



Riga Airport Master Plan 2025-2050

Final Report after Public Hearing 2025

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LIST OF ABBREVIATIONS

AEDT	Aviation Environmental Design Tool
APU	Auxiliary Power Unit
ATCO	Air Traffic Control Officer
ATM	Air Traffic Movement
CNS	Communications, Navigations and Surveillance
CWY	Clearway
DDFS	Design Day Flight Schedule
DME	Distance Measure Equipment
DVOR	Doppler VOR
EASA	European Union Aviation Safety Agency
F&B	Food&Beverage
FBO	Fixed based Operator
GA	General Aviation
GHG	Green House Gases
GPU	Ground Power Unit
GSE	Ground Support Equipment
ICAO	International Civil Aviation Organization
LTO	Landing and Take-off cycle
MARS	Multiple Aircraft Ramp System

MAP	Million Annual Passengers
MRO	Maintenance, Repair and Overhaul
OES	Obstacle Evaluation Surfaces
OFS	Obstacle Free Surfaces
OLS	Obstacle Limitation Surfaces
PRM	Persons with Reduced Mobility
REPEX	Replacement Expenditure
RET	Rapid Exit Taxiway
ROT	Runway Occupancy Time
RWY	Runway
SAF	Sustainable Aviation Fuel
SID	Standard Instrumental Departure
SNM	Strategic Noise Map
STAR	Standard Terminal Arrival Route
THR	Threshold
TODA	Take-off Distance Available
TWY	Taxiway
TXL	Taxilane
VOR	Very high frequency Omnidirectional Range

1. INTRODUCTION

Riga Airport aims to present a comprehensive Master Plan to the aviation community and all relevant stakeholders. This plan is intended to serve as a platform for dialogue and foster the harmonious coexistence between the airport and its surrounding areas.

The Master Plan outlines a strategic development framework for Riga Airport over the next 25 years, through to 2050. It serves as a guiding document across a wide range of activities, including expansion and modernization of airport infrastructure, land acquisition and land use planning, development of landside access and phased implementation of investment programs.

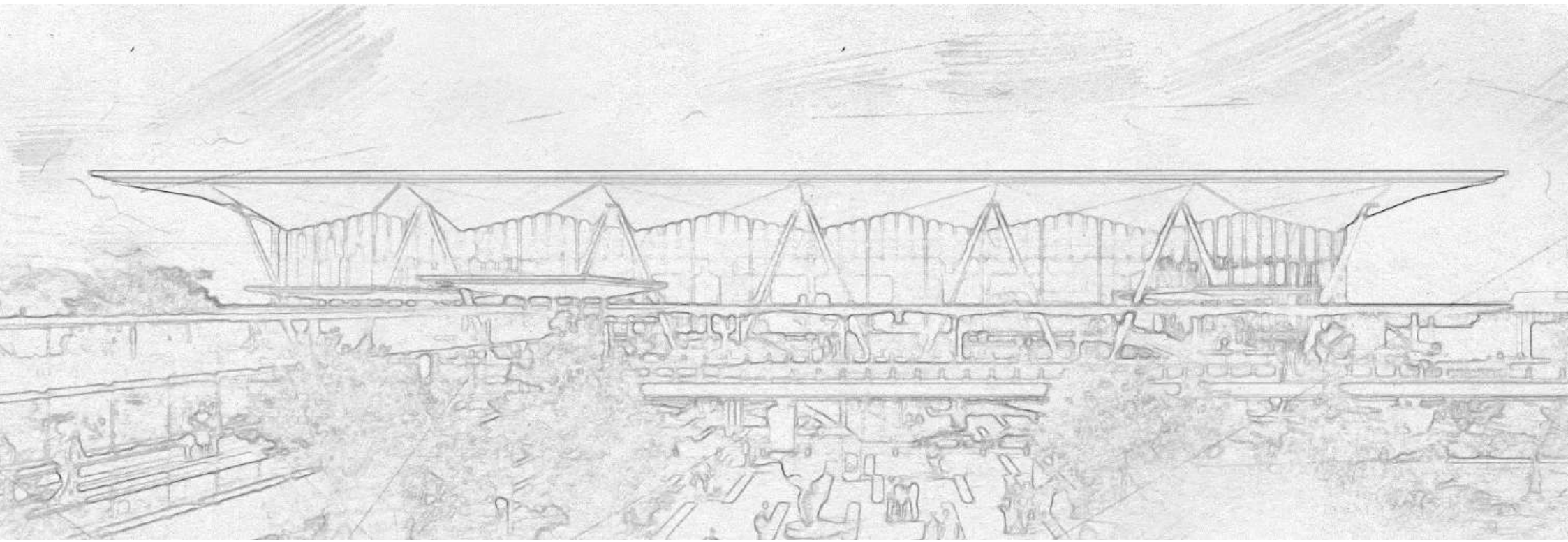
Airport (Master) Plan definition¹:

“An airport master plan presents the planner’s conception of the ultimate development of a specific airport”

“In the context of this definition, the term “development” is taken to mean inclusion of the entire area of the airport - both aviation and non-aviation uses. It also includes suggested land use on land adjacent to the airport”

This definition highlights two key roles for an airport master plan: a strictly technical role (airport planner’s conception) and a “social” role dealing with the impacts of airport operation and development on the surrounding environment and communities. The Master Plan must be subject to Strategic Environmental Assessment, to evaluate environmental impact of proposed developments and identify appropriate mitigation measures.

¹ Source: ICAO’s “Airport Planning Manual” (Doc. 9184-AN/902) Part 1 “Master Planning”, Section One, article “Definition and planning considerations”



Starting Point

This Airport Master Plan was developed during 2024 and 2025 and outlines a development program for Riga Airport for the next 25 years, up to 2050. The starting point for this long-term development program is the current state of the airport's infrastructure and facilities as of 2025, but also including all ongoing and already committed projects at various stages of completion. The following image summarizes recent, ongoing, and planned developments at Riga Airport, reflecting the expected situation upon completion of committed projects. This includes the construction of new access roads, parking areas, a new terminal building, new hangars, and the ongoing development of the Rail Baltica railway connection and train station at Riga Airport.

The Master Plan outlines the airport's development strategy, which is based not on fixed calendar years but on levels of demand and operational growth. The Plan distinguishes between two phases:

- Medium term: Includes projects and solutions required to accommodate forecasted demand in the coming years (approximately until 2030).
- Long term: Encompasses development initiatives to be implemented once the next level of demand is reached, involving significant infrastructure expansion and capacity increases (approximately 2040–2050).

These timeframes are indicative, as the actual transition between the medium and long term will depend on the real growth in flight operations and passenger volumes, rather than on specific calendar years.

Subsequently, this Master Plan will propose airport development projects up to 2050, defining the anticipated future layout of the airport in response to projected demand. All proposed projects intended to accommodate demand growth up to 2050 will be subject to a Strategic Environmental Assessment, including public consultation.



2. DIAGNOSIS AND FUTURE NEEDS

2.1. Diagnosis of current situation

In summary, the analysis of the regional air transport market in Latvia and the broader Baltic area, the current state of airport facilities, the already committed projects, and the regulatory framework under which Riga Airport operates, lead to a number of key conclusions to be carefully considered throughout this Master Plan 2025–2050.

These conclusions are summarized below and further addressed in the following chapters of this document:

- **Strong regional position** the main aviation hub in the Baltics. Solid growth in origin and destination traffic following the COVID-19 pandemic, although transfer traffic remains affected by the Russian invasion of Ukraine.
- **Improved passenger/operation ratio**, driven by fleet changes and better load factors. Passenger traffic in 2025 is expected to approach 2019 levels, with 25% fewer aircraft movements. This will result in reduced noise and emissions, while enhancing the efficiency of airport infrastructure, particularly apron stands and airfield capacity.
- Challenging **flight schedule profile**, with **isolated peaks** for departures in the early morning and for arrivals in the late evening—typical of airports with a strong airline base and significant overnight aircraft parking.
- **Robust development steps already committed** with several projects in the final stages of procurement. Notably, the Stage 6th terminal processor will address current and short-term needs in the terminal’s public areas.
- **Need for rehabilitation** works in the airfield and technical zones, requiring significant investment in resurfacing, refurbishment, and maintenance of critical areas.
- Airfield configuration **complies with international regulations** and offers potential for expansion in certain areas. However, the limited apron depth—i.e., the distance between the parallel taxiway and the terminal’s airside façade—may pose challenges for efficient aircraft circulation.
- **Regulatory constraints**, particularly in **land acquisition**, represent a bottleneck for airport development. The national territory reservation approved by the Cabinet of Ministers in the previous Master Plan appears insufficient. Urban development within the reserved area over the past decade highlights the need for stronger protections and improved coordination between aviation authorities and spatial planners.
- **Disorderly land use** within airport property, due to difficulties in acquiring additional land. This has led to a **mix of** industrial, logistics, commercial, and construction **activities** occupying adjacent areas within the current airport boundaries.

2.2. References to Riga Airport in planning documents

Document type	Document	Connection with the development of RIX Riga Airport
National level	Latvia's Sustainable Development Strategy until 2030 (Latvia2030)	<p>The airport is mentioned as one of the seven priorities within the spatial development perspective, which outlines the policy directions for sustainable and balanced national territory development. The importance of the airport is particularly highlighted, emphasising the improvement of external accessibility. The document stresses that the airport is a dominant force in the Baltics and should develop into a European-level air traffic hub, which would enhance both the competitiveness of the Riga metropolitan region and the economic growth of the entire country.</p> <p>The development of airport infrastructure and route offerings is essential to increase the number of transported passengers to at least 10 million per year. It is also emphasised that the airport should develop not only as a significant destination for direct routes but also as an important transit centre for further flights to Central Asia and CIS countries, providing regular air traffic connections with major EU air transport hubs.</p>
National level	Latvia's National Development Plan 2021 – 2027 (NAP2027)	<p>The document outlines the task of improving international connectivity through the implementation of the Rail Baltica project, further developing the international airport "Riga," and simultaneously enhancing the competitiveness of transit services and the acquisition of new markets. The goal is to establish Riga as a significant and modern multimodal transport hub, particularly by improving infrastructure, thereby increasing the efficiency of the European transport network, and supporting the achievement of environmental objectives.</p> <p>This task is linked to the action direction "Technological Environment and Services," one of the goals of which is to create an integrated, sustainable transport system that enhances international connectivity.</p>
National level	Transport Development Guidelines 2021-2027	<p>The document outlines several performance indicators related to various achievable policy outcomes:</p> <ul style="list-style-type: none"> ➔ Improved mobility options: 1) Number of passengers at RIX airport in 2027: 9 million (transfer/transit >25%). Flight routes (summer/winter): 110/80. ➔ Reduced greenhouse gas emissions and improved environmental quality: area affected by noise around "Riga" airport (Lden >55dB(A)): unchanged until 2027 - 26.6 km². ➔ Ensured a competitive and resource-efficient transport and logistics system: cargo volume by 2027 - 48,000 tonnes. <p>The implementation plan of the guidelines includes the task of continuing to develop Riga as a significant Northern European aviation hub, which specifies four measures related to the airport, including:</p> <ul style="list-style-type: none"> ➔ Expanding the flight route network and developing transit while reducing environmental impact; ➔ Increasing the airport's capacity by constructing the 6th terminal phase and connecting it to Rail Baltica (by 2027); ➔ Completing the Cohesion Fund project concerning safety and environmental requirements (by 2022); ➔ Maintaining infrastructure for cargo handling (by 2027). <p>A separate task is planned for the modernisation of air traffic management infrastructure, ensuring its compliance with the latest technologies as well as increasing environmental and safety requirements. This includes the following measures:</p> <ul style="list-style-type: none"> ➔ Construction of a new air traffic control tower by 31 December 2026; ➔ Development of air traffic management systems and their supporting systems; ➔ Continuation of the implementation of the free route airspace project; ➔ Integration of unmanned aerial vehicles into the air traffic management system; ➔ Development of high-precision navigation (PBN) based on satellite technologies. <p>The task of developing the export potential of Latvia's transport and logistics services specifies two measures that also affect the airport:</p> <ul style="list-style-type: none"> ➔ Continuous monitoring of the situation and identification of administrative barriers in the transit and logistics sectors, developing proposals to enhance the competitiveness of Latvia's logistics system and industry export services; ➔ Coordinated promotion of industry services in the international market under a unified industry brand VIA LATVIA. <p>Another task related to the airport involves implementing measures to reduce noise pollution, which includes developing plans for noise reduction near the most significant transport infrastructure facilities in the country.</p>

Document type	Document	Connection with the development of RIX Riga Airport
National level	Latvian Tourism and events industry export promotion strategy to 2027	All modes of transport, including the aviation sector, play an important role in the export promotion strategy of Latvia's tourism and events sector until 2027. Developing the competitive advantages of the tourism sector - including Riga airport infrastructure and the services of the national airline airBaltic - contributes to the increase of export volumes and revenue from the state budget.
Regional level	Sustainable Development Strategy of the Riga Planning Region 2014-2030 (updated in 2023)	<p>One of the six priorities outlined in the document is comfortable, fast, and climate-neutral mobility and logistics. This priority includes the action direction "Strengthening the unified internal and external accessibility infrastructure networks," which also pertains to the airport. The airport is highlighted as a significant transport hub in the Baltic Sea region, providing connectivity to major European metropolises. At the same time, it is emphasised as an infrastructure facility of common European interest that needs to be developed integrally and communally, utilising metropolitan connections in Riga and its surrounding areas.</p> <p>The document particularly emphasises the connection between Riga's mobility space and the airport, as well as its role in the development of traffic infrastructure, including an international railway station. The vicinity of the airport has been identified as one of the priority development areas in the Riga region, to be developed as an innovative centre—a research and technology park.</p>
Regional level	Riga Planning Region Development Programme 2022-2027	The action plan of the development programme includes measures for the development of access roads to the airport and their connectivity with the rest of the Riga metropolitan area, as well as the integration of "Jūrmala" airport into the overall air transport network.
Regional level	Action Plan for the Development of the Riga Metropolitan Area (approved in 2020)	<p>The airport is defined as one of the international transport hubs in the metropolitan area. Regarding development needs and investment directions to improve area mobility, regular express train connections are mentioned from Mārupe municipality through the airport and Riga Central Station to Stopiņi municipality, as well as from Ogre through Riga Central Station to the airport.</p> <p>The development programme for the Riga Planning Region highlights the previously mentioned airport access road development. Additionally, the development of the airport as an international transport hub, its interconnection, and effective accessibility from metropolitan cities is emphasised in the context of regional and international competitiveness. This is simultaneously outlined as one of the top 10 projects.</p>

Document type	Document	Connection with the development of RIX Riga Airport
Local (municipal) level	<p>Mārupe Municipality Sustainable Development Strategy 2022-2034</p>	<p>The airport is mentioned as a significant infrastructure facility with a substantial impact on transport flows and land use trends. Its location in the municipality attracts logistics services, making it one of the symbols of the municipality's recognition and a key element influencing the development of the municipality's territories, which must ensure accessibility and integration into the settlement structure, as well as the provision of jobs and public space.</p> <p>The vision of Mārupe municipality includes the establishment of the Rail Baltica railway line and station at the airport, as well as the construction of a parallel direct road connection from the airport to the A5 bypass, ensuring rapid development of the airport's surroundings, activating logistics services and tourism, and establishing the airport as a service centre of municipal significance and a regional mobility centre.</p> <p>The development of the airport area and activities related to aviation have been identified as one of the five main directions of the municipality's economic specialisation. It is also emphasised that the expected Rail Baltica railway station in the airport area and the international mobility point will ensure its rapid accessibility, further promoting the airport area as a service centre.</p> <p>The development of the airport is linked to one of the four long-term strategic objectives set for the municipality - SM3 (Economy) - an innovative, growing, and efficient business environment focused on utilising local potential. This is associated with the development of the airport business park, which attracts international investments and serves as a service and business centre to enhance the municipality's recognition. Long-term priorities have been defined based on these long-term goals, including:</p> <ul style="list-style-type: none"> → The priority "Balance in the development of business and living environment," where the airport is mentioned in relation to supporting the development of local tourism potential, cooperation, and the creation of joint products; → The priority "Support for innovation and small business development," where the airport is mentioned in the context of developing the competitiveness of the Riga metropolitan area. <p>The spatial development perspective outlines several solutions:</p> <ul style="list-style-type: none"> → In addition to the municipality's settlement centres, the airport will develop as a service centre of municipal significance and a regional mobility centre. → The airport is included in the urbanised Pierīga area. It is indicated that it should be developed as a significant European-level air traffic hub and an "airport city" from an urban design perspective, without residential functions but with dense and efficient urban structures, technical and commercial construction that provides a wide range of services for business tourism and local entrepreneurs. The area is expected to develop as an international mobility point linked to the Rail Baltica railway line, enhancing the municipality's accessibility, public transport availability, and efficiency. → The guidelines for planning the settlement structure stipulate that the area allocated for parking should be reduced, promoting multi-storey or underground parking solutions (also in the airport area), and encouraging the use of public and shared transport. It is recommended that the development and roads in the airport area be planned as publicly accessible areas, ensuring the functions of an international mobility point at the Rail Baltica railway station. → The guidelines for traffic infrastructure and mobility indicate cooperation in improving new and existing transit connections, including creating a new regional road A5 connection to the airport and a regional railway station in Jaunmārupē, reserving the necessary area for the infrastructure, as well as expanding the airport infrastructure by reserving the required area in the territorial planning documents. The establishment of the airport as an international mobility point and a new tram route from the city of Riga through Mārupe to the international airport is planned. The need to improve access to the airport area from the south and north is emphasised. → Regarding business development areas, it is determined that the airport area should be viewed as an economically well-founded service centre with specific regional and national-level service functions. It is indicated that a business park is expected to be developed in the airport area, activated by the design of the international railway line. → The guidelines for business stipulate the development of the necessary areas for business, logistics, and various aviation-related activities near the international airport "Riga" (aviation training, museum, observation area). It is recommended to create architecturally high-quality business, trade, and service developments near the airport access road. <p>The strategy emphasises the role of municipal cooperation partners, including collaboration with the airport.</p>

Document type	Document	Connection with the development of RIX Riga Airport
<p>Local (municipal) level (binding regulations)</p>	<p>Mārupe Municipality Territorial Planning 2014 – 2026 (currently the new Mārupe Municipality Territorial Planning 2024-2036 is being in preparation process)</p>	<p>The location of the airport in the municipality is noted to create several advantages for business, as well as drawbacks to the quality of life for residents, including that part of the municipality is designated as an airport noise zone (the villages of Skulte and Jaunmārupe). It is indicated that a Southern pier could be established by 2026, and a second runway could be possible by 2036. The development plans include new access roads to the airport area, ensuring cargo transport flows, including a two-level connection to the existing airport access road P133 and the road to the current cargo terminal, with terminal expansion possible after 2036.</p> <p>The territorial plan includes the necessary areas for the airport's future development. The airport is classified as a high-risk area (related to fire safety, explosion risks, and as a mass gathering point). The plan states that the village of Skulte is entirely within the area required for the airport's development, and all buildings are subject to a temporary use status, with no new construction planned during this period.</p> <p>In the long term, there are plans to transform residential areas into business zones (for hotel staff) and to develop production areas with high technology applications, as well as facilities servicing the airport. Regarding transport, the plan includes runway extensions, expanded platforms and aircraft parking, air cargo storage areas, the creation of parallel and perpendicular runways, and a railway line entering the airport area. The possibility of establishing a tram line connecting to the Riga city tram network is also mentioned.</p> <p>The airport area is designated in the functional zoning as a transport infrastructure facility—airfield area (LO), where the permitted use is the construction of the airport and its infrastructure facilities. Additional permitted uses include the construction of office buildings, logistics enterprises, retail and service facilities, as well as the construction of defence and security institutions, parking lots, and garages.</p> <p>Territorial use and construction regulations related to the airport stipulate that:</p> <ul style="list-style-type: none"> → The building line along the state road P-133 (airport access road) is set at a distance of 100m from the road axis. → It is undesirable to place residential and public buildings in new constructions within the zone of increased noise discomfort, where the evening noise level exceeds 45 dBA. → Buildings in the noise zone must be equipped with sound insulation, ventilation, and air conditioning systems, as well as use sound-absorbing materials. → Wind turbines or communication masts must not be placed in the airport take-off and landing safety zone. → The municipality must monitor electromagnetic radiation and restrict the construction of residential buildings in risk zones. → A protective zone of 60m is established for the road P-133 (airport access road). → Protective zones around navigation technical means are established within the airport area, monitored by the Civil Aviation Agency. → A protective zone of 25m is established for the oil pipeline from Olaine to the airport. → In public construction areas PD4 within the airport business park, the conditions, parameters, and land unit sizes for the development of the airport must be adhered to, to be specified when developing a detailed or local plan. <p>Building conditions for the airport area:</p> <ul style="list-style-type: none"> → The maximum height of buildings must not exceed 30 m, while other construction indicators should be determined in individual detailed plans based on the planned activities. → The closed area of the airport must be fenced with a 2.5 m high transparent fence, allowing the use of barbed wire for security purposes. → Buildings or structures with a height reaching 100 m or exceeding 30 m above the airport control point require a permit within a five-kilometre radius. → Buildings, structures, or trees located in the aircraft take-off/landing sector within two kilometres of the runway require a permit. <p>The areas required for the further development of the airport:</p> <ul style="list-style-type: none"> → The planning of Mārupe municipality highlights the areas needed for the development of the airport; → The land use regulations must be specified in accordance with the strategic solutions for the airport's development; → Legally initiated use in these areas can continue until a decision is made regarding infrastructure construction (temporary economic activities are permitted for up to 25 years); → A state permit is required for the economic use and construction of the areas, including: <ul style="list-style-type: none"> ▪ Buildings and structures with a height exceeding 100 m or exceeding 30 m above the airport control point require a permit within a five-kilometre radius of the airport or if they reach the obstacle limitation surface; ▪ Buildings, structures, and trees located in the aircraft take-off or landing sector within two kilometres of the nearest runway threshold require a permit; ▪ Light sources not intended for aeronautical navigation and located in the aircraft take-off or landing sector within five kilometres of the nearest runway threshold require a permit; ▪ Objects that promote mass gathering of birds must not be located within a 15 km radius of the airport control point. → The status and boundaries of a civil aviation aerodrome of national importance are determined by the Cabinet of Ministers, including areas necessary for future development.

Document type	Document	Connection with the development of RIX Riga Airport
Local (municipal) level (binding regulations)	<p>Detailed plan for the eastern part of the real estate of JSC "Riga International Airport" (approved in 2013)</p>	<p>The goal of the detailed plan is to specify and clarify the planned (permitted) use of the detailed plan area as defined in the Mārupe municipality territory plan and its usage restrictions, as well as to determine prospective road, street, and railway access to the existing and planned passenger terminal, parking areas, business parks located within the airport area, and technical and maintenance zones, considering the existing land use and planned airport area development.</p> <p>Within the planning framework:</p> <ul style="list-style-type: none"> → The prospective intensity of transport movement related to the construction of terminal phases 5 and 6 has been assessed, considering the impact of the business park development. → The prospective transport flow limit for the intersection of road P133 and Ziemeļu-Dzirnieku street has been calculated, within which it is permissible (according to globally accepted recommendations) to maintain a grade-level intersection, and based on these economic conditions, the volumes of airport and business park development have been evaluated. → Transport flow volumes at the main terminal access roads have been assessed, along with the necessary number of lanes to terminal 2. <p>The development perspective post-2020 indicates that as passenger numbers exceed 8 million, issues related to aircraft and passenger servicing will be addressed. In part D, the expansion of engineering and aircraft service zones is planned, as well as the construction of a third pier south of the terminal, which will allow for an additional 2.5 to 3 million passengers per year. The construction of a new runway and terminal will increase passenger attraction opportunities.</p> <p>The detailed plan provides recommendations for further transportation infrastructure design, the establishment of new engineering communications, and specifies protective zones.</p> <p>The airport's land use and construction regulations stipulate the following functional zoning: Airport area (LO), Business area (D), Production area (R), Recreation area (A), Linear construction area (TT), Forestry area (MS). Detailed usage regulations are specified for each of the functional zones.</p>
Local (municipal) level (binding regulations)	<p>Amendments to the detailed plan for the eastern part of the real estate "Riga International Airport" (amended in 2024)</p>	<p>The aim of the detailed plan amendments is to rearrange the transport area zoning boundaries in accordance with the construction project solutions for the airport and Rail Baltica railway station access roads, to enable the commencement of construction in the airport-owned vacant areas, developing it as a commercial development area, consistent with the graphic part of the existing detailed plan and land use and construction regulations.</p> <p>One of the tasks of the detailed plan is to identify measures to mitigate environmental impact. The amendments made functional zoning changes in relation to the creation of new access roads. The amendments to the detailed plan removed street red lines and specified the separation zones of roads under construction.</p> <p>In the designated functional zones, the permitted uses in the Business and Service Facilities Construction Area PD4 include: retail or service facilities, office building construction, sports facilities, tourism and recreation establishments, cultural institutions, educational and scientific institutions, as well as health and medical facilities. Additional uses include: public outdoor spaces, parking lots, garages, vehicle maintenance businesses, and the construction of defence and security institutions.</p> <p>In the context of public space, it is indicated that the area of the detailed plan amendments includes part of the RIX Business Park, where hotels, office buildings, conference centres, industrial facilities, and logistics complexes with high added value will be created. The implementation of the Rail Baltica station and associated infrastructure project at the international airport "Riga" will result in a modern and multifunctional passenger service complex connected to the airport infrastructure, providing new mobility opportunities and conveniences for passengers. The detailed plan also offers recommendations for the improvement of public outdoor spaces.</p>
Local (municipal) level	<p>Detailed Transport Development Plan of Mārupe Municipality (not approved)</p>	<p>The Transport Development Plan (although not approved due to the suspension of its development) includes proposals for changing the route of the local state road V14, considering the airport's expansion. The transport plan illustrates the connection points to the state regional road P133 (airport access road), considering the proposal to change transport organisation in the area between the state roads P133 and V16.</p> <p>The document highlights the lack of a direct connection between Mārupe and the surrounding villages to the airport as a significant issue, thus proposing to establish connections from Mārupe and the villages. Additionally, it references the "Mobility Plan for Riga and Pierīga" developed in 2010, which suggests the construction of a new tram line to connect with the airport, emphasising that the passenger flow from the airport is insufficient to justify a railway line with frequently running trains, making the tram the most suitable alternative to the existing bus line No. 22.</p>
Local (municipal) level	<p>Mārupe Municipality Development Programme 2022-2028</p>	<p>The current action plan includes a measure related to the development of the airport—R6.5. Improving public transport accessibility. This measure aims to create an extension of the tram line, connecting the Riga city tram line to the airport.</p>

Document type	Document	Connection with the development of RIX Riga Airport
Local (municipal) level	Riga Sustainable Development Strategy until 2030 (developed in 2024)	<p>Long-term goals related to providing residents with a convenient, safe, and pleasant environment, as well as making Riga an internationally recognised, significant, and competitive Northern European metropolis, include the integration of a rail connection from the centre of Riga to the airport within the transport system. According to the document, it is expected that passenger traffic at the airport will reach 12 million by 2030.</p> <p>The document mentions the Rail Baltica connection with transfer vehicles to the airport, outlining two possible connection options: a train or a high-speed tram through the territory of Mārupe municipality with a connection to the long-term parking facility in Mārupe.</p> <p>Potential development of a tram extension to Mārupe (airport) is planned.</p> <p>It is indicated that if the state chooses a train for the Rail Baltica connection to the airport, an intermodal transport hub for entering and exiting the city by plane or train will be created, integrating the Central Railway Station and the International Bus Station.</p> <p>The included Riga city structural plan encompasses not only the Rail Baltica access and connection to the airport, the airport, and the passenger terminal but also the area for the airport's expansion. The airport is highlighted as a national transport infrastructure facility that is a priority for the city's development. It is stated that a logical public rail transport connection with the international airport must be established from Riga Central Railway Station.</p>
Local (municipal) level <i>(binding regulations)</i>	Riga Territorial Planning (approved in 2021)	<p>The territorial plan specifies the area necessary for the further development of the airport, which primarily includes the Transport Infrastructure area (TR3), the Nature and Greenery area (DA1), as well as the Mixed Centre Construction area (JC4) and the Industrial Construction area (R) functional zones.</p> <p>In relation to the airport, Beberbeķi village, which borders the airport area, is mentioned, as well as Mūkupurvs—a poorly developed, marshy area on the outskirts of Riga near the airport. The development of this area is restricted by the airport's operations, leading to a small number of residential buildings in Mūkupurvs, which has been assessed as unsuitable for residential quality in environmental studies. It is noted that the area adjacent to the northern part of the airfield is undeveloped and marshy. However, with the possible expansion plans for airport service facilities and the upcoming Rail Baltica construction, it has significant development potential. The Zolitūde neighbourhood is also mentioned in the context of the airport, along with the Riga–Tukums railway line, which will be connected to the Rail Baltica route in the northwest corner of the airport area in the future.</p> <p>The construction regulations establish restricted zones around the airport, including:</p> <ul style="list-style-type: none"> → 15 km zone around the airport control points, where a permit from the Civil Aviation Agency is required for activities that promote or could promote mass gathering of birds; → 5 km zone around the airport control points, where a permit from the Civil Aviation Agency is required if structures are built, installed, or placed that exceed 40 m above sea level near the "Riga" airport control point or reach/exceed the airport obstacle limitation surface; → long-range impact zone of 5 to 15 km for ensuring the safety of civil aviation flights (measured from the international airport "Riga" control point), where construction of objects exceeding 67 m above sea level requires a permit from the Civil Aviation Agency; → The take-off and landing sector of "Riga" airport and its high noise level area, with various restrictive conditions regarding construction. <p>Construction near the airport requires approval from the Civil Aviation Agency.</p>
Local (municipal) level	Riga Development Programme 2022-2027	<p>The airport is mentioned in the context of the task to strengthen the city's business environment and attract local and international investments, including from multinational companies. The need to seek solutions for the competitiveness of various economic sectors is emphasised, expanding high-value-added and resource-efficient manufacturing industries into areas related to the airport.</p>

2.3. Demand Forecast

This section presents historical trends and projected growth in passenger traffic and aircraft movements (ATMs) over the planning horizon (2025–2050). These forecasts are essential for guiding decisions related to infrastructure capacity, operational readiness, and future investments.

The projections are based on a combination of historical data analysis, market trends, and economic indicators. As shown in Chart 1, annual passenger volumes ranged between 5 and 8 million annual passengers (MAP) from 2014 to 2024, with a significant decline in 2020 and 2021 due to the COVID-19 pandemic. Looking ahead, passenger traffic is expected to grow steadily, driven by economic development, tourism, and improved connectivity.

As illustrated below, ATMs are projected to follow a similar upward trend, reaching between 130,000 and 140,000 commercial aircraft operations annually by 2050. This growth is closely tied to passenger demand, as higher volumes typically require more aircraft operations—whether through increased flight frequencies, larger aircraft, or the introduction of new routes.

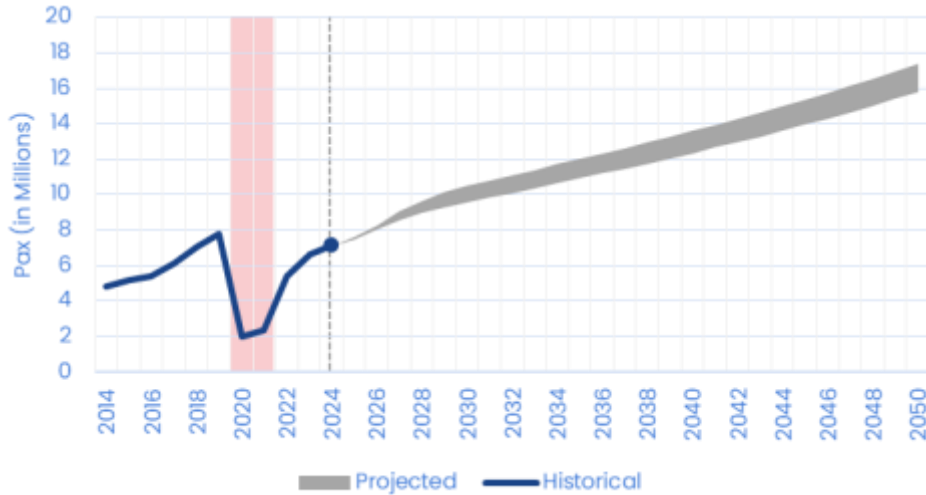


Chart 1 Annual Passenger Volumes (Historical and Projected)
Source: Ineco

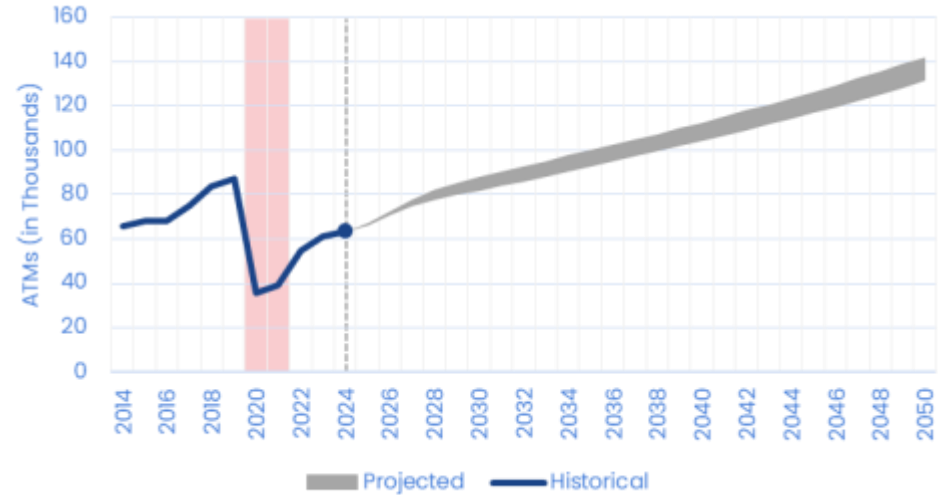


Chart 2 Annual ATMs (Historical and Projected)
Source: Ineco

Riga Airport was significantly impacted by the outbreak of the COVID-19 pandemic, as illustrated in Chart 2, which shows a sharp decline in both passenger numbers and aircraft movements during 2020 and 2021. Although traffic levels have not yet fully returned to pre-pandemic figures, a strong recovery began in 2022. However, this recovery has been affected by the Russian invasion of Ukraine, which led to the suspension of flights to and from Russia and Belarus—markets that previously represented a substantial share of traffic.

Given the complexity and the uncertainty of the current geopolitical context, the Master Plan must adopt a demand-driven approach. Proposed projects must not be tied to fixed timelines but will instead be triggered by actual traffic levels, ensuring that investments are aligned with real operational needs. This approach enables flexible and efficient planning that can adapt to evolving conditions.

Based on the annual forecast, design traffic volumes and peak hour loads are calculated. Peak demand is derived from Design Day Flight Schedules (DDFS), which are used to determine the required capacity of airport facilities. Initially, a Base DDFS is developed using historical data to establish typical arrival and departure patterns for a representative busy day. This Base DDFS is then projected forward to generate mid- and long-term DDFS, reflecting anticipated growth in air traffic movements and passenger volumes. These projections take into account expected ATM growth, changes in market composition, and airline fleet evolution. The mid- and long-term projections consider:

- Annual growth rates by market type
- The type of airlines operating at Riga Airport: Full-service Carriers (e.g. airBaltic), Low-Cost Carriers (e.g. Ryanair), and other operators
- Operational constraints such as the limit on hourly operations and average passenger per operation
- The return of the Ukrainian market
- New routes to/from North America and Asia
- New airlines operating to/from Riga Airport

Chart 3 illustrates the Design Day ATM profiles for the base, mid-term, and long-term planning horizons. Across all scenarios, the peak for arrivals occurs at 10:00 PM, while the peak for departures is observed at 7:00 AM.

For the mid-term planning horizon:

- Arrivals Peak: 32 aircraft movements
- Departures Peak: 29 aircraft movements

For the long-term planning horizon:

- Arrivals Peak: 36 aircraft movements
- Departures Peak: 35 aircraft movements.

The long-term ATM profile further reinforces Riga Airport’s role as a HUB, with several peaks throughout the day.

Passenger profiles follow a similar pattern to ATMs, reflecting the airport’s hub operations with multiple peaks throughout the day, as shown in Chart 4. The peak for arrivals occurs at 10:00 PM, while the peak for departures is at 7:00 AM—both aligned with the ATM peaks.

For the mid-term planning horizon:

- Arrivals Peak: 4,400 passengers of which 77% are Schengen and 23% are non-Schengen
- Departures Peak: 3,600 passengers of which 77% are Schengen and 23% are non-Schengen
- Transfer passengers account for 26% of total passengers, indicating Riga’s Airport growing role as a connecting hub

For the long-term planning horizon:

- Arrivals Peak: 5,100 passengers of which 77% are Schengen and 23% are non-Schengen
- Departures Peak: 4,600 passengers of which 78% are Schengen and 22% are non-Schengen
- The share of transfer passengers is expected to grow up to 30%, further reinforcing the airport’s hub role

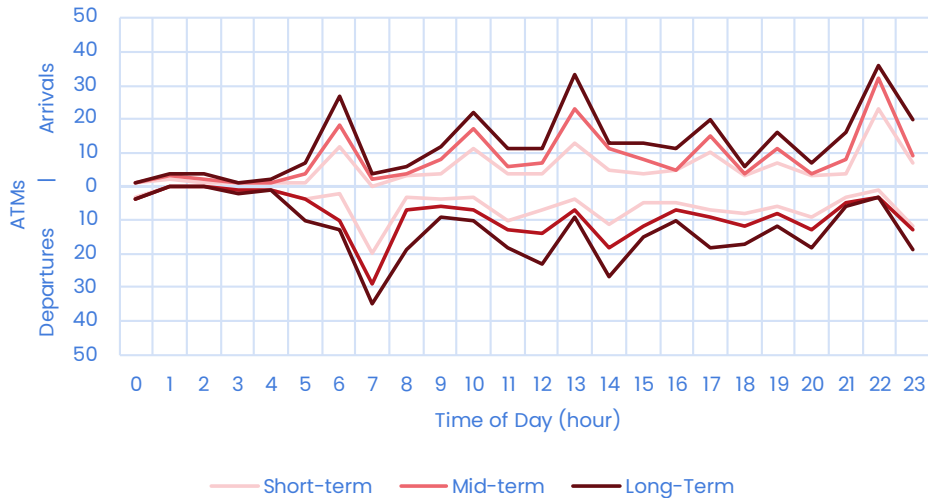


Chart 3 Design Day ATMS (Mid- and Long-term DDFS)- Source: Ineco

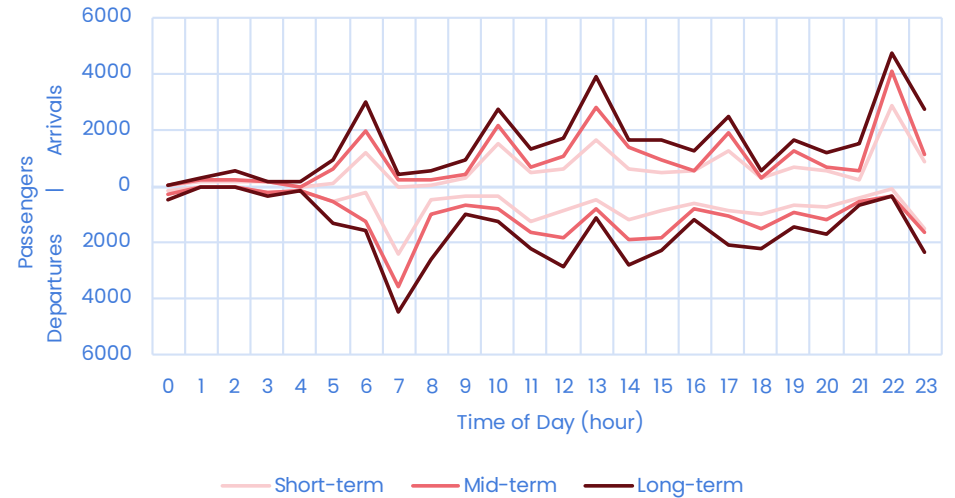


Chart 4 Design Day Passengers (Mid- and Long-term DDFS)- Source: Ineco

In summary, the translation of annual figures into hourly peak loads yields the following key values. As a reference, the mid-term horizon corresponds to traffic levels expected between 2030 and 2035, while the long-term horizon reflects demand projected between 2050 and 2055.

