Palanga International Airport

Master Plan

Executive Summary

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Date	13/10/2023
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NACO
a company of Royal HaskoningDHV

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Authors
Alisa Silven
Asmeeta Das Sharma
Jan Koelink
Kimeshni Naicker
Lise Gascard
Mary Panagopoulou
Michael Doughty
Priscila Coghlan Jonas
Quincy Tjaden
Remco Troquete
Tendayi Chiureki

Checked by
Jan Koelink
Steven Wanders
Date 13/10/2023

Approved by
Tessel Severs
Date 13/10/2023

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NACO, Netherlands Airport Consultants
Schenkkade 49
2595 AR The Hague, The Netherlands
(+31) 88 348 1300
www.naco.nl

Contents

List of figures

List of tables

1. Introduction

A comprehensive master plan of the airport should endeavour to adopt a balanced approach that considers economic, environmental and cultural aspects whereby present needs are met without compromising the ability of future generations to fulfil their own needs.

State Enterprise Lithuanian Airports (LA) is the owner and operator of the airports of Vilnius International Airport (VNO), Kaunas International Airport (KUN) and Palanga International Airport (PLQ) in Lithuania.

To be able to sustain the anticipated further growth of aviation traffic and to bring the world closer to Lithuania in the coming 30 years (until 2052), LA has initiated a project to develop master plans for the Lithuanian airports VNO, KUN and PLQ. These master plans provide guidelines for the necessary developments required to strengthen the positions of the respective airports and turn a new page in the history of Lithuanian Airports.

In November 2022, LA has engaged HaskoningDHV Nederland B.V. operating as NACO Netherlands Airport Consultants (NACO), as their airport master planner.

This Executive Summary presents the key takeaways of the final master plan report for the below topics:

- **Traffic Forecast**: Mapping the trajectory of aviation activity;
- **Passenger Terminal Building**: Enhancing the journey for travellers while accommodating growth;
- **Master Plan**: Guiding airport facilities' growth efficiently;
- **Phasing Strategy**: Sequencing development for optimal outcomes;
- **Environmental Aspects**: Embracing sustainability in expansion;
- **Financial Analysis**: Balancing investments for long-term viability.

For details on the topics in the Executive Summary, reference is made to the final master plan report.

2. Traffic Forecast

Traffic forecast approach

The general forecasting approach is illustrated in the chart on the right. The forecasts for PLQ were generated using a combination of:

- **bottom-up** route-by-route forecasts for the initial years of study and over the COVID recovery period, and;
- **top-down long-term forecasts** based on a macro-economic modelling approach. As such, our forecast methodology blends a top-down macro-econometric modelling approach with a bottom-up analysis of short-term route opportunities.

To address the uncertainty related to the future air traffic development at the airport, three separate scenarios, Low, Base and High were developed.

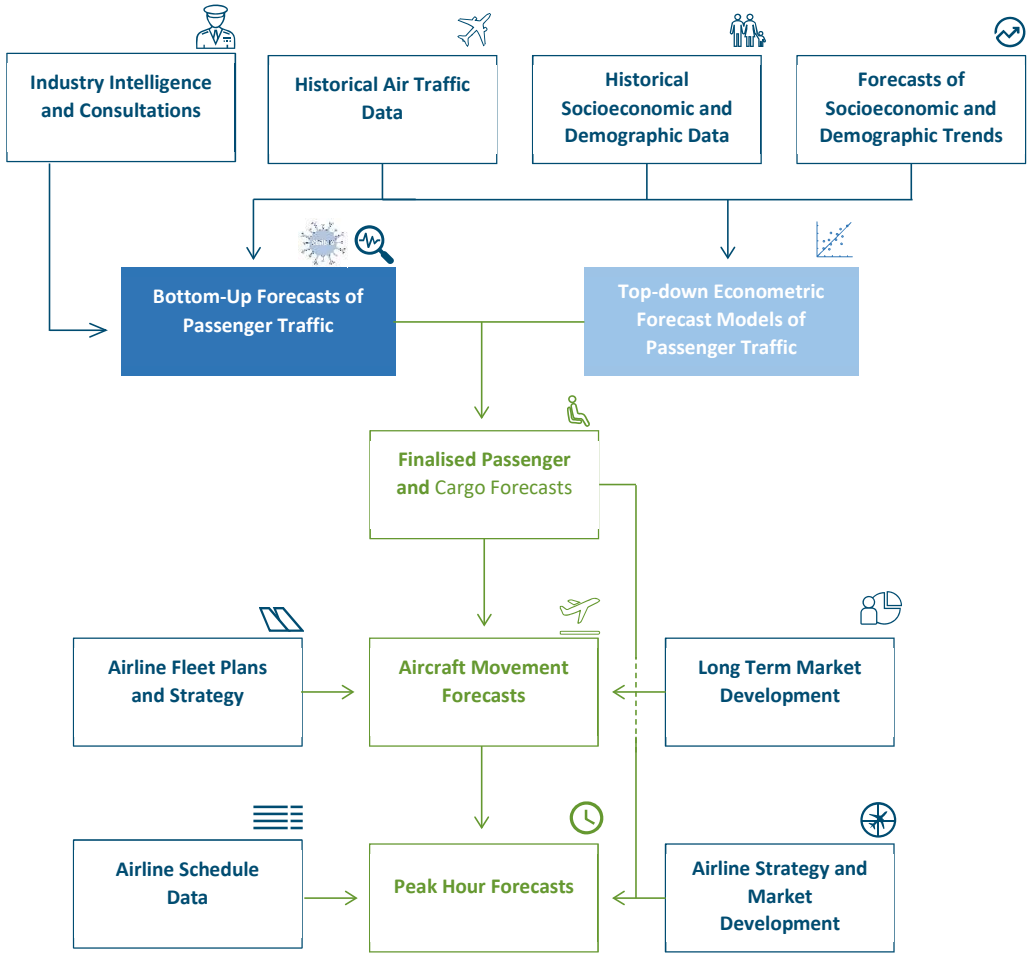

FIGURE 1 NACO FORECAST PHILOSOPHY

Commercial passenger and ATM forecast

Commercial passenger traffic at PLQ is expected to increase from 0.34 million annual passengers in 2022 to the following passenger volumes in 2052:

- Low: 0.57 million, equivalent to a CAGR of 1.9%
- Base: 0.80 million, equivalent to a CAGR of 3.6%
- High: 1.05 million, equivalent to a CAGR of 4.6%

Commercial passenger ATM at PLQ is expected to increase from 3.9 thousand in 2022 to the following passenger volumes in 2052:

- Low: 4.5 thousand, equivalent to a CAGR of 1.4%
- Base: 6.0 thousand, equivalent to a CAGR of 2.4%2.7%
- High: 7.4 thousand, equivalent to a CAGR of 3.1%

