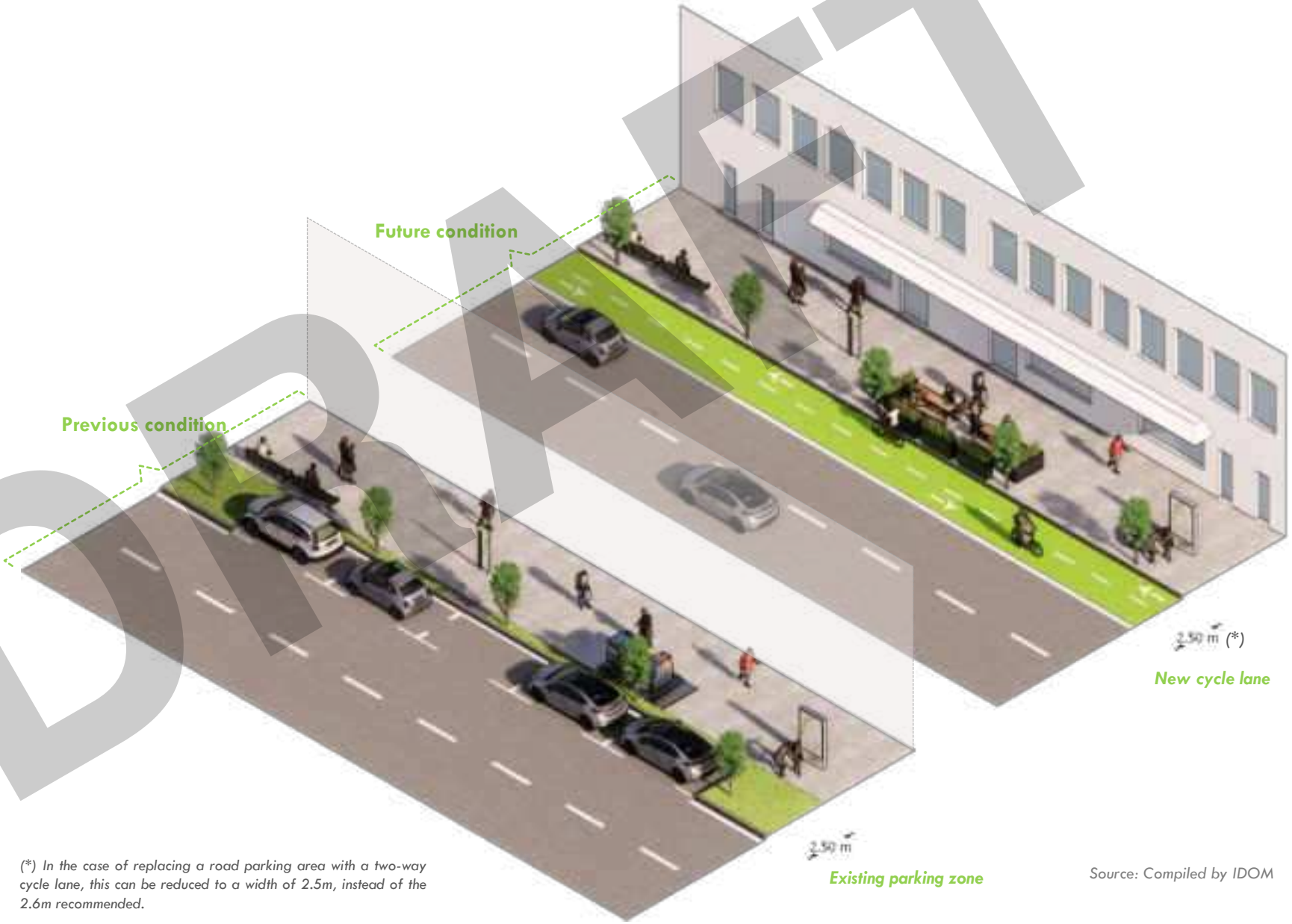


“ Alternative modes of transport seek to solve pollution and traffic problems through solutions for all users who choose not to opt for private vehicles as a means of transport

General strategy of road flexibility

A strategy is established that focuses on the flexibility and adaptation of the road space throughout the field, responding to the multiple needs of the environment and/or changes in the demand for transport.

On the following image, an illustrative example is shown of the conversion of the in-line parking strip for road vehicles into a cycle lane, allowing segregation of different modes of transport without reducing the space allocated to vehicle traffic or pedestrian traffic.



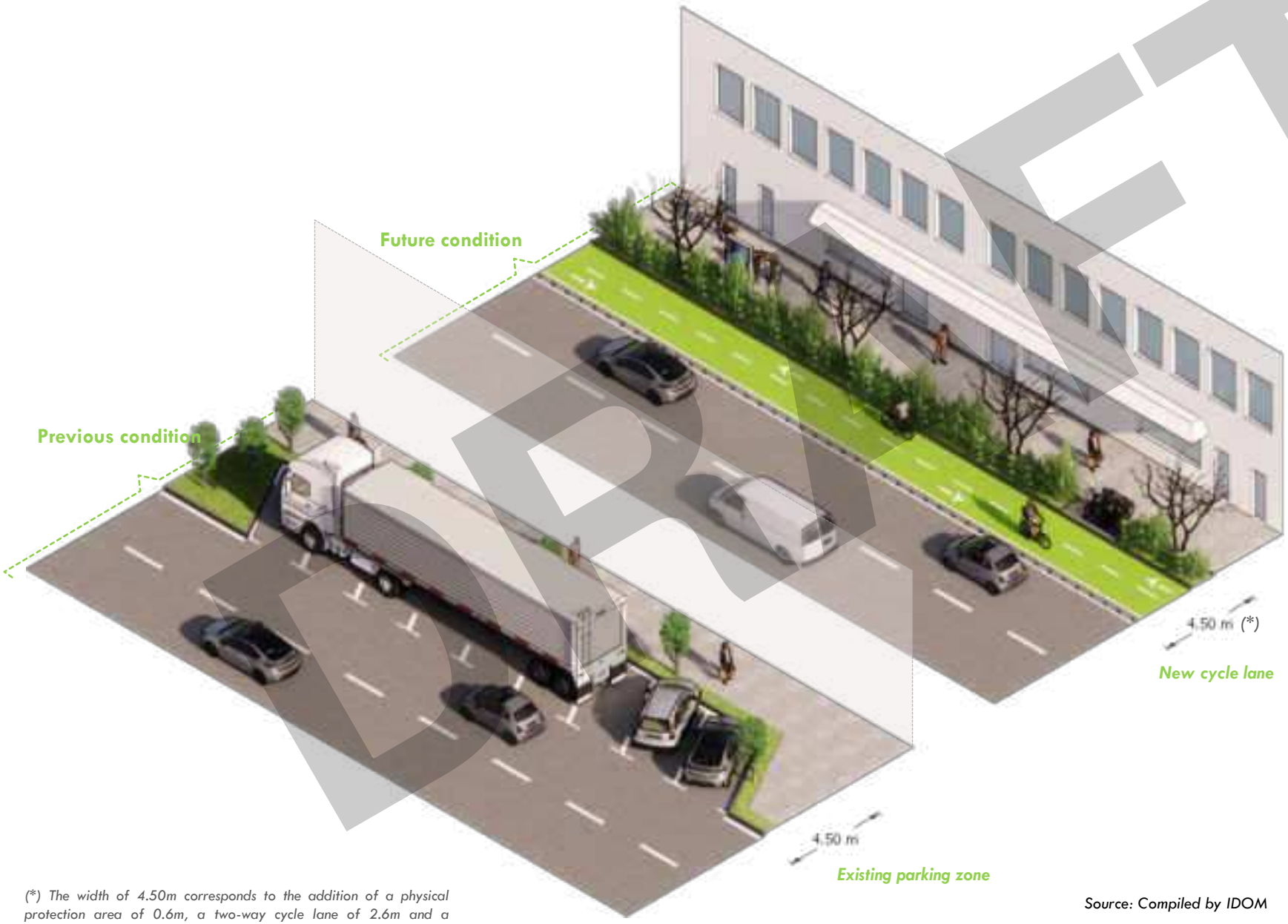
(*) In the case of replacing a road parking area with a two-way cycle lane, this can be reduced to a width of 2.5m, instead of the 2.6m recommended.

Source: Compiled by IDOM

"The flexibility of the parking area enables the maximising of multiple activities over time.

General strategy of road flexibility

On the following image, an illustrative example is shown of the conversion of the in-line parking strip for road vehicles into a cycle lane, allowing segregation of different modes of transport without reducing the space allocated to vehicle traffic or pedestrian traffic.



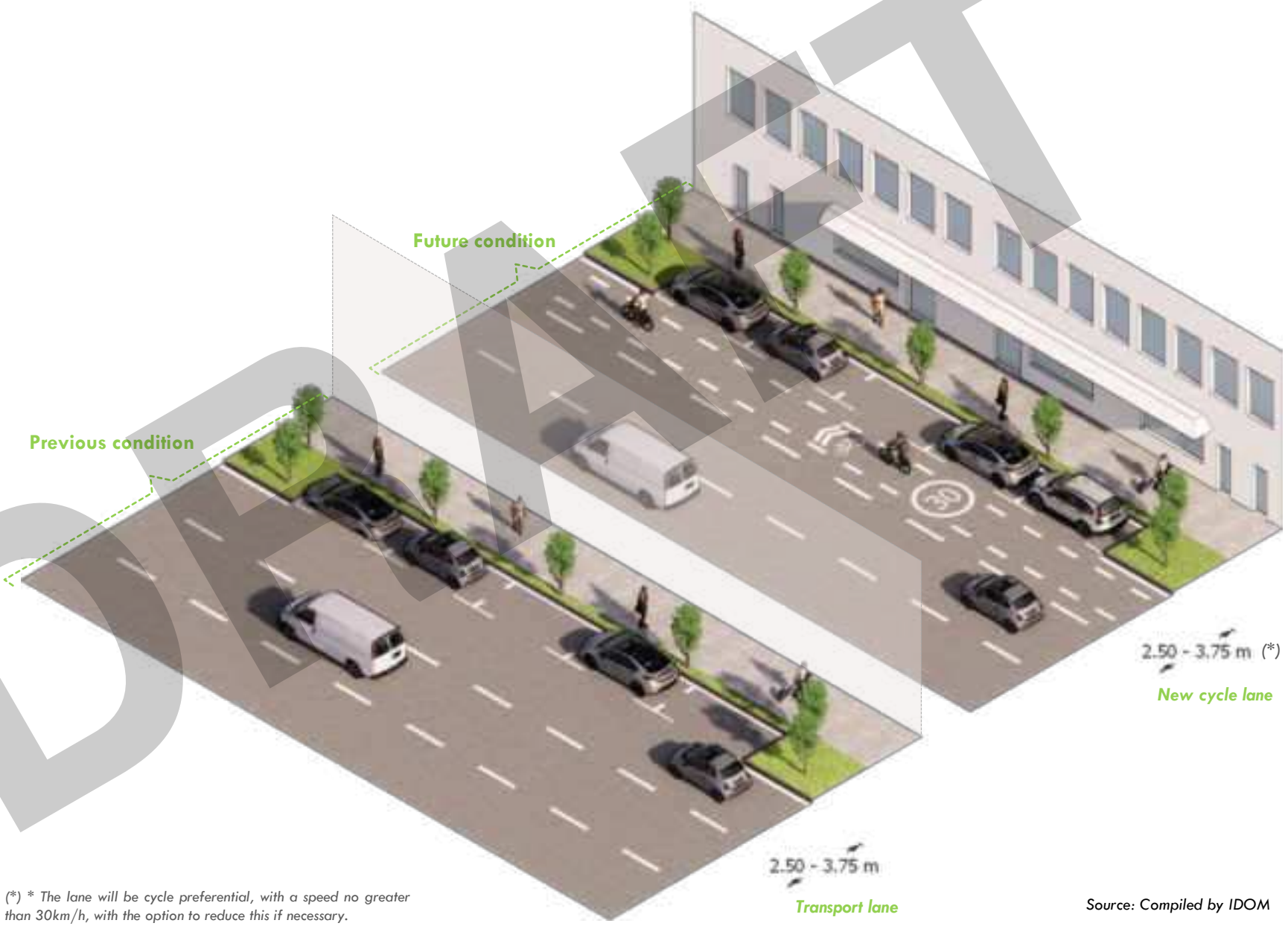
(*) The width of 4.50m corresponds to the addition of a physical protection area of 0.6m, a two-way cycle lane of 2.6m and a vegetation area of 1.3m.

Source: Compiled by IDOM

"The conversion of the parking area into another activity presents an added value of urban quality.

General strategy of road flexibility

The image below shows an illustrative example of adapting an existing vehicle lane to a lane with a bike preference and speed limited to 30km/h, permitting the cohesion of different modes of transport in a same space, giving priority to bicycles and other soft modes of transport.



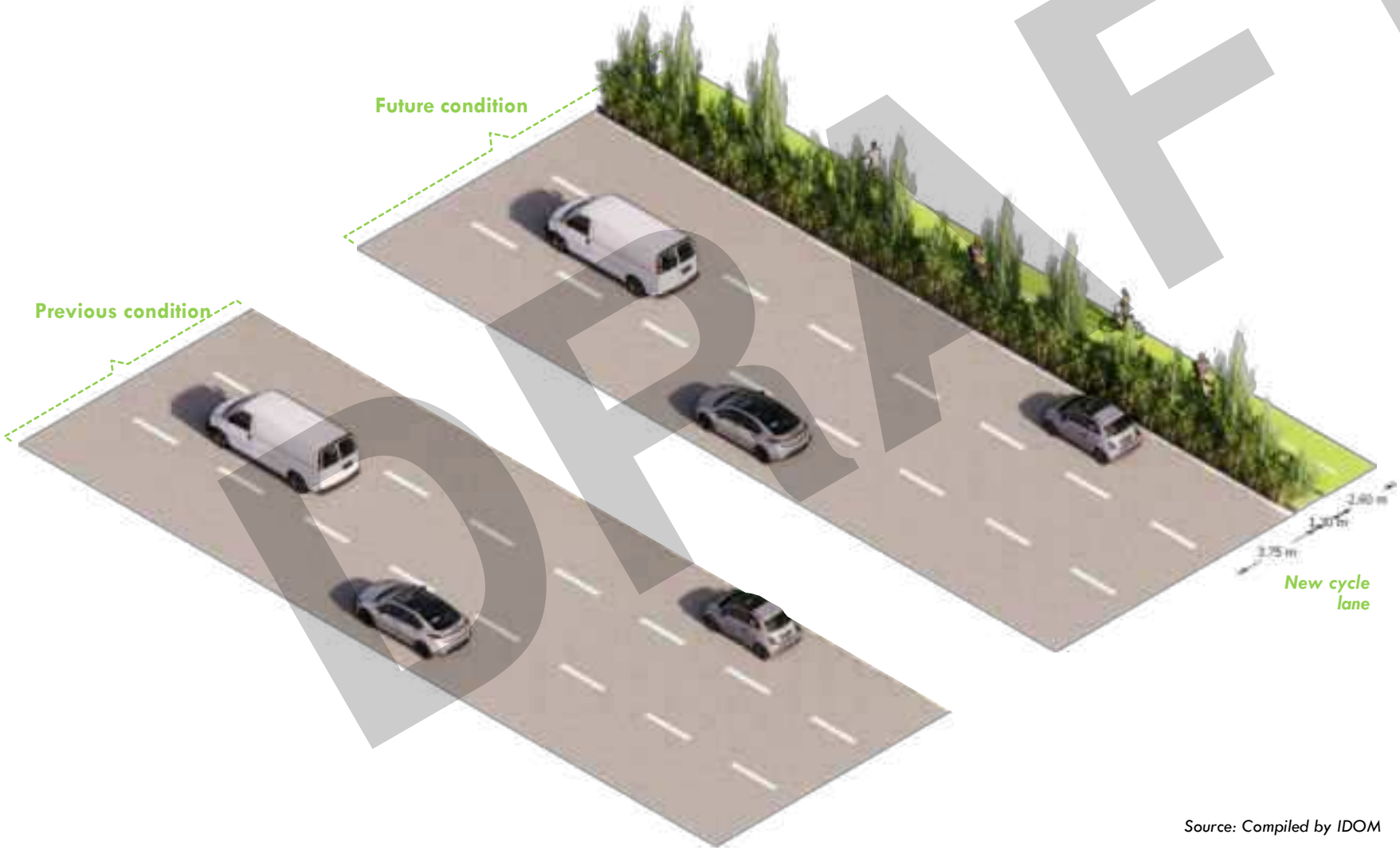
(*) * The lane will be cycle preferential, with a speed no greater than 30km/h, with the option to reduce this if necessary.

Source: Compiled by IDOM

The possibility of prioritising alternative means of transport in existing lanes favours adaptability to demand.

General strategy of road flexibility

The following image shows an illustrative example of the extension of the road section with the addition of a cycle lane on the hard shoulder, or the continuation of it, at the same time implementing a vegetation barrier with the vehicle lane.



Source: Compiled by IDOM

“The diversity of transport means offers the option of road segregation according to type.

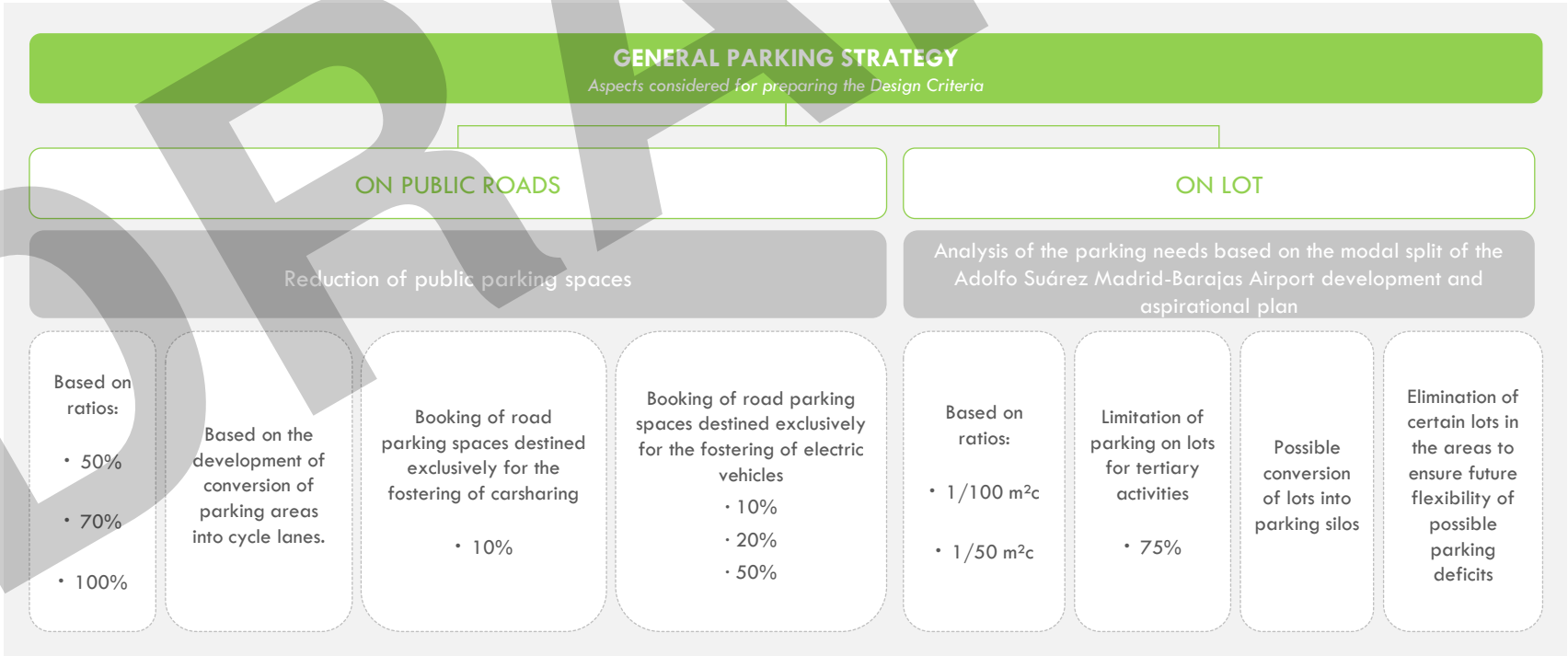
Parking strategy for private vehicles

The parking needs in the area have been envisaged and analysed as a key issue due to the importance of not inadequately equipping the activities inside the lots, causing the consequent problems of excess parking on the public roads and deteriorating the image of development, at the same time, potential problems of traffic saturation of users seeking parking are aggravated, and emissions of CO2 and other greenhouse gases are increased.

Against this, there is a risk of over-requiring and over-providing parking spaces for activities inside the lots, this can lead to a considerable increase in the investment needs of the same if it is underground and to encourage the use of private transport, without taking advantage of the magnificent public transport infrastructures available to it Adolfo Suárez Madrid-Barajas.

As a result, two parking strategies have been proposed according to the location of the car park: On the one hand, it is proposed to reduce the parking spaces on public roads, in order to relocate them inside the lots themselves, this results in a public road model with the potential to accommodate larger green spaces and have segregated bicycle paths connected to the airport terminals themselves, which act as intermodal transport nodes.

In addition, some parking requirements are required inside the lots, aligned with the demands of the municipalities of Madrid and Alcobendas. It also limits the number of parking spaces that may be on the surface, which seeks the objective of reducing the heat island and creating quality green spaces inside the lots.

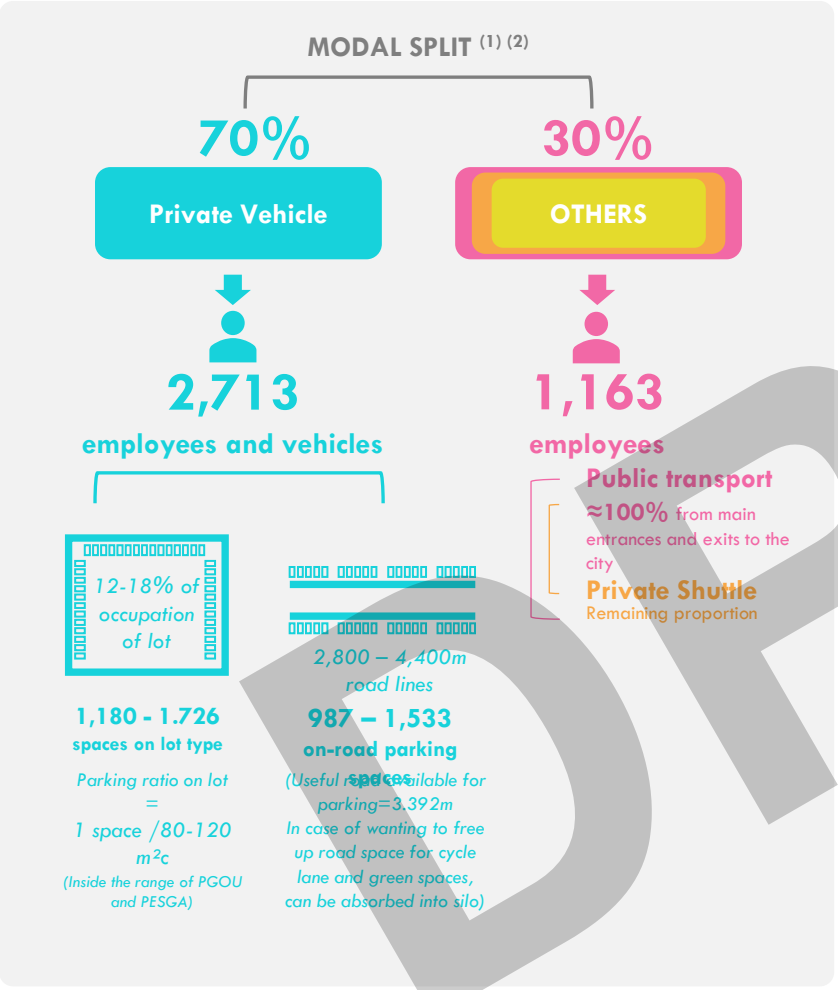


“Rationalisation of the parking needs for private vehicles, both on public roads as well as inside the actual lots.

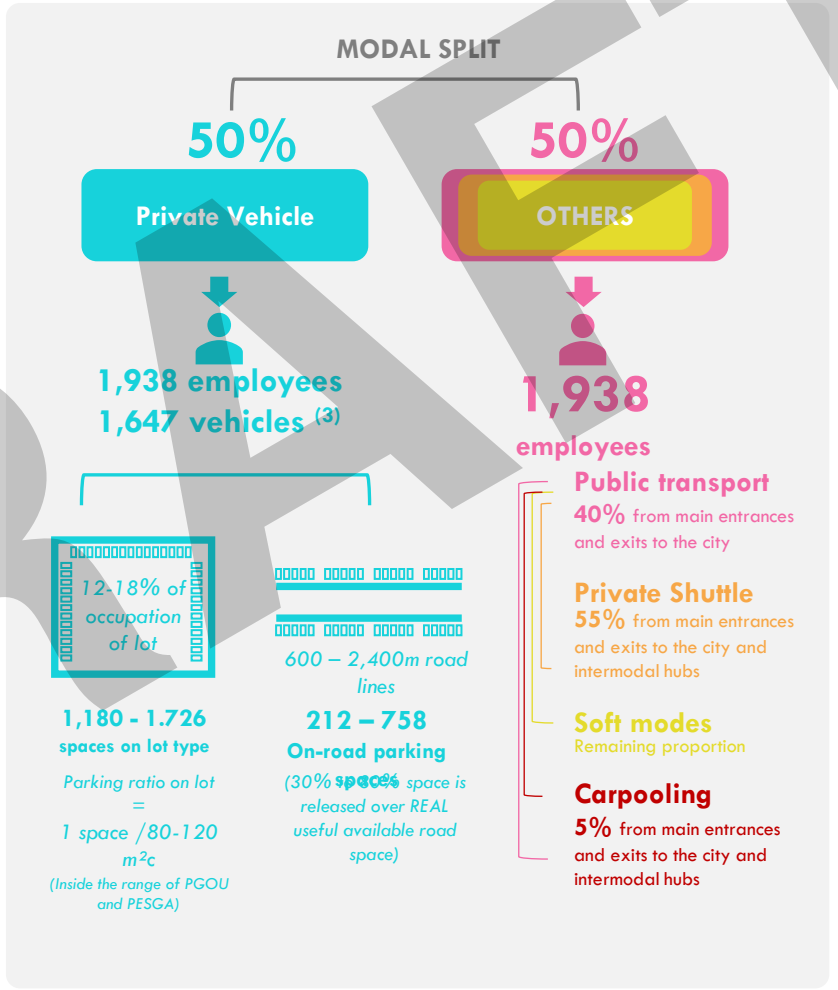
Parking strategy in the area

The development of the parking strategy for this area is based on an aspirational modal split of 50% - 50% (long-term excellence, non-binding and indicative only) in favour of alternative means of transport to the private vehicle which will be supported by specific measures provided for in the corresponding design criteria.

CONVENTIONAL ALTERNATIVE
(Basic good practices)



ASPIRATIONAL ALTERNATIVE
(Good practices based on excellence)



(1) *Current modal split on data base of Master Plan for attracted trips for each of the plots of land*

(2) *The mode of arrival at the final destination is considered*

(3) *It is considered that 30% of employees will share a private vehicle based on 2 employees per vehicle (measure contemplated under Collaborative Mobility criteria)*

"This area expects to achieve equitable contribution of modal split between private vehicles and other means of transport in its aspirational alternative

2.4 COHESION OF AREAS

The cohesion of development in the area deals with its internal connectivity and its lots with the environment, and establishes the elements and services necessary to meet the cohesion objectives during the life cycle of the project.

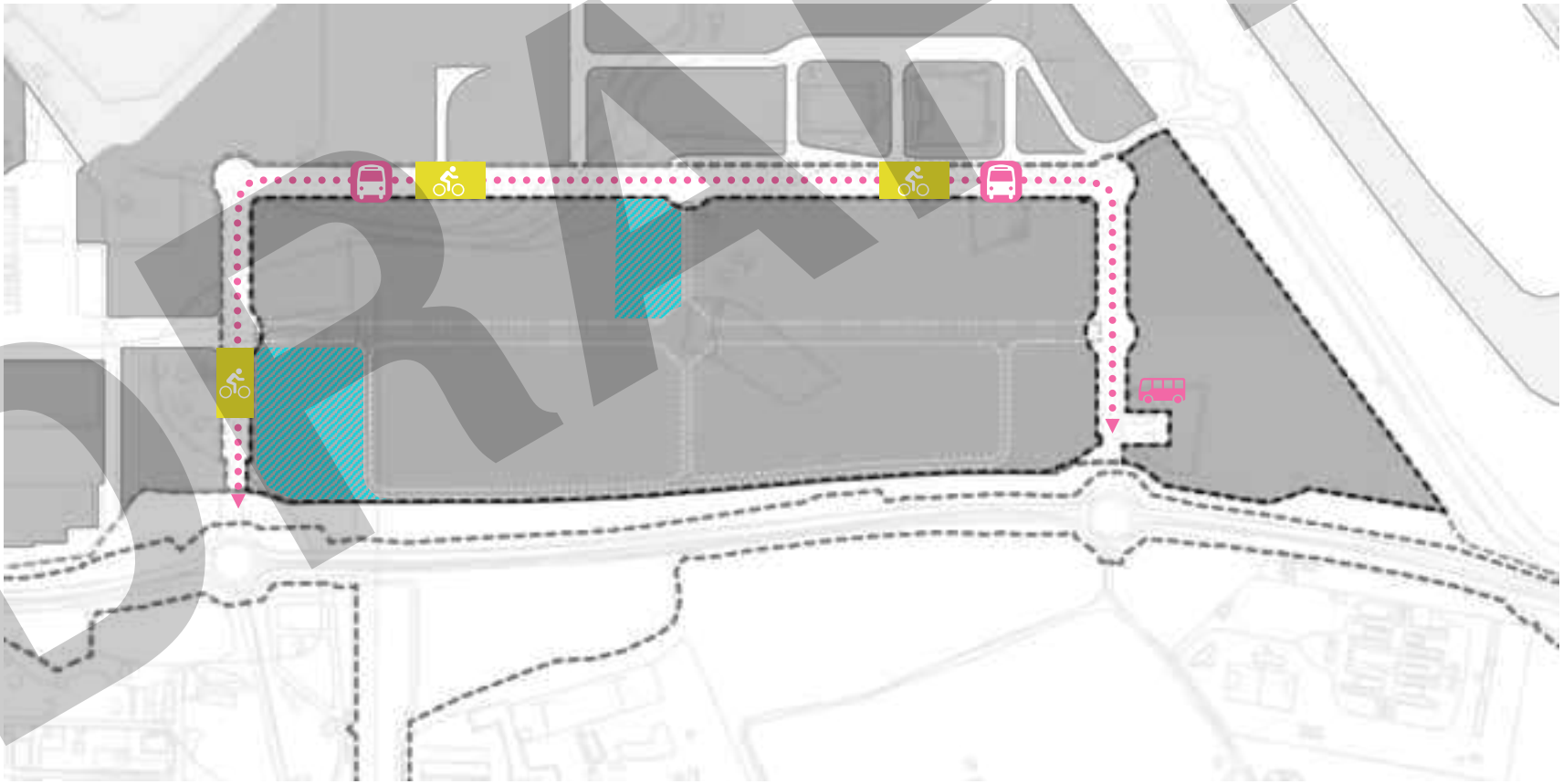
Public transport connectivity

This area is connected to private transport in vehicles and lorries, and alternative transport means through: Public Transport (extension of line 112); Internal shuttle network (area-T4, area-T123 and area-City); Booking of space on public road for collaborative mobility and Soft modes of transport.

The promotion of additional measures to public transport will be basic in order to achieve a modal split less favourable to the private transport of its workers. In order to do this, the criteria set out in Chapter 4 on Innovation for mobility must be met.

Key

- Extension of bus line 112 and stops envisaged in the Adolfo Suárez Madrid-Barajas Airport development plan
- Parking for soft modes of transport (illustrative, they should be focused and adequately suited to the series of lots)
- Potential urbanisation (merely illustrative) of the Truck Centre type of logistics services



Planning, pedestrian connectivity and illustrative green spaces of the Adolfo Suárez Madrid-Barajas Airport City, susceptible to later modification in the resulting planning instruments required. Source: Compiled by IDOM

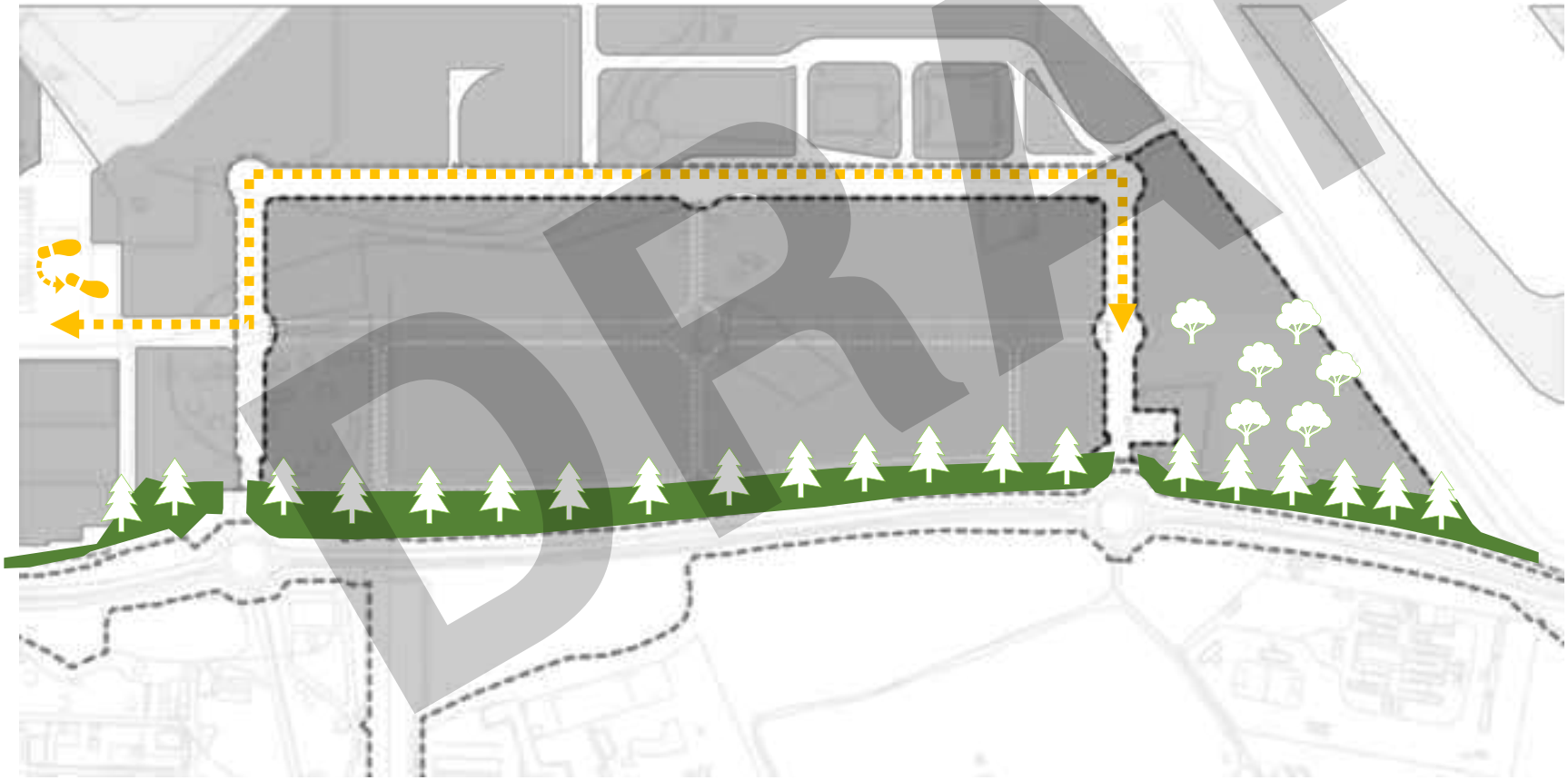
"The intermodal transport flows are critical to the optimum functioning of the areas

Strategy for pedestrian and green space network connectivity

This area will be integrated according to the cohesion criteria, with the city's green spaces, in terms of spatial continuity and with an adequate treatment and ratio of trees and vegetation.

In addition, a green leisure space will be provided for users of the logistics area, which will be maintained by the area's own investment developers.

The area will be connected, both for pedestrian access as well as by soft modes of transport, with Aena's Air Cargo Centre and Terminals T123 and in the future with its intermodal transport hub (metro, local transport, buses, etc).



Planning, pedestrian connectivity and illustrative green spaces of the Adolfo Suárez Madrid-Barajas Airport City, susceptible to later modification in the resulting planning instruments required. Source: Compiled by IDOM

Key

- Main pedestrian connection at area level
- Free zones and green spaces
- Arroyo de Rejas
- Green spaces integration City Council (Metropolitan Forest)

"The continuity of green spaces in the south side of the area serves as a vegetation boundary between the lots and outer road

CONTENTS

3.1 INNOVATION AND FLEXIBILITY IN THE REGULATORY FRAMEWORK

Introduction to the regulatory framework

Forming part of the airport environment involves the adoption of its own regulatory framework that regulates it and its activities.

This regulatory framework adopts an element of specific **flexibility** aimed at the adaptability of these activities to the air transport framework, and to the significant interest in it, by circumventing the specific requirements of common land regulation.

Taking into account the characteristics of the activities inherent in airport use, this white paper presents the maximum flexibility in the installation and adaptability of the specific form of the resulting lots to house them:

- The **structural elements are established: roads, green spaces, service networks**
- **Flexibility** of the introduction of activities and substitution of some for others within the general framework of activities envisaged in the airport environment.
- Applicability of **substitute performance-based criteria** that enable optimum development and resilience to the passing of time.

The current planning is the Modification of the Special Plan of the General Airport System of Madrid-Barajas (MPESGAM-B 2019), approved by the Urban Planning Commission of Madrid by Agreement 46/2019, of 20 May (BOCM no. 164, of 12 July).

Later, and pursuant to the provisions set forth in article 67.3 of the Law 9/2001, of 17 July, on Land of the Community of Madrid, the Consolidated Text of the Special Plan of the General Airport System A.S. Was drafted. Madrid-Barajas (TRPESGA ASM-B), approved by Agreement 14/2020, of 16 March 2020, of the Urban Planning Commission of Madrid (BOCM no. 124, of 25 May 2020.)

The Special Plan sets forth in its article 4.2.1:

> *"3. Other complementary activities may be included within this subsystem: business, scientific and technological, or distribution, derived from the aeronautical activity, as well as installations and equipment, in accordance with Article 2 of Royal Decree 2591/1998, of 4 December.*
>
> *4. These activities fall within the qualified uses in general urban planning as ceded and tertiary for the entire scope of the airport activities subsystem. In the Cargo, Aircraft Service, Services and Energy Supply areas, in addition to the aforementioned, the activities to be located, are framed within the so-called industrial uses, in general urban planning."*

"The white paper lays the foundation for development of the highest quality in urban, architectural and innovation terms

Introduction to the regulatory framework

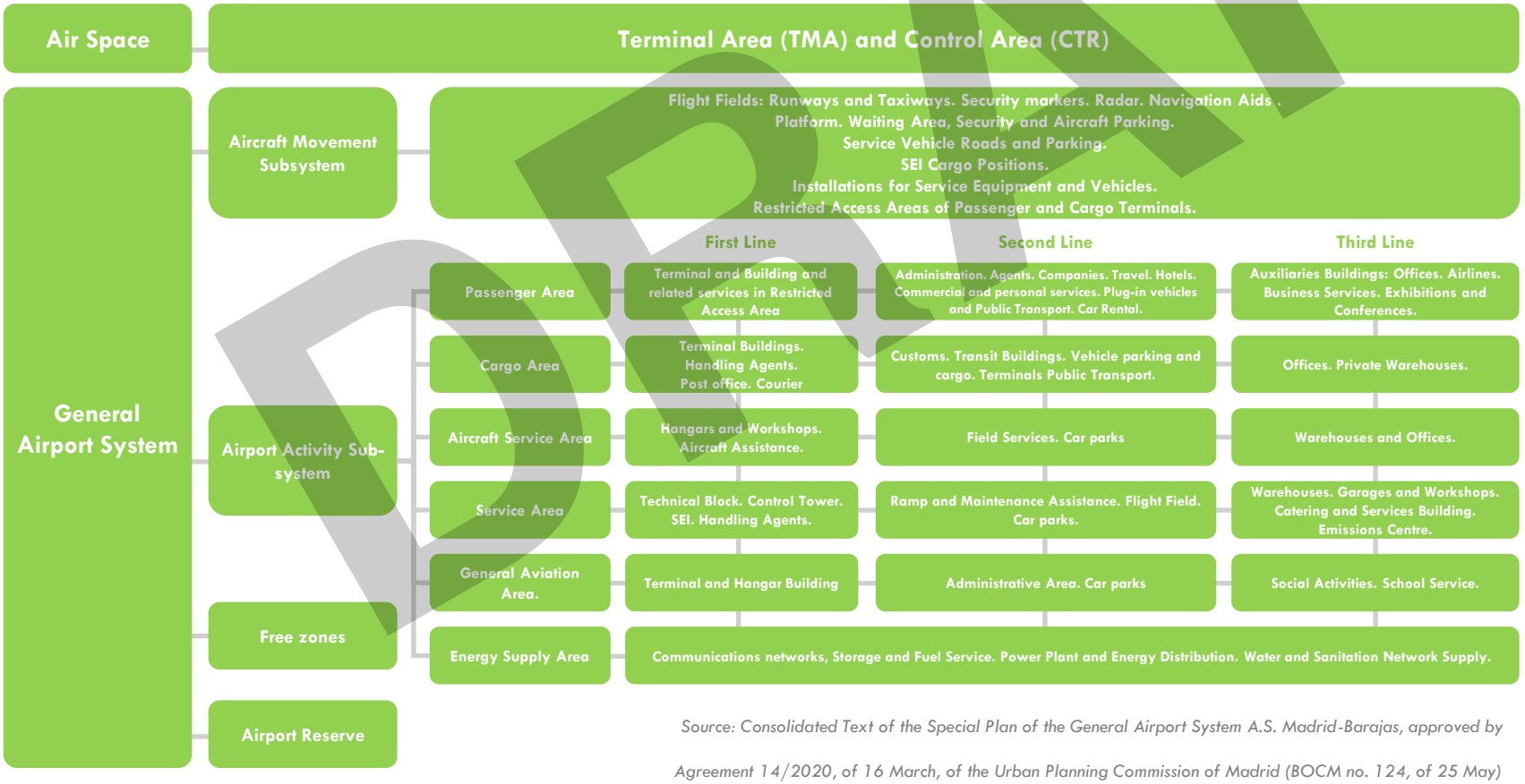
The management and location of activities follows the guidelines of the Director Plan, with the conditions of airport works, facilities and equipment regulated by the sectoral legislation on air navigation, derived from the corresponding International Standards established by the International Civil Aviation Organization (ICAO), as well as the technical regulations of the facility itself, and more specifically by Royal Decree 2591/1998, of 4 December, on General Interest Airport and Service Area Planning.

The PD and PESGA establish a complete forecast of activities in the Airport Activity Sub-system that must comply with Article 2 of RD 2591/1998.

In this context, the activities envisaged in the current planning are: Warehouses; Hotels; Offices; Business centres and business services; Commercial and personal services; Leisure centres; Hospitality services; Social, cultural and sports activities; Car parks; Maintenance workshops, etc.

The works and third-party activities to be implemented within the scope of the SGA are subject to the process for obtaining permits, licences and other authorisations required by the regulations in force, including the The regime of uses of the existing General Plans.

Functional Structure of the Airports



Source: Consolidated Text of the Special Plan of the General Airport System A.S. Madrid-Barajas, approved by Agreement 14/2020, of 16 March, of the Urban Planning Commission of Madrid (BOCM no. 124, of 25 May)

"The aeronautical easements include the aerodrome, radio electrical and aircraft operation easements.

Aeronautical easements

The aeronautical easements define the airspace that must be kept free of obstacles around and inside the airport system in order to ensure the safety of aircraft operations and the protection of navigation aids. Its impact on the area of the Adolfo Suárez Madrid-Barajas Airport City is relevant, as it defines maximum building heights and constructions on the areas of influence defined by the airport's technical requirements.

For this purpose, according to Decree 584/72 three types of aeronautical easements are distinguished:

- Aerodrome easements
- Radio electrical easements
- Aircraft operation easements

Any development within the SGA must receive the approval of Aena and ENAIRE, regardless of the violation or not of the Aeronautical easements, including the area's land because they belong in their entirety to the SGA.

In any case, and regardless of the heights permitted by the aeronautical easements, as established in Art. 5 Decree 584/72, any fixed or mobile construction or installation that rises to a height of more than 100 metres over plains or prominent parts of the land is considered an obstacle to air navigation.

In cases in which the aeronautical easements are violated, the law (Art.29 Decree 584/72) provides that, exceptionally, the Directorate General for Civil Aviation may issue a favourable report for such plans and management instruments, provided that they are accredited, in the opinion of the competent National Supervisory Authority (in this case, AESA), which does not compromise the safety or regularity of aircraft operations at the aerodrome. In addition, point 3 of Article 30 of the aforementioned rule exempts the airport manager from the prior authorisation by the aviation authority for the actions they carry out inside the aerodrome premises in the exercise of their duties.

In cases where Decree 584/72, establishes that, for this purpose, the agency or Administration requesting the favourable report, shall provide an Aeronautical Safety Study, in any case, at the expense of the promoter, signed by the competent technician, to demonstrate that safety and regularity are not compromised in air operations. This will be the subject of consultation with the airport manager and/or the air navigation service provider and informed by the National Civil Supervisory Authority. Consultation with the airport manager will also be necessary and essential for actions within the airport premises.

The aeronautical easements comprise a series of reference areas that establish the maximum heights that can be reached by the constructions, installations and plantations carried out on the surface of the land covered by them, such areas depend on the configuration of the flight field, of CNS systems and aircraft operations. In addition, through the application of Article 10 of D 584/72, an activity limitation facility is established by which activities carried out in the aerodrome environment that may pose a danger to aircraft operations may be prohibited or limited.

"The aeronautical easements include the aerodrome, radio electrical and aircraft operation easements.

Considerations on the mandatory regulations

Taking into account the principle of coherence of the legal system, and in accordance with the lot characteristics of the specific standard for air and airport regulation, those rules that comply with the principle of speciality are considered applicable, and thus are reflected in this white paper, such as those that ensure respect for the environment, the construction of a safe and healthy urban environment, or those that attend to the building, highlighting as an example:

- Sectoral: mandatory airport legislation and Director Plan.
- Environmental: specific state legislation (for example, Law 21/2013 on environmental impact assessment) and in each Autonomous Community (emissions, noise, water contamination, etc.).
- Building: LOE, CTE (DB-SE, DB-HS, others), Accessibility, Energy Certification, EHE, etc.
- Urban Planning: TRPESGA ASM-B and General Development Plans. The consolidated text of the PESGA states the following:

Article 1.2. General Implementing Legislation:

> *"2. Land Regulation: Law 9/2001, of 17 July, on the Land of the Community of Madrid, and Law 9/1995, of 28 March, on Measures of Territorial Policy, Land and Urban Planning shall apply; Law 6/1998, on Land Regime and Valuation and Royal Legislative Decree 1/1992, of 26 June, consolidated text of the Land Law and Urban Planning, in the articles that remain in force. In a supplementary capacity, the Law on Land Regime and Urban Planning (Royal Decree 1346/1976, of 9 April), as well as the Regulations implementing it."*

Article 4.2.1. Definitions:

> *"4. These activities fall within the qualified uses in general urban planning as ceded and tertiary for the entire scope of the airport activities subsystem. In the Cargo, Aircraft Service, Services and Energy Supply areas, in addition to the aforementioned, the activities to be located, are framed within the so-called industrial uses, in general urban planning."*

Article 4.2.4. Development criteria for works promoted by third parties:

> *"4. For the calculation of the building intensity, the constructed area will be considered that computable according to the Urban Municipal Planning Regulations."*

Article 4.2.5. General planning criteria:

> *"3. The conditions of management, contained in this article 4.2.5, may be modified by means of a Detailed Study, which will be processed in accordance with the urban legislation in force. The maximum height of the building shall comply with the provisions of Royal Decree 1541/2003, of 5 December."*

"In the regulatory references those framed in the mandatory regulations in force, guidelines and good reference practices are distinguished.