	Mid-term	Long-term
Million Annual Passengers	10.5	17.5
Commercial airlines annual ATMs	82,000	134,000
Departures Passenger Hourly Peak	3,600	4,600
Arrivals Passenger Hourly Peak	4,400	5,100
ATMs Hourly Peak	35	39

Chart 5 Peak Loads
Source: Ineco

In addition to planning airport facilities, it is also essential to consider how passengers and airport employees access the airport. Ground traffic is expected to grow in line with the airport’s overall development. The ground access projections are based on the following assumptions:

- Steady growth in light vehicle traffic, reflecting the general increase in access by passengers and employees.
- Growth in heavy vehicle traffic aligned with airport operations and the development of new logistics areas. Temporary spikes in heavy traffic volumes are anticipated during the construction of Rail Baltica and other nearby infrastructure projects.
- Modest growth in airport employment over the planning horizon.

A series of phased infrastructure improvements have been proposed:

- Mid-term improvement: Implementation of Phase 1 of Rail Baltica, upgrades to bus line 7, and road enhancements as outlined in the Mārupe mobility plan.
- Long-term improvements: Full operation of Rail Baltica, extension of bus line 46, introduction of new bus line 80, improved access from the A5 highway, and full development of Sirin Park.

Considering the introduction of Rail Baltica, enhancements to bus services, and improved road access, the expected evolution of the modal split is as follows:

Transport Mode	Current	Mid-term	Long-term
Private/Company Car	21%	19%	17%
Private Car Drop-off	22%	21%	19%
Ridesharing	-	-	-
Taxi	31%	27%	24%
Bus/Shuttle/Coach	21%	19%	23%
Rental Car	3%	3%	3%
Rail	-	9%	12%
Other	2%	2%	2%

Chart 6 Evolution of Modal Split on access to Riga Airport
Source: Ineco

2.4. Estimation of Future Needs

Airspace

Riga Airport currently operates with a single runway and is anticipating increased traffic in the coming years. Forecasts indicate the following growth in Air Traffic Movements (ATMs):

	Mid-term	Long-term
Arrivals Peak	33	37
Departures Peak	29	35
Combined Peak (Arrivals and Departures)	35	39

Chart 7 ATMs
Source: Ineco

To meet future demand, the airport must ensure that air navigation services can provide sufficient capacity. To accommodate projected traffic growth, the airport may consider the following operational and strategic measures:

- Optimize Resource Utilization: efficiently manage staffing levels, including air traffic controllers and ground personnel, to effectively handle peak traffic periods.
- Airspace Sectorization: Dynamically configure airspace sectors by opening or closing them based on real-time traffic flows. Sector splitting—dividing airspace into more sectors to distribute traffic and workload among additional controllers—is a common technique.
- Optimize infrastructure utilization: coordinate arrival and departure schedules to prevent bottlenecks and maximize the use of runway and terminal facilities.
- Implement Technological Support Systems: tools such as Arrival Manager (AMAN) or Departures Manager (DMAN) are essential in sequencing aircraft and reducing delays.
- Collaborative Decision Making (CDM): Foster collaboration among airlines, air traffic control, and airport operations to adapt effectively to traffic fluctuations.

Latvijas Gaisa Satiksme (LGS), the airport’s air navigation service provider, has committed to:

- Ensuring that airspace will not become a limiting factor in meeting future demand.
- Implementing airspace capacity improvements, which are more flexible and faster to deploy than infrastructure expansions.
- Taking all necessary measures—including new airspace sectorization, updated procedures, enhancements to support systems, and staffing reinforcements—to ensure operational readiness.

Runway, Taxiways and De-Icing

Riga Airport’s declared runway capacity is 29 movements per hour, which will be insufficient to meet future peak-hour traffic demand. Achieving maximum runway throughput requires maintaining a consistently low Runway Occupancy Time (ROT). To reduce ROT and increase throughput, it is recommended to add two Code E Rapid Exit Taxiways (RETs). RETs enable aircraft to vacate the runway at higher speeds, thereby reducing ROT and improving overall runway capacity.

A simulation model was used to assess the impact of adding two RETs. Results for long-term demand show that, even with increased traffic, the average ROT only slightly increases and remains low, confirming the effectiveness of the RETs. However, the construction of these RETs is considered a mid- to long-term recommendation, and periodic reviews of traffic forecasts should be conducted. Specific geometric studies for RET design will take into account any updates to current forecasts.

Although forecasts indicate distinct peaks for arrivals and departures, there are periods with a high mix of both. A sustained increase in runway use will lead to more apron entries and exits, raising the risk of congestion on Taxiway F. To address this bottleneck, a new full-length parallel taxiway is proposed, with the following considerations:

- The new taxiway should be designed to accommodate Code E aircraft.
- The existing Taxiway F would be downgraded to a Code C taxiway to meet safety standards.

The Airport currently operates two de-icing facilities, each located near the runway thresholds. These facilities are designed with flexible configurations: either three Code C positions or one Code C and one Code E. While this setup provides basic operational coverage, several limitations have been identified that may impact future efficiency and scalability:

- Absence of de-icing/anti-icing fluid recovery systems in the de-icing stands, limiting environmental compliance and operational sustainability;
- Operational complexity to use three stands simultaneously for different aircraft codes (C and E);
- Lack of dedicated facilities for de-icing teams between operations, reducing efficiency and comfort for ground personnel;
- Limited scalability to accommodate increased winter operations.

These constraints highlight the need for a strategic redesign of the de-icing infrastructure to meet future operational and environmental standards. The redesign of the decentralized facilities should consider the following:

- Provision of four Code C or two Code C and one Code E de-icing pads to meet long-term demand;
- Scalable design to accommodate varying levels of winter operations;
- Compliance with Obstacle Limitation Surface (OLS);
- Improved operability, including better accessibility, lighting, and space for ground equipment staging and operations;
- Re-filling facilities located nearby to minimize heavy vehicle movement and reduce operations time;
- Dedicated parking and waiting areas for de-icing teams on site.

Apron Requirements

Stand requirements have been assessed across three operational categories: commercial passenger, cargo, and general aviation. These assessments are based on aircraft movements, turnaround times, and fleet composition.

Commercial passenger stand requirements are calculated using the number of arriving aircraft and the average occupancy time per aircraft type. The current fleet mix at the airport is predominantly composed of Code C aircraft, with less than 2% of operations involving Code D or E aircraft. The existing stand capacity is sufficient to meet mid-term demand, with a projected surplus of 12 stands. However, by the long-term planning horizon, a total of 60 stands will be required, meaning six additional stands must be developed to accommodate projected demand.

Cargo operations are characterized by irregular patterns and long turnaround times—often exceeding 12 hours, with some aircraft remaining for several days. Air traffic analysis shows a stable peak of 8–9 operations, requiring 9 stands. Assuming optimistic growth, mid- and long-term stand requirements are projected at 11 and 13, respectively. While current infrastructure can meet mid-term needs, one additional stand will be necessary to satisfy long-term demand.

General Aviation (GA) operations, like cargo, exhibit irregular patterns and variable turnaround times depending on the user profile. Assuming similar operational behaviour in the future, existing infrastructure is expected to accommodate mid-term demand. However, to meet long-term requirements, two additional stands will be needed to ensure sufficient capacity.

APRON	Starting Point	Mid-term	Surplus/ Deficit	Long-term	Surplus/ Deficit
Commercial Passenger	54	42	12	60	6
Cargo	12	11	1	13	1
General Aviation	8	8	-	10	2
Total	74	61	13	83	9

Chart 8 Apron Requirements (Existing vs. Requirements)
Source: Ineco

Terminal Requirements

The terminal capacity calculations follow the methodology outlined in the IATA Airport Development Reference Manual (ADRM) 12th Edition. This approach is based on design values for different time periods across each terminal process. Using this methodology—along with mid- and long-term Design Day Flight Schedules (DDFS) and passenger presentation curves—the distribution of passengers across each terminal processor throughout the day is determined. Chart 9 shows the passenger peak demand for each processor.

HORIZON	TIME INTERVAL (minutes)	Departures hall (pax)	Check-In (pax)	Boarding Pass (pax)	Security Control (pax)	Departures Passport Control (pax)	Arrivals Passport Control (pax)
Mid-term	15	563	563	585	585	156	396
	30	1,121	1,121	1,126	1,126	306	722
	60	2,104	2,104	2,110	2,110	583	1,065
	120	3,450	3,450	3,472	3,472	1,135	1,648
	240	4,845	4,845	4,856	4,856	1,990	2,696
Long-term	15	708	708	729	729	262	454
	30	1,413	1,413	1,425	1,425	522	875
	60	2,696	2,696	2,734	2,734	1,036	1,551
	120	4,673	4,673	4,681	4,681	1,871	2,491
	240	7,157	7,157	7,173	7,173	3,054	3,991

Chart 9 – Passenger Peak Demand by Process
Source: Ineco

The peak demand values illustrated in Chart 9 serve as a basis for determining the spatial and operational requirements of each terminal processor, as detailed in Chart 10.

Process	Element	Unit	Existing (after Stage 6 th)	Mid-term		Long-term		
				Requirement	Surplus/ Deficit	Requirement	Surplus/ Deficit	
Departures	Departures Hall	m ²	2,148	1,779	369	2,237	89	
	Self-service Check-in	#	40	30	10	37	3	
	Check-in	Agent Desks	#	14	5	9	6	8
		Bag Drops	#	16	11	5	14	2
		Queue Area	m ²	900	788	112	977	77
	Boarding Pass Control	Boarding Pass Control	#	12	10	2	12	-
		Queue Area	m ²	75	48	27	58	17
	Security	Security Lanes	#	10	6	4	8	2
		Queue Area	m ²	400	360	40	480	80
	Schengen Boarding Gates	Contact Gates	#	12	16	2	20	7
		Remote Gates	#	8	6		7	
	Schengen Departures Lounge	Departures Lounge	m ²	6,100	7,910	1,810	9,739	3,639
	Emigration	E-gates	#	12	3	9	6	6
		E-gate Queue Area	m ²	12	2	10	3	9
		Desks	#	7	4	3	6	1
		Desks Queue Area	m ²	65	5	60	10	55
	Non-Schengen Boarding Gates	Contact Gates	#	9	8	1	10	1
		Remote Gates	#	4	3	1	4	-
	Non-Schengen Departures Lounge	Departures Lounge	m ²	3,145	4,253	1,108	5,386	2,241
	Arrivals	E-gates	#	12	7	5	9	2
E-gate Queue Area		m ²	200	4	196	5	195	
Desks		#	16	7	9	9	7	
Desks Queue Area		m ²	215	12	203	15	200	
Baggage Claim		Claim Belts	#	5	5	-	5	-
Arrivals Hall	Arrivals Hall	m ²	1,330	1,217	113	1,476	146	
Transfers	Non-Schengen to Non-Schengen Security	Security Lanes	#	2	1	1	1	1
		Queue Area	m ²	100	50	50	50	50
	Non-Schengen to Schengen Security	Security Lanes	#	6	3	3	4	2
	Queue Area	m ²	125	150	25	200	175	

Chart 10 Terminal Requirements (Existing vs. Required)
Source: Ineco

Access Roads and Parking

Chart 11 shows the traffic analysis for the P133/Dzirnieku intersection. Although service levels are adequate, this intersection has the potential to become a future bottleneck.

Point	Road	Between...	And...	Starting Point	Mid-term	Long-term			
1	P133	A10	Dzirnieku	969	35%	1,321	47%	1,911	68%
2	P133	Dzirnieku	A10	903	32%	1,231	44%	1,781	64%
3	Dzirnieku	Biroju	P133	308	34%	419	47%	607	67%
4	Dzirnieku	P133	Biroju	264	29%	360	40%	521	58%

Chart 11 - Traffic Forecast – P133/Dzirnieku intersection
Source: Ineco

Another critical element of the landside infrastructure is the “Kiss & Ride” area—a designated zone for quick passenger drop-off and pick-up. This area is designed to minimize traffic congestion and facilitate efficient passenger flow. Chart 12 presents the projected traffic volumes and level of service for this area. Although the final layout has yet to be defined, current projections indicate that a single lane will not be sufficient to accommodate future demand. Therefore, at least two lanes will be required to ensure operational efficiency and prevent bottlenecks.

	Starting Point	Mid-term	Long-term
Peak Hour Traffic Demand	563	731	1,058
Single Lane “Kiss & Ride” LoS and Volume/Capacity Ratio	60%	81%	118%
Two-Lane “Kiss & Ride” LoS and Volume/Capacity Ratio	36%	49%	71%

Chart 12 – “Kiss & Ride” Traffic Projections and Volume/Capacity Ratio
Source: Ineco

Chart 13 compares existing parking capacities with projected mid- and long-term requirements. Short-term parking facilities are expected to provide sufficient capacity to meet both mid- and long-term demand. However, long-term parking areas (P3, P4, and P5) are projected to face capacity shortfalls. While the mid-term scenario indicates a minor deficit of 65 spaces, the long-term outlook reveals a more significant shortfall of 921 spaces.

Employee parking presents a greater concern. The current capacity of 863 spaces is already insufficient to meet both mid- and long-term requirements, with projected deficits of 29 spaces in the mid-term and 173 spaces in the long-term. Although a temporary solution could involve relocating excess demand to other parking areas, this approach is not sustainable over the long term.

Parking	Capacity	Mid-term	Surplus/Deficit	Long-term	Surplus/Deficit
Short-term (P1 and Multistorey)	725	282	443	311	414
Long-term (P3, P4 and P5)	2,426	2,491	65	3,347	921
Employees	836	865	29	1,038	173

Chart 13 – Parking (Existing vs. Requirements)
Source: Ineco

Business Park/Airport City Requirements

Future hotel demand at the airport is expected to grow in line with passenger traffic. A first hotel, with a minimum capacity of 200 rooms, is planned for the mid-term. By the long-term horizon, two hotels with a combined capacity of 458 rooms are anticipated.

Complementing this, market studies conducted by Deloitte in 2019 identified potential for hosting events with up to 1,500 participants in a single venue. This demand is closely linked to the successful development of multimodal transport connections and the expansion of hotel capacity in the area. To meet this demand, a phased development of a 4,537 m² facility adjacent to the hotel is proposed, with an initial phase of 3,000 m².

Commercial development within the airport area is driven by strong connectivity to the city, airBaltic’s need for additional office space, and the airport’s plan to relocate its headquarters. An initial office building of 24,000 m² was planned for the mid-term, with two additional buildings considered for the long-term, depending on performance. A phased approach is recommended, stating with 12,000 m² of office space and 2,400 m² of commercial area.

In parallel, demand for air freight and logistics services is increasing, driven by the growth of e-commerce and faster delivery expectations. The Master Plan includes three manufacturing areas totalling 190,000 m² with an initial 40,680 m² planned for the mid-term to support logistics and industrial activity.

Commercial Activity	Mid-term	Long-term
Hotel	200 rooms	458 rooms
Conference Centre	3,000 sqm	4,537 sqm
Office Building	12,000 sqm	36,000 sqm
Commercial Area Support	2,400 sqm	4,800 sqm
Manufacturing Area	40,680 sqm	82,000 sqm

Chart 14 – Business Park/Airport City (Requirements)
Source: Ineco

Airport Technical Zone

The airport’s technical zone and support areas are essential for maintaining the daily operational readiness of airport facilities and airport equipment, as well as aircraft and Ground Support Equipment (GSE).

The existing facilities at the Airport are outdated and no longer meet the demands of growing operations. As traffic increases, additional space and modern infrastructure will be required. Once the preferred apron and terminal development alternatives are selected, a suitable new location (or locations) will be identified to relocate and upgrade the technical and support areas accordingly.

3. DEVELOPMENT ALTERNATIVES FOR 2050 HORIZON

The purpose of this chapter is to define development alternatives for Riga Airport over the next 25 years, in order to accommodate expected demand growth. This chapter focuses in particular on developments with potential environmental impacts, serving as input for the Strategic Environmental Assessment of the Master Plan.



The starting point for the airport site, as described in previous chapters, includes the existing airport infrastructure and ongoing projects—whether under construction or already committed. Within the airport site, there are hard, conditional, and soft constraints that have been taken into account in the development of alternatives. Hard constraints are elements that cannot be altered or impacted during the development period (e.g., existing infrastructure). Conditional constraints are initially considered fixed but may change over time due to specific conditions (e.g., the expiration of a concession contract). Soft constraints are more flexible and can be negotiated or adjusted (e.g., land acquisition). The figure below illustrates the constraints to airport development identified within the airport site.



- A. Rail Baltica alignment and train station
- B. Private land
- C. New maintenance hangar
- D. Existing and new control tower

As outlined in the previous chapter, the current declared runway capacity will not be sufficient to accommodate future peak-hour demand within the Master Plan's time horizon. To support expected traffic growth and meet the needs of airlines and hub operations, the runway must be capable of efficiently handling peak periods, minimizing the need for traffic regulation.

At the same time, it is equally important to continue developing the rest of the airport's infrastructure, including the terminal building, aprons, and aviation-related businesses. In this regard, the western side of the airfield offers the most suitable area for expanding activities such as Maintenance, Repair & Overhaul (MRO) and Fixed-Base Operators (FBOs). This would allow for the release of valuable front-line space on the eastern side for passenger and airline operations.

In the very long term, the western side also represents the only viable option for the full development potential of the airfield.

Figure 1 – Airport Site Starting Point with Constraints
Source: Ineco

3.1. Runway and taxiway system

The projected increase in traffic—particularly during peak hours—combined with planned infrastructure developments, will place additional pressure on the airfield and require improvements to maintain low Runway Occupancy Times (ROT) and accelerate aircraft ground movements. To address these challenges within the Master Plan’s time horizon, two development alternatives have been identified and will be discussed in this chapter:

1. Maximizing the capacity of the existing Runway, through the construction of a new taxiway parallel to the existing Taxiway F, along with two new Rapid Runway Taxiways (RETs)
2. Construction of a new runway 18/36, complete with a full RET and taxiway system, converting the existing runway into a parallel taxiway.

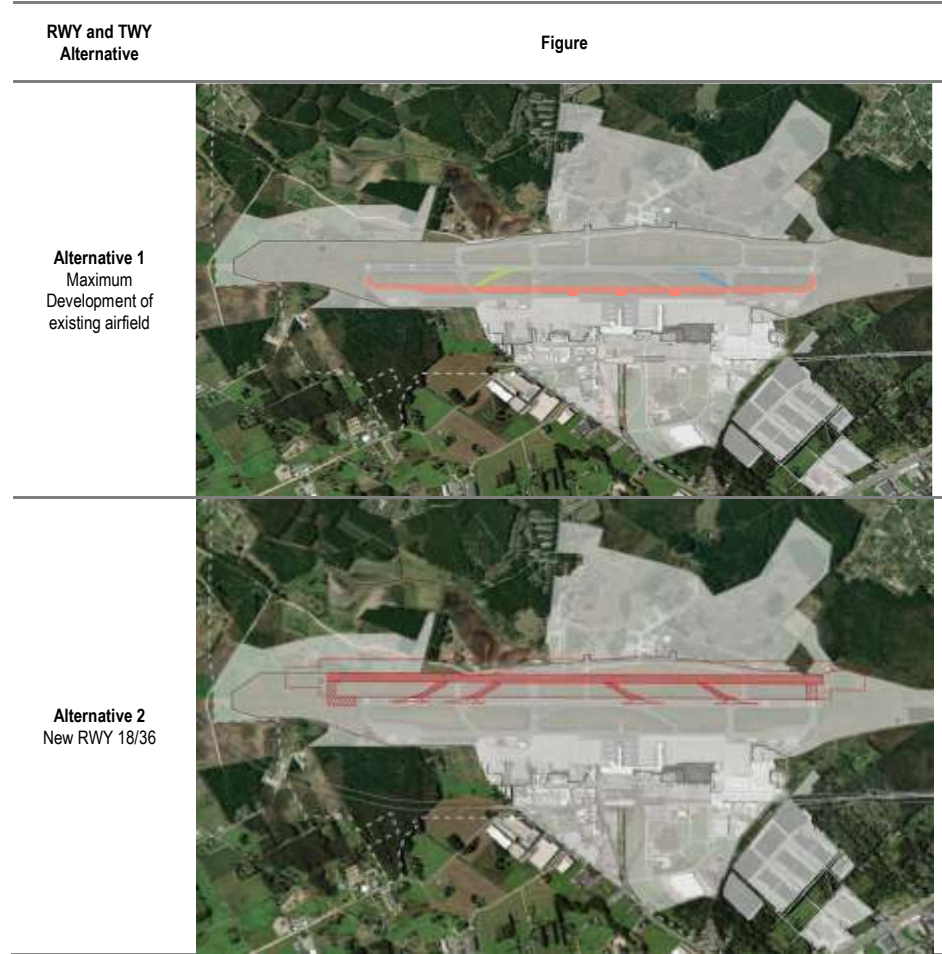


Chart 15 –RWY Alternatives
Source: Ineco

3.1.1. Description of alternatives

Alternative 1 – Maximum Development of RWY 18/36

This alternative involves the construction of a new Code E taxiway, parallel to the runway, at 172.5 m to the east. It also includes two new Code E Rapid Exit Taxiways (RETs), one for each runway direction. Given the distance between the centerlines of the parallel taxiways, the existing Taxiway F would be downgraded to a Code C apron taxilane.



Figure 2 –RWY Alternative 1
Source: Ineco

This alternative could increase capacity to a maximum of 45 operations per hour, provided that the adjacent subsystems such as Air Navigation, Apron, and Airport Operations, do not impose additional limitations.

The implementation of this alternative could be phased. The parallel taxiway should become operational prior to the construction of a new pier or any potential apron expansion to the south. The RETs may be constructed as needed, depending on the evolution of peak arrival traffic.

The main advantages of this alternative include:

- No land acquisition required, as all developments take place within existing airport property;
- No need for a full Environmental Impact Assessment (EIA), with no direct impact on neighboring areas;
- Phased implementation allows for better financial planning.
- Phasing also enables flexibility to adapt the development plan in case of significant shifts in demand structure.

Alternative 2 – New RWY 18/36

This alternative proposes the construction of a new runway 18/36, located 270m westwards to the existing one. The existing runway would be converted into a Code E parallel taxiway. The new runway would require, at least, the construction of two threshold access taxiways, and two rapid exit taxiways per direction. The final configuration would feature a double parallel taxiway system. This alternative allows the possibility of keeping the former runway as contingency.



Figure 3 –RWY Alternative 2
Source: Ineco

This alternative offers the same expected runway capacity as the previous option—up to 45 operations per hour. However, it requires land acquisition and approval of an Environmental Impact Assessment (EIA). From an air navigation perspective, new systems as well as revised procedures (SIDs and STARs) would be necessary. It is advisable to have an additional operational parallel taxiway in place before proceeding with the construction of new piers or the expansion of the apron to the south. Therefore, the new runway—representing the main investment—should be considered a mid-term development. Compared to Alternative 1, Alternative 2 offers similar runway capacity, slightly greater flexibility in ground movements, and the added benefit of a contingency runway². However, it also presents several disadvantages:

- Significantly higher financial cost;
- Limited flexibility in financial planning;
- Slight increase in taxi distance;
- Implementation challenges including land acquisition and EIA approval.

² This possibility should be carefully assessed in terms of operational safety and investment in REPEX.

3.1.2. Alternatives Assessment

This section includes the assessment of the previously described alternatives and the identities the recommended option for the development of the runway and taxiing system.

This assessment is conducted through a multi-criteria analysis of the alternatives. The following set of criteria will be considered.

- **Cost of the alternative** - Evaluates the level of investment required for new infrastructure, equipment, replacement of affected services, and land acquisition. These costs are estimated using ratios and the consultant’s expertise, and are used solely for comparison purposes. Alternatives with lower costs receive higher ratings.
- **Operability** - Assesses the ease and efficiency of aircraft operations under the proposed development, and its integration with overall airport operations (e.g., fluid and flexible movements, minimization of operational constraints).
- **Environmental impact** - evaluates the impact on surrounding communities in terms of noise, air quality, CO₂ emissions, and land use. It also considers waste generation during construction, development footprint, and the extent of civil works required. Alternatives with lower environmental impact and smaller footprints receive higher ratings.
- **Impact and integration on existing facilities and operation** - Assesses the effect on both landside and airside facilities, existing equipment, and the ease of relocating affected infrastructure within the airport campus. Alternatives with minimal impact and better integration with existing facilities are rated higher.
- **Ease of phasing and future expansion** - Evaluates the feasibility of phased implementation and the potential for future growth beyond the long-term horizon, including financial planning and spatial flexibility. Alternatives that allow for less disruptive, scalable, and financially manageable phasing receive higher ratings.
- **Operational impact / Disruption during construction** - Assesses the potential impact on airport operations during construction, including effects on runway usage, taxiways, taxilanes, and gate availability, as well as the duration of such disruptions. Alternatives with minimal and shorter operational impacts receive higher ratings.
- **Administrative difficulties**. Evaluates the complexity and feasibility of implementation due to land acquisition requirements, permits, and Strategic Environmental Impact Assessment (SEIA) procedures. Alternatives located on airport-owned land or requiring fewer permits are rated more favourably.

Each criterion is scored on a scale from 1 to 5, with the following considerations:

- 5 – Best score
- 1 – Worst score
- Intermediate values – Assigned through linear interpolation

Not all criteria carry the same level of importance. Therefore, each has been assigned a specific weight to reflect its relative significance in the evaluation process. The assigned weight values are as follows:

	Criterion	Weight
Runway	1. Cost of Alternative	30%
	2. Operability	20%
	3. Environmental impact	10%
	4. Impact and integration on existing facilities	20%
	5. Ease of Phasing and future expansion	10%
	6. Operational Impact/disruptions during the works	5%
	7. Administrative difficulties	5%

*Chart 16 – Evaluation Matrix Weight (runway)
Source: Ineco*

Each alternative has been evaluated as follows:

1. **Cost of the alternative:** Alternative 1 involves significantly lower investment while delivering a similar overall capacity outcome.
2. **Operability:** Alternative 2 includes dual Code E parallel taxiways, offering greater flexibility for wide-body aircraft operations throughout the day. It also provides the option of a contingency runway, enhancing operational flexibility and facilitating more efficient ground movements.
3. **Environmental impact:** No significant environmental impacts have been identified for Alternative 1. In contrast, Alternative 2 would require land acquisition and is expected to have a greater impact on surrounding areas.
4. **Impact and integration on existing facilities and operation:** Both alternatives have a similar impact on existing facilities and require minimal integration investment. However, Alternative 2 would necessitate the implementation of new air navigation procedures and additional training.
5. **Ease of phasing:** Most actions under Alternative 2 would need to be executed in a single phase during the mid-term, alongside terminal and apron investments. This reduces flexibility and concentrates financial risk.
6. **Operational impact / Disruption during construction:** Alternative 1 is expected to have a greater impact on ongoing operations during construction due to its proximity to the existing runway and apron areas.
7. **Administrative difficulties:** Alternative 2 involves land acquisition, runway construction approval, and an Environmental Impact Assessment (EIA), making the implementation process more complex and time-consuming.

The results of the assessment, incorporating the weighted criteria, are presented in the following table..

CRITERIA	WEIGHT	Alt 1	Alt 2
Cost of alternative	30%	4	2
Operability	20%	2	4
Environmental impact	10%	4	3
Impact on existing facilities and operation	20%	3	2
Ease of phasing and future expansion	10%	4	2
Operational impact / Disruption during construction	5%	2	5
Administrative difficulties	5%	5	1
Assessment	100%	67%	52%

*Chart 17 – Runway Alternatives Evaluation Matrix
Source: Ineco*

In conclusion, Alternative 2 offers the same solution to the runway capacity challenge as Alternative 1—namely, maximizing the capacity of the existing runway. However, it entails significantly higher costs and greater financial and implementation complexity.

Therefore, **Alternative 1 is the recommended option** for the development of the runway.

3.2. Terminal and Apron Alternatives

Taking into account the various constraints, three zones have been identified as potential areas for apron development:

- Zone A – West Expansion
- Zone B – Northeast Expansion
- Zone C – Southeast Expansion



Figure 4 – Terminal and Apron Alternatives
Source: Ineco

Development Zone	Advantages	Disadvantages
Zone A	→ Plenty space for development	→ Requires land acquisition
	→ Extent of land owned by the airport	→ Long distance to existing terminal building and aprons
	→ No phasing required	→ Hinges future runway expansion
	→ Does not impact existing facilities	→ Requires reconfiguration of airport road network
	→ Reduced taxi-times if second runway is built to midfield terminal.	→ Complex ground access
		→ Diversification of handling in the two locations
Zone B	→ New terminal/apron location close to existing facilities	→ Requires land acquisition
	→ Quick access to existing runway	→ Requires construction phasing
	→ Does not hinge future runway expansion	→ Limited space for expansion due to existing and planned developments
Zone C	→ New terminal/apron location close to existing facilities	→ Requires land acquisition
	→ Quick access to existing runway	→ Requires phasing
	→ Does not hinge future runway expansion.	
	→ Apron continuity with growth happening parallel to runway.	
	→ Lowest taxi times	

Chart 18 – Development Zones
Source: Riga Airport

Based on the analysis of potential development zones, Zone A is excluded as a location for commercial passenger terminal and apron expansion. Although it offers ample space and is located within airport-owned land, its considerable distance from the existing terminal and apron areas would result in operational inefficiencies and increased passenger transit times. Additionally, reconfiguring the airport road network and addressing complex ground access requirements would pose significant logistical challenges. Moreover, a potential second runway is only possible on Zone A, and developing this area would require an early decision on its location, further complicating long-term planning. Zone A may be considered for other uses, such as Maintenance, Repair & Overhaul (MRO) or General Aviation (GA). In contrast, Zones B and C offer proximity to existing facilities and the runway/taxiway system, ensuring quick access and operational continuity. Although these zones require land acquisition and phased construction, their integration with existing infrastructure and reduced taxi times make them more viable options for commercial passenger terminal and apron expansion. Therefore, the development alternatives presented will focus on Zones B and C, as they better align with operational efficiency.



The purpose of this section is to describe the terminal and apron development alternatives at Riga Airport for the long-term horizon, aimed at accommodating anticipated traffic growth. As stated in the previous chapter, the long-term horizon refers to the point at which the airport is projected to require a total of 83 stands in day-use configuration: 60 for commercial passenger aircraft, 13 for cargo, and 10 for general aviation. This will necessitate the provision of additional apron space.

3.2.1. Description of alternatives

Considering the apron requirements and the limitations of the airport site, five development alternatives have been formulated. These alternatives explore potential expansions for commercial and cargo operations in Zones B and C, while General Aviation (GA) operations are proposed in Zone A across all options.

All alternatives foresee the long-term relocation of MRO and GA facilities to the western side of the airfield, opposite the existing runway. This would allow the current area to be dedicated exclusively to airline passenger and cargo operations.

The proposed alternatives combine terminal location and apron development, and will be evaluated as integrated solutions that address both components comprehensively.

Terminal Alternative	Figure
<p>Alternative 1 North Single-sided Perpendicular Pier</p>	
<p>Alternative 2 South Double-sided Parallel Pier</p>	



<p>Alternative 3 South Circular Pier</p>	
<p>Alternative 4 South Single-sided Perpendicular Pier</p>	
<p>Alternative 5 South Double-sided Perpendicular Pier</p>	

Chart 19 – Terminal and Apron Alternatives
Source: Ineco

Alternative 1 – North Single-sided Perpendicular Pier

Alternative 1 proposes an expansion to the northeast of the airport site (Zone B), featuring a single-sided pier perpendicular to Pier C. This alternative involves converting existing remote stands on Apron 3 into contact stands, providing up to seven additional gates. This addresses the long-term (2050) need for contact stands without affecting the cargo apron. From an airside perspective, the new pier integrates with existing stand and taxiway alignments, requiring only minor modifications to the apron layout.

The proposed pier is a three-story, single-sided structure measuring 205 meters in length and 25 meters in width. It offers sufficient holdroom and circulation space, though it provides limited flexibility for commercial and retail areas. The three levels allow for operational flexibility, including ground-floor walk-boarding and deboarding, which aligns with the operating model of low-cost carriers. The pier will be connected to the main processor via an elevated walkway and may serve both Schengen and Non-Schengen passengers. However, the location of the new pier results in relatively long walking distances for passengers accessing gates at its far end, negatively impacting the passenger experience. The existing walkway connecting Pier C to the main processor may need to be widened to accommodate increased passenger volumes. All MRO and GA facilities should be gradually relocated to the western side of the runway, with full transition expected by 2050. This phased relocation aligns with apron capacity requirements for commercial passenger operations. As MRO and GA facilities are moved, the vacated areas will be repurposed to expand the apron for commercial passenger use. This approach separates general aviation and MRO traffic from passenger and cargo operations, helping to reduce congestion in the airport’s landside access areas by diverting GA traffic.

This alternative maximizes the use of existing apron space by converting remote stands on Apron 3 into contact stands, thereby reducing the need for expansion of Apron 2. However, it only provides additional Code C contact stands with no upgrade potential and impacts the new BT MRO and RAF-Avia hangar, both considered hard constraints. The location of the new pier also limits future expansion, as it would interfere with the existing cargo apron and further increase passenger walking distances.

Due to the challenges posed by the presence of the BT MRO, RAF-Avia hangar, and the existing cargo apron and terminal, no further alternatives in Zone B are proposed.



Figure 5. Terminal and Apron Alternative 1 – North Single-sided Perpendicular Pier
Source: Ineco

Alternative 2 – South Double-sided Parallel Pier



*Figure 6 – Terminal and Apron Alternative 2 – South Double-sided Parallel Pier
Source: Ineco*

Alternative 2 proposes an expansion to the southeast of the airport campus (Zone C), featuring a double-sided pier parallel to Pier B. This alternative includes a new pier with up to nine Code C contact stands, two of which are MARS (Multiple Aircraft Ramp System), addressing the long-term (2060 or beyond) need for contact stands. The terminal/apron configuration mirrors that of Piers B and C, allowing for efficient taxiing operations.

The new pier would be located approximately 250 meters south of Pier B to accommodate airside roads, stands, and taxilanes. The proposed three-story structure, measuring 170 meters in length and 35 meters in width, provides ample boarding space on both sides, along with commercial and retail opportunities. It also offers operational flexibility, including ground-floor walk-boarding and deboarding, suitable for low-cost carrier operations.

The pier's location places the main processor centrally between all piers, resulting in relatively short walking distances for passengers. It will be connected to the main processor via an elevated walkway, which can serve both Schengen and Non-Schengen passengers. The infrastructure allows for the segregation of Schengen and Non-Schengen flows, either through a secure walkway or a mezzanine level, ensuring separation of arriving and departing passengers.

All General Aviation and heavy MRO facilities should be gradually relocated to the western side of the runway.

Alternative 2 prioritizes maintaining the main processor's central position, which minimizes passenger walking distances. However, the construction of the new pier on Aprons 1 and 2 will result in the loss of some stand capacity, which must be compensated through the extension of Apron 2.

Alternative 3 – South Circular Pier



*Figure 7 – Terminal and Apron Alternative 3 – South Circular Pier
Source: Ineco*

Alternative 3 proposes an expansion to the southeast of the airport campus (Zone C), featuring a circular pier. This alternative includes a new pier with nine Code C contact stands, without upgrade potential. To enable taxi-in and taxi-out operations, additional depth will be required on Apron 1.

The circular pier, with a footprint similar to that of Alternative 2 in size, offers ample boarding space around its full perimeter, along with commercial and retail opportunities. It also provides operational flexibility for ground-floor walk-boarding and deboarding. This configuration places the main processor centrally, resulting in short and balanced walking distances from all piers.

Compared to a parallel pier, the circular layout maximizes space utilization by offering boarding positions around the entire circumference, potentially accommodating more passengers and aircraft efficiently. However, due to the unique geometry of the layout, segregating Schengen and Non-Schengen passenger flows is more complex.

As with Alternative 2, all General Aviation and heavy MRO facilities should be gradually relocated to the western side of the runway.

The stand capacity lost due to the construction of the new pier on Aprons 1 and 2 will need to be compensated through the extension of Apron 2. Additionally, the pier's configuration may affect push-back operations, which could interfere with taxilane movements. East-facing stands will require additional apron depth to ensure safe and efficient operations.

Alternative 4 – South Single-sided Perpendicular Pier



*Figure 8 – Terminal and Apron Alternative 4 – South Single-sided Perpendicular Pier
Source: Ineco*

Similar to Alternative 1, Alternative 4 proposes an expansion featuring a single-sided pier perpendicular to Pier B, this time to the southeast of the airport campus (Zone C). This alternative includes eight Code C contact stands, aligned with long-term requirements projected for 2055. From an airside perspective, the new pier integrates with existing stand and taxiway alignments, requiring only minor modifications to the apron layout.

The proposed pier is a three-story, single-sided structure measuring 285 meters in length and 25 meters in width. It offers sufficient holdroom and circulation space, although it provides limited flexibility for commercial and retail areas. The three levels allow for operational flexibility, including ground-floor walk-boarding and deboarding. The pier will be connected to the main processor via an elevated walkway and will serve both Schengen and Non-Schengen passengers.