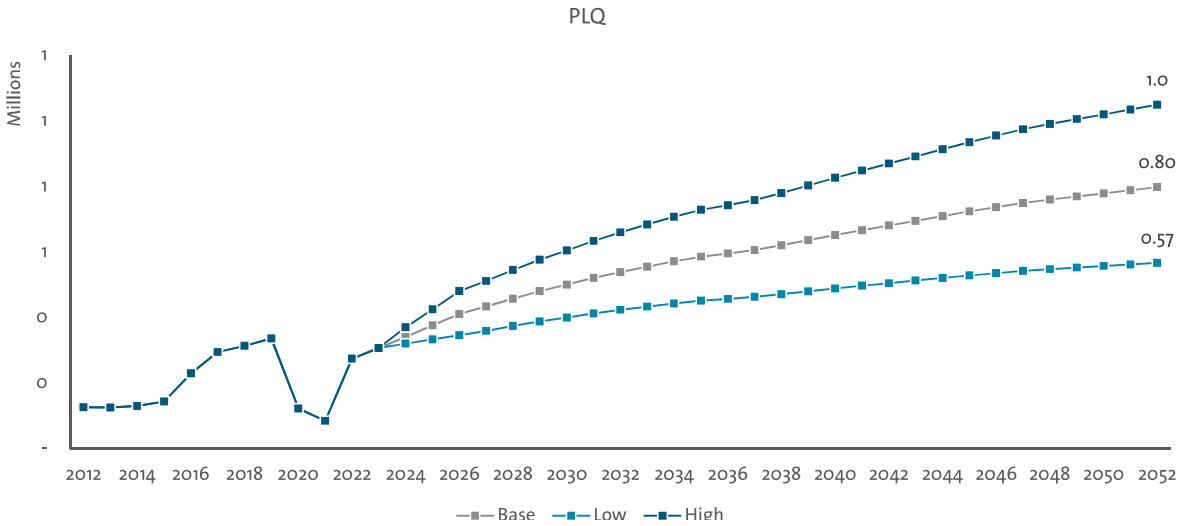

FIGURE 3 PLQ PASSENGER FORECAST

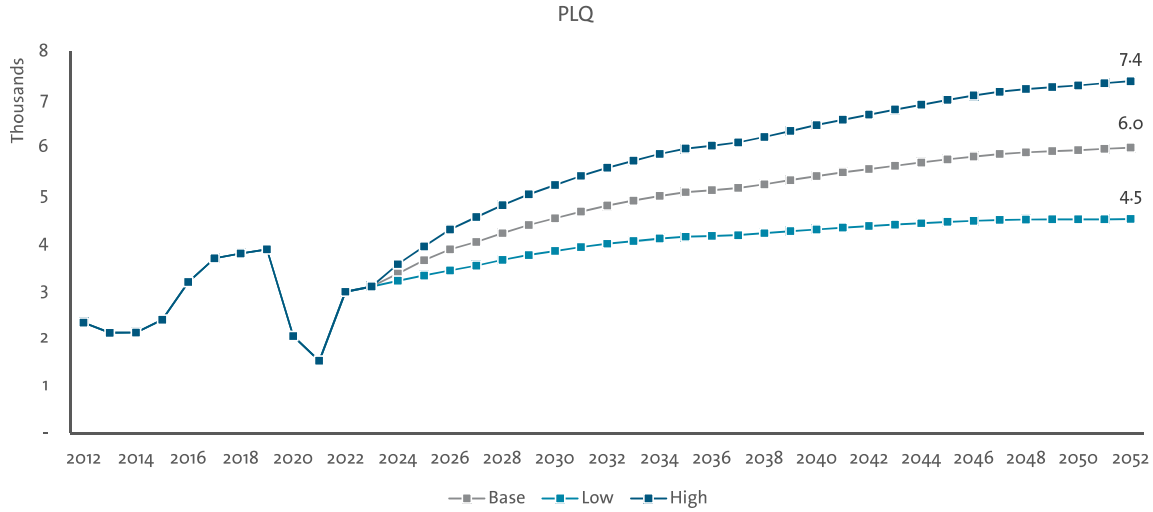

FIGURE 2 PLQ COMMERCIAL ATM FORECAST

Peak hour forecast

Based on the peak hour benchmark, depending on the scenario, PLQ will serve the following 30th peak hour volumes for passenger flows as well as the absolute peak for ATMs.

Low Scenario

- 600 total two-way passengers and 6 ATMs;

Base Scenario

- 760 total two-way passengers and 7 ATMs;

High Scenario

- 910 total two-way passengers and 8 ATMs.

TABLE 1 PLQ 30TH PASSENGER PEAK HOUR FORECAST (ROUNDED TO CLOSEST 10 PASSENGERS)

	PLQ	2019	2022	2032	2042	2052	2022 - 2052	2032 - 2042	2042 - 2052	2042 - 2052
Low	2-way	473	397	520	570	600	1.4%	2.7%	0.9%	0.5%
	Arr	283	230	310	340	370	1.6%	3.0%	0.9%	0.8%
	Dep	280	217	300	350	380	1.9%	3.3%	1.6%	0.8%
Base	2-way	473	397	610	700	760	2.3%	4.6%	1.6%	0.9%
	Arr	283	230	360	420	460	2.3%	4.6%	1.6%	0.9%
	Dep	280	217	350	420	480	2.7%	4.9%	1.8%	1.3%
High	2-way	473	397	700	820	910	3.0%	6.0%	1.8%	1.3%
	Arr	283	230	410	490	560	3.0%	6.0%	1.8%	1.3%
	Dep	280	217	400	500	580	3.3%	6.3%	2.3%	1.5%

TABLE 2 PLQ ABSOLUTE ATM PEAK HOUR FORECAST

	PLQ	2019	2022	2032	2042	2052	2022 - 2052	2022 - 2032	2032 - 2042	2042 - 2052
Low	2-way	6	4	5	6	6	1.3%	2.3%	1.0%	0.7%
	Arr	3	2	3	3	4	2.1%	3.3%	1.6%	1.2%
	Dep	3	2	3	3	4	2.1%	3.2%	1.7%	1.3%
Base	2-way	6	4	6	6	7	1.9%	3.4%	1.4%	0.9%
	Arr	3	2	3	4	4	2.6%	4.4%	2.0%	1.5%
	Dep	3	2	3	4	4	2.7%	4.4%	2.1%	1.6%
High	2-way	6	4	6	7	8	2.3%	4.4%	1.6%	1.1%
	Arr	3	2	3	4	5	3.1%	5.4%	2.2%	1.7%
	Dep	3	2	3	4	5	3.1%	5.4%	2.3%	1.7%

Cargo forecast

Air cargo at PLQ is forecast to increase from 3 tons in 2022 to:

- Low: 10 tons in 2052, equivalent to a CAGR of 4.3%;
- Base: 19 tons in 2052, equivalent to a CAGR of 6.6%;
- High: 30 tons in 2052, equivalent to a CAGR of 8.4%.