Considerations on the reference regulations and best practices

The construction of a high-quality environment in the development of the airport environment, as well as considering that the purpose of this development is to contribute to the creation of a quality urban environment, make it necessary to take as guiding standards of development those that have been effective throughout their implementation, and constitute positive references and best practices:

- Municipal approaches from the neighbouring municipalities, for example, in the space pertaining to the municipality of Madrid, the municipal plans of Alcobendas constitute a reference document without mandatory compliance.
- Sustainable mobility ordinances, protection of the urban environment, efficient water management and use, noise pollution, design and management of public road works, of the Madrid City Council.
- Publications without the status of standards, aimed at the quality of urban development:
    - Urban sustainability indicator plans (Vitoria Gasteiz, Barcelona…).
    - Director Plan for road trees of the city of Madrid.
    - Green Infrastructure and Biodiversity Plan of Barcelona 2020
    - Etc.

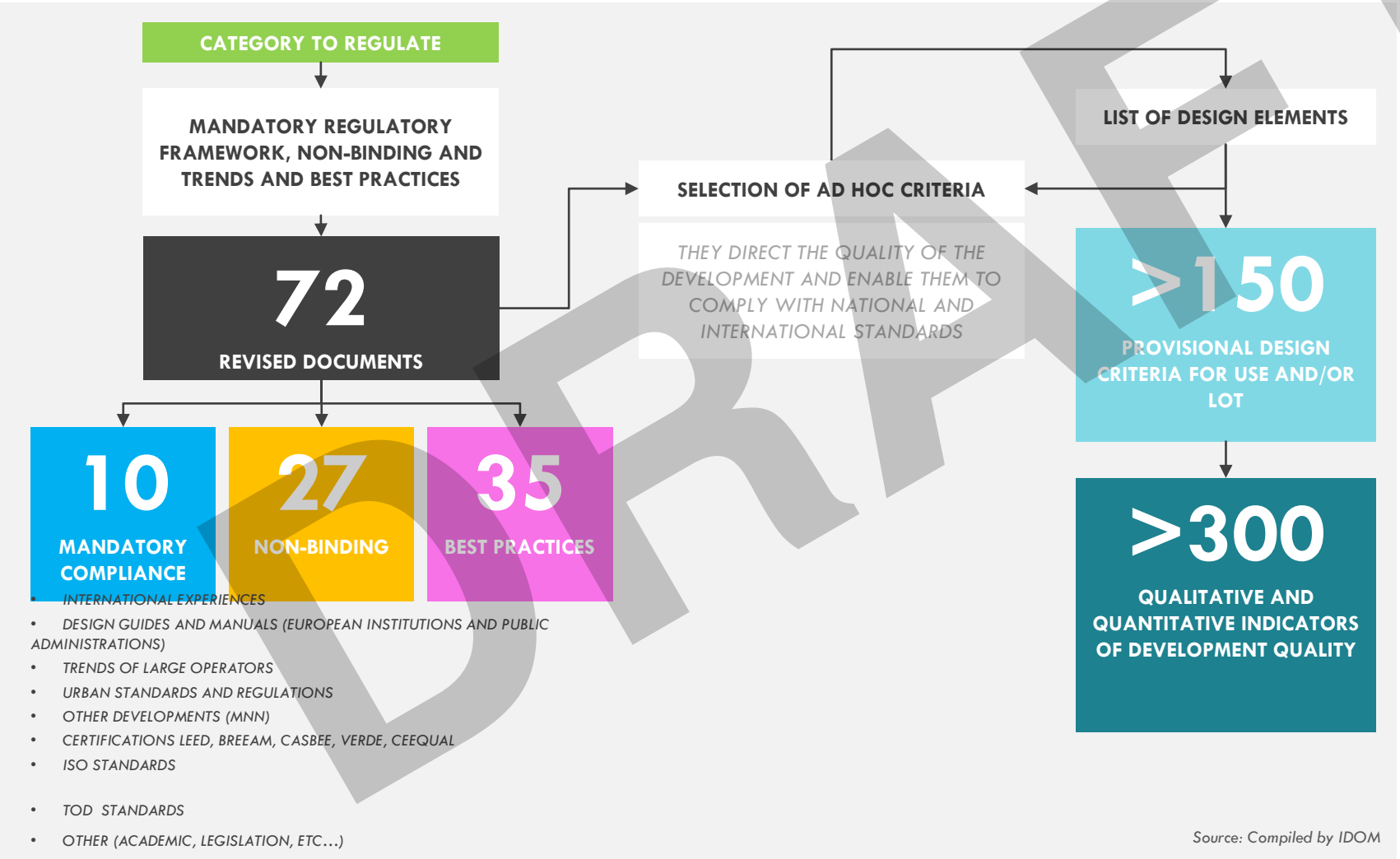
Aena does not require any type of certification through this white paper. However, the criteria in this document are compatible with and comply with industry-certified standards.

The aeronautical easements include the aerodrome, radio electrical and aircraft operation easements.

Application methodology of regulatory framework and best practices

The applicability of the regulatory framework and best practices to the design criteria of this White Paper meets two main objectives: (1) to manage the quality of the development, and (2) enable compliance with national and international standards.

For this 72 documents have been reviewed, based on international experiences, design guides and manuals, urban standards, other developments in the area, internationally recognised certifications, etc. Through this compilation, an ad hoc selection of criteria has been made, resulting in more than 150 design criteria and more than 300 qualitative and quantitative indicators that guarantee the quality of the Adolfo Suárez Madrid-Barajas Airport City development.



Source: Compiled by IDOM

"In the regulatory references those framed in the mandatory regulations in force, guidelines and good reference practices are distinguished.

CONTENTS

LIST OF GENERAL DESIGN CRITERIA FOR STRUCTURAL ELEMENTS - GC

p.	CODE	TITLE	GOOD PRACTICE B	GOOD PRACTICE R	GOOD PRACTICE E	STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE 5
CG-A SUSTAINABILITY CRITERIA FOR STRUCTURAL ELEMENTS										
	GC-A1	*Water*								
80	GC-A1.1	GLOBAL STORMWATER REUSE STRATEGY		R	E	1	2			
	GC-A2	*Electric vehicle*								
81	GC-A2.1	ELECTRIC VEHICLE CHARGING INFRASTRUCTURE	B			1			4	
	GC-A3	*Public transport*								
81	GC-A3.1	PUBLIC TRANSPORT	B		E	1	2			
	GC-A4	*Smart parking*								
81	GC-A4.1	SMART PARKING			E	1	2			
GC-B CRITERIA FOR THE URBANISATION OF ROADS, OPEN SPACES AND GREEN AREAS OF STRUCTURAL ELEMENTS										
	GC-B3	*Urbanisation in green areas*								
84	GC-B3.1	GREEN SPACE STRATEGY IN BUFFER AREAS CLOSE TO NATURAL STREAMS	B	R		1	2			
84	GC-B3.2	STRATEGY FOR GREEN AREAS IN VACANT AND RESIDUAL SPACES BETWEEN ROAD INFRASTRUCTURE	B			1	2			
85	GC-B3.3	SLOPES	B			1	2			
85	GC-B3.5	AIRPORT ACTIVITY PROTECTION	B			1				
CG- C DIFFERENTIAL ASPECT CRITERIA FOR STRUCTURAL ELEMENTS										
	GC-C1	*Airport City Identity*								
88	GC-C1.1	CREATION OF IDENTITY DESIGN	B	R		1	2		4	
89	GC-C1.2	UNIQUE DIGITAL PANEL SOLUTIONS		R		1	2		4	
89	GC-C1.3	INFORMATION IN UNIQUE DIGITAL PANEL SOLUTIONS		R		1	2		4	
90	GC-C1.4	UNIQUE URBAN FURNITURE SOLUTIONS		R	E	1	2		4	
91	GC-C1.5	UNIQUE SIGNAGE SOLUTIONS		R	E	1	2		4	

	B	R	E
GOOD PRACTICE	Basic	Relevant	Excellence

	1	2	3	4	5
STAGE	Urban Planning	Design	Construction	Use and Maintenance	End of life

p.	CODE	TITLE	GOOD PRACTICE B	GOOD PRACTICE R	GOOD PRACTICE E	STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE 5
		UP-A CRITERIA FOR URBAN EXPERIENCE								
	UP-A1	*Flexibility and functional mix*								
94	UP-A1.1	COMPLEMENTARY ACTIVITIES TO THE CHARACTERISTIC OR MAIN ACTIVITY	B	R	E	1				
95	UP-A1.2	SPECIFIC TO OFFICE, COMMERCIAL AND HOTEL: COMPLEMENTARY AND COMPATIBLE ACTIVITIES ON THE GROUND FLOOR	B	R	E	1				
95	UP-A1.3	SPECIFIC TO LOGISTICS: AUXILIARY SERVICES	B	R	E	1				
96	UP-A1.4	FLEXIBILITY OF DIVIDING LOTS	B	R	E	1				
	UP-A2	*Compactness and volumetry*								
97	UP-A2.1	MAXIMUM NET BUILDING INTENSITY	B	R	E	1				
98	UP-A2.2	MAXIMUM LOT OCCUPANCY	B	R	E	1				
98	UP-A2.3	MAXIMUM BUILDING HEIGHT	B	R	E	1				
103	UP-A2.4	MINIMUM BUILDING SETBACKS	B	R	E	1				
	UP-A3	*Furniture and lighting*								
105	UP-A3.1	FURNITURE AND ELEMENTS IN OPEN SPACES	B	R	E	1				
107	UP-A3.2	OUTDOOR LIGHTING	B	R	E	1				
108	UP-A3.3	OUTDOOR LIGHTING LEVELS	B	R	E	1				
	UP-A4	*Urbanisation maintenance conditions*								
110	UP-A4.1	QUALITY OF OUTDOOR URBANISATION	B	R	E	1				
111	UP-A4.2	BASIC CONDITIONS FOR URBANISATION MAINTENANCE	B	R	E	1				

	B	R	E
GOOD PRACTICE	Basic	Relevant	Excellence

	1	2	3	4	5
STAGE	Urban Planning	Design	Construction	Use and Maintenance	End of life

LIST OF URBANISATION AND LANDSCAPE DESIGN CRITERIA - UP (2/3)

p.	CODE	TITLE	GOOD PRACTICE B	GOOD PRACTICE R	GOOD PRACTICE E	STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE 5
UP-B CRITERIA FOR OPEN SPACES, ROADS AND GREEN AREAS										
	UP-B1	*Road urbanisation conditions*								
114	UP-B1.1	DIMENSION OF THE ROAD SECTION AND ITS COMPONENTS	B	R	E	1				
117	UP-B1.2	PROMOTION OF PEDESTRIAN MOBILITY AND SOFT MOBILITY SYSTEMS	B	R	E	1				
117	UP-B1.3	SPECIFIC TO LOGISTICS: FREIGHT AND TRANSPORT ROADS	B	R	E	1				
118	UP-B1.5	CYCLE LANE ROUTES	B	R	E	1				
119	UP-B1.6	INTEGRATION OF CYCLE LANES ON ROADS	B	R	E	1				
120	UP-B1.7	DISTRIBUTION OF PARKING ON ROADS	B	R	E	1				
121	UP-B1.8	CONCENTRATION OF PARKING SPACES INSIDE LOTS OR IN SILOS	B	R	E	1				
	UP-B2	*Urbanisation conditions for open spaces (non-road)*								
122	UP-B2.1	OPEN SPACES AND GREEN AREAS	B	R	E	1				
123	UP-B2.2	TREE CHARACTERISTICS	B	R	E	1				
125	UP-B2.3	CHARACTERISTICS OF THE RECREATIONAL AREAS DEPENDING ON THE ORIENTATION AND CLIMATOLOGY	B	R	E	1				
125	UP-B2.4	HEDGEROW	B	R	E	1				
	UP-B3	*Differential aspects*								
126	UP-B3.2	LOCATION OF VEHICLE SIGNAGE	B	R	E	1				
127	UP-B3.3	LOCATION OF PEDESTRIAN SIGNAGE	B	R	E	1				
	UP-B4	*Recreation and leisure*								
128	UP-B4.1	QUALITIES OF RECREATION AND LEISURE SPACES	B	R	E	1				

GOOD PRACTICE	B	R	E
	Basic	Relevant	Excellence

STAGE	1	2	3	4	5
	Urban Planning	Design	Construction	Use and Maintenance	End of life

p.	CODE	TITLE	GOOD PRACTICE B	GOOD PRACTICE R	GOOD PRACTICE E	STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE 5
UP-C CRITERIA FOR SUSTAINABILITY										
	UP-C1	*Energy*								
132	UP-C1.1	RENEWABLE ENERGIES	B	R	E	1				
132	UP-C1.2	SMART GRID	B	R	E	1				
133	UP-C1.3	USE OF RENEWABLE ENERGY SOURCES DURING THE CONSTRUCTION PHASE	B	R	E	1		3		
	UP-C2	*Health and comfort*								
134	UP-C2.1	OUTDOOR CLIMATIC COMFORT	B	R	E	1	2			
135	UP-C2.3	SHADING ELEMENTS	B	R	E	1	2			
135	UP-C2.4	OUTDOOR ACOUSTIC COMFORT	B	R	E	1	2			
	UP-C3	*Water*								
136	UP-C3.1	SEPARATE GRIDS	B	R	E	1	2			
136	UP-C3.2	RECLAIMED WATER GRID	B	R	E	1	2			
137	UP-C3.3	PERMEABILITY OF PAVEMENTS	B	R	E	1	2	3	4	
137	UP-C3.4	SUSTAINABLE URBAN DRAINAGE IN OPEN SPACES	B	R	E	1	2	3	4	
	UP-C4	*Circular economy*								
138	UP-C4.1	REGIONAL MATERIALS	B	R	E		2	3	4	5
138	UP-C4.2	RESPONSIBLE REMOVAL OF MATERIALS	B	R	E		2	3	4	5
139	UP-C4.3	OPTIMISATION OF CONSUMPTION, NATURAL RESOURCES AND WASTE	B	R	E		2	3	4	5
UP- D CRITERIA FOR URBAN NETWORKS										
	UP-D1	*Urban networks*								
142	UP-D1.1	CHARACTERISTICS OF SERVICE INFRASTRUCTURE NETWORKS	B	R	E	1	2	3	4	
143	UP-D2.1	WATER CYCLE, SUPPLY, SANITATION, TREATMENT AND RECLAIMED WATER	B	R	E	1	2	3	4	
144	UP-D3.1	STORAGE, COLLECTION AND TREATMENT OF URBAN WASTE	B	R	E	1	2	3	4	5
144	UP-D4.1	ENERGY SUPPLY AND PRODUCTION	B	R	E	1	2	3	4	
145	UP-D5.1	LIGHTING AND TRAFFIC LIGHTS	B	R	E	1	2	3	4	
145	UP-D6.1	TELECOMMUNICATIONS AND DATA	B	R	E	1	2	3	4	

GOOD PRACTICE	B	R	E
	Basic	Relevant	Excellence

STAGE	1	2	3	4	5
	Urban Planning	Design	Construction	Use and Maintenance	End of life

LIST OF CONSTRUCTION DESIGN CRITERIA – CO (1/3)

p.	CODE	TITLE	GOOD PRACTICE B	GOOD PRACTICE R	GOOD PRACTICE E	STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE 5
CO-A CRITERIA FOR ARCHITECTURAL EXPERIENCE										
	CO-A1	*Implementation*								
148	CO-A1.1	MAXIMUM SLOPES OF THE AREA	B	R	E	1	2	3		
148	CO-A1.2	LAND REUSE	B	R	E	1	2	3		
	CO-A2	*Typological flexibility*								
149	CO-A2.1	TYPOLOGICAL FLEXIBILITY	B	R	E		2	3		
150	CO-A2.2	SURFACE AREA OF OFFICE SPACES	B	R	E		2	3		
151	CO-A2.3	SURFACE AREA OF LOGISTICS SPACES	B	R	E		2	3		
	CO-A3	*Headroom*								
152	CO-A3.1	HEADROOM OF SPACES	B	R	E		2	3		
154	CO-A3.2	HEIGHT DIVERSITY OF LOGISTICS SPACES	B	R	E		2	3		
	CO-A4	*Hollows*								
155	CO-A4.1	OPTIMISATION OF OPENINGS IN THE ENVELOPE	B	R	E		2	3		
156	CO-A4.2	FAÇADE OPENINGS	B	R	E		2	3		
157	CO-A4.3	FAÇADE INSULATION	B	R	E		2	3		
157	CO-A4.4	PEDESTRIAN ACCESS TO THE BUILDING	B	R	E		2	3		
	CO-A5	*Roofing*								
158	CO-A5.1	PHOTOVOLTAIC PANELS ON ROOFS	B	R	E		2	3		
158	CO-A5.2	OPTIMISATION OF THE ROOF SURFACE	B	R	E		2	3		
159	CO-A5.3	SPECIFIC TO OFFICE, COMMERCIAL AND HOTEL: VEGETATION COVER	B	R	E		2	3		
160	CO-A5.4	FIFTH FAÇADE	B	R	E		2	3		
160	CO-A5.5	HVAC INSTALLATIONS ON ROOFS	B	R	E		2	3		
160	CO-A5.6	RAINWATER HARVESTING	B	R	E		2	3		

GOOD PRACTICE	B	R	E
	Basic	Relevant	Excellence

STAGE	1	2	3	4	5
	Urban Planning	Design	Construction	Use and Maintenance	End of life

p.	CODE	TITLE	GOOD PRACTICE B	GOOD PRACTICE R	GOOD PRACTICE E	STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE 5
CO-B CRITERIA FOR OPEN AND GREEN AREAS WITHIN LOTS										
	CO-B1	*Green areas within lots*								
170	CO-B1.1	RATIO OF GREEN AREAS WITHIN LOTS	B	R	E	1	2	3		
170	CO-B1.2	CHOICE OF TREE TYPE	B	R	E	1	2	3		
171	CO-B1.3	SHADING AREAS	B	R	E	1	2	3		
	CO-B2	*Open spaces within lots*								
172	CO-B2.1	RATIO BETWEEN OPEN-PRIVATE AREAS OF THE LOT AND OPEN SPACES OF THE AREA	B	R	E	1	2	3		
172	CO-B2.2	QUALITY OF ACCESS ROUTES	B	R	E	1	2	3		
	CO-B3	*Parking within lots*								
173	CO-B3.1	PARKING SPACES WITHIN THE LOT	B	R	E	1	2	3		
CO-C CRITERIA FOR SUSTAINABILITY										
	CO-C1	*Energy*								
178	CO-C1.1	ZERO CARBON	B	R	E		2		4	
179	CO-C1.2	RENEWABLE ENERGIES	B	R	E		2		4	
179	CO-C1.3	BUILDING ENERGY SIMULATION	B	R	E		2		4	
179	CO-C1.4	CHARACTERISTICS OF THE ENVELOPE	B	R	E		2	3	4	
180	CO-C1.5	PASSIVE ENERGY EFFICIENCY MEASURES	B	R	E		2	3	4	
181	CO-C1.6	BUILDING AND LOT ORIENTATION	B	R	E		2	3	4	
182	CO-C1.7	ACTIVE MEASURES (MINIMUM COP PERFORMANCE)	B	R	E		2	3	4	
182	CO-C1.8	ACTIVE MEASURES (ACS PRODUCTION)	B	R	E		2	3	4	
182	CO-C1.9	ACTIVE MEASURES (LOW-TEMPERATURE USE SYSTEMS)	B	R	E		2	3	4	
183	CO-C1.10	GHG EMISSIONS	B	R	E		2		4	
183	CO-C1.11	COMMISSIONING VERIFICATION	B	R	E		2		4	5

GOOD PRACTICE	B	R	E
	Basic	Relevant	Excellence

STAGE	1	2	3	4	5
	Urban Planning	Design	Construction	Use and Maintenance	End of life

LIST OF CONSTRUCTION DESIGN CRITERIA – CO (3/3)

p.	CODE	TITLE	GOOD PRACTICE B	GOOD PRACTICE R	GOOD PRACTICE E	STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE 5
CO-C CRITERIA FOR SUSTAINABILITY										
	CO-C2	*Health and comfort*								
184	CO-C2.1	INDOOR HYGROTHERMAL CONTROL	B	R	E		2			
184	CO-C2.2	SUFFICIENT AND EFFICIENT AIR RENEWAL	B	R	E		2			
185	CO-C2.3	NATURAL LIGHTING	B	R	E		2			
186	CO-C2.4	INDOOR LIGHTING	B	R	E		2			
186	CO-C2.5	ENVELOPE PERMEABILITY TO EXTERNAL NOISE	B	R	E		2			
187	CO-C2.6	PROTECTION FROM NOISE GENERATED INDOORS	B	R	E		2			
187	CO-C2.7	INDOOR NOISE REVERBERATION TIME	B	R	E		2			
188	CO-C2.8	SPECIFICALLY FOR OFFICE SPACES: VIEWS	B	R	E		2			
	CO-C3	*Water*								
189	CO-C3.1	WATER MANAGEMENT SEPARATION SYSTEM	B	R	E		2			
189	CO-C3.2	RAINWATER RETENTION AND FILTERING SYSTEMS FOR REUSE	B	R	E		2			
190	CO-C3.3	WATER SELF-SUFFICIENCY	B	R	E		2			
190	CO-C3.4	REDUCTION OF WATER DEMAND	B	R	E		2		4	
191	CO-C3.5	POTENTIAL USES OF WATER REUSE	B	R	E		2		4	
191	CO-C3.6	QUALITY OF THE SERVICE	B	R	E		2		4	
192	CO-C3.7	OIL AND/OR HYDROCARBON SEPARATOR SYSTEMS	B	R	E		2		4	
192	CO-C3.8	LEAK DETECTION	B	R	E		2		4	

GOOD PRACTICE	B	R	E
	Basic	Relevant	Excellence

STAGE	1	2	3	4	5
	Urban Planning	Design	Construction	Use and Maintenance	End of life

p.	CODE	TITLE	GOOD PRACTICE B	GOOD PRACTICE R	GOOD PRACTICE E	STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE 5
IN-A CRITERIA FOR SMART MOBILITY										
	IN-A1	*Collaborative mobility*								
196	IN-A1.1	COLLABORATIVE MOBILITY	B		E	1				
	IN-A2	*Transport shuttles*								
197	IN-A2.1	SHUTTLE SERVICE	B	R		1				
IN- B CRITERIA FOR SMART BUILDINGS										
	IN-B1	*Building management system*								
200	IN-B1.1	BUILDING MANAGEMENT SYSTEM	B	R			2			
	IN-B2	*Digital twin*								
201	IN-B2.1	DIGITAL TWIN	B	R		1	2	3	4	5
	IN-B3	*Sensorisation*								
202	IN-B3.1	COMMUNICATION OF SENSORISATION ELEMENTS		R			2		4	5
	IN-B4	*Promotion of Smart buildings*								
202	IN-B4.1	PROMOTION OF SMART BUILDINGS	B				2	3	4	5
IN-C DATA AND MONITORING CRITERIA										
	IN-C1	*Urban control, automation and monitoring infrastructure*								
206	IN-C1.1	URBAN CONTROL, AUTOMATION AND MONITORING INFRASTRUCTURE	B	R	E	1	2		4	
	IN-C2	*Building control, automation and monitoring infrastructure*								
207	IN-C2.1	BUILDING CONTROL, AUTOMATION AND MONITORING INFRASTRUCTURE	B	R	E		2		4	

GOOD PRACTICE	B	R	E
	Basic	Relevant	Excellence

STAGE	1	2	3	4	5
	Urban Planning	Design	Construction	Use and Maintenance	End of life

For the different design criteria, the White Paper establishes **indicators** and three levels of applicability (basic, relevant and excellence good practices).

If there is no basic good practice for the indicators of a criterion, compliance with that criterion is not mandatory.

Compliance with good practices shall be cumulative (e.g. for compliance with the relevant good practice it is necessary to comply with the basic good practice).

Indicator (quantitative or qualitative)

Description of the indicator.

Basic good practice:	*Mandatory Compliance*	✓
Relevant good practice:	*Optional Compliance*	✓
Excellence good practice:	*Optional Compliance*	✓

Complementary measures raise the basic good practice or relevant good practice referenced in its description by one level.

If there is no mention in the description of the complementary measure about the level of good practice that is achieved after compliance, it will be assumed that it raises any good practice by one level.

Illustrative example of complementary measure ✓

An excellence good practice can be obtained if there is a centralisation within the Solar and/or micro-wind energy area registered in the signage elements, which can be used in other urban elements.

Substitute measures replace the need to comply with the quantitative or qualitative parameter of the good practice referenced in its description. They may involve a replacement of the indicator (illustrative example 1), or the possibility of compliance with the indicator with an additional aspect (illustrative example 2) or exemption from compliance with the indicator based on a condition (illustrative example 3).

If there is no mention in the description of the substitute measure of the level of good practice it replaces, the basic good practice will be assumed.

Illustrative example 1 of substitute measure ✓

A basic good practice is to differentiate accesses within the same lot and to build an accessible street façade.

Illustrative example 2 of substitute measure ✓

Places for excellence good practice may be compensated between Areas, provided they are the closest to each other.

Illustrative example 3 of substitute measure ✓

Pre-existing roads shall be exempted from compliance with the quantitative indicator, provided that they have a pavement width greater than or equal to 1,5 m.

The stages are the phases of the development of Airport City Adolfo Suárez Madrid-Barajas that cover the design criteria, classified as (1) urban planning, (2) design, (3) construction, (4) use and maintenance and (5) end of life.

Strategic commitments are the basis for quality, sustainable and resilient development, but also lead to value-added development for the investor, and include (1) commitment to the city, (2) sustainability, (3) airport identity and (4) innovation.

Objectives are the specific goals that the design criteria are meant to achieve.

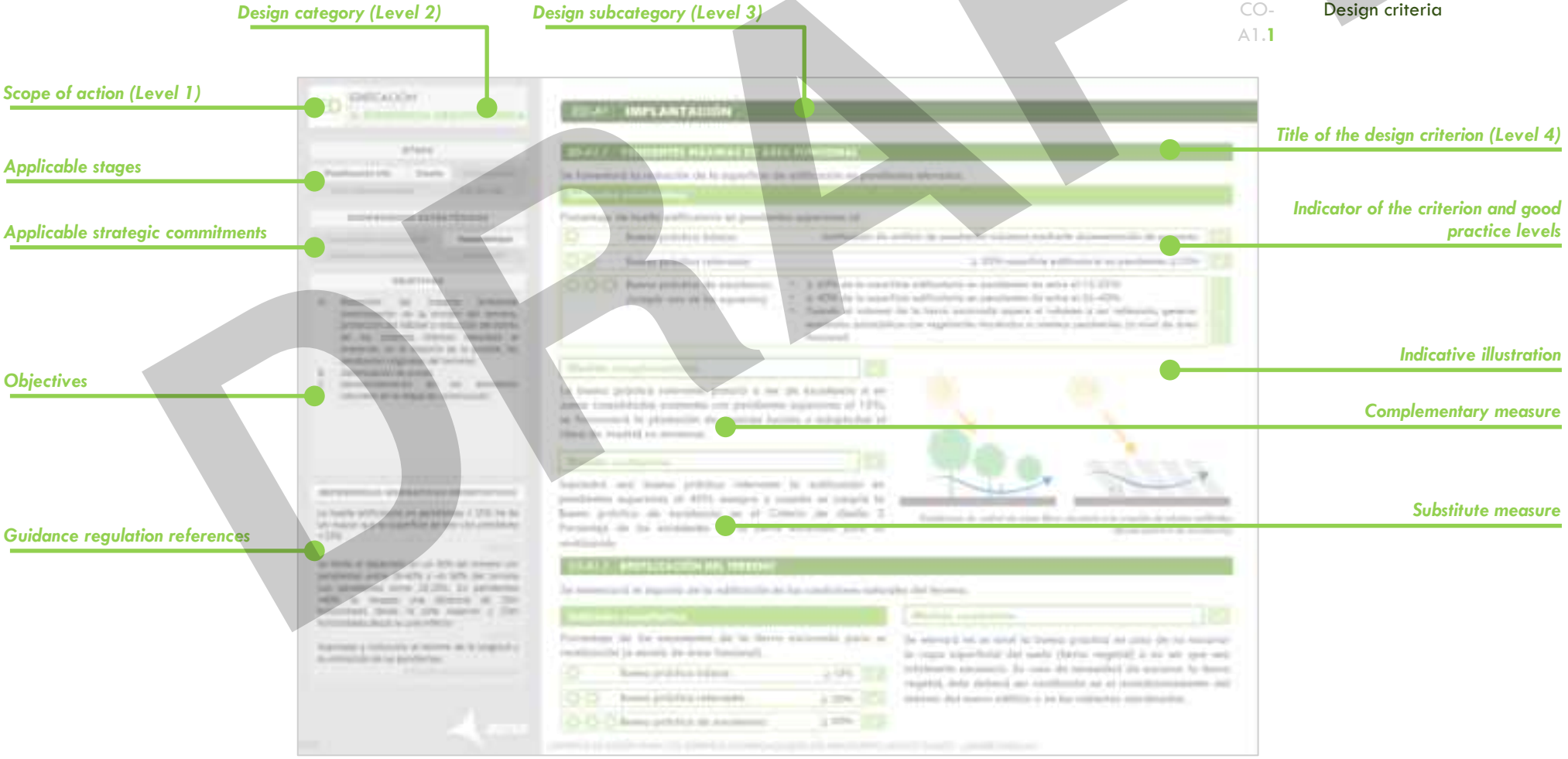
Guidance regulation references include the mandatory regulatory framework, recommended guidelines and good practice benchmarks.

C - A 1 . 1

CODES OF THE DESIGN ELEMENTS

Scope of action	Design category	Design subcategory	Design criteria
CO-	A	1	.1

CO-A1.1	Scope of action
CO-**A**1.1	Design category
CO-A**1**.1	Design subcategory
CO-A1.**1**	Design criteria



CONTENTS

GC General criteria for structural elements

Structuring elements are the relevant criteria that (1) require a different mention to the other the categories in chapter 4, that (2) require the involvement of external agents to fulfil them or that (2) enable coordination, cohesion and joint development with other Areas within Airport City Adolfo Suárez Madrid-Barajas the application scope of which exceeds the Area itself.

A. Sustainability

Sustainability in the urban planning of the airport plays a fundamental role in the achievement of sustainable local development, especially if we take into account what an operation of this magnitude means for the city.

This section lays the foundations for the criteria that will guarantee an environmentally committed development by means of structuring criteria for the Airport City Adolfo Suárez Madrid-Barajas. The sustainability performance of each of the Areas depends, to some extent, on the fulfilment of these objectives.

STAGE

Urban Planning	**Design**	Construction
Use and Maintenance	End of life	

STRATEGIC COMMITMENTS

Commitment to the city	Sustainability
Airport identity	Innovation

OBJECTIVES

A. Decrease in demand in the municipal supply network and in the flow in the municipal sewerage network
B. Optimisation of the irrigation system
C. Provide recharging points distributed throughout the area
D. Promoting low or zero emission mobility

REGULATORY AND GOOD PRACTICE FRAMEWORK

Have a separate network for rainwater and waste water.
GREEN Guide for Urban Developments in Industrial Estates

Public-Private Involvement in Sustainable Mobility
Madrid's Sustainable Urban Mobility Plan
Responsibility of the electric vehicle charging infrastructure company
National Integrated Energy and Climate Plan
2% reserve for carpooling, 2% for carsharing and 2% for electric vehicles
GREEN Guide for Urban Developments in Industrial Estates

GC-A1 WATER

GC-A1.1 GLOBAL STORMWATER REUSE STRATEGY

The implementation of a general rainwater reuse strategy will be promoted throughout the scope of the Airport City Adolfo Suárez Madrid-Barajas. This strategy will consist of channelling the remaining water from the plots to public or private uses with non-potable water needs, with the necessary mechanisms to avoid attracting birds, mainly in areas where this could increase the risk to operational safety.

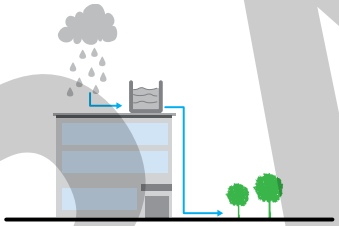
Quantitative indicator

Implementation of the overall storm water reuse strategy.

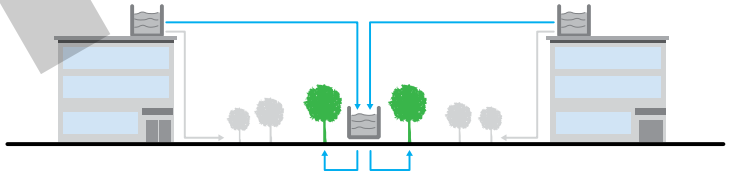
Relevant good practice:	Complies within the Area (points 1 and 2)	✓
Excellence good practice:	Complies with areas outside the Area (point 3)	✓

Storm water reuse will aim at the following points, ordered in a sequential and prioritised manner:

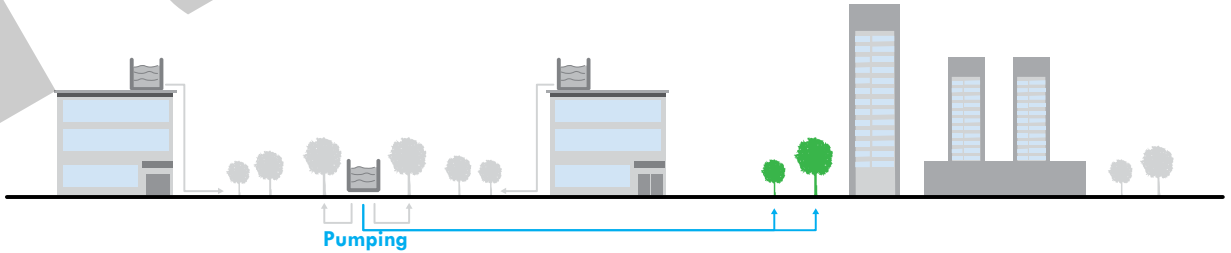
1. Rainwater harvesting on roof for own use of the lot



2. The surplus from the use of the lot will be taken to the Area's own tank, for use in green areas and other uses of the Area.



3. In case of surplus water at the Area level (logistics activities), and for logistics areas close to others with large water requirements for irrigation (e.g. from the north-west area to Terminal 4), the development of irrigation networks, pumped from the Area tanks, will be favoured.



GC-A2.1 ELECTRIC VEHICLE CHARGING INFRASTRUCTURE

The standardisation of electric vehicle charging infrastructure will be promoted both within the lot and on roads, following always the proposed Aena standards and complying with current legislation regarding electric vehicle charging infrastructure requirements at the time of any new development.

Charging points can be classified according to their charging speed: super-slow charging (power of 2.3 kW or less), slow charging (between 3.6 and 7.3 kW), semi-fast charging (between 3.7 and 22 kW), fast charging (between 43 and 50 kW) and ultra-fast charging (power over 80 kW). Currently, the requirements of RD 1053/2014 approving Complementary Technical Instruction (Instrucción Técnica Complementaria, ITC) BT 52 "Special purpose installations. Infrastructure for charging electric vehicles" shall be complied with.

The number and/or percentage of parking spaces for electric vehicles are included in the criteria UP-B1.6 "DISTRIBUTION OF PARKING ON ROADS" and CO-B3.1 "PARKING SPACES WITHIN THE LOT".

Qualitative indicator

Standardisation of recharging infrastructure in the whole Area.

☀	Basic good practice:	Compliant ✓

Qualitative indicator

Type of electric vehicle charger.

Spaces inside the lot	☀	Basic good practice:	≥40% of the spaces with semi-fast or higher charge and the remaining with slow charge ✓
Roadside parking spaces	☀	Basic good practice:	100% of spaces with slow charge ✓

GC-A3 PUBLIC TRANSPORT

GC-A3.1 PUBLIC TRANSPORT

The efficiency of public transport will be maximised by means of promotional measures.

Quantitative indicator

Actions to promote public transport.

☀	Basic good practice: Collaborative design of the public transport strategy by the public transport provider and Aena	✓
☀☀☀	Excellence good practice: Establish agreements with EMT for the implementation of the stop-on-demand bus service	✓

GC-A4 SMART PARKING

GC-A4.1 SMART PARKING

The aim will be to minimise and reduce the time vehicles spend looking for a parking space within the Area.

Quantitative indicator

Actions to promote smart parking

☀☀☀	Excellence good practice: *(choose one option)* • Mechanisms for integrating the supply and demand of parking spaces between different lots • Application to check real-time availability of roadside and in-lot parking	✓

CONTENTS

GC General criteria for structural elements

Structuring elements are the relevant criteria that (1) require a different mention to the other the categories in chapter 4, that (2) require the involvement of external agents to fulfil them or that (2) enable coordination, cohesion and joint development with other Areas within Airport City Adolfo Suárez Madrid-Barajas the application scope of which exceeds the Area itself.

B. Open spaces, roads and green areas

This section presents the general criteria that structure the general strategy for open spaces, roads and green areas for Airport City Adolfo Suárez Madrid-Barajas.

The integration of the flows of the different modes of transport on the road and their relationship with the pedestrian component in the area facilitate accessibility and connectivity between the different spaces.

Green areas contribute both to promoting a quality corporate image for identity design and to reducing air pollution and contributing to engagement with the city, visitors and employees.

STAGE

Urban Planning	**Design**	Construction
Use and Maintenance	End of life	

STRATEGIC COMMITMENTS

Commitment to the city	Sustainability
Airport identity	Innovation

OBJECTIVES

A. Developing a green continuum
B. Use of residual space
C. Balance between full and empty spaces
D. Adaptation and topographical suitability
E. Protection of existing natural resources
F. Compatibility of the Areas with airport activity

REGULATORY AND GOOD PRACTICE FRAMEWORK

Maintain at least 75% of ecological value and at least 25% of existing vegetation

CEEQUAL v6 INTERNATIONAL

Perception of green in >5% (optimum >30%) of the field of vision

Vitoria-Gasteiz Urban Sustainability Indicators

>85% of the planted vegetation is native and varied

Sustainable Building of Basque Country Industry

Trees every 10 m, 9 m or 7.5 m in length if the road width is 60 m, 50 m or 30 m.

Trends and good practices

GC-B3 URBANISATION IN GREEN AREAS

GC-B3.1 GREEN SPACE STRATEGY IN BUFFER AREAS CLOSE TO NATURAL STREAMS

The implementation of wooded buffer zones (≥10 m on each side of the stream) on the edges of streams will be encouraged, promoting a landscaped treatment and transformation into linear green areas that invite employees and visitors to stay. Work on watercourses, including their easement (5 m) and police (100 m) areas, would require prior authorisation from the competent body (Confederación Hidrográfica del Tajo). In addition, any action in areas containing habitats of community interest shall, in addition to the above, be subject to at least a simplified environmental impact assessment.

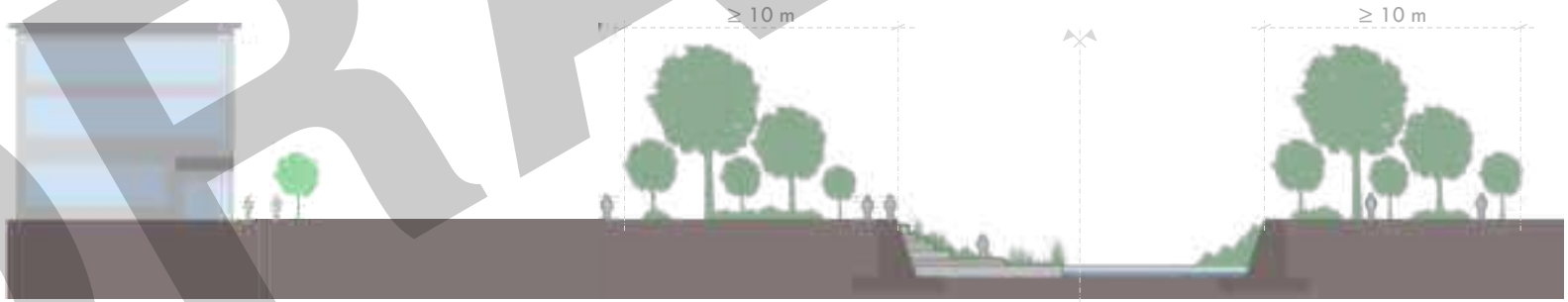
Quantitative indicator

Buffer zone control measures in streams.

Basic good practice: *(comply with both points)*	• Artificial trees/elements and effective vegetation to anchor the ground • Meets all green area design criteria (native vegetation, porous paving, shade, etc.)	✓
Relevant good practice: *(comply with both points)*	• Spatial integration with the green area system • Integration of recreational and outdoor spaces in stream buffers	✓

Substitute measure

This criterion does not apply to developed areas where natural streams have been previously channelled. ✓



Illustrative example of a green area strategy in areas close to natural streams

GC-B3.2 STRATEGY FOR GREEN AREAS IN VACANT AND RESIDUAL SPACES BETWEEN ROAD INFRASTRUCTURE

The placement of trees and green elements in the vacant and residual spaces of the road infrastructure will be encouraged, with a uniform and compensated distribution.

Quantitative indicator

Use of vacant and residual spaces between road infrastructure as green areas.

Basic good practice:	Compliant ✓

Illustrative example of vegetation in residual spaces between roads and on roundabouts

GC-B3.3 SLOPES

The effective anchoring of land with a slope over 30% will be encouraged through the incorporation of low vegetation or artificial elements. On the slopes adjacent to the Areas, a continuity treatment regarding the green area inside the Area will be favoured. Access (secondary service access) will be promoted on slopes of up to 45% by means of stairs that are integrated into the landscape.

Quantitative indicator 1

Slope control measures.

Basic good practice:
(comply with both points)
- Ground anchoring using vegetation and/or artificial elements
- Accessible pedestrian walkway every 100 m of slopes with ≤ 45% gradient

Illustrative examples of slope control measures.

GC-B3.5 AIRPORT ACTIVITY PROTECTION

In order to protect airport activity, the following compliance points are set out:

- The risk of attracting birds in the airport environment will be avoided, with the choice of plant species and the implementation of water areas that meet this objective, with prior approval by Aena or following the instructions established later by Aena for this matter.
- The risk of glare on the airfield (both to pilots and to certain installations) shall be prevented by means of project documentation, caused by reflections from the lighting system, photovoltaic cover or reflective materials used in the buildings, among other elements.
- Any infringement of aeronautical easements shall be avoided by means of project documentation previously approved by Aena.

In this regard, we would like to point out that Article 10 of Decree 584/1972, on Aeronautical Easements, establishes that the national civil supervision authority may prohibit, limit or condition any activity in the area covered by legally established aeronautical easements if it poses a danger to aircraft operations or to the correct functioning of aeronautical radio installations. We therefore recommend that the configuration of green areas be previously analysed in such a way that they do not stimulate the activity of fauna, avoiding in any case the establishment of water masses in the immediate vicinity of airports.

Qualitative indicator

Elimination of the risk of attracting birds, glare or any other action that could cause problems in the correct development of airport activities or a violation of aeronautical easements.

Basic good practice: Compliant

CONTENTS

GC General criteria for structural elements

Structuring elements are the relevant criteria that (1) require a different mention to the other the categories in chapter 4, that (2) require the involvement of external agents to fulfil them or that (2) enable coordination, cohesion and joint development with other Areas within Airport City Adolfo Suárez Madrid-Barajas the application scope of which exceeds the Area itself.

C. Differential aspects

This section proposes design guidelines aimed at promoting identity design through differential aspects that give continuity to the corporate image and facilitate the airport's activity in an innovative way, making the development a reference space for investors.

The criteria presented here will establish the airport identity that it is recommended to be continued in the different Areas, thus providing a differential continuity based on sustainability, innovation and commitment to the city.

STAGE

Urban Planning	Design	Construction
Use and Maintenance	End of life	

STRATEGIC COMMITMENTS

Commitment to the city	Sustainability
Airport identity	Innovation

OBJECTIVES

A. Creation and strengthening of its own identity design as an added value in the scope of Airport City Adolfo Suárez Madrid-Barajas
B. Unique identification of each Area
C. Technological interaction between services and the population
D. Promoting activities and ensuring high visibility and integration in the spatial context
E. Supporting flexibility and a range of options facing future change

REGULATORY AND GOOD PRACTICE FRAMEWORK

Identity design for uniquely themed buildings
Trends and good practices

Digital billboards and bus shelters with relevant information: time, location and warning notices
Madrid's Identity

Columns with standardised brackets and display of the corporate stripe
Madrid's Identity

GC-C1 AIRPORT CITY IDENTITY

GC-C1.1 CREATION OF IDENTITY DESIGN

The creation of the Area's own identity design will be promoted by following guidelines and directives applicable to elements of urban and architectural design, signage, trees and vegetation, materials, and additionally in the digital environment, advertising, publications or vehicles, among others.

In this context, the enhancement of fixed tangible identity elements that link all the Areas of the Airport City Adolfo Suárez Madrid-Barajas developments will be promoted, in order to generate a sense of belonging and strengthen their unique and uniform image.

Proposals for the creation of an identity design are subject to the agreement and approval of Aena.

Quantitative indicator

Compliance with the creation of an identity design, with Aena's prior approval.

Basic good practice:	Creation of the Area's own identity design	✓
Relevant good practice:	Relationship of the identity design with other Airport City ASM-B Areas	✓

Illustrative example of Airport City's exterior signage at Berlin-Brandenburg Airport. Source: Moniteurs. moniteurs.de

GC-C1.2 UNIQUE DIGITAL PANEL SOLUTIONS

The possibility of creating unique solutions of digital panels is established, which can be interacted with, displaying information on different aspects, including information related to aeronautical activity such as flight departures and arrivals in areas of office, hotel and commercial activities. The recommended panel specifications are as follows:

- Ensure adequate visibility. As a guideline, the recommended size will be between 0.6 and 1 metre long and between 2 and 3 metres high
- The interactive panel will indicatively be between 55 and 80 inches and a maximum of 1.2x1.75 metres.
- The use of durable materials, such as aluminium for the casing and glass for the touch screens, will be favoured.
- Positioning of the panels on the pavement so as to ensure a minimum distance of 2.5 metres from the free pedestrian crossing area of the pavement.
- Uniform distribution throughout the area, prioritising areas with high levels of traffic.
- Energy saving system, minimising energy consumption during night-time periods based on the astrological clock, by reducing and deactivating brightness and animations while there is no interaction with the user.

Qualitative indicator

Inclusion of the recommended specifications on the list in the unique digital billboard solutions.