As with Alternative 2, all General Aviation and heavy MRO facilities should be gradually relocated to the western side of the runway.

This alternative impacts Aprons 1 and 2, the VIP terminal, handling areas, and equipment storage buildings. The construction of the new pier and its adjacent apron area affects at least three existing Code C remote stands. However, the lost capacity is recovered and upgraded within the new pier. Due to the impact on equipment and storage buildings, this alternative results in a significant loss of space for ground support equipment placement.

Alternative 5 – South Double-sided Perpendicular Pier



*Figure 9 – Terminal and Apron Alternative 5 – South Double-sided Perpendicular Pier
Source: Ineco*

Alternative 5 presents a combined solution based on Alternatives 2 and 4. It proposes an expansion to the southeast of the airport campus (Zone C), featuring a double-sided pier perpendicular to Pier B. This alternative includes a new pier with ten Code C contact stands, addressing the very long-term (2065) need for contact gates.

The proposed three-story pier, measuring 170 meters in length and 35 meters in width, offers ample boarding space on both sides, along with commercial and retail opportunities. It also provides operational flexibility, including ground-floor walk-boarding and deboarding. The pier will be connected to the main processor via an elevated walkway, which can serve both Schengen and Non-Schengen passengers. The infrastructure allows for the segregation of Schengen and Non-Schengen flows, either through a secure walkway or a mezzanine level, ensuring separation of arriving and departing passengers.

As with Alternative 2, all General Aviation and heavy MRO facilities should be gradually relocated to the western side of the runway.

Compared to Alternative 4, this pier maximizes space utilization by offering boarding positions on both sides, enabling more efficient accommodation of passengers and aircraft. However, taxiing around the eastern stands may create bottlenecks due to taxiing speeds and the configuration of stands and taxilanes in that area. Therefore, additional apron depth will be required to support east-facing stands and ensure smooth ground operations.

3.2.2. Alternatives Assessment

The purpose of this subsection is to provide a comprehensive evaluation of the proposed terminal and apron development alternatives. The evaluation matrix assesses each option based on a set of predefined criteria, ensuring an objective comparison. This approach supports the identification of the most viable solution for accommodating future growth at Riga Airport.

The alternatives will be evaluated according to the following criteria:

- **Cost of the alternative.** Assesses the level of investment required for new infrastructure, equipment, replacement of affected services, and land acquisition. Cost estimates are based on ratios and the consultant’s expertise and are used solely for comparative purposes. Alternatives with lower costs receive higher ratings.
- **Operability.** Evaluates the ease and efficiency of passenger and aircraft operations. Terminal performance is assessed based on the simplicity of passenger flows and integration with existing airport operations. Apron performance is evaluated based on aircraft movement fluidity and operational flexibility. Alternatives that enable smoother and more efficient operations receive higher ratings.
- **Environmental impact.** Assesses the impact on surrounding populations in terms of noise pollution, air quality, CO₂ emissions, and land use during construction. Waste generation, development footprint, and the extent of civil works are also considered. Alternatives with lower environmental impact and reduced land occupation receive higher ratings.
- **Impact on and integration with existing facilities.** Evaluates the effect on landside and airside facilities, existing equipment, and the ease of relocating affected infrastructure within the airport campus. Alternatives with minimal impact and better integration with existing facilities receive higher ratings.
- **Ease of phasing and future expansion.** Assesses the feasibility of phased implementation and the potential for future growth beyond the long-term horizon, including financial planning and spatial flexibility. Alternatives that allow for scalable, less disruptive development receive higher ratings.
- **Operational impact/disruptions during the works.** Evaluates the potential impact on airport operations during construction, including closures of taxiways, taxilanes, stands, and gates, as well as the duration of such disruptions. Alternatives with minimal and shorter operational impacts receive higher ratings.
- **Administrative Difficulties.** Assesses the complexity and feasibility of implementation, considering land acquisition challenges, required permits, and existing agreements. Alternatives located on airport-owned land or with fewer administrative barriers receive higher ratings.

Each criterion is scored on a scale from 1 to 5, with the following considerations:

- 5 – Best score
- 1 – Worst score
- Intermediate scores – Assigned through linear interpolation

Not all criteria carry the same level of importance. Therefore, each has been assigned a specific weight to reflect its relative significance in the evaluation process. The assigned weight values are as follows:

	Criterion	Weight
Terminal	1. Cost of Alternative	30%
	2. Operability	15%
	3. Environmental Impact	10%
	4. Impact on Existing Facilities	20%
	5. Ease of Phasing and Future Expansion	15%
	6. Operational Impact/disruptions during the works	5%
	7. Administrative Difficulties	5%
Apron	1. Cost of Alternative	25%
	2. Operability	20%
	3. Environmental Impact	20%
	4. Impact on Existing Facilities	20%
	5. Use of Existing Infrastructure	5%
	6. Ease of Phasing and Future Expansion	5%
	7. Operational Impact/disruptions during the works	5%

*Chart 20 – Evaluation Matrix Weight (terminal and apron)
Source: Ineco*

Each alternative has been evaluated as follows:

1. Cost of the Alternative.

Based on the cost analysis, Alternative 1 emerges as the most cost-effective option. It has the smallest terminal footprint and requires minimal investment in new infrastructure. Although this alternative involves relocating the new BT hangar, no additional land acquisition is needed. The pier provides seven Code C contact stands by converting existing remote stands on Apron 3 into contact stands. All additional stand growth will occur south of Apron 2; however, since there is no loss in capacity, only a modest expansion of the southern apron is required. Additionally, reconditioning existing remote stands does not require airfield modifications, resulting in the lowest overall cost among all alternatives.

Alternative 2 ranks as the second most cost-effective option. It features a slightly larger terminal footprint with nine contact stands, leading to a higher infrastructure investment compared to Alternative 1. The proposed pier on Apron 1 necessitates a larger southern apron extension to compensate for the temporary loss of stand capacity during construction.

Alternative 4 offers a moderately cost-effective solution, with a larger terminal footprint than Alternatives 1 and 2 and eight contact stands. It utilizes part of Apron 1 and is likely to affect existing ground handling facilities and the VIP terminal. Similar to Alternative 1, it requires a smaller southern apron extension due to minimal impact on Apron 1. However, the pier's location overlaps with the existing VIP terminal and hangar, requiring their demolition and relocation, which increases the overall cost.

Alternatives 3 and 5 receive the lowest cost-efficiency scores. Both propose a new pier on Apron 1, requiring the same southern apron extension as Alternatives 2 and 4 to offset temporary capacity loss. Additionally, both require increased apron depth on Apron 1 to support aircraft movements around the pier, impacting the existing VIP terminal and maintenance hangar. These factors, combined with significant disruption to existing infrastructure, result in the highest overall costs among the proposed alternatives.

2. Operability

Alternative 2 scores highest in operability. It is the most operationally efficient option, offering short walking distances and a layout that facilitates the clear separation of Schengen and Non-Schengen passenger flows. With a pier providing nine contact gates (five Code C and four MARS), it offers the greatest flexibility in stand allocation. The location of the new pier on Apron 1 has minimal impact on existing passenger terminal operations.

Alternative 4 ranks second, also offering short walking distances and an efficient layout that supports the separation of Schengen and Non-Schengen flows. It has minimal impact on current terminal operations and provides eight Code C contact gates.

Alternative 5 is comparable to Alternatives 2 and 4 in terms of walking distances and ease of passenger flow separation. However, the pier includes ten Code C contact stands and, due to its configuration, requires additional apron depth to accommodate push-back operations.

Alternative 3, while offering short walking distances, features a unique circular layout that complicates the separation of Schengen and Non-Schengen flows and results in less intuitive passenger routing. The pier includes nine Code C contact stands and, like Alternative 5, requires additional apron depth for push-back operations.

Alternative 1 receives the lowest operability score. The proposed connection between the new pier and the main processor via Pier C complicates the separation of Schengen and Non-Schengen flows. It also results in the longest walking distances among all alternatives. Additionally, terminal expansion is proposed to the north while stand growth occurs to the south, potentially impacting existing operations by increasing traffic volumes on service roads and requiring more bussing between the terminal and southern remote stands.

3. Environmental Impact.

Alternative 1 scores highest in terms of environmental impact. It proposes a new pier located north of the airport, and although it requires the demolition of the new airBaltic hangar, the reconfiguration of existing remote stands on Apron 3 into contact stands reduces the need for southern apron expansion. This minimizes the overall environmental footprint and waste generation.

Alternative 2 follows closely with the second-highest score. It proposes a new pier to the south of the airport, along with a larger southern apron extension. However, this alternative has a relatively low environmental impact, as it does not affect any existing facilities.

Alternative 4 has a moderate environmental impact. Similar to Alternative 1, it places the new pier in an area currently occupied by existing facilities, including the VIP terminal and maintenance hangar, which would need to be demolished. Additionally, further apron development is required to accommodate the new stands and connect to Apron 1, increasing the overall footprint.

Alternatives 3 and 5 receive the lowest scores in environmental impact. The configuration of the piers in both cases requires additional expansion of the southern apron as well as extensions to the east and west of Apron 1, resulting in a larger footprint. Furthermore, the demolition of the VIP terminal and maintenance hangar contributes to increased waste generation and a higher overall environmental impact.

4. Impact and Integration with Existing Facilities.

Alternative 1 scores highest in terms of integration with existing facilities, as it causes minimal disruption and allows for the straightforward relocation of affected infrastructure. This alternative proposes terminal development to the north of the airport, where current operations are concentrated, enabling seamless integration of the new pier without significant interference.

Alternative 2 ranks second. It primarily affects apron areas, temporarily reducing stand capacity. To compensate, the southern apron would need to be extended. Importantly, this alternative does not impact other existing facilities.

Alternatives 3, 4, and 5 receive the lowest scores due to their greater disruption to existing infrastructure, including Aprons 1 and 2, the VIP terminal, and ground handling equipment storage areas and buildings. In addition to requiring southern apron extensions to offset temporary stand losses, these alternatives involve relocating support facilities. Furthermore, Alternatives 3 and 5 require additional apron depth, increasing the complexity of integration.

5. Ease of phasing and future expansion.

Alternative 5 scores highest in terms of both terminal and apron phasing. It offers flexibility to adapt to operational changes, with a pier design that supports modular growth. The layout allows for future expansion in the same direction without impacting existing facilities. However, phasing would require the demolition of the existing VIP terminal and maintenance hangar to create sufficient apron space around the pier.

Alternative 2 ranks second. It also provides flexibility to adapt to operational changes and stand growth. However, further expansion in the same direction is limited due to potential impacts on the apron taxiway system.

Alternative 4 receives a moderate score. While it allows for modular stand growth, the single-sided pier layout is less flexible than double-sided configurations. Future pier expansion in the same direction is possible but would affect existing facilities, reducing the overall score.

Alternative 1 scores low in terms of ease of phasing and future expansion. It accommodates only Code C stands, with no possibility of upgrading to MARS or Code E stands without affecting existing Apron 3 stands. Terminal expansion to the north is constrained by the presence of the cargo terminal and aprons. Although the phasing itself is straightforward, the limitations on future growth make this one of the least favorable options.

Alternative 3 receives the lowest score. Its circular layout does not support terminal expansion or modular stand growth, nor does it offer flexibility to adapt to future operational changes. Similar to Alternative 1, future growth would be limited to the southern apron. Additionally, the pier configuration requires extra apron space, necessitating the demolition of the VIP terminal and maintenance hangar, which adds complexity to the phasing process.

6. Operational impact/disruptions during the works.

Alternatives 1 and 4 score highest in terms of operational impact. Both alternatives have minimal effect on existing taxiway and runway access, and their construction is unlikely to significantly disrupt the passenger experience. While Alternative 1 may cause some inconvenience due to the connection between the new pier and Pier C, the overall impact remains low.

Alternative 2 receives a moderate score. Although it does not interfere with existing taxiway or runway access, the construction of the new pier affects Apron 1. This may result in passengers being bussed to stands located further south, increasing traffic on airside service roads and negatively impacting the passenger experience.

Alternatives 3 and 5 score lowest in this category. Both require additional depth on Apron 1, which leads to the demolition of existing facilities. The construction of the new pier also affects Apron 1, potentially requiring passengers to be bussed to more distant stands. This increases airside road traffic and disrupts the passenger experience. Overall, these alternatives have the highest operational impact, resulting in lower scores.

7. Administrative difficulties.

Alternative 4 scores highest in terms of administrative feasibility. Although it does not affect concessioned buildings directly, the relocation of certain facilities—such as the VIP terminal—may require adjustments to service provider contracts.

Alternative 2 follows closely. It only requires additional land acquisition to expand the southern apron and avoids impacting existing concessions, making it one of the least administratively complex options.

Alternatives 3 and 5 receive similar scores. Both require expansion of Apron 1 to accommodate the new pier and affect existing concessions, increasing administrative complexity.

Alternative 1 scores lowest in this category. While it does not require additional land acquisition, its impact on the existing hangar—subject to a concession contract valid until 2050—presents a significant administrative challenge, making it the least favorable option from a feasibility standpoint.

Based on the evaluation matrix, the recommended alternative for terminal and apron development is **Alternative 2 – South Double-Sided Parallel Pier**. This alternative will be carried forward and further refined in subsequent planning stages.

The table below summarizes the assessment of the five proposed alternatives, based on the evaluation criteria previously defined.

		North Single-sided Perpendicular Pier	South Double-Sided Parallel Pier	South Circular Pier	South Single-sided Perpendicular Pier	South Double-sided Perpendicular Pier
	Weight	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
Terminal						
1. Cost of the Alternative	30%	4	5	2	3	2
2. Operability	15%	2	4	3	5	4
3. Environmental impacts	10%	4	4	3	2	3
4. Impact and integration on existing facilities	20%	4	3	2	3	2
5. Ease of phasing and future expansion	15%	2	4	1	3	5
6. Operational impact/disruption during construction	5%	4	3	2	4	2
7. Administrative difficulties	5%	2	4	4	5	4
Apron						
1. Cost of the Alternative	30%	5	3	2	4	2
2. Operability	25%	2	5	2	3	2
3. Environmental impact	10%	5	3	2	4	2
4. Impact and integration on existing facilities	20%	5	4	2	3	2
5. Ease of phasing and future expansion	5%	3	3	2	4	5
6. Operational impact/disruption during construction	5%	5	5	1	5	1
7. Administrative difficulties	5%	5	5	3	5	3
Terminal Assessment	50%	66%	81%	44%	67%	59%
Apron Assessment	50%	83%	78%	40%	73%	43%
Alternative Assessment (Terminal + Apron)	100%	75%	80%	42%	70%	51%

Chart 21 – Terminal and Apron Alternatives Evaluation Matrix
Source: Ineco

3.3. Ground access

Based on the needs identified in the previous chapter, several proposals have been analyzed to improve accessibility to the airport. Certain elements have been considered fixed, such as the full operation of Rail Baltica by 2050 and the enhancement of the public bus transportation network.

These improvements are expected to result in a modal shift, with more users opting for public transport to access or leave the airport. Nevertheless, light vehicles—including private cars, rentals, and taxis—will remain the primary mode of transport.

In addition, urban development around the airport, including Sirin Park, the Airport City/Business Park, and new logistics and maintenance projects, will further influence accessibility requirements.

To facilitate the monitoring and implementation of these improvement proposals, they have been categorized into three focus areas:

- Enhancements to the passenger pick-up and drop-off areas (kiss and ride), as well as access and exit points to airport facilities.
- The intersection of P133 and Dzirnietu Street.
- A potential new access to the airport area (north access).

Regarding parking, the current shortage of spaces can be reasonably mitigated through effective space management. This section also outlines proposed actions to address this issue.

3.3.1. Improvements within the airport grounds

The airport's new departure and arrival layout, along with planned construction projects, will reshape how vehicles (cars and buses) and passengers access the airport. Key improvements include the Rail Baltica station, the construction of a new multi-storey car park, and the designation of a new area for city and long-distance buses—all of which will enhance overall accessibility.

Access to these areas will be regulated by control barriers at both entry and exit points, allowing for the monitoring of vehicle dwell times within the airport premises.

Following the Stage 6th terminal extension, the kiss-and-ride area for both arriving and departing passengers is expected to operate smoothly, according to simulation results. The same applies to the designated bus and Rail Baltica zones. However, during peak periods, a high concentration of vehicles tends to form at the airport exit, where multiple roads converge.

The current design includes four exit barriers, but during peak seasons (such as spring and autumn) and busy hours of the day, traffic congestion can extend up to the upper level of the kiss-and-ride platform.

Simulation modelling has been used to analyse various alternatives. The simplest and most effective solution is to increase the number of exit barriers from four to five. Simulation results show that this adjustment significantly reduces vehicle congestion. Nevertheless, the implementation strategy should be dynamically aligned with demand patterns, most likely no earlier than 2030, in coordination with other infrastructure development projects and with already implemented infrastructure.

Additionally, to further improve traffic flow, it is recommended that the road system leading to and from the airport be designed to prevent bottlenecks. Specifically, the section between the intersection of P133 and Dzirnietu Street and the airport should maintain at least three lanes in each direction.



Figure 10 – Proposal to expand the number of lanes
Source: Ineco



Figure 11 – Traffic simulation – 2050 – Traffic jam - four exit barriers - Source: Ineco



Figure 12 – Traffic simulation – 2050 – No traffic jam - five exit barriers - Source: Ineco

3.3.2. Current access point: P133 and Dzirnietu

The intersection of P133 and Dzirnietu Street is—and will remain—one of the key access points to the airport. Several previous studies have highlighted its strategic importance and proposed various alternatives to improve traffic flow at this location. However, its current configuration, which allows left turns, significantly limits the duration of green light phases at the traffic signals.

With the future development of the airport's surroundings, traffic conditions are not expected to improve. On the contrary, congestion during peak periods is likely to worsen, and new bottlenecks may emerge.

Microsimulation analysis has identified critical pressure points at this intersection. The main finding is that vehicle accumulation on P133 (from the A10 junction), as well as on Dzirnietu and Ziemeļu Streets, will be considerable. In some cases, vehicles may need to wait through more than five traffic light cycles to pass through the intersection.



Figure 13 – Traffic simulation 2050 – Current network (do nothing scenario) – Queues due to traffic jam
Source: Ineco

In response to the identified challenges, three main alternatives have been analyzed as improvements over the "do-nothing" scenario:

- Construction of an overpass to directly connect P133 and Dzirnietu.
- Conversion of the intersection into a roundabout.
- A combination solution: a roundabout with an overpass.

P133/Dzirnietu int.	Proposal
Alternative 1	Overpass
Alternative 2	Roundabout
Alternative 3	Overpass & Roundabout

Chart 22 – Alternatives/solutions (ground accesses)
Source: Ineco

Alternative 1: An Overpass crossing the intersection

As part of the A5 improvement project—which includes a southern connection to the airport—this initiative considers the construction of an overpass to facilitate direct movement between southbound and eastbound traffic (and vice versa). This would eliminate two of the most problematic turns: the left turn from P133 onto Dzirnietku Street and the right turn from Dzirnietku onto P133. Additionally, the plan includes widening Dzirnietku Street to two lanes in each direction.

Traffic microsimulation has been used to assess the impact of this measure. While the overpass would improve traffic flow—particularly by reducing congestion on P133—it would not eliminate vehicle accumulation on Dzirnietku and Ziemeļu Streets. This is primarily because over 50% of traffic on Dzirnietku is either heading to the airport or continuing straight through the intersection, meaning these vehicles would still be subject to traffic signal limitations. Similarly, nearly all new traffic generated by the RIX Airport City/Business Park would rely on this intersection, whether traveling north (via P133 and its connection to A10), south (via Dzirnietku), or toward Riga.

Additionally, the exit through Sirin Park does not provide a northbound route, and using the A10 to reach Riga or the southern areas is a longer alternative compared to passing through this intersection.

The following images illustrate the traffic challenges that would persist if only the overpass is constructed.



Figure 14 – Traffic simulation – 2050 – Network with overpass – Queues in Dzirnietku street
Source: Ineco



Figure 15 – Traffic simulation – 2050 – Network with overpass – Queues in Ziemeļu street
Source: Ineco

Alternative 2: A Roundabout managing the traffic

As an alternative to the overpass, the possibility of constructing a roundabout was examined. This solution would facilitate all traffic movements at the intersection without the need for traffic signals. A roundabout is considered viable provided that several conditions are met:

- It must have a sufficient number of lanes to safely accommodate all traffic movements.
- Its size must be appropriate for the types of vehicles expected to use it—particularly heavy vehicles.
- Traffic entering the roundabout must be sufficiently balanced to prevent any access point from being blocked by continuous flow from other directions.



Figure 16 – Intersection turned into a roundabout
Source: Ineco

With this configuration, vehicle movements have been observed to flow smoothly on both P133 and at the airport entrance. Ziemeļu Street shows no signs of congestion, while Dzirnietu Street—due to its single-lane configuration in each direction—remains the most congested, although less so than in other scenarios.

Another aspect identified for potential improvement is traffic flow toward C19-Ainavas. Currently, turns from Dzirnietu onto C19-Ainavas (and vice versa) are permitted from all directions. However, with the introduction of the roundabout, left turns from Dzirnietu occasionally cause traffic backups, slightly disrupting the roundabout’s operation.

To mitigate this issue, it is recommended to prohibit left turns from Dzirnietu onto C19-Ainavas. Similarly, vehicles traveling south should be restricted from making a left turn from C19-Ainavas onto Dzirnietu and should instead use the roundabout.



Figure 17 – Traffic simulation – 2050 – Network with roundabout
Source: Ineco



Figure 18 – Traffic simulation – 2050 – Possible critical point
Source: Ineco

Alternative 3: Overpass & Roundabout

Additionally, the feasibility of implementing both scenarios—the overpass and the roundabout—simultaneously has been analyzed, taking into account that the placement of the overpass pillars must align with the space available within the roundabout layout. In this combined scenario, the proposed measures further improve traffic flow, particularly at the airport exit. However, some congestion is still expected to persist on Dzirnieku Street.



Figure 19 – Traffic simulation – 2050 – Network with roundabout and overpass
Source: Ineco

3.3.3. Alternatives Assessment

This section evaluates the alternatives outlined earlier in this chapter and identifies the recommended option for the development of the current terminal area. The evaluation is conducted using a multi-criteria analysis, based on the following set of criteria:

- **Cost of the alternative:** Assesses the overall project cost and future maintenance requirements. Lower costs result in a better evaluation.
- **Operability:** Evaluates the alternative’s ability to manage intersection traffic efficiently. Higher traffic-handling capacity yields a better score.
- **Environmental impact:** Assesses the foreseeable environmental and visual impact, with particular emphasis on land use. Lower impact results in a higher rating.
- **Operational impact / Disruption during construction:** Evaluates the extent to which construction activities will affect airport operations. Less disruption leads to a better score.
- **Administrative Difficulties:** Assesses potential bureaucratic challenges, including permitting and coordination. Easier implementation results in a higher score.

Since only three alternatives are being considered, a three-point scoring system will be used, with 3 representing the best value and 1 the lowest.

However, not all criteria carry the same weight in the selection process. Certain aspects have been deemed more relevant than others, as shown in the following table:

	Criterion	Weight
P133 & Dzirnieku Intersection	1. Cost of Alternative	30%
	2. Operability	40%
	3. Environmental impact	15%
	4. Operational Impact/disruptions during the works	5%
	5. Administrative difficulties	10%

Chart 23 – Evaluation Matrix Weight (ground accesses)
Source: Ineco

In terms of cost, the most economical option is the construction of a roundabout (Alternative 2), as it requires no additional structures and would eliminate the need for existing traffic signal installations. The overpass alternative (Alternative 1) is more expensive due to the need for elevated infrastructure, which involves ground reinforcement, structural works, and increased maintenance. The combined solution (Alternative 3) represents the highest cost, as it requires the execution of both projects.

Another way to assess the suitability of the different scenarios is by evaluating the intersection's vehicle capacity and traffic speed (Operability). Dynamic simulation models confirm that both traffic volume and speed improve under all alternative scenarios compared to the current configuration, reinforcing the need for intervention.

The intersection's entry and exit points have been analyzed as indicators of traffic flow quality, considering not only vehicle volume (vehicles per peak hour by 2050) but also average speed (km/h). The following image and table present the results of this analysis.



Figure 20 – Traffic control points
Source: Ineco

Section	Direction	Number	Current network		Overpass (Alternative 1)		Roundabout (Alternative 2)		Overpass & Roundabout (Alternative 3)	
			Flow	Speed	Flow	Speed	Flow	Speed	Flow	Speed
P133/A10	Westbound	1	906	29	1.182	34	1.488	38	1.524	39
	Eastbound	2	810	72	936	74	1.170	82	1.190	82
P133/Airport	Westbound	3	672	51	1.008	49	912	49	950	49
	Eastbound	4	744	32	930	40	996	28	997	28
Dzirnieku	Northbound	5	276	14	420	18	570	26	571	26
	Southbound	6	612	32	918	36	960	47	948	47
Ziemeļu	Northbound	7	288	43	492	44	558	38	560	38
	Southbound	8	318	12	408	14	528	22	558	24

Chart 24 – Traffic volume and speed -2050(P133/Dzirnieku intersection)
Source: Ineco

Based on the results obtained, Alternative 1 is not the most suitable option for managing traffic at the intersection. Maintaining the current signalized configuration with left turns would preserve several existing issues.

In contrast, Alternative 2 demonstrates better traffic absorption capacity, as confirmed by dynamic simulation results. Alternative 3 offers a slight improvement over Alternative 2.

The environmental impact assessment is nearly identical across all alternatives in terms of land use, as the proposed infrastructure utilizes space currently occupied by the existing roadway. However, in the case of an overpass (Alternatives 1 and 3), the visual impact would be more significant compared to a standalone roundabout (Alternative 2).

Regarding operational impact during construction, the overpass alternatives (1 and 3) are expected to cause greater disruption, although not substantially more than the roundabout alternative.

Finally, no major administrative difficulties are anticipated from local or state authorities, considering that the area required for Alternative 1 does not exceed the current intersection footprint. In contrast, the implementation of a roundabout (Alternatives 2 and 3) affects a larger area and may require additional administrative coordination..

Taking all these elements into account, the evaluation of each alternative is summarized below (with higher scores indicating better performance):

CRITERIA	WEIGHT	Alt 1	Alt 2	Alt 3
Cost of alternative	30%	2	2	1
Operability	40%	1	2	3
Environmental impact	15%	2	2	2
Operational impact / Disruption during construction	5%	1	2	2
Administrative difficulties	10%	1	1	1
Assessment	100%	1,45	1,9	2

*Chart 25 – Ground Accesses Alternatives Evaluation Matrix
Source: Ineco*

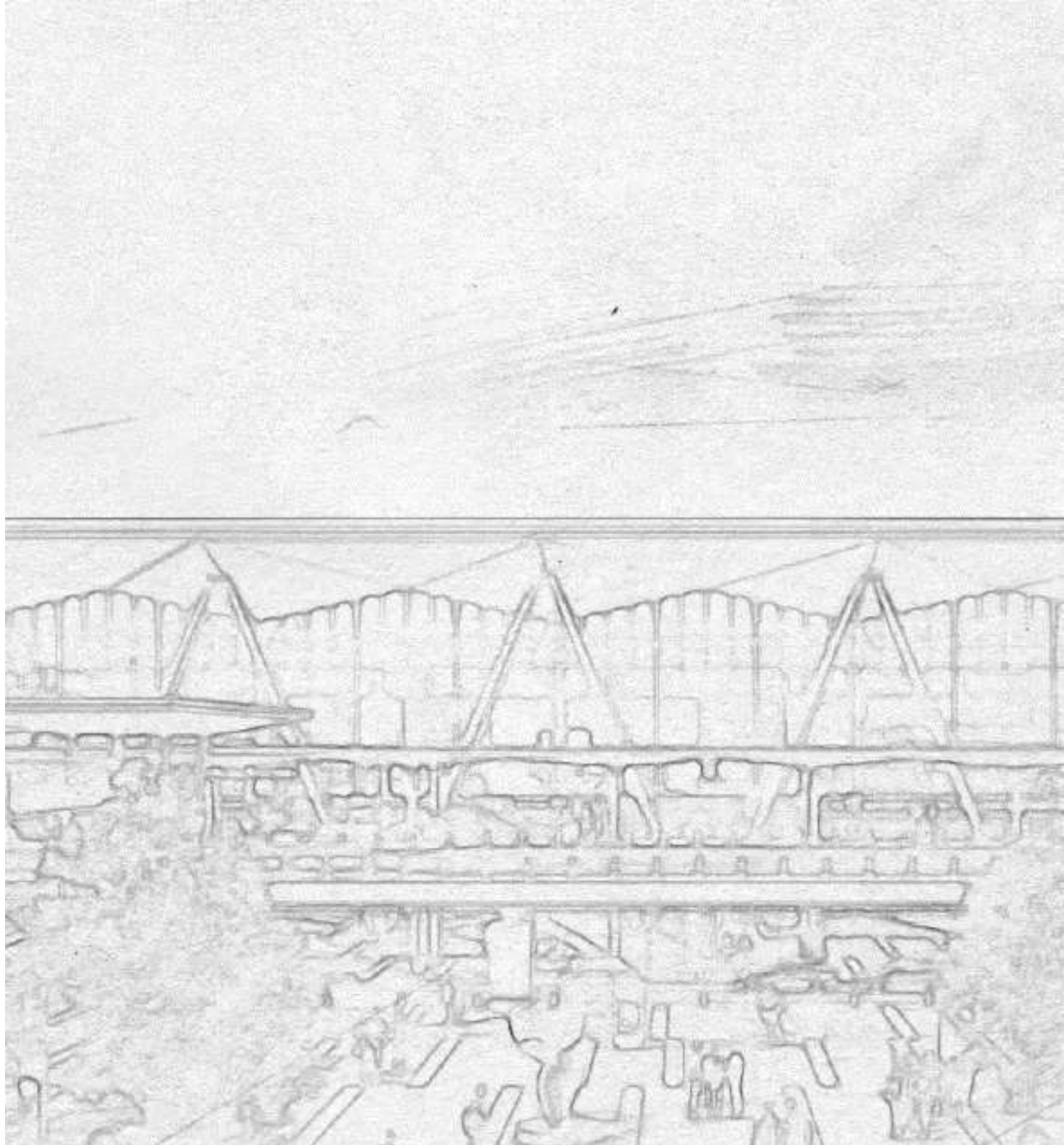
Alternatives 2 and 3 received very similar scores in the evaluation. While Alternative 3 offers a technically and operationally superior solution, it also entails higher costs.

Given the strategic importance of ensuring efficient traffic flow at the airport’s main access point—and to avoid interference caused by pass-through traffic—Alternative 3 is recommended. Its implementation should be coordinated closely with national and municipal authorities to ensure alignment with broader infrastructure planning.

4. PROPOSED AIRPORT DEVELOPMENT 2025-2050

The following chapter provides detailed descriptions of the various development areas, outlining the specific enhancements and expansions planned for each phase—provided that mid-term and long-term traffic thresholds are reached.

This structured approach ensures that Riga Airport can achieve its 2050 vision in response to projected demand growth, in a sustainable and efficient manner.



4.1. RIX 2050 image

The 2050 Master Plan presents a comprehensive vision for the future development of Riga Airport, focusing on maximizing the use of existing infrastructure while incorporating essential upgrades and new facilities. The plan aims to significantly increase the airport's capacity and operational efficiency, ensuring it can meet growing air travel demand and remain competitive in the global aviation market.

The following section provides detailed descriptions of the specific development areas, including enhancements to airfield and apron capacity, expansions of the passenger terminal, implementation of business park projects, and upgrades to essential airport services and infrastructure.



4.1.1. Airfield and apron

As part of the long-term development strategy, a key objective is to extend the operational lifespan of the existing airfield infrastructure. Regular maintenance and targeted interventions are essential to ensure that the runway, taxiways, taxilanes, and apron surfaces remain safe and functional for aircraft operations. In addition to new projects, the following rehabilitation and reconstruction works must be carried out:

- ➔ Rehabilitation of Taxiways B, C, D, E, F, and Y to preserve structural integrity, maintain operational efficiency, and ensure safe aircraft movement.
- ➔ Runway surface rehabilitation to extend its lifespan and guarantee safe landings and takeoffs.
- ➔ Rehabilitation of Taxilanes S, T, and U1, as well as service roads around Terminals B and C, which require upgrades to support efficient ground operations and vehicle movement.
- ➔ Electrical infrastructure upgrades to be implemented in parallel with all rehabilitation works.

The sequence of these projects will be determined by the airport operator, based on operational priorities, resource availability, and evolving traffic demands.

In parallel, expansions will be carried out to accommodate expected demand growth. The proposed development for the 2050 horizon will significantly increase runway capacity, enabling up to 39 operations per hour, compared to the current declared capacity of 29 operations per hour.

The airfield development plan includes:

- ➔ **New Code E Parallel Taxiway:** A full-length Code E taxiway will be constructed parallel to the existing Taxiway F. Its primary purpose is to reduce interference between arriving and departing aircraft, enhance airside efficiency by separating traffic flows, and facilitate the movement of larger aircraft (up to Code E).
- ➔ **Taxiway F Reclassification:** Due to the proximity of the new parallel taxiway, Taxiway F will be downgraded to a Code C taxilane, ensuring compliance with safety regulations. This configuration allows simultaneous and independent taxiing operations for Code C aircraft in both directions, improving airfield efficiency.
- ➔ **New Rapid Exit Taxiways (RETs):** Two Code E RETs will be added to expedite aircraft exits from the runway, reducing Runway Occupancy Times (ROT) and increasing overall runway capacity, safety and efficiency.
- ➔ **New Partial Parallel Taxiway:** A partial parallel taxiway will be developed on the western side of the existing runway to provide access to future MRO and General Aviation developments.
- ➔ **Reconfiguration of the Centralized Aircraft De-icing Facilities:** The de-icing facilities will be reconfigured to expand the number of de-icing pads, improve operability, and enable dual use as runway access holding bays to support departure management during peak traffic periods.

Figure 21– Riga Airport Runway and Taxiway System 2050 Horizon - Source: Ineco



The apron development planned for the same period, illustrated in Figure 22, aims to establish a clear functional distinction between apron areas. On the eastern side of the runway, aprons will primarily be dedicated to commercial passenger and cargo operations, ensuring efficient handling of aviation revenue-generating activities. Conversely, apron areas on the western side of the runway will be designated for Maintenance, Repair & Overhaul (MRO) activities and General Aviation (GA) operations.



Figure 22 – Riga Airport Apron Development 2050 Horizon
Source: Ineco

The apron development plan includes the following components:

- ➔ Reconfiguration of Apron 1: A new pier will be constructed across Aprons 1 and 2, with capacity for nine Code C contact stands. During construction, Apron 1 will temporarily lose some stand capacity, which will be recovered once the pier becomes operational.
- ➔ Reconfiguration and Expansion of Apron 2: Apron 2 stands will be reconfigured to improve aircraft movement around the apron, the southern expansion, and the new pier. This reconfiguration will optimize space usage and enhance operational flow. The construction of the pier and associated separation and movement areas will reduce the number of existing stands. In later phases, Apron 2 will be further expanded to provide additional remote positions.
- ➔ Southern Apron Expansion: Apron 2 will be extended southward to compensate for the temporary loss of capacity during pier construction and to increase remote stand capacity once the pier is operational.
- ➔ New MRO Apron: A new apron will be developed west of the existing runway to support MRO operations. Mid-term development includes relocating part of the current MRO activities to this area. Skulte Road will serve as the access route, and the connection to Jaunmārupe will need to be rerouted.
- ➔ New GA Apron: A new apron will be developed west of the runway for General Aviation (GA) and business aviation (FBO) operations.
- ➔ DVOR/DME RIA relocation: The proposed development of MRO, FBO, and other aviation-related activities on the western side of the runway will require relocating the DVOR/DME RIA system, originally installed in 2005 and renovated in 2022. The new location will be coordinated with Latvijas Gaisa Satiksme (LGS) to ensure compatibility with future airport developments.
- ➔ Isolated Parking Stand Relocation: The existing Z3 isolated aircraft parking stand will be relocated to accommodate western MRO development. A potential new location is west of THR 36. The relocated stand could also serve as an engine test area to minimize impact on surrounding zones.

4.1.2. Passenger Terminal building

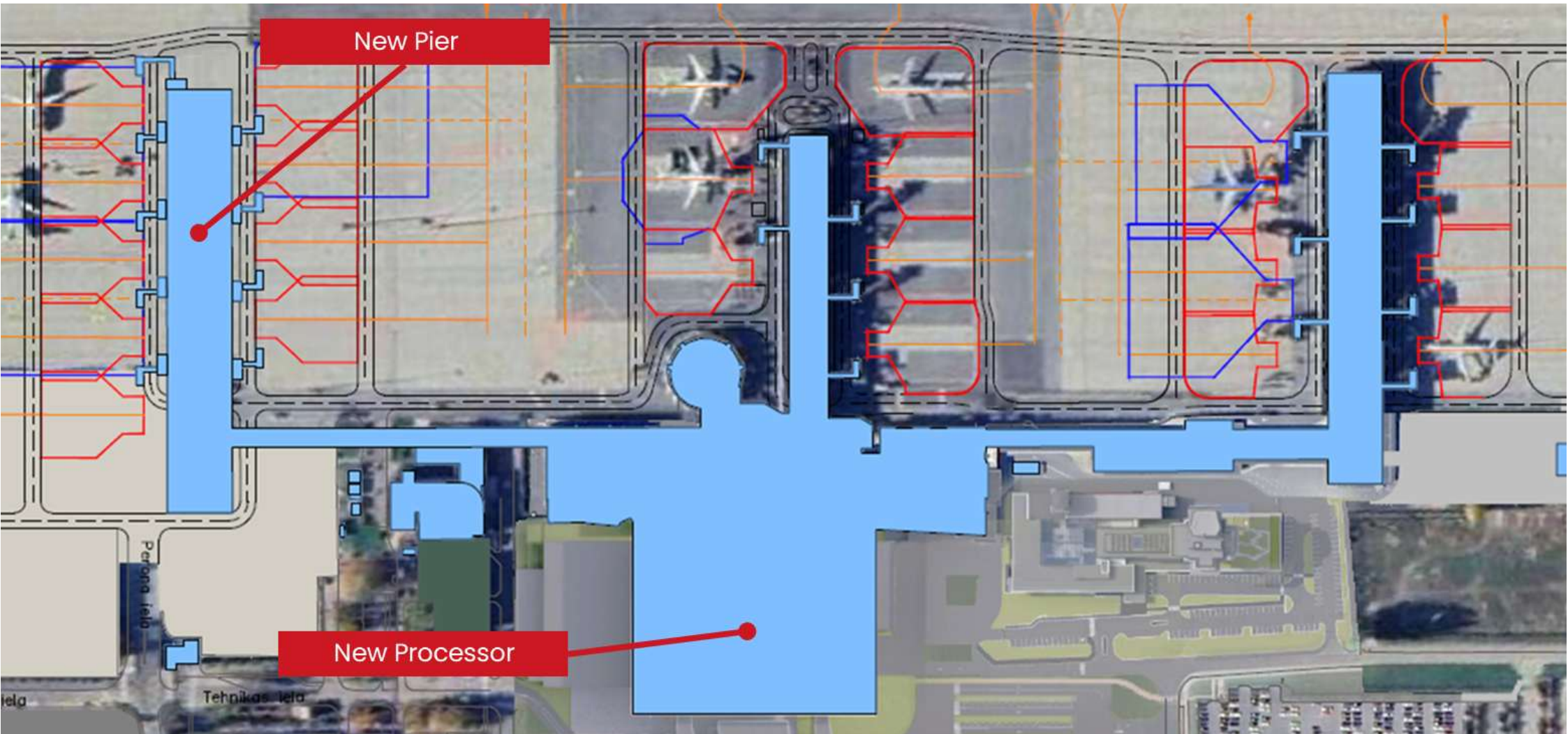
Figure 23 illustrates the terminal development planned for the 2050 horizon, which includes both the new terminal processor (Stage 6th) and a new pier. All developments will comply with applicable regulations, including the Accessibility Act for Persons with Reduced Mobility (PRM). Stage 6th is a major expansion project aimed at modernizing the airport and increasing passenger capacity in line with projected growth. It will be located adjacent to the existing terminal building and will expand the following areas:

- Passenger services in the public part: including the check-in hall, security checkpoint, airline ticket offices, airport administration offices, and retail spaces accessible to all visitors.
- Baggage handling infrastructure: expansion of the baggage sorting and storage facilities.
- Arrival infrastructure: including passport control for Non-Schengen passengers, a transfer security checkpoint for Non-Schengen passengers traveling to Schengen destinations, baggage claim hall, airport offices, warehouses, cleaning facilities and mechanical, electrical, and plumbing (MEP) systems.