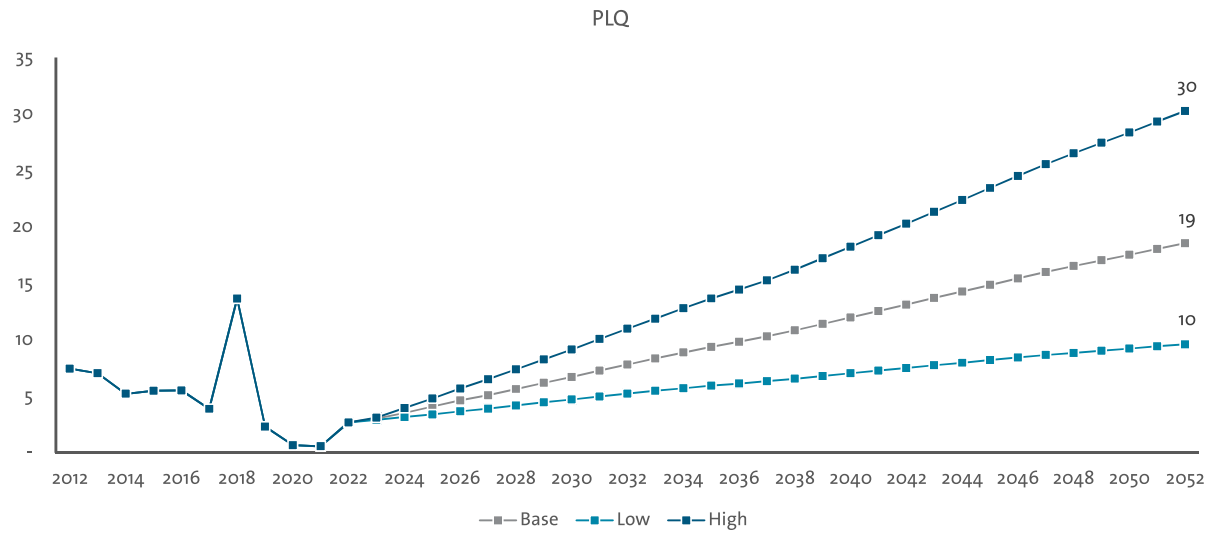

FIGURE 4 PLQ COMMERCIAL AIR CARGO FORECAST (IN METRIC TONS)

General Aviation forecast

GA ATMs at PLQ are forecast to increase from 740 in 2022 to:

- Low: 0.8 thousand 2052, equivalent to a CAGR of 0.4%;
- Base: 1.2 thousand in 2052, equivalent to a CAGR of 1.6%;
- Base: 1.9 thousand in 2052, equivalent to a CAGR of 3.3%.

Stronger growth in High scenario is anticipated to be driven by private aviation and recovery of training flights after COVID-19.

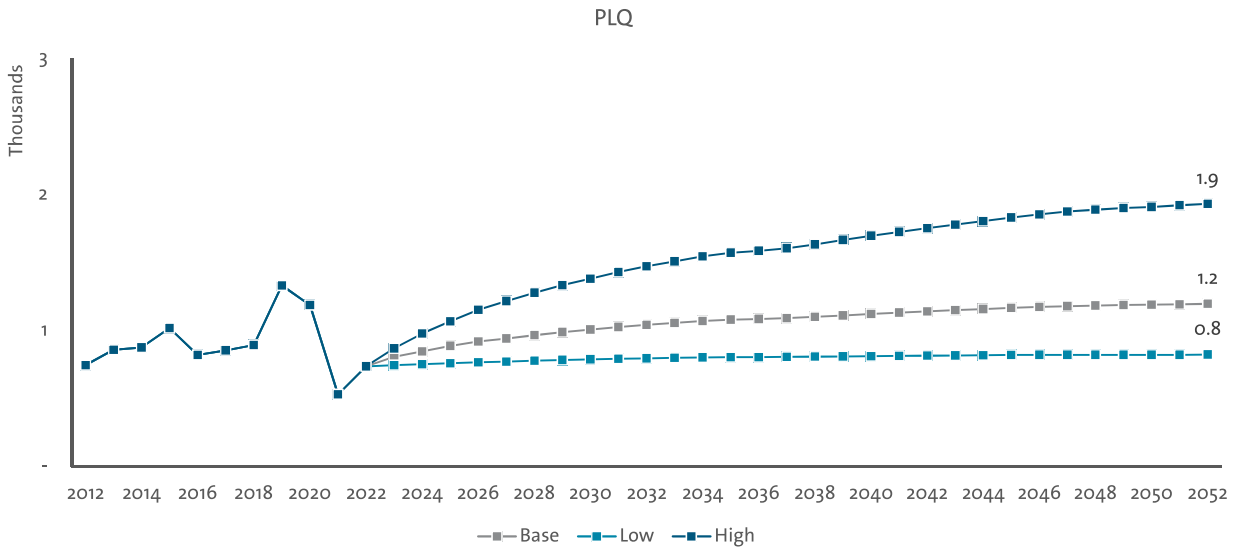

FIGURE 5 PLQ GA FORECAST

3. Passenger Terminal Building

FIGURE 6 VIEW ON THE PASSENGER TERMINAL BUILDING

This section presents the passenger terminal development required in response to the traffic forecast. The approved traffic forecast (high scenario), presented in part II of the report, has been used as an input for this calculation. Based on the outcome of workshops and meetings with Lithuanian Airports, the facility sizing, and gap assessment have been updated and refined.

Facility requirements 2052

The facility sizing takes into consideration the annual and peak hour figures. Based on this, the facility requirements and related waiting areas are calculated for the year 2052. The results are presented in Table 3.

The data are used to calculate the number of required equipment and floor area of the passenger processes of the airport terminal which need to be incorporated in the terminal layout to accommodate the anticipated future demand.

CHECK-IN

The number of counters in the gap assessment in part II of the report was calculated based on maximum common use facilities. To provide the flexibility to allocate some counters specifically to airlines, a surplus is added, resulting in a total number of 9 conventional counters.

GATE WAITING AREA

To optimise the space use for gate waiting, a swing solution is proposed. At least 4 Schengen gates shall be accommodated during the Schengen peak and 2 Non-Schengen gates during the Non-Schengen peak. The total number shall not be less than 5 gates.

PASSPORT CONTROL INBOUND (IMMIGRATIONS)

It is considered that the two Non-Schengen flight will not arrive spread over the hour. Therefore, it is assumed that 60% of the passengers show up within 30 minutes, which represents a large code C aircraft (more than 200 seats).

RECLAIM

Considering that one belt can accommodate 3 code C flights per hour, two belts are needed to process the 5 simultaneous flights in 2052.

COMMERCIAL AREAS

Space reservations for commercial facilities in the airport are sized based on 1,250 m2 per departing MAP. The number is based on benchmark figures from other European airports. For the division between landside and airside a split of 30%-70% is considered.

TABLE 3 FACILITY REQUIREMENTS

2052		
Check-in	Facilities (#)	Queueing (m²)
Conventional counters	9	156
Drop-off counters	0	0
Kiosks	0	0
Security	Facilities (#)	Queueing (m²)
Boarding card control	1	20
Security lanes	3	70
Border control outbound	Facilities (#)	Queueing (m²)
Manual counters	5	56
ABC readers	0	0
Border control inbound	Facilities (#)	Queueing (m²)
Manual counters	6	70
ABC readers	0	0
European Entry System (EES)	Facilities (#)	Queueing (m²)
EES kiosks	3	17
Baggage reclaim	Facilities (#)	Queueing (m²)
Reclaim belt length	47	140
Min. no. of belts	2	
Customs	Facilities (#)	Queueing (m²)
Green channel	1	20
Red channel	1	
Inspection positions	1	
Gate waiting	Facilities (#)	Queueing (m²)
Schengen	4	765
Non-Schengen	2	604
Combined	5	1,260
Commercial		Area (m²)
Landside		195
Schengen		255
Non-Schengen		140

Expansion phasing

To be able to continue operations, the extension and refurbishment envisioned in four steps, as illustrated in the images on this page, leading to the final functional layout for 2052.

STEP 1

Expand on south side with a new arrival facility, including baggage offload and reclaim, immigration and customs.

STEP 2

Refurbish the north part of the building with the relocation of aviation security and on the airside an extra gate.

STEP 3

Relocation of the BHS towards the area in between the existing. Together with the addition of an arrival hall including commercial facilities. Extra gate and commercial facilities on airside. Expansion of the check-in area in the departure hall.