Relevant good practice: Compliant

GC-C1.3 INFORMATION IN UNIQUE DIGITAL PANEL SOLUTIONS

Unique digital billboard solutions will be promoted to include some of the following features and elements, the specifications of which will be specifically agreed with Aena. The recommended characteristics are:

- Publication of real time notices regarding the Area's own activity
- Free Wi-Fi access.
- Emergency services call button.
- Fast charging of multiple devices, such as laptops, tablets or smartphones.
- Permanent information on time, location, temperature and relative humidity.
- Quick access to language switching on the interface, with at least English and Spanish.
- Interface with touch panel, motion sensor, voice control or similar technology.
- Bi-directional interface that can provide open data to the user and receive data from the user.

Illustrative example of digital airport information billboards

Qualitative indicator

Inclusion of at least two of the recommended characteristics from the list in the unique digital billboard solutions.

Relevant good practice: Compliant

GC-C1.4 UNIQUE URBAN FURNITURE SOLUTIONS

Uniformity in all elements of street furniture within the Area is promoted, with a certain margin for personalisation of specific components of the furniture. To this end, the possibility of creating unique urban furniture solutions is established, which requires Aena's prior acceptance.

Quantitative indicator

Number of implemented qualities of the listed urban elements.

Relevant good practice:	≥ 5	✓
Excellence good practice:	≥ 10	✓

CATEGORIES	QUALITIES OF URBAN ELEMENTS	
Regarding the use	Use reading: Clear form – function relationship	✓
	Insurance: No sharp edges; Structural strength according to use	✓
	Ergonomics	✓
Maintenance	Prevents water stagnation	✓
	Resistant materials	✓
	Anti-graffiti/vandalism	✓
Physiological	Rough, very cold or very hot surfaces are avoided	✓
	Reflectance under 50%	✓
Universality	Adapted to different users: Elderly, disabled, children..	✓
Psychological	Shapes considered aggressive are not used	✓
	Neutral colours	✓
Sustainability, health and well-being	Uses recycled/reused/reusable materials	✓
	Integrates solar, wind or water harvesting elements	✓
	Visual sustainability elements	✓
	Noise and environmental pollution reduction elements	✓
Branding	Integrates elements of airport branding and identity	✓
Innovation	Brings a differentiating innovation element	✓

Furniture with solar panels

Integration of natural elements in furniture

GC-C1.5 UNIQUE SIGNAGE SOLUTIONS

The possibility of creating unique signage solutions is established, which requires Aena's prior acceptance. The signage will ensure that the overall design of elements is of adequate quality and complies with the following recommendations:

- Concentrate pedestrian signs at the nodal points of pedestrian routes, at eye level and without obstructing sight lines or views.
- Map orientation with north at the top.
- Standardisation of the design inside the Area, recommending the use of strong colours, clear contrasts, non-reflective surfaces and simple graphics on maps.
- Use of several languages for pedestrian-oriented signs, following the choice of languages used inside the airport terminals.
- Self-supply of solar and/or micro-wind energy captured by the signage element itself, in case it needs power supply. For large signage elements that do not require energy, solar and/or micro-wind energy will also be used to supply other elements in open areas.

Qualitative indicator

Compliance with the requirements for unique signage solutions.

☀	Relevant good practice:	≥ 2
☀☀	Excellence good practice	5

Complementary measure

An excellence good practice can be obtained if there is a centralisation within the Solar and/or micro-wind energy area registered in the signage elements, which can be used in other urban elements.

Illustrative example of signage design for the airport area of Adolfo Suárez Madrid-Barajas Airport

CONTENTS

The criteria set out below aim to improve the urban experience through a quality urban design that guarantees volumetric continuity and spatial rationality within the Area and regulates the form of land occupation to achieve a balance between full and empty spaces, making the airport development a functional and vital space adapted to the activities that take place there.

The main considerations have to do with the flexibility of activities and the functional mix; compactness and volumetry adapted to the character of each Area; design criteria for open spaces in terms of furniture and lighting.

STAGE

Urban Planning	**Design**	Construction
Use and Maintenance	End of life	

STRATEGIC COMMITMENTS

Commitment to the city	Sustainability
Airport identity	Innovation

OBJECTIVES

A. Activity compatibility in the Areas
B. Diversification of compatible activities
C. Rationalisation of spaces
D. Adaptation of adjacent spaces to guarantee the correct operation of the activities

REGULATORY AND GOOD PRACTICE FRAMEWORK

The activities that are compatible and authorised are those that meet the requirements of the aforementioned article 2 of Royal Decree 2.591/1998: 3. Other complementary activities may be included in this subsystem: business, scientific-technological or distribution activities derived from aeronautical activity, as well as facilities and equipment.

Article 4.2.1 of the TRPESGA ASM-B

The activities are considered to be activities of the main use of air transport: airport logistics-storage, industry, airport maintenance and business services, offices, hotels, commercial, etc.

Madrid GUDP

UP-A1 FLEXIBILITY AND FUNCTIONAL MIX

UP-A1.1 COMPLEMENTARY AND COMPATIBLE ACTIVITIES TO THE CHARACTERISTIC OR MAIN ACTIVITY

The inclusion of different activities within the Area will be considered, including activities that are complementary and compatible with the main logistics activity, which correspond to the provisions of Article 2 of Royal Decree 2591/1998.

The planning projects and detailed studies assign activities for each lot, so in the case they are modified, an amendment to the aforementioned development plans will need to be processed.

For the choice of complementary and compatible activities to be implemented, the following needs to be taken into account: the main target client of these activities needs to be the user of the main activity of the Area.

The main logistics activity includes the complementary activities of commercial, office, hotel, sports facilities and public services (maintenance and cleaning of the city, security and public safety, postal service and fuel supply for vehicles), as well as other auxiliary logistics services usually included in the truck-centres (maintenance and repair services for heavy vehicles, resting areas for drivers with restaurant service, toilet facilities and vehicle scales).

Quantitative indicator 1

Percentage of the built surface area of the Area intended for complementary and compatible activities to the main activity.

Basic good practice:	≥ 5 and ≤ 10
Relevant good practice:	≥ 10 and ≤ 25

This percentage can be no greater than 25%.

Quantitative indicator 2

Number of activities that are complementary and compatible with the main activity and need to be different from each other.

Basic good practice:	≥ 3
Relevant good practice:	≥ 5

Substitute measure for quantitative indicator 2

The activities located outside the Area at a pedestrian distance under 500 m from the boundary of the Area itself may be considered for the calculation of the number of complementary and compatible activities.

UP-A1.2 SPECIFIC TO OFFICE, COMMERCIAL AND HOTEL: COMPLEMENTARY AND COMPATIBLE ACTIVITIES ON THE GROUND FLOOR

In the case of buildings within the Area intended for office, commercial or hotel use, a mix of activities will be encouraged on the ground floor, prioritising those related to pedestrians and the exterior, seeking formal solutions that favour the construction of walkable streets and facilitate environments that are more elastic and permeable to change. The same complementary activities described in criterion UP-A1.1 are considered, prioritising the implementation of commercial activity on the ground floor.

Quantitative indicator

Percentage of ground floor façade of office and hotel buildings to be used for complementary and compatible activities, prioritising commercial activities.

Relevant good practice:	≥ 30%	✓
Excellence good practice:	≥ 60%	✓

Substitute measure

The percentage of façades of floors above the ground floor may be counted towards the values of the indicator, provided that they are used for the same activity as the ground floor.

UP-A1.3 SPECIFIC TO LOGISTICS: AUXILIARY SERVICES

The provision of auxiliary services for workers and truck drivers, such as recreational, rest, sports or canteen areas, will be promoted.

These spaces may be located within the logistics buildings, as an annex to these buildings or in independent buildings, as long as they are located in the Area.

Quantitative indicator

Areas dedicated to auxiliary services within the Area.

Basic good practice:	≥ 1	✓
Relevant good practice:	≥ 2	✓
Excellence good practice:	≥ 3	✓

UP-A1.4 FLEXIBILITY OF DIVIDING LOTS

Flexibility of dividing lots will be permitted, as long as it does not affect structuring roads within the Area, in order enable the area to adapt to the functional needs of the activities to be implemented.

The development planning instruments (Detailed Studies and Planning Projects) include the roads, the lots (which do not involve urban subdivision) and open spaces, and the investor can modify them by joining or dividing the lots within the Area. When the flexibility of joining and/or dividing lots affects a road that has already been ordered by a Planning Project or Detailed Study, it shall be modified by means of new planning.

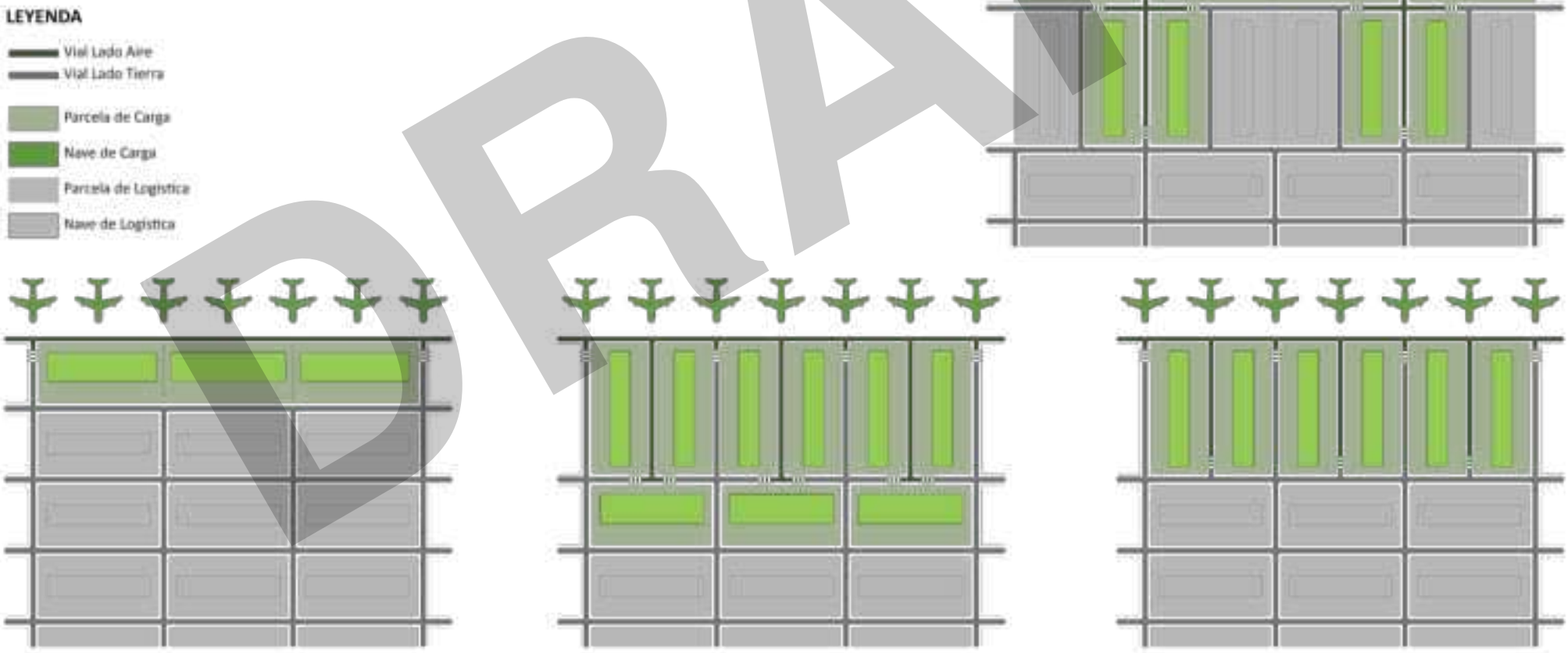
If any pre-existing road or road considered as a structuring road in this white paper (page 26) is modified, it will require a traffic study to determine that the modification does not affect the mobility of the area as a whole. Similarly, this comment should be reflected in all White Papers.

Quantitative indicator

Compliance with the criterion.

Basic good practice:	Compliant

Illustrative example of occupancy flexibility for first line aeronautical lots
The division into lots in the development planning instruments is merely illustrative.



UP-A2.1 MAXIMUM NET BUILDING INTENSITY

The regulation of the maximum building intensity permitted for each type of activity will be favoured, achieving an equitable distribution of buildable square metres and volumetric coherence in the airport area.

Quantitative indicator

Total maximum net building intensity.

Logistics	Basic good practice:	0.6 m^2c/m^2s
Office, hotel and commercial	Basic good practice:	1.0 m^2c/m^2s
Green areas	Basic good practice:	0.1 m^2c/m^2s

Substitute measure

The net building intensities indicated in the table above can be considered indicative based on the typologies proposed for each activity, and should be included in the CO that develops the Area.

In all cases, the maximum limits established in the other criteria, if any, shall be complied with and in no case shall the maximum net building intensity per activity established by this criterion be exceeded by more than double, nor shall the maximum gross building intensity of 1 m^2c/m^2s required by the GUDP of Madrid be exceeded.

STAGE

Urban Planning	**Design**	Construction
Use and Maintenance		End of life

STRATEGIC COMMITMENTS

Commitment to the city	Sustainability
Airport identity	Innovation

OBJECTIVES

A. Adaptation of urban density to each area and building typology
B. Rationalisation of spaces
C. Balance between full and empty spaces
D. Ensure mobility with accessible distances and routes
E. Development of spatial continuity

REGULATORY AND GOOD PRACTICE FRAMEWORK

Maximum permitted gross building intensity of 0.12m^2c/m^2s for GHS and 1m^2c/m^2s for each development area
TRPESGA ASM-B and Madrid GUDP

Maximum building occupation of 50% of the land under concession.
TRPESGA ASM-B

Maximum buildable area 3.00m^2c/m^2s -
LEED ND. Compactness and volumetric criteria

Minimum setbacks of 10 m to central roads and 5 m to perimeter roads
Special Airport Plan AS-MB

Minimum separation between buildings of 4 m
Alcobendas Building, Construction and Installations Ordinance.

UP-A2.2 MAXIMUM LOT OCCUPANCY

The regulation of the maximum occupancy permitted for each type of activity will be encouraged, achieving a compact space with quality open spaces within the open spaces of the Area that balances full and empty spaces.

Quantitative indicator

Maximum permitted lot occupancy. When the occupation is >50%, a Detailed Study will need to be developed.

Logistics	☀	Basic good practice:	≥20% and ≤60%
Offices, hotel	☀	Basic good practice:	≥10% and ≤40%
Commercial	☀	Basic good practice:	≥10% and ≤50%

Substitute measure

Occupancy for logistics activities may be increased, subject to justification of functional requirements previously accepted by Aena, up to a maximum of 85%. The increase in the maximum occupancy of the Area shall be included in the CO that the Area develops, otherwise it will need to be modified.

UP-A2.3 MAXIMUM BUILDING HEIGHT

The number of stories will be regulated in order to achieve volumetric coherence that respects the height restrictions in the airport space.

In order to comply with basic good practice, which considers compliance with the maximum MSL determined by the corresponding aeronautical easement studies for each corresponding area, the maximum height above ground level, including all installations and constructions on roofs, shall be defined by the maximum MSL determined by the corresponding aeronautical easement studies, and when necessary, an aeronautical safety study will also be carried out, in accordance with the provisions of Article 33 of Decree 584/1972 on Aeronautical Easements in its current wording, which will also analyse the auxiliary means to be used to carry out each action.
Relevant good practices shall comply with SA or submit an Aeronautical Safety Study.

Quantitative indicator

Maximum building height above ground level.

All	☀	Basic good practice:	SA compliant
Logistics	☀☀	Relevant good practice:	≤ 16 m
Offices	☀☀	Relevant good practice:	≤ 41 m
Hotels	☀☀	Relevant good practice:	≤ 41 m
Commercial	☀☀	Relevant good practice:	≤ 30 m
Commercial	☀☀☀	Excellence good practice: Architectural integration with other activities	

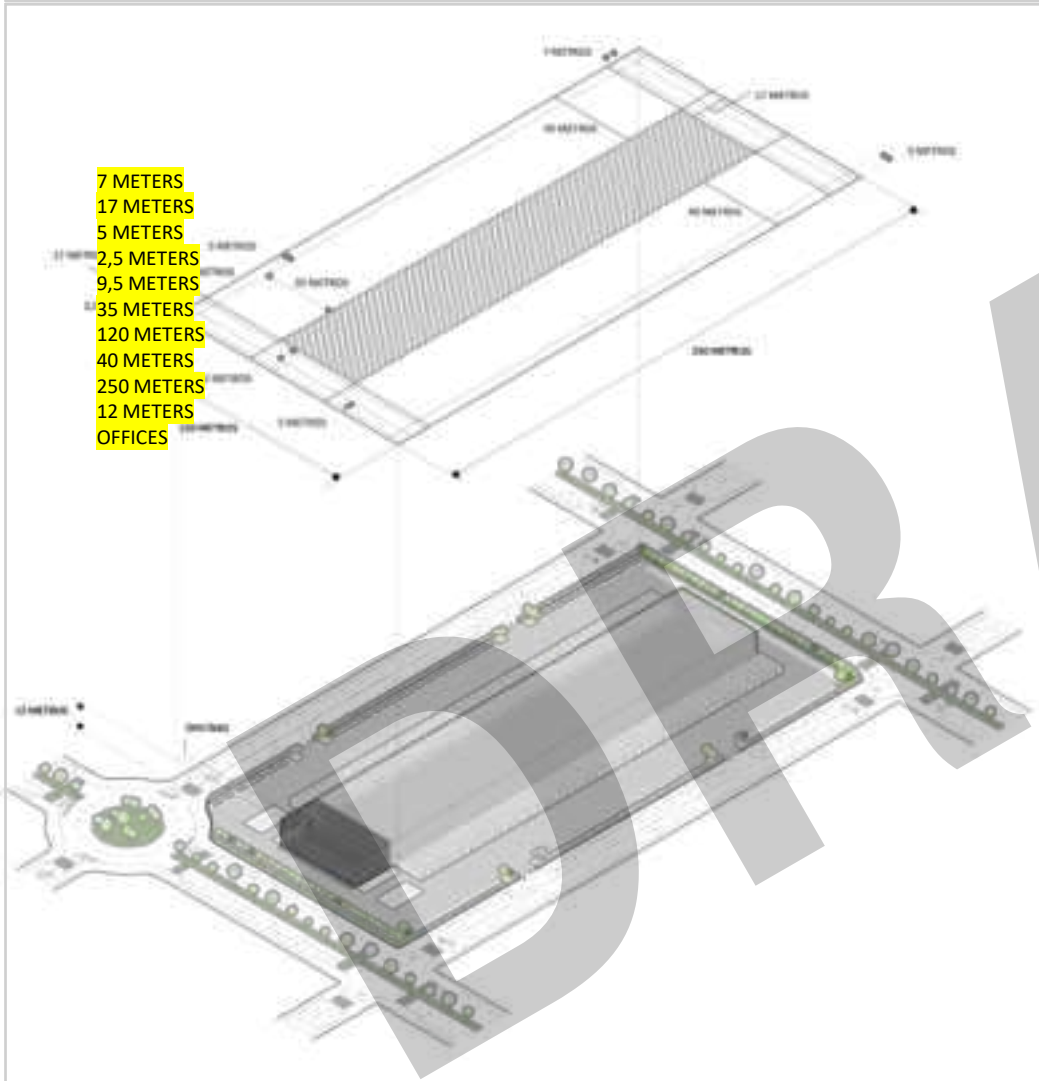
Substitute measure

The maximum height required for the relevant good practice may be exceeded for unique buildings with strategic sustainability commitments through the installation of renewable energy capture elements. For this purpose, an aeronautical safety study needs to be carried out, as established in art. 33 of Decree 584/1972, on Aeronautical Easements.

Illustrative example of possible typologies of logistical activities

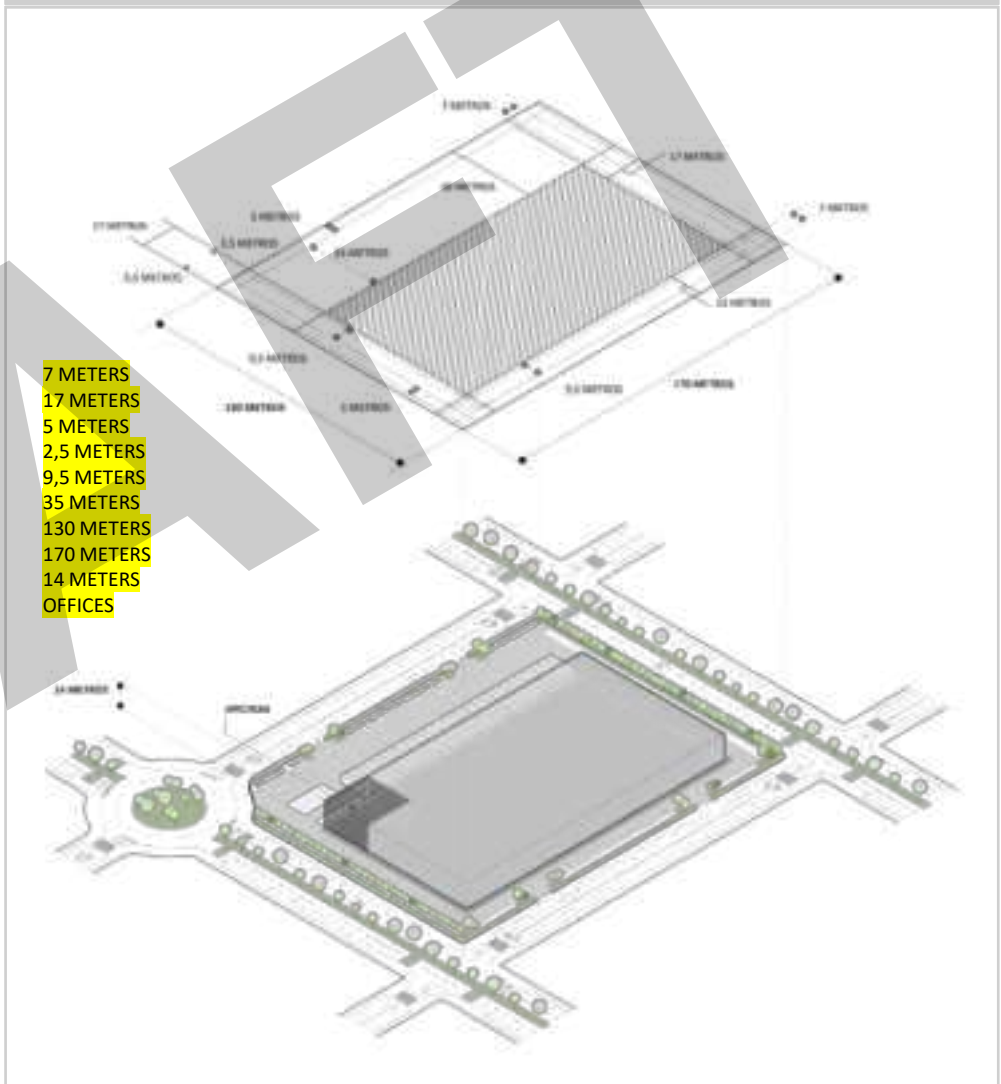
These examples are for illustrative purposes only, do not constitute design guidelines and are for reference and support of typological possibilities only.

Cross-docking WAREHOUSE



2.5-4 ha	0.6 m²c/m²s	≤ 30%	≤ 14 m	6-12 m	≥ 40 m	≥ 17 m	120-130 m	35-50 m
recommended lot size	maximum buildable area	Lot occupancy	max. recommended height	usual max. height	minimum setback from access/exit road	minimum setback from the boundary	recommended lot depth	recommended warehouse depth

Distribution WAREHOUSE with Storage and Office

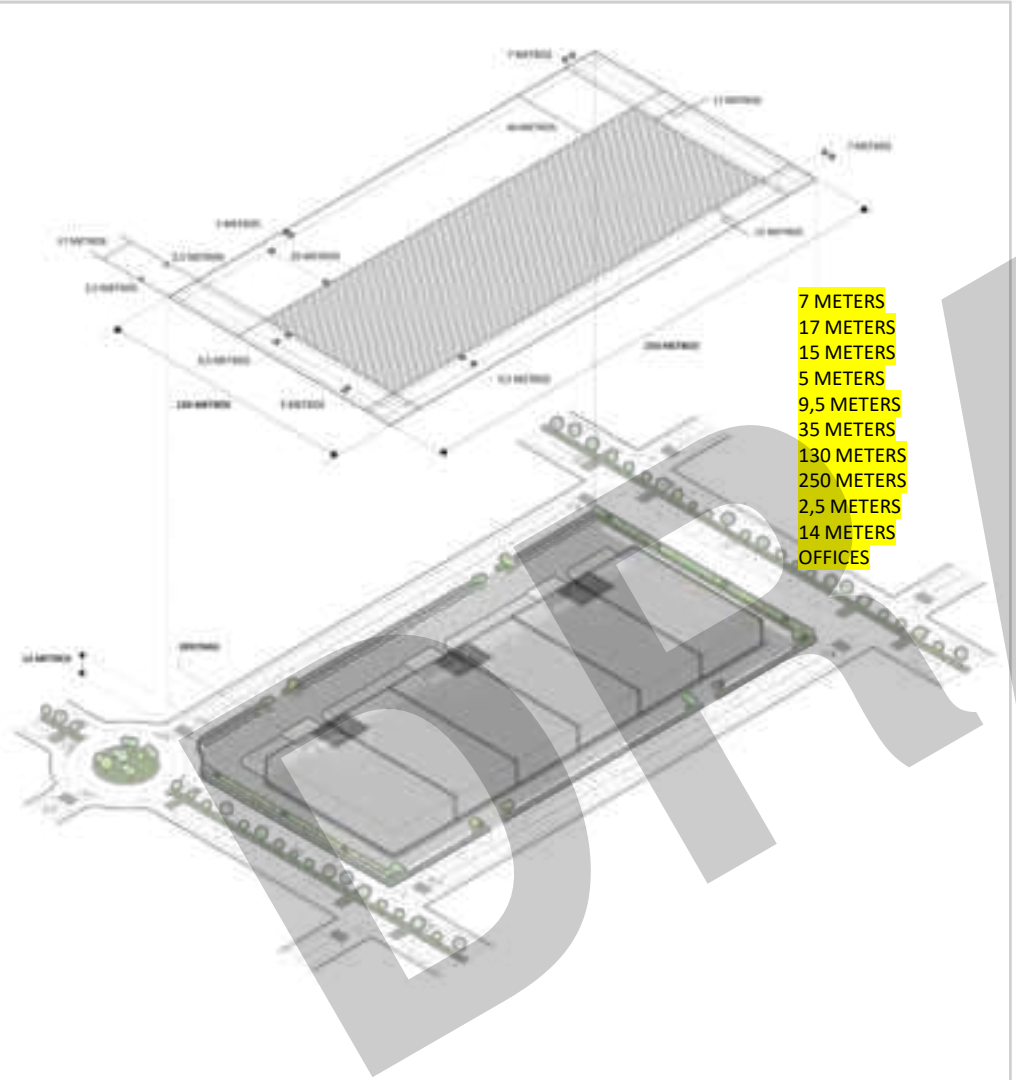


3-5 ha	0.6 m²c/m²s	≤ 47%	≤ 16 m	12-14 m	≥ 40 m	≥ 15 m	120-130 m	60-90 m
recommended lot size	maximum buildable area	Lot occupancy	max. recommended height	usual max. height	minimum setback from access/exit road	minimum setback from the boundary	recommended lot depth	recommended warehouse depth

Illustrative example of possible typologies of logistic and tertiary activities (offices, hotels, commercial)

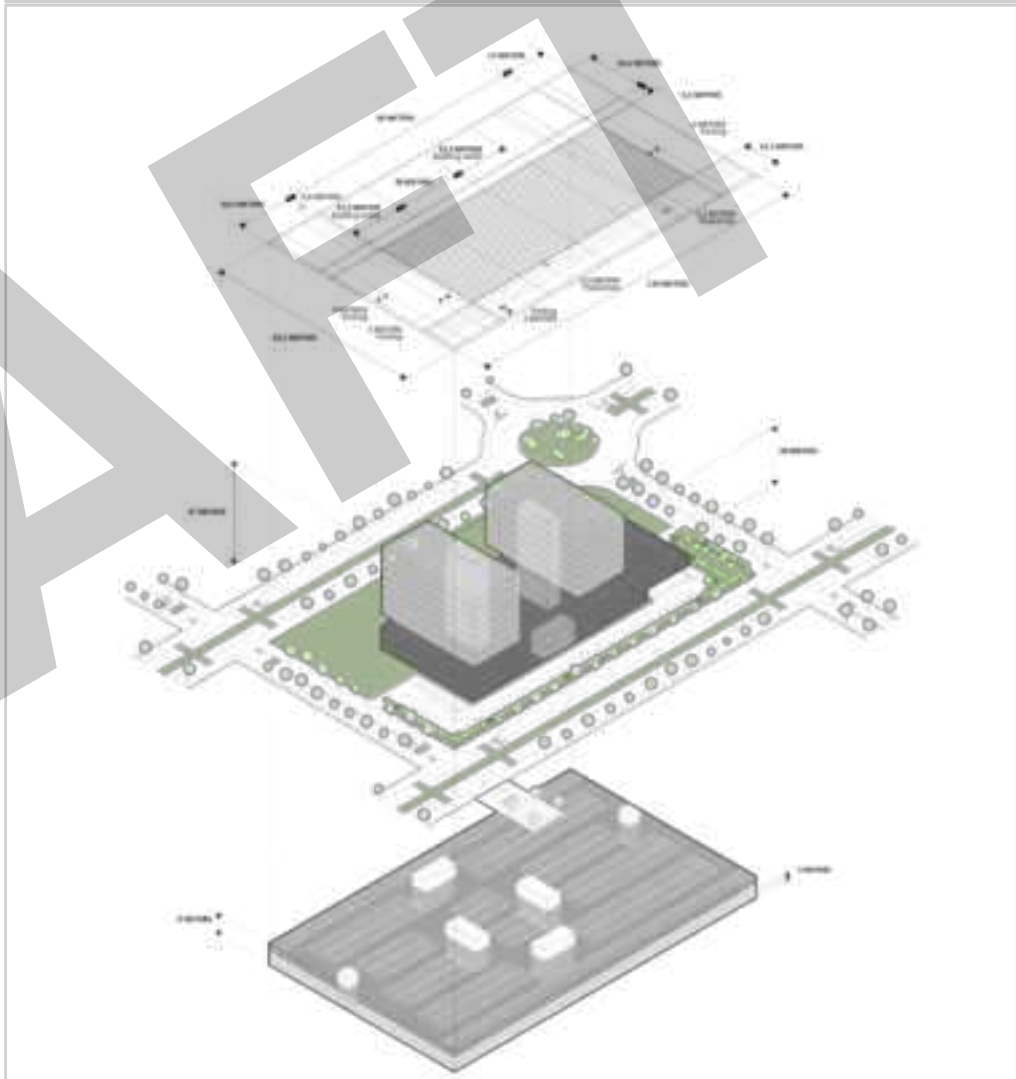
These examples are for illustrative purposes only, do not constitute design guidelines and are for reference and support of typological possibilities only.

Modular Distribution WAREHOUSE



3-5 ha	0.6 m²c/m²s	≤ 50%	≤ 16 m	12-14 m	≥ 40 m	≥ 17 m	150-200 m	60-90 m
recommended lot size	maximum buildable area	Lot occupancy	max. recommended height	usual max. height	minimum setback from access/exit road	minimum setback from the boundary	recommended lot depth	recommended warehouse depth

OFFICES two towers with plinth

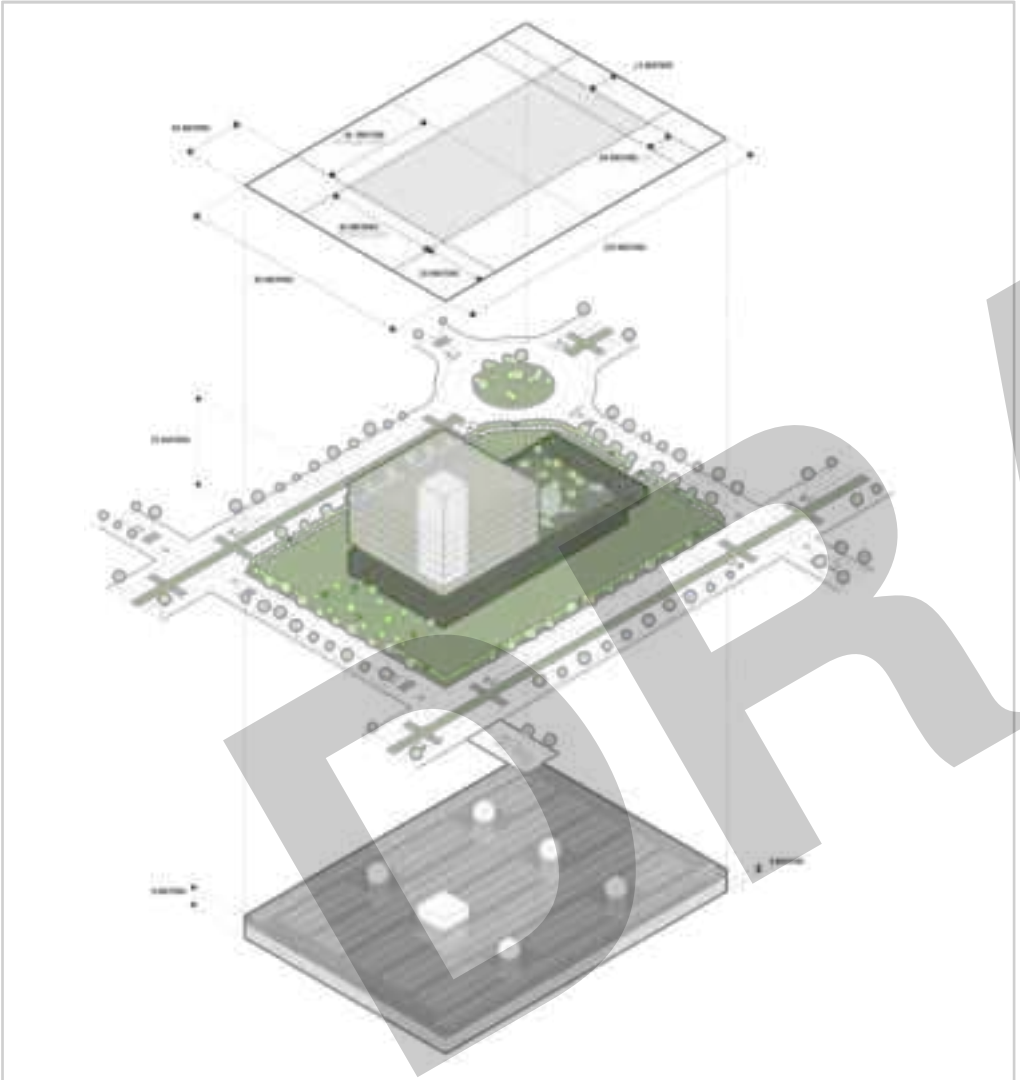


1.3-1.8 ha	1.7 m²c/m²s	≤ 40%	≤ 41 m	33-37 m	≥ 24 m	≥ 17 m	90 m	22.5*45 m	45*85 m
recommended lot size	maximum buildable area	Lot occupancy	max. recommended height	usual max. height	minimum setback from access/exit road	minimum setback from the boundary	recommended lot depth	recommended tower dimensions	recommended plinth dimensions

Illustrative example of possible typologies of tertiary activities (offices, hotels, commercial)

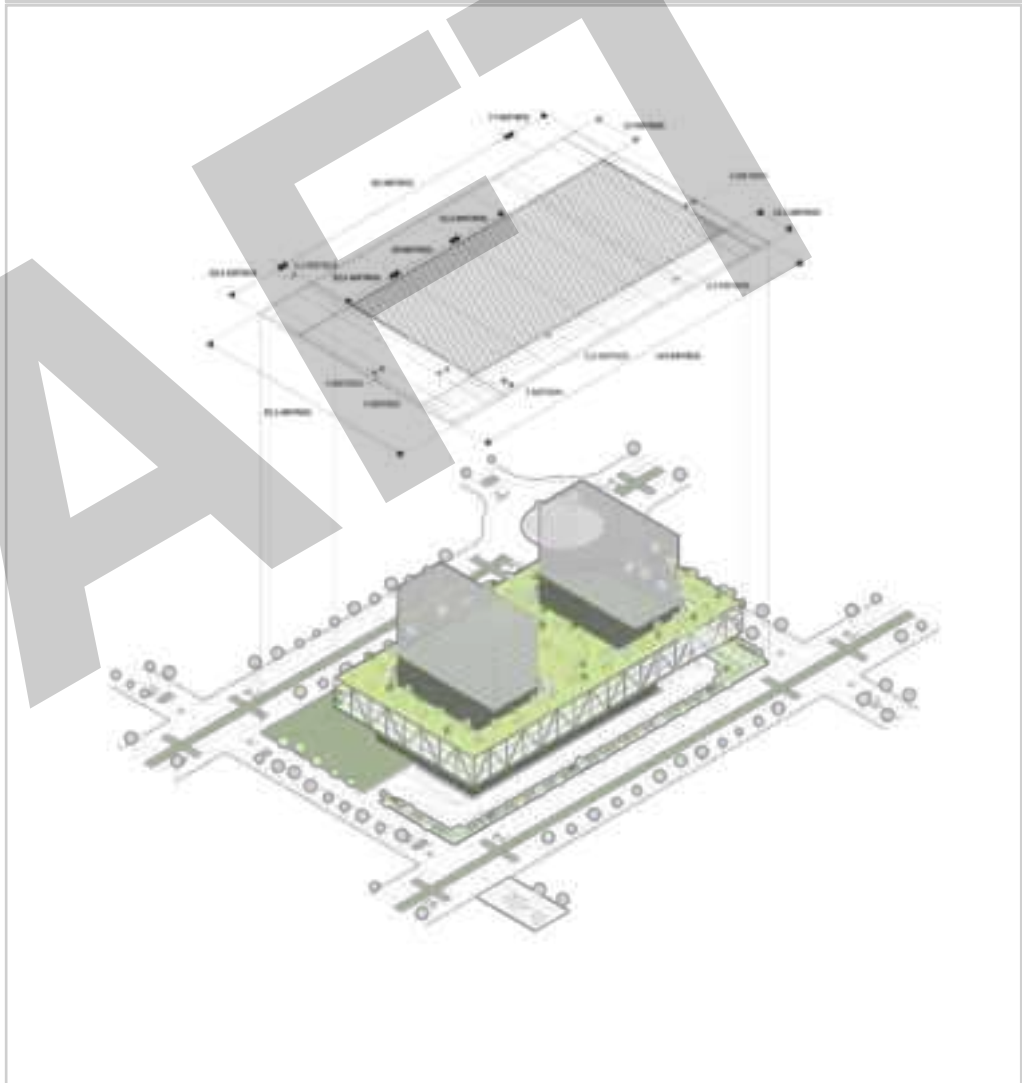
These examples are for illustrative purposes only, do not constitute design guidelines and are for reference and support of typological possibilities only.

OFFICES one tower with plinth



1.2-1.5 ha	1.7 m²c/m²s	≤ 35%	≤ 41 m	33-37 m	≥ 24 m	≥ 17 m	95 m	45*45 m	45*85 m
recommended lot size	maximum buildable area	Lot occupancy	max. recommended height	usual max. height	minimum setback from access/exit road	minimum setback from the boundary	recommended lot depth	recommended tower dimensions	recommended plinth dimensions

OFFICES two towers with plinth

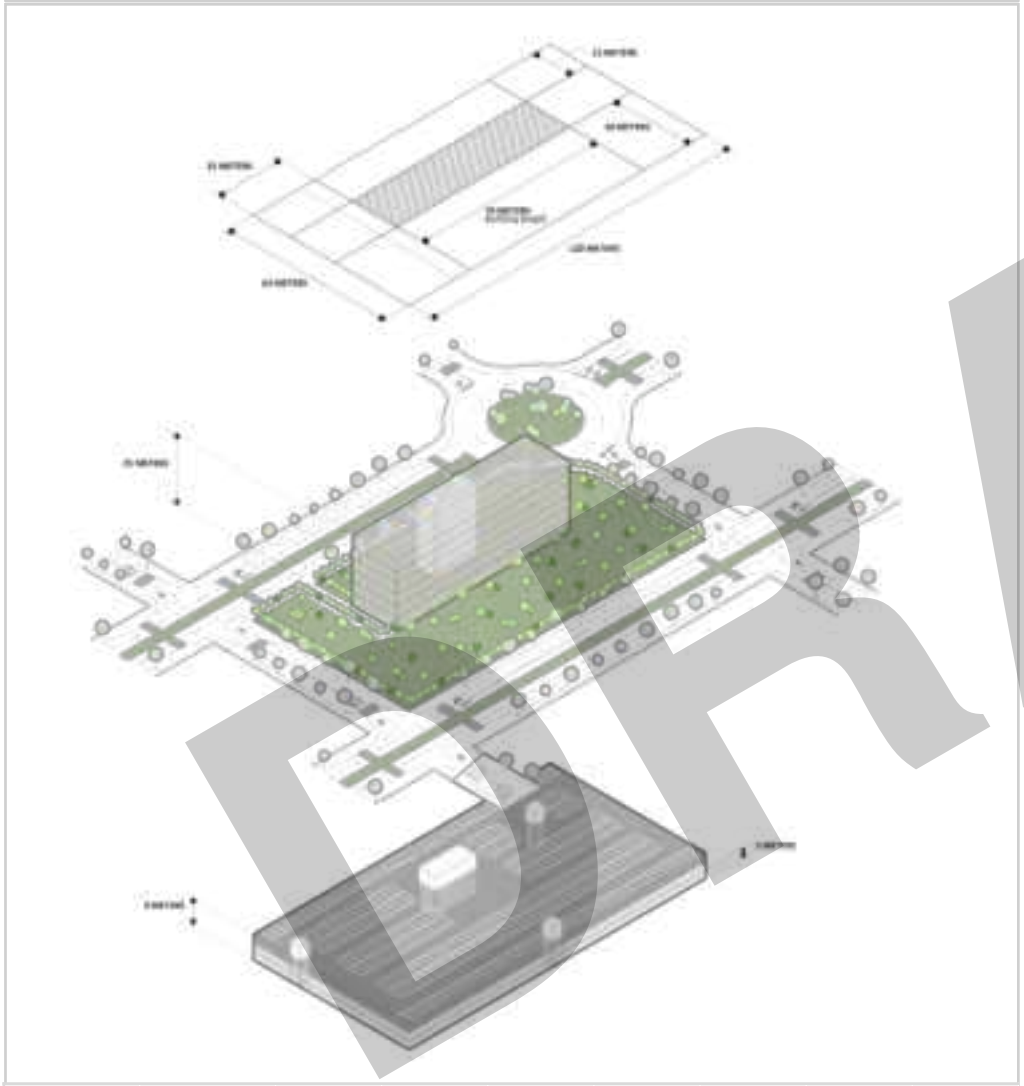


1.3-1.8 ha	1.7 m²c/m²s	≤ 40%	≤ 41 m	33-37 m	≥ 24 m	≥ 17 m	90 m	22.5*45 m	45*85 m
recommended lot size	maximum buildable area	Lot occupancy	max. recommended height	usual max. height	minimum setback from access/exit road	minimum setback from the boundary	recommended lot depth	recommended tower dimensions	recommended plinth dimensions

Illustrative example of possible typologies of tertiary activities (offices, hotels, commercial)

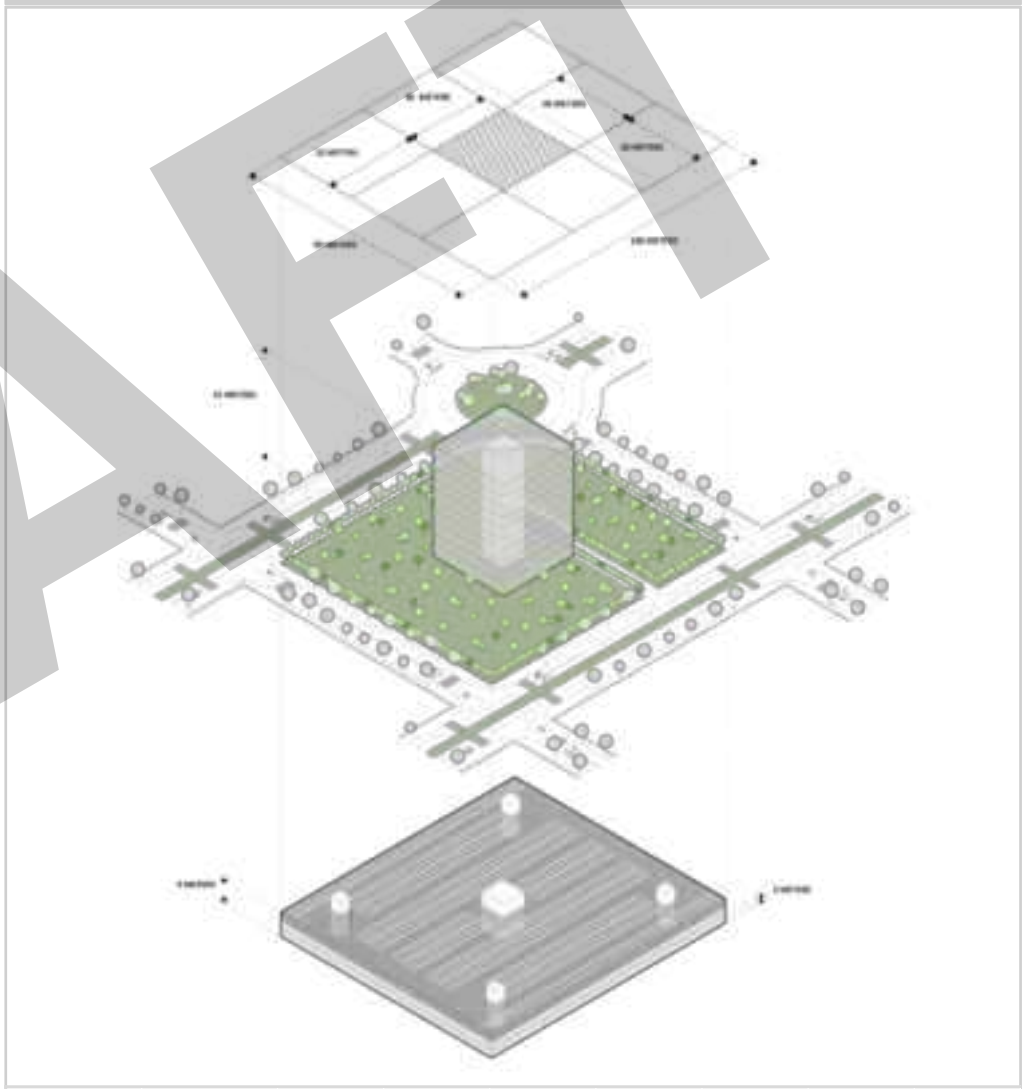
These examples are for illustrative purposes only, do not constitute design guidelines and are for reference and support of typological possibilities only.