The proposed new pier will extend the terminal to the south and accommodate up to nine Code C aircraft contact stands, or a combination of three Code C and three Code E stands in MARS configuration. It will connect to the main processor via a second-level corridor and will serve both Schengen and Non-Schengen passengers. The pier will be structured across three levels:

- First and Second floors: These levels will house departure lounges, including holdrooms, seating areas, and commercial spaces. Passport control facilities will be provided for Non-Schengen passengers to access designated departure areas.
- Mezzanine or third level: This level will be dedicated to arriving passengers from Non-Schengen countries and will include specially adapted service areas for transit passengers or those arriving in Latvia from outside the Schengen zone.

Figure 23 – Riga Airport Terminal Development 2050 Horizon Source: Ineco



4.1.3. Ground access

There are two main actions to be carried out to improve ground access to Riga Airport:

- The roundabout and overpass connecting the P133 road and Dzirnietu Street.
- The new northern access with connection to the A10.

Roundabout P133/Dzirnietu Street

In the previous chapter, three possible solutions for this link were proposed:

- Alternative 1: Construction of an overpass to directly connect P133 and Dzirnietu Street.
- Alternative 2: Conversion of the intersection into a roundabout.
- Alternative 3: A hybrid solution combining both, a roundabout with an overpass.

The recommended solution, Alternative 3, involves a phased approach: first, converting the intersection into a roundabout (Alternative 2), and later constructing an overpass (Alternative 1) to further enhance traffic flow and mobility throughout the area.



Figure 24 – Intersection turned into a roundabout and an overpass (by 2040)
Source: Ineco

New northern access – connection to the A10

To further improve airport accessibility, a new access road connecting the A10 to the airport facilities has been proposed. This link would not only serve airport traffic but also enhance connectivity to nearby residential areas, such as Beberbeķi.

The new interchange would be located approximately midway between the existing A10 junction with the A5 and the P133. It would provide a U-turn option for Beberbeķi residents, significantly reducing travel time and vehicle emissions.



Figure 25 – New link connection with A10
Source: Ineco

Other access improvements required

The development of Sirin Park presents new connectivity opportunities with both the A10 and P133. However, these access points do not support all traffic movements, meaning vehicles must rely on either the P133 or the P133/A10 link to access the A10 northbound.

Furthermore, these connections offer limited benefit to areas beyond Sirin Park, as the Rail Baltica track acts as a physical barrier, separating Sirin Park from the airport except at a single crossing point. Without a dedicated crossing, the railway could become a significant obstacle, leaving Grenču Street as the only viable route for direct access.



Figure 26 – New accesses in Sirin Park to the Airport cargo and logistic area
Source: Ineco



Figure 27 – Barrier effect of Rail Baltica tracks
Source: Ineco

4.1.4. Airport City and other commercial areas

The commercial implementation of Airport City at Riga Airport can be carried out under various management models, each aligned with the following general objectives:

- Enable rapid and efficient development to optimize revenue generation. The selected model must ensure the economic and commercial success of the operation.
- Maximize project profitability and self-financing capacity, while minimizing Riga Airport's direct financial contributions.
- Leverage the management expertise of market-leading operators.
- Apply a flexible management model that does not impose restrictions on the selection of the most efficient operators.

The consulting team recommends attracting a private partner for the development and management of the Airport City project, due to the experience and resources that a private entity can offer—particularly in managing high-capacity real estate assets.

Depending on the type of real estate involved, and in accordance with the various models permitted under Latvian legislation, the proposed approach involves engaging private partners for both the development and management of Airport City. This can be implemented either through a landlord model or via an integrated model, such as establishing a joint venture between Riga Airport and a private partner.

Figure 28 depicts the Airport City Development for the 2050 planning horizon including:

- Hotels:
 - Hotel 1: Minimum of 200 rooms, with a design ratio of 25–30 square meters per room plus an additional 30% for common areas. Total buildable area: 9,000 m².
 - Hotel 2: Same specifications as Hotel 1, with a total buildable area of 9,000 m².
- Conference Centre with a buildable area of 3,000 m². It will be located near Hotel 1 to leverage commercial synergies between both business lines.
- Two office buildings:
 - Office Building 1: Designed to accommodate approximately 1,200 employees, with an occupancy ratio of 10 m² per employee. Total buildable area: 12,000 m², with a building coefficient of 2.
 - Office Building 2: Same specifications as Office Building 1.
- Supporting commercial areas: a total of 7,200 square meters will be allocated for commercial support services.
- Industrial area: depending on the success of existing cargo operators and future demand, several industrial zones are planned, with a total buildable area of 81,720 m².
- Full-service Fuel Station: The station will include fuelling space for at least six vehicles and two trucks or buses, an EV charging station, car wash facilities, retail and food services, and parking for up to 12 trucks simultaneously.

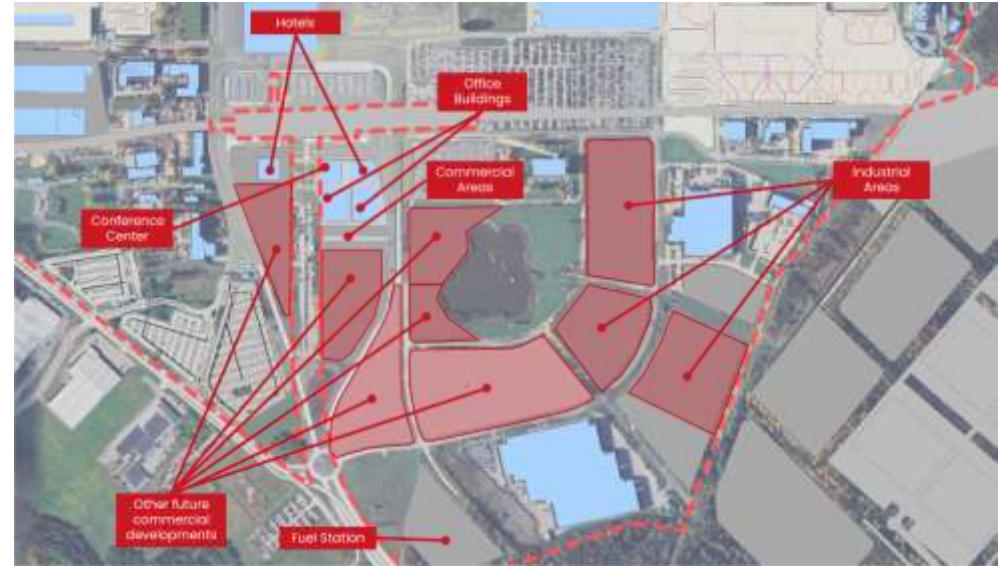


Figure 28 – Airport City Development 2050 Horizon - Source: Ineco

Parking

Parking facilities will represent a significant source of revenue for Riga Airport. A variety of parking options will be offered to meet diverse user needs, including short-term parking for travellers requiring quick access, long-term parking for those leaving their vehicles for extended periods, and designated parking areas for airport employees. These parking services not only generate income but also enhance convenience and improve the overall experience for both passengers and staff.



Figure 29 – Parking Developments
Source: Ineco

Commercial concessions at terminal building

In-terminal concessions will play a crucial role in generating non-aeronautical revenue for Riga Airport. These include a duty-free area located after the new security screening checkpoint, retail shops, food and beverage (F&B) outlets, and other services such as currency exchange, car rentals, and business lounges. With the significant enhancements introduced by the new terminal processor under Stage 6th, the commercial area will expand considerably. This expansion will offer passengers a wider variety of shopping and dining options, enhancing their overall airport experience while boosting the airport’s income from commercial activities.



4.1.5. Other airport support and service infrastructure

Airport Electrical Network

The airport has launched a series of projects aimed at enhancing its electrical systems, including the renovation and modernization of several substations. Some existing substations have been dismantled to make way for more advanced infrastructure. Future projects will require the reconstruction of additional substations and the renewal of key components to ensure a reliable power supply for planned developments.

It is important to note that all future projects at the airport—particularly those proposed on the western side of the current runway—will include the necessary pipelines, installations, and substations to guarantee a dependable power supply for each facility.

Water system

The existing water supply network will need to be rebuilt or renovated as necessary to maintain its condition and ensure reliable service. Extensions to the current network, required to support new airport facilities, must be designed in accordance with local regulations and tailored to the specific needs of each location—taking into account topography, pressure requirements, and the need for new depots.

Riga Airport has already completed several key upgrades to its water infrastructure, including the construction of a second water inlet for the administration building and the reconstruction of the main network along Tehnikas Street. Although the modernization of the water treatment station has been postponed, the airport is now prioritizing the establishment of two new water supply connections to the Riga city network. These projects aim to enhance the airport’s infrastructure and ensure efficient, reliable water management. Figure 30 shows in blue the two new water inlets agreed with Riga Municipality.



Figure 30 – New water inlets
Source: Riga Airport

In addition, the rehabilitation of drainage systems and the development of sewage networks for the business park area are also planned. Two separate sewer systems—domestic and stormwater—are in place to ensure wastewater management in compliance with the requirements of the Category B Polluting Activity Permit.

A total of 16 wastewater treatment facilities are currently installed within the airport grounds. These facilities are designed to purify stormwater that may contain petroleum products. New treatment units are also planned as part of the Rail Baltica project.

The airport’s stormwater drainage system includes six discharge points that collect and treat stormwater before releasing it into the environment. From these points, water flows into a drainage ditch connected to the Nerija River. Future designs must assess whether the Nerija River can accommodate increased water volumes. In some cases, it may be necessary to increase the river’s capacity in coordination with municipal and environmental authorities.

To monitor groundwater quality and control pollution, eight monitoring wells are installed across the airport site—three near the fuel storage facility and five along the runway.

These improvements will address water supply, wastewater treatment, and drainage challenges, supporting both operational needs and environmental standards. As with previous infrastructure sections, it is important to note that all future airport developments—particularly those planned west of the current runway—will include the necessary pipelines and installations to ensure a reliable water supply.

The airport also aims to enhance sewage outlet capacity by connecting to the Riga municipal sewage system.

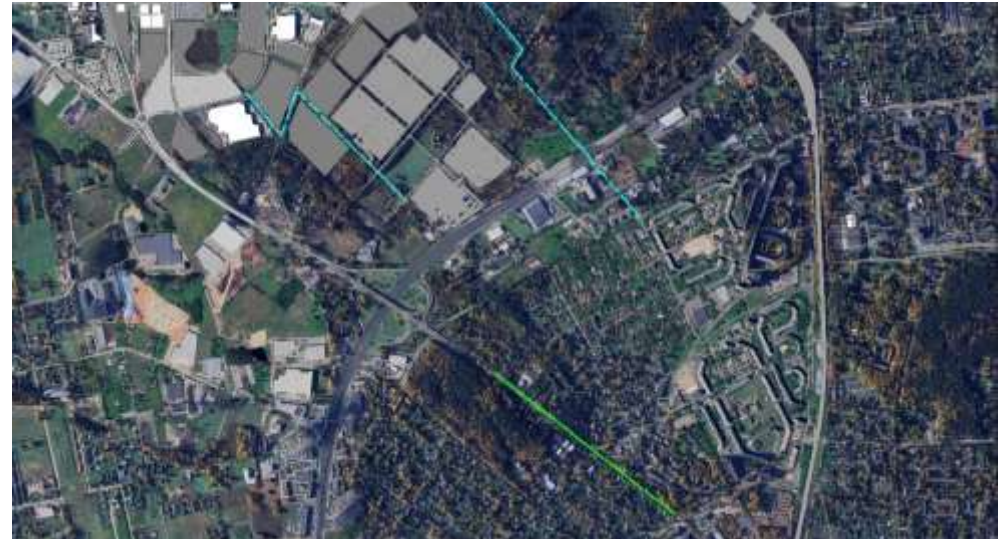


Figure 31 – New sewage line extension from existing exhaust point
Source: Riga Airport

Airport Equipment

Ground handling services—such as passenger check-in, baggage handling, towing, de-icing, and fueling—are essential to airport operations. Under EU regulations, most ground handling services at larger airports are subject to free competition, offering airlines greater choice.

From a planning perspective, the airport must ensure sufficient space and facilities are available for ground handling agents to support aircraft operations. In particular, adequate space must be allocated for equipment and vehicles required to deliver these services throughout the 2025–2050 period.

The same principle applies to other operational equipment, whether provided by the airport operator or by emergency services such as firefighting units.

Vehicles are grouped into the following categories:

- Passenger Services: includes vehicles for VIP transport, passenger shuttles, minibuses, and special assistance vehicles.
- Airport Operations: includes operation and surveillance vehicles.
- Maintenance: used for the upkeep of airport infrastructure, including runways, taxiways, aprons, buildings, and technical systems.
- Emergency Vehicles: includes firefighting and rescue vehicles essential for safety and emergency response.
- Security: includes patrol and surveillance vehicles, as well as staff transport units.

To meet future demand, the airport must ensure sufficient space is available to accommodate ground handling, operational, and emergency service vehicles—estimated to reach approximately 280 units by 2050.

Chart 26 summarizes the vehicle acquisition requirements for 2050 by group.

Category	No. Vehicles
Passenger	25
Airport Operations	21
Maintenance	68
Emergency	8
Security	8
Total	130

Chart 26 – Vehicle Acquisition Requirements (2050 Horizon)

Source: Ineco

All apron and terminal area developments proposed in this Master Plan include provisions for additional space—either directly on the airside or with easy access to airside zones—to accommodate the equipment and facilities required by ground handling service providers in the future.

Airport Technical Zone

The airport’s industrial and technical zone is a key component of the airside infrastructure, designed to support the daily operational readiness of aircraft, Ground Support Equipment (GSE), and all airport maintenance systems. The new technical zone will remain in its current location but will be reorganized with a new layout.

This zone will include facilities for GSE and maintenance equipment storage and servicing, vehicle depots, and operational support buildings. Its location ensures efficient access to aircraft while minimizing interference with passenger and cargo flows.



Figure 32– Airport Technical Zone

Source: Ineco

This area will have direct access to the airport perimeter road, which will also need to be renovated and extended to accommodate future airport development.

Aviation Fuel Storage

Riga Airport currently operates two fuel storage facilities, managed by RIXJET RIGA and Gulfstream Oil. These operators are responsible for fuel logistics, safety compliance, and ensuring supply continuity. The fuel storage concessions are due for renewal in the coming years, and the airport intends to extend them to maintain operational continuity and ensure compliance with sustainable aviation fuel regulations. In 2023, the airport recorded a fuel demand of 130,000 tons, which slightly decreased to 126,000 tons in 2024. The existing fuel storage facilities are currently sufficient to meet operational needs. Based on projected demand, the current tank capacity is expected to remain adequate throughout the planning horizon. However, once fuel demand approaches the limits of existing capacity, it will be necessary to modify or upgrade the storage infrastructure.

Net Zero CO2e initiatives

Solar power plants and electric charging stations

To align with Riga Airport’s sustainability roadmap and meet the energy demands of expanding infrastructure and increased traffic, solar power capacity must be expanded. Additional space for solar parks has been identified either adjacent to the existing solar park project or on the southwestern side of the runway. The southwestern location offers scalable land availability, sufficient space for a new power substation, and compatibility with the airport’s long-term development plans.

Additional electric charging stations should be installed in public parking areas, as well as in airside and landside airport facilities. These stations do not require strict safety measures and can be implemented with relative ease.

Hydrogen storage and refueling stations

Hydrogen storage and refueling infrastructure is already under consideration by Riga Airport. Future development of hydrogen-powered airport vehicles, GSE, and public transport must be factored into planning. Two potential locations³ have been identified, both with access to airside areas as required. The initial development will be located near the Airport Technical Zone, while the southeastern reserved site offers airside and landside access, sufficient space, and compliance with safety regulations for hydrogen storage. However, the development of a hydrogen fuel station should be carefully evaluated in line with the evolution of hydrogen technology, its adoption in the public and GSE markets, and evolving safety standards.



Figure 33 – Solar park and Hydrogen fuel station locations
Source: Ineco

³ These infrastructures can only be implemented upon the relevant risk assessment.

4.2. Phasing

The Master Plan is structured to ensure a phased and systematic approach to the airport’s development, allowing for the gradual implementation of enhancements and expansions aligned with projected growth and operational needs. The phasing strategy is essential for managing resources efficiently, minimizing disruptions to ongoing operations, and ensuring that each stage builds upon the previous one to achieve the overall 2050 vision.

This Master Plan adopts a demand-driven approach. Proposed projects are not tied to fixed timelines (e.g., 2025, 2030, 2040, 2050). Any reference to specific years in this document should be understood as corresponding to the traffic levels forecasted for that year. Investment decisions will be triggered by the achievement of those traffic thresholds, ensuring that development responds to actual operational needs.

4.2.1. 2025-2030: Starting Point

The first phase of the development plan spans from 2025 to 2030 and focuses on laying the groundwork for future growth while enhancing existing infrastructure. Key projects during this period include the construction of the new terminal building (Stage 6th), which will significantly improve passenger and baggage processing capacity and efficiency, as well as the reconstruction of Apron 4.

Additionally, strategic land acquisitions may be carried out to facilitate projects in subsequent phases, ensuring the airport’s ability to expand as needed.

Rehabilitation works on the runway, taxiways, and aprons are planned to maintain and enhance the operational integrity of these critical areas. This phase also includes the initial development of Riga Airport City, featuring a hotel, conference centre, office building, fuel station, and industrial area—aimed at boosting the airport’s commercial appeal and supporting regional economic growth.

Land Acquisition

The actions proposed during the initial phase do not require land acquisition. However, in preparation for future decades, the airport must proactively acquire the plots of land necessary for subsequent development stages.



Figure 34 – Development Area 2025 – 2030 Period - Source: Ineco



Airfield and Apron

During this phase, the focus will be on extending the operational lifespan of the existing airfield infrastructure. Periodic interventions will be carried out on the runway, taxiways, taxilanes, and apron surfaces to ensure they remain safe and functional for aircraft operations.

Passenger Terminal Building

The new terminal building is a major expansion project aimed at modernizing the airport and increasing its passenger capacity. The new processor will be located adjacent to the existing passenger terminal, as illustrated in Figure 35.

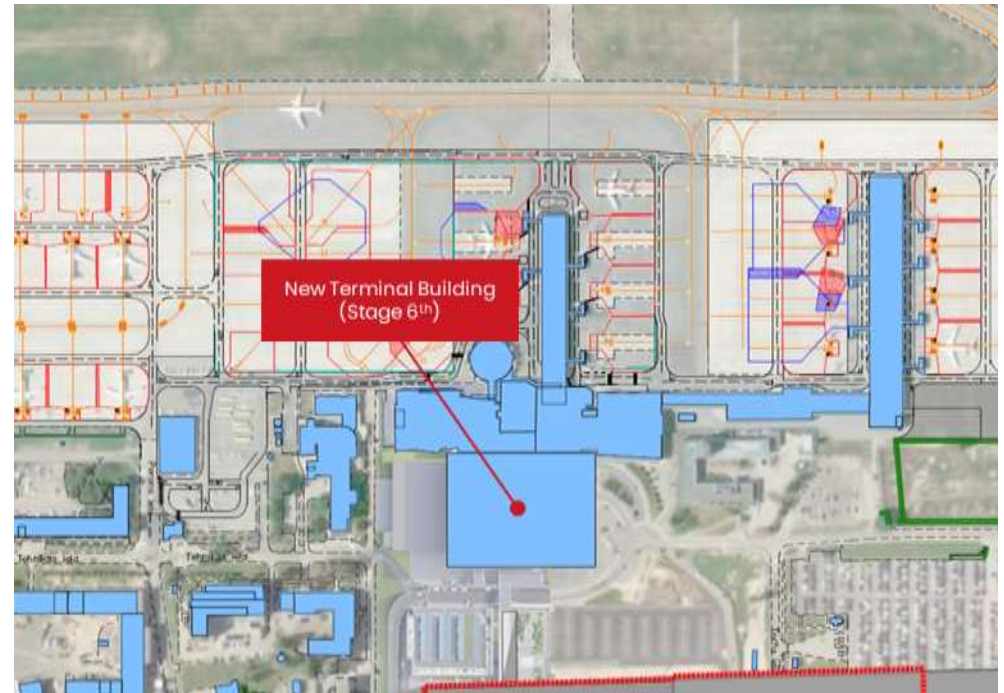


Figure 35 – Passenger Terminal Building (Starting Point 2025 – 2030)
Source: Ineco

Ground Access

Over the coming years, improvements to the airport access road will focus on the intersection between P133 and Dzirnietu Street. The proposal for 2030 involves converting the existing intersection into a roundabout, designed to efficiently manage traffic from all converging roads. This upgrade is expected to significantly improve traffic flow, particularly by reducing queue lengths during peak hours.



Figure 36 – Improvement of the P133/Dzirnietu Intersection (from Current Situation to Alternative 2)
Source: Ineco

Airport City and Other Commercial Areas

Business Park

The implementation of the Business Park development during the Starting Point period will be carried out in four action groups:

- Hotel 1 and Conference Center
- Office Building 1 and supporting commercial areas
- Industrial area 1
- Full-service fuel station

The implementation strategy must consider the airport’s priorities and aim to minimize operational impact. Phasing will be organized by action group.

Group 1: Hotel 1 and Conference Centre

The consulting team recommends establishing a single contract for the operation of both business lines. The tender should specify the required services for the hotel, including event organization at the conference centre, and indicate a hotel category between three and four stars. The hotel must accommodate approximately 200 rooms, with a design ratio of 25–35 square meters per room plus an additional 30% for common areas, resulting in a total buildable area of 9,000 m². The conference centre will have a buildable area of 3,000 m² and will be developed alongside Hotel 1 to leverage commercial synergies. Combined, the total buildable area is 12,000 m².

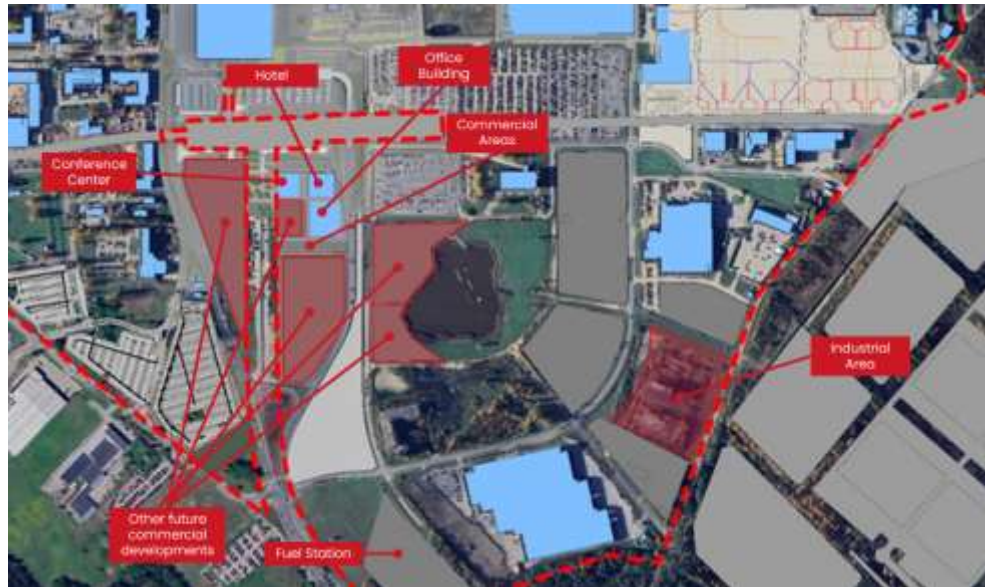


Figure 37 – Business Park 2030 Horizon developments
Source: Ineco

Group 2: Office Building 1 and Supporting Commercial Area

To minimize Riga Airport’s investment, it is recommended to launch a tender for the concession of the designated areas for construction, rental, and operation. With a projected demand of 1,200 employees and an occupancy ratio of 10 m² per employee, the office building will have a buildable area of 12,000 m², with a building coefficient of 2.

Group 3: Industrial Area 1

Based on consultations with RIX air cargo operators, there is no clear certainty regarding the need for additional space beyond current facilities. Therefore, this action should be contingent on market demand. The selected operator must carry out pre-commercialization, construction, and rental of a 40,860 m² buildable warehouse in the first stage. The tender may require the submission of preliminary agreements with companies interested in occupying the space.

Group 4: Full-service Fuel Station:

Already in the procurement stage at the time of drafting this document, the new fuel station will include fuelling space for at least six vehicles and two trucks or buses, an EV charging station, car wash facilities, retail and food services, and parking for up to 12 trucks simultaneously.

Strategic Land Reservation

In anticipation of future market trends and commercial opportunities, the airport will reserve specific areas for potential developments, ensuring flexibility to adapt to emerging business needs.

In-Terminal Commercial Concessions

As previously mentioned, in-terminal concessions will play a key role in generating revenue for Riga Airport. The size and distribution of commercial areas will be defined as part of the refurbishment of the existing terminal building, coinciding with the construction of the new Stage 6th passenger and baggage processor, as follows:

Floor	First Floor	Second Floor	Third Floor
Duty Free	260 m ²	3,770 m ²	-
F&B and Commercial	250 m ²	4,140 m ²	545 m ²
Total	510 m²	7,910 m²	545 m²

Chart 27 – New Terminal Commercial Areas
Source: Ineco

4.2.2. 2031-2040: Next Steps

The second phase of development, covering the period up to the point when the airport reaches 13.5 million annual passengers (expected around 2040 according to the Master Plan demand forecast), focuses on major expansions and relocations to support growing operations and enhance infrastructure.

A new full-length parallel taxiway for Code E aircraft will be constructed to improve the efficiency and safety of aircraft movements. During this phase, a new pier will also be built, increasing the airport's capacity and improving passenger flow.

The southern apron will be extended, and Aprons 1 and 2 will be reconfigured to accommodate the new pier, ensuring seamless operations and improved aircraft handling. MRO facilities will be partially relocated to the west of the runway, where a new MRO development will be constructed. The maintenance area will be reorganized to include new buildings for workshops and storage, along with a new area for handling equipment and offices for ground service providers located on the front line of the apron.

Further development of the business park is also planned, including the addition of a second hotel, a new office building, and an expanded industrial area.

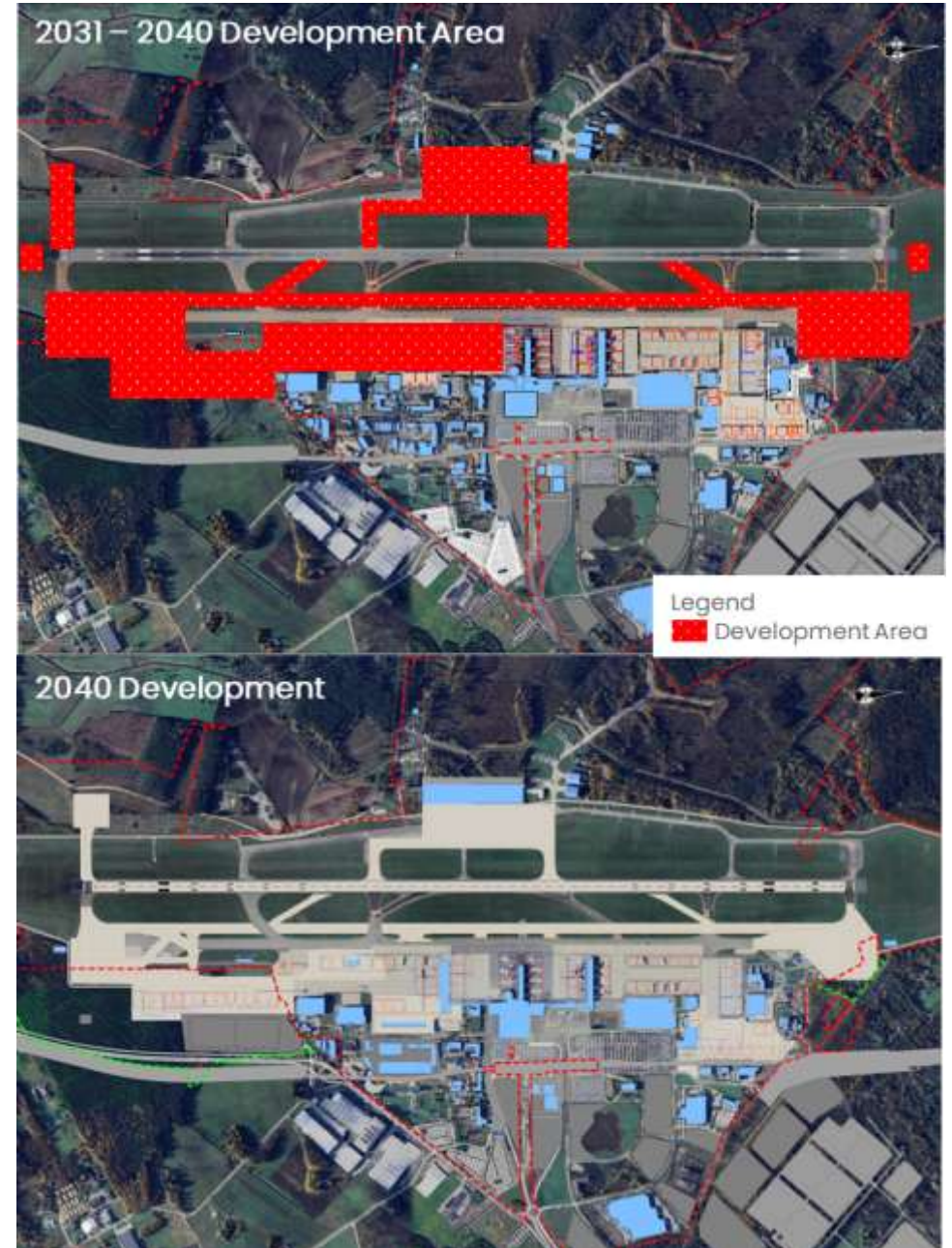


Figure 38 – Riga Airport Mid-term Development (2040) - Source: Ineco



Land Acquisition

During the Next Steps period the airport authority must acquire the territories highlighted in Figure 39, to ensure that future projects can be executed effectively. The green line indicates the required new property, while the red line represents current airport-owned land.



*Figure 39 – Land Acquisition 2031 – 2040 Period
Source: Ineco*

The total area to be acquired for development by 2040 amounts to 45.6 hectares. This acquisition is essential for the expansion and modernization of airport infrastructure and must be completed in a timely manner to allow construction to begin according to the planned schedule for each project.

Airfield and Apron

Riga Airport is expected to efficiently handle projected demand through 2050 with a single runway. However, to ensure optimal operational efficiency and safety, significant upgrades to the taxiway system will be required. The preferred development strategy focuses on maximizing the use of existing infrastructure while incorporating essential enhancements that will increase overall airfield capacity.



Figure 40 – Riga Airport Runway and Taxiway System Mid-term Development (2040)
Source: Ineco

The development plan for the maneuvering area during the 2031–2040 period includes the following key projects:

- New Code E Parallel Taxiway: A full-length Code E taxiway will be constructed parallel to the existing Taxiway F. Its primary purpose is to reduce interference and potential conflicts between arriving and departing aircraft, thereby enhancing airside efficiency by separating traffic flows. Additionally, it will facilitate the movement of larger aircraft (up to Code E) and increase overall taxiway capacity.
- New Rapid Taxiway Exits (RETs): Two Code E RETs will be added to expedite arriving aircraft exits from the runway, reducing ROTs and improving overall efficiency.
- New Partial Parallel Taxiway: A partial parallel taxiway will be developed on the western side of the existing runway to provide access to the western new MRO development.
- Centralized Aircraft De-icing Facilities. The two existing de-icing areas at each end of the runway will be redesigned. These facilities are essential for de-icing and anti-icing treatments prior to takeoff. The redesigned areas may also serve as runway access holding bays to manage departures during peak traffic periods, enhancing both operational efficiency and safety.
- DVOR/DME RIA relocation: The planned development of MRO, FBO, and other aviation-related activities on the western side of the runway will require the relocation of the DVOR/DME RIA system, originally installed in 2005 and renovated in 2022. The new location will be coordinated with Latvijas Gaisa Satiksme (LGS) to ensure compatibility with future airport developments.
- CWY: Although extending the runway length is not necessary, it is proposed to declare a CWY to increase the Take-Off Distance Available (TODA). This proposal will be further analysed within the Obstacle Limitation Surfaces (OLS) framework.

The mid-term development phase includes significant enhancements to apron areas to accommodate increased capacity and operational needs. The 2031–2040 development plan includes:

- South Extension of Apron 2: Apron 2 will be expanded southward to compensate for the temporary loss of capacity caused by the construction of the new pier.
- New MRO Apron West of the Runway: A new apron will be developed west of the existing runway to support MRO operations. The mid-term plan proposes relocating part of the current MRO activities from Apron 2 to this new western area.
- Reconfiguration of Apron 1: Apron 1 will be reconfigured to accommodate the new pier, which will feature nine Code C contact stands.
- Reconfiguration of Apron 2: Apron 2 stands will be reorganized to improve aircraft movement around the apron and its southern extension, optimizing space usage and enhancing operational flow.
- Isolated Parking Stand: The isolated aircraft parking stand will be relocated west of THR36 to enable western MRO development. This stand may also be used for engine testing, minimizing impact on surrounding areas.
- Electrical Infrastructure Upgrades: All planned apron expansions and reconfigurations will be accompanied by comprehensive electrical works, including the installation and relocation of airfield lighting systems, power supply for Ground Support Equipment (GSE), and aircraft Ground Power Units (GPUs).



Figure 41 – Riga Airport Apron Mid-term Development (2040)
Source: Ineco

New MRO and GA areas

Figure 41 illustrates the western development area, where MRO and GA operations will be partially relocated. At the Starting Point, Apron 2 is primarily used for business aviation, general aviation (GA), and aircraft maintenance. During the 2031–2040 period, Apron 2 will undergo expansion and reconfiguration, with all stands repurposed for commercial passenger operations. This change necessitates the relocation of GA and MRO activities.

The western side of the airport will be developed to accommodate these operations. The proposed development of MRO, FBO, and other aviation-related activities on the western side of the runway will require the relocation of the DVOR/DME RIA system—installed in 2005 and renovated in 2022—as well as the Z3 isolated parking stand. The new location of the VOR will be coordinated with Latvijas Gaisa Satiksme (LGS) to ensure full operability and compatibility with Master Plan developments. The relocated isolated aircraft parking stand is proposed to be situated west of THR 36.

Rehabilitation requirements

In addition to new projects initiated during the Next Steps period, the following rehabilitation and reconstruction works must be carried out:

- ➔ Rehabilitation of Taxiway F surface (between TXL Q & U1): Last redeveloped in 2018, this taxiway requires resurfacing to maintain its structural integrity and operational efficiency.
- ➔ Rehabilitation of Taxiway Y surface: Last redeveloped in 2021, this taxiway needs resurfacing to ensure smooth and safe aircraft movement.
- ➔ Rehabilitation of Taxiway B and F (between TWY A & C) surface: Also, last redeveloped in 2018, this taxiway requires resurfacing to prevent wear and tear from affecting aircraft operations.
- ➔ Rehabilitation of Runway between Taxiway A and Taxiway B: Last redeveloped in 2020, this section of the runway requires resurfacing to extend its lifespan and ensure safe landings and takeoffs.

Aircraft de-icing Facilities and Runway Access Holding Bays

The existing centralized aircraft de-icing facilities will not be sufficient to meet future traffic demand, and it is recommended to incorporate holding bays to help manage departing traffic. The current configuration presents limitations in terms of scalability and operational efficiency.

It is advised to provide at least four Code C or two Code C and one Code E aircraft de-icing pads. However, before investing in additional infrastructure, the operations of service providers should be optimized, and Service Level Agreements should be clearly defined and met.

The new proposed configuration for these facilities should meet the following requirements:

- ➔ Scalability to accommodate traffic growth and increasingly extreme weather conditions
- ➔ Functionality as holding bays for aircraft sequencing and queuing during peak departures periods
- ➔ Bypass capability for aircraft not requiring de-icing
- ➔ Independent access and operation of de-icing/holding pads (supporting multiple queues)
- ➔ Capacity to handle both Code C and Code E aircraft
- ➔ Full compliance with Obstacle Limitation Surfaces (OLS)

To ensure optimal operability of the de-icing facilities, the following elements must be incorporated into the design:

- ➔ Installation of de-icing/anti-icing fluid recovery systems to support environmental compliance and operational sustainability
- ➔ On-site fluid reservoirs with centralized management (by the airport authority or concessionaire)
- ➔ Equipment staging areas with sufficient space for multi-vehicle de-icing operations
- ➔ Upgraded lighting systems on de-icing aprons
- ➔ Convenient rest areas for de-icing crews located adjacent to the de-icing pads

Figure 42 presents a proposed configuration for the aircraft de-icing facilities and holding bays in both runway ends.