STEP 4

Refurbishment of the airside lounge: extra departure gates, including the swing gates, emigration and commercial facilities.

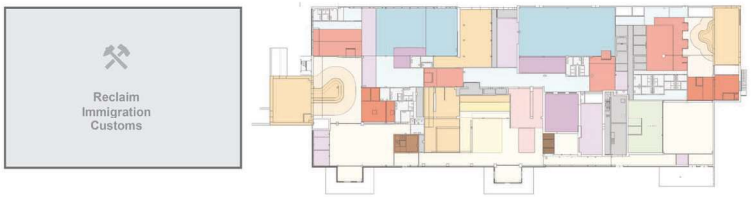

FIGURE 7 DEVELOPMENT STEP 1

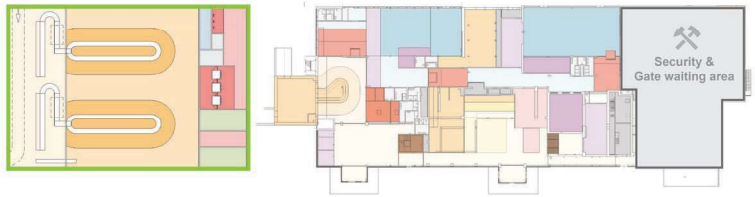

FIGURE 8 DEVELOPMENT STEP 2

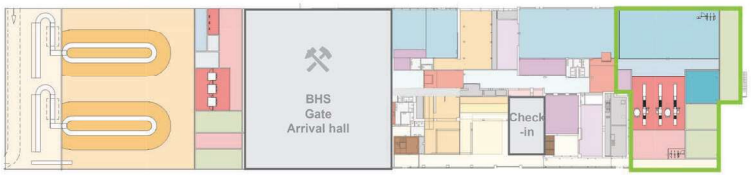

FIGURE 9 DEVELOPMENT STEP 3

FIGURE 10 DEVELOPMENT STEP 4

Functional zoning plans

With the expansion of the terminal building, the one-level handling concept stays intact: Arriving and departures are still located on the same floor.

The new layout is partly driven by the structure of the existing building. The layout follows the existing structure as much as possible.

LEVEL 1

All passenger processes are located on level 1 of the building. The building roughly can be divided in two parts: Departure process on the right: with the check-in hall, aviation screening and the departure lounge. The arriving processes on the left, with the baggage hall in between the two parts. The existing location of the entrance gives direct access to the check-in hall, a new exit directly connects to the arrival hall. The existing corridor connects all landside public areas.

On the airside, outside the building, covered preboarding areas have been provided to temporary hold people before bus boarding or safely walk to the aircraft.

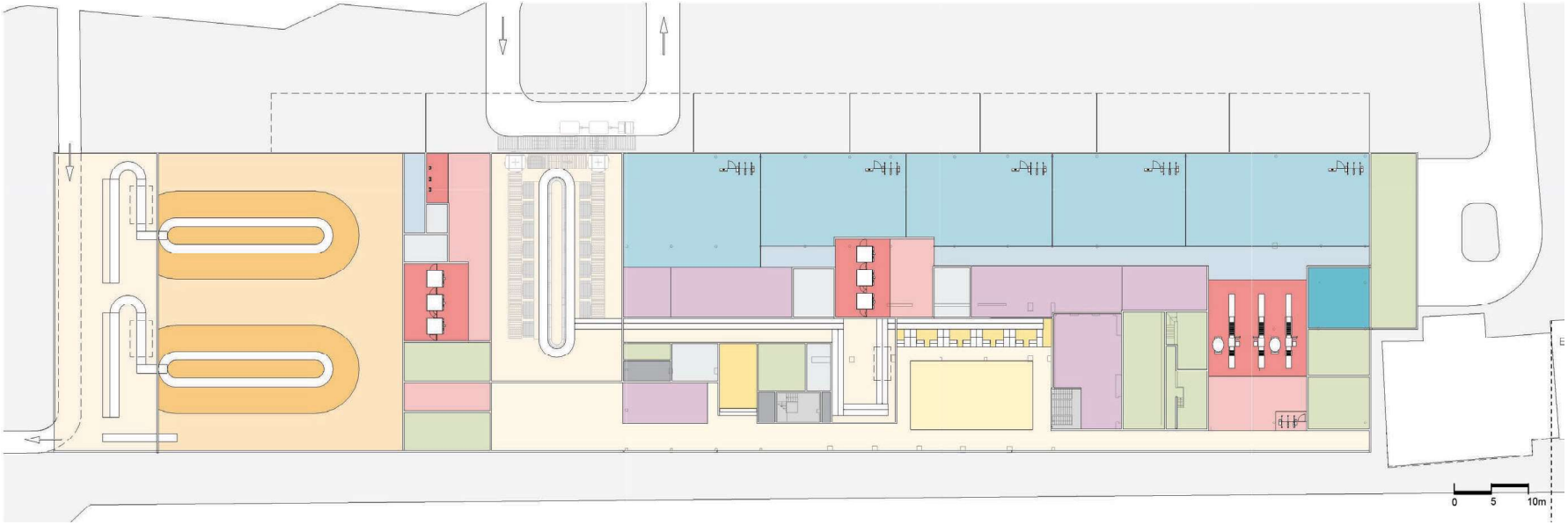

FIGURE 11 FUNCTIONAL ZONING PLAN LEVEL 1

LEVEL 2

The functional areas on the second level and access from level 1 will not change. This floor contains back of house facilities such as offices, meeting rooms and technical areas.

A new technical room will be provided above the reclaim off-load.