OFFICES without commercial on ground floor



0.7-1.1 ha	1.0 m²c/m²s	≤ 20%	≤ 35 m	21-29 m	≥ 15/30 m	≥ 25 m	65 m	18*70 m
recommended lot size	maximum buildable area	Lot occupancy	max. recommended height	usual max. height	minimum setback from access road exit	minimum setback from the boundary	recommended lot depth	recommended tower dimensions

TOWER OFFICES



0.9-1.2 ha	1.0 m²c/m²s	≤ 10%	≤ 41 m	37-41 m	≥ 30 m	≥ 35 m	90-100 m	30*30 m
recommended lot size	maximum buildable area	Lot occupancy	max. recommended height	usual max. height	minimum setback from access/exit road	minimum setback from the boundary	recommended lot depth	recommended tower dimensions

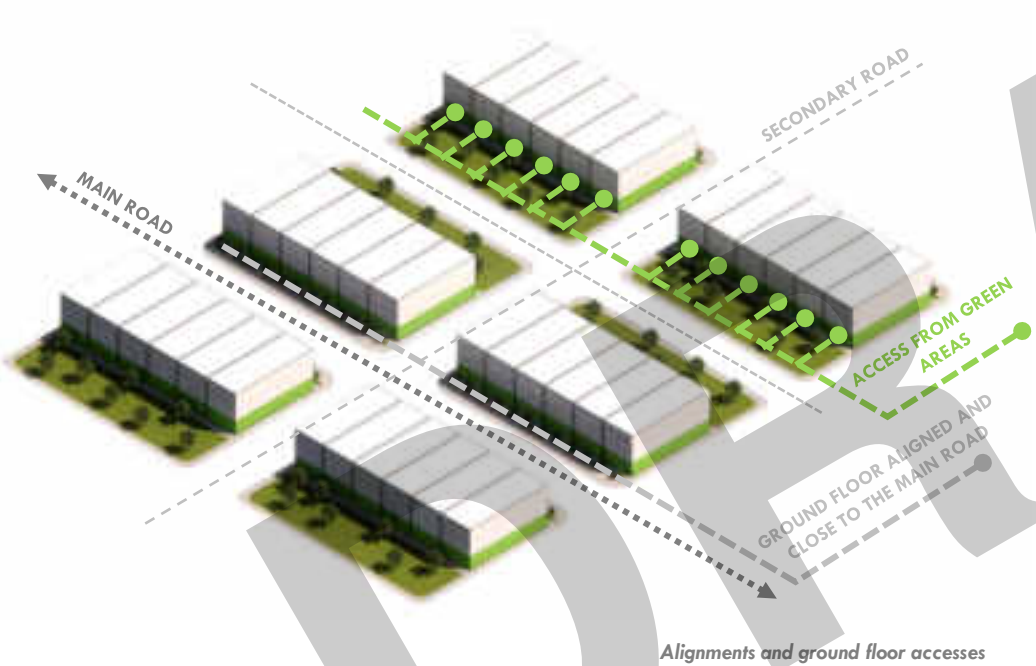
UP-A2.4 MINIMUM BUILDING SETBACKS

The limitation of minimum building setbacks regarding the access and exit road and the boundary with neighbouring plots will be promoted.

Qualitative indicator

Pedestrian access on the ground floor will be linked to the strategy of green areas, aligning the façades of the ground floors with each other and parallel to the main road axis and close to it.

Relevant good practice: Compliant



Alignments and ground floor accesses

Quantitative indicator 1

Minimum setback from the perimeter of the GHS.

Basic good practice: ≥ 10 m

Quantitative indicator 2

Minimum setback to main road.

Basic good practice: ≥ 15 m

Quantitative indicator 3

Minimum setback to roads with secondary accesses and to boundaries with other lots.

Basic good practice: ≥ 10 m

Substitute measure 1 for quantitative indicator 2 and 3

The bodies may protrude up to 5 m above the compulsory alignment and shall be included in the Detailed Study.

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UP-A3.1 FURNITURE AND ELEMENTS IN OPEN SPACES

The uniform and balanced distribution of street furniture on pavements and open spaces will be encouraged.

In addition, the furniture will be grouped together to make it easier for users to find and use at the same time and to make maintenance more cost-effective.

Quantitative indicator 1

Compliance with the maximum distances between individual furniture items as indicated in the table below for each of the requirement levels.

		Basic good practice	Relevant good practice	Excellence good practice
Seats, benches, chairs and other seating elements	Logistics	≤ 200 m	≤ 100 m	≤ 50 m
	Offices, commercial and hotels	≤ 100 m	≤ 50 m	≤ 30 m
Bins	Logistics	≤ 200 m	≤ 100 m	≤ 50 m
	Offices, commercial and hotels	≤ 100 m	≤ 50 m	≤ 30 m
Containers for waste and recycling *(considering a volume of 1 m3 per type of waste)*	Logistics	≤ 500 m	≤ 200 m	
	Offices, commercial and hotels	≤ 100 m	≤ 60 m	
Pedestrian signage (including digital billboards)	Logistics	≤ 300 m	≤ 300 m	
	Offices, commercial and hotels	≤ 100 m	≤ 50 m	

The general criteria for the choice and design of each of these urban elements are addressed in the general criteria GC - C1.1, GC - C1.2, GC - C1.3, GC - C1.4 and GC - C1.5

Criteria and guidelines for the layout of other elements of the urban space such as trees, lighting, parking points for soft mobility vehicles and public transport stops are addressed in the corresponding specific criteria (UP-A3.2, UP-B2.2, UP-B1.9 and IN-A2.1 respectively).

Quantitative indicator 2

Number of elements grouped in the same space.

- Basic good practice: ≥ 2
- Relevant good practice: ≥ 3
- Excellence good practice: ≥ 4

Substitute measure for quantitative indicator 2

Placing multi-purpose street furniture that fulfils one or more functions in an integrated manner in locations with limited space will be considered basic good practice.

STAGE

Urban Planning | Design | Construction | Use and Maintenance | End of life

STRATEGIC COMMITMENTS

Commitment to the city | Sustainability | Airport identity | Innovation

OBJECTIVES

A. Provide identity and security for users of roads and open spaces
B. Make it pleasant to stay or walk around, with furniture and lighting appropriate to the function and the space
C. Continuity and material and ornamental quality in the design of individual objects and coherence in the design of grouped objects
D. Improve efficiency and energy savings in outdoor lighting systems as well as reduce light and environmental pollution

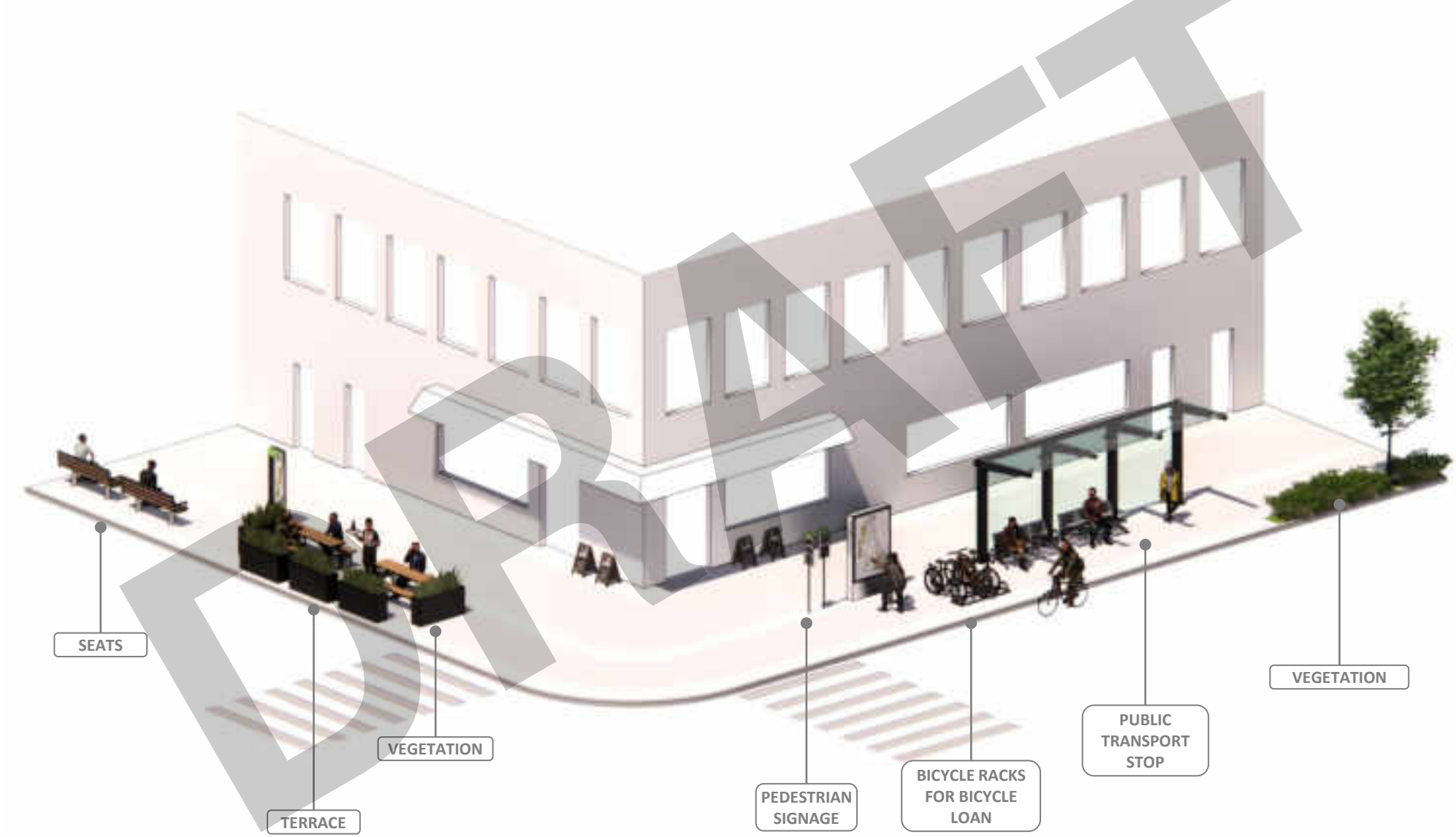
REGULATORY AND GOOD PRACTICE FRAMEWORK

Distance of ≤50 m between seats on main streets, squares and sloping areas
UK Streetscape Guidance

Seating in seating areas: 1 for every 30 m of pavement length.
Instruction on Public Roads Madrid City Council

Bins: 1 for every 100 m of public road fronted by buildings, facilities and landscaped areas.
Instruction on Public Roads Madrid City Council

Illustrative example of street furniture grouping



UP-A3.2 OUTDOOR LIGHTING

Outdoor lighting typologies shall meet the following requirements, always avoiding glare to the airfield.

Quantitative indicator

Compliance with the outdoor lighting characteristics of the following table for 100% of the lighting infrastructure.

		Pedestrian pavement (pavement width (A) = 2.5-6 m) Roads within the Area (12 m) Roads outside the Area (>12 m)					
		Basic good practice		Relevant good practice		Excellence good practice	
Glare		100% of the lighting does not produce any glare towards the airfield 100% of efficient and responsible lighting for nocturnal ecosystems					
Applicable regulations		Compliance with the requirements of standard ITC-EA-03 or current regulations					
Colour rendering of lighting				60	✓	>60	✓
Post height	on pedestrian pavement					1x (A) [1]	✓
	on roads			1x (A) [1]	✓	1x (A) [1]	✓
Separation between elements	on pedestrian pavement					3x (A)	✓
	on roads			3x (A)	✓	3x (A)	✓
Light sources	on pedestrian pavement	1	✓	>1	✓	>3	✓
	on roads	1	✓			>1	✓
Direction of luminous flux		< 75° [4]	✓	45 - 75° [4]	✓	< 45° [4]	✓
Light temperature	on pedestrian pavement	3300 K (neutral white)	✓	3300 K – 2200 K	✓	≤2200 K (warm white)	✓
Innovative elements [2]		1	✓	>2	✓	>3	✓
Average lighting life		10,000 h	✓	24,000 h	✓	>24,000 h	✓
Lighting performance		100 lum/W	✓	175 lum/W	✓	>175 lum/W	✓
Impact on astronomy		Low	✓				
Colour rendering of lighting				60	✓	>60	✓

(1) Up to a maximum of 6 m. Above this height, parallel rows of lighting shall be used
(2) The following light sources shall be considered light sources: various types of posts, façades, illuminated signs, illuminated decorations. Each type of post counts as an additional element
(3) 2200 K Corresponds to the colour AMBAR WHITE
(4) Measured from the vertical
(5) Innovative elements to be considered are the use of self-dimming lighting depending on the different conditions of the day (traffic, number of pedestrians, etc.); the inclusion of solar and wind energy collection elements, monitoring elements, etc.

UP-A3.3 OUTDOOR LIGHTING LEVELS

Lighting level shall be determined by the distance and quality of the lighting, trying to minimise dark areas. Do not exceed the recommended lighting levels in order to avoid excessive light pollution. In addition, a priority shall be not exceeding the average reference levels established for each type of outdoor space by more than 20%. Where different lighting types or lighting levels can be used for the same traffic intensity, the selection of the one corresponding to the most critical level of demand shall be favoured.

Qualitative indicator

Compliance with the outdoor lighting levels of the following table for 100% of the lighting infrastructure. The outdoor lighting levels are shown on the next page.

Types of outdoor space (*)	Basic good practice	Relevant good practice	Excellence good practice
TYPE A: High-speed roads s>60	AL-3 ✓	AL-2 ✓	AL-1 ✓
TYPE B: Moderate speed roads 30<s<60	AL-3 ✓	AL-2 ✓	AL-1 ✓
TYPE C: Bicycle lanes	AL-6 ✓	AL-5 ✓	AL-4 ✓
TYPE D: Low-speed roads 5<s<30	AL-10 ✓	AL-9 ✓	AL-8 ✓
TYPE E: Pedestrian areas	AL-9 ✓	AL-8 ✓	AL-7 ✓
TYPE F: Green areas	AL-11 ✓	AL-10 ✓	AL-9 ✓

Substitute measure ✓

As an alternative for calculating the outdoor lighting level, calculating the lighting type is proposed by adding the partial weight (P) values and entering them into the following calculation formula: **AL=11-P**

For example, if a sum of achieved weight of 9 is achieved for TYPE A roads, according to the equation, it would mean a level of AL-2, resulting from subtracting 11-9, and therefore a relevant good practice is achieved on that type of road.

	Options	Reference weight	Weight reached
Speed	High	2	
	Medium	1	
	Low	0	
Traffic Intensity	High	1	
	Medium	0	
	Low	-1	
Existence of parked vehicles	Yes	1	
	No	0	
Intersection density	High	1	
	Medium	0	
	Low	-1	
Ambient brightness	High	1	
	Moderate	0	
	Low	-1	
Traffic composition	🚗+🚲+🚶	2	
	🚲+🚶	1	
	(🚗) (🚲) (🚶)	0	
Facial recognition	Necessary	1	
	Not necessary	0	
Crime risk	Yes	1	
	No	0	
Urban prestige	Yes	1	
	No	0	
Sum of weights achieved (maximum 10)			
Result of the formula AL=11-P			**AL-**

Values of compliance with the required lighting types in the qualitative indicator

List of lighting properties for compliance with the qualitative indicator.

	Surface luminance			Disruptive glare	Surrounding lighting
	Mean luminance [1] E_m(lux) [2]	Global Uniformity U_o [3]	Longitudinal Uniformity U_l	Increase TI Threshold [3] (%)	SR Environment Ratio [4]
AL-1	40	0.40	0.70	10	0.50
AL-2	30	0.40	0.70	10	0.50
AL-3	20	0.40	0.70	15	0.50
AL-4	15				
AL-5	10				
AL-6	5				
AL-7	25	0.35			
AL-8	20	0.35			
AL-9	15	0.35			
AL-10	10	0.35			
AL-11	5	0.35			

(1) The given luminance values can be converted into luminance values by dividing the former by the R-coefficient of the pavement used, taking 15 when this is not known
(2) The levels considered require a high maintenance factor for the used lamp to ensure the minimum levels.
(3) With wet road conditions this value shall be 0.15
(4) When using low luminance light sources (fluorescent and low pressure sodium vapour lamps) an increase of 5% of the threshold increment (TI) may be allowed
(5) The SR environment ratio should be applied on roads where there are no other adjacent areas that have their own requirements. The width of the adjacent strips for the SR environment ratio shall be at least equal to the width of a traffic lane, where possible 5 lanes wide

STAGE

Urban Planning	Design	Construction
Use and Maintenance	End of life	

STRATEGIC COMMITMENTS

Commitment to the city	Sustainability
Airport identity	Innovation

OBJECTIVES

A. Consider maintenance as part of ensuring the lifetime and durability of the infrastructure.
B. Establish the maintenance needs in perfect service quality conditions, avoiding their deterioration.
C. Consider the full integration of the outdoors as a resource for economic activity.

REGULATORY AND GOOD PRACTICE FRAMEWORK

Instruction for the Design of Public Roads. Madrid City Council
Trends and good practices

Master Plan for Roadside Trees in the city of Madrid. Madrid City Council
Trends and good practices

Barcelona 2020 Urban Sustainability Indicators Plan. Barcelona Urban Ecology Agency
Trends and good practices

UP-A4 URBANISATION CONDITIONS

UP-A4.1 QUALITY OF OUTDOOR URBANISATION

The design of the spaces outside the lot, which have been expressly assigned/considered as part of the execution and maintenance commitments of the lot, shall be included in the development project, and will also be subject to subsequent execution and maintenance.

In order to ensure the quality of these spaces, their full integration into the development proposal of the spaces not occupied by the building, so that they are not considered as residual spaces, and constitute resources that are favourable to economic activity, as part of the detailed development requested, the following conditions will be applied, which complement those established for these same spaces within the lot, and the following conditions shall be met:

1. Location and study of the context, in order to maximise the most appropriate layout for the use of the space (whether it is a more natural area, landscaping for public use, living areas, etc.), propose technical solutions and finishes that are durable and of aesthetic quality, maximise landscaped and wooded areas, limit the areas built with non-permeable materials, and reduce and optimise water and energy consumption in the maintenance phase.
2. Drawing up of a specific study for the development of open space and green areas, including pedestrian and cycling continuity, as well as the technical solutions and finishes of the elements specific to the activities and functions of the area (recreation, leisure, landscaping, shaded areas, etc.)
3. Balanced planting of landscaped/wooded areas with all their elements in open spaces
4. Use of efficient irrigation systems
5. Design of the lighting of the area, exclusively regarding pedestrian walkways or pedestrian areas, if any.
6. Avoid earthworks as much as possible, considering in any case that for areas larger than 2,000 m2, accessible spaces without architectural barriers need to be built.
7. Compliance with aspects that are not regulated in this White Paper and are related to exterior urban development, taking as a reference the basic urbanisation qualities of the Madrid City Council.

Quantitative indicator

Compliance with the conditions of the list.

Basic good practice:	Complies with all

UP-A4.2 BASIC CONDITIONS FOR URBANISATION MAINTENANCE

The drafting of an activity and maintenance manual for the Area's installations is requested, with the aim of facilitating the conservation of the urbanisation work, minimising maintenance needs, with the consequent savings in materials, land activity, energy and a reduction in the generation of atmospheric emissions.

This document will be added to the urbanisation book. In order to facilitate the management and provision of services for companies in the Area, the creation of a comprehensive service provision platform for the whole Area is advisable, offering assistance in various areas related to the operation of the companies

The predictive maintenance models (sensors and smart) will be considered in the aforementioned urbanisation book, which will include the temporary requirements for the revision of the different service networks within the Area, in the event that the revision is not carried out by the supply company, and a specific maintenance plan for each of the services with the periodic maintenance actions, or protocols for repair tasks.

In short, the drafting of the following shall be promoted:

- Urbanisation book: a document similar to the building book, which will always make it possible to ensure how the different networks have been executed and their qualities.
- Maintenance book: document that implies an objective control of revisions and execution of maintenance works of the networks (e.g. sewerage and wells, supply, lighting, etc.).

The two documents may be unified as part of a single book, in which the maintenance part would need to be differentiated.

Quantitative indicator

Compliance with the criterion.

Basic good practice:	Compliant

CONTENTS

This section emphasises the importance of the dimension of open spaces in general and green areas in particular as elements of continuity within the Area.

These criteria are intended to promote an integrated and balanced development of pedestrian and vehicle space as well as the activities of the Area and pedestrians' appropriation of open spaces for social interaction for employees and visitors.

The criteria for the urbanisation of roads, open spaces and differential aspects to improve the user experience and strengthen the airport's identity design as an added value are presented.

STAGE

Urban Planning	Design	Construction
Use and Maintenance		End of life

STRATEGIC COMMITMENTS

Commitment to the city	Sustainability
Airport identity	Innovation

OBJECTIVES

A. Integrated planning of the street and mobility dimension and land activities
B. Design spaces according to mobility needs, with networks of pedestrian and soft mobility routes
C. Arrange parking to make the use and enjoyment of the open spaces compatible with the comfort of parking users.

REGULATORY AND GOOD PRACTICE FRAMEWORK

Instruction for the Design of Public Roads. Madrid City Council
Trends and good practices

Master Plan for Roadside Trees in the city of Madrid. Madrid City Council
Trends and good practices

Barcelona 2020 Urban Sustainability Indicators Plan. Barcelona Urban Ecology Agency
Trends and good practices

UP-B1 ROAD URBANISATION CONDITIONS

UP-B1.1 DIMENSION OF THE ROAD SECTION AND ITS COMPONENTS

The modal distribution of road space will be balanced according to its functionality, avoiding excessive land occupation and encouraging the creation of pedestrian spaces and recreational areas with an appropriate spatial scale. The dimensions of traffic lanes on main roads shall not be less than 3.5 metres, in order to allow full public transport functionality, and shall be designed for an average use speed under or equal to 40 km/hour, for which specific traffic calming systems may be established.

Quantitative indicator

Compliance with the values in the table below.

	Basic good practice	Relevant good practice	Excellence good practice
Value 1: Dimensions of traffic lanes	≥ 3.5 m ✓		
Value 2: Average speed of traffic lanes	≤ 40 km/hour ✓		
Value 3: Percentage of road section allocated to recreational areas and pedestrian spaces.	≥ 20% ✓	≥ 40% ✓	≥ 50% ✓
Value 4: Obstacle-free pavement width	≥ 3 m ✓	≥ 4 m ✓	≥ 5 m ✓
Value 5: Percentage of road section on a single platform		≥ 50% ✓	100% ✓
Value 6: Removal of architectural barriers and accessible routes in all pedestrian areas inside and outside the lot.	Compliant ✓		

Substitute measure for Value 3 ✓

Pedestrian and recreational areas may be concentrated in specific areas, provided that in a road segment of 500 metres long, their surface area equals the percentages of the quantitative indicator regarding the total road surface area.

Substitute measure for Value 4 ✓

This dimension may be complied with by occupying part of the interior space of a lot, by setting back buildings and reserving space for pedestrian use.

Substitute measure for Value 5 ✓

Concentrating spaces on the same platform in specific areas is possible, provided that in a road segment of 500 metres long, its surface area equals the percentages of the quantitative indicator regarding the total road surface area.

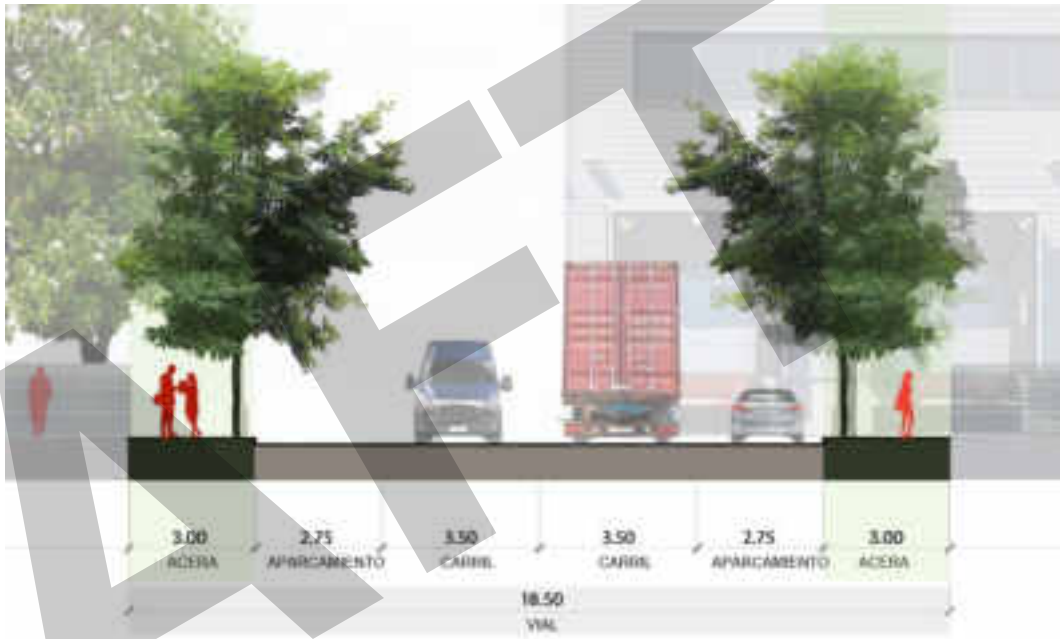
Illustrative example of a road section. Source: IDOM elaboration

Illustrative example of separation or differentiation of accessible pedestrian route

Universal accessibility through pedestrian routes implies anticipating a series of actions aimed at guaranteeing mobility for people with reduced mobility: safe passageways and adapted slopes will be provided.

The different administrations have regulations or legislative provisions regarding accessibility and the elimination of architectural barriers, which shall be complied with, and maximum slopes of no more than 6% in the preferential pedestrian routes for the Area as a whole need to be considered.

These examples are merely illustrative and do not constitute design guidelines, but serve only for consultation and support of separation or differentiation possibilities of the accessible pedestrian itinerary regarding the total surface of the logistics roads (above) and mixed-use roads (below) within the Master Plan for the development of Airport City Adolfo Suárez Madrid-Barajas.



Total road area

Separate or differentiated area for the accessible pedestrian itinerary

Illustrative example of reconversion and adaptability of the road into a single platform

Changes in mobility needs should allow for the transformation of the road section over the years. To this end, the possibility of executing the urbanisation on a single platform (road section at the same level, with no differences in level between the road and the pavement) is recommended, which will enable better adaptability to different dimensions of each of its components, as well as the reversibility of any design of the road section.

The objective is to reduce the use of any mode of transport that uses energy (excluding vehicles powered exclusively by human muscle power), regardless of the source, including 100% clean energy vehicles, as well as to promote public transport and the use of roads for other activities and improve the quality of public spaces.

Illustrative proposal for a change of road section to a single platform.
Source: IDOM's own elaboration

AÑO 1

In year 1, the parking requirements need a parking area to be provided at the end lanes of the road section. The road section is designed as a single platform with a view to its future transformation from a car-based city scheme to a pedestrian-based one

YEAR 20 - OPTION 1

The single-platform road section makes it possible to generate open spaces over time that replace parking space with green space in this case

YEAR 20 - OPTION 2

The future scheme not only implies an increase in green space but also favours the colonisation of open spaces by pedestrians who take the street as a stage for the development of commercial, recreational or sporting activities, among other potential activities

UP-B1.2 PROMOTION OF PEDESTRIAN MOBILITY AND SOFT MOBILITY SYSTEMS

The Area's pedestrian routes and their minimum width shall be established in accordance with the contents of this book, guaranteeing their formal design, quality and comfort, convenience and functionality, following the guidelines below:

- Prioritise pedestrian traffic at all times, as a basic element of the correct design of crossings.
- Establish mechanisms to control and separate pedestrian space and to prevent vehicles from occupying this space, either with street furniture, specific devices or wooded/landscaped strips.
- Design a suitable, non-slip, resistant and easy-to-maintain pavement and a signage system for routes linked to daily mobility needs or routes between facilities and services.
- The location of transport/soft mobility stops or stations should respond both to the principle of centrality, serving areas of higher density, and to the principle of universal pedestrian accessibility from any point in the Area, not invading pedestrian space.

The design elements of the pedestrian routes will be detailed in the graphic documentation and in the development project report, establishing the minimum widths of free crossing.

Quantitative indicator

Compliance with all the guidelines described.

Basic good practice:	Complies with all	✓

UP-B1.3 SPECIFIC TO LOGISTICS: FREIGHT AND TRANSPORT ROADS

The dimension of logistics activity forces in many cases the mono-functionality of large lots with exclusive accesses for its different users. Therefore, efforts will be made to establish a differentiation between streets for freight and service access and those for vehicle and pedestrian access, so that an urban space can be built that is not exclusive due to the difficulty of integrating freight movement and pedestrian movements.

Quantitative indicator

Percentage of freight and transport façades where the distribution of pedestrian and vehicle activity is differentiated.

Basic good practice:	≥ 20%	✓
Relevant good practice:	≥ 50%	✓
Excellence good practice:	100%	✓

Substitute measure

A basic good practice is to differentiate accesses within the same lot and to build a street façade.

STAGE

Urban Planning	Design	Construction
Use and Maintenance		End of life

STRATEGIC COMMITMENTS

Commitment to the city	Sustainability
Airport identity	Innovation

OBJECTIVES

A. Integrated planning of the street and mobility dimension and land activities
B. Design spaces according to mobility needs, with networks of pedestrian and soft mobility routes
C. Arrange parking to make the use and enjoyment of the open spaces compatible with the comfort of parking users.

REGULATORY AND GOOD PRACTICE FRAMEWORK

Instruction for the Design of Public Roads. Madrid City Council
Trends and good practices

Master Plan for Roadside Trees in the city of Madrid. Madrid City Council
Trends and good practices

Barcelona 2020 Urban Sustainability Indicators Plan. Barcelona Urban Ecology Agency
Trends and good practices

STAGE

Urban Planning	Design	Construction
Use and Maintenance	End of life	

STRATEGIC COMMITMENTS

Commitment to the city	Sustainability
Airport identity	Innovation

OBJECTIVES

A. Promotion of cycling
B. Special segregation measures between cycling, pedestrian and vehicle flow
C. Development of circuits linking adjacent towns
D. Risk reduction at overlaps with vehicle traffic
E. Flexibility in routing circuits to adapt to changes in usage patterns or means of transport

REGULATORY AND GOOD PRACTICE FRAMEWORK

Segregation of cycling and pedestrian lanes if speed >15 km/h or if pavement width >3 m
LEED for Cities and Communities: Plan and Design

Segregation of cycle and vehicle lanes if their speed is >30 km/h
BREEAM EN Urban Planning

Cycle lanes within 200 metres or 100 metres of building entrances
ITDP 1706 TOD Standard

UP-B1 ROAD URBANISATION CONDITIONS

UP-B1.5 CYCLE LANE ROUTES

The continuity of cycle lanes will be promoted by connecting to existing or proposed cycle lanes both in the vicinity of the GHS and between the Areas. In addition, a minimum width of 1.50 metres for one-way sections and a minimum width of 2.60 metres for two-way sections is requested.

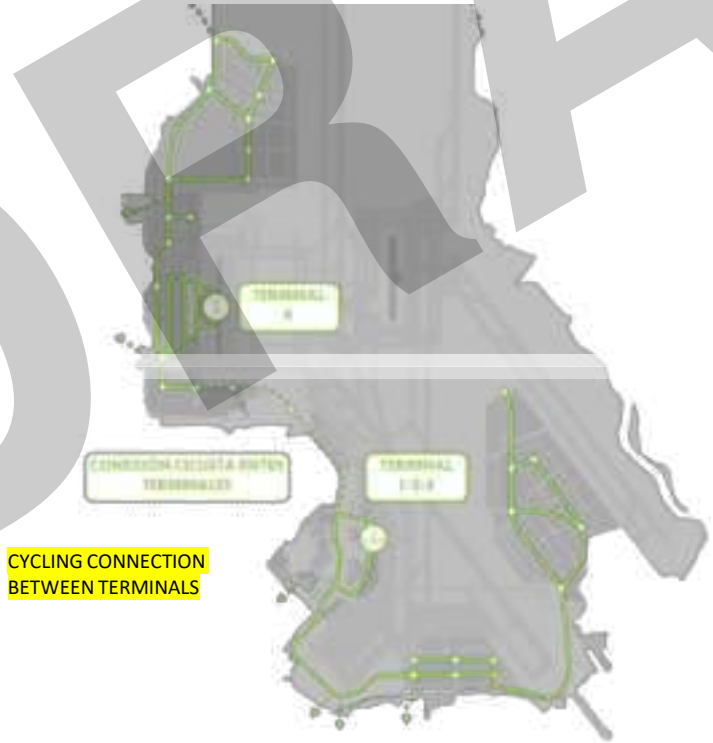
Qualitative indicator

Ensure cycling continuity with the connection of cycle lanes between the Areas and in the vicinity of the GHS.

Basic good practice:	Compliant

Substitute measure

Where there are no existing or proposed cycle lanes near the GHS, road space within the Area will be reserved for future conversion to cycle lanes.



Illustrative example of cycling continuity between Areas

The design of cycle lane routes with sections close to building entrances will be promoted, with the aim of promoting alternative forms of transport, and which in turn connect to the nearest intermodal nodes (Air Terminals) of public transport.

In addition, we recommend that bioclimatic solutions be implemented on the cycling route with elements that provide shade.

Quantitative indicator 1

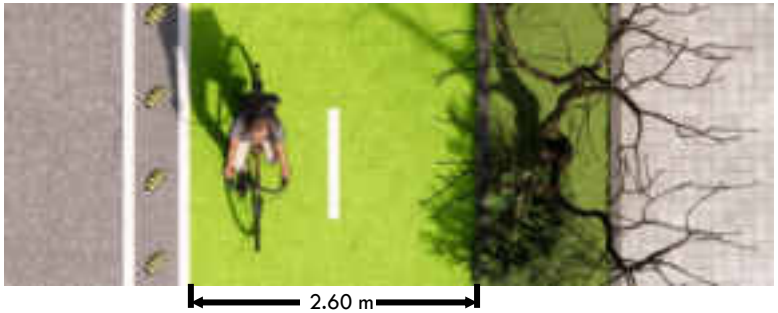
Distance between the entrance of the building or public transport stop/shuttle and the nearest point on the cycle lane network.

Basic good practice:	≤ 350 metres
Relevant good practice:	≤ 200 metres
Excellence good practice:	≤ 100 metres

Quantitative indicator 2

Width of cycle lanes.

Basic good practice: *(comply with both points)*	• One way: 1.50 m • Two way: 2.60 m



Illustrative example of a two-way cycle lane

UP-B1.6 INTEGRATION OF CYCLE LANES ON ROADS

The segregation of road space will be encouraged by allocating part of it for the implementation of a cycle lane, preferably between the space intended for vehicle mobility and the space intended for pedestrian mobility.

In addition, in order to contribute to the implementation of safe and comfortable spaces, the placement of separating elements of the cycle lane regarding other forms of mobility (vehicle and/or pedestrian) will be favoured according to the maximum permitted speed, following the guidelines described in the quantitative indicator of the following table.

This segregation may consist of either the identification of a separation and safety strip with paint on the pavement or the use of physical separation elements.

Quantitative indicator

Cycle lane segregation according to the conditions in the following text.

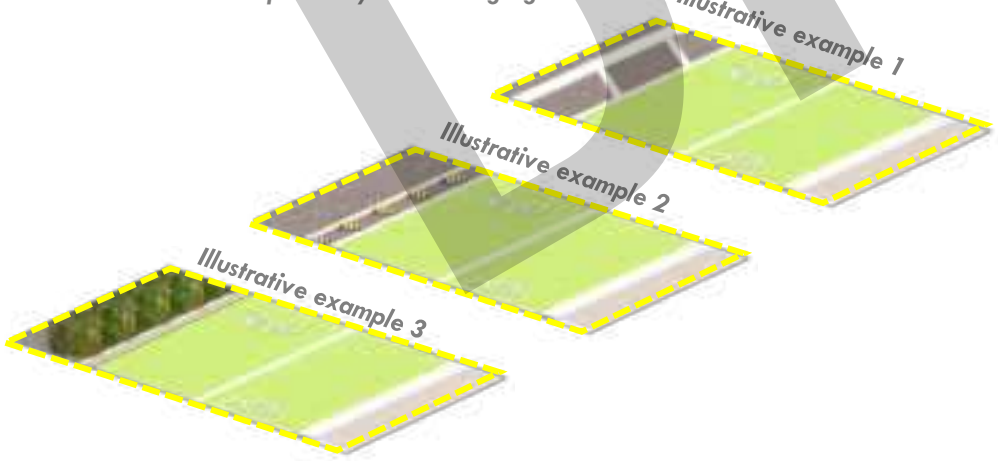
Basic good practice:	Compliant

Segregation between the cycle lane and the pedestrian lane is mandatory if at least one of the conditions is met:

- If the maximum speed allowed on the cycle lane is ≥ 15 km/h
- If the unobstructed pavement width ≤ 3 metres

Segregation between the cycle lane and the vehicle lane is mandatory if the maximum speed allowed on the vehicle road is ≥ 30 km/h.

Detail of the examples of cycle lane segregation



Illustrative example 1
Cycle lanes segregation with paint

Illustrative example 2
Cycle lane segregation with artificial physical elements

Illustrative example 3
Cycle lane segregation with natural physical elements

STAGE

Urban Planning	Design	Construction
Use and Maintenance		End of life

STRATEGIC COMMITMENTS

Commitment to the city	Sustainability
Airport identity	Innovation

OBJECTIVES

A. Balance of parking spaces
B. Promotion of soft means of transport
C. Ensure the deployment of electric vehicles
D. Flexibility in the use of parking spaces
E. Uniform distribution of green elements on the road

REGULATORY AND GOOD PRACTICE FRAMEWORK

On-street or on-lot parking ratio of 2:3 (optimal 1:3)

Vitoria-Gasteiz Urban Sustainability Indicators

Public parking on > 70% of the length of the road on both sides of the road

LEED Neighborhood Development

Public parking on < 70% of the length of the road on both sides of the road

BREEAM EN Urban Planning

>80% of areas within <300 m of bicycle loan points

Vitoria-Gasteiz Urban Sustainability Indicators

UP-B1 ROAD URBANISATION CONDITIONS

UP-B1.7 DISTRIBUTION OF PARKING ON ROADS

As a general parking strategy, the following points are shown:

- The development of a joint and integrated on-street and on-lot car parking strategy will be encouraged with the ultimate aim of encouraging the concentration of vehicles as much as possible within the lot they serve, and limiting the creation of large areas of battery parking in open spaces. In the case of on-street parking, they will be built in such a way that, in the medium term, they can be transformed into spaces for Smart mobility, soft mobility and pedestrian areas and fully integrated into the urban landscape.
- The development of a parking strategy for electric vehicles with the necessary infrastructure for charging will be encouraged.
- The use of soft mobility means of transport will be encouraged by reserving parking spaces for bicycles and scooters on roads, preferably in the same parking strip as vehicle parking. These spaces shall also include electric charging centres for these means of transport, and the surface area of these spaces shall be greater than or equal to 50 m² (recommended space of 25 m long and 2 m wide).

Quantitative indicator

Compliance with the values in the table below.

	Basic good practice	Relevant good practice	Excellence good practice
Value 1: Total vehicle spaces in the Area	1 place / 100 m²c ✓		
Value 2: Percentage of Value 1 places located on roads	≤ 50% ✓		
Value 3: Percentage of Value 2 places located on roads reserved for electric vehicles		≥ 10% ✓	
Value 4: Distance between soft mobility parking	≤ 800 metres ✓	≤ 600 metres ✓	≤ 300 metres ✓
Value 5: Places in each soft mobility parking space	≥ 20 places ✓		

Value 1 of the table: Total number of parking spaces in the Area, adding those located on the road and inside the lot.
Value 2 of the table: Percentage of parking spaces located on roads, regarding the total number of parking spaces of Value 1
Value 3 of the table: Percentage of total on-street parking spaces (Value 2) to be reserved for electric vehicles and with charging infrastructure
Value 4 of the table: Pedestrian distance between soft mobility parking spaces.
Value 5 of the table: Number of places in the same space.

Substitute measure for Value 5 ✓

Good practice will be raised by one level if these spaces are integrated with public transport stops and/or shuttles.

Substitute measure for Value 2 ✓

The required parking spaces may be located in specific lots within the development, complying with the good practice percentage. For logistic activities, this substitute measure may in no case exceed 18% of the occupation of the Area.

UP-B1.8 CONCENTRATION OF PARKING SPACES INSIDE LOTS OR IN SILOS

In order to free up on-street parking space for a better integration of the activities of each Area in the urban space or if there is a lack of parking space, on-street parking spaces may be concentrated in dedicated lots, either in the form of surface parking or in multi-storey silos.

The impact on pedestrian continuity will be minimised, concentrating as far as possible access and exit flows at as few points as possible: preferably a single point under 5 m wide per direction of traffic (access and exit).

Each specific solution will require Aena's approval.

Qualitative indicator

Integration of the parking spaces with the surroundings.

	Basic good practice	
Parking in multi-storey silos	Façade integrated with the surrounding buildings	✓
Surface parking	Unobtrusive location at the rear of the lot by means of a vegetation barrier, etc.	

Quantitative indicator

Maximum occupancy of accesses and exits regarding the total length of the lot frontage dedicated to parking.

Basic good practice:	≤ 30%	✓
Relevant good practice:	≤ 15%	✓
Excellence good practice:	≤ 5%	✓

Complementary measure of the quantitative indicator ✓

If silos are chosen, the maximum height above ground level, including all installations and constructions on roofs, will be defined by the maximum MSL determined by the corresponding aeronautical easement studies, and when necessary, an aeronautical safety study will also be carried out, in compliance with the provisions of Article 33 of Decree 584/1972 on aeronautical easements in its current wording.

Complementary measure of the quantitative indicator ✓

The building intensity of the silos will be taken into account in the calculation of the total building intensity of the Area. Under no circumstances the maximum gross building intensity exceed the ratio of 1 m^2c/m^2s required by the GUDP for each Area.

STAGE

Urban Planning	Design	Construction
Use and Maintenance		End of life

STRATEGIC COMMITMENTS

Commitment to the city	Sustainability
Airport identity	Innovation

OBJECTIVES

A. Integrated planning of open spaces for collective use and recreation in order to achieve a sufficient quality of the urban environment based on design for all (accessibility, perception and orientation)
B. Consider these spaces as an integral part of the town's green infrastructure network
C. Ensure minimum comfort conditions that maximise their use.

REGULATORY AND GOOD PRACTICE FRAMEWORK

Green areas within a maximum walking distance of 800 metres
LEED Cities and Communities - Plan and Design

Parks or playgrounds at a distance of <500 m from the entrance of the buildings
ITDP 1706 TOD Standard

Master Plan for Roadside Trees in the city of Madrid. Madrid City Council
Trends and good practices

UP-B2 URBANISATION CONDITIONS FOR OPEN SPACES

UP-B2.1 OPEN SPACES AND GREEN AREAS

Green areas will be designed according to the needs in terms of surface dimension, spatial location in relation to the area and lot, and selection of appropriate plant species following water and climate efficiency criteria. They should preferably be built on soils with permeable or semi-permeable surfaces, which allow air and water to pass through, with a connection to natural soil that enables the growth of large trees. Green areas constitute locations for citizen coexistence and support the environmental quality conditions of the urban space.

Illustrative example of green areas in the Master Plan in Palmas, Brazil. Source: Prepared by IDOM

Quantitative indicator

Compliance with the values in the table below.

		Basic good practice	Relevant good practice	Excellence good practice
Value 1: Area of green areas	Logistics	≥ 15 m²s ✓		
	Offices, commercial and hotels	≥ 15 m²s ✓	≥ 20 m²s ✓	≥ 30 m²s ✓
Value 2: Distance between the entrance to the building and the nearest green area with a surface area of ≥ 1.000 m²s	Logistics	≤ 800 m ✓		
	Offices, commercial and hotels	≤ 800 m ✓	≤ 500 m ✓	≤ 300 m ✓
Value 3: Percentage of green areas with buildings		≤ 10% ✓		
Value 4: Green continuity		Compliant ✓		

Value 1 of the table: Surface area of green areas with public accessibility per 100 square metres of built surface area in the Area, which may be located inside or outside the lot, always within the Area itself. Green areas on roofs of any building are excluded.
Value 2 of the table: Distance from the entrance of the buildings to the nearest green and/or landscaped area with a surface area of 1,000 m² or more.
Value 3 of the table: Green areas with buildings of a maximum of two storeys and intended for small and medium-sized businesses, recreational tertiary uses (meeting rooms, shows and hotels), sports activities and cultural facilities, provided that their maintenance and management will be the responsibility of the investor. The activity to be implemented, as well as its buildability or location, shall require Aena's approval.
Value 4 of the table: Continuity with metropolitan green infrastructure, prioritising connectivity and a correct transition between them.

Substitute measure ✓

In order to comply with value 1, green areas outside the Area itself may be counted, provided that they comply with value 2 and that there is green continuity with the Area boundaries. Furthermore, their maintenance need to be compatible with the Area regarding which they are considered.

Illustrative example of a hospitality building in a green area

UP-B2.2 TREE CHARACTERISTICS*

* It affects both roads and open spaces on the outside and inside of the lot to the same extent

In order to contribute to the improvement of environmental conditions, reduction of soil sealing, reduction of pollution, improvement of air quality, reduction of heat island, and improvement of urban landscape conditions, the following guidelines are proposed:

- Preferably, trees should be planted next to roads (when they are wider than 12 m), parallel to the parking strip and/or the pedestrian walkway, and in green areas.
- The use of grass and water-intensive ground cover plants will be minimised for landscaping.
- Strips alternating trees and shrubs will be preferably implemented, especially tree pits.
- Efforts shall be made to keep existing trees, or to transplant them to suitable areas within the Area or lot.
- The creation of visual plant barriers and accompanying landscaping elements for spaces adjacent to car parks will be encouraged.

Quantitative indicator

Characteristics of trees located parallel to the pedestrian area, parking strip and/or evenly distributed in the green areas, including those located both inside and outside the lot, always within the Area. All features included and excluded from this list shall follow Aena's tree selection guidelines.

	Basic good practice	Relevant good practice	Excellence good practice
Road width for tree planting	≥ 12 m ✓		
Percentage of open spaces (excluding roads) with wooded areas	≥ 40% ✓	≥ 60% ✓	≥ 80% ✓
Percentage of lawns in relation to the total area of green areas	≤ 30% ✓	≤ 15% ✓	0% ✓
Linear distance between trees on roads and in open spaces	≤ 15 m ✓	≤ 9 m ✓	≤ 7 m ✓
Tree pit permeable area	≥ 1.5 m² ✓	≥ 3 m² ✓	
Minimum tree size on the outside of the lot	≥ 18 cm ✓		
Minimum canopy base height of trees near parking areas	≥ 2.25 m ✓		
Diameter of trees close to parking areas	≥ 4 m ✓		
Native vegetation and low irrigation requirements	≥ 50% ✓	100% ✓	
Vegetation diversity			Each species does not exceed 10% of total wooded positions ✓
Conditions for transplanting existing trees	Submission of a detailed study and environmental impact assessment ✓	Specimens ≤1 m high ✓	One adult specimen of the same species is planted for each year of the age of each felled specimen ✓

UP-B2.2 TREE CHARACTERISTICS (continued)

Substitute measure 1

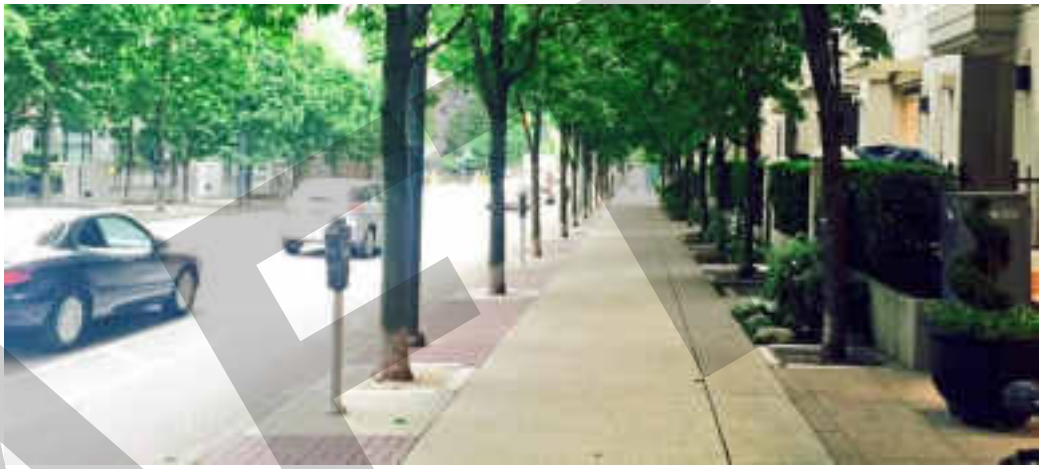
If non-native species are chosen, it shall be justified that the irrigation conditions are equal to or less than those required for a native species.