Figure 42 –De-icing facilities / Holding bays new configuration
Source: Ineco

Passenger Terminal Building

As described in Chapter 3, various alternatives for terminal development were considered. The preferred option, Alternative 2, proposes an expansion to the south of the airport campus, featuring a double-sided pier parallel to Pier B and serving Apron 1. This alternative includes a new pier with capacity for up to nine Code C aircraft contact stands.

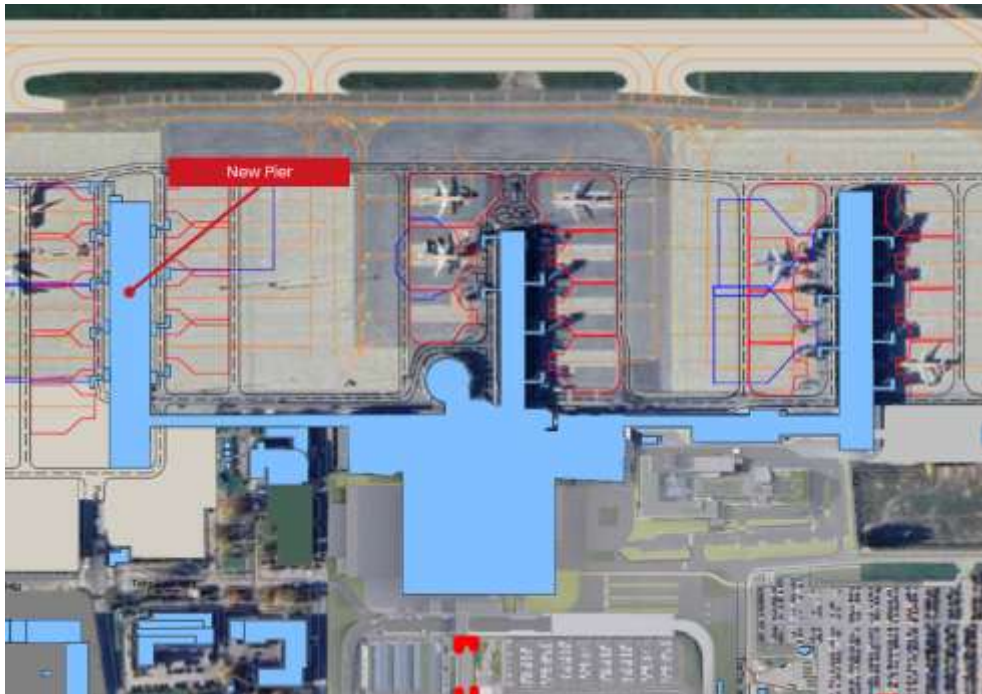


Figure 43 – Terminal Development (2031 – 2040)
Source: Ineco

Gate Usage

Gate usage refers to whether a gate serves Schengen or Non-Schengen destinations, while gate type indicates how passengers access the aircraft from the boarding areas in the terminal. Contact gates are those where passengers board the aircraft via a passenger boarding bridge, stairs, or by walking directly to the aircraft. Remote gates are those where passengers are transported to the aircraft by bus.

RIX’s gate usage and boarding types, based on 2024 data, are illustrated in the following chart.

Gate Type	Boarding Type	% of Departure Pax
Contact	Bridge	43.6%
	Walking	36.5%
	Stairs	14,2%
Remote	Bus	5.7%

Chart 28 – 2024 Gate and Boarding Types
Source: Ineco

In 2024, 94% of passengers were served via contact gates, with approximately 45% boarding through passenger boarding bridges. This data serves as the basis for determining future gate requirements by gate type and boarding method.

Using the current gate usage shares and the target percentage of passengers served by contact gates, the projected future requirements for contact and remote gates are illustrated in the following chart:

Gate Type	Schengen	Non-Schengen
Contact	20	10
Remote	7	4

Chart 29 – Long-term Gate Requirements
Source: Ineco

Schengen and Non-Schengen peak operations occur at different times of the day; therefore, gate requirements are calculated based on individual peak periods rather than a combined peak.

Considering the gate requirements and the preferred terminal development, several gate usage configurations are feasible for the new pier. All options meet projected demand, but each presents different operational advantages and disadvantages.

New Pier layout

In addition to gate usage, the internal layout of the terminal will depend on how the new pier integrates with the Stage 6th development and its operations. Non-Schengen passenger flows are the most complex, as they vary depending on passenger type and travel requirements. From a passenger flow perspective, there are three categories of Non-Schengen passengers:

- ➔ Non-Schengen to Non-Schengen connecting passengers: These passengers must undergo security screening upon arrival and before boarding their next flight.
- ➔ Non-Schengen to Schengen connecting passengers: These passengers must go through both passport control and security screening upon arrival before entering the Schengen area.
- ➔ Non-Schengen terminating passengers: These passengers must pass through passport control before reaching the baggage reclaim area and exiting the terminal.

There will always be two operational scenarios feasible:

- ➔ Centralized Non-Schengen Processing: The mezzanine level of the new pier will be used for Non-Schengen arrivals. Passengers connecting to Non-Schengen flights departing from the new pier will go through transfer security screening at the mezzanine level. All other Non-Schengen passengers—whether connecting or terminating—will use a sterile corridor from the new pier to the centralized passport control and security screening facilities in Stage 6th building. This scenario centralizes Non-Schengen processing within Stage 6th areas.
- ➔ Decentralized Non-Schengen Processing: All Non-Schengen passengers will be processed in the mezzanine level of the new pier. Connecting passengers to Non-Schengen flights will go through transfer security screening at the mezzanine level. Passengers connecting to Schengen destinations will undergo passport control and security screening within the new pier. Terminating passengers will pass through passport control and access the baggage reclaim area via a segregated corridor connecting the new pier to the existing reclaim facilities.

The layout of the new pier will need to adapt to those requirements. In general, the options are:

- ➔ A dedicated mezzanine or corridor for Non-Schengen passengers, located either between levels 1 and 2 of the new pier or as a third-level corridor.
- ➔ Various configurations for the corridor connecting the new pier to Stage 6th processing areas, which may involve one or two levels and different routing options, each with varying degrees of flow interference and investment requirements.

Any option will require a three-level pier with each floor dedicated to specific operations: in general the first floor will be for Schengen operations, the second floor for Non-Schengen departures, and the mezzanine or the third floor for Non-Schengen arrivals.

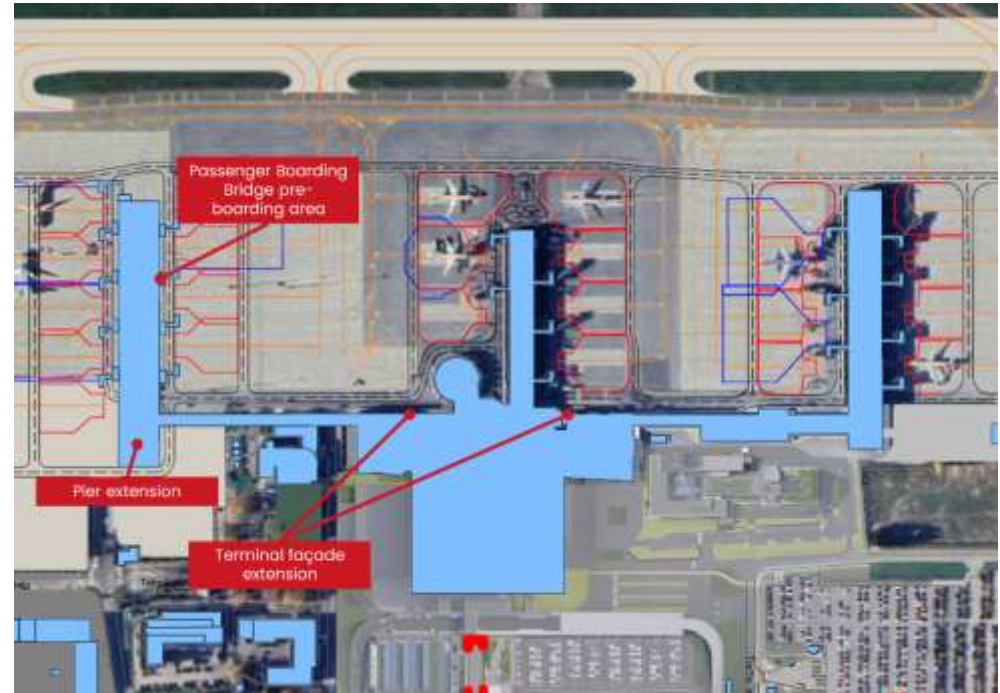


Figure 44 – New Pier Option E
Source: Ineco

This configuration provides nine full-contact gates for both Schengen and Non-Schengen flights. A preboarding bridge located after the boarding pass checkpoint ensures full flexibility for use across all three levels. Additionally, at least five Schengen bus gates are included in the pier extension to provide further operational flexibility.

Non-Schengen arriving passengers will access the mezzanine (level 3) via vertical circulation from the preboarding bridge. Schengen passengers will pass through the boarding pass checkpoint on the first floor and proceed to the passenger boarding bridge via vertical circulation within the same preboarding bridge, which is also used by arriving passengers.

The preboarding bridge plays a key role in enhancing operational efficiency while offering a higher level of service for passengers.

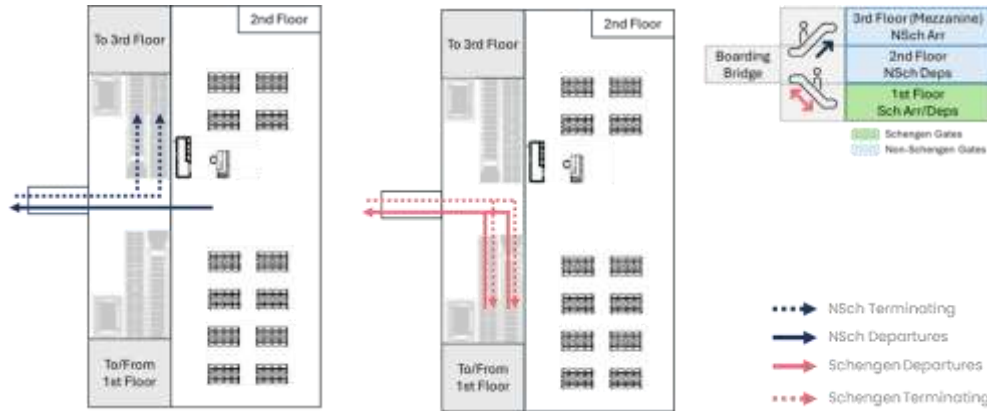


Figure 45 – New Pier Holdroom and Preboarding Bridge Example
Source: Ineco

Non-Schengen departing passengers will access the boarding gates after passing through emigration passport control, located at the beginning of the pier on Level 2. The Non-Schengen departure lounge will include nine holdrooms, restrooms, and food & beverage (F&B) and commercial areas.

Schengen passengers will access the departure lounge on Level 1 via vertical circulation located before the emigration passport control.

Non-Schengen arriving passengers will enter the mezzanine level of the new pier (Level 3) through the preboarding bridge. Connecting passengers to Non-Schengen destinations will go through the transfer security screening checkpoint and proceed to Level 2, where they can access boarding gates for their onward flights. Passengers connecting to Schengen destinations will pass through a small immigration checkpoint—decentralized but integrated with emigration control—before entering the Schengen area.

This configuration of contact gates and dedicated arrival and departure areas provides a seamless passenger experience. Other gate usage configurations are also feasible and may be adopted depending on the evolution of Non-Schengen traffic.

Layout for the corridor connecting New Pier and main terminal processor

A connecting corridor between the new pier and the main processor is required to accommodate the following passenger flows:

- ➔ Schengen and Non-Schengen departing passengers boarding from gates in new pier (Pier A). Most will arrive from the centralized commercial area on Level 2.
- ➔ Schengen arriving passengers from gates in new Pier A, en route to the baggage reclaim area in the central Stage 6th processor. These passengers may share the corridor with departing flows, preferably on Level 2 with Schengen designation.
- ➔ Non-Schengen arriving passengers from gates in new Pier A, heading to immigration control and the reclaim area in the Stage 6th processor. These passengers must be isolated in a sterile corridor and directed to immigration control on Level 1 of the Stage 6th building.

Two corridor configurations are feasible:

- ➔ Two separate corridors on Level 2
- ➔ A two-story corridor, with Level 2 serving bidirectional Schengen flows and Level 3 serving one-way Non-Schengen flows

In either case, the corridor must be designed as a “bridge” between the new pier and the processor, allowing apron vehicle circulation on Level 1 and maintaining access to and from the VIP center, as in the current layout.

The most critical section of the connecting corridor is the route through existing buildings (and post-Stage 6th execution) leading to immigration control on Level 1. Several routing scenarios are feasible, each with varying impacts on passenger flows, vertical circulation requirements, and investment levels.

One potential solution involves routing the corridor along the second-floor airside façade of the terminal. In this configuration, Non-Schengen arriving passengers are directed into the existing Non-Schengen arrivals corridor and processed through the current transfer security screening and passport control checkpoints.

This approach also requires shifting the airside terminal façade to accommodate the corridor, which not only meets operational needs but also enables an expansion of the commercial area on the second floor by 1,290 square meters. As a result, the design improves both passenger flow functionality and commercial capacity.

Advantages:

- ➔ Minimum number of level changes
- ➔ No impact on future commercial expansion area
- ➔ No interference with existing terminal facilities

Disadvantages:

- ➔ Corridor along the airside façade may obstruct apron views from the second floor
- ➔ May require shifting the terminal façade forward to accommodate the corridor and repurpose additional space
- ➔ Requires an overpass to bypass the Pier B/Main Processor connector
- ➔ Requires new vertical circulation between the second and first floors

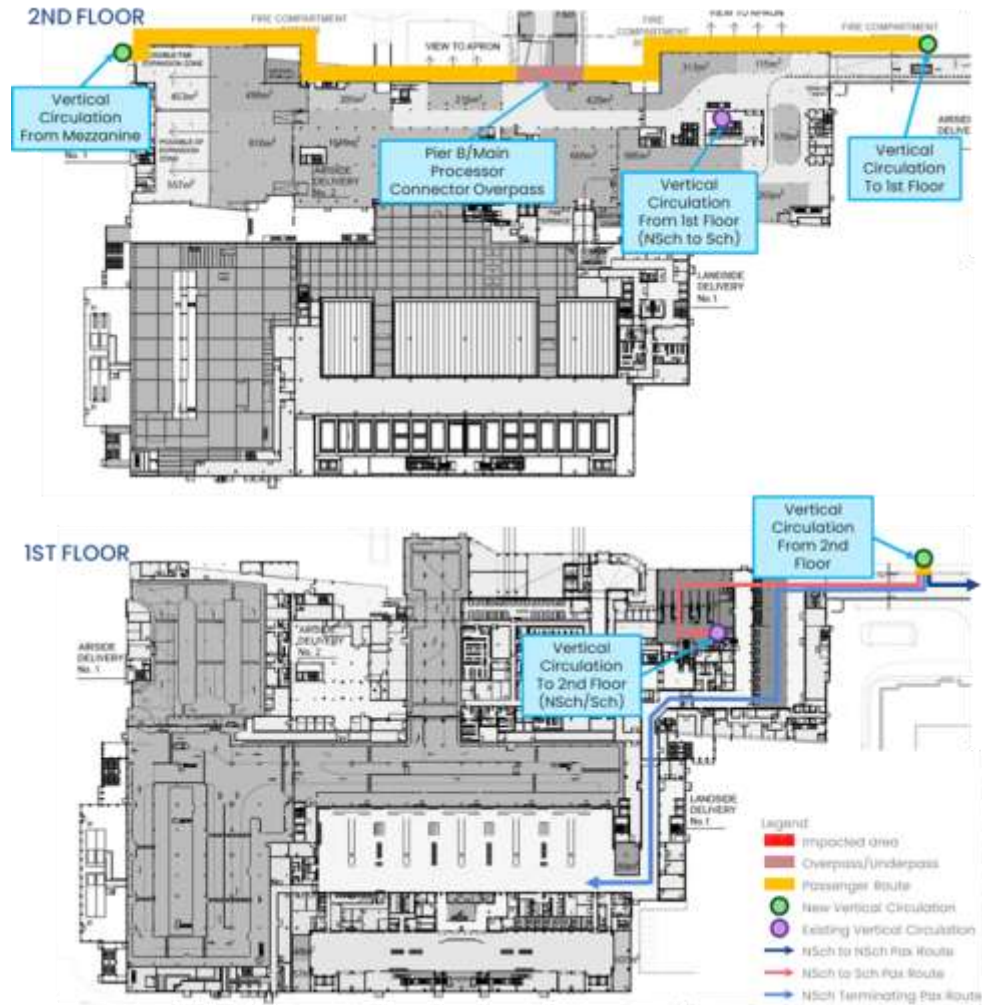


Figure 46 – Scenario 1a: Routing through second floor (façade)
Source: Ineco

Airport City and Other Commercial Areas

During the second phase of development, the implementation of Industrial Area 2 is proposed, with a total buildable area of 40,860 square meters.

As mentioned earlier, there is no clear certainty that the market will require additional industrial space beyond what currently exists. Therefore, this action should be contingent upon confirmed demand. The selected operator must carry out pre-commercialization, construction, and subsequent rental of the warehouse space in the initial stage.

The tender process may require the awarded company to present prior agreements or letters of intent from businesses interested in occupying the land, ensuring the viability and success of the development.

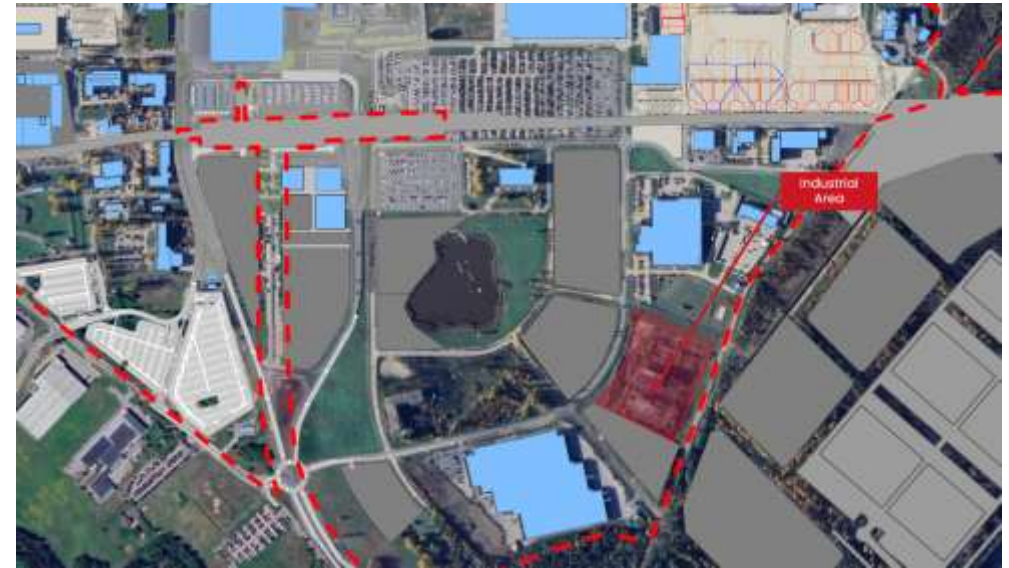


Figure 47 – Business Park 2040 Horizon developments
Source: Ineco

4.2.3. 2041-2050: Long Term Development

The third phase of development, covering the years 2041 to 2050, focuses on major expansions and relocations to support the airport's growing operations and further enhance its infrastructure.

Maintenance, Repair and Overhaul (MRO) facilities and General Aviation (GA) operations will be fully relocated to the western side of the runway, where new MRO and GA developments will be expanded. A plot of land near the new MRO area will be reserved for a dedicated military apron, should such a development be required. This phase also includes the extension of the partial parallel taxiway west of the runway to improve airside connectivity.

The southern apron will be further extended to accommodate additional remote stands. Continued development of the business park is also planned, including the addition of another hotel, a new office building, and an expanded industrial area.

Land Acquisition

During the long-term development period, the airport authority must acquire the territories highlighted in Figure 48, to ensure that future projects can be executed effectively. The green line indicates the desired new property, while the red line represents the current airport-owned land.



Figure 48 – Land Acquisition 2041 – 2050 Period
Source: Ineco

The total area to be acquired for developments planned by 2050 amounts to 0.7 hectares. This acquisition is essential for the expansion and modernization of airport infrastructure and must be completed in sufficient time to allow construction to begin according to the timeline of each specific project.

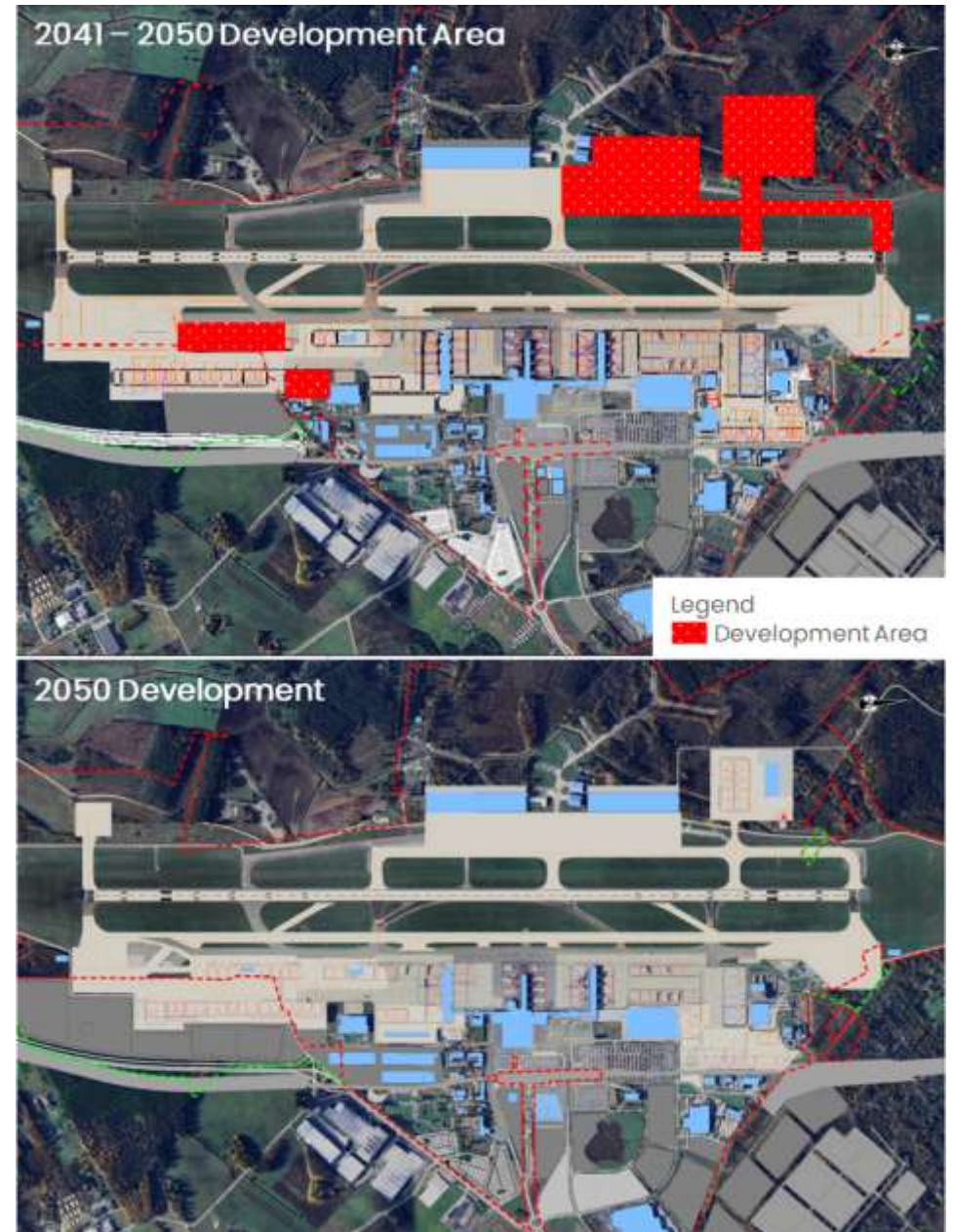


Figure 49 – Riga Airport Long-term Development (2050) - Source: Ineco



Airfield and Apron

The long-term development plan for 2050 focuses on enhancing connectivity with the western development area of the airport. The primary infrastructure project is the extension of the western parallel taxiway, which will facilitate smoother and more efficient access to the western zones designated for MRO, GA, and military operations.

The long-term development plan for 2050 includes the following apron and infrastructure enhancements:

- ➔ Expansion of the Southern Apron: The southern apron will be expanded to create two rows of aircraft stands. This expansion will significantly increase capacity and improve the efficiency of aircraft parking and ground movements.
- ➔ Expansion of the MRO Apron: The MRO apron will be extended to accommodate the full relocation of Maintenance, Repair, and Overhaul operations to the west of the runway. This relocation will optimize space usage and streamline MRO activities.
- ➔ New General Aviation and Business Aviation Apron: A new apron will be developed on the western side of the runway to host all General Aviation (GA) and Business Aviation (FBO) operations. This relocation will enhance operational efficiency and provide dedicated space for these activities.
- ➔ Electrical Infrastructure Upgrades: All planned expansions, reconfigurations, and stand developments will be accompanied by comprehensive electrical works. These will include the installation and relocation of airfield lighting systems, power supply for Ground Support Equipment (GSE), and aircraft Ground Power Units (GPUs).



Figure 50 – Riga Airport Runway and Taxiway System Long-term Development (2050)

Source: Ineco



Figure 51 – Riga Airport Apron Long-term Development (2050)

Source: Ineco

Terminal Building

No developments are planned for the terminal building during the 2041–2050 period.

Ground Access

During this period, construction of the new area designated for maintenance and general aviation facilities in the western section of the airport is expected to be completed. To ensure efficient access to this zone, a new connection to the A10 highway to the north is proposed, in accordance with the territorial plans for the area. Additionally, Skulte Road should be refurbished and potentially widened to accommodate the anticipated increase in traffic.



Figure 52 – New connection access to the A10
Source: Ineco

Airport City and Other Commercial Areas

Business Park

The proposed long-term developments within the business park include:

- Hotel 2
- Office Building 2

Hotel 2 must be designed to accommodate approximately 200 rooms, using a ratio of 25–35 square meters per room, plus an additional 30% for common areas. This results in a total buildable area of 9,000 square meters.

For Office Building 2, with a projected demand of 1,200 employees and an occupancy ratio of 10 square meters per employee, a total buildable area of 12,000 square meters is proposed, with a building coefficient of 2.

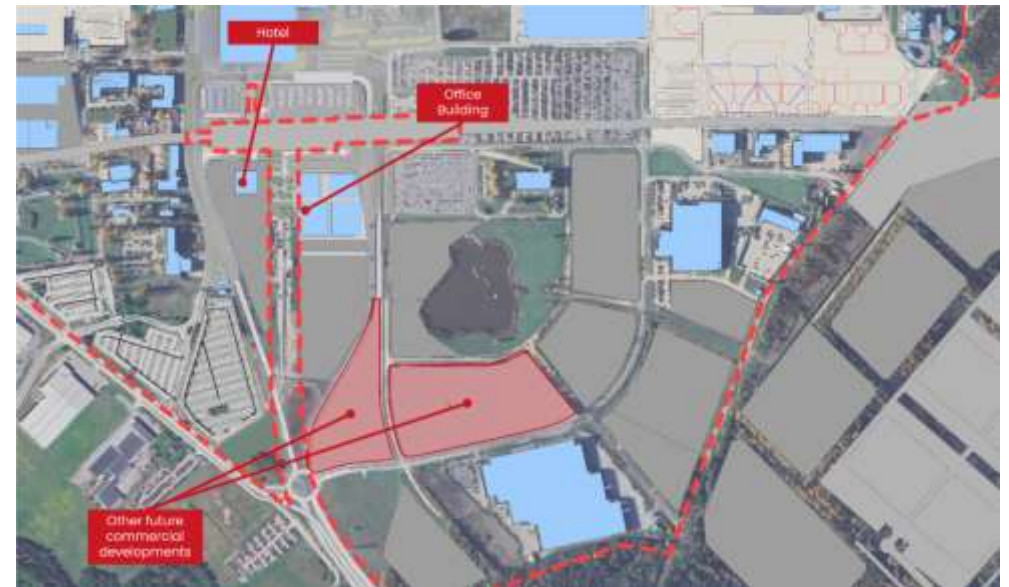


Figure 53 – Business Park 2050 Horizon development
Source: Ineco

5. IMPACTS OVER SURROUNDING AREAS

The development of airport infrastructure requires a thorough evaluation of environmental impacts to ensure sustainable growth while minimizing negative effects on surrounding communities. Noise pollution and emissions are key concerns, as they can significantly affect air quality, public health, and ecological balance.

This chapter examines these environmental challenges, analysing their influence on airport operations and long-term planning. Through detailed assessment, it aims to support responsible decision-making and promote a balance between economic development and environmental stewardship.

In addition, the impact on surrounding areas must also consider height limitations for developments near airport facilities. This chapter includes the proposed Obstacle Limitation Surfaces (OLS), which will be updated in accordance with evolving aviation regulations.



5.1. Noise Assessment

A key factor in evaluating the airport’s environmental impact is the assessment of noise pollution levels.

An analysis of noise contours for 2030 and 2050 has been conducted to assess the impact of proposed actions in the Riga Airport Master Plan on surrounding areas. These contours, along with associated data, provide a detailed overview of the airport’s acoustic footprint, identifying the areas and populations most affected.

This study specifically focuses on noise levels generated by aircraft take-off and landing operations.

5.1.1. Noise assessment methodology

The noise footprints have been calculated using version 3g of the Aviation Environmental Design Tool (AEDT), developed by the Federal Aviation Administration (FAA). AEDT is a software tool that models aircraft performance over time and space, estimating noise levels, fuel consumption, emissions, and air quality impacts.

For each scenario, AEDT requires baseline data on the airport’s physical layout and its surrounding environment. Additionally, the tool relies on detailed flight operation data, including aircraft types, take-off and landing patterns, flight paths, and departure dispersions.

5.1.2. Noise computation input data

The required inputs for the noise simulation study are presented in the table below.

INPUT DATA				
Runway		Single runway 18-36 orientation Length: 3,200 meters Width: 45 meters		
Physical configuration of the airport		RWY	Lat (deg)	Long (deg)
	THR Coordinates	18	56.935070	23.973075
		36	56.906448	23.968355
Regime of runway use	RWY Designation 18 - 63% RWY Designation 36 - 37%			
Landing and take-off paths	Information provided by the Sustainability and Environmental Management Unit (Quality and Sustainability Department)			
Dispersion in relation on the backbone track				

INPUT DATA				
Scenario	Annual data (APP/DEP)			
	Total	Day (7-19h)	Evening (19-23h)	Night (23-7h)
Number of operations (APP/DEP)				
2022	54,697	36,036	10,320	8,341
2030	88,123	55,663	18,042	14,418
2050	142,100	89,592	29,048	23,460

Scenario	Training flights			
	Total	Day (7-19h)	Evening (19-23h)	Night (23-7h)
Number training operations				
2022	999	831	53	115
2030 & 2050	1,021	854	52	115

Scenario	Go-arounds operations			
	Total	Day (7-19h)	Evening (19-23h)	Night (23-7h)
Number go-arounds operations				
2022	282	233	30	19
2030	423	343	49	31
2050	682	553	79	50

Meteorological data	Temperature: 8.08 °C (2014-2023 average) Air Pressure: 1011.69 mbar Relative Humidity: 77.21%
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Noise Metrics	<p>L_{day}, $L_{evening}$, L_{night} are the A-weighted long-term equivalent sound levels over a year during a specific part of the day:</p> <ul style="list-style-type: none"> Day (07:00–19:00) Evening (19:00–23:00) Night (23:00–07:00) <p>L_{den} is the long-term equivalent noise indicator for the whole day, with 5 dBA added to the evening level and 10 dBA added to the night level. The A weighting is designed to reflect the human ear’s response to sound.</p>
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Chart 30 – Noise input parameters
Source: Riga Airport, Ineco and AEDT software

The aircraft fleet mix used for future scenarios is based on assumptions regarding market trends and the fleet renewal strategies of major airlines. It is anticipated that the current fleet will be gradually replaced by next-generation aircraft. In both scenarios, the Airbus A220 is expected to be the predominant aircraft model, accounting for approximately 60% of operations.

The primary aircraft models projected to operate at the airport are listed in the following table:

SCENARIO NOISE MAPS 2022		SCENARIO 2030		SCENARIO 2050	
ICAO	%	ICAO	%	ICAO	%
BCS3	49.2%	BCS3	58.48%	BCS3	59.87%
B738	20.8%	B738	11.67%	B38M	20.26%
A320	4.7%	B38M	8.57%	E295	5.97%
AT72	3.8%	E195	5.28%	A20N	4.75%
B38M	2.8%	A320	2.41%	A21N	1.85%
B734	2.1%	A20N	2.01%	C700	1.52%
F100	1.9%	C700	2.01%	AT72	1.04%

Chart 31 – Aircraft fleet mix. Scenario 2030 and 2050
Source: Riga Airport and Ineco

5.1.3. Noise results

The noise contours generated represent lines of equal noise exposure levels at various points surrounding the airport.

These contours are differentiated by time periods and are aligned with current noise regulations, specifically *Cabinet of Ministers Regulation No. 16 of 7 January 2014. Noise assessment and management procedures.*

The contours are shown in the following images. Although not part of the core scope of this study, this report also includes the noise contours from the Strategic Noise Map of Riga Airport, using 2022 data as the baseline reference. This supplementary information provides valuable context and enables comparison with current noise levels, supporting a more precise and well-founded assessment of the airport’s acoustic impact on surrounding areas.

Daytime (07:00 – 19:00)

The Leq levels considered during daytime are 55, 60, 65, and above 70 dB (A).

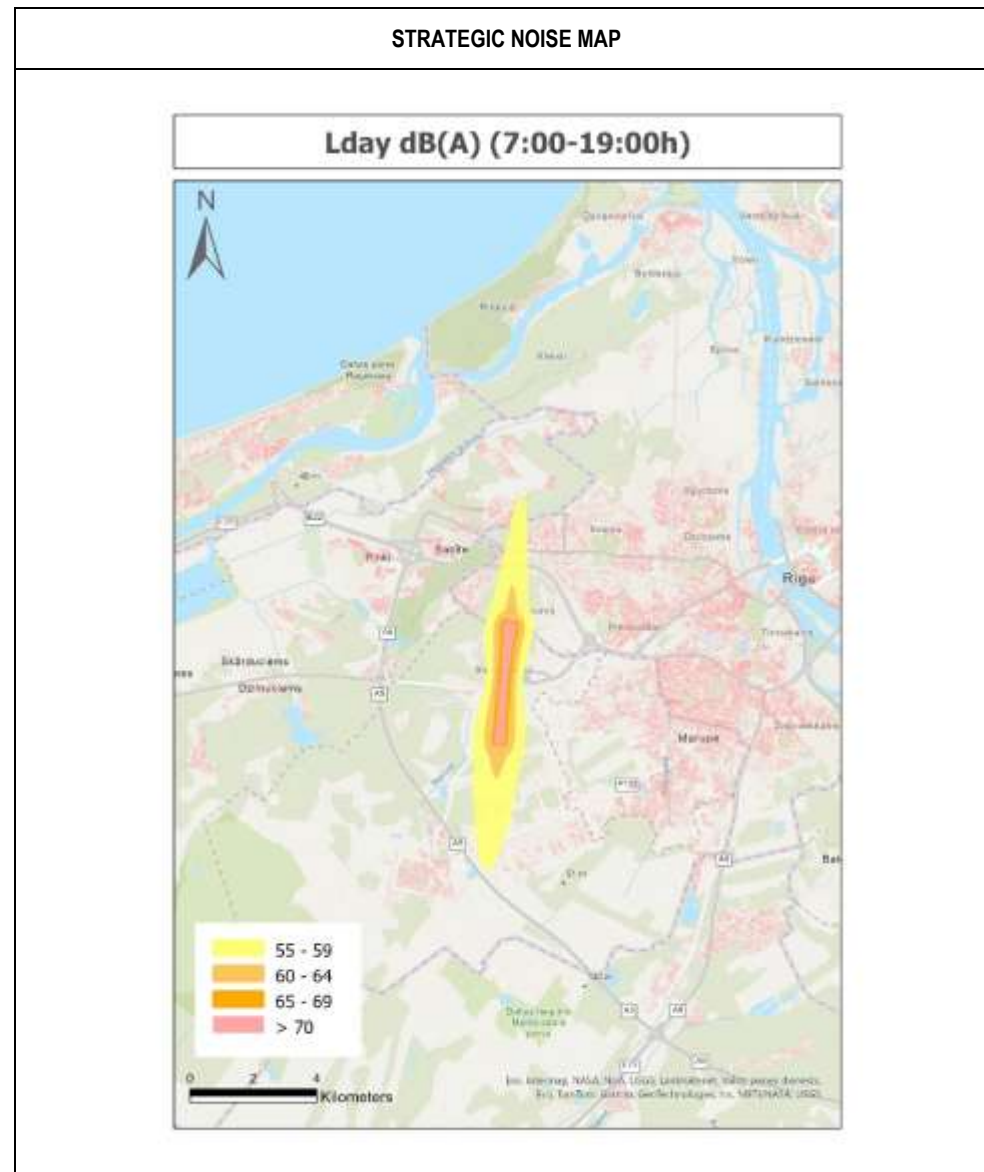


Figure 54 – Noise contours Lday (7-19h) – Strategic Noise Map Riga Airport
Source: Strategic Noise Map (SNM) Riga Airport

SCENARIO 2030

SCENARIO 2050

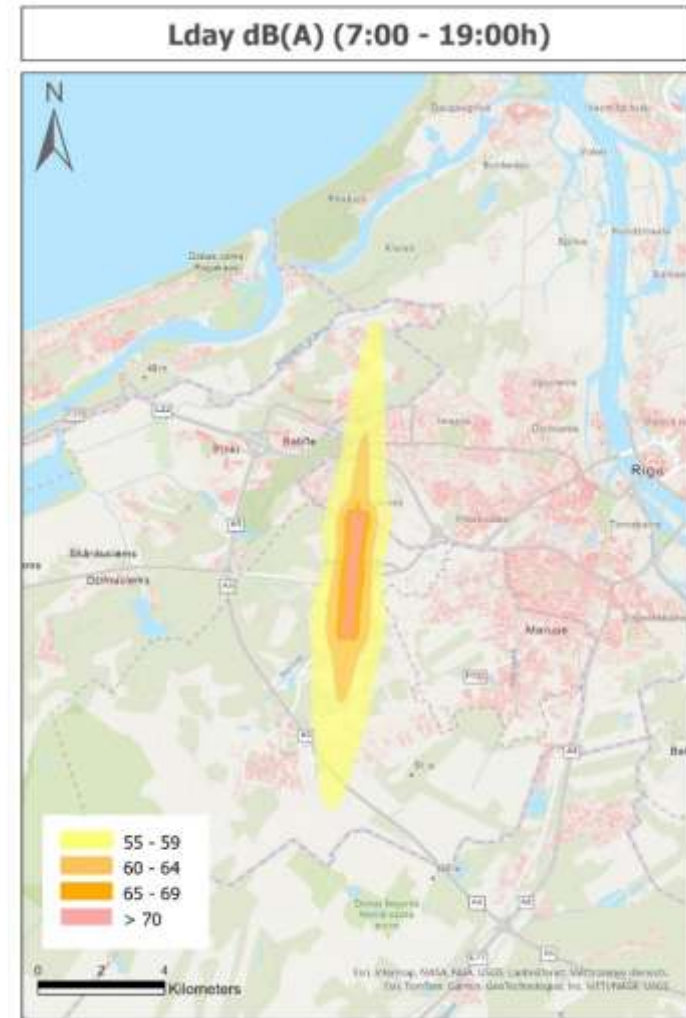
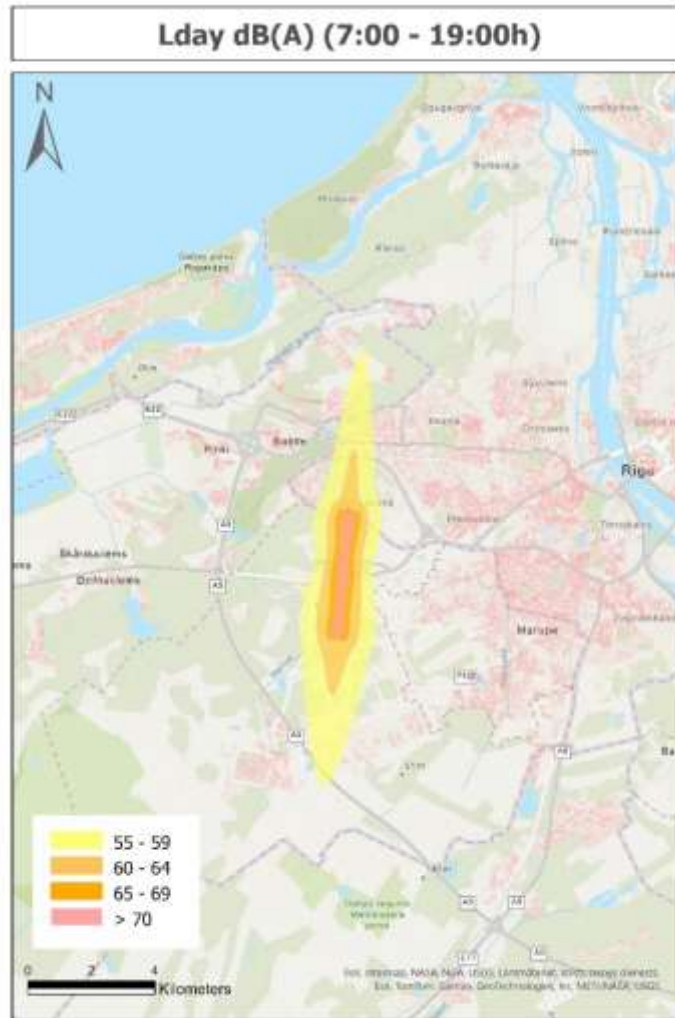


Figure 55 – Noise contours Lday (7-19h) – Scenario 2030 and 2050
Source: Ineco

Evening (19:00 – 23:00)

Evening Leq values include 50, 55, 60, 65, and greater than 70 dB (A).