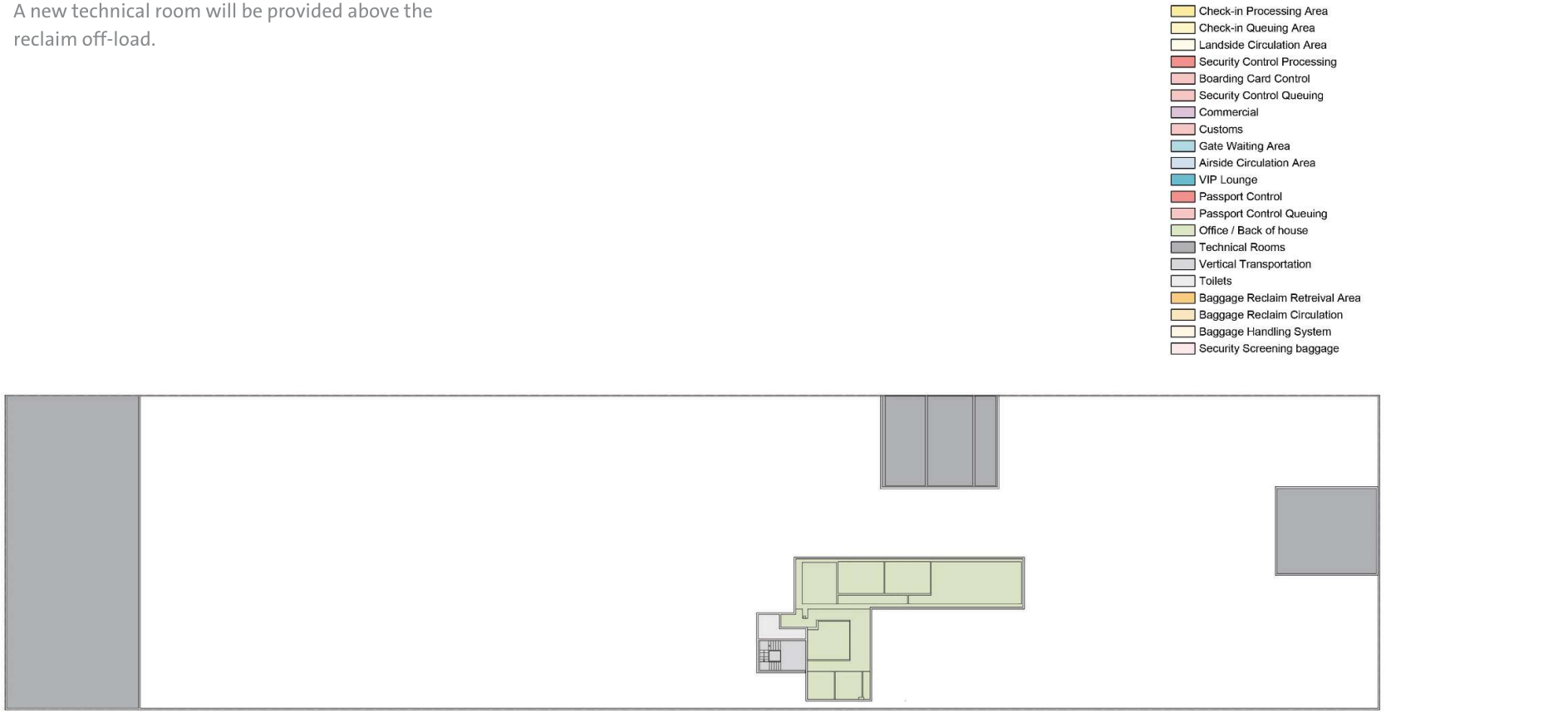

FIGURE 12 FUNCTIONAL ZONING PLAN LEVEL 2

BASEMENT

The functional areas in the basement level will not change either, as well as the access to this level. The basement contains a toilet block, which can be used by departing passengers. The rest of this area is back of house: access to the air traffic control centre and technical areas.

The access to the control room on the mezzanine level, stays the same, just as the location and size of the current control room.

FIGURE 13 FUNCTIONAL ZONING PLAN BASEMENT

4. Master Plan

This section outlines the strategic and required developments for the airport. First the critical airside infrastructure (runway, taxiways, aprons) is discussed, followed by the support facilities at the airport. In the end, the landside accessibility of the airport is discussed. The sizing of all infrastructure and facilities is based on the high scenario from the traffic forecast.

Airside

The existing runway at PLQ (01-19) has a total length of 2,280 meters. The runway has sufficient length and capacity for the forecasted traffic growth. Hence, no changes are foreseen for the runway, nor for the navigational aids within the master plan. A study was made on how the runway could be extended should there arise a need beyond the horizon of 2052.

The proposed solution would be a stopway on the northern runway end with a length of 220 m (extension of the RWY to 2,500 m length without relocating the thresholds and runway ends). The extension will increase the available length for take-off towards the south without affecting the obstacle limitation surfaces.

The Air Traffic Control (ATC) tower is planned to be replaced by a digital (camera) tower for remote control, but the ATC building can be retained.

The taxiway systems will efficiently be expanded and adjusted to provided adequate access to the respective aprons for different sizes of aircraft (see Figure 14).

As a result, the passenger terminal area of the airport is compliant for aircraft up to ICAO code C, whereas northern area is compliant for ICAO code E aircraft. The GA/FBO apron can be accessed by aircraft up to ICAO code B.

The following aircraft parking stands are provided:

- Commercial passenger apron: 7 code C;
- GA apron: 6 code B;
- Military apron: 1 code D, 1 code E.

Two of the aircraft stands at the commercial passenger apron are equipped for collecting de-icing fluids. Collected de-icing fluid will be transported to VNO.

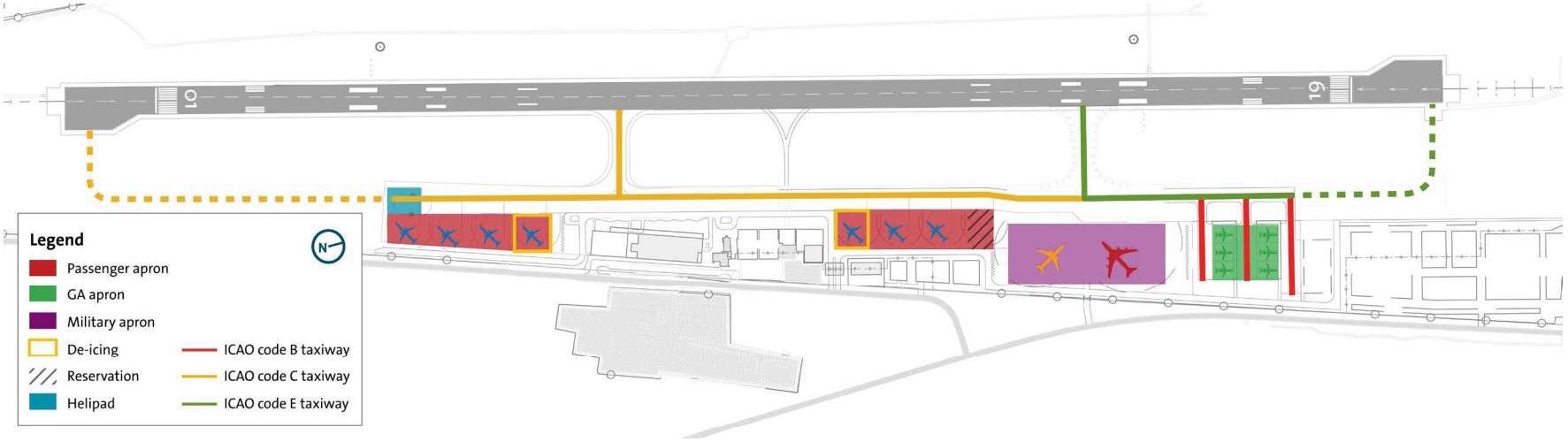

FIGURE 14 TAXIWAYS AND APRONS

Cargo facilities

Cargo is currently handled directly by truck/van and does not pass through a cargo terminal on the airport. The cargo is escorted from outside in a sealed truck/van to the airside. It is anticipated that the present process will continue in the future. Nonetheless, a strategic area reservation is included in the master plan for a cargo area. The plot is close to the terminal building to enable efficient belly cargo operations. Besides, a customs facility is planned at this location.

Aircraft Maintenance (MRO) facilities

Currently there are no aircraft maintenance facilities at PLQ. Neither are there plans for aircraft maintenance facilities within the planning horizon. Nonetheless, a plot reservation is made in the north to allow for two narrow body hangars, or one wide body hangar.

Military, General Aviation, and VIP facilities

There are currently no dedicated military facilities at the airport. The master plan incorporates the Military Mobility plan, which provides an apron for one code D and one code E aircraft.

In the existing situation a small apron and hangar are available in the north-eastern corner of the airport for GA. In the master plan, a new GA apron is included, as well as a reservation for hangars.

Adjacent to the terminal building, a plot reservation is included for a VIP terminal.

Airport support facilities

The airport has several facilities that support the operations.