Substitute measure 2

The basic good practice on the percentage of lawn in relation to the total area of green areas if a lawn type with low water requirements is chosen, when justified with project documentation. For illustrative purposes, as an example, the species Zoysia tenuifolia.

Substitute measure 3

Areas outside the Area itself that comply with the basic good practice of the previous criterion (UP-B2.1) may be counted towards the percentage of open spaces with wooded areas.



Illustrative example of trees parallel to a pedestrian space. Source: Stewart Butterfield

Illustrative example of tree typology

These examples are for illustrative purposes only, do not constitute design guidelines and are for reference and support of vegetation possibilities only, they are not a tree selection list. The selection of tree typology shall follow the characteristics described in the criterion and comply with Aena guidelines.

Cork tree
(Quercus suber)

Hackberry
(Celtis australis)

Common poplar
(Populus nigra)

Holm oak
(Quercus ilex)

Narrow-leaved ash
(Fraxinus angustifolia)

Laurel
(Laurus nobilis)

Aleppo pine
(Pinus halepensis)

Stone pine
(Pinus pinea)

Laurustinus
(Viburnum tinus)

Lavender
(Lavandula angustifolia)

Strawberry tree
(Arbutus unedo)

Myrtle
(Myrtus communis)

Tree germander
(Teucrium fruticans)

Rosemary
(Rosmarinus officinalis var. prostratus)

Chasteberry
(Vitex agnus-castus)

Linden
(Tilia platyphylos)

UP-B2.3 CHARACTERISTICS OF THE RECREATIONAL AREAS DEPENDING ON THE ORIENTATION AND CLIMATOLOGY

Multifunctionality and the guarantee of improvement of the urban microclimate, correction of impacts such as noise and pollution, and the complementarity of these spaces as natural connectors integrated as far as possible into the city's green infrastructure will be sought. The location of open spaces shall be sought in sunny areas, preferably with south-east, south and south-west orientations.

For landscaped areas, the chosen plant species shall be typical of the Mediterranean landscape, ground cover, low shrubs and sub-shrubs, perennials and bulbous, often adopting spherical shapes as an adaptation strategy, occasionally thorny or with foliar adaptations to the scarcity of water and strong sunlight, with very interesting textures and colours throughout the year. Efforts will be made to select species of greater visual impact, with a selection of flowering plants over grasses and avoiding species that are very different in height, concentrating on species that can be ornamental, colour, size or flowering characteristics.

Qualitative indicator

Compliance with the criterion.

Basic good practice:	Compliant ✓

UP-B2.4 VEGETATIVE BARRIER

Low evergreen vegetation and medium and high deciduous vegetation will be favoured in order to achieve a green continuity effect throughout the year, while at the same time avoiding the creation of undesirable shades on nearby buildings in winter, in the following locations:

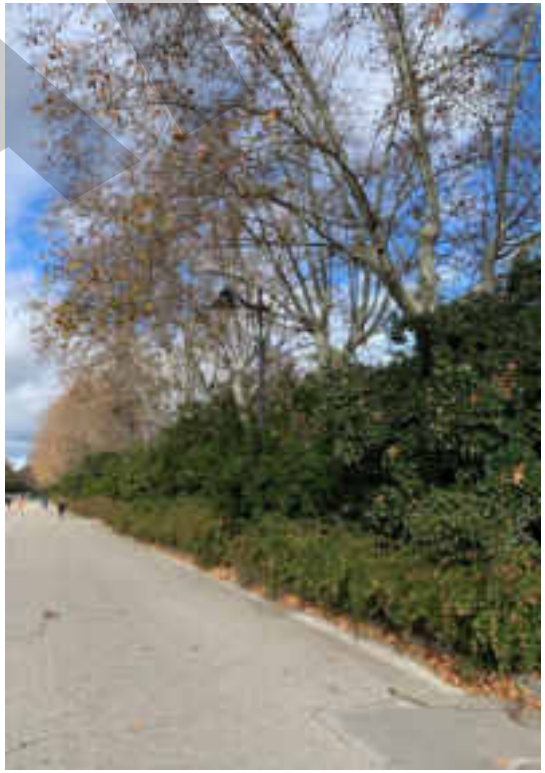
- Lateral areas of roads where there are no buildings, to achieve a visual barrier using vegetation and to emphasise the directionality of the layout
- Central reservations and perimeter areas in large green areas
- Open spaces requiring a natural vegetation separation barrier

Qualitative indicator

Compliance with the criterion.

Basic good practice:	Compliant ✓

Illustrative example of a plant barrier



Illustrative example of a vegetation barrier in Madrid's Retiro Park, for a year-round green space strategy for the Area, using evergreen shrubs below and deciduous trees

STAGE

Urban Planning	Design	Construction
Use and Maintenance		End of life

STRATEGIC COMMITMENTS

Commitment to the city	Sustainability
Airport identity	Innovation

OBJECTIVES

A. Creation and strengthening of its identity design as an added value in the scope of Airport City Adolfo Suárez Madrid-Barajas
B. Unique identification of each Area
C. Technological interaction between services and the population
D. Promoting activities and ensuring high visibility and integration in the special context
E. Supporting flexibility and a range of options facing future change

REGULATORY AND GOOD PRACTICE FRAMEWORK

Branding for uniquely themed buildings

Trends and good practices

Digital billboards and bus shelters with standardised 118,5*175 cm supports. Digital billboards with time, location and warning notices

Madrid's Identity

Columns with standardised 118*351 cm supports, with the corporate band in the upper and lower areas of 17 cm

Madrid's Identity

UP-B3 DIFFERENTIAL ASPECTS

UP-B3.2 LOCATION OF VEHICLE SIGNAGE

Adequate location of signage elements oriented to vehicle traffic will be promoted.

- Fixed elements are encouraged in the buffer zone, located on the part of the pavement closest to the vehicle lane and with a recommended width of 0.6 metres. Signs related to traffic flow and route indications will be prioritised.
- The placement of panels at intersections indicating the number of available on-street electric vehicle charging stations, if any, is encouraged.

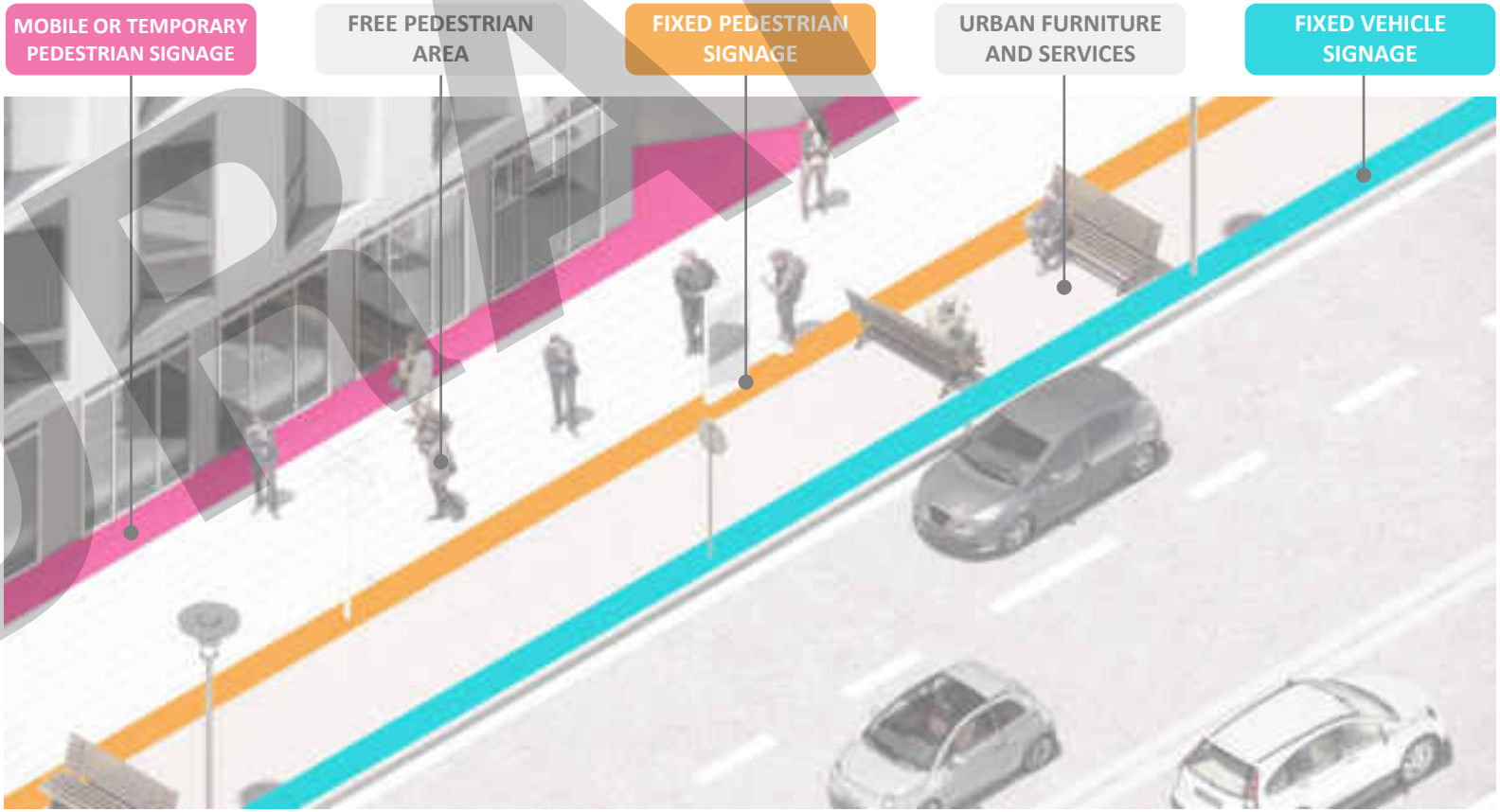
Qualitative indicator

Compliance with the points of the criterion

Basic good practice: Complies with all

Substitute measure

A different layout of signage may be considered, subject Aena's approval.



Illustrative example of location of pedestrian signage

UP-B3.3 LOCATION OF PEDESTRIAN SIGNAGE

Adequate location of signage elements oriented to pedestrian traffic will be promoted, which in turn encourages and optimises the use of open spaces.

- The placement of fixed elements is encouraged in the separation strip between the open pedestrian space and the urban furniture and services area, which may be set back by up to 1 metre in order to provide a space for observing the sign.
- The placement of elements of a mobile or temporary nature is encouraged in the area adjacent to the building façade, not more than 1 metre from the lot edge.

In both cases the width of the area shall always respect an obstacle-free pedestrian area of 3.0 metres.

Qualitative indicator

Compliance with the above points.

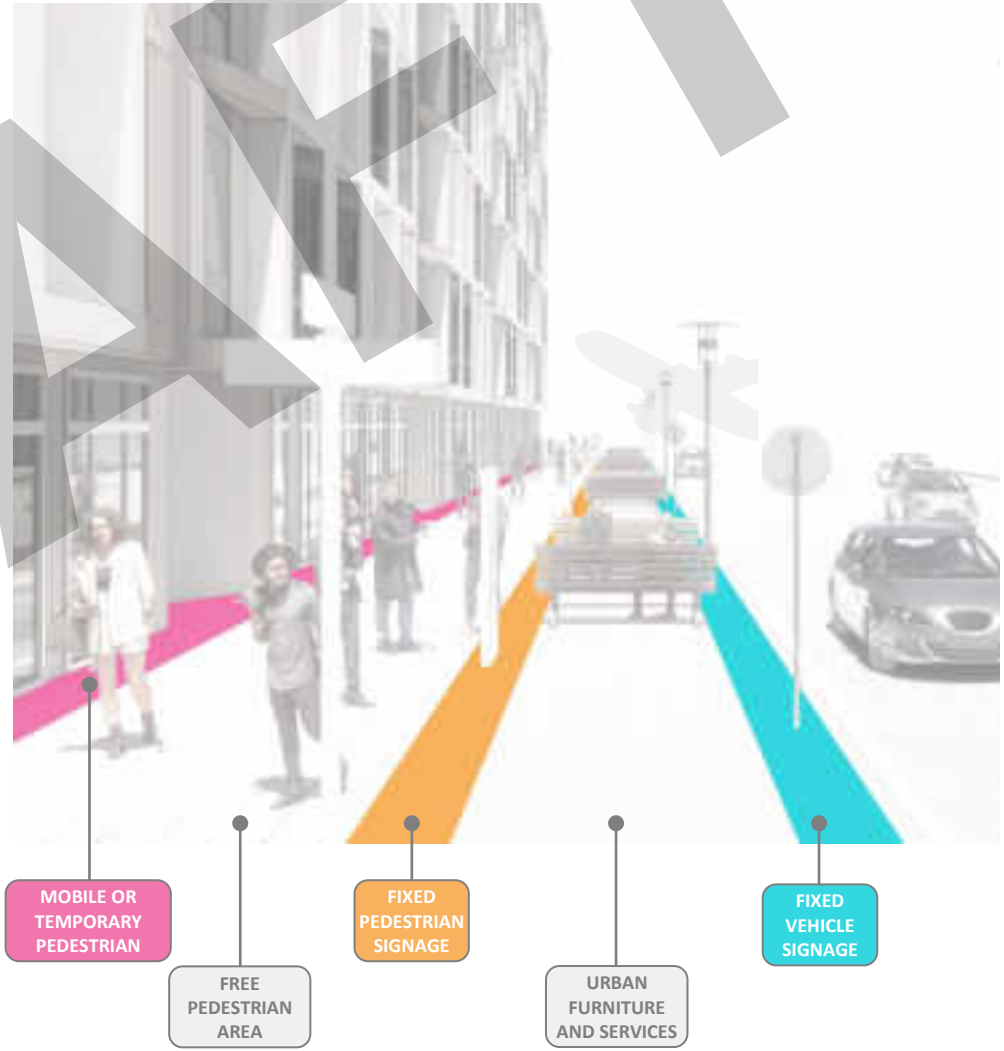
Basic good practice: Complies with all

Substitute measure 1

A different layout of signage may be considered, subject Aena's approval.

Substitute measure 2

On a pre-existing low pedestrian traffic road with an obstacle-free width between 1.5 metres and 2.5 metres, the frontage area and the urban furniture and services area shall be removed and signage elements may be placed in the buffer area, together with vehicle signage.



Illustrative example of location of pedestrian and vehicle signage

STAGE

Urban Planning	Design	Construction
Use and Maintenance	End of life	

STRATEGIC COMMITMENTS

Commitment to the city	Sustainability
Airport identity	Innovation

OBJECTIVES

A. Local accessibility to natural areas
B. Implementation of circuits and green belts
C. Improving the functionality of activity centres
D. Dynamism in the mix of activities

REGULATORY AND GOOD PRACTICE FRAMEWORK

Surface area of pocket parks between 80 and 800 m², average 275 m²

Pocket parks in Philadelphia. Alison Blake

Recommended minimum dimensions for pocket parks on pavements of 4.5 m * 6 m

San Francisco Better Streets Plan

Minimum recommended dimensions for pocket playgrounds on central reservations of 3.6 m * 7 m

San Francisco Better Streets Plan

UP-B4 RECREATION AND LEISURE

UP-B4.1 QUALITIES OF RECREATION AND LEISURE SPACES

The development of a strategy for the implementation of small opportunity areas for the placement of recreation and leisure spaces, also called pocket parks, will be encouraged. The location of these spaces will be facilitated at (1) pavements, (2) road intersections and central reservations, and (3) spaces between the dividing walls of buildings. Other locations may also be considered.

Illustrative example of recreation and leisure spaces in dividing walls

Quantitative indicator

Surface area of pocket parks.

Relevant good practice: ≥200 m² and ≤500 m²

In addition, the following qualities will be considered:

- items of furniture, such as seating, coffee tables, playground equipment, small sports facilities, etc.
- Perimeter border of natural elements that serves as a buffer for adjacent traffic.
- terracing the ground in sloping areas and providing resting areas.
- green areas, with landscaping and trees in compliance with the ratios of the green space criteria.
- pavements different from the regular pavements, highlighting their segregation from the regular pavement or central reservation.
- Their visibility and accessibility will be maximised
- Provide a variety of activities in the open space. Food-truck activities may be located in areas close to office activities with a recommended maximum occupancy of 40% of the pocket park with a minimum free support space of 15m²

Illustrative example of recreation and leisure spaces in vacant areas

Qualitative indicator

Compliance with the qualities described.

Relevant good practice: Compliant

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CONTENTS

The sustainability criteria for urbanisation and landscape propose development guidelines aimed at optimising the consumption of natural resources, energy and water; promoting the generation, management and integration of renewable energies; reusing waste water; improving health conditions and outdoor comfort in order to promote development that is committed to the environment.

STAGE

Urban Planning	Design	Construction
Use and Maintenance	End of life	

STRATEGIC COMMITMENTS

Commitment to the city	Sustainability
Airport identity	Innovation

OBJECTIVES

A. Promotion of renewable energy generation
B. Promotion of energy cogeneration systems
C. Optimisation of self-sufficiency
D. Adaptive control of supply and demand

REGULATORY AND GOOD PRACTICE FRAMEWORK

Incorporate a district heating and/or cooling system for buildings covering 80% of annual consumption

LEED Neighborhood Development

Stand-alone power supply system that can cover the Area's needs for at least 72 hours

CASBEE for Urban Development

Prioritisation of a system with connection to (1) district heating and cooling network, (2) district heating network or (3) to a CHP system in the building.

Green Paper on Urban and Local Sustainability in the Information Age

UP-C1 ENERGY

UP-C1.1 RENEWABLE ENERGIES

Covering the demand for electricity consumed in urbanisation, building and infrastructure areas with renewable energies will be promoted.

Quantitative indicator 1

Percentage of renewable energy use in buildings and infrastructures in the Area.

Basic good practice:	100%

These renewable energies can come from:

1. Buying and selling energy with renewable energy certification
2. Self-production in the scope of the airport

Qualitative indicator 1

Origin of energy from renewable sources.

Basic good practice:	Buying and selling *
Relevant good practice:	Self-production

** The supplier will be required to certify that 100% of the energy comes from renewable sources.*

In addition, the reduction of energy demand in public infrastructures will be promoted through the implementation of energy-efficient elements.

These public infrastructures can consist of street lighting, traffic lights, signage, street furniture and water pumps, among others.

Quantitative indicator 2

Percentage reduction of energy demand in public infrastructure, compared to standardised infrastructure.

Basic good practice:	≥ 15%

The aesthetic integration of renewable energy production elements into the urban space will be promoted.

By way of illustration, it may be integrated in the following ways, among others:

- Integration of photovoltaic and/or micro-wind power in street furniture
- Use of photovoltaic pergolas
- Introduction of photovoltaic ground

Qualitative indicator 2

Aesthetic integration of renewable energies in urban space.

Basic good practice:	Compliant

UP-C1.2 SMART GRID

The implementation of a flexible, accessible, reliable and cost-effective Smart Grid system will be promoted. To this end, the following features are proposed for implementation:

- Demand response: able to notify the consumer of the periods in which it is cheaper to consume energy.
- Automation of consumption: connection of the signal with the Building Management System and optimisation of switch-on and switch-off times for outdoor lighting.

Qualitative indicator

Implementation of the described features.

Basic good practice:	Demand response	✓
Relevant good practice:	Automation of consumption	✓

UP-C1.3 USE OF RENEWABLE ENERGY SOURCES DURING THE CONSTRUCTION PHASE

The use of energy from renewable sources will be promoted during the construction phases.

Quantitative indicator

Percentage of renewable energy used during the construction phase.

Relevant good practice:	≥ 15%	✓

STAGE

Urban Planning	Design	Construction
Use and Maintenance		End of life

STRATEGIC COMMITMENTS

Commitment to the city	Sustainability
Airport identity	Innovation

OBJECTIVES

A. Reduction of the heat island effect
B. Development of passive and active microclimate response mechanisms in open spaces
C. Implementation of natural elements to contribute to temperate climatic conditions
D. Location of circuits, urban elements and central areas that receive sun in winter and are protected from the sun in summer
E. Design of acoustically singular points

REGULATORY AND GOOD PRACTICE FRAMEWORK

Provide shade on >40% of the pedestrian length of pavements and cycle paths.

LEED Cities and Communities - Plan and Design

>75% of road segments with shading and/or sun shading elements.

ITPD TOD Standard

UP-C2 HEALTH AND COMFORT

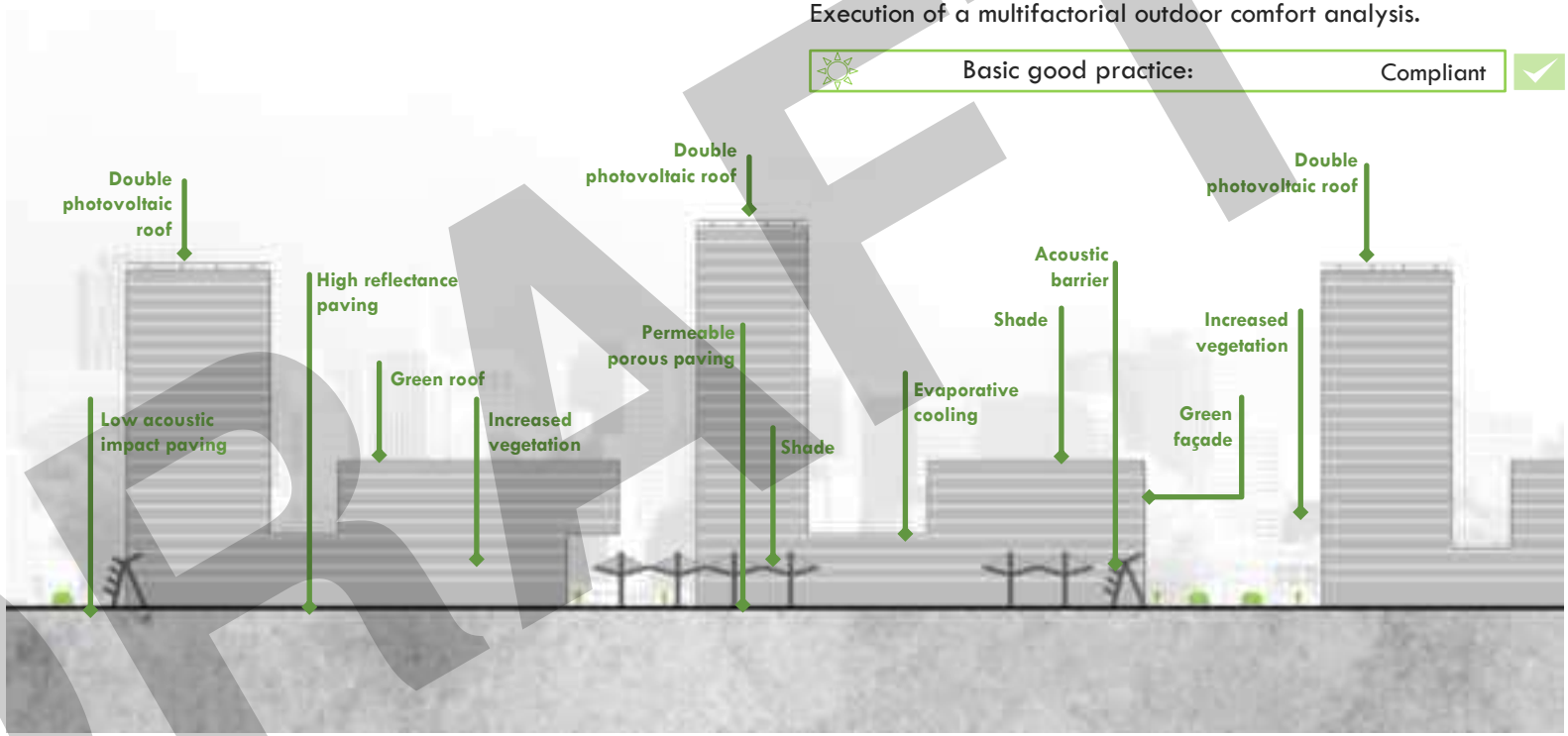
UP-C2.1 OUTDOOR CLIMATIC COMFORT

A multifactorial outdoor comfort analysis will be promoted, taking into account the bioclimatic properties of the outdoor space, such as temperature, humidity, shading, vegetation, radiant temperature, air movement, sheltering, etc.

Qualitative indicator

Execution of a multifactorial outdoor comfort analysis.

Basic good practice: Compliant



Illustrative example of outdoor climate comfort elements.

UP-C2.3 SHADING ELEMENTS

Elements shall be placed in pedestrian open spaces to provide shade.

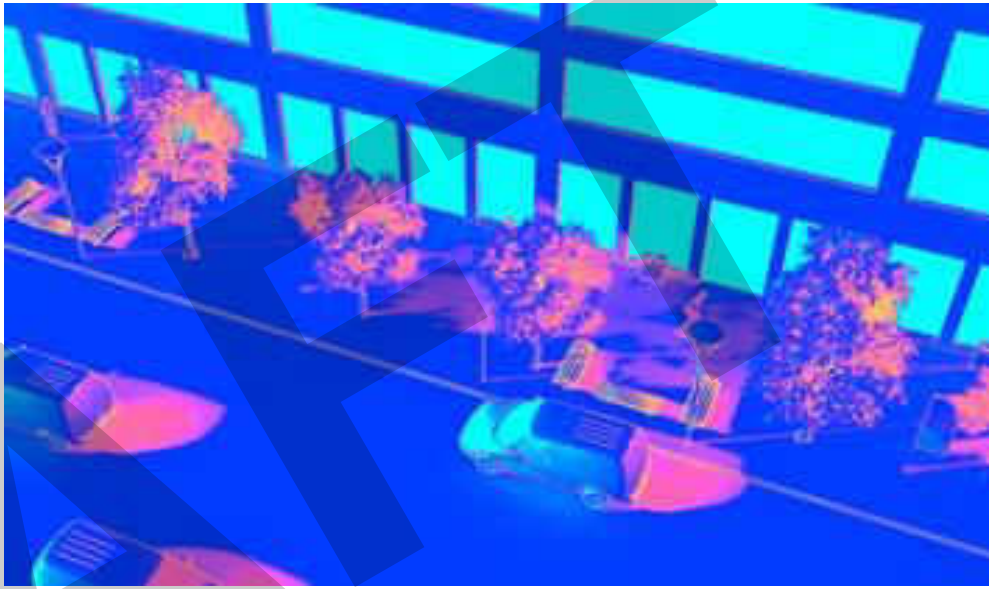
Quantitative indicator

Percentage length of shaded pedestrian and cycle paths, analysed on 21 June at 15:00 local time, including all obstacles that cast shadows on pedestrian paths, such as buildings, furniture and natural elements, among others.

☀	Basic good practice:	≥ 40%
☀☀	Relevant good practice:	≥ 60%
☀☀☀	Excellence good practice:	≥ 80%

Substitute measure

The percentages of the quantitative indicator may be modified based on the results of the multi-factor outdoor comfort analysis carried out.



Illustrative example of a shade study in open spaces.

UP-C2.4 OUTDOOR ACOUSTIC COMFORT

The generation of specific soundscapes will be favoured, identifying representative sound activities both for their preservation and for their reduction/confinement that allow the generation of specific spaces that are attractive for their singular characteristic, through the following guidelines:

- use of natural or artificial obstacles
- use of sound absorbing materials
- use of artistic and/or architectural elements that work as sound masking/filtering systems
- introduction of sound generators that allow these areas to be singled out in a non-invasive way.

On the other hand, soundscapes are a form of information and communication with the environment around us. This concept may be linked to thematic itineraries, and aims to establish pleasant sound elements in the open space, whether they be natural or artificial.

Illustrative examples of soundscapes
Source: Alamy Stock Photo (left), Liminal (centre), Soundscape Malmö - St. Knuts torg (right)

Qualitative indicator

Development of acoustic solutions in urban spaces.

☀	Basic good practice:	Implementation of ≥1 of the guidelines
☀☀☀	Excellence good practice:	Soundscape areas

STAGE

Urban Planning	Design	Construction
Use and Maintenance	End of life	

STRATEGIC COMMITMENTS

Commitment to the city	Sustainability
Airport identity	Innovation

OBJECTIVES

A. Storage and local use of waste water
B. Decrease in demand in the municipal supply network and in the flow in the municipal sewerage network
C. Optimisation of the irrigation system
D. Simplicity of the system by avoiding additional elements such as filters or pressure pumps

REGULATORY AND GOOD PRACTICE FRAMEWORK

Have a separate network for rainwater and waste water.

GREEN Guide for Urban Developments in Industrial Estates

Permeable exterior paving on 50% of its surface.

GUDP Alcobendas

Permeable soil in 30% of its surface area (Soil Biotic Index)

Green Paper on Urban and Local Sustainability

Runoff percentile for landscaped areas of 30%, permeable paved areas of 70%, impermeable paved areas of 90% and roofing of 100%

Sustainable Storm water Systems Design

UP-C3 WATER

UP-C3.1 SEPARABLE NETWORKS

Two sewerage networks will be designed in the Airport City Adolfo Suárez Madrid-Barajas developments in public areas, one for rainwater and the other for waste water, which will be connected to the buildings' separate systems.

Qualitative indicator

Implement a separate network for rainwater and waste water.

Basic good practice: Compliant

UP-C3.2 RECLAIMED WATER GRID* * It affects both URBANISATION AND LANDSCAPE and CONSTRUCTION to the same extent

A connection will be made to the nearest branch of the town's reclaimed water network. Reclaimed water is treated waste water that has undergone a complementary treatment process in a waste water treatment plant (WWTP) and can be reused for non-drinking water requirements.

Qualitative indicator

Connection to the town's reclaimed water network.

Basic good practice: Compliant

Substitute measure

If the connection with the town's reclaimed water network cannot be established due to technical impediments or non-existence of such a network in the immediate surroundings, a reservation of land space will be made for the future network of reclaimed water pipes coming from outside the Area.

UP-C3.3 PERMEABILITY OF PAVEMENTS

The implementation of permeable paving in open pedestrian spaces, green areas and cycle paths will be encouraged, both outside and inside the plots. Excluded from these criteria are road areas, parking areas or vehicle manoeuvring sills.

Substitute measure

The minimum percentage of area with permeable pavements will need to be increased as long as an estimate of the difference between post-development and pre-development runoff volume of <10% cannot be guaranteed.

Quantitative indicator

Percentage of surface with permeable pavements.

	Basic good practice	
	Permeable pavements (runoff level ≥ 70%)	Waterproof pavements (runoff level ≥ 90%)
Free pedestrian spaces (pavements, boulevards, squares...)	≥ 50%	≤ 50%
Green areas	≥ 50%	≤ 50%
Bicycle lanes	≥ 80%	≤ 20%

UP-C3.4 SUSTAINABLE URBAN DRAINAGE IN OPEN SPACES

Sustainable urban drainage devices will be implemented as far as possible. The installation of devices that promote sustainable urban drainage will be encouraged:

- permeable pavements
- structural tree pits
- rain gardens
- Infiltration wells and ditches
- cells and lattice boxes
- filter drains
- vegetated ditches
- Miscellaneous

Qualitative indicator

Placement of devices to promote sustainable urban drainage.

Basic good practice: Compliant

Substitute measure

The non-placement of sustainable urban drainage devices will be contemplated and shall need to be justified by means of a water capacity study of the land that advises against it. This study will be part of the project.




Illustrative examples of devices that promote sustainable urban drainage.

STAGE

Urban Planning	Design	Construction
Use and Maintenance	End of life	

STRATEGIC COMMITMENTS

Commitment to the city	Sustainability
Airport identity	Innovation

OBJECTIVES

A. Promote the use of materials extracted/manufactured in the region
B. Encourage the use of products and materials for which information on their life cycle is available and have a low environmental, economic and social impact.
C. Minimising the amount of water lost due to runoff
D. Collect treat and reuse rainwater

REGULATORY AND GOOD PRACTICE FRAMEWORK

Use construction materials or products sourced at a distance of ≤ 800 km from the project site for ≥ 10% (optimal ≥ 20%) of its total value.

LEED BD+C

Meet at least one criterion for 20% (optimum 40%) (by cost) of the 3 most used materials:
(1) (extended) producer responsibility
(2) organic materials
(3) Forest Stewardship Council certified timber or equivalent
(4) reused materials
(5) materials with recycled content.

LEED BD+C

UP-C4 CIRCULAR ECONOMY* * It affects both URBANISATION AND LANDSCAPE and CONSTRUCTION to the same extent

UP-C4.1 REGIONAL MATERIALS

The use of regional materials or materials close to the Community of Madrid will be encouraged in order to reduce the need for transport from the place of extraction to the place of construction, thus minimising the environmental impact. In order to comply with this criterion, an extraction origin certificate of the raw material shall be obtained from the supplier.

Quantitative indicator

Percentage of materials extracted at a distance of 800 km or less from the project site, based on the proportion of the cost of their item in the total materials budget.

Relevant good practice:	≥ 10%
Excellence good practice:	≥ 20%

Substitute measure

If only a portion of the material used has been extracted, harvested or recovered and manufactured in the region, only the proportionate share (in cost) of the total will be counted.

UP-C4.2 RESPONSIBLE REMOVAL OF MATERIALS

Responsible extraction of materials will be encouraged.

Quantitative indicator

The following criteria shall be met:

Relevant good practice:	100% of the materials are sourced from certified suppliers with a quality system based on ISO 14001 ISO 9001 ISO 26000 standards or similar ones
Relevant good practice:	≥ 20% (by cost) of the three most commonly used materials meet at least one of the responsible extraction requirements
Excellence good practice:	≥ 40% (by cost) of the three most commonly used materials meet at least one of the responsible extraction requirements

Responsible extraction requirements

Extended producer responsibility	Products purchased from a manufacturer (producer) that participates in an extended producer responsibility programme or is directly responsible for extended producer responsibility.
Organic materials	Organic raw materials other than wood shall be tested using the ASTM D-4359-90 test method and need to have been legally harvested, as defined by the exporting and receiving country and on the basis of the Sustainable Agriculture Network. Fur products, such as leather and other animal skin materials are excluded.
Timber materials	Wood products shall be certified by the Forest Stewardship Council or accredited equivalent.
Reuse of materials	Reuse includes recovered, refurbished or reused products. This criterion will count double the weight of the materials that comply with it
Recycled content	Component materials or parts of components from recycled sources.

UP-C4.3 OPTIMISATION OF CONSUMPTION, NATURAL RESOURCES AND WASTE

The responsible management of waste generated on site will be encouraged, as well as the reuse of construction elements on the site itself or in adjacent works within the Area. In addition, environmental management during the construction phase will be promoted through the implementation of an on-site environmental management system.

Qualitative indicator 1

Implementation of the following elements.

Basic good practice: *(both to be complied with)*	• On-site environmental management system • On-site waste management plan

Quantitative indicator 2

Percentage of separated DRC waste, by weight.

Relevant good practice: Separation of ≥ 50% of CDW on site with at least two material flows	
Excellence good practice: Separation of ≥ 75% of CDW on site with at least three material flows	

Substitute measure for quantitative indicator 2

If they are not separated on site, it is equally valid for relevant and excellence good practice to send them to a certified separation plant that is external to the development in the same proportion.

Quantitative indicator 3

Percentage of on-site CDW reused, by weight.

Basic good practice:	≥ 40%
Relevant good practice:	≥ 70%

Substitute measure for quantitative indicator 3

Alternative justification for basic good practice will be the generation of on-site CDW below 36.6 kilograms of CDW per m² on site.

STAGE

Urban Planning	Design	Construction
Use and Maintenance		End of life

STRATEGIC COMMITMENTS

Commitment to the city	Sustainability
Airport identity	Innovation

OBJECTIVES

A. Promote the use of materials extracted/manufactured in the region
B. Encourage the use of products and materials for which information on their life cycle is available and have a low environmental, economic and social impact.
C. Minimising the amount of water lost due to runoff
D. Collect treat and reuse rainwater

REGULATORY AND GOOD PRACTICE FRAMEWORK

≥70% (by weight) of non-hazardous construction and demolition waste (excluding natural materials mentioned in European Waste List 2000/532/EC , category 17 05 04) generated on the construction site is prepared for reuse, recycling and recovery.

European Commission - Green Taxonomy

Reuse of (≥25% / ≥40%) of Construction and Demolition Waste (C&DW)

Certification of Ecological Urbanism and PNIR

CONTENTS

Urban network criteria promote integrated planning of service networks and the urban spaces through which they run, facilitating their implementation and maintenance and improving their functionality.

In this sense, general criteria are set out for the implementation of service infrastructure networks as well as specific criteria for the networks of the water cycle (supply, sewerage, purification, water reuse); urban waste (storage, collection and treatment of urban waste); energy (supply and production); lighting and telecommunications.

STAGE

Urban Planning	Design	Construction
Use and Maintenance	End of life	

STRATEGIC COMMITMENTS

Commitment to the city	Sustainability
Airport identity	Innovation

OBJECTIVES

A. Integrated planning of service networks and the open spaces through which they run, facilitating their implementation, improvement and maintenance.
B. Ensure minimum conditions of service quality and continuous improvement.
C. Foresee the necessary land reserves for its transformation and the execution of all the elements that ensure its functionality.

REGULATORY AND GOOD PRACTICE FRAMEWORK

Instruction for the Design of Public Roads. Madrid City Council
Trends and good practices

Master Plan for Roadside Trees in the city of Madrid. Madrid City Council
Trends and good practices

Barcelona 2020 Urban Sustainability Indicators Plan. Barcelona Urban Ecology Agency
Trends and good practices

UP-D1 CHARACTERISTICS OF SERVICE INFRASTRUCTURE NETWORKS

UP-D1.1 CHARACTERISTICS OF SERVICE INFRASTRUCTURE NETWORKS

A balance in the distribution and occupation of open spaces (roads, pedestrian routes and landscaped and recreational areas) will be favoured for the occupation in the subsoil of the infrastructure networks that are necessary to meet the needs of the different Areas, on the basis that infrastructure services are critical to achieve sustainable development, avoiding environmental and water pollution, promoting energy efficiency and ensuring access to renewable or low-carbon energies.

Facilities and services should be designed in such a way that they are easily accessible and manipulable, scalable and adaptable. Urban development and channelling of service infrastructure networks will be carried out taking into account the safety areas recommended for the different infrastructure networks and technical services, maximising the safety areas whenever possible in order to avoid affecting them and to take advantage of their layout. Efforts will be made to use standardised construction systems (prefabricated and/or industrialised), which allow assembly and disassembly with less waste, avoiding unnecessary oversizing, and in compliance with the requirements of the different service companies to ensure their connection to the different urban networks.

The preparation of the development work book will be required to include the historical record of technical, legal and administrative incidents of development and the data and instructions that are necessary for its proper use in a single document, and to enable subsequent maintenance and repair, renovation or rehabilitation works.

In addition to the above, it is important to note that the network connections will be specified in the Tender Documents for each Area, and in the event of a difference, what appears in the Tender Documents will prevail over what is indicated in the White Paper on Design Criteria. The technical specifications will indicate the civil works infrastructure (piping) that will be left at the foot of the lot in each Area, so that, in general, the installation of each of the connections can be carried out later.

Quantitative indicator 1

Percentage of surface area built with prefabricated or industrialised construction systems.

Basic good practice:	≥ 20%	✓
Relevant good practice:	≥ 50%	✓
Excellence good practice:	100%	✓

Quantitative indicator 2

Percentage of surface area executed in gallery layout.

Relevant good practice:	≥ 30%	✓
Excellence good practice:	≥ 50%	✓

Qualitative indicator

Execution of the service networks in accordance with the technical considerations of Madrid City Council, and those of the service companies (Canal de Isabel II, Gas, Electricity, etc.), and those specifically established by Aena for connection to its service networks.

Basic good practice:	Compliant	✓

UP-D2.1 WATER CYCLE, SUPPLY, SANITATION, TREATMENT AND RECLAIMED WATER

In order to establish a correct use of the available water resources, the following is requested:

- A study of the area's hydrological and flooding conditions will be carried out, with the determination of the existing watercourses, their streams and flows, with the aim of utilising these conditions for natural drainage systems. Flood studies will also minimise the risks of flooding or allow for the provision of systems to mitigate the consequences of flooding.
- In order to optimise the behaviour of the urbanisation in terms of water consumption throughout its cycle, an overall study will be carried out that encompasses the operation of the three systems that comprise it (supply, sewerage and drainage systems), making it possible to establish the global measures to be adopted according to their technical and economic viability.
- Connection of the networks to the structures of the metropolitan area and/or Aena networks will be necessary.
- Efforts will be made to ensure treatment in tertiary systems and the use of reclaimed water from these systems, or from those of the surrounding metropolitan area, for which the necessary networks will be provided, or in their absence, the reservation of land for their subsequent implementation.
- Leak detection systems will be installed.

Qualitative indicator

Compliance with all the points in the previous paragraph.

Basic good practice:	Complies with all

Rainwater, grey water and/or reclaimed water can be reused as non-potable water requirements, with the applicable treatments.

The Ordinance for the management and efficient use of water in the city of Madrid, in articles 100 and 101, indicates that alternative water resources can be used for the irrigation of green areas, alternative water resources being:

- Reclaimed water from the waste water treatment plants of the city's sewerage system.
- Drainage water from Madrid's underground infrastructure network and other groundwater collection wells.
- Water from rainwater harvesting and storage systems.

The uses foreseen in the current regulations for the reuse of reclaimed water in urban areas include the irrigation of urban green areas (parks, sports fields and similar), street washing and fire-fighting systems.

Reclaimed water used for the uses provided for in the regulations shall comply with the quality criteria laid down in Annexes I, II and III of the Tagus Hydrological Plan, approved by Royal Decree 1664/1998 of 24 July 1998.

Quantitative indicator

Percentage of non-potable water demand covered by reclaimed water, and with systems that minimise water consumption, management and pressure regulation.

Basic good practice:	100%

Substitute measure

During the period in which using reclaimed water is not possible due to the impossibility or non-existence of a specific network, or insufficient flow from the reclaimed water network to cover the percentage of the quantitative indicator, this indicator will be exempted from compliance and instead, the installation of rainwater storage tanks for irrigation and cleaning of public spaces will be sought, as well as the possible reuse of rainwater, grey water and/or reclaimed water from adjacent buildings.

UP-D3.1 STORAGE, COLLECTION AND TREATMENT OF URBAN WASTE

Improvements in waste management and/or reduction of waste generation will be pursued through the provision of separate waste collection points integrated into the urban design and that encourage their use. Preference will be given to the use of underground containers, compressors or pneumatic waste collection, whether they be static or mobile systems. Separate collection will enable the reuse of waste for energy generation (biogas) and recycling.

Quantitative indicator 1

Execution of integrated underground waste storage systems in open spaces.

☼	Basic good practice:	Buried containers
☼☼	Relevant good practice:	Mobile pneumatic collection
☼☼☼	Excellence good practice:	Fixed pneumatic collection

In order to optimise waste collection, the sensorisation of containers will be promoted to enable the management of dynamic routes according to the level of filling.

Quantitative indicator 2

Implementation of waste collection systems.

☼☼	Relevant good practice: *(both to be complied with)*	• Level of filling monitoring • Establish dynamic waste collection routes based on container levels of filling

In addition, the conversion of organic and municipal solid waste into energy will be promoted through a waste-to-energy strategy aimed at generating of biogas or aviation biofuel. For this purpose, Aena reserves the right to decide whether it requires a specific waste manager.

Quantitative indicator 3

Implementation of waste treatment systems.

☼	Basic good practice: *(both to be complied with)*	• Diversion of waste for reuse by Aena • Aena reserves the right to decide on the waste manager

Illustrative example of buried containers

UP-D4.1 ENERGY SUPPLY AND PRODUCTION

Potential environmental and human health impacts caused by the electrical and telecommunications system will be considered during the drafting of the development project.

Where possible, design alternatives for such services that avoid or minimise such impacts will be implemented. The feasibility of designing centralised thermal production systems for distribution in the urbanisation (District heating or District cooling) and/or the possibility of combined generation of electricity and thermal energy will be studied, and the different alternatives will be assessed in relation to the available fuels (solid urban waste —SUW—, surpluses from nearby industrial processes or installations, renewable energies, etc.).

Renewable energy systems will be designed into the development, and will be needed to cover the energy demand of street furniture elements.

Quantitative indicator

Percentage of the energy demand of urban elements covered by self-produced energy in the SGA of Airport City Adolfo Suárez Madrid-Barajas.

Basic good practice:	≥ 20%	✓
Relevant good practice:	≥ 50%	✓
Excellence good practice:	100%	✓

UP-D5 LIGHTING

UP-D5.1 LIGHTING AND TRAFFIC LIGHTS

Public lighting shall be sized to ensure an adequate level of illumination, adjusted to the strict needs of each area according to the activities that take place there, and avoiding oversizing the system. Installing lighting that prevent light pollution and avoid its dispersion into the sky shall me a requirement.

Maximum energy efficiency will be pursued through the installation of smart management systems and high-efficiency lighting, including the installation of smart micro-grid systems. The use of warm colour temperatures adapted to a more comfortable use of the free areas is recommended.

Quantitative indicator

Characteristics of lighting and traffic lights.

Basic good practice: *(both to be complied with)* • 100% of the lighting and traffic lights does not produce any glare towards the airfield • 100% of high-efficiency lighting		✓

UP-D6 TELECOMMUNICATIONS

UP-D6.1 TELECOMMUNICATIONS AND DATA

Consideration of the potential impacts attributable to the telecommunications system as a whole, both of its networks and cabling and of the transformation, protection and transmission installations, transmitting antennas (radio, TV and mobile telephony): landscape impacts to be avoided by planning them together with elements such as vegetation, lighting, colour scheme, etc.; impact in relation to electromagnetic pollution; systems that attenuate the fields they produced will be promoted, burying all installations the functionality of which allows it.

Quantitative indicator

Percentage of integration of the telecommunication infrastructure into the landscape with vegetation, lighting, furniture, etc.

Basic good practice:	≥ 50%	✓
Relevant good practice:	≥ 70%	✓
Excellence good practice:	100%	✓

CONTENTS

The following criteria aim to improve the architectural experience through quality design that optimises workflows and ensures individual and group spatial comfort and ergonomics as well as flexibility and resilience of architectural spaces.

Under these considerations, guidelines are proposed for the implementation of the building; typological flexibility; the spatial qualities of the architectural space to offer a comfortable workplace with added value services; optimisation of hollows and roofs to reduce consumption and maximise natural lighting as well as aesthetic criteria that promote identity design.

STAGE

Urban Planning	**Design**	Construction
Use and Maintenance	End of life	

STRATEGIC COMMITMENTS

Commitment to the city	**Sustainability**
Airport identity	Innovation

OBJECTIVES

A. Reducing environmental impact (minimising soil erosion, protecting the habitat and reducing stress on natural water systems by preserving, as much as possible, the original slopes of the land)
B. Cost optimisation
C. Use of natural elements at the construction stage

REGULATORY AND GOOD PRACTICE FRAMEWORK

The building footprint on slopes < 15% shall be larger than the lot area on slopes > 15%

LEED ND

Development is limited to ≤40% of land with slopes between 26-40% and ≤60% of land with slopes between 15-25%. On slopes >40% a distance of 15 m horizontally from the upper elevation and 23 m horizontally from the lower elevation is respected.