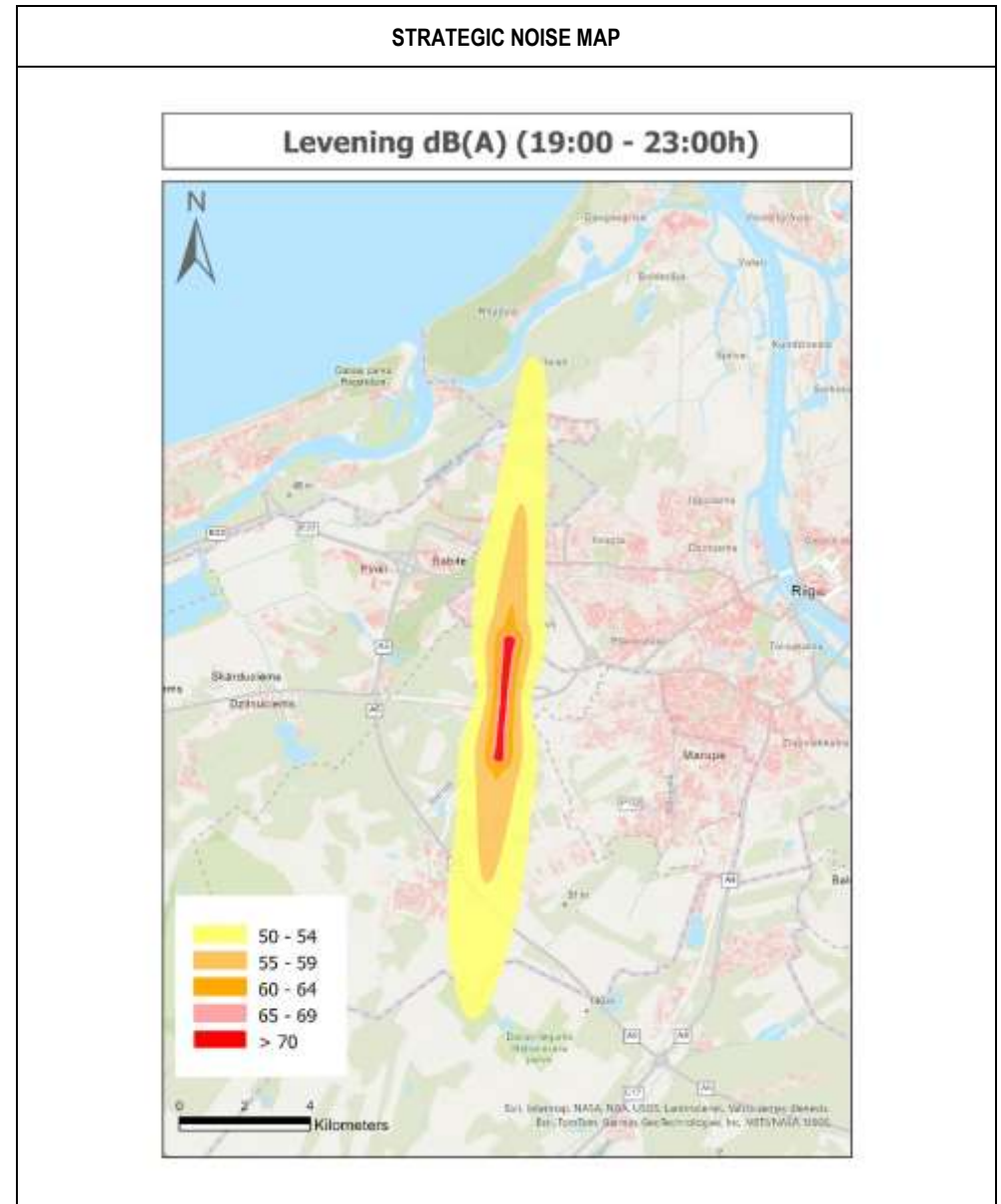


Figure 56 – Noise contours Lday (7-19h) – Strategic Noise Map Riga Airport
 Source: Strategic Noise Map (SNM) Riga Airport

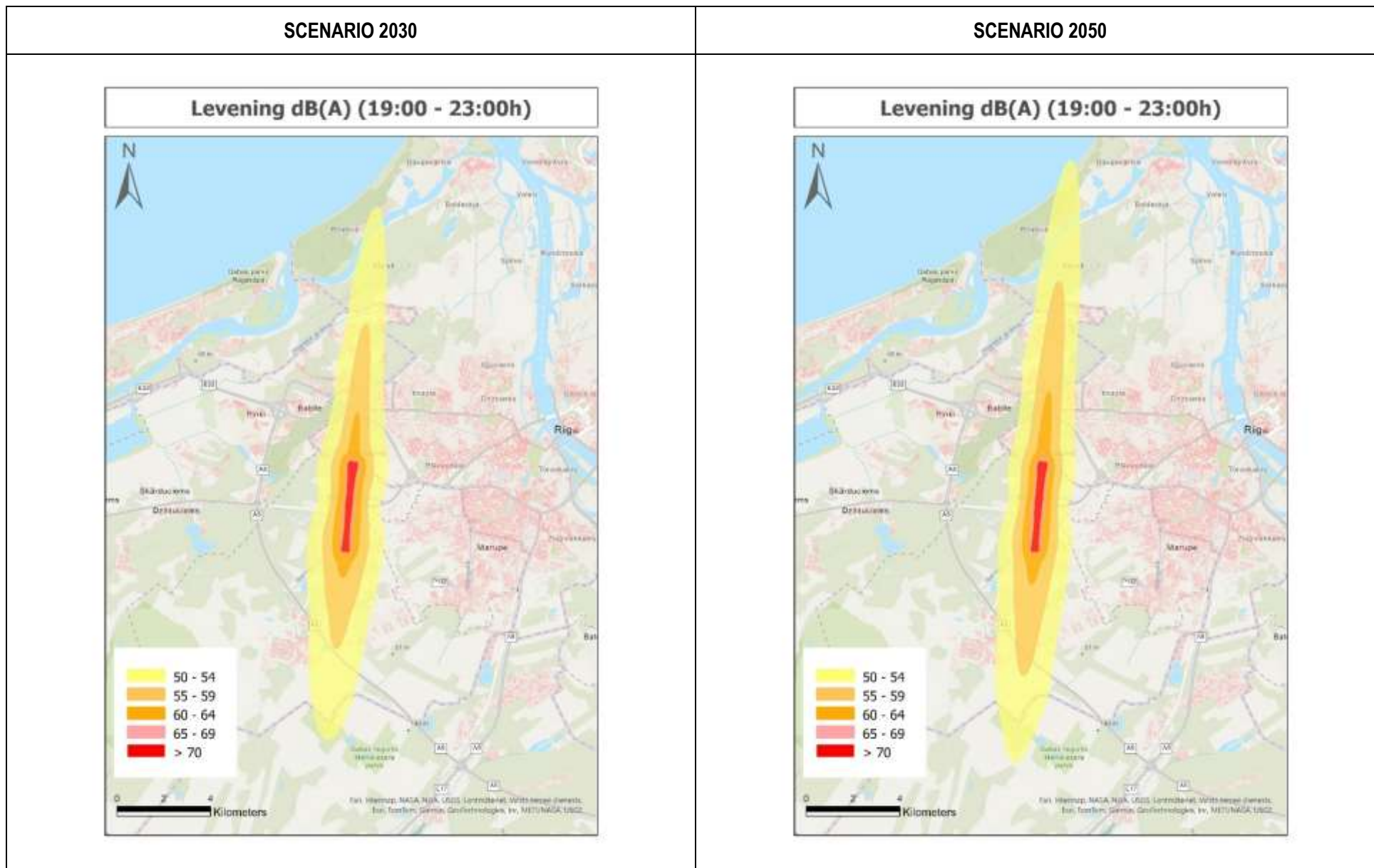


Figure 57 – Noise contours Levening (19-23h)– Scenario 2030 and 2050
Source: Ineco

Nighttime (23:00 – 07:00)

Nighttime (23:00 – 07:00h)

Nighttime Leq values include 45, 50, 55, 60, and greater than 65 dB (A).

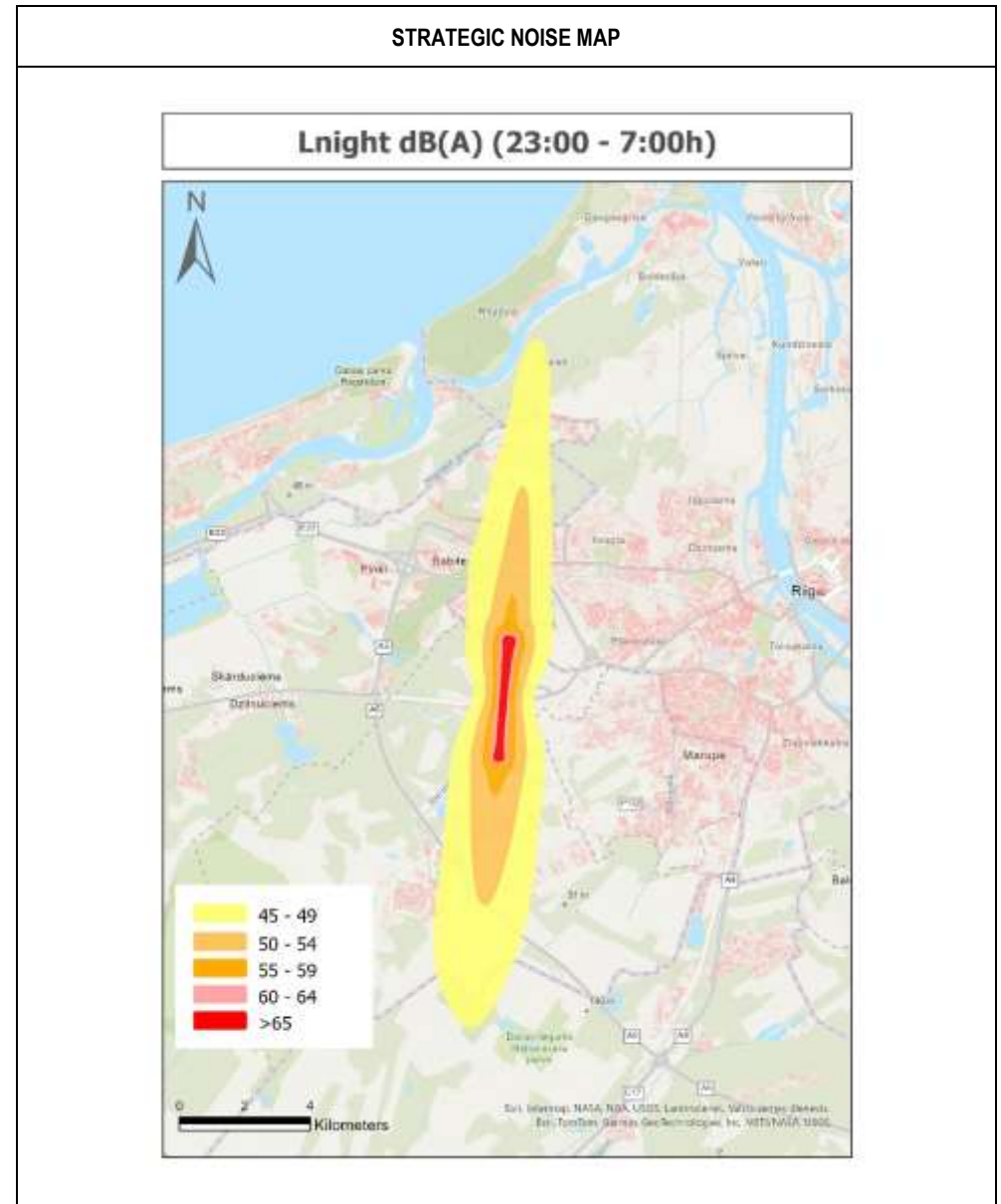


Figure 58 – Noise contours Lnight (23-7h) – Strategic Noise Map Riga Airport
 Source: Strategic Noise Map (SNM) Riga Airport

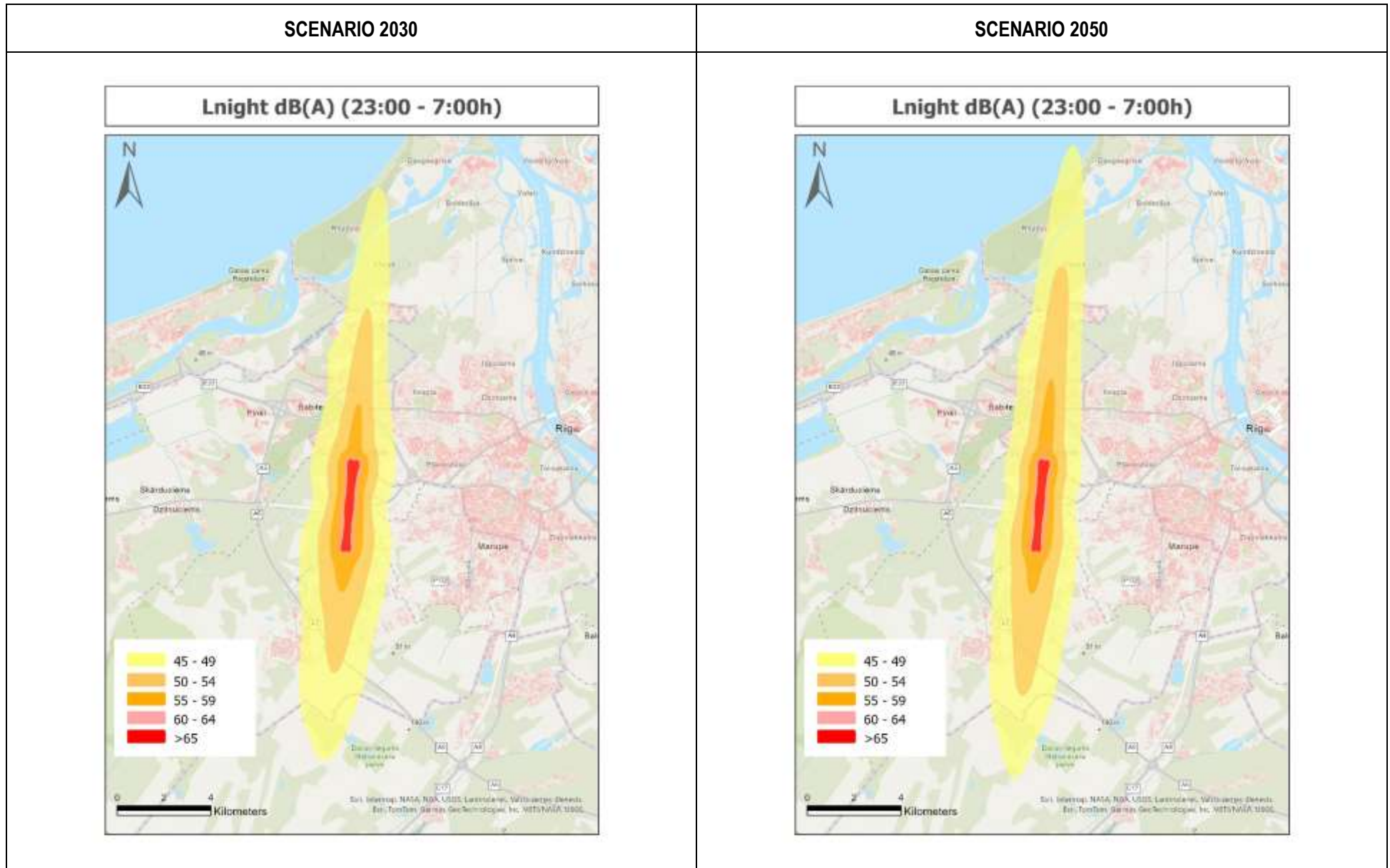


Figure 59 – Noise contours Lnight (23-7h) – Scenario 2030 and 2050
Source: Ineco

24-hour Noise Indicator (Lden)

The 24-hour noise indicator is represented with Leq values of 55, 60, 65, and above 70 dB (A).

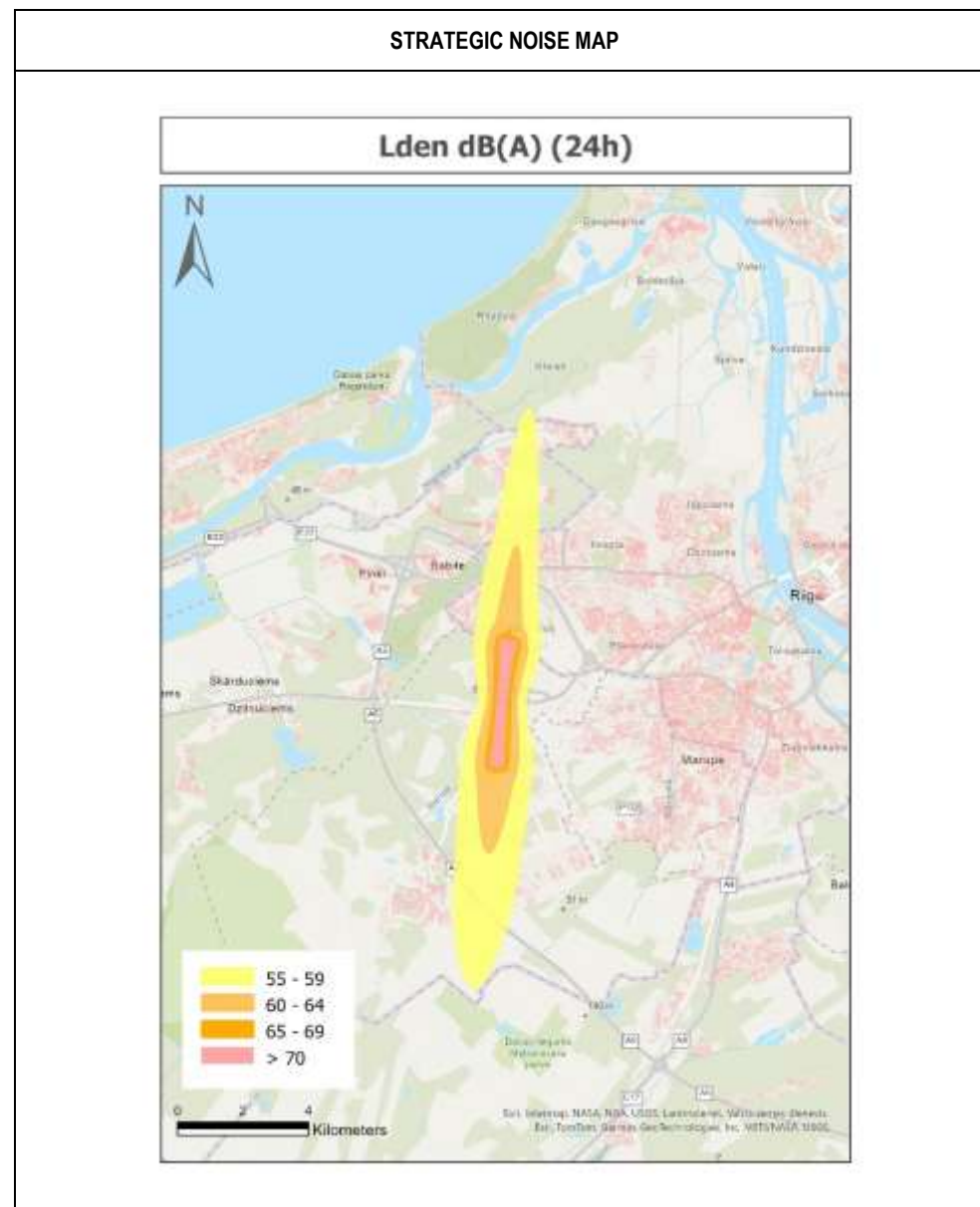


Figure 60 – Noise contours Lden(24h) – Strategic Noise Map Riga Airport
Source: Strategic Noise Map (SNM) Riga Airport

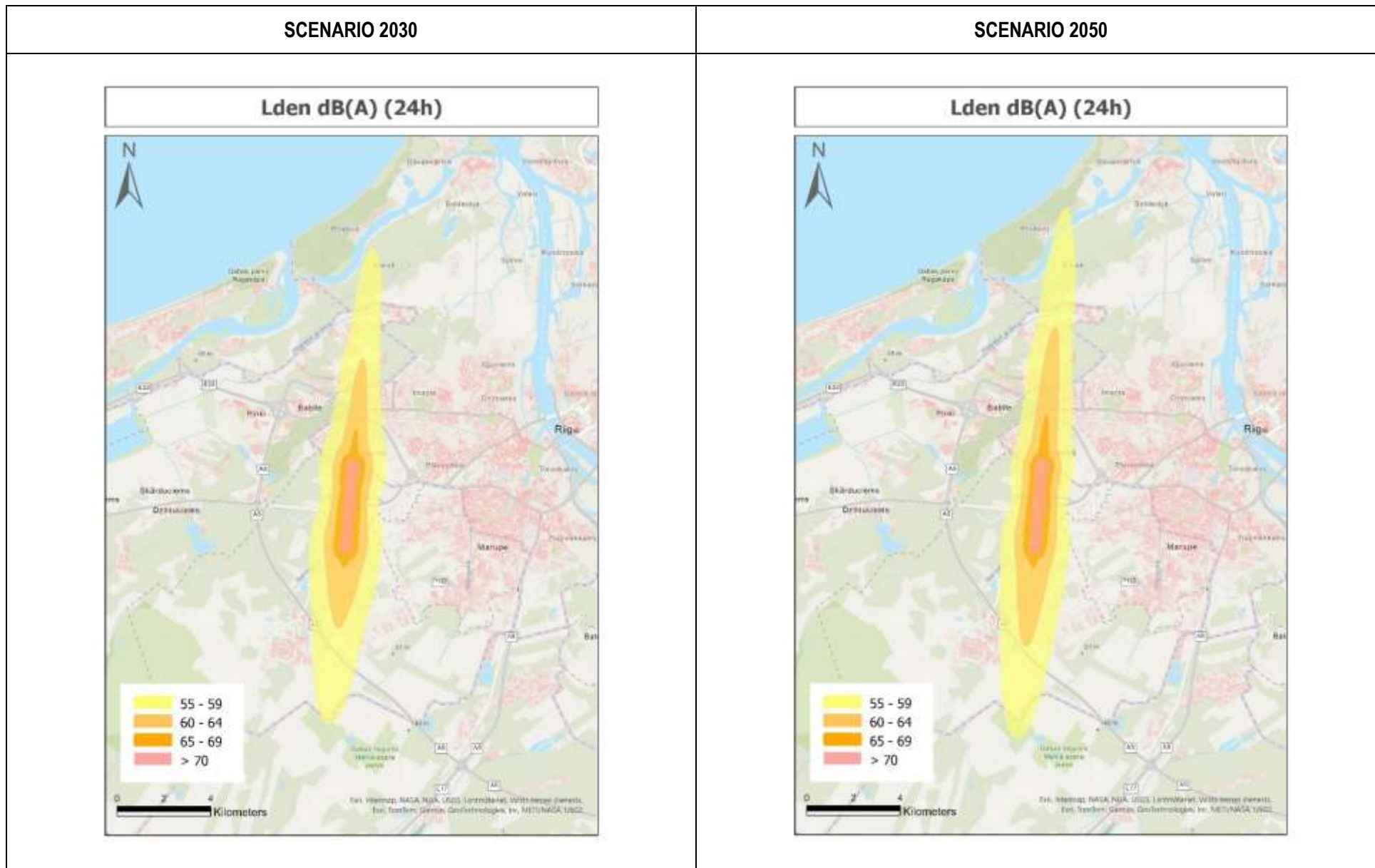


Figure 61 – Noise contours Lden (24h) – Scenario 2030 and 2050
Source: Ineco

5.1.4. Noise assessment

The assessment of noise level changes resulting from the Master Plan scenarios for the area surrounding the airport has involved two distinct types of analysis:

- Exposed land area to noise (km²), differentiated by time period and noise level metric.
- Number of inhabitants exposed to noise levels exceeding the limit values established in the *Cabinet of Ministers Regulation No. 16 of 7 January 2014 on Noise assessment and management procedures*.

Although not part of the current scope, this section also includes results from the Strategic Noise Map (SNM) of Riga Airport, providing valuable insights into the extent of noise exposure affecting residential areas and serving as a baseline scenario.

Noise limit values

According to the regulation, the permissible traffic-related environmental noise limit values are defined in Annex 2, Paragraph 2, as shown in the following table:

Traffic noise limit values		
L _{day} (dB(A))	L _{evening} (dB(A))	L _{night} (dB(A))
65	60	55

Chart 32 – Annex 2, point 2
Source: MC 16/2014

Exposed land areas (km²)

The following tables present the exposed land area values of the noise contours for each time period, comparing the variations between the 2030 and 2050 scenarios. These values reflect the size of the areas affected by noise levels exceeding regulatory thresholds.

NOISE LEVEL	L _{day} (7-19h)		
	STRATEGIC NOISE MAP	SCENARIO 2030	SCENARIO 2050
>55 dB(A)	9.8	15.5	17.7
>60 dB(A)	3	5.3	5.8
>65 dB(A)	1.3	2.1	2.2
>70 dB(A)	0.6	1.0	1.0

Chart 33 – Exposed land area (km²) - L_{day} (07-19H)
Source: Ineco

NOISE LEVEL	Levening (19-23h)		
	STRATEGIC NOISE MAP	SCENARIO 2030	SCENARIO 2050
>50 dB(A)	27.0	36.3	41.3
>55 dB(A)	8.3	13.0	15.6
>60 dB(A)	2.4	4.2	4.7
>65 dB(A)	1.1	1.7	1.7
>70 dB(A)	0.5	0.8	0.8

Chart 34 – Exposed land area (km²) - Levening (19-23H)

NOISE LEVEL	L _{night} (23-07h)		
	STRATEGIC NOISE MAP	SCENARIO 2030	SCENARIO 2050
>45 dB(A)	33.3	45.8	48.8
>50 dB(A)	10.7	17.1	19.3
>55 dB(A)	3.2	5.6	5.7
>60 dB(A)	1.3	2.1	2.1
>65 dB(A)	0.7	1.0	1.0
>70 dB(A)	0.1	0.4	0.4

Chart 35 – Exposed land area (km²) - L_{night} (23-7H)
Source: Ineco

NOISE LEVEL	L _{den} (24h)		
	STRATEGIC NOISE MAP	SCENARIO 2030	SCENARIO 2050
>55 dB(A)	21.2	30.5	33.7
>60 dB(A)	6.4	10.4	11.7
>65 dB(A)	2.1	3.4	3.6
>70 dB(A)	1	1.5	1.5

Chart 36 – Exposed land area (km²) - L_{den} (24H)
Source: Ineco

In both scenarios, the largest isophone zones correspond to nighttime noise footprints ($L_{night} > 45$ dB(A)), covering an area of 45.8 km² in the 2030 scenario and expanding to 48.8 km² in the 2050 scenario. These zones extend across Mārupe Municipality and Riga City, also reaching parts of Jūrmala City and Olaine Municipality.

The noise contours expand further both to the south and north along the runway axis, primarily due to the predominant southern configuration, which results in a higher proportion of approaches and departures in that direction.

The expansion of noise footprints in the 2050 scenario compared to 2030, across all time periods, is mainly driven by the projected increase in airport traffic.

Number of inhabitants

The assessment of exposed population focuses on residents living in dwellings where noise levels exceed the quality criteria established for residential areas.

The total potential population exposed to noise levels for each indicator and scenario is shown below:

NOISE LEVEL dB(A)	L _{day} (7-19h)		
	STRATEGIC NOISE MAP	SCENARIO 2030	SCENARIO 2050
55 - 59	393	1,076	1,211
60 - 64	<10	12	63
65 - 69	-	-	-
>70	-	-	-

Chart 37 – Number of inhabitants-L_{day} (07-19H)
Source: Ineco

NOISE LEVEL dB(A)	Levening (19-23h)		
	STRATEGIC NOISE MAP	SCENARIO 2030	SCENARIO 2050
50 - 54	2,204	3,609	3,643
55 - 59	351	801	1066
60 - 64	-	17	99
65 - 69	-	-	-
>70	-	-	-

Chart 38 – Number of inhabitants-L_{evening} (19-23H)
Source: Ineco

NOISE LEVEL dB(A)	L _{night} (23-07h)		
	STRATEGIC NOISE MAP	SCENARIO 2030	SCENARIO 2050
45 - 49	3,715	6,171	5,638
50 - 54	635	1,116	1,249
55 - 59	<10	51	199
60 - 64	-	-	-
65 - 69	-	-	-
> 70	-	-	-

Chart 39 – Number of inhabitants - L_{night} (23-7H)
Source: Ineco

NOISE LEVEL dB(A)	L _{den} (24h)		
	STRATEGIC NOISE MAP	SCENARIO 2030	SCENARIO 2050
55 - 59	1,509	2,702	2,831
60 - 64	133	492	765
65 - 69	-	1	1
>70	-	-	-

Chart 40 – Number of inhabitants – L_{den} (24H)
Source: Ineco

The following table presents the number of inhabitants exposed to noise levels exceeding the permitted thresholds, in accordance with the traffic-related noise limits established in Annex 2, Paragraph 2 of Cabinet of Ministers Regulation No. 16 of 7 January 2014.

AFFECTED RESIDENTS								
L _{day} (7-19h)			Levening (19-23h)			L _{night} (23-07h)		
SNM	2030	2050	SNM	2030	2050	SNM	2030	2050
-	-	-	-	17	99	<10	51	199

Chart 41 – Noise limit exceedances – Affected residents
Source: Ineco

The newly affected population is concentrated in residential areas located to the north of the airport.

5.2. Air Quality Assessment

The aim of this assessment is to evaluate the potential impacts on air quality resulting from the actions proposed in the Riga Airport Master Plan, including the projected increase in aircraft operations and passenger numbers over time, as each phase of the plan is implemented.

5.2.1. Calculation Horizons

To assess variations in air quality impacts resulting from operational changes at the airport, specific evaluation horizons have been defined. These allow for a structured comparison over time as the Riga Airport Master Plan is implemented. The three selected calculation horizons are as follows:

- Current Situation (2024): Represents the existing airport infrastructure currently in operation, including the aircraft movement subsystem (runways, taxiways, and aprons), as well as current traffic volume and fleet mix. This scenario reflects conditions in the year 2024.
- 2030 Horizon: Corresponds to the projected traffic volume and infrastructure expected by 2030, based on the planned actions outlined in the Master Plan.
- 2050 Horizon: Reflects the anticipated traffic volume and infrastructure associated with the full implementation of the Master Plan by 2050.

Horizon	Passengers	Operations
2024	7,116,829	63,186
2030	10,509,188	88,123
2050	17,376,050	142,100

Chart 42 – Number of passengers and operations by horizon
Source: Ineco

5.2.2. Regulatory Framework

Air quality in Latvia is regulated under the Regulations Regarding Ambient Air Quality (Regulation No. 1290), adopted on 3 November 2009. This legislation sets limit values for key air pollutants to protect human health. The most relevant thresholds are:

- NO₂: Annual limit value for the protection of human health: 40 µg/m³. Hourly limit value: 200 µg/m³, which must not be exceeded more than 18 times per calendar year.
- CO: Maximum 8-hour average limit for health protection: 10 mg/ m³.
- SO₂: Daily limit for health protection: 125 µg/ m³, not to be exceeded more than 3 times per calendar year. Hourly limit value: 350 µg/ m³, not to be exceeded more than 24 times per calendar year.
- PM₁₀: Annual limit value: 40 µg/ m³. Daily limit value: 50 µg/ m³, not to be exceeded more than 35 times per year.
- PM_{2,5}: Annual limit value for health protection: 25 µg/ m³.
- Benzene: Annual limit value for the protection of human health: 5 µg/ m³.

5.2.3. Characterization of emission sources

This assessment considers a comprehensive range of emission sources associated with airport operations. The following sources were included in the analysis:

- Aircraft emissions during the Landing and Take-Off (LTO) cycle.
- Auxiliary Power Units (APUs).
- Ground Support Equipment (GSE).
- Vehicles in airport parking areas and at airport access points.
- Stationary sources: Boilers, stationary generators and fire service training.

LTO cycle

The analysis of pollutant emissions from the Landing and Take-Off (LTO) cycle at Riga Airport was carried out through a simulation of airport operations using the latest version (3g) of the Aviation Environmental Design Tool (AEDT), released on August 28, 2024.

AEDT, developed by the Federal Aviation Administration’s Office of Environment and Energy (FAA-AEE), is one of the few air quality assessment tools specifically tailored for airport environments. It integrates modules for both emissions and dispersion modeling and includes extensive databases covering aircraft emission factors, ground support equipment (GSE), and auxiliary power units (APUs).

A key starting point for developing the airport’s emissions inventory is the characterization of the aircraft fleet and the annual number of operations for each specific aircraft/engine combination.

The modeling of aircraft activity has been based on detailed operational data provided by the airport’s internal database. This dataset includes the following key information for each movement:

- Aircraft model.
- Type of operation (arrival or departure).
- Origin or destination airport.
- Runway used for the operation.
- Date and time of the operation.
- Stand used for the operation.

The current configuration of the airport’s runways, taxiways, and aprons has been incorporated into the simulation to accurately represent the 2024 horizon.

For the future horizons, the projected fleet mix and number of operations outlined in the Master Plan have been considered. Additionally, the planned configuration of runways, taxiways, and aprons, as defined in the Master Plan, has been incorporated for both the 2030 and 2050 scenarios.

For the future horizons, the provisions of the ReFuelEU Aviation initiative regarding the use of sustainable aviation fuels (SAF) have also been considered. This initiative is part of the “Fit for 55” legislative package, which aims to align EU energy and climate regulations with the updated 2030 target: a minimum 55% reduction in greenhouse gas (GHG) emissions compared to 1990 levels.

ReFuelEU Aviation sets binding targets for the minimum share of SAF in aviation fuel blends, starting from January 1, 2025, with gradual increases leading to a 70% SAF share by 2050. For the 2030 horizon simulation, a minimum

SAF share of 6% has been assumed, while for the 2050 horizon, the simulation reflects the target of achieving a 70% SAF share. This high level of SAF usage will contribute significantly to the reduction of emissions for the various pollutants analyzed in this study.

Auxiliary Power Units

Emissions from Auxiliary Power Units (APUs) were calculated using the AEDT 3g model (Aviation Environmental Design Tool), developed by the Federal Aviation Administration’s Office of Environment and Energy (FAA-AEE).

APUs are small turbine engines integrated into the aircraft, used to supply electrical power when the main engines are shut down, typically during the aircraft’s turnaround phase while parked. Although part of the aircraft, APUs are treated as distinct emission sources due to their specific operational role during ground handling.

The AEDT model includes a database of APUs linked to each aircraft type. For this assessment, the default APUs assigned by AEDT for each aircraft model were used in the emissions calculations.