EMERGENCY FACILITIES

The existing Aircraft Rescue and Firefighting (ARFF) station has sufficient capacity to host the minimum of three ARFF vehicles that are required for the airport. However, the by ICAO defined response times for emergency situations cannot be met. Therefore, a breakout road is planned to provide easier and faster access to the runway from the ARFF station.

GSE FACILITIES

The Ground Support Equipment (GSE) fleet requires sufficient parking space. Several central

FIGURE 15 SUPPORT FACILITIES

parking areas are reserved in the passenger terminal area (see Figure 15). Within the staging areas, also charging facilities for electrified GSE (eGSE) is available.

A facility for the maintenance of GSE is included in the master plan and provides a capacity of 5 vehicle bays.

AIRPORT MAINTENANCE

The airport is currently developing a workshop building, which is incorporated in the master plan.

AIRSIDE/LANDSIDE GATES

A new main airside/landside gate is planned, north of the ARFF station. A secondary airside/landside gate is planned adjacent to the military apron, to provide direct and segregated access.

IN-FLIGHT CATERING

At PLQ there are currently no in-flight catering facilities. The company GTS Palanga UAB is providing in-flight catering services. A strategic reservation is made in case the need arises to develop an in-flight catering facility at the airport.

COMMERCIAL FACILITIES

Space is reserved for commercial facilities north of the passenger terminal area. The total area reserved is 1 ha. Logistics, industrial and educational facilities can be realized there.

FIGURE 16 VIEW ON THE MASTER PLAN OF PLQ

Landside accessibility

The master plan does not plan major changes in the landside road infrastructure. However, it is recommended to relocate the main airport road as shown in Figure 17 if the opportunity arises in the future.

The existing parking is expanded within the airport property to provide 1,100 parking bays for passengers. In the same area, also part of the employee parking is located. The other part of the employee parking is situated adjacent to the main airside/landside gate. In total 210 parking bays for employees are provided.

The car rentals are located next to the terminal building, providing a capacity of 88 bays. Opposite of the terminal building, a 500 m² taxi and bus buffer is planned.

The kerb in front of the terminal is expanded to 200 m length, following the terminal building expansion.

FIGURE 18 VIEW ON THE KERB

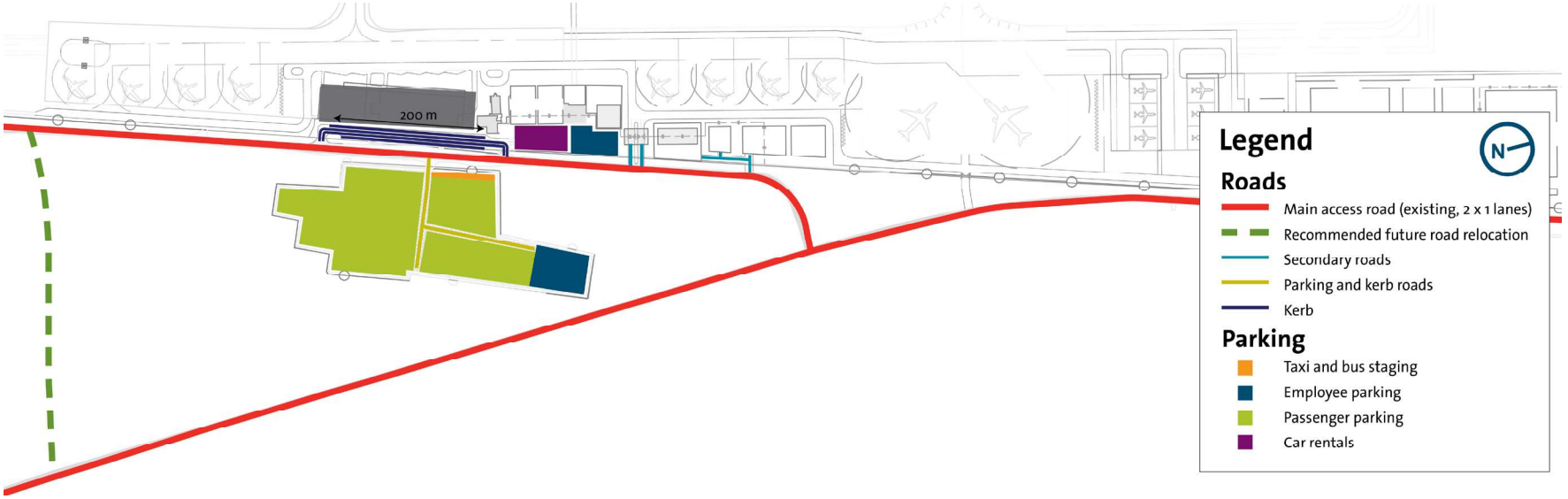

FIGURE 17 LANDSIDE ACCESSIBILITY

Utilities

WATER

Water supply and treatment for Palanga International Airport is carried out by the UAB Palangos vandenys (EN Palanga water), and this potable water is used for all water-consuming activities such as food preparation, drinking, cleaning, irrigation, toilet flushing, firefighting, aircraft lavatories, and de-icing fluid dilution.

The average water consumption per passenger was estimated to be 19 litres per day. This forecasted demand does not include water needed for firefighting, irrigation, aircraft lavatories, and de-icing, which can potentially be supplied with non-potable water. It is recommended that groundwater be used to meet these non-potable water demands.

The master plan includes spatial reservations for future expansion, including areas for groundwater treatment, potable water storage, and firewater based on forecasted future demands.

WASTEWATER

Wastewater at PLQ is handled by UAB Palangos vandenys. The master plan estimates future wastewater production to be a percentage of the potable water demand as well as the wastewater from the aircraft on a peak day. UAB Palangos vandenys will be able to handle the additional flow expected to be generated by Palanga airport with additional upgrades. The current wastewater distribution and treatment philosophy should be maintained for the forecasted horizon.

SOLID WASTE

The waste management in Palanga is handled by the Klaipėda Regional Waste Processing Center (KRATC) and transported to the regional landfill located in Dumpiai, Klaipėda district. For hazardous waste management, a state-owned company called JSC "Toksika" handles toxic waste activities. Forecasted solid waste production at the airport is estimated to be 0.3 kg of waste per passenger per day on average. Additional infrastructure for solid waste handling should be developed in response to demand, including more garbage trucks and storage space and a solid waste sorting area.

DRAINAGE

It can be assumed that the surface runoff will not increase significantly since there will be minimal upgrades to the hardened area. Downpipes will be installed for the new facilities to be connected to the existing storm water drainage network.

ELECTRICAL POWER SUPPLY

PLQ receives electrical power supply from Palanga City via a medium voltage underground cable. There are six substations that receive power from the medium voltage cable and distribute power throughout the airport. The passenger terminal has a single connection to the power substation and two backup diesel generators.

Based on the maximum pre-pandemic historical data, which indicated a peak energy demand of 106,206 KWh, the corresponding peak power demand was estimated to be 215 kW for the existing situation. Based on the assessed demands, by year 2052 the airport will require at least 1,6 MW.

By 2025, the airport plans to install three electric vehicle (EV) charging stations for electric buses, airfield vehicles, and partner cars to meet European Union targets for zero emissions.

SOLAR POWER

Two solar farms are planned on the west side of the runway, covering approximately 70,500 m2 in total. These farms have the potential to generate an average peak power output ranging from 1 MW in winter, lasting up to 5 hours, and up to 5 MW in summer, up to 8 hours, with a total peak capacity of 14.77 MWp.

