Pärnu Airport

Gap Analysis Report

18/05/2016

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List of Abbreviations

AIP	Aeronautical Information Publication
AIS	Aeronautical Information Service
ANS	Air Navigation Service
ASDA	Accelerate Stop Distance Available
ATC	Air Traffic Control
ATM	Air Traffic Management
ATS	Air Traffic Service
CAA	Civil Aviation Authority
CAD	Civil Aviation Directorate
CAT	Category (of the ILS)
CNS	Communication, Navigation and Surveillance
CCTV	Closed Circuit Television
DME	Distance Measuring Equipment
ICAO	International Civil Aviation Organisation
ILS	Instrument Landing System
LDA	Landing Distance Available
NDB	Non Directional Beacon
NIP	National Investment Programme
PAPI	Precision Approach Path Indicator
PAX	Passenger
PCN	Pavement Classification Number (bearing strength index)
RFFS	Rescue and Fire Fighting Services
SMATSA	Serbia and Montenegro Air Traffic Services Agency
TODA	Take Off Distance Available
TORA	Take Off Run Available
VASI	Visual Approach Slope Indicator
VOR	Very high frequency Omni directional Range (radio navigation beacon)

1 Introduction

The Local Authority of Pärnu County (the "City") has commissioned the Swedish consultants LFV Aviation Consulting to carry out a Gap Analysis for Pärnu Airport. The airport (the "Company") is a state owned company 100% controlled by Tallinn Airport LTD.

This report marks the conclusion of the site visit and is the end product of the Consultants' work.

This report provides a description of the present situation Pärnu Airport. Also, this report discusses some key success factors and potential risks to the realization of the business plan.

While the consultants cannot assume responsibility for the accuracy of the information, this document is intended as a supporting document when seeking financing for the necessary investments. If not stated otherwise, the figures reflect the situation at March 10, 2016.

In order to create an attractive destination the Airport must undertake certain critical investments. These are summarized below and further developed later in the report. The investments lie mainly in facilities and equipment at the Airport. These investments have been identified as critical because they facilitate growth of the Airport in that they increase the capacity of the Airport but also because they are necessary for the Airport to comply with international safety and environmental standards and requirements.

Technical:

- An upgrade of the Airport's **electrical power system** is required as this, to a large extent, is outdated.
- The **capacity of the terminal** will need to be expanded in phases. This can initially be done through modifications to improve the passenger flow and investment in new security and check-in equipment. In the longer term, if annual passenger volumes increase, a completely new terminal building is probably needed.
- There is almost no Ground handling equipment at the airport, some new items need to be bought
- Fire trucks and snow removal items need to be upgraded or changed into newer standards
- Landside facilities must also be adapted to an increased volume of traffic. More **parking spaces** in connection with the terminal are needed and the airport access road needs improvement.
- The airport drainage system can require investment in **treatment facilities**.
- Fresh water supply and sewage need to be capacity calculated and perhaps also connected to the city system.
- The **capacity of the apron** can be improved by a new parking stand layout and through **investment in ground support equipment**.

An Airport Master Plan is necessary to assess the base for further investment and developments.

2 Pärnu Airport

Pärnu airport is situated between capitals of Estonia and Latvia. Pärnu is a tourism- and business destination. It has famous sandy beach and are the summer-capital of Estonia. It is also a large SPA-city, in 2015, four spa hotels were renovated to welcome new customer.

The airport was built to by the Soviet military, its concrete cover is from those days and are in bad shape. Today Tallinn Airport Ltd, a state owned company, manages the airport. Part of the runway with size 799 x 23 metres was renovated in summer 2014 (joints between concrete plates where cleaned and filled, bigger potholes where filled and some of the worst concrete plates were replaced). Some works have been done with joints and apron also in summer 2015. Only VFR flights are served. Few instrumental approach-facilities that were functioning at some point, are now worn out and therefore non-certified and switched off.

Runway lights are switched off and partly taken off due to the change of runway threshold.