As part of the “Fit for 55” legislative package, the Regulation on the Deployment of Alternative Fuels Infrastructure establishes that, starting in 2030, all airport stands—both fixed and remote—must be equipped to provide electrical power to parked aircraft. This requirement is expected to significantly reduce the operating time of APUs per turnaround in both future scenarios (2030 and 2050).

In addition, the ReFuelEU Aviation initiative has been considered for APU emissions in the future horizons. This regulation mandates the use of at least 6% SAF by 2030 and 70% SAF by 2050. The integration of SAF into APU operations will further contribute to the reduction of emissions associated with aircraft on-ground power supply.

Ground Support Equipment

This category includes all service vehicles involved in ground handling operations such as baggage loading and unloading, catering and supply delivery, cabin and lavatory cleaning, refueling, and aircraft towing.

As with APUs, emissions from GSE have been calculated using the AEDT 3g model. This tool also includes a dedicated database of GSE types usually associated with each aircraft model, allowing for detailed and aircraft-specific emissions estimates.

The following chart provides the fuel-type distribution of GSE used in the analysis for each horizon, information provided by the airport.

Horizon	Diesel	Gasoline	Biodiesel/Hydrogen	Electric
2024	85%	2%	-	13%
2030	58%	2%	-	40%
2050	-	-	36%	64%

*Chart 43 – Fuel-type distribution of GSE by horizon
Source: Ineco*

Vehicles in airport parking areas and at airport access points

This section estimates the emissions generated by ground transportation vehicles, both public and private, that travel through the airport’s access roads and park in its designated parking areas.

The access routes considered in the emissions inventory include:

- Roads within the airport service area that connect to the regional network.
- Internal airport roads.
- Entry lanes to the various simulated parking lots.

Total emissions from airport access are calculated based on several variables: the annual number of vehicles using each route, average vehicle speed, emission factors per vehicle, and the length of each road segment.

To estimate the annual traffic volume for each horizon, calculations were based on the projected number of passengers and the modal split by transport type. For 2024, actual modal distribution data were used, while expected distributions were applied for 2030 and 2050, as detailed in the following table.

Mode of Transportation	2024	2030	2050
Private/Company Car	21%	19%	17%
Private car dropped off by someone	22%	21%	19%
Taxi/Limo	31%	27%	24%
Bus/Shuttle/Coach	21%	19%	23%
Rental Car	3%	3%	3%
Rail/Subway	-	9%	12%
Other	2%	2%	2%

*Chart 44 – Modal distribution by horizon
Source: Ineco*

For airport employees, a conservative assumption was made for all horizons: 100% of employees are assumed to commute by private vehicle from the city center of Riga.

In addition, the type and number of parking facilities expected for each horizon, as outlined in the Master Plan, have been considered.

Future scenarios also include a progressive increase in electric vehicle usage, from 1% in 2024, to 5% in 2030, and 44% by 2050.

Access-related emissions have been modeled using MOVES 4 (Motor Vehicle Emission Simulator), developed by the U.S. Environmental Protection Agency (EPA). This tool provides detailed estimates of vehicle emissions under a wide range of user-defined parameters. During the modeling process, factors such as vehicle types, pollutants, operation modes, road categories, and time periods were specified to reflect each scenario as accurately as possible.

Stationary sources

This section estimates the emissions generated by the airport's stationary sources, which include stationary generators, boilers and fire service training exercises.

Stationary Generators

At Riga Airport, the current consumption of stationary generators is approximately 1,899.4 liters of diesel fuel per year.

For future horizons, it is assumed that diesel fuel will continue to be used in 2030, while by 2050, a transition to biodiesel is expected. However, the use of battery-powered or hydrogen-based systems is also considered a plausible scenario.

Boilers

For 2024, boiler emissions have been calculated based on fuel consumption data from both the airport's own facilities and its tenants.

For future horizons (2030 and 2050), the same consumption levels have been assumed, although a gradual transition toward cleaner fuels and more energy-efficient boiler systems is anticipated.

Fire Service Training Exercises

In the current year (2024), emissions from fire service training are considered negligible, with an estimated consumption of approximately 5 liters of petrol annually.

For both 2030 and 2050, the same level of consumption has been assumed.

5.2.4. Other input data

Meteorological Data

Before estimating emissions dispersion and assessing potential impacts on the population, it is essential to process meteorological data and determine key atmospheric parameters such as the mixing layer height and stability class.

For this purpose, the AERMET meteorological preprocessor was used. AERMET requires two meteorological input files representative of the study area:

- A surface file in SAMSON format, which includes key meteorological variables recorded at the surface level corresponding to the airport's elevation.
- An upper air sounding file in TD-6201 format, which provides vertical profiles of meteorological conditions, including pressure, temperature, humidity, and wind speed/direction as a function of altitude.

These files were sourced from the World Meteorological Organization's Weather Research and Forecasting (WRF) model, which is widely recognized in the field and endorsed by the U.S. EPA as representing the state of the art in meteorological modeling.

In addition to meteorological data, AERMET requires inputs describing the land surface characteristics of the airport's surrounding area, defined by the following parameters:

- Surface roughness (m): The height at which wind speed is effectively reduced to zero due to surface obstacles.
- Bowen ratio: The ratio of sensible to latent heat flux, indicative of surface moisture conditions.
- Albedo: The fraction of incoming solar radiation reflected by the surface.

AERMET processes the input data in three stages:

1. Extraction and preprocessing of surface and upper air records.
2. Integration and merging of meteorological data into a single dataset.
3. Estimation of planetary boundary layer parameters from the merged file.

The result of this process is two key output files:

- The SFC file, which contains hourly estimates of mixed-layer parameters.
- The PFL file, which provides vertical profiles of wind speed and direction, temperature, and the standard deviation of wind components at multiple altitudes.

Airport Spatial Configuration

The assignment of runways, taxiways, and apron positions to each aircraft is a key element in accurately mapping emissions during the different phases of aircraft operation, as well as emissions from apron-based ground support equipment.

For the current horizon (2024), the simulation within AEDT reflects the existing layout of the airport infrastructure. For the future scenarios (2030 and 2050), the updated airside configuration as defined in the RIX Master Plan has been incorporated, including anticipated modifications to taxiways and apron layouts specific to each projected horizon.

Discrete Receptors

To assess pollutant concentration levels in the vicinity of the airport, 13 discrete receptors were strategically placed over urbanized areas surrounding the airport. These receptors were positioned at a height of 1.8 meters above ground level, representing average human breathing height.

The exact locations of the receptors are shown in Figure 62, and the results of the dispersion simulation are presented in the following section.



Figure 62 – Discrete Receptors
Source: Ineco

5.2.5. Results

Emissions inventory

The following tables present the emissions inventories corresponding to each of the study horizons.

SOURCE	CO	BENZENE	NO _x	SO _x	PM ₁₀	PM _{2,5}	CO ₂
	Tonnes/Year						
LTO cycle	90.19	0.13	240.28	19.05	1.15	1.15	45,283.16
APU	1.36	0.00	1.55	0.21	0.17	0.17	708.71
GSE	27.68	0.01	0.92	0.01	0.05	0.05	515.76
Ground access and parking	4.92	0.01	0.25	0.00	0.03	0.01	235.37
Stationary Generators	0.03	0.00	0.14	0.00	0.01	0.01	5.15
Boilers	1.19	0.00	1.45	0.11	0.03	0.03	1,748.29
Fire Service Training Exercises	0.00	0.00	0.00	0.00	0.00	0.00	0.01
TOTAL	125.37	0.15	244.59	19.38	1.44	1.42	48,496.45

Chart 45 – Emissions inventory. 2024
Source: Ineco

SOURCE	CO	BENZENE	NO _x	SO _x	PM ₁₀	PM _{2,5}	CO ₂
	Tonnes/Year						
LTO cycle	105,49	0,12	343,12	25,30	1,41	1,41	59,187.10
APU	1,30	0,00	1,31	0,19	0,15	0,15	580,05
GSE	26,48	0,01	0,88	0,01	0,05	0,05	493,48
Ground access and parking	5,65	0,01	0,25	0,00	0,05	0,02	249,21
Stationary Generators	0,03	0,00	0,14	0,00	0,01	0,01	5,15
Boilers	1,19	0,00	1,45	0,11	0,03	0,03	1,748.29
Fire Service Training Exercises	0.00	0.00	0.00	0.00	0.00	0.00	0.01
TOTAL	140.14	0.14	347.15	25.61	1.70	1.67	62,263.29

Chart 46 – Emissions inventory. 2030
Source: Ineco

SOURCE	CO	BENZENE	NO _x	SO _x	PM ₁₀	PM _{2,5}	CO ₂
	Tonnes/Year						
LTO cycle	157.53	0.21	545.30	26.57	0.90	0.90	30,311.10
APU	1.73	0.00	2.05	0.19	0.09	0.09	288.59
GSE	26.06	0.01	0.87	0.01	0.05	0.05	485.54
Ground access and parking	2.10	0.01	0.13	0.00	0.07	0.02	194.55
Stationary Generators	0.02	0.01	0.12	0.00	0.01	0.01	1.03
Boilers	1.19	0.00	1.45	0.11	0.03	0.03	1,748.29
Fire Service Training Exercises	0.00	0.00	0.00	0.00	0.00	0.00	0.01
TOTAL	188.63	0.24	549.92	26.88	1.15	1.10	33,029.11

Chart 47 – Emissions inventory. 2050
Source: Ineco

Comparison of Emissions Inventory Results Across Horizons

The following is a comparative analysis of emissions by source across the different time horizons:

LTO Cycle: Emissions from this source are expected to rise significantly due to the increase in aircraft operations across future horizons. However, considering the SAF (Sustainable Aviation Fuel) targets established under the ReFuelEU Aviation initiative, and gradual change of aircraft fleet to aircraft with less emissions, the increase in emissions is less pronounced than expected. In fact, for particulate matter and CO₂, emissions in the 2050 horizon are reduced compared to 2024.

GSE (Ground Support Equipment): Despite the growth in operations, emissions from GSE decrease due to the rising share of electric ground handling equipment over the future horizons.

APUs (Auxiliary Power Units): As with aircraft emissions, APU-related emissions are expected to grow with increased operations. However, a reduction is observed in 2030 due to the combined effect of SAF adoption and regulatory requirements mandating electrical power supply at all parking positions—both contact and remote—starting in 2030. For 2050, emissions increase moderately but remain below expected levels thanks to these same measures.

Access Roads and Parking: Emissions from this category are largely driven by the number of passengers and employees traveling to and from the airport. While passenger numbers rise by 48% in 2030 and by 144% in 2050, overall emissions from ground transport do not increase at the same rate. In fact, a reduction is observed in 2050 due to:

- The increasing adoption of electric vehicles, which are projected to make up 44% of all passenger vehicles by 2050.
- Lower emission factors for all vehicle-related pollutants over time.

Boilers: Emissions from boilers remain constant across the three horizons in this conservative scenario. Nevertheless, a gradual shift toward cleaner fuels and more energy-efficient systems is anticipated, which is likely to result in actual emissions reductions over time.

Stationary Generators: Emissions remain unchanged between 2024 and 2030, assuming continued diesel use. However, in 2050 emissions are expected to decrease as biodiesel is introduced.

SEI (Fire Service Training Exercises): Emissions from this source are assumed to remain constant across all horizons, as a conservative approach was applied, with no changes in fuel type or consumption considered.

Global Emissions Overview:

In the 2030 horizon, passenger traffic increases by 48% and aircraft operations by 39% compared to 2024. Of all pollutants, only NO_x shows a comparable increase (42%), as it benefits less from SAF usage. The emissions of other pollutants rise much more moderately.

By 2050, passenger numbers grow by 144% and aircraft operations by 125% compared to 2024. Again, only NO_x emissions reflect a proportional increase (125%), while other pollutants show significantly smaller increases—or even reductions. Notably, particulate matter and CO₂ emissions are reduced by approximately 20% to 32% relative to 2024 levels.

Concentration analysis

Nitrogen Dioxide (NO₂)

According to Latvian regulations, the current annual limit value for NO₂ to protect human health is set at 40 µg/m³.

As shown in Figure 4, the annual limit value for NO₂ (40 µg/m³) is not exceeded in any of the populated areas surrounding Riga Airport, nor within the airport's service area. The highest concentrations are observed near Runway 18 threshold.

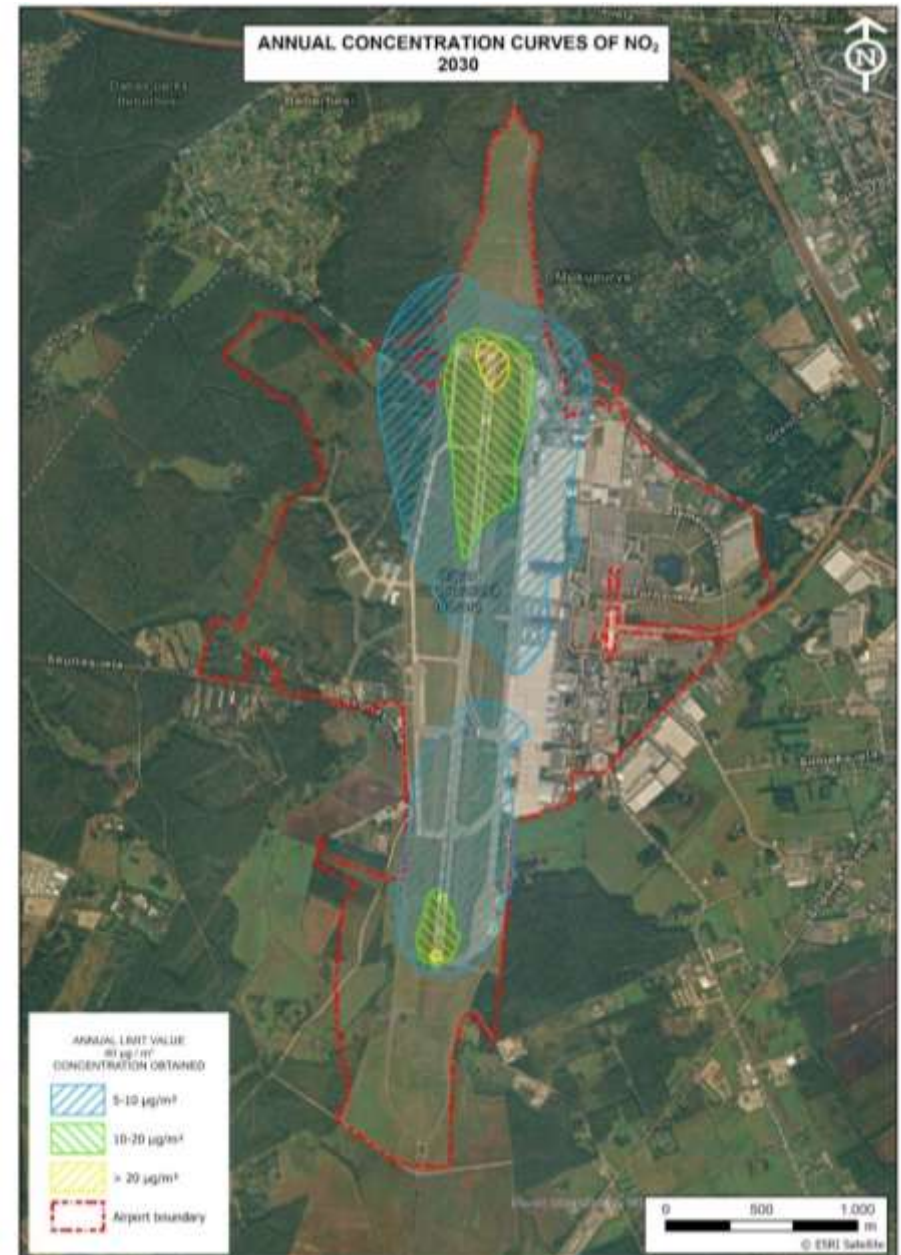




Figure 63 – Annual NO₂ Isoconcentration Curves for Riga Airport
Source: Ineco

Regarding the hourly limit value for the protection of human health, current legislation sets it at 200 µg/m³, which must not be exceeded more than 18 times per calendar year. The 99.8th percentile of an hourly dataset (based on 8.760 values per year) corresponds to the 19th highest hourly value. If this percentile value is less than or equal to 200 µg/m³, the regulation is considered met. As can be observed in the following tables, none of the receptors exceed the hourly limit value established by the legislation. Therefore, compliance is achieved for both the annual and hourly NO₂ concentration limits across the study area.

Receptor	Horizon	Hourly 99.8th percentile of NO ₂ (µg/m ³)
Beberbeķi	2024	159.00
	2030	121.03
	2050	156.00
Brīvkalni	2024	55.69
	2030	47.69
	2050	65.06
Imantas rietumi	2024	22.05
	2030	33.63
	2050	50.74
Jaunmārupe	2024	21.46
	2030	16.35
	2050	27.20
Liberi	2024	100.27
	2030	71.76
	2050	111.46
Mārupe	2024	27.62
	2030	22.08
	2050	29.91
Mārupes austrumi	2024	25.75
	2030	37.30
	2050	55.84
Mūkupurvs	2024	142.39
	2030	81.03
	2050	134.61
Mazāvas	2024	97.24
	2030	62.52
	2050	90.83

Receptor	Horizon	Hourly 99.8th percentile of NO ₂ (µg/m ³)
Skulte	2024	95.90
	2030	70.53
	2050	97.83
Spilve	2024	98.64
	2030	73.87
	2050	109.27
Vētras	2024	28.27
	2030	19.31
	2050	29.51
Zolitūde	2024	93.76
	2030	63.73
	2050	91.14

Chart 48 – Hourly concentrations of NO₂
Source: Ineco

Carbon monoxide (CO)

In the case of carbon monoxide, no annual average limit is established. Current legislation sets a limit value of 10 mg/m³ for the maximum daily 8-hour average, aimed at protecting human health. The following tables present the simulation results for all receptors. As shown, the maximum values obtained remain well below the legal threshold at all evaluated points, confirming full compliance with the applicable air quality standard for carbon monoxide.

Receptor	Horizon	Max. eight-hour concentration of CO (mg/m ³)
Beberbeķi	2024	0.12
	2030	0.09
	2050	0.15
Brīvkalni	2024	0.05
	2030	0.03
	2050	0.05
Imantas rietumi	2024	0.03
	2030	0.04
	2050	0.04
Jaunmārupe	2024	0.01
	2030	0.02
	2050	0.02

Receptor	Horizon	Max. eight-hour concentration of CO (mg/m ³)
Liberi	2024	0.10
	2030	0.07
	2050	0.07
Mārupe	2024	0.02
	2030	0.02
	2050	0.03
Mārupes austrumi	2024	0.06
	2030	0.04
	2050	0.05
Mūkupurvs	2024	0.04
	2030	0.04
	2050	0.06
Mazāvas	2024	0.04
	2030	0.04
	2050	0.06
Skulte	2024	0.09
	2030	0.05
	2050	0.08
Spilve	2024	0.13
	2030	0.09
	2050	0.10
Vētras	2024	0.02
	2030	0.01
	2050	0.02
Zolitūde	2024	0.05
	2030	0.04
	2050	0.05

Chart 49 – Eight-Hourly concentrations of CO
Source: Ineco

Sulfur Dioxide (SO₂)

There is no annual limit value for sulfur dioxide (SO₂) set for the protection of human health. The critical annual level defined for this pollutant relates to vegetation protection. However, for the protection of human health, the current legislation establishes hourly and daily limit values for SO₂.

The simulation results refer to total sulfur oxides (SO_x). Since legal thresholds are defined specifically for SO₂, and in order to evaluate compliance with the legislation, it has been assumed that all SO_x are present in the form of sulfur dioxide (SO₂).

The daily limit value for SO₂ is set at 125 µg/m³, not to be exceeded more than three times per calendar year. As in the case of NO₂, the 99.18th percentile of daily concentrations is used as an indicator, representing the fourth highest daily value in a series of 365 days. As shown below, this threshold is not exceeded in any of the study scenarios.

Receptor	Horizon	Daily 99.18th percentile of SO ₂ (µg/m ³)
Beberbeķi	2024	1.97
	2030	3.25
	2050	2.59
Brīvkalni	2024	0.76
	2030	1.10
	2050	1.07
Imantas rietumi	2024	0.55
	2030	0.81
	2050	0.69
Jaunmārupe	2024	0.29
	2030	0.48
	2050	0.44
Liberi	2024	1.21
	2030	1.70
	2050	1.81
Mārupe	2024	0.38
	2030	0.67
	2050	0.58
Mārupes austrumi	2024	0.76
	2030	1.11
	2050	0.97
Mūkupurvs	2024	1.56

Receptor	Horizon	Daily 99.18th percentile of SO ₂ (µg/m ³)
	2030	2.05
	2050	2.04
	2024	1.30
Mazāvas	2030	1.53
	2050	1.64
Skulte	2024	1.53
	2030	2.09
	2050	2.17
Spilve	2024	1.32
	2030	1.98
	2050	1.82
Vētras	2024	0.35
	2030	0.54
	2050	0.50
Zolitūde	2024	1.14
	2030	1.66
	2050	1.79

Chart 50 – Daily concentrations of SO₂
Source: Ineco

The hourly limit value is set at 350 µg/m³, not to be exceeded more than 24 times per calendar year. The 99.73rd percentile of the annual hourly data series, representing the 25th highest value, is used for evaluation. Additionally, the SO₂ alert threshold is defined at 500 µg/m³, which is considered exceeded if this concentration is maintained for three consecutive hours. The simulation results are shown in the following tables. As observed, none of the legal thresholds are exceeded in any of the evaluated scenarios.

Receptor	Horizon	Hourly 99.73rd percentile of SO ₂ (µg/m ³)
Beberbeķi	2024	10.07
	2030	13.93
	2050	13.81
Brīvkalni	2024	4.03
	2030	5.97
	2050	5.49
Imantas rietumi	2024	2.61
	2030	4.11
	2050	3.43
Jaunmārupe	2024	1.57
	2030	2.13
	2050	2.05
Liberi	2024	7.01
	2030	8.58
	2050	8.15
Mārupe	2024	2.14
	2030	3.18
	2050	3.13
Mārupes austrumi	2024	3.75
	2030	4.71
	2050	4.95
Mūkupurvs	2024	7.19
	2030	10.10
	2050	9.98
Mazāvas	2024	6.35
	2030	7.94
	2050	7.80

Receptor	Horizon	Hourly 99.73rd percentile of SO ₂ (µg/m ³)
Skulte	2024	6.84
	2030	9.15
	2050	8.82
Spilve	2024	5.32
	2030	10.61
	2050	9.14
Vētras	2024	1.93
	2030	2.69
	2050	2.49
Zolitūde	2024	6.02
	2030	7.80
	2050	8.39

Chart 51 – Hourly concentrations of SO₂
Source: Ineco

Particulate Matter (PM₁₀)

Legislation sets both annual and daily limit values for suspended particulate matter (PM₁₀) to protect human health.

The annual limit value for human health protection is 40 µg/m³. As shown in the following figure, this limit is not exceeded at any point outside the airport or within its service area. The recorded values remain well below the legal threshold.

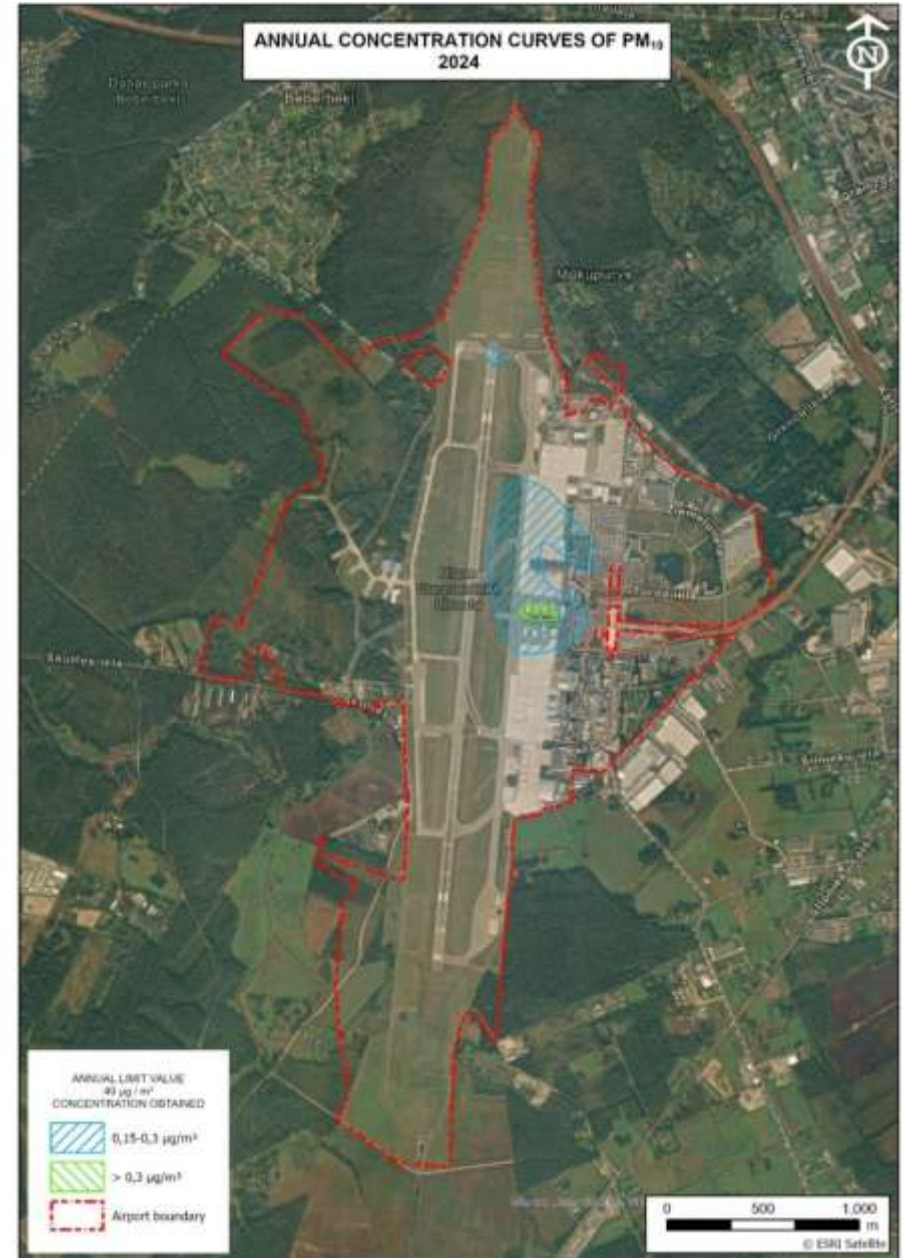




Figure 64 – Annual PM₁₀ Isoconcentration Curves for Riga Airport
Source: Ineco

The daily limit value is set at 50 µg/m³, which must not be exceeded more than 35 times per calendar year. To verify compliance with this requirement, the 90.4th percentile of the daily concentration distribution is used, representing the 36th highest daily value in a 365-day series. The following table presents the values obtained at each of the receptors analyzed for all study scenarios. All simulation results are significantly below the established legal limits.

Receptor	Horizon	Daily 90.4th percentile of PM ₁₀ (µg/m ³)
Beberbeķi	2024	0.07
	2030	0.10
	2050	0.06
Brīvkalni	2024	0.03
	2030	0.04
	2050	0.02
Imantas rietumi	2024	0.02
	2030	0.02
	2050	0.01
Jaunmārupe	2024	0.01
	2030	0.01
	2050	0.00
Liberi	2024	0.04
	2030	0.06
	2050	0.04
Mārupe	2024	0.01
	2030	0.01
	2050	0.01
Mārupes austrumi	2024	0.02
	2030	0.03
	2050	0.02
Mūkupurvs	2024	0.05
	2030	0.06
	2050	0.03
Mazāvas	2024	0.03
	2030	0.04
	2050	0.02

Receptor	Horizon	Daily 90.4th percentile of PM ₁₀ (µg/m ³)
Skulte	2024	0.07
	2030	0.08
	2050	0.05
Spilve	2024	0.02
	2030	0.03
	2050	0.02
Vētras	2024	0.01
	2030	0.01
	2050	0.01
Zolitūde	2024	0.04
	2030	0.04
	2050	0.02

Chart 52 – Daily concentrations of PM₁₀
Source: Ineco

Particulate Matter (PM_{2.5})

The annual limit value for PM_{2.5} for the protection of human health is set at 25 µg/m³.

As illustrated in the following figure, this limit is not exceeded at any point outside the airport or within its service area. The values obtained are well below the legal threshold.





Figure 65 – Annual $PM_{2.5}$ Isoconcentration Curves for Riga Airport
Source: Ineco

Benzene (C_6H_6)

According to current legislation, the annual limit value for the protection of human health for benzene is set at $5 \mu\text{g}/\text{m}^3$.

Since AEDT does not provide a method for calculating this compound directly, the estimation was made using the guidance document "Recommended Best Practice for Quantifying Speciated Organic Gas Emissions from Aircraft Equipped with Turbofan, Turbojet, and Turbo-prop Engines – Version 1.0". published by the U.S. EPA. According to this document, benzene represents 1.681% by mass of the total organic gases (TOG) emitted by turbofan, Turbojet, and turbo-prop engines.

Based on this, the calculated TOG emissions from AEDT were multiplied by this factor to obtain an approximate estimate of benzene emissions.

As shown in the following figure, the annual limit value is not exceeded at any point within the airport system.





Figure 66 – Annual Benzene Isoconcentration Curves for Riga Airport
Source: Ineco

5.3. Obstacle Limitation Surfaces

The safe and efficient operation of airports requires the implementation of specific precautionary measures to ensure that no obstacles interfere with take-off, holding, or approach procedures.

Obstacle Limitation Surfaces (OLS) define the airspace surrounding an airport that must remain free of obstacles to allow aircraft operations to be conducted safely. These surfaces are essential to prevent the airport from becoming unusable due to the encroachment of obstacles in its vicinity.

ICAO Annex 14 and Document 9137 – Airport Services Manual, Part 6: Control of Obstacles establish international standards and recommended practices for OLS. These documents define the boundaries within which objects must not penetrate the airspace to maintain the safety and functionality of airport operations. In Europe, the European Union Aviation Safety Agency (EASA) regulates the specific surfaces applicable to each airport.

The concept of OLS has long been a cornerstone of airport planning and airspace protection. These imaginary surfaces are defined around airports to ensure safe aircraft operations during critical flight phases—such as take-off, approach, and landing—by limiting the presence of obstacles in designated areas.

Traditionally, OLS have been based on fixed geometric shapes and gradients, applied uniformly regardless of the specific operational context of each airport. These surfaces include elements such as the take-off climb surface, approach surface, transitional surfaces, and inner horizontal surfaces, among others. Their purpose is to create a protected volume of airspace free from obstacles that could endanger aircraft operations.

However, this conventional model has certain limitations. It does not fully account for the performance capabilities of modern aircraft, the precision of contemporary navigation systems, or the increasing complexity of airport environments. As a result, the current OLS framework can sometimes be overly restrictive or, conversely, insufficiently responsive to actual operational risks.

Recognizing these challenges, the International Civil Aviation Organization (ICAO) is preparing a major revision to Annex 14, which governs aerodrome design and operations. This revision introduces a new conceptual model that replaces traditional OLS with a more nuanced, performance-based approach. The new model is centred around two types of surfaces:

- Obstacle Free Surfaces (OFS)
- Obstacle Evaluation Surfaces (OES)

This shift represents a paradigm change in how obstacle limitation is understood and applied. Rather than relying solely on geometric constraints, the new approach incorporates risk assessment and operational considerations, offering greater flexibility while maintaining—or even enhancing—safety standards.

ICAO has scheduled the new OLS framework to become applicable by the end of 2030. As this date aligns with the first planning horizon of the Master Plan, the OLS for this phase have been designed and calculated in accordance with the upcoming Standards and Recommended Practices (SARPs). Nevertheless, the surfaces will need to be adjusted to comply with the regulations approved by EASA once the ICAO documents are formally adopted.

5.3.1. Obstacle Free Surfaces (OFS) and Obstacle Evaluation Surfaces (OES)

As part of the upcoming revision to ICAO Annex 14, a new conceptual framework is being introduced to modernize the way obstacle limitation is managed around airports. This framework is based on two distinct types of surfaces: Obstacle Free Surfaces (OFS) and Obstacle Evaluation Surfaces (OES).

Obstacle Free Surfaces (OFS) are critical zones in the vicinity of an airport that must remain completely free of obstacles. These surfaces are designed to protect essential flight paths and ensure safe aircraft operations during the most vulnerable phases of flight, such as take-off and landing. The presence of any object within an OFS is considered unacceptable, as it poses a direct threat to flight safety.

In contrast, Obstacle Evaluation Surfaces (OES) are used to assess whether the presence of an object within a defined airspace volume is compatible with safe aircraft operations. Unlike OFS, the intrusion of an object into an OES does not automatically render it unacceptable. Instead, it triggers a safety assessment process that considers various operational factors, such as aircraft performance, navigation procedures, and the availability of mitigating measures.

This dual-surface approach allows for a more flexible and performance-based assessment of obstacles, aligned with the capabilities of modern aircraft and navigation systems. It also supports more efficient land use around airports, enabling better integration of aviation infrastructure with urban development while maintaining high safety standards.

The introduction of OFS and OES represents a significant evolution in obstacle management philosophy, shifting from a purely geometric model to a risk-based and operationally informed framework.

The surfaces that constitute the Obstacle Free Surfaces (OFS) are as follows:

- Approach Surface: Protects the airspace along the extended centreline of the runway during the approach phase.
- Transitional Surface: Ensures lateral obstacle clearance adjacent to the runway and approach surfaces.
- Inner Approach Surface: Protects the final segment of the approach path immediately before the runway threshold.
- Inner Transitional Surface: Ensures obstacle clearance in the lateral areas adjacent to the runway and approach path.
- Balked Landing Surface: Safeguards the area used in the event of a missed approach or go-around.
- Take-off Climb Surface: Protects the departure path beyond the OFS.

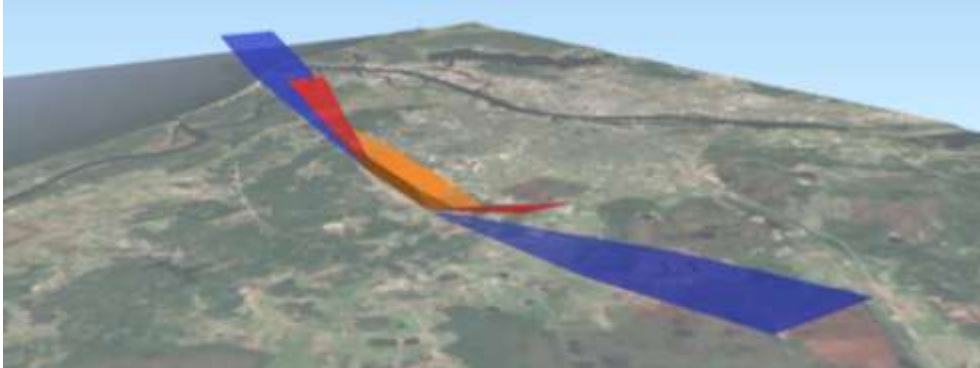


Figure 67 – Obstacle free surfaces (OFS)
Source: Ineco

5.3.2. OLS Design and analysis

In order to provide a comprehensive and forward-looking analysis, the Obstacle Limitation Surfaces (OLS) have been calculated for two distinct runway configuration scenarios:

- Current Runway Configuration: This scenario reflects the existing physical characteristics of the runway, without any modifications or extensions. The OLS in this case are based on the current declared distances and runway layout.
- Runway with 300 m Clearway (CWY) at Each End: In this scenario, a 300-meter clearway has been considered at both ends of the runway. The inclusion of clearways extends the available take-off distance without requiring physical runway extension.

By evaluating both scenarios, the analysis ensures that the airport's obstacle environment is compatible not only with current operations but also with potential future enhancements.

On the other hand, Obstacle Evaluation Surfaces (OES) include the following:

- Horizontal surface: Maintains a clear zone above the aerodrome to protect aircraft manoeuvring in the vicinity.
- Surface for precision approaches.
- Instrument departure surface.

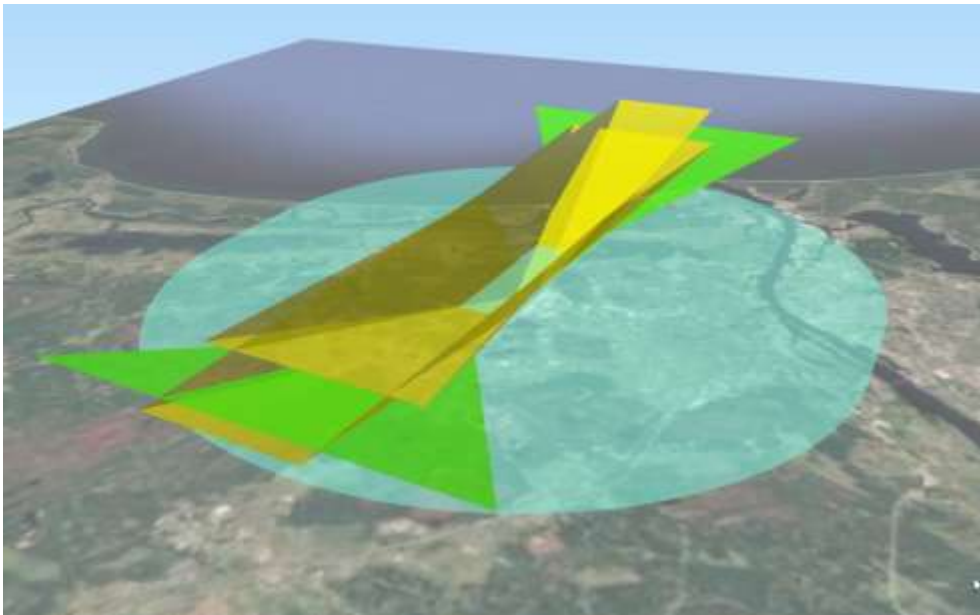


Figure 68 – Obstacle evaluation surfaces (OES)
Source: Ineco

Scenario 1: no CWY

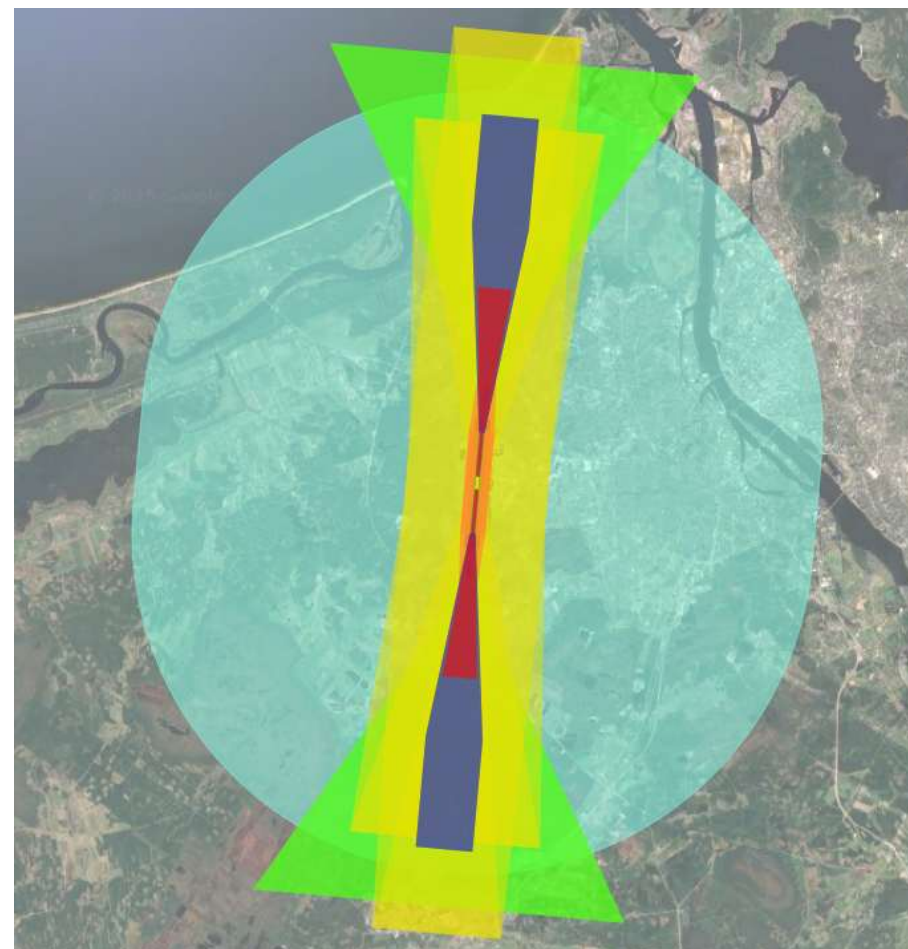
In this scenario, the runway is considered as a precision instrument runway with a Take-Off Distance Available (TODA) of 3.200 meters. and no clearways (CWY) at either end. This configuration reflects the current operational conditions of the runway.