A solar glare assessment was conducted for the proposed solar farms. It found that Runway 19 will be most impacted by solar glare, showing yellow glare concentrated between the hours of 14:00 and 17:30, between early October and early March. Mitigation measures should be put into place to reduce solar glare.

AVIATION FUEL

The airport provides Jet A1 and AVGAS 100LL fuels through Baltic Ground Services UAB. Fuel is supplied via trucks to the fuel storage facility covering 3,500 m^2 with a storage capacity of 300 m^3 for Jet A1 and 25 m^3 for AVGAS 100LL. There's also a petrol station for GSE owned by Lithuanian Airports.

The existing fuel setup involves trucks crossing public areas, which is suboptimal for safety and efficiency.

The forecasted demand suggests that by 2052, the airport will require around 900 m^3 of fuel storage capacity for a 10-day supply. For future planning, an additional 600 m^3 of fuel storage is recommended to meet the demands of 2052.

The European Commission Green Deal recently enacted legislation that sets specific targets for the mandatory implementation of electric recharging and hydrogen refuelling infrastructure.

TELECOMMUNICATIONS

The airport features a basic physical underground telecommunication ducting system that interconnects various facilities within the greater airport precinct. Core telecommunications infrastructure includes server rooms, data centres, air traffic control, Instrument Landing Systems, Airfield Ground Lighting and more.

All infrastructure should align with the latest telecommunications industry standards and codes, including the BICSI TDMM, Outside Plant Design Reference Manual, ANSI/TIA—568E series, IEEE standards, NEC, and local building regulations.

HEATING AND COOLING

The heating and cooling strategy for PLQ focuses on heating only due to mild summer temperatures. During the winter season, the terminal building's heating requirements are met by locally installed natural gas boilers, with a thermal energy capacity of approximately 11 – 12 MW. The peak monthly thermal energy consumption reaches around 120 MWh, which typically occurs in the coldest winter month of January.

The existing thermal energy capacity surpasses the assessed demand until the year 2052. However, as new facilities are introduced or existing ones are expanded, the hot water pipe network will still need to be extended where necessary. It is noted that as part of GHG reduction measures up to 2030, LT is planning to upgrade the heating system by installing air to air heat pumps.

5. Phasing Strategy

The main objective of the PLQ master plan is to reserve space. Space is required to safeguard future development flexibility and expansion in the short and in the long term. The purpose of the phasing strategy is to guide these developments in the most efficient way. This phasing strategy prevents that short-term developments will obstruct long term developments and at the same time reduces the risk of over-investment and over-capacity by a stepwise approach.

The phasing strategy is divided in the following four phases:

- Phase 1 2023-2027 (0.5 MAP)
- Phase 2 2028-2032 (0.7 MAP)
- Phase 3 2033-2042 (0.9 MAP)
- Phase 4 2043-2052 (1.0 MAP)

While some facilities and infrastructure such as apron expansion can be phased as they are related to aircraft movements it can be more economical to build the facility or infrastructure in one step rather than phased. Therefore some developments have been planned to be constructed in one phase instead of multiple.

Figure 19 shows an overview of the airport master plan with the developments coloured per phase. The numbers correspond to the phasing timeline as shown in Figure 20.