LEED ND

Smoothing and minimising the length and steepness of slopes.

BREEAM New Construction

CO-A1 IMPLEMENTATION

CO-A1.1 MAXIMUM SLOPES OF THE AREA

The reduction of building area on steep slopes will be encouraged.

Quantitative indicator

Percentage of building footprint on slopes steeper than:

Basic good practice: *(both to be complied with)*	• 100% of building area on slopes ≤ 40% • ≤ 40% of the building area on slopes between 26-40%	✓
Relevant good practice:	≥ 50% building area on slopes ≤ 15%	✓

Substitute measure 1 ✓

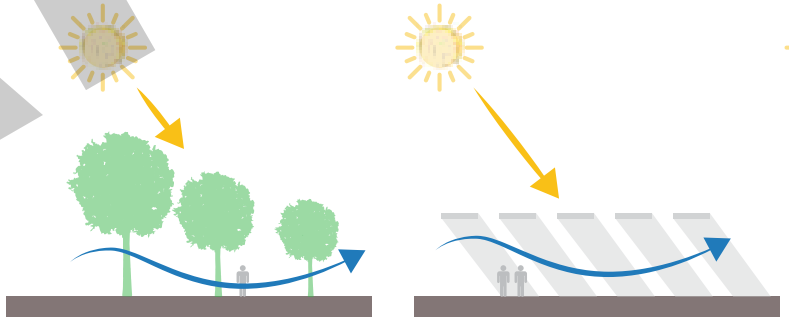
It is good basic practice to build on slopes steeper than 40% provided that more than ≥ 50% of surplus excavated soil (at Area scale) is reused.

Substitute measure 2 ✓

A relevant good practice will be when, in existing consolidated areas with slopes of more than 15%, the planting of local species or non-invasive species adapted to the climate of Madrid is favoured.

Complementary measure ✓

The basic good practice will be raised by one level if vegetated landscape mounds are generated in connection with footpaths (at Area scale) when the volume of excavated soil exceeds the volume to be backfilled.



Comfort conditions in open spaces linked to the creation of artificial slopes (excellence good practice).

CO-A1.2 LAND REUSE

The impact of the building on the natural conditions of the terrain shall be minimised.

Quantitative indicator

Percentage of surplus excavated soil for reuse (at Area scale).

Basic good practice:	≥ 15%	✓
Relevant good practice:	≥ 30%	✓
Excellence good practice:	≥ 50%	✓

Substitute measure ✓

The good practice shall be raised by one level if topsoil is not excavated unless it is absolutely necessary. If topsoil needs to be excavated, it should be reused in the landscaping of the surroundings of the new building or in the landscaped roofs.

CO-A2.1 TYPOLOGICAL FLEXIBILITY

The design of the building with standardised parameters that allow for flexibility of activities inside the building will be promoted, both for the activities contemplated during the design phase and for the possible reconversion of these spaces for other compatible and complementary activities.

Quantitative indicator

Justification by means of project documentation the compatibility of the proposed building parameters (in terms of centreline, location of communications hubs, façade openings, headroom, etc.) with their potential typological adaptation to other possible compatible and complementary activities on the lot.

Excellence good practice: Compliant

In addition, the design of warehouses prepared to enable sectorisation or functional division for different users or activities, including individualised air conditioning, fire load, etc., will be facilitated.

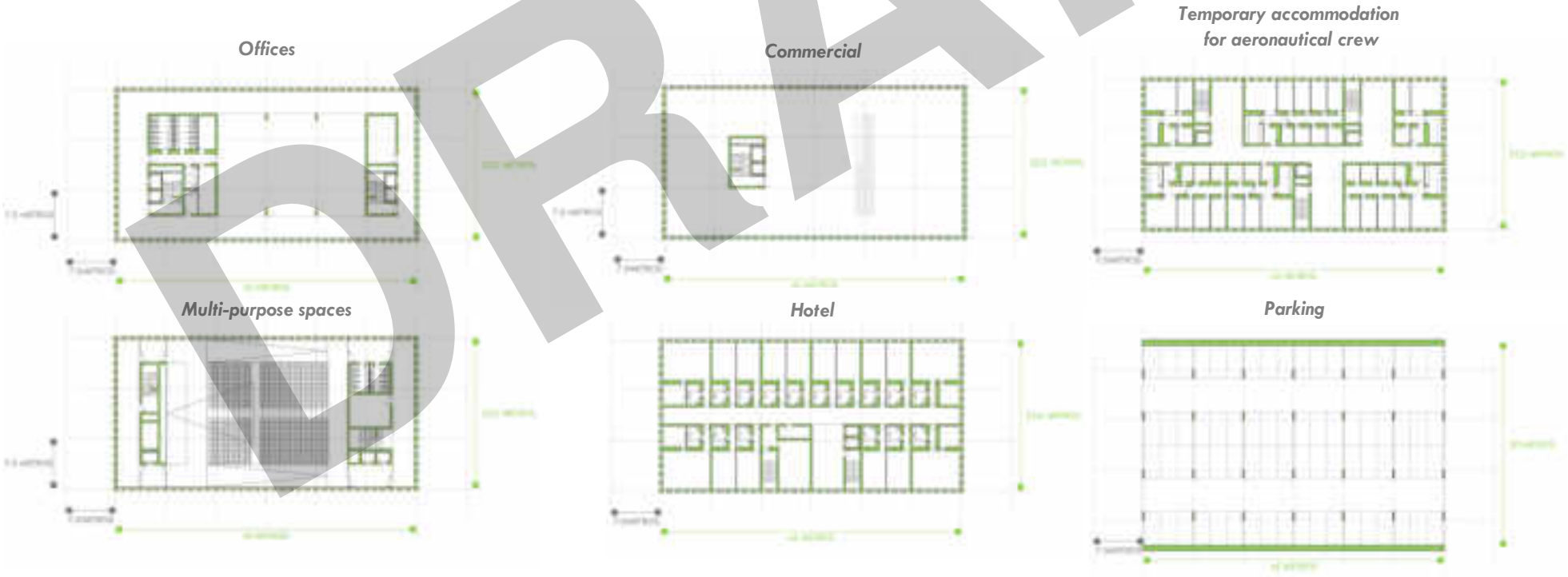
Quantitative indicator

Spaces for sectorisation or functional division for different users or activities.

Basic good practice: Compliant

Substitute measure

In the case of pre-existing buildings with at least the structure in place, a study will be carried out on the flexibility of typological adaptation to the planned activities.



Illustrative study of possible typological flexibility based on the same centreline

STAGE

Urban Planning	**Design**	**Construction**
Use and Maintenance	End of life	

STRATEGIC COMMITMENTS

Commitment to the city	Sustainability
Airport identity	Innovation

OBJECTIVES

A. Workspace optimisation
B. Individual security
C. Individual and group spatial comfort
D. Work flow improvement

REGULATORY AND GOOD PRACTICE FRAMEWORK

Minimum dimensions of working premises: 2 m² clearance per worker, 3 m headroom and 10 m3 unoccupied per worker

Royal Decree 486/1997 of 14 April 1997

>40% of fast and demountable interior partitions in offices: partitions, partition walls made of metal or wooden profile and plasterboard, wood or similar and other solutions

Sustainable Building of Basque Country Offices

COVID-19 infection prevention measures: distance >2m without mask, physical distance >1.5m

Good workplace practices

CO-A2 TYPOLOGICAL FLEXIBILITY

CO-A2.2 SURFACE AREA OF OFFICE SPACES

In the interests of good health and hygiene at the workplace, individual workspaces are required to have a minimum area of 4.5 m² per worker. This area shall ensure a minimum distance of 2 metres between workers, both on entering and leaving the workplace and while on site.

In addition to the individual work area, an additional area —calculated per worker and corresponding to the common facilities— shall be considered based on the following table.

Quantitative indicator

Compliance with the floor area and space allowance values in the table below.

	Relevant good practice		Excellence good practice	
Value 1: Individual workstation in offices	≥ 4.5 m²	✓		
Value 2: Events room			≥ 0.55 m²	✓
Value 3: Meeting spaces	≥ 2.00 m²	✓	≥ 3.50 m²	✓
Value 4: Rest areas (vending point)	≥ 0.15 m²	✓		
Value 5: Canteen	≥ 1.50 m²	✓		
Value 6: Kitchens and services	Reservation of space for food service	✓	≥ 1.60 m²	✓
Value 7: Childcare			≥ 0.15 m²	✓
Value 8: Reception of parcels	Reservation of space separate from the main entrance for e-commerce parcels	✓		
Value 9: Sports area			Reservation of outdoor and/or indoor sports space	✓

Complementary measure for Value 1 ✓

In addition, for workstations that are not individual PC workstations, a minimum surface area of 4.5 m² shall also be respected and sufficient space shall be ensured so that workers can carry out their duties without compromising the minimum interpersonal distance of two metres.

Complementary measure for Values 7 and 9 ✓

Childcare and sports areas may be located outside the lot itself, provided that they are within 500 m pedestrian distance from the entrance of the building and have the required surface area.

Illustrative example of net floor area of individual workstations in office space

CO-A2.3 SURFACE AREA OF LOGISTICS SPACES

The design of adequate spaces for workers, for rest areas, changing rooms and toilets, among other aspects, shall be enabled, depending on the number of workers.

Quantitative indicator

Compliance with the floor space and seat percentage values in the table below.

	Relevant good practice	
Resting area	≥ 0,06 m²/ worker	✓
Changing rooms	≥ 0,03 m²/ worker ≥ 2% of the total number of changing facilities shall be accessible and adapted to persons with reduced mobility	✓

STAGE

Urban Planning	Design	Construction
Use and Maintenance		End of life

STRATEGIC COMMITMENTS

Commitment to the city	Sustainability
Airport identity	Innovation

OBJECTIVES

A. Ensure additional value-added services
B. Comfort and enjoyment of rest areas
C. Adaptation of additional spaces according to user priorities

REGULATORY AND GOOD PRACTICE FRAMEWORK

Minimum dimensions of working premises: 2.8 m² net at a workstation in enclosed spaces, and 10 m² in open spaces.

Trends and good practices

Rest areas of 0.06 m² per worker, changing rooms of 0.03 m² per worker and toilets for every 40 workers in air-side logistics and every 83 workers on ground-side.

Trends and good practices

COVID-19 infection prevention measures: distance >2m without mask, physical distance >1.5m

Good workplace practices

STAGE

Urban Planning	Design	Construction
Use and Maintenance	End of life	

STRATEGIC COMMITMENTS

Commitment to the city	**Sustainability**
Airport identity	Innovation

OBJECTIVES

A. Effectiveness of human scale in interior spaces
B. Ensure minimum safety and health conditions in the workplace
C. Ensure architectural quality

REGULATORY AND GOOD PRACTICE FRAMEWORK

The headroom in circulation areas shall be at least 2,10 m in restricted areas and 2,20 m in all other areas

CTE - DB. SUA 2

Headroom shall be >2.50 m in habitable areas and >2.2 m in non-habitable areas

Madrid GUDP

In public garages, the headroom shall be 2.3 m on the first floor and 2.1 m on the remaining floors

Madrid GUDP

In garages, the headroom shall be 2.5 m

Alcobendas Building Ordinance

CO-A3 HEADROOM

CO-A3.1 HEADROOM OF SPACES

Indoor spaces shall be designed with adequate spatial comfort for general occupied and unoccupied spaces.

In addition, the maximum permissible headroom shall be limited to facilitate the air conditioning of workspaces. The incorporation of false ceilings or technical ceilings allows the headroom to be adjusted to desirable levels. Regulations limit the maximum headroom in spaces intended for economic or artistic activities to no more than 5 metres. However, it is recommended that this height should not exceed 3.50 metres in order to optimise air conditioning.

In order to guarantee vehicle accessibility of different sizes, spaces will be designed following the minimum headroom criteria for above and below ground parking

Quantitative indicator

Compliance with the headroom values in the table below.

	Basic good practice	Relevant good practice	Excellence good practice
Value 1: Usually occupied areas	≥ 2.75 m ✓	≥ 3.25 m ✓	
Value 2: Not usually occupied areas	≥ 2.50 m ✓	≥ 3.00 m ✓	
Value 3: Working areas in offices		≤ 3.50 m ✓	
Value 4: Indoor spaces on the ground floor	≥ 3.50 m ✓		
Value 5: Ground floor outdoor spaces (unobstructed from ground level to overhangs and gantries)	≥ 3.20 m ✓		
Value 6: Above-ground parking areas	≥ 2.75 m ✓	≥ 2.75 m ✓	≥ 3.00 m ✓
Value 7: Below-ground parking areas	≥ 2.20 m ✓	≥ 2.50 m ✓	≥ 3.00 m ✓

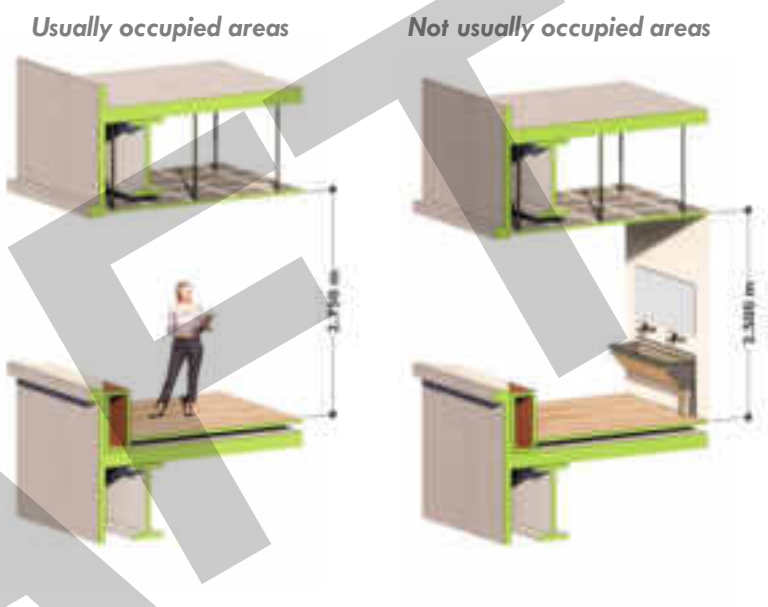
Complementary measure for Value 3 ✓

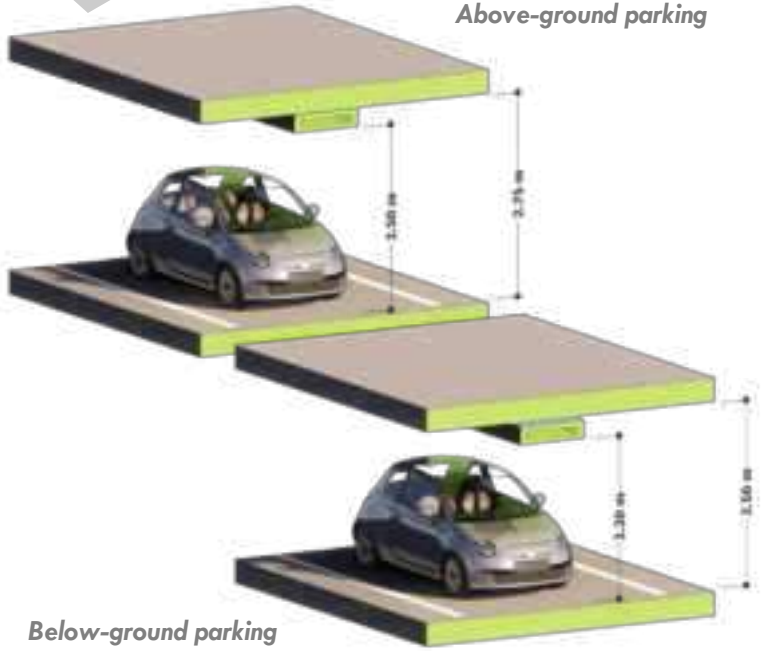
In spaces with headrooms outside the basic range, a study will need to be conducted to ensure the same demand for air conditioning through passive measures.

Complementary measure for Value 4 ✓

Commercial spaces on the ground floor may have a minimum headroom of 3.2 metres, provided that the ground floor and the upper floor belong to the same establishment and have some double-height space.

Illustrative example of headrooms in interior spaces of the building





STAGE

Urban Planning	Design	Construction
Use and Maintenance	End of life	

STRATEGIC COMMITMENTS

Commitment to the city	Sustainability
Airport identity	Innovation

OBJECTIVES

A. Effectiveness of spatial scale in workspaces
B. Ensure minimum safety and health conditions in the workplace
C. Ensure architectural quality

REGULATORY AND GOOD PRACTICE FRAMEWORK

60% of logistics with a headroom of 10-15 m.
Trends and good practices

The headroom of office premises shall be 2.5 m, in small and medium-sized industry, 3 m, and in commerce, 2.8 m.
Alcobendas Building Ordinance

The headroom between the pavement and any projecting body of the façade shall be 3.4 m
Madrid GUDP

The minimum height from floor to ceiling shall be 250 cm. *Royal Decree 486/1997 minimum health and safety provisions in the workplace*

CO-A3 HEADROOM

CO-A3.2 HEIGHT DIVERSITY OF LOGISTICS SPACES

Although workspaces in logistics activity areas require specific headrooms based on their functional activity, standardisation of headrooms is encouraged as far as possible in order to maximise the functional diversity of activities and future users.

Therefore, it is recommended to design spaces oriented towards more standardised heights, allowing greater flexibility to adapt to the temporary needs of the user, or future users, and thus allowing for a longer useful life of the building, while mitigating potential demolition needs and less waste generation.

Current trends and best practices show a preference for spaces with headrooms in logistics activities between 10 and 15 metres.

The current distribution of preferences for logistics space shows the following distribution:

- 10% of spaces with headrooms < 10 metres
- 60% of spaces with headroom of between 10 and 15 metres
- 20% of spaces with headroom of between 15 and 20 metres
- 10% of spaces with headrooms > 20 metres

Quantitative indicator

Percentage of spaces for logistics activities with headrooms between 10 and 15 metres.

Relevant good practice:	≥ 40% and ≤ 80%	✓
Excellence good practice:		✓

DISTRIBUTION OF THE DIVERSITY IN HEIGHT OF LOGISTICS SPACES ACCORDING TO A MARKET STUDY

CO-A4.1 OPTIMISATION OF OPENINGS IN THE ENVELOPE

The treatment of openings in the façade will be facilitated depending on the orientation of the façade, following the guidelines below:

- On façades with a predominantly NORTH orientation, as much natural light as possible should be captured, ensuring that it is distributed evenly throughout the interior of the building.
- In façades with a predominantly SOUTH orientation, part of the intense direct solar radiation should be avoided, filtering the light and ensuring that it does not disturb or dazzle the interior of the building. Solar incidence shall be controlled by means of preferably external elements, while indirect light shall allow work to be carried out in the health and comfort required for each activity.
- On façades with a predominantly EAST and WEST orientation, direct solar radiation should be avoided by screening the light with preferably external elements. The WEST orientation is the most exposed in summer in Madrid, and therefore, minimising direct solar incidence through the openings in the façade is recommended.

However, in buildings with privileged and representative locations, openings in the façade that offer the best views will be encouraged, both in the airport environment and towards the city of Madrid (mainly to the west) and the nearby towns. This will be achieved by promoting the connection of the occupants inside the building with the natural outdoor environment, providing quality views that contribute to a better indoor environmental quality. The design of façade openings will be a comprehensive process that must be implemented in accordance with the other criteria of this white paper.

Fixed solar protection elements at the new Red Eléctrica campus in Tres Cantos, Madrid. Project prepared by IDOM

For logistics buildings, the use of hollow openings in the building envelope is recommended to increase the interior surface area that receives natural light. For this purpose, the following solutions are recommended:

- Skylights with shading measures with translucent elements to reduce glare and overheating in the interior space.
- Saw-tooth or similar construction elements facing north or other orientations with low thermal load, with the addition, where necessary, of a reflective surface so that incident light is more diffuse than external light.
- Light tubes that allow spaces without direct connection to the outside to receive natural lighting.
- Reflective louvres in front of façade opening that reflect light deeper into the interior of the building

Qualitative indicator 1

Compliance with the guidelines described in the previous paragraph.

Basic good practice:	Complies with all	✓

Substitute measure

Justification by means of a solar incidence analysis that guarantees the same conditions by means of passive systems and elements.

Qualitative indicator 2

Incorporation of shading systems, if necessary.

Basic good practice:	Fixed systems	✓
Relevant good practice:	Mobile systems	✓
Excellence good practice:	Sensor-managed mobile systems	✓

Quantitative indicator

Implementation of at least one solution described in the paragraph on the left.

Relevant good practice:	Complies with all	✓

STAGE

Urban Planning	Design	Construction
Use and Maintenance	End of life	

STRATEGIC COMMITMENTS

Commitment to the city	Sustainability
Airport identity	Innovation

OBJECTIVES

A. Optimise the thermal inertia of the building
B. Avoid overheating in the most unfavourable orientations
C. Establish a balanced façade composition between openings and blind walls

REGULATORY AND GOOD PRACTICE FRAMEWORK

50% of office buildings and 100% of mixed activity buildings with 60% of façade with a glazed commercial ground floor at a height of between 0.9 and 2.5 metres.

LEED Neighborhood Development

Blind façades to the road for < 40% of their length (maximum 15 metres).

LEED Neighborhood Development

30% of ground floor commercial façades with visually permeable elements.

LEED Neighborhood Development

10% of ground floor commercial façades with visually permeable elements.

ITPD TOD Standard

CO-A4 HOLLOWS

CO-A4.2 FAÇADE OPENINGS

A visually active façade is defined as the ground floor segment of façades facing the public road and is visually penetrable, i.e. both the interior space can be observed from the road and the exterior space can be observed from the interior of the ground floor. In addition, a correct permeability of openings in façades will be established, which will contribute to the visual connection of the interior and exterior space. Visual permeability from the interior of the ground floor to the exterior will be encouraged. The visually active façade may contain the following elements at a height of between 0.9 metres and 2.5 metres:

- windows, whether or not fitted with operable interior or exterior curtains or blinds
- partially or completely transparent materials
- accessible open spaces, such as playgrounds, parks, decks and courtyards

Qualitative indicator

Compliance with the guidelines described in the table below, excluding logistics buildings.

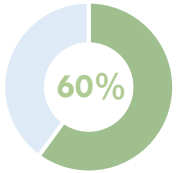
	Basic good practice		Relevant good practice		Excellence good practice	
Value 1: Percentage of façade with openings in the ground floor	≥ 10%	✓	≥ 30%	✓	≥ 60%	✓
Value 2: Percentage of façade with openings on upper floors		✓	≥ 60%	✓	≥ 70%	✓
Value 3: Distance between blind elements on the façade	≤15 m	✓		✓		✓

Value 1 of the table: Percentage of ground floor horizontal perimeter with a visually permeable surface at a height of between 0.9 metres and 2.5 metres.
Value 2 of the table: Percentage of the sum of the horizontal perimeters of the upper storeys that have a visually permeable surface at a relative height of between 0.9 metres and 2.5 metres.
Value 3: Distance of the unit façade segment with blind elements.

Illustrative example of a ground floor commercial façade with visually permeable elements

Substitute measure ✓

This criterion does not apply to façades adjacent to interior spaces that are not air-conditioned and are not regularly occupied, whether they are storage areas, installations or vehicle parking, among other compatible cases. This criterion will also be waived, by means of project justification, in cases where different functional needs are justified.



Ground floor façade at a height of between 0.9 m and 2.5 m

Visually permeable façade

CO-A4.3 FAÇADE INSULATION

The use of externally insulated enclosures is recommended wherever possible.

For the choice of insulation material, it is recommended to include those with the lowest environmental impact such as foam insulation, rock wool, glass and cellular glass made with >50% recycled materials or wood-based insulation materials, including those using recycled wood.

Qualitative indicator

Design of façades with external insulation.

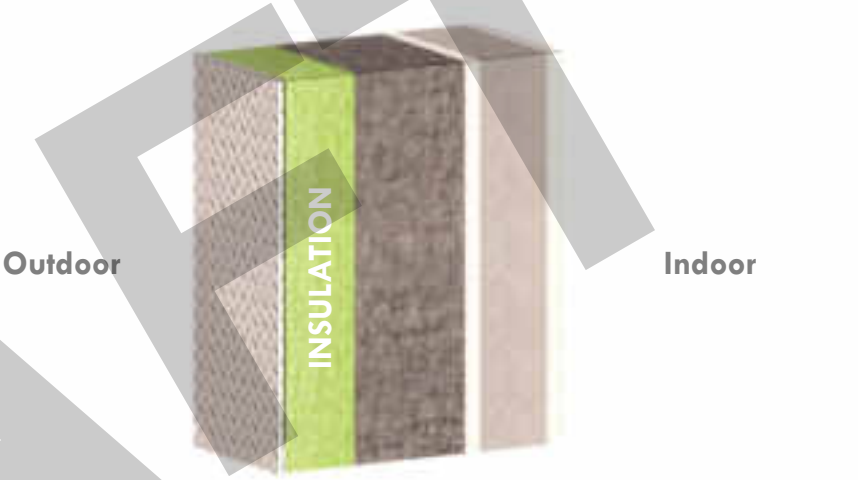
Relevant good practice: Compliant

Substitute measure 1

Façades with interior spaces that are usually unoccupied, or without air conditioning requirements, are excluded from compliance with this criterion.

Substitute measure 2

Implementation of a double façade or another system that makes it impossible to insulate the outer layer, but justifies a thermal inertia of the wall equal to the single façade solution with external insulation.



Illustrative example of a façade section with insulation on the outer layer

CO-A4.4 PEDESTRIAN ACCESS TO THE BUILDING

Minimise thermal oscillations in the access spaces to the interior of buildings through the following implementation options at pedestrian accesses to the building and pedestrian connections to non-air-conditioned spaces:

- Automatic closing systems for access doors.
- Automatic opening systems with presence sensors, avoiding continuous and indiscriminate opening.
- Windbreak doors or double door systems with at least 1,5 metres clear space in between.

Qualitative indicator

Implementation of a system for pedestrian access to the building.

Basic good practice: *(choose one option)*

- Automatic closing systems
- Sensor opening systems
- Double door or windbreak

Substitute measure 1

Justification of a large pedestrian access or loading and unloading access points making it impossible to implement any system described above.

Substitute measure 2

Pedestrian accesses serving as the only emergency exit from the building are excluded from this criterion.

STAGE

Urban Planning	Design	Construction
Use and Maintenance		End of life

STRATEGIC COMMITMENTS

Commitment to the city	Sustainability
Airport identity	Innovation

OBJECTIVES

A. Minimise energy and noise losses in the building
B. Prevent overheating of roofs and below-roof installations
C. Reduce of the heat island effect
D. Purify the air
E. Use rainwater by harvesting it
F. Aesthetically pleasing roof space design that is visually accessible from the airfield

REGULATORY AND GOOD PRACTICE FRAMEWORK

Power to be installed for self-consumption between 30 kW and 100 kW.

CTE DB-HE

Green roof on >20-40% of the total roof area.

CASBEE for Urban Development

HVAC and other rooftop installations should not occupy >35% of the total roof area or use a double roof system

Trends and good practices

>5-50% of roof area with rainwater harvesting and/or vegetation cover.

BREEAM Communities

CO-A5 ROOFING

CO-A5.1 PHOTOVOLTAIC PANELS ON ROOFS

The use of the roof as a space for capturing solar energy by means of photovoltaic panels will be facilitated, with losses due to shades of less than 5%, avoiding the production of reflections or glare during manoeuvres in the airfield, and being able to be integrated into the constructive elements of the roof in such a way as to allow the roof to be used as a walkable space. These surfaces shall be designed to be the most favourable in orientation and slope, and shall be allowed to be combined with strategies to maximise vegetation cover.

The current regulations of the HE Energy Saving Basic Document (CTE DB-HE), in its fifth section, requires the installation of power between 30 kW and 100 kW for electricity generation in buildings with a floor area of over 3,000 m². The minimum power to be installed shall be calculated according to the following expressions:

Minimum power (Pmin) = 0.01* Building floor area (m²)

Limit power (Plim) = 0.05 * Built-up area of the building roof (m²)

In accordance with current regulations on photovoltaic self-consumption (RD 244/2019), industrial activities (logistics) with installed power of less than 100 Kw may opt for the modality with surpluses subject to compensation (the electricity retailer will compensate the energy fed into the grid on our electricity bill). In any activity with an installed capacity of more than 100 kW, the surplus will not be eligible for the surplus compensation modality, so that it will be fed into the grid on a sale basis. If a photovoltaic installation is implemented on the roof of the building with a capacity of more than 100 kW, a study will be conducted to maximise the surface area occupied on the roof and therefore the total capacity, through the formalisation of agreements with third parties (the airport itself, other energy managers or through the creation of energy cooperatives) for the leasing of these surfaces and/or the use of this surplus renewable energy.

However, this criterion is linked to the percentage of roof area, making compatible the multiple roof uses, such as a fifth façade, HVAC installations and landscaped roof (the latter exclusively for office, commercial and hotel activities).

Quantitative indicator

Percentage of roof area with photovoltaic panels, with respect to the total useful roof area, as a space for solar energy collection.

Logistics	Basic good practice:	≥ 70%
Offices, commercial and hotels	Basic good practice:	≥ 50%

Substitute measure 1

Phasing of the photovoltaic installation will be allowed for logistics with a time span of 3-5 years from the date of completion of the construction of the building.

Substitute measure 2

A reduction of the roof area for energy generation will be allowed if the minimum energy production is justified according to the current regulations (CTE DB-HE) through other renewable energy sources generated in the Area itself, such as wind energy and/or geothermal energy, among others.

CO-A5.2 OPTIMISATION OF THE ROOF SURFACE

The implementation of double roofing will be encouraged, the benefits of which include, among others:

- promote the covering or concealment of the machines of the building installations on the roof
- position the opportunity space as a fifth façade, which is seen from the aircraft approaches to Adolfo Suárez Madrid-Barajas Airport
- use a larger area of the canopy as vegetation cover to reduce the heat island
- use surface area for the photovoltaic panels, in addition to minimising solar radiation on the rooftop HVAC installations, allowing for greater energy savings and less emissions pollution.

In the case of a double roof, the percentages of total useful roof area for other criteria shall only include the area of the single roof. For example, in a tertiary building with a usable roof area of 1,000 m² where a double roof is implemented, the minimum percentage of vegetation cover of 20% would be 200 m², although using a double roof, the usable area could be up to 2,000 m².

Qualitative indicator

Use of double roofing.

☼☼	Relevant good practice:	Compliant ✓

IDOM Madrid office with double roof (left) and IDOM Bilbao office with green roof (right)

CO-A5.3 SPECIFIC TO OFFICE, COMMERCIAL AND HOTEL: VEGETATION COVER

The aim will be to improve the building's thermal insulation against solar radiation, air quality and reduce CO_2 emissions through the use of roofs and/or landscaped façades. To this end, the placement of a vegetation cover, or landscaping, with elements that prevent birds from nesting, will be favoured.

Qualitative indicator

Percentage of landscaped roof area, with respect to the total usable roof area, provided that it is greater than 1,000 m².

☼	Basic good practice:	≥ 20%	✓
☼☼	Relevant good practice:	≥ 35%	✓

Complementary measure

Both the vegetation area of the roof and the ventilated cavity roof area with highly reflective external surfaces with a reflection index of ≥ 50% can be counted towards the percentage of a relevant good practice, provided that the green roof complies with the minimum percentage of the basic good practice.

Substitute measure

A basic good practice will be met with one of the following options:

- Implementation of continuous plant elements on the façade, covering an area equal to or greater than 30% of the façade area or 15% of the roof area, whichever is less.
- Design of a flood roof with a surface area equal to or greater than the percentage required for a basic good practice.

CO-A5.4 FIFTH FAÇADE

The use of the roof as a fifth façade will be favoured, placing visual elements that contribute to the differentiation and identity of the building, and advertising elements that are not related to the building or the airport area will not be allowed.

The use of the available roof surface is encouraged, as long as it is equal to or greater than 1,000 square metres (minimum area visible from the airfield next to the airport) for signage and visual identity elements, oriented to be seen from air means of transport.

Qualitative indicator

Visual identity elements shall be implemented on the roof provided that the usable roof area complies with the following values.

	Basic good practice	Relevant good practice
Logistics	≥ 2,000 m²	
Office, hotel and commercial		≥ 1,000 m²

CO-A5.5 HVAC INSTALLATIONS ON ROOFS

Efforts will be made to minimise the roof area occupied by HVAC installations by ensuring that rooftop machines are concealed from both street level and from the sky.

Quantitative indicator

Percentage of roof area with HVAC installations in relation to the total usable roof area.

	Basic good practice	Relevant good practice
Logistics	≤ 15%	
Office, hotel and commercial	≤ 30%	≤ 15%

Qualitative indicator

Machines on the roof and façade totally or partially concealed both from street level and from the sky.

☀	Basic good practice:	Compliant

Substitute measure for the quantitative indicator

Higher requirements for the percentage of roof area for machinery than the basic good practice can be justified by project documentation, provided that a 100% electrified energy model has been chosen.

CO-A5.6 RAINWATER HARVESTING

The use of the roof surface as a space for rainwater harvesting and reuse will be facilitated to minimise and manage water demand. Rainwater harvesting is intended firstly to cover the non-potable water demand in the building, and secondly, for urbanisation spaces outside the lot. Rainwater harvesting also helps to reduce the amount of water discharged into drains and watercourses, the risk of localised flooding and the consumption of water from the town's water supply.

Rainwater collected on the roof will be stored in a tank (cistern), the characteristics of which are detailed in criterion CO-C3.2 and the uses of its reuse in criterion CO-C3.5

Quantitative indicator

Roof area as area of rainwater harvesting for reuse, in relation to the total usable roof area.

☀	Basic good practice:	Maximise harvesting area
☀☀	Relevant good practice:	100%

Substitute measure for the qualitative indicator

Lot open space and/or structures that are independent of the building may be used as a storm water harvesting area.

Summary table of criteria regarding building roofing for logistics activities

The following table shows the indicators for the criteria relating to building roofing. The description of these criteria and the accompanying and alternative measures are presented in the relevant criteria.

		Basic good practice	Relevant good practice
CO-A5.1	Percentage of roof with photovoltaic panels	≥ 70% ✓	
CO-A5.2	Optimisation of the roof surface		Double roof * ✓
CO-A5.3	Percentage of vegetation cover	*Not applicable*	
CO-A5.4	Fifth façade if the usable roof area is	≥ 2,000 m² ✓	
CO-A5.5	Percentage of rooftop HVAC installations	≤ 15% ✓	
CO-A5.6	Value 1: Percentage of non-potable water demand covered by rainwater captured during the rainy season that makes it possible.	100% ✓	
	Value 2: Percentage of roofs with rainwater harvesting		100% ✓

* If there is a double roof solution, the values in the table and the criteria for building roofs shall refer to the single roof area.

Summary table of criteria regarding building roofing for office, hotel and commercial activities

The following table shows the indicators for the criteria relating to building roofing. The description of these criteria and the accompanying and alternative measures are presented in the relevant criteria.

		Basic good practice	Relevant good practice
CO-A5.1	Percentage of roof with photovoltaic panels	≥ 50% ✓	
CO-A5.2	Optimisation of the roof surface		Double roof * ✓
CO-A5.3	Percentage of vegetation cover	≥ 20% ✓	≥ 35% ✓
CO-A5.4	Fifth façade if the usable roof area is	≥ 1,000 m² ✓	
CO-A5.5	Percentage of rooftop HVAC installations	≤ 30% ✓	≤ 15% ✓
CO-A5.6	Value 1: Percentage of non-potable water demand covered by rainwater captured during the rainy season that makes it possible.	100% ✓	
	Value 2: Percentage of roofs with rainwater harvesting		100% ✓

* If there is a double roof solution, the values in the table and the criteria for building roofs shall refer to the single roof area.

Illustrative example of possible roofs on tertiary buildings (offices, hotels and commercial)

These examples are for illustrative purposes only, do not constitute design guidelines and are intended for consultation and support of roof space optimisation possibilities only.

OFFICES two towers with plinth

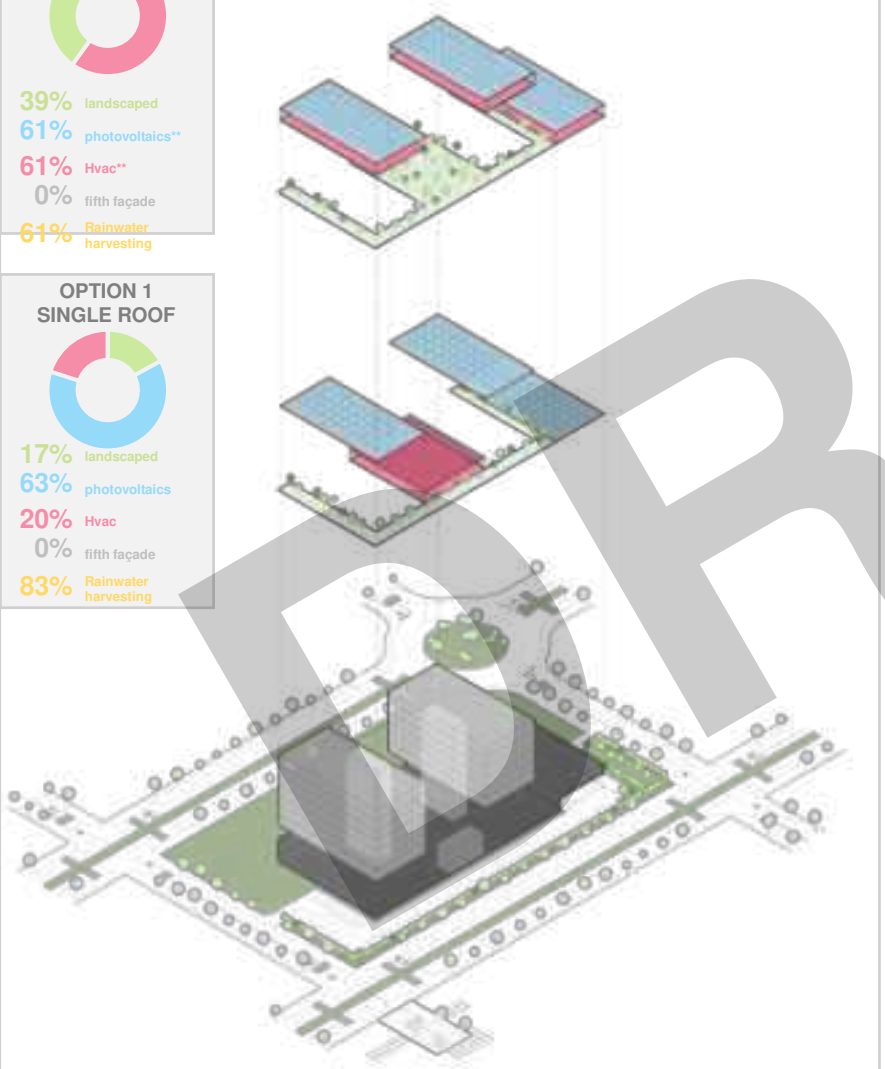
** Percentage in relation to the available single roof area*
*** Use of the roof in double roof spaces*

OPTION 2* DOUBLE ROOF

- 39% landscaped
- 61% photovoltaics**
- 61% Hvac**
- 0% fifth façade
- 61% Rainwater harvesting

OPTION 1 SINGLE ROOF

- 17% landscaped
- 63% photovoltaics
- 20% Hvac
- 0% fifth façade
- 83% Rainwater harvesting



OFFICES one tower with plinth

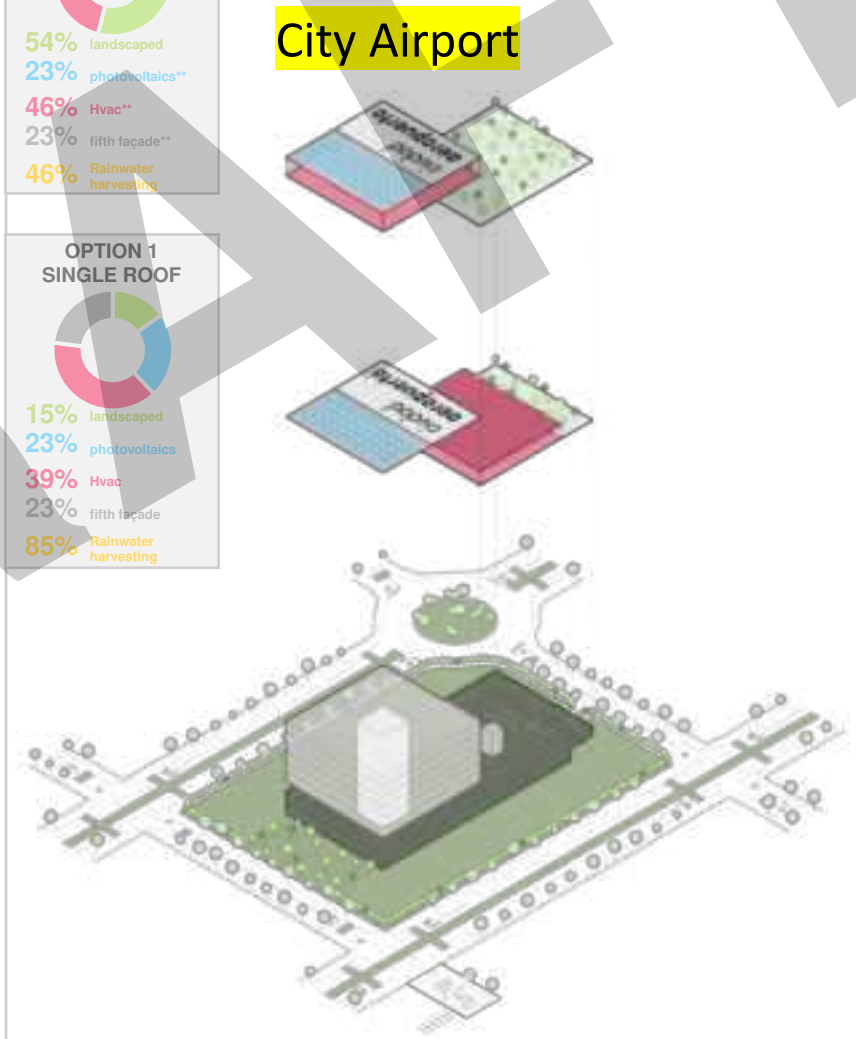
** Percentage in relation to the available single roof area*
*** Use of the roof in double roof spaces*

OPTION 2* DOUBLE ROOF

- 54% landscaped
- 23% photovoltaics**
- 46% Hvac**
- 23% fifth façade**
- 46% Rainwater harvesting

OPTION 1 SINGLE ROOF

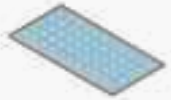
- 15% landscaped
- 23% photovoltaics
- 39% Hvac
- 23% fifth façade
- 85% Rainwater harvesting



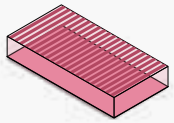
KEY

Landscaped

Photovoltaics and rainwater harvesting

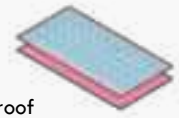


HVAC installations



Fifth façade

Double roof (photovoltaic + HVAC)



Double roof (fifth façade + HVAC)

Illustrative example of possible roofs on tertiary buildings (offices, hotels and commercial)

These examples are for illustrative purposes only, do not constitute design guidelines and are intended for consultation and support of roof space optimisation possibilities only.

OFFICES without commercial on ground floor

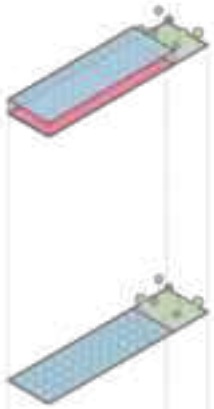
OPTION 2* DOUBLE ROOF

21% landscaped
79% photovoltaics**
79% Hvac**
0% fifth façade
79% Rainwater harvesting

OPTION 1 SINGLE ROOF

21% landscaped
79% photovoltaics
0% Hvac
0% fifth façade
79% Rainwater harvesting

* Percentage in relation to the available single roof area
** Use of the roof in double roof spaces



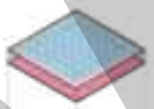
* Percentage in relation to the available single roof area
** Use of the roof in double roof spaces

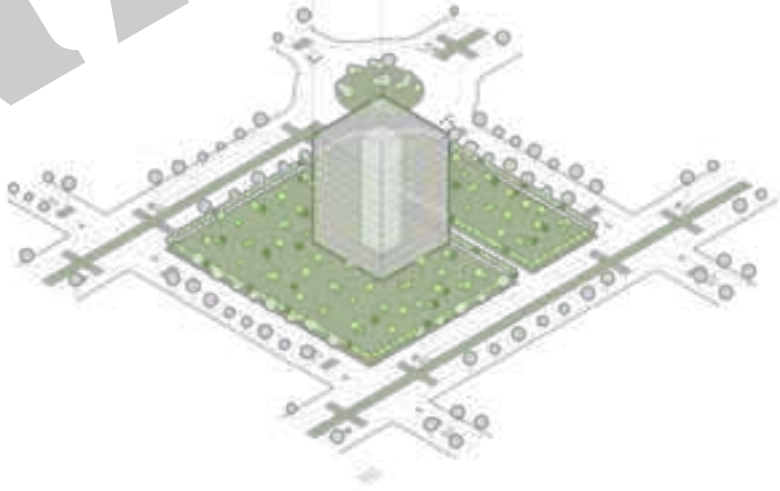
TOWER OFFICES

OPTION 2* DOUBLE ROOF

0% landscaped
100% photovoltaics**
100% Hvac**
0% fifth façade**
100% Rainwater harvesting

* Percentage in relation to the available single roof area
** Use of the roof in double roof spaces

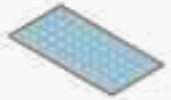




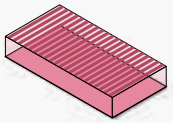
KEY

Landscaped

Photovoltaics and rainwater harvesting



HVAC installations



Fifth façade

Double roof (photovoltaic + HVAC)

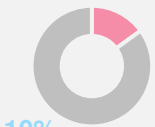
Double roof (fifth façade + HVAC)

Illustrative example of possible roofs on logistics buildings

These examples are for illustrative purposes only, do not constitute design guidelines and are intended for consultation and support of roof space optimisation possibilities only.