All OLS have been calculated and modelled in three dimensions. This 3D modelling enables precise visualization and analysis of potential obstacle intrusions. as illustrated in Figure 69.

Based on these 3D OLS, the existing obstacles in the vicinity of the airport have been identified and are listed in next chart:

ID	X (m)	Y (m)	Z (m)	Description	OLS	Penetration (m)
EVRA-VSPT-005083	498,207.927	306,523.951	19.60	TREE	PRECISION APPROACHES RWY 36	0.78
EVRA-VSPT-005084	498,217.480	306,495.750	19.60	POLE	PRECISION APPROACHES RWY 36	0.24
EVRA-VSPT-001480	498,188.189	306,507.695	32.00	POLE	TRANSITIONAL SURFACE RWY 36	2.58
EVRA-VSPT-001480	498,188.189	306,507.695	32.00	POLE	NSTRUMENT DEPARTURE SURFACE RWY 18	4.36
EVRA-VSPT-001480	498,188.189	306,507.695	32.00	POLE	PRECISION APPROACHES RWY 36	12.82
EVRA-VSPT-001602	498,947.071	311,996.860	48.30	TOWER	PRECISION APPROACHES RWY 18	1.90
EVRA-VSPT-001475	502,214.697	313,232.284	133.00	TOWER	HORIZONTAL SURFACE	33.08
EVRA-VSPT-001477	502,671.398	311,523.963	111.70	TOWER	HORIZONTAL SURFACE	11.78
RIX_G_2	502,634.168	309,974.109	125.50	POLE	HORIZONTAL SURFACE	25.58
RIX_G_51	502,576.603	309,920.584	125.50	BUILDING	HORIZONTAL SURFACE	25.58
RIX_G_1	502,660.100	310,045.633	110.60	POLE	HORIZONTAL SURFACE	10.68

Chart 53 – Obstacles identified in Scenario 1



- S_OFS_APPROACH SURFACE RWY
- S_OFS TAKE OFF CLIMB SURFACE RWY
- S_OFS_TRANSITIONAL SURFACE RWY
- S_OFS_INNER_TRANSITIONAL SURFACE RWY
- S_OFS_INNER APPROACH SURFACE RWY
- S_OFS_BALKED LANDING SURFACE RWY
- S_OES_SURFACE FOR PRECISION APPROACHES RWY
- S_OES_INSTRUMENT DEPARTURE SURFACE RWY
- S_OES_HORIZONTAL SURFACE
- S_HELI TAKE-OFF

Figure 69 – OLS TODA 3.200 m. no CWY
Source: Ineco

The identified obstacles are shown in Figure 70

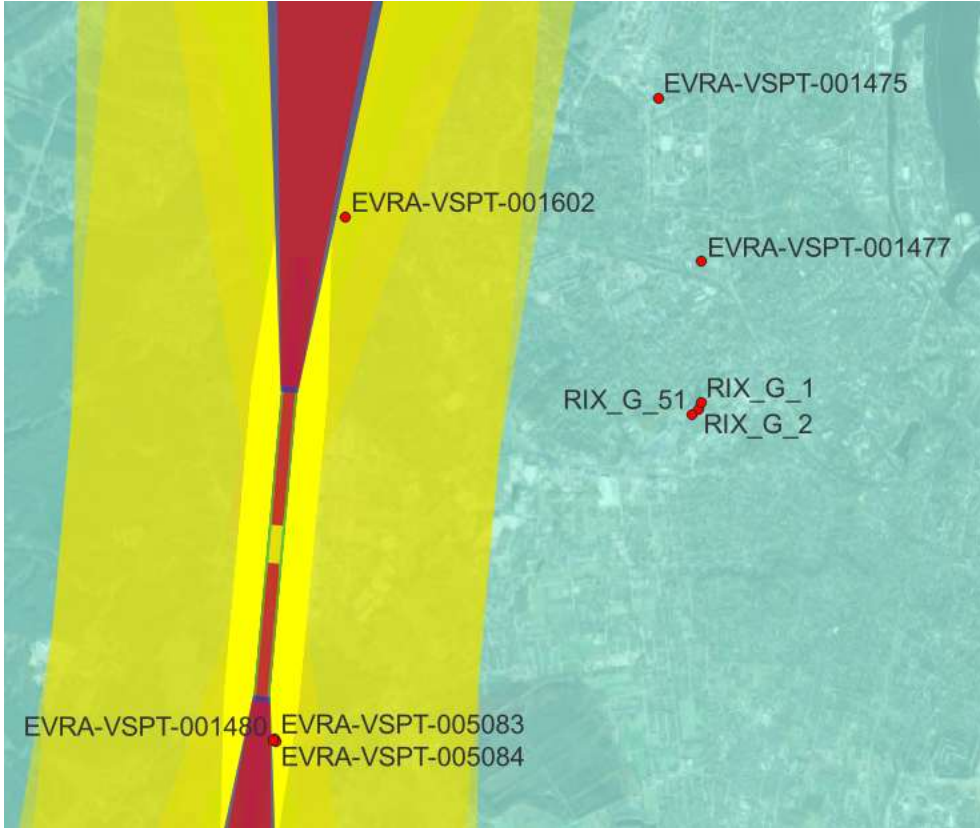


Figure 70 – Identified obstacles Scenario 1
Source: Ineco

Scenario 2: 300 m CWY

This scenario considers the addition of a 300-meter clearway at each end of the runway, resulting in a TODA of 3.500 metres.

The 3D model of the OLS for this scenario is shown in Figure 72.

Based on these 3D OLS, the existing obstacles in the vicinity of the airport have been identified and are listed in next chart:

ID	X (m)	Y (m)	Z (m)	Description	OLS	Penetration (m)
EVRA-VSPT-005083	498,207.927	306,523.951	19.60	TREE	PRECISION APPROACHES RWY 36	0.78
EVRA-VSPT-005084	498,217.480	306,495.750	19.60	POLE	PRECISION APPROACHES RWY 36	0.24
EVRA-VSPT-001480	498,188.189	306,507.695	32.00	POLE	TRANSITIONAL SURFACE RWY 36	2.58
EVRA-VSPT-001480	498,188.189	306,507.695	32.00	POLE	INSTRUMENT DEPARTURE SURFACE RWY 18	11.86
EVRA-VSPT-001480	498,188.189	306,507.695	32.00	POLE	PRECISION APPROACHES RWY 36	12.82
EVRA-VSPT-002902	498,682.052	311,562.788	36.70	TREE	TAKE OFF CLIMB SURFACE RWY 36	4.23
EVRA-VSPT-001481	498,493.310	310,728.324	16.90	ANTENNA	TAKE OFF CLIMB SURFACE RWY 36	1.39
EVRA-VSPT-001602	498,947.071	311,996.860	48.30	TOWER	PRECISION APPROACHES RWY 18	1.90
EVRA-VSPT-001475	502,214.697	313,232.284	133.00	TOWER	HORIZONTAL SURFACE	33.08
EVRA-VSPT-001477	502,671.398	311,523.963	111.70	TOWER	HORIZONTAL SURFACE	11.78
RIX_G_2	502,634.168	309,974.109	125.50	POLE	HORIZONTAL SURFACE	25.58
RIX_G_51	502,576.603	309,920.584	125.50	BUILDING	HORIZONTAL SURFACE	25.58
RIX_G_1	502,660.100	310,045.633	110.60	POLE	HORIZONTAL SURFACE	10.68

Chart 54 – Obstacles identified in Scenario 2
Source: Ineco

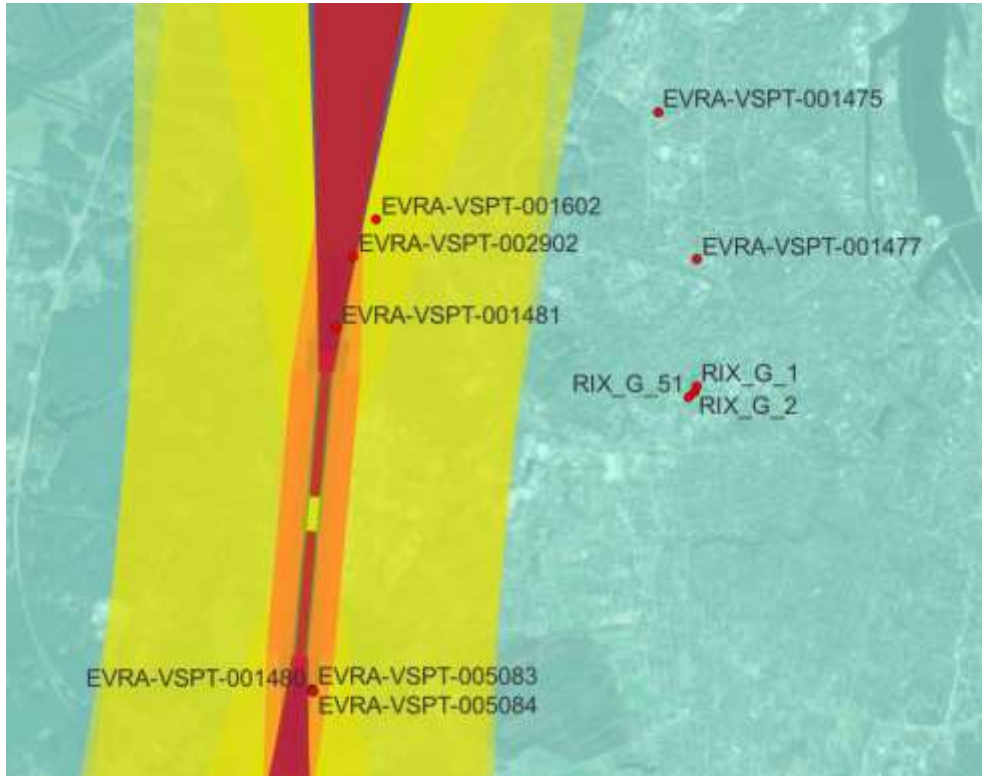
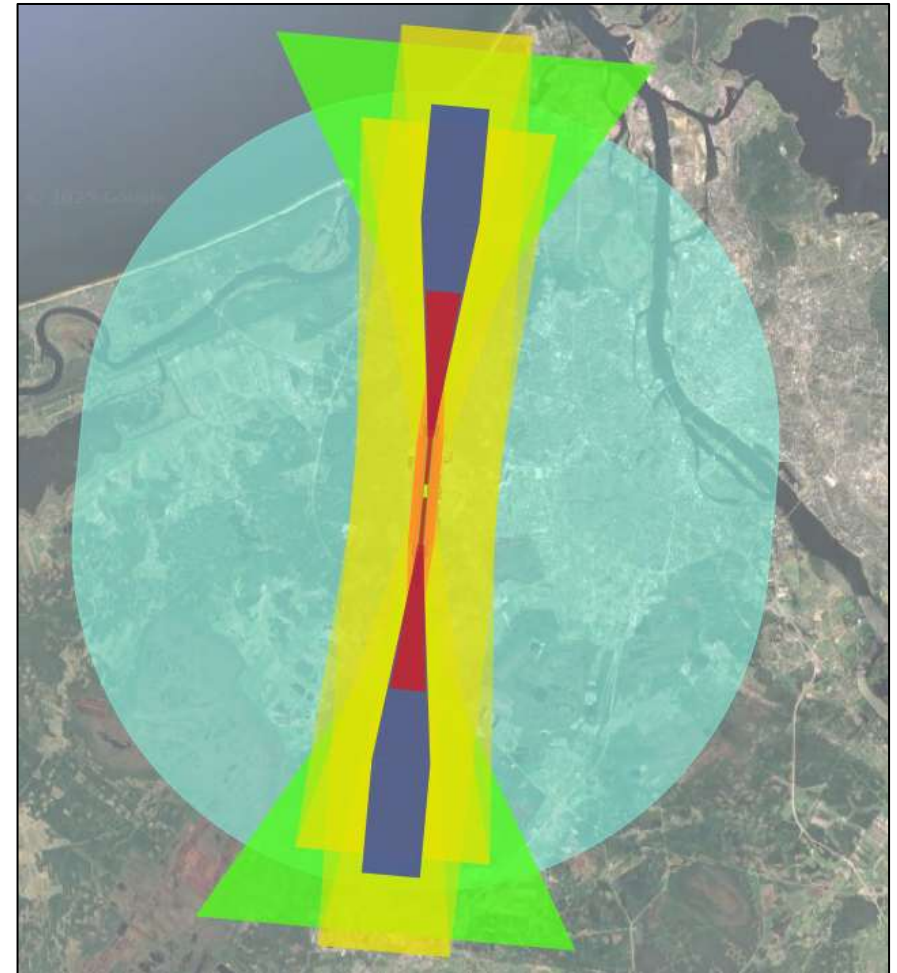


Figure 71 – Identified obstacles Scenario 2
Source: Ineco



- ✓ ■ S_OFS_APPROACH SURFACE RWY
- ✓ ■ S_OFS_TAKE OFF CLIMB SURFACE RWY
- ✓ ■ S_OFS_TRANSITIONAL SURFACE RWY
- ✓ ■ S_OFS_INNER_TRANSITIONAL SURFACE RWY
- ✓ ■ S_OFS_INNER APPROACH SURFACE RWY
- ✓ ■ S_OFS_BALKED LANDING SURFACE RWY
- ✓ ■ S_OES_SURFACE FOR PRECISION APPROACHES RWY
- ✓ ■ S_OES_INSTRUMENT DEPARTURE SURFACE RWY
- ✓ ■ S_OES_HORIZONTAL SURFACE
- ✓ ■ S_HELI TAKE-OFF

Figure 72 – OLS TODA 3.500 m and 300 m CWY
Source: Ineco

ANNEX: INITIAL RECOMMENDATIONS FOR DEVELOPMENTS BEYOND 2050

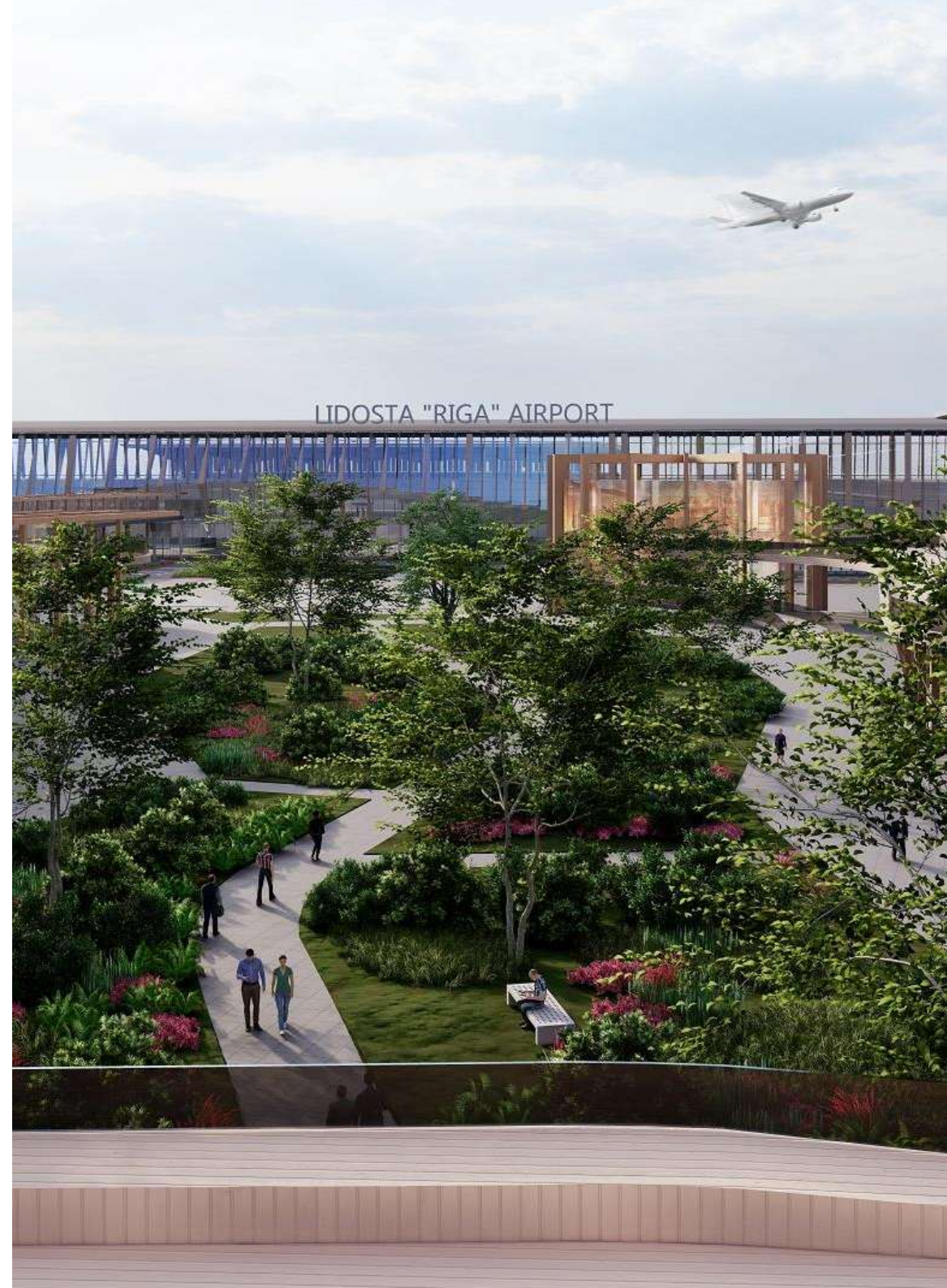
This chapter presents initial considerations for developments beyond the year 2050, extending to 2065, with a focus on land reservation for the very long-term expansion of Riga Airport. Specific proposals and decisions regarding developments beyond 2050 will be addressed in future versions of the Riga Airport Master Plan.

The airport development outlined here is presented at a high level, focusing on strategic guidelines for future expansion. It briefly identifies the key actions required for implementation and highlights the optimal areas for locating new airport facilities.

The primary objective of this conceptual definition is to provide competent authorities with the opportunity to reserve the necessary land for future airport expansion. To achieve this, it is essential to:

- Protect the land designated for future airport facilities by formally identifying it as airport reserve
- Limit land use in areas affected by physical or radioelectric easements and noise contours associated with future airport operations

These measures should be implemented as early as possible to ensure the long-term viability of airport development.



RIX 2065 image

A very high-level air traffic forecast for Riga Airport up to 2065 indicates that 25 million annual passengers (MAP) could be expected. In terms of peak operations, the evolution of the flight schedule profile beyond 2050 is expected to exceed 45 operations per hour, requiring an increase in runway capacity.

Runway and aircraft taxiing developments

Following the developments proposed between 2030 and 2050—including two new Rapid Exit Taxiways (RETs), a full-length Code E parallel taxiway, and the reconfiguration of de-icing pads to serve as holding bays when not in use—the construction of a second runway becomes necessary before 2065 to meet projected demand.

It is important to note that the Master Plan presents the second runway as a recommendation, and several viable options are outlined below. The final decision should be made in the next version of the Riga Airport Master Plan, once there is greater certainty regarding demand, required capacity, and available technology.

The options proposed are at a high-level planning stage, intended to define an envelope of possibilities and ensure their feasibility in the future. The objective of this analysis is to establish a land reservation that will allow any of the second runway options to be implemented when the time comes. This reserved land would be formalized as a National Interest Boundary.

The second runway would be designated as Runway 18R–36L, while the existing runway would be redesignated as Runway 18L–36R. These designations may need to be updated periodically to reflect changes in magnetic variation.

The runway options analysed are described in the following sections.

Option 1 – Dual Runway System

This option involves the construction of a new Category 4F runway, designated 18R–36L, parallel to the existing runway and located to its west, with a minimum separation of 270 meters between centrelines. The proposed configuration assigns departures to the new runway and arrivals to the existing one, although other operational configurations may be considered. The main conclusions remain consistent across variations.

This option offers minimal land use, low environmental impact, and reduced impact on neighbouring areas, along with a relatively low cost. It provides a moderate increase in capacity, allowing for up to 50–52 operations per hour, with no more than 38 arrivals per hour. However, it lacks the flexibility to manage unbalanced peak periods, which are characteristic of Riga Airport’s traffic profile.

The use of the new runway for departures is proposed to minimize investment, but the impact of runway crossings on overall capacity must be assessed in detail before finalizing the solution.

While this option offers a modest increase in total capacity, it is not sufficient to accommodate the forecasted unbalanced peak demand at Riga Airport. Despite its relatively low cost, the investment may not be justified under current demand projections. Nevertheless, it could be considered a contingency option if future demand patterns shift significantly.



Figure 73 – Dual Runway System
Source: Ineco

Option 2 – Segregated parallel Runway System

The second option consists of constructing a new Category 4F runway, designated 18R–36L, parallel to the existing runway and located to its west, with a minimum separation of 720 meters between centrelines. This configuration allows for segregated operations.

This option requires greater land use and has a moderate environmental impact, which could be significant in the Skulte area.

It offers a higher increase in capacity than the dual-runway configuration, supporting up to 80 operations per hour, but only under balanced demand conditions.

The proposal suggests using the new runway primarily for departures, as this requires less investment. However, the impact of runway crossings on overall capacity must be carefully assessed before finalizing the solution.

In conclusion, while this option increases capacity, it does not address the forecasted unbalanced peak demand at Riga Airport. Due to its complex approval process, higher cost, and operational limitations, the investment may not be justified under current projections. Nevertheless, if the structure of peak demand changes in the future, this alternative could be reconsidered.



Figure 74 – Segregated parallel Runway System
Source: Ineco

Option 3 – Dependent parallel Runway System

This option proposes the construction of a new Category 4F runway, designated 18R–36L, parallel to the existing runway and located to its west, with a dependent approach configuration and a minimum separation of 915 meters between centrelines. This configuration offers a highly flexible solution.

This alternative requires greater land use and has a high environmental and social impact, particularly in the neighbouring areas of Skulte and Dzērves.

It provides a significant increase in capacity, reaching up to 85 operations per hour, and offers strong flexibility to manage unbalanced peak periods of arrivals and departures, which are typical of Riga Airport’s traffic profile. However, it also introduces increased complexity in airborne operations, requiring airspace redesign and high-precision CNS (Communication, Navigation, and Surveillance) equipment. Additionally, visibility from the air traffic control tower should be analysed.

Ground operations will need to address runway crossings and long taxiing distances. The space between runways could be used for additional airport functions such as FBO, MRO, or even satellite terminals.

This alternative meets the maximum demand projected in the Master Plan and provides excellent operational flexibility under various configurations. However, it also involves high complexity in terms of approval processes, cost, and operational management.



Figure 75 – Dependent parallel Runway System
Source: Ineco

Option 4 – Independent parallel Runway System

Option 4 proposes the construction of a new Category 4F runway, designated 18R–36L, parallel to the existing runway and located to its west, with an independent approach configuration and a minimum separation of 1,035 meters between centrelines. This configuration offers the highest level of operational flexibility.

This option requires extensive land use and has a high environmental and social impact, particularly in the neighbouring areas of Skulte and Dzērves.

It provides a significant increase in capacity, reaching up to 90 operations per hour, and offers excellent flexibility to manage unbalanced peak periods of arrivals and departures, which are typical of Riga Airport’s traffic profile. However, it also introduces increased complexity in airborne operations, requiring airspace redesign, high-precision CNS (Communication, Navigation, and Surveillance) equipment, and a detailed analysis of visibility from the air traffic control tower. Ground operations must also consider runway crossings and long taxiing distances. The space between runways could be used for additional airport functions such as FBO, MRO, or even satellite terminals.

This option provides the highest capacity and operational flexibility, offering the strongest foundation for the airport’s future development—including the potential construction of a satellite terminal. However, it also involves greater complexity in terms of approval processes (land acquisition, relocations, environmental permits) and higher investment costs.



Figure 76 – Independent parallel Runway System
Source: Ineco

Option 5 – Near parallel Runway System

Near-parallel runways are non-intersecting runways whose extended centerlines have an angle of convergence or divergence of 15° or less. These configurations are typically designed to avoid obstacles or reduce noise impact on specific areas. Both runways operate for departures and arrivals as a dependent system. The following considerations apply to any near-parallel configuration at Riga Airport, regardless of whether the runways converge or diverge:

- Most near-parallel configurations in Europe are segregated, with one runway used for arrivals and the other for departures.
- Dependent operations require RNP AR procedures (Required Navigation Performance – Authorization Required), which are highly complex and demand airspace redesign, specific onboard equipment, and specialized training for air traffic controllers. “AR” indicates that authorization is required—at least for one of the runways—for both aircraft and pilots. Currently, approximately 55% of flight plans at Riga Airport comply, making this a potential future alternative.
- The convergence point in the proposed configuration implies a near-single line approach, meaning that arrival capacity would be equivalent to that of a single-runway operation.
- Missed approach procedures in the converging direction must be carefully analyzed, as they may affect overall capacity.

Despite these challenges, the optimal geometric configuration should be studied in detail, along with a comprehensive aeronautical assessment. This option would be the most complex to approve, requiring extensive land acquisition, relocations, environmental approvals, and representing the highest cost among the alternatives.



Figure 77 – Near parallel Runway System
Source: Ineco

Option 6 – Dependent parallel Staggered Runway System

The final option analysed is a variation of Option 3, involving a system of dependent parallel runways with a separation of 915 meters between centrelines. In this variation, the new runway is proposed to be staggered approximately 900 meters to the south.

One of the main advantages of this configuration is that it significantly reduces the environmental and social impact on the Dzērves village and Beberbeķi neighbourhood.



Figure 78 – Dependent parallel Staggered Runway System
Source: Ineco

As previously mentioned, one of the analysed options is currently recommended, as shown in the plans and the following images. However, the final decision regarding which second runway to construct should be made in the next version of the Riga Airport Master Plan, once there is greater certainty regarding projected demand and available technology.

Proposed development

A second runway, 3,500 meters long and 60 meters wide, is proposed as a recommendation to the west of the current runway, parallel to it and separated by 915 meters between centrelines. The new runway is staggered 900 meters to the south. It will feature an access taxiway at each threshold, a rapid exit taxiway in each direction, and a parallel taxiway to the east of the new runway for Code F aircraft. The rapid exit taxiways are planned to be located approximately 2,300 meters from each threshold. However, the final location and exit angles must be determined through a specific study prior to construction and validated by the relevant authorities.

The new runway will be connected to the rest of the airport by five Code F taxiways. Two will connect to the new developments proposed between 2035 and 2050 on the west side of the current runway. Two will connect directly to the existing runway. One will connect to the parallel taxiway of the current runway proposed for 2040. Additionally, the second runway will include two de-icing pads located to the east, one at each end, similar to those proposed for the current runway. These pads may also be used as holding bays when not in use for de-icing. A new taxiway is also proposed to serve the expansion of the general aviation area, which will be detailed later in this report.

The following image illustrates the proposed developments for the runways and taxiways, as described above.

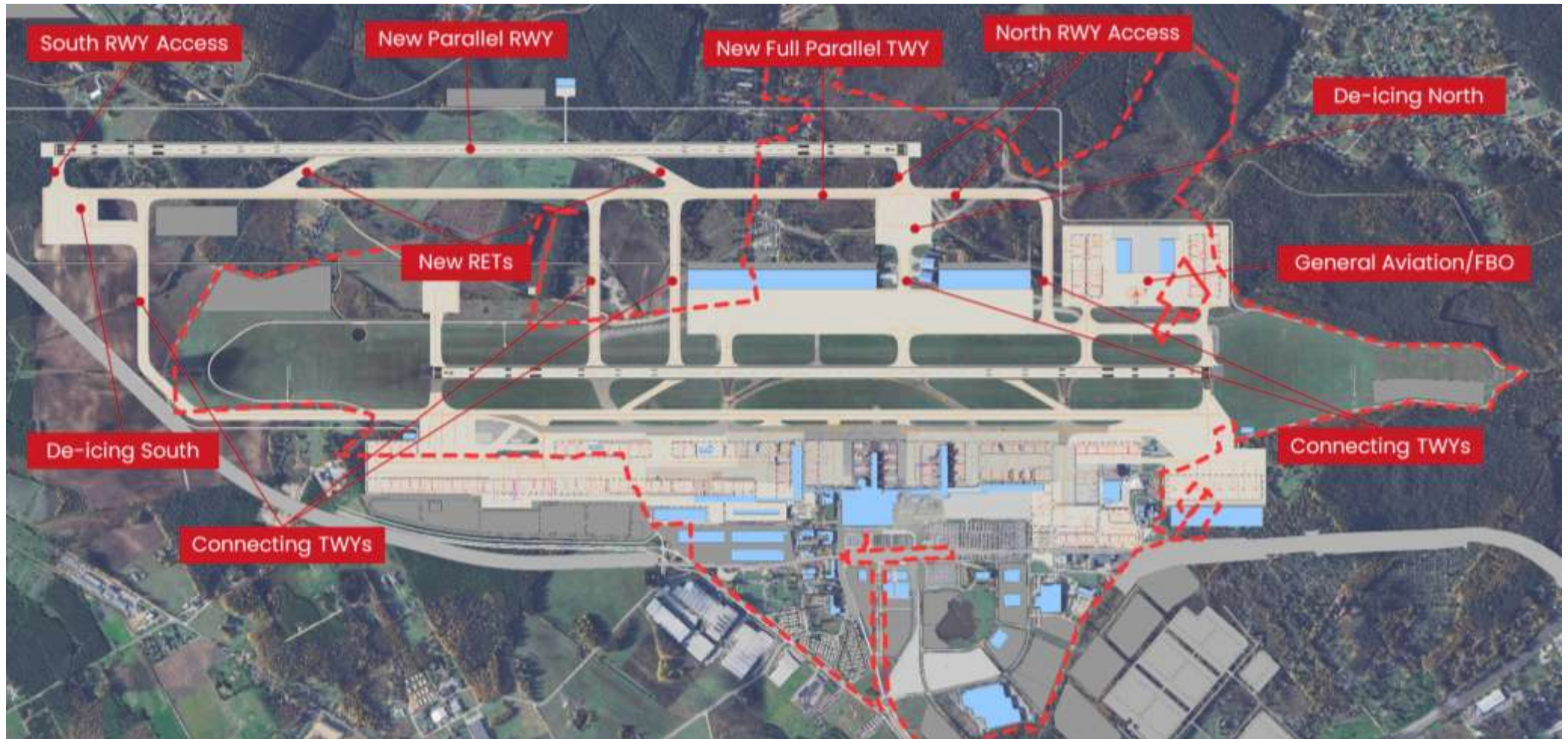


Figure 79 – Runway and taxiway developments - Source: Ineco

Apron and Terminal developments

Passenger commercial stands

The proposed actions for commercial passenger aircraft apron developments between 2050 and 2065 are summarized below:



Figure 80 – 2065 distribution of Apron - Source: Ineco

Passenger terminal

The proposed developments for the passenger terminal building between 2050 and 2065 are described below and can be seen in the following image.



Figure 81 – 2065 Passenger terminal building developments
Source: Ineco

The first proposed action is the northward expansion of the processing building, adding approximately 3,700 m² per floor. This expansion will provide sufficient space to enlarge the departure hall, check-in area, and security checkpoint on the third floor. Additionally, the immigration control, baggage claim area, and arrivals hall on the first floor will also be expanded.

It is also proposed to expand both the Schengen and Non-Schengen boarding areas, adding new boarding gates and increasing the area allocated to emigration control. To achieve this, the construction of two new perpendicular boarding piers is recommended—one to the north of existing Pier C and another to the south of existing Pier B, as shown in the previous image.

Each of the five piers that the terminal will have by 2065 will be dedicated exclusively to Schengen or Non-Schengen traffic. One of the new piers will serve Non-Schengen traffic and will feature two floors and a mezzanine, allowing boarding on both levels and managing arrivals via the mezzanine. The pier assigned to Schengen traffic will have two floors. This exclusive use of piers will also enable the centralization of outbound passport controls.

The northern pier will have an approximate area of 7,000 m² per floor, while the southern pier will have around 6,800 m² per floor. Both piers will be connected to the main terminal building via connecting corridors.

The construction of these piers will require the demolition of the hangars indicated in the following image.



Figure 82 – Affected Hangars – 2050 plan
Source: Ineco

Cargo stands

Regarding the cargo aprons at Riga Airport, a new apron is proposed to the north of the fuel area and east of the northern de-icing apron. The new cargo apron will include eight parking positions for Code C aircraft, or alternatively, four Code C positions and two Code F positions, thanks to the inclusion of two MARS (Multiple Aircraft Ramp System) positions.

The following image illustrates the details described above.



Figure 83 – Cargo Apron developments
Source: Ineco

Cargo Terminal

The following figure shows the distribution and location of the various cargo terminals projected for the year 2065. As illustrated, a new cargo terminal is proposed in front of the new cargo apron, described in previous sections. The terminal will have an approximate area of 3,300 m² and will support apron operations with eight Code C aircraft positions, or alternatively, four Code C and two Code F positions, thanks to the inclusion of two MARS positions.

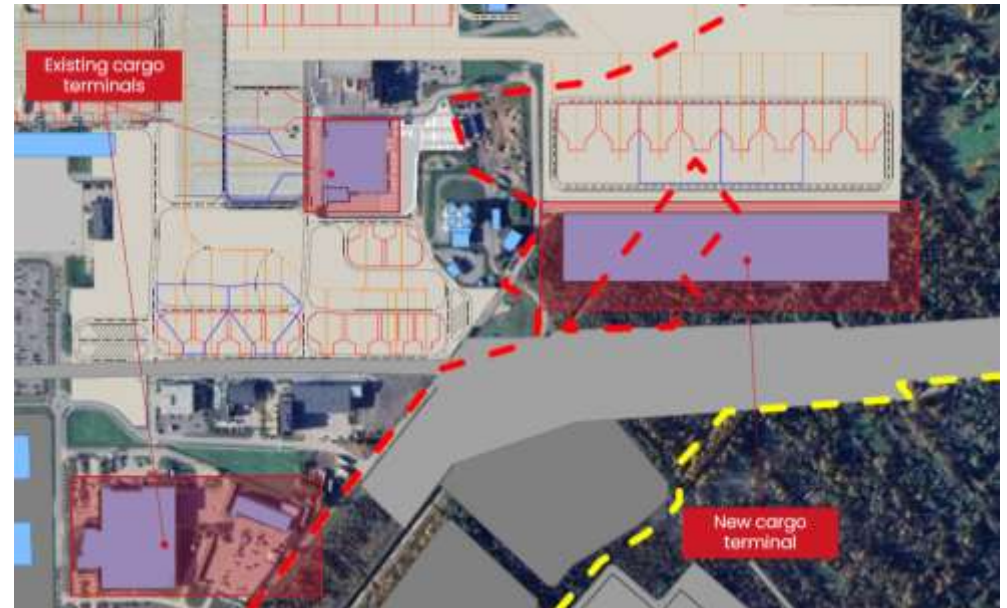


Figure 84 – Cargo Terminals proposed
Source: Ineco

The construction of the new cargo terminal will also allow for the relocation of the existing terminals listed below, whose location became suboptimal following the commissioning of Rail Baltica, as the railway line now lies between these terminals and the apron.



Figure 85 – Relocated Cargo Terminals – 2050 plan
Source: Ineco

Road Access

In 2065, a new southern access road is proposed, connecting the A5 highway to the MRO area developed between the runways. This connection will improve accessibility to the western airfield developments and support operational efficiency for maintenance and support services.



Figure 86 – New Road access proposed from south
Source: Ineco

Reserved areas

On the other hand, within the land designated as the Airport Service Area, and in compliance with current environmental regulations for land use, strategies may be implemented to support the development of sustainable airport infrastructure that minimizes environmental impact. These strategies may include the installation of facilities linked to both current and future renewable energy sources, such as wind energy, solar energy (photovoltaic and solar thermal), hydropower, biomass and biogas, geothermal energy, tidal and wave energy, bioethanol, and biodiesel.

Guidelines for Riga Airport 2065 Development

As a summary, the following image presents the complete development vision for Riga Airport in the year 2065.

The main objective of this analysis is to define the new “national territories” area to be reserved through this Master Plan, ensuring that future developments are feasible and compatible with urban growth around the airport.

Figure 87 displays:

- The existing national territories area approved by Cabinet Regulation in 2013 (shown in blue)
- The new proposed reservation for national territories (shown in yellow)

The previous reservation covered 1,905.7 hectares, while the new proposal includes 1,803.4 hectares. This means that 279.8 hectares are excluded from the previous reserve, and 177.4 hectares are added to the new one.



Figure 87 – Riga Airport 2065 Development
Source: Ineco

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