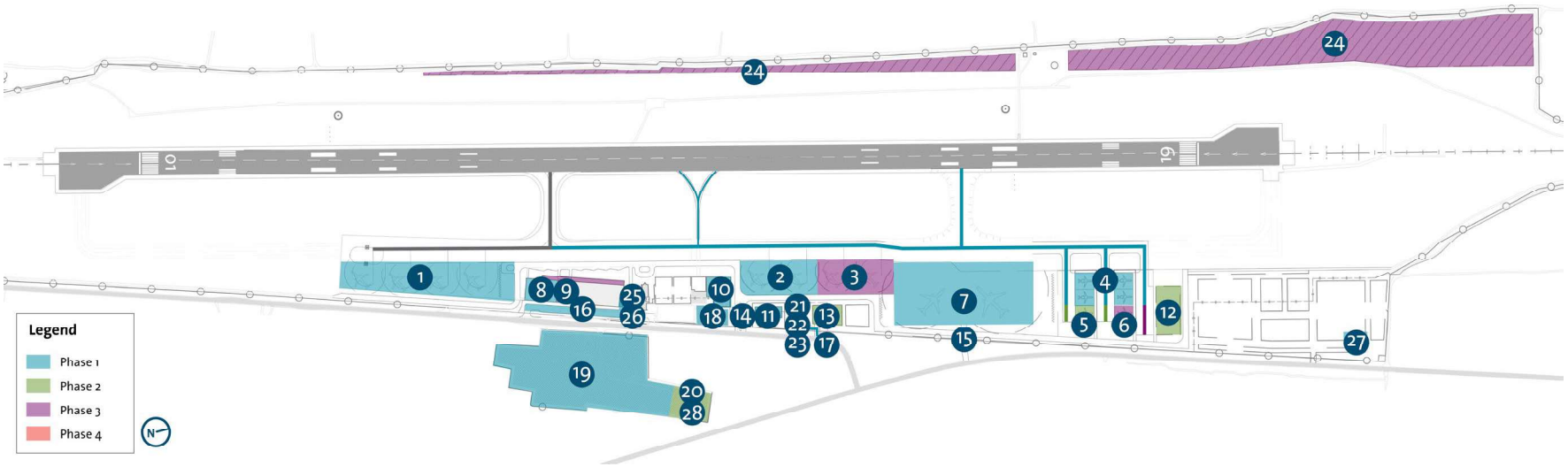

FIGURE 19 PHASING STRATEGY

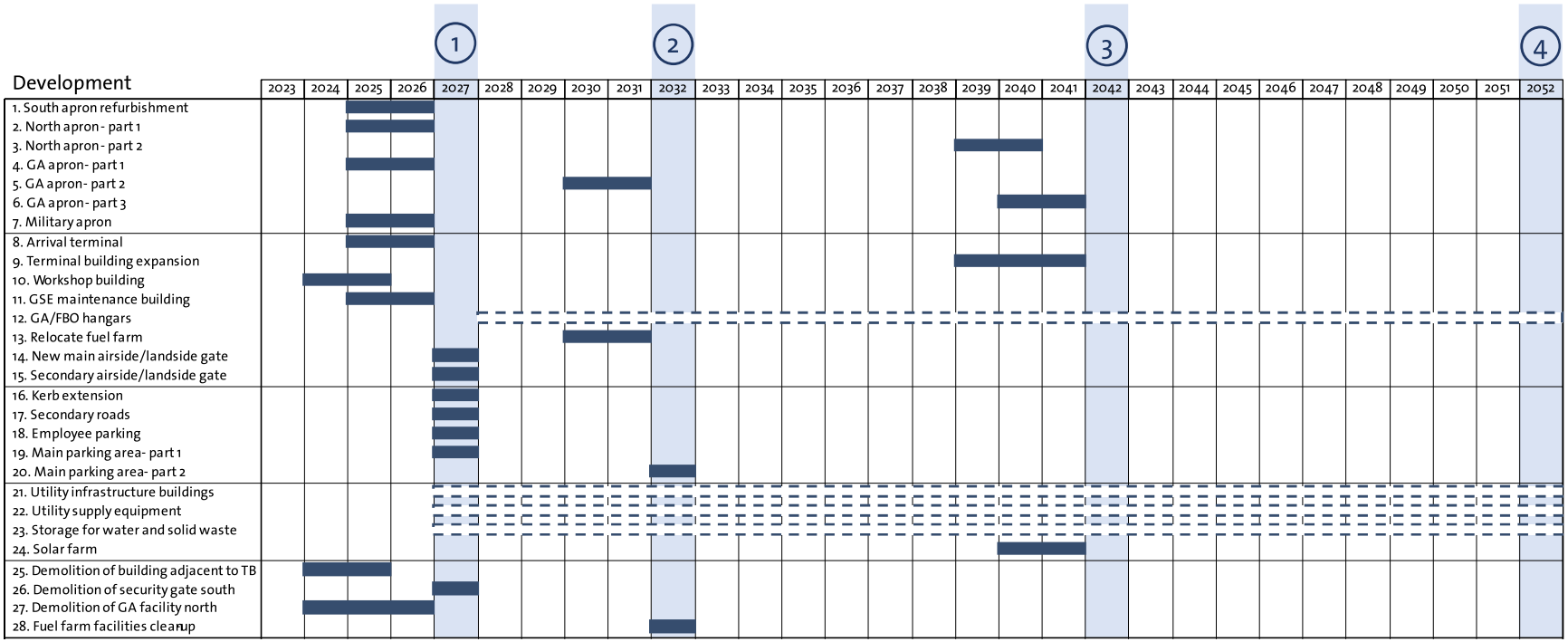

FIGURE 20 PHASING TIMELINE

6. Environmental Aspects

The environmental aspects analyses has been performed in accordance with the Directive 2001/42/EC of the European Parliament and of the Council of the European Union of 27 June 2001 on the assessment of the effects of certain plans and programs on the environment, transposed in the Environmental Law of Lithuania. The current and general environmental impact has been assessed as low, with particular attention points on noise and carbon emissions.

In scoping this environmental assessment, three key issues (noise and its impact on residential areas, CO_2 emissions and how to reach Net Zero Carbon and air quality and its impact on human health) have been particularly assessed, following the topics developed by the EU in their major vision (Zero Pollution Act) and policy initiatives (European Green Deal).

Noise impact

By 2052, it is expected that the maximum number of annual movements will be just below 10,000 against 5,189 in 2019. This increase in number of movements will have an impact on the noise regulations as well as the noise footprint and its impact on residential areas.

While evaluating what will be the impact, a noise modelisation using tool compliant with ECAC Doc 29 has been performed, comparing 2019 and 2052 scenarios.

Focusing on Lden 65dB(A) and Lnight 55dB(A), the surface are likely to increase by +56% and +126% respectively. However, noise impact remain limited as the airport is in a very low-density area.

Impact on CO_2 and air quality

The impact on CO_2 and air quality is directly correlated to the increase in traffic, the local emissions coming in majority from the LTO (landing and take-off) cycle.

While a set of regulations are being taken with regards to CO_2 emissions, at the European level, there are various legislation regarding air quality (e.g. 2008/50/EC, 2008/1/EC, 2001/81/EC) but none of them are specifically targeted to airport-related emissions. In the future, with the science evolving on this topic, this could change and in order to prepare for more stringent legislation and to pioneer in working conditions for ground staff, there are measures that PLQ can already implement. However, it is very likely that PLQ will; be exempted of these regulations according to the number of movements expected.

Becoming 'zero-emissions'

In 2021, European airports have committed to reach Net Zero carbon emissions by 2050 as well as the full aviation sector. To prepare for this objective, the European Union put forward the Green Deal, the backbone of the European decarbonisation strategy. For the transport sector, a milestone is to be reached in 2030 where emissions must have reduced of 55% against a 1990 baseline. The figure below, summarises the

TABLE 4 SURFACES OF NOISE CONTOURS FOR BEFORE AND AFTER MITIGATION MEASURES

Scenario	Lden 65 dB(A)		Lden 55 dB(A)	
	Surface (m²)	Impact	Surface (m²)	Impact
2019	593,968		717,641	
2052	929,503	+ 56%	1,623,005	+ 126%

TABLE 5 IMPACTING LEGISLATION

Legislation	Emission targeted	Palanga
Energy efficiency **Energy building performance** Expected to be adopted Q3 2023 **dates are yet to be set by the European legislator*	New building Net Zero emissions	2030
	Solar panels on roof of new/existing buildings*	~ 2030
AFIR Expected to be adopted Q3 2023	*GPU at contact stands*	*2025*
	GPU at remote stands	*2052 +*
	EV chargers (along TEN-T network)	2025 +
Refuel EU Expected to be adopted Q4 2023	All measures	2039
TEN-T Provisional agreement expected by the end of 2023	*PCA at contact stand*	*2040*
	Access to airport by rail mode	*2040*

legislation that PLQ will be impacted by, as of now, when it comes to its sustainability policy. Most of the regulations are recommendations for Palanga.

Moreover, LTOU has committed to Net Zero by 2050 for its 3 airports: Vilnius, Kaunas and Palanga and should provide their roadmap to ACI Europe by May 2024 at the latest, including an intermediate step of being carbon neutral by 2030.

Being Net Zero Carbon, in the ACA program and for ACI, means reducing its own emissions (i.e. Scope 1 and scope 2 emissions) as much as possible [1]. Three main sources of (scope 1 and scope 2) emission are present at PLQ:

- electricity: to achieve the European Net Zero ambitions and the Lithuanian airports ambition to produce, on site, 100% green electricity for its consumption, it is necessary to foresee local electricity supply. The installation of a solar farm on the airport facilities and investing in power purchase agreements with wind farms is among the preferred solution.
- Transport: progressively replacing light vehicles with electric vehicles and purchase HVO100 for heavy vehicles before the introduction of a more mature solution seems to be most suitable at this stage
- thermal energy: multiple options might be feasible such as biomass, heat pump and biogas and should be explored further.

Moreover, airport have a role of guiding and influencing its stakeholders to reduce scope 3 emissions. This influence might impact the infrastructure in the future and especially with the introduction of fossil-fuel free aircraft.

Future aircraft

Radical changes to aircraft are required to meet sustainability targets. There are multiple sustainable aviation technologies in development, which all have their own specific relevance in terms of aircraft size and range. Airports should prepare for these new technologies. The Alliance for Zero-Emission Aviation (AZEA) is currently developing guidelines for airports how to prepare infrastructure for future aircraft. The table below identifies the benefits and concerns of the new technologies.

Some of the first highlighted infrastructure requirements are developed in the core document. This topic being currently in constant development, it is strongly advised to follow the latest developments in the near future.

Other aspects

The other aspects of the environment and in particular water, waste, biodiversity have been evaluated and the impact will remain low with the foreseen developments. Some examples to lower the impact as developing waste management strategy to reduce waste under circular economy principles could be explored further.

TABLE 6 BENEFITS AND CONCERNS OF NEW AIRCRAFT TECHNOLOGIES

	Electric flight	Hydrogen	SAF
Benefits	• 100% emissions reduction (when using green energy) • Commercially available • Small adjustments to infrastructure	• 100% emissions reduction • No limit on capacity and range	• No infrastructural adjustments required • Commercially available • No limit on capacity and range
Concerns	• Limited capacity and range • High electricity demand • Medium-term solution • Medium TRL	• high energy demand • Long-term solution • Low TRL • Safety	• Not fully eliminating emissions • Availability is limited • High price • Land use impacts

[1] According to the European Commission mobility plan, Net Zero emission means a reduction of 90% of Carbon emissions against a 1990 baseline (resource.html (europa.eu))