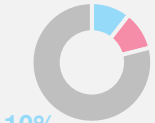
Distribution WAREHOUSE with storage and offices

OPTION 2* DOUBLE ROOF



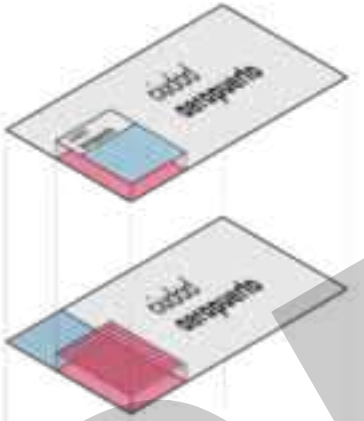
10% photovoltaics**
15% Hvac**
85% fifth façade
100% Rainwater harvesting

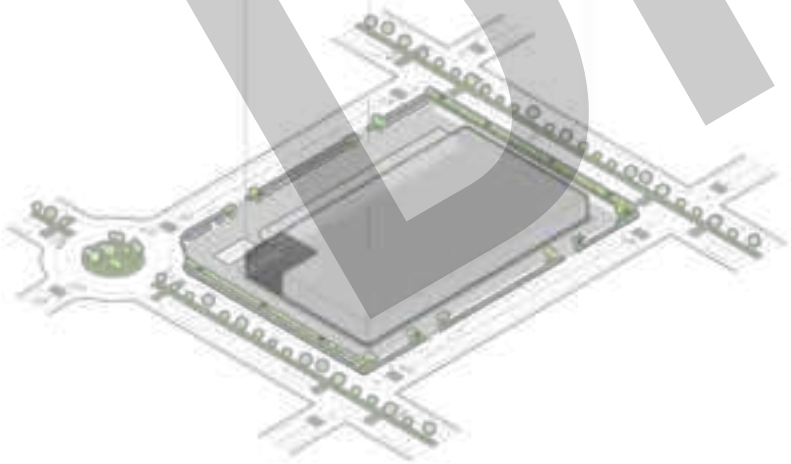
OPTION 1 SINGLE ROOF



10% photovoltaics
15% Hvac
75% fifth façade
100% Rainwater harvesting

** Percentage in relation to the available single roof area*
*** Use of the roof in double roof spaces*





Modular distribution WAREHOUSE

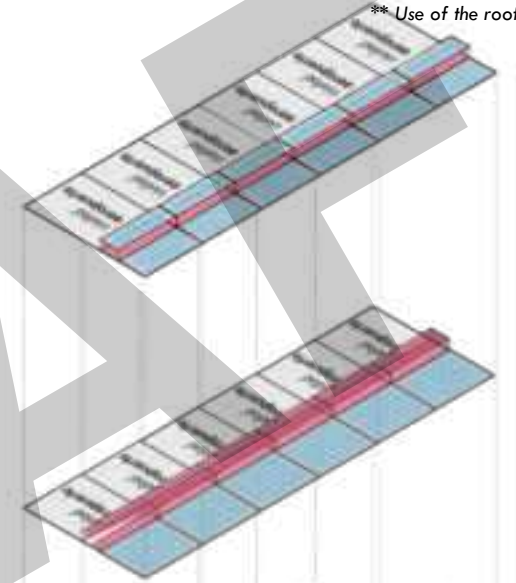
OPTION 2* DOUBLE ROOF

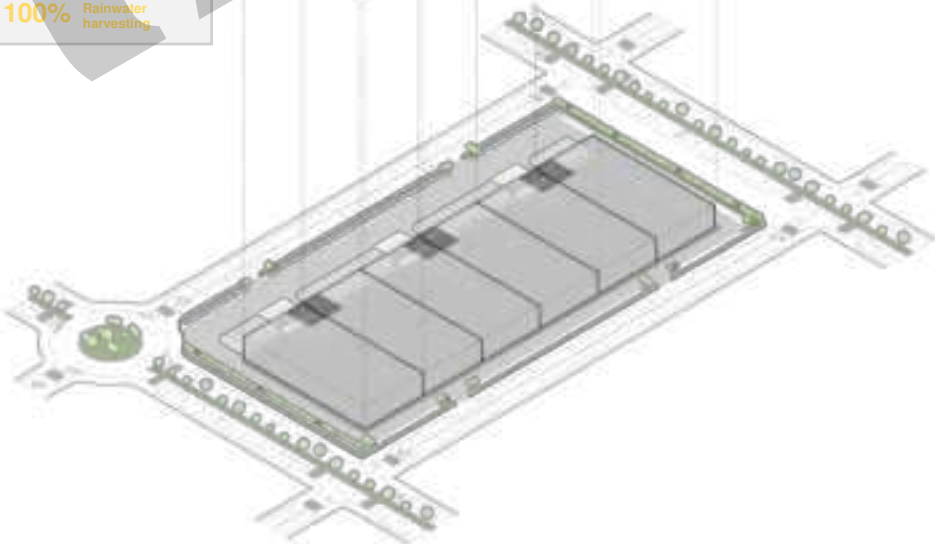
36% photovoltaics**
15% Hvac**
64% fifth façade
100% Rainwater harvesting

OPTION 1 SINGLE ROOF

38% photovoltaics
15% Hvac
47% fifth façade
100% Rainwater harvesting

** Percentage in relation to the available single roof area*
*** Use of the roof in double roof spaces*

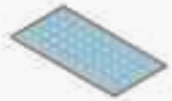




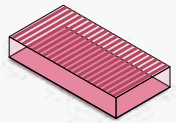
KEY

Landscaped

Photovoltaics and rainwater harvesting

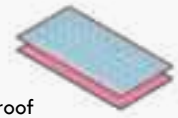


HVAC installations



Fifth façade

Double roof (photovoltaic + HVAC)



Double roof (fifth façade + HVAC)

Illustrative example of possible roofs on logistics buildings

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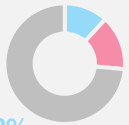
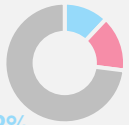
Cross-docking distribution WAREHOUSE

OPTION 2* DOUBLE ROOF



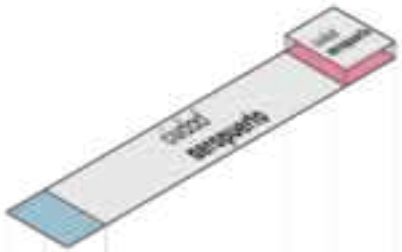
12% photovoltaics
15% Hvac**
88% fifth façade**
100% Rainwater harvesting

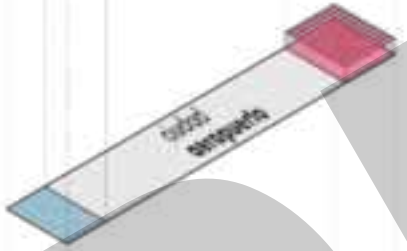
OPTION 1 SINGLE ROOF

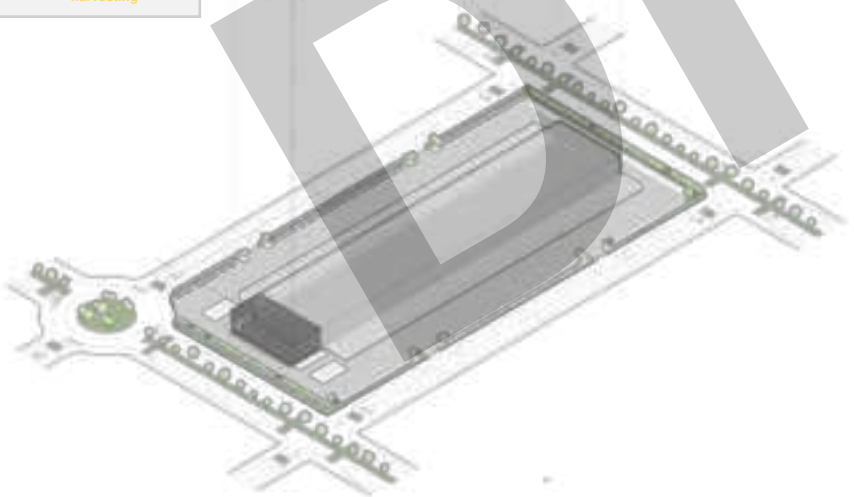


12% photovoltaics
15% Hvac
73% fifth façade
100% Rainwater harvesting

* *Percentage in relation to the available single roof area*
** *Use of the roof in double roof spaces*

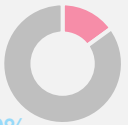






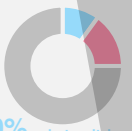
BPO WAREHOUSE (Business Process Outsourcing)

OPTION 2* DOUBLE ROOF



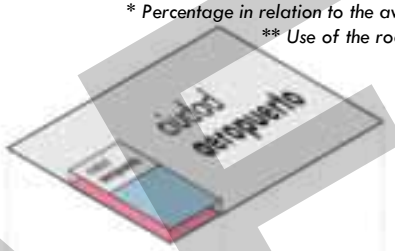
10% photovoltaics**
15% Hvac**
90% fifth façade**
100% Rainwater harvesting

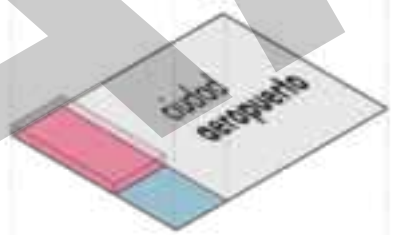
OPTION 1 SINGLE ROOF

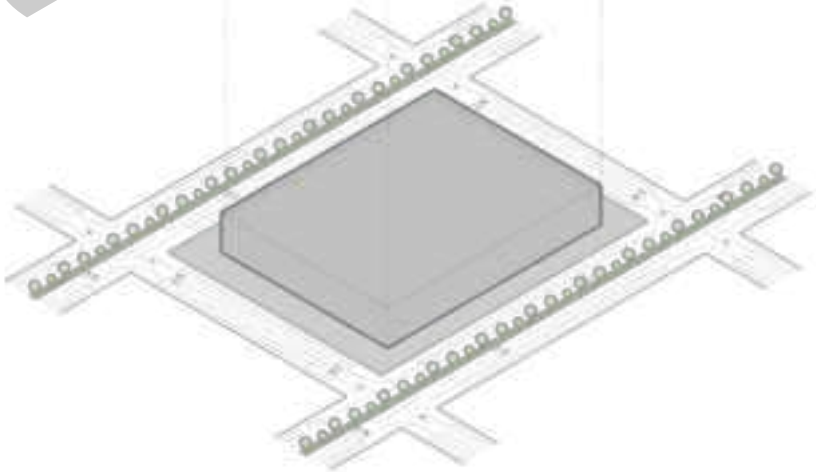


10% photovoltaics
15% Hvac
75% fifth façade
100% Rainwater harvesting

* *Percentage in relation to the available single roof area*
** *Use of the roof in double roof spaces*



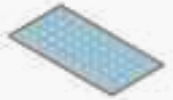




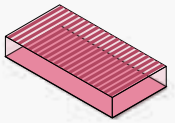
KEY

Landscaped

Photovoltaics and rainwater harvesting

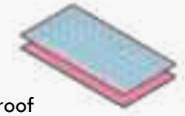


HVAC installations



Fifth façade

Double roof (photovoltaic + HVAC)



Double roof (fifth façade + HVAC)

Illustrative example of possible roofs on logistics buildings

These examples are for illustrative purposes only, do not constitute design guidelines and are intended for consultation and support of roof space optimisation possibilities only.

nest WAREHOUSE

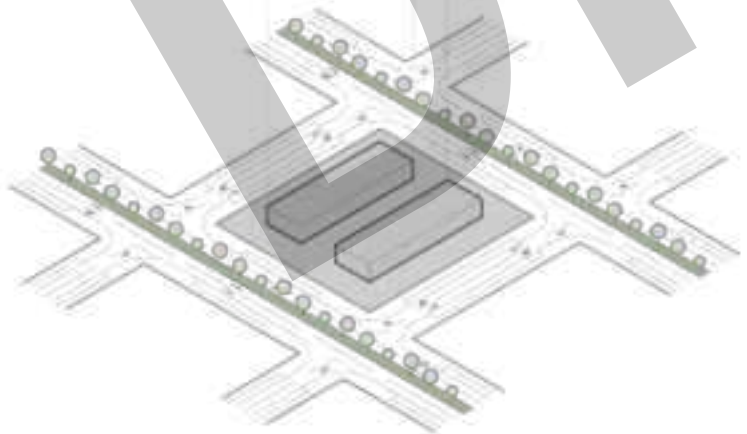
OPTION 2* DOUBLE ROOF

100% Photovoltaics**
10% Hvac**
0% fifth façade
100% Rainwater harvesting

OPTION 1 SINGLE ROOF

100% photovoltaics
0% Hvac
0% fifth façade
100% Rainwater harvesting

** Percentage in relation to the available single roof area*
*** Use of the roof in double roof spaces*



showroom WAREHOUSE

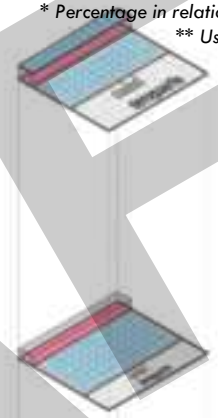
OPTION 2* DOUBLE ROOF

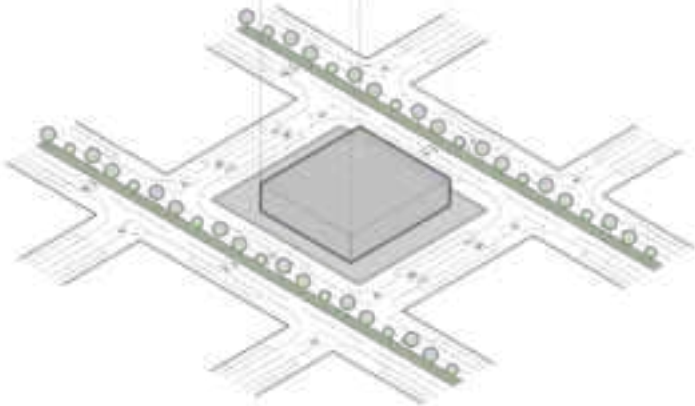
58% photovoltaics**
15% Hvac**
42% fifth façade
100% Rainwater harvesting

OPTION 1 SINGLE ROOF

58% photovoltaics
15% Hvac
27% fifth façade
100% Rainwater harvesting

** Percentage in relation to the available single roof area*
*** Use of the roof in double roof spaces*

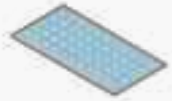




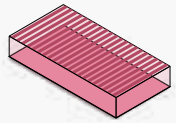
KEY

Landscaped

Photovoltaics and rainwater harvesting

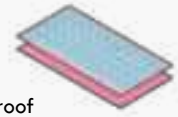


HVAC installations



Fifth façade

Double roof (photovoltaic + HVAC)



Double roof (fifth façade + HVAC)

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CONTENTS

The criteria set out in this section regulate the configuration of the free area of the lot, aiming at a quality private outdoor space for employees with a minimum of green areas and recreational areas; balanced parking provision for trucks, private motor vehicles and alternative means of transport.

It also promotes continuity with outdoor open spaces by removing visual barriers and promoting the visibility of landmark buildings from the public road.

STAGE

Urban Planning	Design	Construction
Use and Maintenance	End of life	

STRATEGIC COMMITMENTS

Commitment to the city	Sustainability
Airport identity	Innovation

OBJECTIVES

A. Guarantee a minimum area of green space per user of the lot and Area
B. Reduce soil sealing in urbanisation processes
C. Promote the landscaping of roofs and terraces
D. Minimise irrigation requirements
E. Maximising outdoor hygrothermal comfort using vegetation

REGULATORY AND GOOD PRACTICE FRAMEWORK

Landscaping ≥ 50% of private open area

GUDP Madrid 1997

Outdoor space >30% of the total site area, with 25% of this space planted with two or more types of vegetation

LEED BD+C

Native species in an area equal to or greater than 10% of the Development

LEED Neighborhood Development

% native species (45%-60% 60%-75% ≥75%) and grass surface (15-30% 0-15% 0%)

GSAS Distict Assessment

% of shaded open spaces

GSAS Parks assessment

CO-B1 GREEN AREAS WITHIN LOTS

CO-B1.1 RATIO OF GREEN AREAS WITHIN LOTS

A minimum ratio of green areas will be established, in order to establish an adequate quality of the open space of the lot with the implantation of at least two plant species, one of them a tree species.

Quantitative indicator

Percentage of area dedicated to green areas in relation to the unoccupied area of the lot.

Logistics	☀	Basic good practice:	≥ 10%
Logistics	☀☀	Relevant good practice:	≥ 15%
Logistics	☀☀☀	Excellence good practice:	≥ 20%
Offices, commercial and hotels	☀	Basic good practice:	≥ 50%
Offices, commercial and hotels	☀☀	Relevant good practice:	≥ 70%
Offices, commercial and hotels	☀☀☀	Excellence good practice:	≥ 90%

Substitute measure 1

For logistics activity, the minimum percentage of green space may be replaced by a 2.5 m strip along the entire perimeter of the lot (except for vehicle access and manoeuvring areas), or distributed in parking and/or parking areas to provide shade.

Substitute measure 2

For office, hotel and commercial activities, landscaped rooftop and/or plinth areas of the building may be counted as part of the required ratio of green space within the lot.

CO-B1.2 CHOICE OF TREE TYPE

The tree typology inside the lot will be selected according to the requirements of hygrothermal wellbeing during the different seasons of the year, with the necessary mechanisms to avoid attracting birds, mainly in areas where this could increase the risk to operational safety and with the need for Aena's prior validation.

The choice of tree typology within the plots shall comply with criterion UP-B2.2, regarding tree characteristics. In this regard, compliance with the following characteristics will also be considered:

Orientation	Tree typology inside the lot
South	Deciduous species with dense crown and predominantly horizontal dimension
West	Deciduous and evergreen species with a predominance of vertical dimension
East	Low density deciduous species

Quantitative indicator

Compliance with the typologies on the table.

☀	Basic good practice:	Complies with all

CO-B1.3 SHADING ELEMENTS

The creation of shaded areas in the open space inside the lot will be encouraged, mainly in the south and east orientations, which have the highest solar incidence during the summer months, using deciduous trees in order to maximise hygrothermal comfort during the hottest seasons.

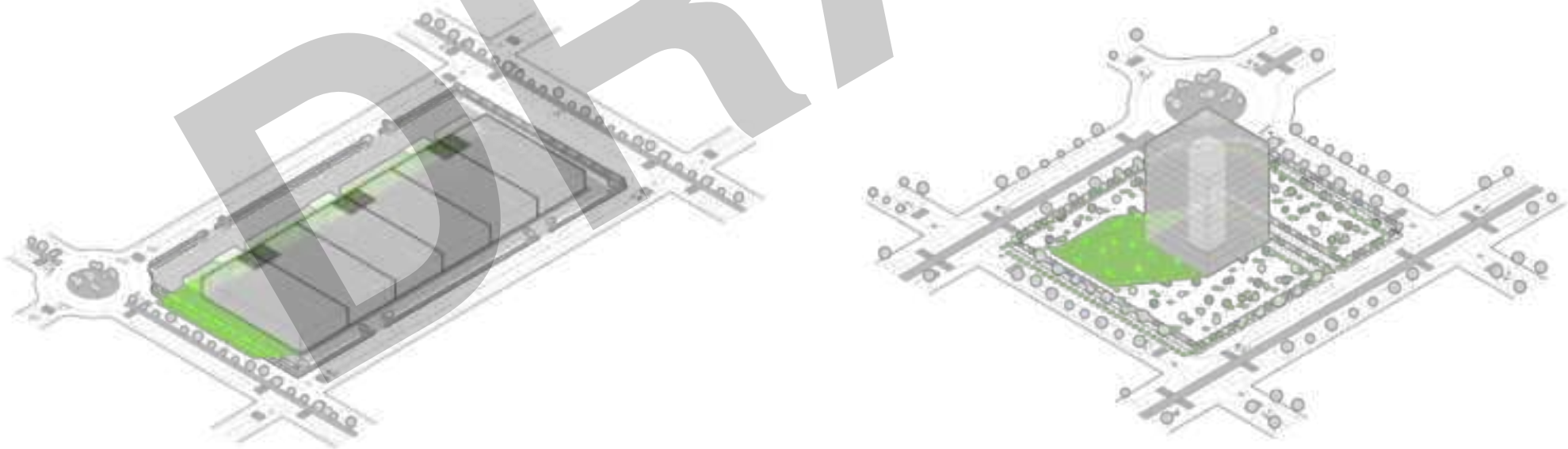
Quantitative indicator 1

Percentage of shaded area in the areas on the table below. It will be analysed on 21 June at 15:00 local time, including all obstacles that cast shades, such as the shade cast by the building itself, furniture and natural elements, among others.

		Basic good practice	Relevant good practice	Excellence good practice
Value 1: Parking areas	Logistics	≥ 20% ✓	≥ 50% ✓	
	Offices, commercial and hotels	≥ 40% ✓	≥ 80% ✓	
Value 2: Pedestrian and recreational areas	Logistics	*Not applicable*		
	Offices, commercial and hotels	≥ 20% ✓	≥ 40% ✓	≥ 80% ✓

Substitute measure ✓

The percentages of the quantitative indicator may be modified based on the results of the multi-factor outdoor comfort analysis carried out.



Illustrative examples of shaded spaces inside the lots

STAGE

Urban Planning	Design	Construction
Use and Maintenance	End of life	

STRATEGIC COMMITMENTS

Commitment to the city	Sustainability
Airport identity	Innovation

OBJECTIVES

A. Promote the continuity of Area's open space
B. Remove visual barriers and promote views of buildings
C. Generate open and continuous development
D. Maximise the visibility of the flagship building from the public highway

REGULATORY AND GOOD PRACTICE FRAMEWORK

Good practice in business park design
Good practices and case studies
Good corporate design practices
Good practices and case studies

CO-B2 OPEN SPACES WITHIN LOTS

CO-B2.1 RATIO BETWEEN OPEN-PRIVATE AREAS OF THE LOT AND OPEN SPACES OF THE AREA

The relationship between the free-private space inside the plots and the free areas of the development outside the plot will be favoured, with the aim of generating a sense of continuity of green space and removing, as far as possible, visual barriers.

Requirements

- Visual and/or physical barriers between the exterior and the interior of the lots are avoided (except for functional safety requirements, previously accepted by Aena)
- The building's own installations, whether integrated into the building or free-standing on the lot, shall not be exposed or visible from the outside of the lot.
- For tertiary activities, it is requested that parking and service areas be located mostly at the side and rear of the lot.
- Landscaping and recreational areas are encouraged at the main pedestrian entrances to the building

Quantitative indicator

Compliance with all the requirements in the table on the left.

Basic good practice: Complies with all

CO-B2.2 QUALITY OF ACCESS ROUTES

The main accesses to the lots will be an element of corporate identity, and will therefore be preferably from the main road and towards the main façade of the building, leaving the accesses from secondary roads for service vehicles. Accesses shall be designed to be accessible and free of architectural barriers.

Recommendations

- The main entrance of the building should be located in front of a main road, in order to be more representative
- Service accesses should be at the sides and rear of the lot
- The main entrance to the building should be located as close as possible to the main public transport links

Quantitative indicator

Compliance with all the requirements in the table on the left.

Basic good practice: Complies with all

Substitute measure

In the event that due to special conditions previously justified by project documentation, it is not possible to eliminate architectural barriers, an alternative access for people with reduced mobility shall be provided close to the entrance of the building

CO-B3.1 PARKING SPACES WITHIN THE LOT

As a parking strategy within the lot, the following points are shown:

- Compliance with the minimum parking ratios for vehicles within the lot, including parking spaces reserved for persons with reduced mobility, will be encouraged. In addition, the reservation of places for bicycles and other alternative modes of transport will be considered.
- Below-ground parking will be encouraged as a measure to reduce the heat island in the development, with no more than 20% of the total free area of the lot being enabled for parking up to a maximum of 0.8 ha for lots smaller or equal to 8 ha and 1.6 ha for lots over 8 ha.
- The design of parking spaces for heavy goods vehicles (trucks) within the lot will be facilitated.
- The development of a strategy for electric vehicle parking spaces within the lots will be encouraged and these spaces will be provided with the necessary infrastructure for electric vehicle charging.
- Providing a number of parking spaces for soft modes of transport within the lot is recommended, with an anchoring support adaptable to any typology and independent of those provided on public roads.

Quantitative indicator

Compliance with the values in the table below.

		Basic good practice	Relevant good practice	Excellence good practice
Value 1: Total vehicle spaces in the Area		1 place / 100 m²c ✓		
Value 2: Vehicle spaces inside the lot		≥ 50% ✓		
Value 3: Below-ground parking strategies		*Not applicable*		
Value 4: Electric vehicle places			≥ 20% ✓	≥ 50% ✓
Value 5: Truck places		1 place / 1,500 m²c ✓		
Value 6: Places for private soft modes of transport	Logistics	1 place / 500 m²c ✓	1 place / 100 m²c ✓	
	Hotels	1 place / 1,500 m²c ✓	1 place / 100 m²c ✓	
	Office and commercial	1 place / 200 m²c ✓	1 place / 100 m²c ✓	
Value 7: Soft mode places with recharging			≥ 5% ✓	≥ 10% ✓

Value 1 of the table: Number of total parking spaces in Area based on the constructed area.
Value 2 of the table: Percentage of value 1 places to be located within the area.
Value 3 of the table: Percentage of parking spaces below ground level, regarding the total number of parking spaces within the lot.
Value 4 of the table: Percentage of total value 2 spaces reserved for electric vehicles, preferably those closest to the access to the building.
Value 5 of the table: Number of parking spaces for lorries, excluding the manoeuvring area for loading and unloading.
Value 6 of the table: Number of parking spaces for private soft modes of transport within the lot, located at a distance of less than 60 m from an entrance to the building.
Value 7 of the table: Percentage of Value 6 places with electric charging infrastructure.

STAGE

Urban Planning	Design	Construction
Use and Maintenance		End of life

STRATEGIC COMMITMENTS

Commitment to the city	Sustainability
Airport identity	Innovation

OBJECTIVES

A. Provide the development with the minimum required parking spaces
B. Make it easier for investors to take alternative measures to reduce parking requirements
C. Promote sustainability measures in the design and construction of parking lots

REGULATORY AND GOOD PRACTICE FRAMEWORK

1 out of every 40 places need to be allocated to electric vehicles

Directive EU/2018/844/EU

1 place every 100 m²c for industrial activity, accommodation, and offices and 1 place every 50 m² for commercial activity

TRPESGA ASM-B and Madrid GUDP

1 parking space every 50 m²c for industrial, accommodation, office and commercial activities

Article 162 of Alcobendas Building, Construction and Installations Ordinance

Above-ground parking on <20% of the lot (maximum 0.8 ha)/Above-ground parking on the side or rear of the lot

LEED Neighborhood Development

CO-B3.1 PARKING SPACES WITHIN THE LOT (continued)

All replacement measures will require the drafting of a Detailed Study (with the exception of the replacement measure for Value 2 and 3).

Substitute measure for Value 1

The reduction of 1 space inside the area for every seven employees using alternative means of transport to private vehicles may be justified, detailing the alternative mobility measures offered to the users of the building, such as shuttles to the city or to the airport terminals themselves, which act as intermodal transport hubs, and the forecast of modal distribution with respect to the trips attracted and generated from the lot itself, by means of project documentation and prior approval by Aena.

Substitute measure for Value 2 and 3

Substituting parking spaces on the road and/or above ground within the lot will be possible by means of project documentation and with prior approval from Aena, for those parking spaces or temporary stopping areas for vehicles that meet the following characteristics:

- Places for carpooling vehicles with limited permanence time and carsharing modality
- Places for bicycles and other soft means of private transport
- Spaces reserved for the loading and unloading of passengers, as well as taxi ranks or similar services
- Places reserved for specific users due to the functionality of the building or access

Qualitative indicator

Provide a space inside the building and close to the entrance with a single shower and changing area for every 10 places.

Excellence good practice: Compliant

Substitute measure 1 for Value 2

For the first buildings within the Area, the provision of minimum parking spaces within the lots may be postponed, provided that they are the only building existing at that time with its adjoining roads. The parking spaces to be postponed will be equivalent to 60% of the existing parking spaces in the adjoining roads.

When new buildings are developed adjacent to these roads, the buildings that have benefited from this substitution measure will have to justify full compliance with basic good practice within their lot. In order to be eligible for this substitute measure, an explicit approval by Aena shall be obtained.

Substitute measure 2 for Value 2

For the first buildings within the Area, the provision of minimum parking spaces within the lots may be deferred, provided that there is a vacant lot that could be temporarily converted into a surface parking lot and that it is within a 250-metre radius. The spaces to be postponed shall be equivalent to 80% of the spaces with parking permits in the vacant lot.

When building on the vacant lot, the buildings that have benefited from this substitution measure will have to justify full compliance with basic good practice within their lot. In order to be eligible for this substitute measure, an explicit approval by Aena shall be obtained.

Illustrative example of a parking space for a truck, an electric vehicle and soft means of private transport

These examples are for illustrative purposes only, do not constitute design guidelines and are intended for consultation and support of temporary parking possibilities in an adjacent vacant lot only.

Illustrative example of a temporary parking strategy in an adjacent vacant lot

These examples are for illustrative purposes only, do not constitute design guidelines and are intended for consultation and support of temporary parking possibilities in an adjacent vacant lot only.

ASM-B REAL ESTATE PLAN

ALCOBENDAS REGULATIONS

General Urban Zoning Plan (PGOU) Alcobendas
Article 6.11.2. Application

The provision of the **parking** service will be implemented in private spaces using one of the following solutions:

a) On the plot, free space or built-up space.
b) **On communal space, built-up or free, with the relevant easement in the latter case.**

Combined parking spaces are accepted.

The use of vacant plots may be provisionally authorised as ground level parking with the relevant paving and enclosure works.

PLOTS NEXT TO PARKING

Illustrative and hypothetical example of temporary parking in an adjacent lot in the Northwest Logistics Area

Example of temporary parking in an adjacent lot in the Santander Financial City, Madrid

CONTENTS

Architectural design shall take advantage of the great possibilities often offered by the terrain, the air and the sun that are present in the environment and that, through their correct integration into the design, make it possible to compensate energy consumption (reaching almost zero consumption) and improve the overall sustainability of the building.

In addition, the integrated design in balance with the elements of nature increases air quality and comfort and reduces the resources and maintenance required.

The proposed guidelines in the form of criteria are based on passive measures that do not entail additional cost and provide major benefits to building performance.

They address issues of optimising energy consumption and the water cycle as well as improving health and comfort conditions in buildings.

STAGE

Urban Planning	Design	Construction
Use and Maintenance	End of life	

STRATEGIC COMMITMENTS

Commitment to the city	Sustainability
Airport identity	Innovation

OBJECTIVES

A. Boost the commitment to carbon neutrality
B. Promote the use of renewable energies in buildings as much as possible
C. Establish a digital twin of the design for the verification of its energy balance
D. Implement passive energy efficiency measures during the design

REGULATORY AND GOOD PRACTICE FRAMEWORK

Carbon neutral with the possibility of offsetting emissions by 2026 and aiming to be Net Zero Carbon by 2040.

Aena Strategic Objectives

The Primary Energy Demand (PED) does not exceed the threshold set for Nearly Zero Energy Building Requirements (NZEB) in the national regulations implementing Directive 2010/31/EU.

European Commission - Green Taxonomy

Renewable energy in 70% of the annual ACS energy demand.

CTE DB-HE Energy Saving

15-25% of energy demand covered by renewable energies.

BREEAM Communities

CO-C1 ENERGY

CO-C1.1 ZERO CARBON

A development oriented to Aena's corporate strategy to ensure carbon neutrality will be promoted.

Qualitative indicator

Justification of compliance using project documentation.

Basic good practice: Complies with the 2026 Neutrality Commitment and 2040 Zero Emissions Commitment

In order to meet the carbon neutrality commitment, buildings shall comply with the following guidelines:

- For office, commercial and hotel activities, the CTE calculation methodology for non-renewable primary energy (Pnrp) will be applied.
- For logistics activity, CO_2 emissions linked to non-renewable primary energy will be limited in kWh/m².

For all activities, CO_2 emission factors and primary energy conversion factors for different final energy sources consumed shall be taken from the most up to date official source of the Institute for Energy Diversification and Saving (Instituto para la Diversificación y Ahorro de la Energía, IDAE). The following table illustratively shows the values in force in 2020 according to the IDAE:

	PRIMARY ENERGY/TOTAL ENERGY PATH COEFFICIENT		CO_2 EMISSION FACTOR
	Energía primaria total (EPtot) / Energía final total (Efinal)	Energía primaria No Renovable (EPnr) / Energía final total (Efinal)	Emisiones de CO_2 / Energía final total (Efinal)
	kWh / kWh	*kWh / kWh*	*kg CO_2/ kWh*
Electricity	2.368	1.954	0.331
Natural gas	1.195	1.19	0.252
Solar Thermal Energy	1	0	0
Solar PV	1	0	0
Aerothermal or geothermal energy (*)	$1 - \frac{1}{SCOP}$	0 (if SCOP > 2.5)	0

Substitute measure

The commitment to Carbon Neutrality 2026 and Zero Emissions 2040 will need to be aligned with any changes to its strategy contained in the Climate Action Plan in force at the time.

CO-C1.2 RENEWABLE ENERGIES

Ensure that electricity and air-conditioning are provided using renewable sources.

These renewable energies can come from:

1. Purchase and sale of energy with renewable energy certification, for activities not included in the CTE
2. Renewable energy production in buildings.
3. Renewable energy production on an Area or Airport City Adolfo Suárez Madrid-Barajas scale

Quantitative indicator 1

Origin of energy from renewable sources.

☀	Basic good practice:	Buying and selling *
☀☀	Relevant good practice:	Construction
☀☀☀	Excellence good practice:	Area and/or Airport City Adolfo Suárez Madrid-Barajas

** The distributor will be required to certify that 100% of the energy comes from renewable sources.*

CO-C1.3 BUILDING ENERGY SIMULATION

The energy simulation of the building will be encouraged at the design stage. In addition, including a calculation justifying the level of efficiency of the demand shall be included, based on the construction solutions used for the envelopes, orientations and levels of airtightness with the following maximum reference levels:

	EFFICIENCY OF THE SYSTEMS IN kWh/m²- year			
	Heating	Cooling	ACS	Lighting
Commercial	25	90	25	90
Offices	25	30	5	15

Qualitative indicator

Energy simulation of the building in the design phase.

☀	Basic good practice:	Compliant

Nearly Zero Energy Consumption Buildings (nZEB) are those buildings with a very high level of energy efficiency in which the very low amount of energy required should be covered, to a very large extent, by renewable energy sources. Through compliance with the limit values set in the DB-HE of the current CTE, buildings will be considered as nZEB.

Quantitative indicator 2

Percentage limit of non-renewable primary energy balance (Epnr), inside the thermal envelope of the building, with respect to the limit values set in the DB-HE of the current CTE or regulations that replace it.

☀	Basic good practice:	≤ 70%
☀☀	Relevant good practice:	≤ 40%

Quantitative indicator

Percentage limit of total primary energy balance (Ept), inside the thermal envelope of the building, with respect to the limit values set in the DB-HE of the current CTE or regulations that replace it.

☀	Basic good practice:	≤ 85%
☀☀	Relevant good practice:	≤ 55%

CO-C1.4 CHARACTERISTICS OF THE ENVELOPE

It is recommended that the different elements of the building envelope, in air-conditioned spaces, have lower envelope transmittances with respect to those limited by the CTE.

Quantitative indicator

Percentage reduction with respect to the thermal transmittance limit values set out in the Basic Document on Energy Saving (CTE DB-HE1).

☀☀☀	Excellence good practice:	≥ 20%

CO-C1.5 PASSIVE ENERGY EFFICIENCY MEASURES

The energy demand for air conditioning shall be minimised through the implementation of passive energy efficiency measures, which may consist of one or more of the following non-exhaustive list:

- Ventilated façades or double façade systems in east, south and west orientations to reduce the high solar load received
- Insulation systems on the exterior of the envelope
- Green roofs and/or façades acting as solar protection
- Exploitation of thermal inertia through the thermal mass of the envelope or the floor
- Waste heat recovery in installations
- Night cooling
- Sustainable alternative solutions (e.g. trombe wall) on façades
- Infiltration control systems

Quantitative indicator

Number of passive measures to be implemented, to be defined by project documentation.

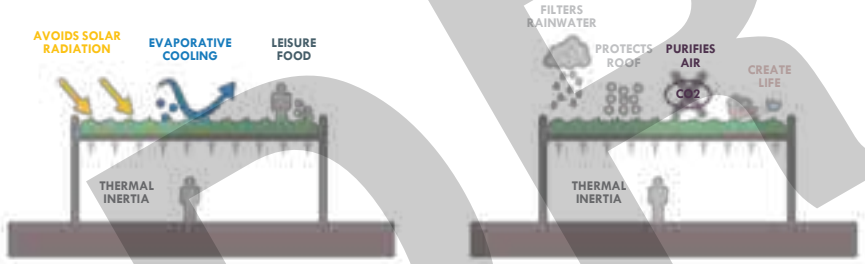
☀	Basic good practice:	≥ 3 ✓
☀☀	Relevant good practice:	≥ 5 ✓
☀☀☀	Excellence good practice:	≥ 7 ✓

Substitute measure ✓

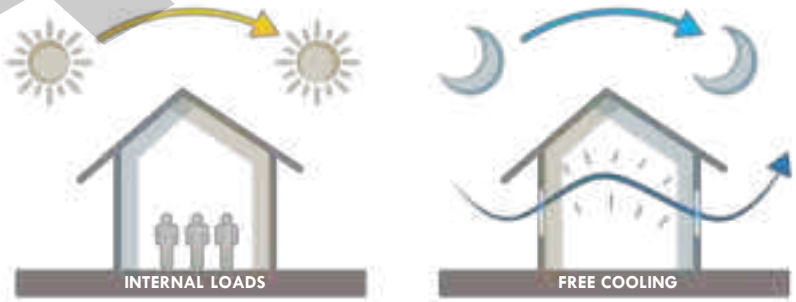
Any other passive measure not listed above will count as a passive measure implemented to achieve good practice excellence.

Illustrative examples of passive measures

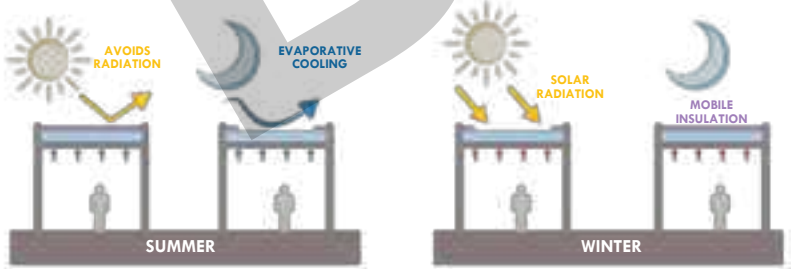
LANDSCAPED ROOF



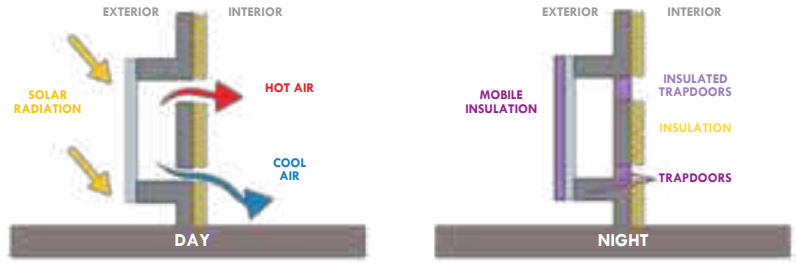
FREE COOLING



POND ROOF



PARIETODYNAMIC WALL



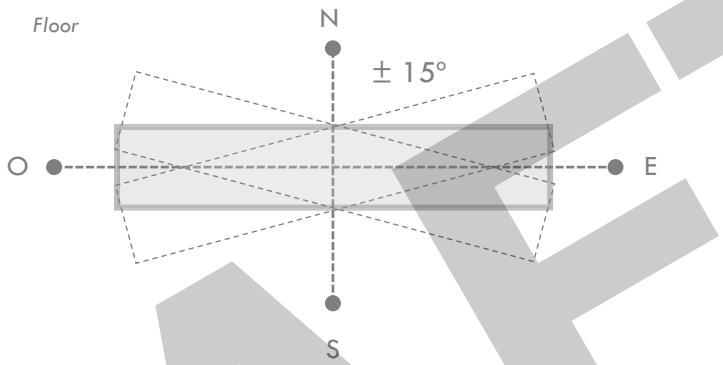
CO-C1.6 BUILDING AND LOT ORIENTATION

Adequate climatic orientation of the lot and the building shall be sought. In addition, please justify orientation, tilt and shading losses being below the thresholds recommended by the IDAE and best practice.

Quantitative indicator

Percentage of the built-up area of the lot oriented ±15° to the east-west axis.

Basic good practice: Justification of the orientation using project documentation		✓
Relevant good practice:	≥ 75%	✓
Excellence good practice:	≥ 90%	✓

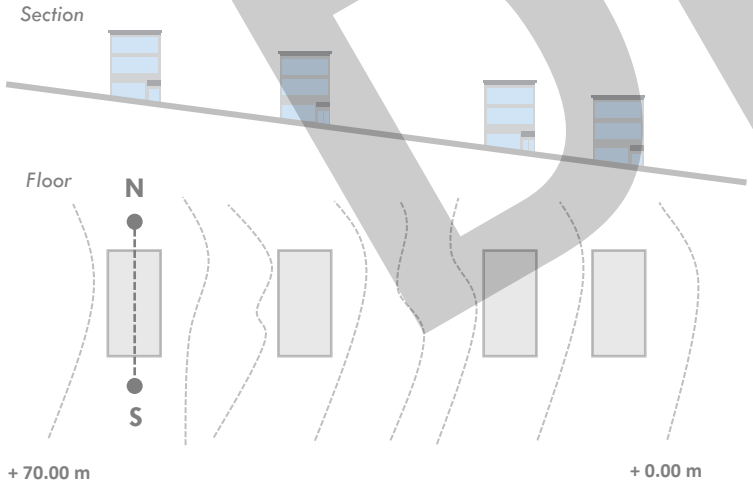


Substitute measure 1

Justifying the orientation of the lot by means of a specific sunlight study will be a good basic practice.

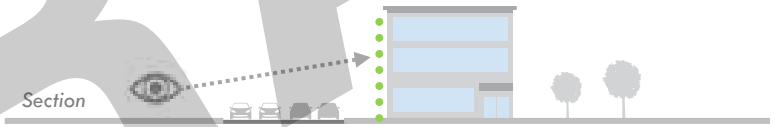
Substitute measure 2

Justifying the orientation of the lot by means of a topographic adaptation criterion, minimising earthworks outside the Area, will be a good basic practice.



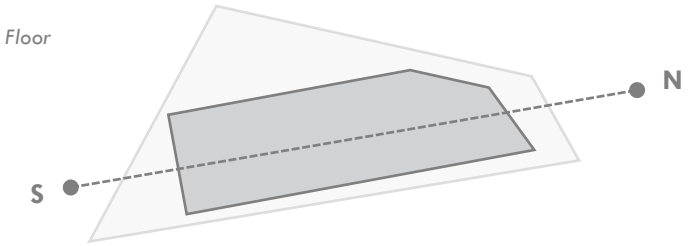
Substitute measure 3

Justifying the orientation of the lot by means of a criterion of visibility from a specific road or point of interest will be a good basic practice.



Substitute measure 4

Justifying the orientation of the building due to the longer side of the lot will be a basic good practice.



STAGE

Urban Planning	**Design**	Construction
Use and Maintenance		End of life

STRATEGIC COMMITMENTS

Commitment to the city	**Sustainability**
Airport identity	Innovation

OBJECTIVES

A. Use of natural light
B. Adaptation to existing natural features
C. Optimising energy savings through solar exposure according to orientation
D. Implementation with maximisation of building visibility

REGULATORY AND GOOD PRACTICE FRAMEWORK

Orientation of >75% of the built-up area within ± 15º of the east-west axis and the length of the east-west axis is 1.5 times longer than the north-south axis

LEED Neighborhood Development

Orientation of the lot with ± 15º of the east-west axis

Guide to Good Practice in Sustainable Urban Planning. Castilla La Mancha

Main façade with ± 18º south orientation

Guide to the Sustainable Construction of Industrial Buildings in the Basque Country

STAGE

Urban Planning	Design	**Construction**
Use and Maintenance	End of life	

STRATEGIC COMMITMENTS

Commitment to the city	**Sustainability**
Airport identity	Innovation

OBJECTIVES

A. Maximise the use of active measures to achieve indoor comfort conditions
B. Minimise the use of refrigerant emissions
C. Establish a methodology for verifying the commissioning of the building

REGULATORY AND GOOD PRACTICE FRAMEWORK

Install cooling systems with COP = Energy Efficiency Rate (EER) >3 (>4 optimum value)
Sustainable Building of Basque Country Offices

Use refrigerants with a Global Warming Potential (GWP) of <5
Sustainable Building in Basque Country Offices

Not use refrigerants using chlorofluorocarbons (CFCs), using refrigerants with a potential ozone depletion rate (ODP)
LEED BD+C

CO-C1 ENERGY

CO-C1.7 ACTIVE MEASURES (MINIMUM COP PERFORMANCE)

The implementation of high efficiency air-conditioning equipment will be encouraged, preferably in a centralised installation. The classification of air-conditioning equipment is based on the coefficient of energy efficiency (COP), with the values indicated as high efficiency being those above 3.5.

Substitute measure

In case of the existence of a district heating network, the building shall be connected to it, and the released areas can be used for other activities, as well as for the additional installation of rooftop solar photovoltaics to increase the level of self-consumption from renewable sources.

Quantitative indicator

Coefficient of energy efficiency (COP) of air-conditioning equipment.

Basic good practice:	≥ 3.5
Relevant good practice:	≥ 7.0
Excellence good practice:	≥ 9.9

CO-C1.8 ACTIVE MEASURES (ACS PRODUCTION)

The contribution to the energy demand for domestic hot water (DHW) with renewable and/or self-produced energies in the Area itself will be favoured. This criterion shall apply to activities included and not included in the CTE.

Quantitative indicator

Percentage of annual DHW energy demand covered by solar thermal energy in the Area.

	DHW demand in litres/day		
	≤ 5,000	≤ 6,000	>6,000
Relevant good practice	≥ 60%	≥ 65%	≥ 70%

Substitute measure 1

Solar thermal energy can be replaced by any other renewable energy produced in the Area.

Substitute measure 2

In the event that it is impossible to meet the minimum levels of annual energy demand for DHW, the contribution of residual energy from existing equipment in the building itself that can be used for this purpose may be added.

CO-C1.9 ACTIVE MEASURES (LOW-TEMPERATURE USE SYSTEMS)

Implement energy-saving air-conditioning systems that optimise the coverage of the thermal comfort demand inside the building.

For this purpose, the use of the following low-temperature systems is recommended wherever possible:

- Structural thermoactivation by thermal mass
- Geothermal energy for air-conditioned hall air conditioning
- Underfloor heating
- Miscellaneous

Quantitative indicator

Implementation of at least one recommended system.

Relevant good practice:	Compliant

CO-C1.10 GHG EMISSIONS

The transition to a low-emission model will be encouraged, minimising environmental and economic damage from excessive energy consumption.

Quantitative indicator

GWP indicator of the refrigerants used.

Basic good practice:	≤ 700	✓
Relevant good practice:	≤ 10	✓

	R717 (NH3)	R744 (CO_2)	R131a	R290	R170 Ethan	Methane (CH4)	Nitrous oxide (N2O)	HFCs	CFC	PFCs	SF6
GWP indicator	0	1	1.85	3	3	21	310	140-11,700	3,800-8,100	6,500-9,200	23,900
	Relevant good practice										
	Basic good practice										

CO-C1.11 COMMISSIONING VERIFICATION

The commissioning verification will be encouraged to ensure the correct functioning of all building elements.

Basic commissioning includes the following activities:

- Review owner's project requirements, basis of design
- Validate the inclusion of commissioning requirements in the construction documents.
- Develop construction checklists, the system test procedure and validate the execution of the test.
- Continuously record problems, findings and recommendations
- Produce a final report of the basic commissioning process.

Quantitative indicator

Type of implemented commissioning

Basic good practice:	Basic Commissioning	✓
Relevant good practice:	Advanced Commissioning	✓

Advanced commissioning includes the activities of basic commissioning and additionally includes the following activities:

- Verify systems manuals, operator and occupant training requirements, and seasonal testing
- Review building operations ten months after its completion
- Develop monitoring procedures for energy and water systems: measurement requirements, location, frequency and duration, limits of acceptable values
- Identify, predict, correct errors and operational deficiencies, and plan for repairs
- Quarterly analysis for at least the first year of occupancy
- Building envelope assessment

Substitute measure ✓

The list of basic and/or advanced commissioning activities may be modified by reference to a recognised standard and subject to approval by Aena.

STAGE

Urban Planning	Design	**Construction**
Use and Maintenance	End of life	

STRATEGIC COMMITMENTS

Commitment to the city	**Sustainability**
Airport identity	Innovation

OBJECTIVES

A. Create thermal comfort conditions in the building.
B. Use the advantages and possibilities offered by bioclimatic architecture and other passive measures as much as possible to achieve indoor comfort conditions
C. Ensure air renewal at the flow rate and frequency necessary to create a healthy and pleasant space
D. Facilitate air renewal through passive measures in the building

REGULATORY AND GOOD PRACTICE FRAMEWORK

Area thermostatic control on >70% of the working surfaces with 19-21 °C in winter and 22-26 °C in summer

GREEN Guide Equipment

Minimum indoor air renewal 8 L/s per person (12.5 L/s in offices)

RITE

Indoor air renewal of 3 L/s minimum per person.

Passivhaus

Minimum indoor air renewal of 1.5 L/s per square metre.

LEED BD+C

CO-C2 HEALTH AND COMFORT

CO-C2.1 INDOOR HYGROTHERMAL CONTROL

Area and centralised indoor temperature control with an optimal temperature range will be promoted. It is recommended that the relative humidity be limited to levels no higher than 70% and the temperature to a range between 21 °C and 24 °C, with the exception of logistics activities, which will have a range between 16 °C and 27 °C.

In office spaces, easy and accessible control by users shall be allowed in offices and meeting rooms, with the possibility of ± 2 °C adjustment of the existing temperature.

Qualitative indicator 1

Automated and area control with the described relative humidity and temperature values.

Relevant good practice:	Compliant	✓

Quantitative indicator 2

Offices and meeting rooms with individual thermostatic control with the possibility of ± 2 °C adjustment.

Basic good practice:	Compliant	✓

CO-C2.2 SUFFICIENT AND EFFICIENT AIR RENEWAL

Achieve a high mechanical ventilation flow rate, above standards, to ensure sufficient and healthy indoor air renewal.

Quantitative indicator 1

Indoor air renewal in litres per second per person.

Basic good practice:	≥ 15.0	✓
Relevant good practice:	≥ 17.5	✓
Excellence good practice:	≥ 20.0	✓

In addition, support compliance with minimum indoor air renovations using the following guidelines:

- Natural ventilation is compulsorily subject to outdoor air quality monitoring.
- Installation of units to control and monitor CO_2 concentrations to enable automatic corrective measures to be taken
- Openings in opposite façades open either directly to an outdoor space, or to a ventilated atrium/gallery, to allow for natural ventilation when required.
- Control and regulation system that enables "smart" ventilation, being able to combine and balance natural ventilation with forced ventilation.
- Sensors for detecting CO concentrations in parking lots.

Quantitative indicator 2

Number of guidelines implemented in addition to the mandatory guideline.

Basic good practice:	≥ 2	✓
Relevant good practice:	≥ 3	✓
Excellence good practice:	≥ 4	✓

CO-C2.3 NATURAL LIGHTING

Optimise natural light in the spaces that are usually occupied, with the appropriate design of the opening of hollows, prioritising natural lighting over artificial lighting, avoiding excessive heating of the interior space and glare from direct incidence due to an excessive entry of sunlight. For this reason, it is necessary to implement shading systems on the façade or roof that enable the solar intensity to be regulated.

A solar incidence analysis and Day Light Factor simulation will need to be carried out at the design stage, ensuring that interior spaces that are usually occupied or transited have daylighting levels between 300 and 3,000 lux, analysed for 09:00 and 15:00 at the spring and autumn equinoxes.

Quantitative indicator

Percentage of the surface area of the building's normally occupied spaces that receives natural lighting, according to the analysis carried out.

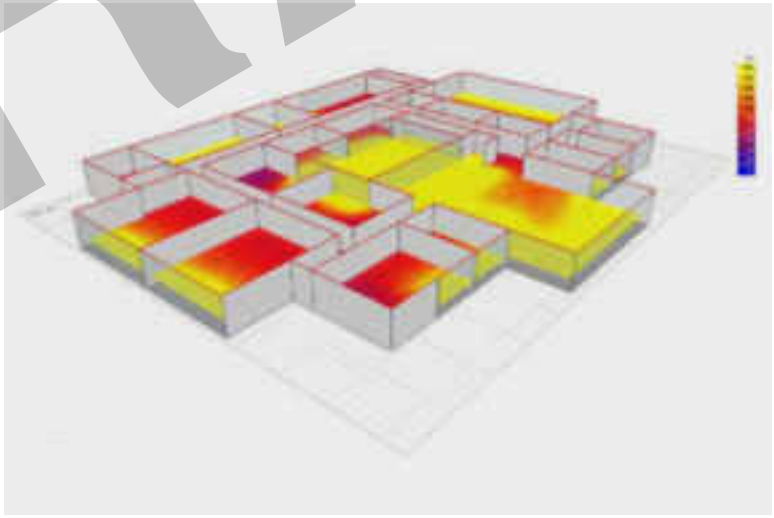
Offices	☀	Basic good practice:	≥ 40%
All	☀☀	Relevant good practice:	≥ 55%
All	☀☀☀	Excellence good practice:	≥ 75%

Qualitative indicator

Indoor lighting quality in relation to the outdoor lighting shall be justified based on project documentation prepared by means of a Day Light Factor simulation.

☀	Basic good practice:	Compliant

Natural lighting in meeting rooms at IDOM Madrid headquarters



Study of the entry of natural light for each of the façades of the new Red Eléctrica campus in Tres Cantos, Madrid. Project prepared by IDOM

STAGE

Urban Planning	Design	Construction
Use and Maintenance		End of life

STRATEGIC COMMITMENTS

Commitment to the city	Sustainability
Airport identity	Innovation

OBJECTIVES

A. Achieve favourable acoustic comfort conditions inside the building
B. Properly isolate buildings and/or outdoor spaces from noise sources that may disturb the activities to be carried out
C. Control noise levels generated by the buildings' own installations.

REGULATORY AND GOOD PRACTICE FRAMEWORK

Envelopes with acoustic insulation that is proportional to external noise.

BREEAM + DBHR

Envelope openings with minimum attenuations ≥10 dB (125 Hz), ≥17.5 dB (250 Hz), ≥25 dB (500 Hz).

CASBEE for Buildings (New Construction)

Noise immission <50 dbA in multiple offices, <40 dBA in individual offices and conference rooms and <35 dBA in bedrooms.

BREEAM Building Non-Residential (New Construct.)

Reverberation time <0.6s in closed indoor environments and <0.8s in open

LEED BD+C

CO-C2 HEALTH AND COMFORT

CO-C2.4 INTERIOR LIGHTING

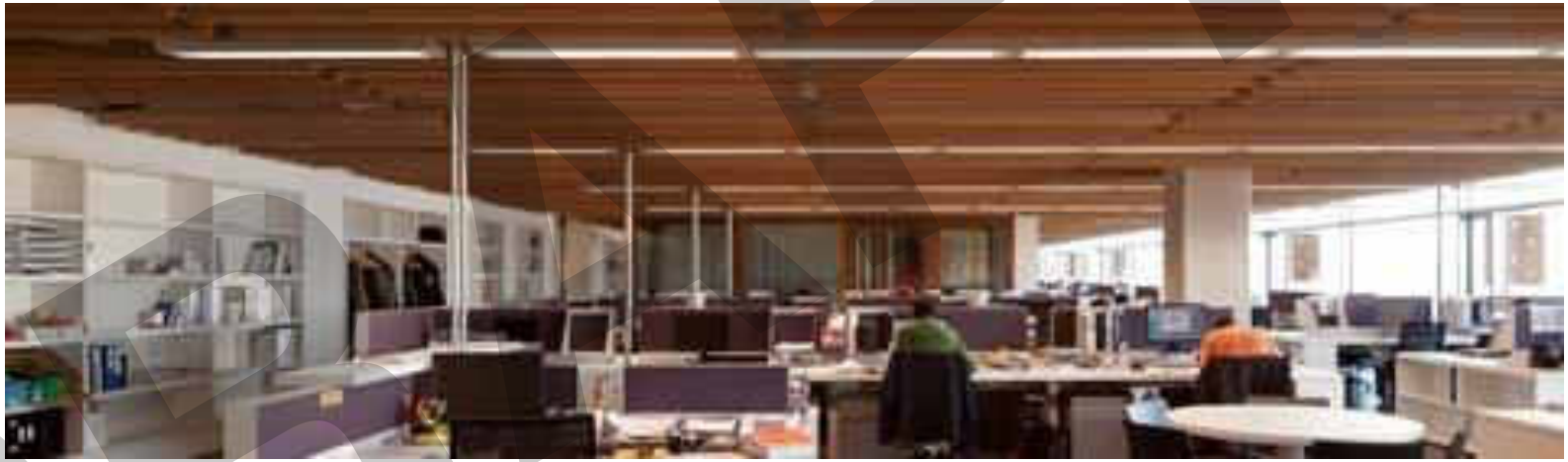
Adaptability of the intensity of the artificial lighting depending on the distance of the lighting from the façade, in order to achieve uniform lighting comfort over the entire interior surface of the building and to reduce energy consumption.

Quantitative indicator

Lighting intensity adapted to the distance to the façade in usually occupied spaces.

Logistics and offices	☼	Basic good practice:	Compliant ✓
Hotel and commercial	☼☼	Relevant good practice:	Compliant ✓

\+ Lighting intensity as a function of distance from the façade -



Adaptive artificial lighting in IDOM Madrid office

CO-C2.5 ENVELOPE PERMEABILITY TO EXTERNAL NOISE

The design of openings in the building envelope (windows, façade doors, etc.) as well as façades/roofing of sensitive enclosures shall be facilitated, with sound insulation proportional to the prevailing outdoor noise in the area (Equivalent Daytime Sound Levels - Ld).

Qualitative indicator

Minimal sound transmission losses in the envelope openings.

☼	Basic good practice:	D2mnTAtr (sensitive) ≥ Outdoor Noise (Ld) - 27 dBA D2mnTAtr (rest) ≥ Exterior Noise (Ld) - 32 dBA ✓
☼☼	Relevant good practice:	D2mnTAtr ≥ Exterior Noise (Ld) - 25 dBA D2mnTAtr (rest) ≥ Exterior Noise (Ld) - 30 dBA ✓

CO-C2.6 PROTECTION FROM NOISE GENERATED INDOORS

In office, commercial and hotel activity spaces, acoustic exposure from building installations in the sensitive spaces described above and/or comparable spaces shall be limited in accordance with the following target values.

Qualitative indicator 1

Project document justifying compliance with the limit values for noise from building installations in the sensitive areas typologies in the following table.

Basic good practice: Compliant

Typology of sensitive space	Noise level from installations
Commercial spaces, restaurants and sports areas	≤ 55 dBA
Open work areas, cafeterias and common areas	≤ 50 dBA
Individual offices, break rooms and meeting rooms	≤ 40 dBA
Teaching or seminar rooms, and hotel rooms	≤ 35 dBA

In areas of logistics activities, efforts shall be made to reduce the exposure of workers to noise and vibration generated by logistics activities as far as possible. To this end, compliance with the following guidelines is recommended:

- In the design, consider the correct separation of sensitive spaces (rest, work, office, etc.) from potentially noisy logistics areas.
- Incorporate acoustically absorbent materials inside potentially noisy logistic areas
- Design anti-vibration systems for machinery generating vibrations by rotation or impact.

Qualitative indicator 2

Compliance with the recommended guidelines in the above paragraph.

Relevant good practice: Complies with all

Evaluation of the acoustic impact generated by the ventilation of the facilities at the Lima Convention Centre. Project prepared by IDOM

CO-C2.7 INDOOR NOISE REVERBERATION TIME

The limitation of the reverberation time of the most acoustically sensitive indoor spaces shall be encouraged for sound frequencies of 500 Hz, 1,000 Hz and 2,000 Hz:

Enclosed indoor spaces are hotel rooms and executive and private offices, meeting/conference rooms in offices, among others.

Open-plan interiors are meeting and reception rooms in hotels and open-plan work areas without individual physical floor-to-ceiling partitioning in offices, or similar spaces.

Quantitative indicator

Maximum reverberation time of 0.6 seconds in enclosed spaces and 0.8 seconds in open spaces (without furniture).

Relevant good practice: Compliant

STAGE

Urban Planning	Design	Construction
Use and Maintenance	End of life	

STRATEGIC COMMITMENTS

Commitment to the city	Sustainability
Airport identity	Innovation

OBJECTIVES

A. Use views to achieve privacy or visibility conditions as appropriate
B. Maximise desired visibility and hide unwanted views
C. Use architecture as a way of branding

REGULATORY AND GOOD PRACTICE FRAMEWORK

Direct view to the outside in 75% of usually occupied spaces, with multiple lines of sight at least 90° apart and including at least two of the following: (1) flora, fauna or sky; (2) movement; and (3) objects at a distance greater than 7.5 metres.

LEED BC+D

60-80% of workspaces with visual access to the outside

GREEN Guide Equipment

CO-C2 HEALTH AND COMFORT

CO-C2.8 SPECIFICALLY FOR OFFICE SPACES: VIEWS

Improve the quality of indoor space by providing outdoor facing spaces, which improve employee productivity, reduce the associated visual hazards in IT environments and improve access to natural light and indoor quality of life.

Quantitative indicator

Percentage of spaces usually occupied with direct views to the outside. The most frequently occupied spaces in the building are those areas where at least one person is present for more than one hour per day or during the working day.

Relevant good practice:	≥ 75%

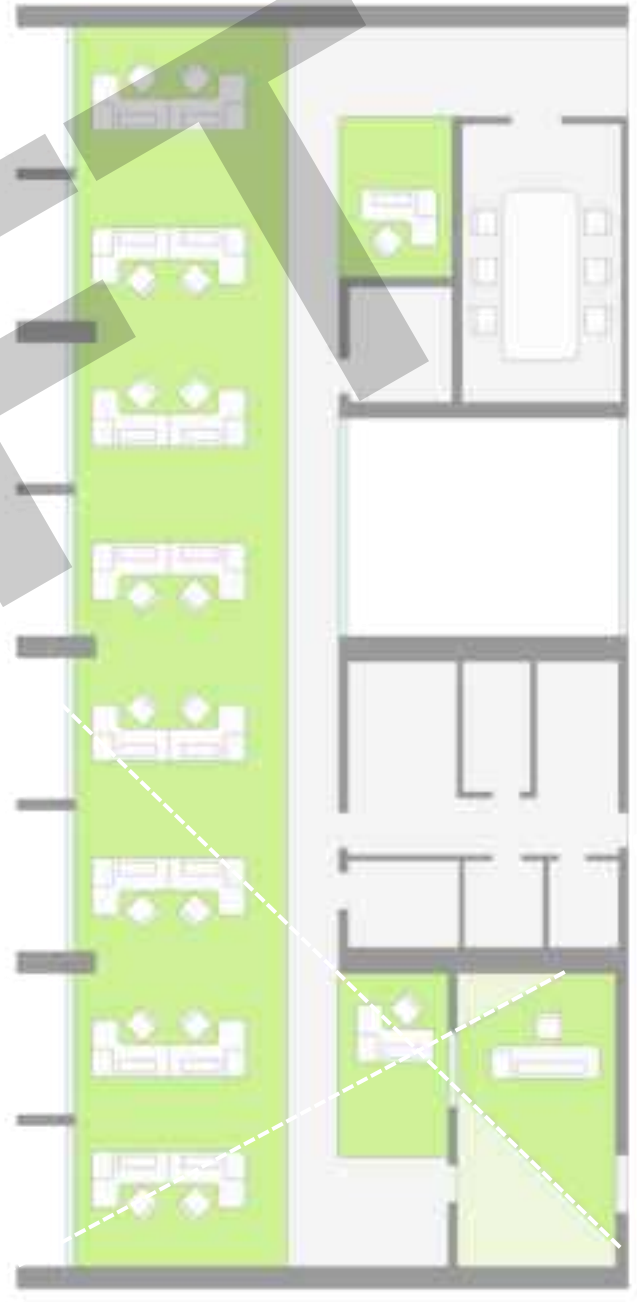
Qualitative indicator

Number of recommendations to be met in the same direct view for normally occupied spaces that have direct views to the outside.

Relevant good practice:	≥ 2
Excellence good practice:	4

Direct views may comply with the following recommendations:

- Multiple lines of sight from the same observation point, separated by at least 90°
- Views of flora, fauna or sky
- Views of areas with movement
- Views of areas with distant objects at a distance of more than 7.5 metres from the façade



Work areas with views to the outside
Work areas without views to the outside
Auxiliary areas without view requirements

Illustrative example of view analysis at work areas

CO-C3.1 WATER MANAGEMENT SEPARATION SYSTEM

Design the water network with a separate drainage system for rainwater and waste water on the lot, with pipes that connect independently to the municipal drainage network for all activities, both covered and not covered by the CTE.

Qualitative indicator

Implementation of a separate system for the evacuation of rainwater and waste water to the external network.

Basic good practice: Compliant

Quantitative indicator

Percentage of connections to the external network with smart water meters.

Basic good practice: 100%

CO-C3.2 RAINWATER RETENTION AND FILTERING SYSTEMS FOR REUSE

The collection of rainwater on the roof of the building and on the surface of the Area in storage tanks (cisterns) will be encouraged for subsequent reuse at water service points without potable demand. This water will be used primarily for non-potable water requirements in the building and the lot and secondly, the off-lot spaces.

The appropriate volume of such a deposit will take into account the amount of rainwater captured on the lot, the demand for non-potable water, the expected storage time for periods of low rainfall and other relevant aspects.

Qualitative indicator 1

Implementation of a cistern with the following required qualities:

- be watertight, lightweight, durable and made of opaque, non-reflective materials
- the entire sheet of water must be covered, to avoid attracting birds
- allow easy access for cleaning
- have a pre-treatment by means of a self-cleaning screen
- be visually integrated into the building

Basic good practice: Compliant

Qualitative indicator 2

Location of the cistern

Relevant good practice:
Minimisation of pumping requirements

Cisterns can be gravity-fed or pumped. Their location in the building where it has the greatest reduction of pumping requirement in the system is recommended.

Rainwater cistern in office building IDOM Madrid

STAGE

Urban Planning	Design	Construction
Use and Maintenance		End of life

STRATEGIC COMMITMENTS

Commitment to the city	Sustainability
Airport identity	Innovation

OBJECTIVES

A. Implement a separate rainwater and waste water management system
B. Minimise the risk of runoff water pollution
C. Optimise natural water resources
D. Collect and reuse rainwater as much as possible
E. Minimise the use of drinking water

REGULATORY AND GOOD PRACTICE FRAMEWORK

Have a separate network for rainwater and waste water. Incorporate a pollutant separation system (hydrocarbon separators, or others) in the collection of water in paved areas

GREEN Guide for Urban Developments in Industrial Estates

>80% rainwater harvesting. Use of waste water in most installations

CASBEE for Urban Development

Use of grey water and/or rainwater for 20-90% of non-potable water needs

GREEN Guide Equipment

STAGE

Urban Planning	Design	Construction
Use and Maintenance	End of life	

STRATEGIC COMMITMENTS

Commitment to the city	Sustainability
Airport identity	Innovation

OBJECTIVES

A. Collect and reuse rainwater as much as possible
B. Establish mechanisms to regulate the water balance (demand and locally harvested water resources)
C. Use filtered water for non-potable water uses

REGULATORY AND GOOD PRACTICE FRAMEWORK

The flushing flow rate of sanitary appliances: (1) taps in washbasins, kitchens and showers with ≤6 L/min, (2) toilets, washbasins and cisterns with ≤6 litres per total flush and ≤3.5 L per average flush and (3) urinals with ≤ 2 litres/cup/hour and with ≤ 1 litre per flush

European Commission - Green Taxonomy

Use of grey water and/or rainwater for irrigation, with programmed system and humidity sensors.

Sustainable Building of Basque Country Offices

Retention of 25% of annual waste water for reuse.

LEED Neighborhood Development

CO-C3 WATER

CO-C3.3 WATER SELF-SUFFICIENCY

Increase water self-sufficiency by reducing dependence on the town's water supply network, prioritising the use of rainwater and grey water for non-potable water demand.

Quantitative indicator

Percentage of non-potable water demand within the lot (building and vacant areas) covered by rainwater and/or grey water.

Basic good practice:	100%

Substitute measure

In the event that rainwater or grey water is not available due to functional requirements of the building or due to low uptake, the demand for non-potable water shall be covered by the flow rate supplied by the reclaimed water network as much as possible.

CO-C3.4 REDUCTION OF WATER DEMAND

The design of water service points with energy-efficient systems will be encouraged.

Qualitative indicator

Reduction of baseline water consumption at service points, in litres per use or litres per minute, according to type.

Basic good practice:	Complies with the baseline
Relevant good practice:	≥ 20%
Excellence good practice:	≥ 30%

Substitute measure

The installation of dual push-button flush valves and infrared sensor taps in public and/or private washbasins allows for relevant good practice in the category of public and/or private fittings, as appropriate.

Complementary measure 1

The installation of taps with aerators, pressure reducers or flow restrictors, if not used for the compliance with basic good practice, raises the level of good practice in public and/or private fittings by one level.

Complementary measure 2

The installation of thermostatic shower fittings takes good practice to a new level for showers.

	Toilet *	Urinal *	Public taps **	Private taps **	Shower **
Baseline	6.0	4.0	4.5	5.7	9.5

* Units in litres per use.
** Units in litres per minute

Public taps are those that can be used by the non-regular user of the building, e.g. in public toilets. Private taps are those that can only be used by the regular user of the building, e.g. cooks with fittings in kitchens.

CO-C3.5 POTENTIAL USES OF WATER REUSE

Storm water, grey water and/or reclaimed water may be used for at least the following uses within the lot:

- Sanitary use, e.g. for flushing water in toilets
- Cleaning of communal areas of the building by washing down
- Irrigation of green areas in the Area
- Vehicle cleaning
- Cleaning and sweeping of pavements and roads

The reuse of rainwater collected and stored in cisterns or tanks for irrigation purposes will require authorisation by the competent environmental body, although no prior treatment will be required, as long as it is not used for sprinkler irrigation.

Qualitative indicator

Uses of rainwater, grey water and/or reclaimed water.

Basic good practice:
- Sanitary use
- Irrigation of green areas
- Cleaning of roads
- Vehicle cleaning

CO-C3.6 QUALITY OF THE SERVICE

Provide adequate water pressure at service points, using efficient pumps. Correct pressure prevents continuous and indiscriminate water consumption, which reduces the effectiveness of automatic tap opening and closing systems.

Quantitative indicator

Pressure range at water service points.

Relevant good practice: ≥ 1,5 bar and ≤ 3 bar

STAGE

Urban Planning	Design	Construction
Use and Maintenance		End of life

STRATEGIC COMMITMENTS

Commitment to the city	Sustainability
Airport identity	Innovation

OBJECTIVES

A. Collect and reuse rainwater as much as possible
B. Implement a separate rainwater and waste water management system
C. Minimise the risk of runoff water pollution
D. Ensure an optimal operational level at water service points
E. Avoid water pollution
F. Minimise the occurrence of leaks in the network

REGULATORY AND GOOD PRACTICE FRAMEWORK

Cover 20-90% of non-potable water needs with rainwater and grey water

GREEN Guide Equipment

Water operating pressure between 1 and 5 bar.

CTE DB-HS Health

Operating water pressure between 1.5 and 3 bar.

Sustainable Building of Basque Country Offices

Use of oil separators in: (1) car parks >800 m² or >50 parking spaces, (2) manoeuvring and maintenance areas, (3) roads, (4) industrial areas, (5) refuelling facilities and (6) other areas at risk of contamination

BREEAM EN Urban Planning

CO-C3.7 OIL AND/OR HYDROCARBON SEPARATOR SYSTEMS

The installation of oil, hydrocarbon or equivalent separators in critical areas shall be encouraged. Such separators shall be designed into drainage systems whenever there is a high risk of contamination or discharge of such substances. These assumptions include the following critical areas within the Area:

- For connection to Aena's own networks, oil separators, hydrocarbon separators or any other type of element that allows compliance with the requirements determined by Aena at that time shall be installed. For connection to the town networks of Madrid and Alcobendas, the minimum requirements established by each of the towns in question shall be complied with. In any case, the developer shall be responsible for compliance with these requirements and for the execution of the necessary installations.
- roads, manoeuvring and maintenance areas
- refuelling facilities
- logistic - industrial areas with oil stocks
- Commercial or industrial kitchens, if any.

In addition, the parameters of discharge into the sewage network and its water quality will be monitored by an authorised company. The control and analysis of the water discharged from the buildings will be carried out on an annual basis, the limit values being those stipulated by the applicable regulations at the time.

Minimising the length and steepness of the slopes of the critical area soils is recommended.

Quantitative indicator

Installation of oil and/or hydrocarbon separators in critical areas.

Basic good practice:	Compliant	✓

Substitute measure ✓

Implement sedimentation basins to prevent the displacement of sediments out of the Area, especially during the construction phase.

CO-C3.8 LEAK DETECTION

Early detection of leaks in the water network shall be facilitated and it is recommended that leak detection systems are connected to network shut-off actuators.

The following leak detection systems may be chosen for, illustrative purposes:

- Flood detection systems in wet areas of the building, e.g. flood sensors
- Network leakage detection devices
- Presence detectors in toilets, urinals and washbasins

Quantitative indicator

Number of leak detection systems implemented.

Basic good practice:	≥ 1	✓
Relevant good practice:	≥ 2	✓

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CONTENTS

The smart mobility criteria set out good practices to enable a shift in modal split towards reducing demand for individual private transport and promoting innovative transport measures that enable collaborative mobility.

STAGE

Urban Planning	Design	Construction
Use and Maintenance	End of life	

STRATEGIC COMMITMENTS

Commitment to the city	Sustainability
Airport identity	Innovation

OBJECTIVES

A. Promoting sustainable mobility and intermodality
B. Reducing demand for individual private transport
C. Encouraging collaborative means of transport

REGULATORY AND GOOD PRACTICE FRAMEWORK

2% reserve for carpooling, 2% for carsharing and 2% for electric vehicles

GREEN Guide Estate

Parking reserved for shared vehicles equal to 10% of the parking spaces

LEED Neighborhood Development

Shared vehicles: 1/100 employees (and provide vehicle).

LEED Neighborhood Development

Transit service with 45 trips per day on weekdays and 30 trips per day on weekends.

LEED Neighborhood Development

Minimum frequency every 15 minutes within 300 m of the building entrance (minimum 30 min and 500 m)

Sustainable Building and Offices of the Basque Country

IN-A1 COLLABORATIVE MOBILITY

IN-A1.1 COLLABORATIVE MOBILITY

The use of a carpooling system (a collaborative system of sharing one's own car with other people making a similar trip) will be encouraged in the Area to reduce the individual use of private vehicles, maximising the number of occupants per vehicle and therefore reducing the overall CO_2 emissions of the transport sector and the saturation of roads, among other numerous advantages.

Quantitative indicator 1

Measures implemented in the Area in favour of a carpooling system to encourage private car sharing.
Compliance with good practices shall be cumulative (e.g. for compliance with the excellence good practice it is necessary to comply with the basic good practice).

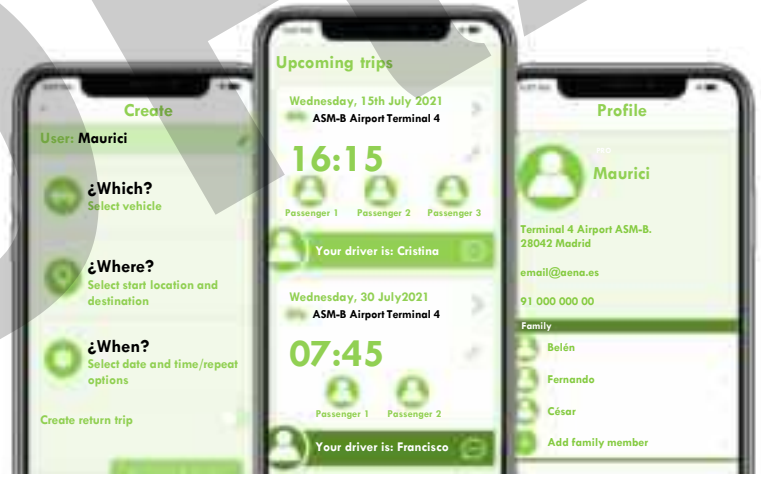
Basic good practice: *(comply with both points)*	• Reservation of one carpooling vehicle space for every 100 employees • A specific website/app is available to organise carpooling	✓
Excellence good practice:	The company provides one zero-emission vehicle for every 100 employees	✓

These reserved spaces for carpooling vehicles will be used exclusively by employees or carpoolers, either in their own vehicle or in a vehicle provided by the company.

Quantitative indicator 2

Distance of the carpooling spaces from the entrance of the building.

Relevant good practice:	≤ 60 m	✓



Illustrative example of a mobile app to organise Carsharing

Complementary measure of the quantitative indicator 1 ✓

The basic good practice will be upgraded to relevant good practice in the case of integration of the carpooling system within a superior MaaS (Mobility As A Service) platform, where the shuttle service, access to the public transport area, etc. is also managed.

Substitute measure for quantitative indicator 1 ✓

The excellence good practice may be met in the case of companies specialised in carsharing providing and guaranteeing the availability of one zero-emission vehicle for every 100 employees during peak hours of the working day, whereby dedicated parking spaces shall be reserved for such vehicles.

IN-A2.1 SHUTTLE SERVICE

Facilitating the mass transport of employees from the workplace to the main urban and intermodal transport nodes is requested.

- Internal shuttles connecting the Airport City ASM-B development with the intermodal transport nodes of the Airport terminals (T123 and T4).
- Shuttles connecting the Area with the main intermodal transport hubs in Madrid or other nearby urban centres.

90% of trips should be concentrated in the morning and evening peak hours (07:30-09:30 and 17:00-19:00)

Quantitative indicator 1

Measures implemented at the level of the shuttle service for employees in the Area itself.
Compliance with good practices shall be cumulative (e.g. for compliance with the relevant good practice it is necessary to comply with the basic good practice).

Logistics	☀	Basic good practice:	Shuttle service for ≥30% of employees connecting the main transport hubs from the terminals with Areas
Offices, commercial and hotels	☀	Basic good practice:	Shuttle service for ≥15% of employees connecting the main transport hubs from the terminals with Areas
All	☀☀	Relevant good practice:	Shuttle service for employee demand identified according to modal split, connecting the city's main transport hubs to the Areas

Substitute measure 1 for quantitative indicator 1

If there is a public bus, metro or shuttle service provided by Aena or another entity that meets the basic good practice requirements of all the indicators of this criterion (service capacity, frequency, connections, distance to nearest stop, etc.), it will not be necessary to implement a shuttle service in the Area.

Substitute measure 2 for quantitative indicator 1

The requirements for each level of performance will be subject to the implementation of the service and real-time study of demand. Where appropriate, the % of employees for whom the shuttle service is offered may be modified upon justification.

Substitute measure 3 for quantitative indicator 1

The basic good practice will be upgraded to a relevant good practice if an allowance is offered to each employee to cover the costs associated with monthly public transport to their usual place of residence.

A balanced distribution of shuttle stops in the Area will be favoured following the relevant guidelines for accessibility from the building to the nearest stops.

Quantitative indicator 2

Pedestrian distance from the main entrance of the building to the nearest shuttle stop in the Area.

☀	Basic good practice:	≤ 800 metres
☀☀	Relevant good practice:	≤ 400 metres

Quantitative indicator 3

Implementation of a passenger information system (PIS) with the possibility of booking/paying for tickets and the visualisation of at least the frequencies, actual status and location of the shuttle vehicles.

☀	Relevant good practice:	Through a website or mobile APP
☀☀	Excellence good practice:	On billboards at bus stops

CONTENTS

A smart building provides values such as greater energy efficiency, increased security, better connectivity, as well as increased user comfort.

The design criteria in this regard are oriented towards building management systems; digital twin; sensorisation and promotion and smart buildings.

STAGE

Urban Planning	**Design**	Construction
Use and Maintenance		End of life

STRATEGIC COMMITMENTS

Commitment to the city	**Sustainability**
Airport identity	**Innovation**

OBJECTIVES

A. Implement a comprehensive building management system
B. Make us of available technological resources
C. Improve design, analysis and operational forecasting processes with the use of the digital twin
D. Implementation of digital elements: Smart meters, sensors and actuators, function optimisation, warning service, etc.

REGULATORY AND GOOD PRACTICE FRAMEWORK

Implementing a basic, higher or additional scope management system

GREEN GUIDE Equipment

Implement advanced energy meters.

LEED BD+C

Use programmable thermostats for the air-conditioning system.

Sustainable Office Buildings in the Basque Country

National Plan for Smart Territories of the Ministry of Energy, Tourism and the Digital Agenda

RED.ES

Smart cities: Smart station and connection to the smart platform

UNE 178109:2017 and UNE 178108:2018

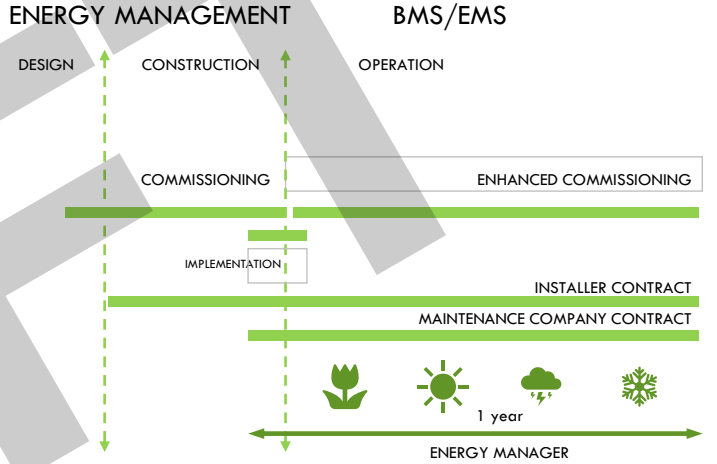
IN-B1 BUILDING MANAGEMENT SYSTEM

IN-B1.1 BUILDING MANAGEMENT SYSTEM

Building Management Systems (BMS) consist of integrated networks of data and control systems to achieve monitoring, automation and control of the different networks of building installations, and a workstation or cloud application can be used for control and bidirectional communication. They can have a basic scope, a superior scope and/or an additional scope.

Integrated building management is to provide, right from the initial contracts, continuity throughout the process:

- The involvement of an independent agent, an energy manager, is recommended from the design phase into the subsequent construction and operation phases.
- It is also recommended that the commissioning phase be extended (Enhance commissioning) for at least one year after the commissioning of the building.
- During the first year of operation, the installer shall be contractually bound to the building and shall coordinate with the maintenance company for adjustment and servicing operations.
- Finally, the maintenance company shall be contracted and appear before the commissioning operations, at the end of the construction phase.



Schematic diagram of the building management system

The BASIC Outreach Management System includes monitoring, automation, zoning and control of the following:

- Final energy consumption (thermal and electrical) separating the processes of (1a) heating, (1b) DHW, (1c) cooling, (1d) ventilation, (1e) lighting, (1f) other consumptions higher than 1,000 w/h and/or 5,000 w/day and (1g) other consumptions.
- Water consumption by separating the processes of (2a) landscaping, (2b) specific uses and (2c) leakage control
- Indoor environmental quality (only in areas of primary occupancy) considering (3a) temperature, (3b) humidity and (3c) CO_2 level

The RELEVANT Outreach Management System includes monitoring, automation, zoning and control of the following:

- Monitoring of the outdoor temperature and CO_2 level and issuing warnings to make use of natural ventilation
- Warning of open windows while air-conditioning processes are running
- Daylighting level and automatic warning or switching on of artificial ambient lighting
- Concentration level of other pollutants such as VOCs or NOx

Qualitative indicator

Implemented management system.

Basic good practice:	Basic scope	✓
Relevant good practice:	Relevant scope	✓

Substitute measure

Implementation of a building management system maintained by third party companies, with proprietary hardware and software, which monitors, automates and controls the basic scope management system sections.

IN-B2.1 GEMELO DIGITAL

Production of AS BUILT plans in digital format to optimise the predictive maintenance of both the building and the open spaces.

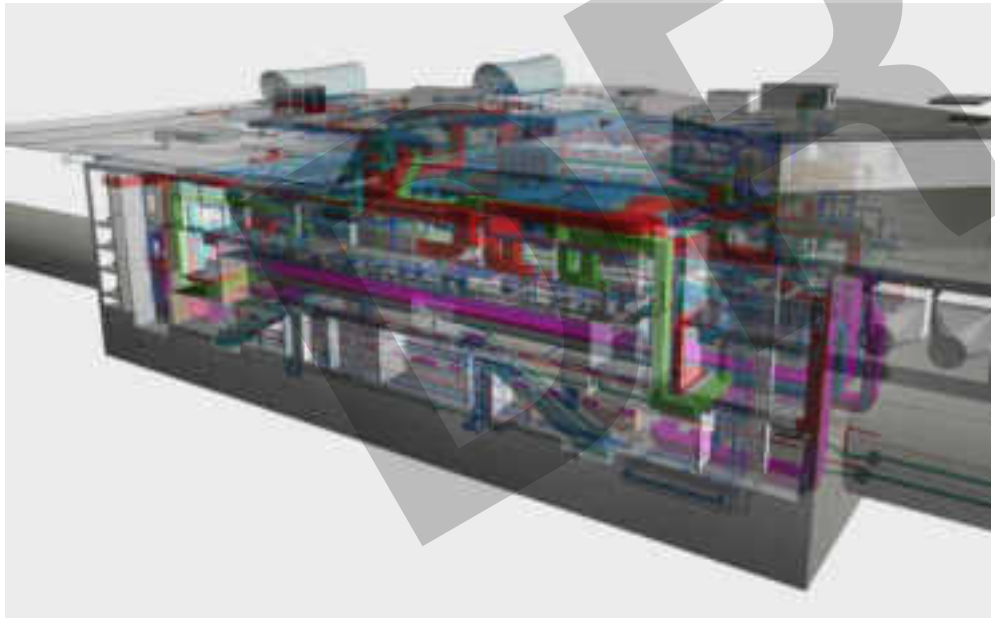
The use of a BIM methodology will help to streamline the design and construction processes and, in turn, improve the quality of the built asset and reduce the overall cost of the project.

In the event that Aena does not have a platform and a specific protocol for the preparation of digital plans using BIM technology at the time of development, for the project, work, detection and maintenance stages, the following guidelines should be complied with by default:

- use BIM software packages, in a collaborative data environment.
- georeferenced documentation in Geographic Information Systems (GIS) compatible formats.
- use open data models, as far as possible, following Aena standards:
    - Methodology, Organisation and Exploration (M.O.E.) standard of the DIACAE information system used by Aena for CAD documents, or any other system in force by Aena at the time of its development.
    - Industry Foundation Classes (IFC) standard for BIM documents, or similar institution, to be defined by Aena, if it does not have its own protocols.

In addition, the BIM methodology shall comply with the guidelines on *"Organisation and digitisation of information in building and civil engineering works using BIM"* and *"Information management when using BIM"*, contained in UNE-EN ISO 19650 Parts 1 and 2.

It will be the responsibility of the building users (Facility Manager or person designated by the developer) to create, share and keep these files and data updated with the responsible departments of Aena.



Illustrative image of a digital BIM model of a station on line 3 of the Riyadh Metro.
Project prepared by IDOM

Quantitative indicator

Development of digital twins, in accordance with Aena protocols.

Basic good practice:	Compliant	✓
Relevant good practice:	Digital twin with real time information via installed sensor system	✓

IN-B3 SENSORING

IN-B3.1 COMMUNICATION OF SENSORISATION ELEMENTS

If available at the time of development, the 5G network of Adolfo Suárez Madrid-Barajas Airport will be made available for development. This will facilitate its use for all telecommunications-demanding applications. In addition, any initiative aimed at 5G coverage will require prior consultation and approval by Aena.

Regarding Airport City Adolfo Suárez Madrid-Barajas, the Area, lots and buildings, the 5G technology provided by the Airport (Aena) will be used for sensor communications.

Quantitative indicator

Use of 5G technology provided for the communications of sensorised elements.

Relevant good practice: Compliant

Substitute measure

Any technology that outperforms 5G technology and is provided at the Airport (Aena) will be used, subject to Aena's approval.

IN-B4 PROMOTION OF SMART BUILDINGS

IN-B4.1 PROMOTION OF SMART BUILDINGS

The implementation of innovative smart buildings will be promoted, following the basic guidelines of the following non-exhaustive list:

- Interoperability between the IoT nodes of buildings with Aena's Smart platform, if it exists.
- Additionally, they need to be interoperable through the UNE 178108:2017 standard (Smart Cities. Requirements for smart buildings for consideration as an IoT node) or the regulation in force.
- Implementation of monitoring infrastructure.
- Establishment of a communication system with the monitoring infrastructure.
- Use of applications, data and communication protocols in standard and open formats, such as the MQTT protocol.
- Implementation of two-way communication tools with users, based on a digital strategy.
- Ongoing training of staff responsible for the management and maintenance of buildings and open spaces.
- Development of a public communication and transparency strategy with the town open data portal.
- Monitoring, evaluation, impact measurement analysis and/or auditing of systems.

Quantitative indicator

Implementation of the basic guidelines.

Basic good practice: Compliant

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The data and monitoring criteria are oriented towards urban control, automation and monitoring infrastructure with the objective of ensuring ongoing performance analysis and establishing value-added indicators for process improvement.

STAGE

Urban Planning	**Design**	Construction
Use and Maintenance		End of life

STRATEGIC COMMITMENTS

Commitment to the city	**Sustainability**
Airport identity	**Innovation**

OBJECTIVES

A. Implementation of digital elements: Smart meters, sensors and actuators, function optimisation, warning service, etc.
B. Ongoing performance analysis
C. Establish value-added indicators for process improvement

REGULATORY AND GOOD PRACTICE FRAMEWORK

Smart Cities Indicators - Sustainable Cities and Communities

ISO 37122-2019

Smart Cities. Requirements for smart buildings to be considered as an IoT node according to the UNE 178104 Standard

UNE 178108:2017

Smart City Management Systems and Scorecard Indicators

UNE 178201-2:2016

Smart Community Infrastructures: principles and requirements for performance metrics

ISO 37151:2015

IN-C1 URBAN CONTROL, AUTOMATION AND MONITORING INFRASTRUCTURE

IN-C1.1 URBAN CONTROL, AUTOMATION AND MONITORING INFRASTRUCTURE

The optimisation of the control, automation and monitoring of the urban elements and systems of the Area will be promoted through the guidelines recommended in the following non-exhaustive list of indicators.

INDICATOR		UNITS
	HEALTH AND COMFORT	
Basic	• People counting in open spaces	No. Persons/m²
Relevant	• Telematic booking of public use services	No. Persons/use
Basic	• Monitor outdoor air quality and display it on digital panels in open spaces	µg/m³
Basic	• Monitor environmental noise	dB
Excellent	• Quantify GHG emissions during the construction phase (e.g. with portable stations)	ton CO_2 eq
	ENERGY AND POLLUTION	
Basic	• Monitoring of electrical and thermal energy, both consumed and self-produced	kWh/m²a
Relevant	• Advanced energy meters: recording consumption and demand of public infrastructure	kWh/m²a
Basic	• Automation of the switching on/off of lighting according to time of day and presence	Time and person
	WATER	
Basic	• Monitoring of the supply system, sanitation, irrigation of green areas and grey, waste and rainwater reuse system and estimation of losses in the water networks	m³ day
	MATERIALS AND WASTE	
Excellent	• Consumption of building materials and generation of demolition waste over the lifetime of the development	kg/m² year
Basic	• Sensorisation of town waste collection and smart collection route management based on container capacity	% full
	• Number of products with Environmental Product Declaration	
Excellent	• Tax on works for the conservation and renovation of roads, open spaces, etc.	Units
Excellent		m²/m²
	MOBILITY	
Basic	• Smart mobility management with input/output sensorisation at Area level	No. of vehicles
Relevant	• Visualisation of traffic conditions, road saturation and possible traffic diversions to avoid affecting the mobility of airport terminals (Airport City Adolfo Suárez Madrid-Barajas criteria)	No. of vehicles
Basic	• Soft mobility sensorisation (parking and soft modes of transport)	Units
Basic	• Information on public transport services on panels in open spaces	Frequency (min)
Basic	• Reservation of places and counting of people on shuttles	No. of persons
Relevant	• Proximity detection at intersections with traffic light priority for preferential vehicles	Vehicle
Basic	• Sensorisation of parking occupancy and electric vehicle recharging stations on roads	No. of places

Qualitative indicator

Type of guidelines implemented in the urban space.

☀	Basic good practice:	Basics ✓
☀☀	Relevant good practice:	Basic and relevant ✓
☀☀☀	Excellence good practice:	Basic, relevant and excellence ✓

Substitute measure ✓

Any indicator on the previous non-exhaustive list may be replaced by another indicator that is not on the list, provided that it is included in a regulated UNE, ISO or similar standard and there is prior acceptance by Aena.

IN-C2.1 BUILDING CONTROL, AUTOMATION AND MONITORING INFRASTRUCTURE

Optimisation of the building's automatic systems and control of occupant interactions with the systems themselves will be encouraged through the following recommended guidelines:

	INDICATOR	UNITS
	ARCHITECTURAL EXPERIENCE	
Basic	• Access and exit control by biometrics or other systems	No. of persons
Relevant	• Occupancy detection and automatic opening/closing of passage elements, such as doors, lifts, etc.	No. of persons
Relevant	• Real-time monitoring of the availability of dynamically occupied positions without personal assignment (office hotspots) and display of the information on digital information boards close to the communication areas.	No. of vacant positions
	HEALTH AND COMFORT	
Relevant	• Programmable thermostats in the office areas and meeting rooms for the air-conditioning system with ± 2 °C regulation.	°C
Basic	• Indoor and outdoor air quality meters	µg/m³
	ENERGY AND POLLUTION	
Basic	• Energy demand and primary energy consumption meters and historical data storage, remotely accessible.	kWh/m²a
Basic	• Monitoring of self-produced energy on the rooftop	kWh/m²a
Basic	• Automatic on/off system for lighting according to presence in areas that are not usually occupied, such as toilets or corridors, among others.	
Basic	• System for automatic switching on/off of lighting in working areas at the beginning and end of working hours, which can be reset by push button + timer	
	WATER	
Basic	• Water meters in the irrigation system, indoor supply, DHW supply and water reuse system	m³ day
	MATERIALS AND WASTE	
Relevant	• Consumption of building materials and generation of demolition waste over the lifetime of the building	kg/m² year
Relevant	• Waste generation	kg/occupant per day
Relevant	• Sensorisation of and automation of the request for replacement of building maintenance elements	Units
Relevant	• Number of products with Environmental Product Declaration	Units
Relevant	• Renovation and refurbishment rate in the useful life of the building	m²/m²
	MOBILITY	
Basic	• In-lot and underground parking occupancy sensors	No. of places
Basic	• Reservation of places for electric and shared vehicles	No. of places

Quantitative indicator

Type of guidelines implemented in the building and lot.

☀	Basic good practice:	Basics ✓
☀☀	Relevant good practice:	Basic and 4 relevant ✓
☀☀☀	Excellence good practice:	Basic and 8 relevant (all) ✓

Substitute measure ✓

Any indicator on the previous non-exhaustive list may be replaced by another indicator that is not on the list, provided that it is included in a regulated UNE, ISO or similar standard and there is prior acceptance by Aena.

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