Up until 2013 the airport had a 2.5 km runway and ILS in one direction. Charter flights from Finland was stopped in 2013 due to inadequate quality of the runway, causing a threat of small stones into the engines. The airport now serves flight to small islands in Gulf of Riga with a small piston engine planes.

Tanking possibilities are not modern. AVGAS100LL fuel station is quite basic. Tanking of JET A1 is done via tanking-car with total capacity of about 4500 l. There is no stationary tank-park for keeping JET A1.

There are a couple of people employed at the airport, there are winter and summer maintenance and a AFIS tower is online. A security guard is standby 24/7 from an external company. The organization is small and all the personal has multi competence at the airport. Some staff are also certified to work in Tallinn and at Kurresare Airport.

3 The Airport and its surroundings

Pärnu has potential volume range of "overnights" that can be estimated from existing numbers of Finnish "overnights", already visiting the region during the last 10 years:

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
total	711424	731720	731655	663361	627621	682413	703420	710423	730707	767055	775348
EST	168 000	209 461	238 909	224 754	187 327	200 741	221 478	233 800	237 427	263 858	277 461
LIT	2 088	2 422	2 948	3 460	3 794	3 576	5 469	4 462	4 526	5 049	5 404
LAT	4 630	6 617	7 213	10 045	11 071	14 955	15 629	17 652	18 257	27 143	32 884
NOR	8 903	13 590	13 058	11 714	10 503	9 305	9 064	7 315	7 200	6 691	6 525
SWE	51 281	50 097	41 787	37 328	33 162	34 635	31 998	34 656	41 321	36 796	37 217
GER	9 904	7 518	7 828	8 316	13 560	9 263	7 328	7 492	6 537	7 888	7 928
RUS	6 449	8 107	6 503	9 034	8 595	12 363	21 157	25 422	30 076	29 146	18 063
FIN	441 486	415 075	391 305	341 650	344 730	380 680	366 905	358 842	365 728	367 844	366 736
others	186 683	228 294	261 013	241 814	202 206	217 636	245 870	254 582	257 062	286 498	300 591

Table: Historical overnights form main market

Based on 366,736 overnight stays from Finland, and based on 60% capacity utilization of 5,000 beds, the number of visitors is estimated to be visiting Pärnu is around 20 000 to 30 000 depending on how long they stay.

Based on the above, the same numbers could possibly arrive from Norway and double that number from Sweden if reasonably priced air travel to Pärnu was in place and marketing of the region is successful over the long term.

Pärnu, as a holiday and medical spa town, is of great interest for pensioners and for young people who are on a reasonable or tight budget. In other words, the town represents good value for the largest population sectors who are not the most affluent nor the most in need. They represent the median populations who would find what Pärnu has to offer as great value for money. Such numbers are well within the capacity of Pärnu assuming that increase in hotel capacity continued to be available over the coming years.

The main problem is how to secure new arrivals at the airport because trips across the Baltic Sea are too slow for most people from Sweden and Norway. Even residents in the Helsinki and Turku area still have a 2-hour bus ride if they arrive by ferry to Tallinn.

3.1 How to attract new passengers

Our proposal is to look into an approach by seeking out actively cooperation between smaller airports that can deliver planeloads of passengers in smaller turbo-jet aircraft with seating capacity of 32 and 64 passengers. This is essential given the need to keep any investment in renovating Pärnu's runway and landing instruments to the minimum whilst allowing all-weather safe landings.

Given the above there could be some 50 000 individual visitors coming each year for 2 or 3 days on average over time, but starting with much more modest numbers in the early years.

Given that the average maximum load of 32 passengers per flight and some 2 incoming and outgoing flights each day on average then around 20 000 can pass through the airport be

managed in the short term. In the longer term more landings can be achieved by actively cooperate with other regions, more if there are 5 incoming and outgoing flights each day on average.

Any such airport development is dependent on the creation of a network of small airports like Sandefjord – Torp Airport and Haugesund Airport in Norway as well as Malmi in Finland and Stockholm Bromma in Sweden, etc can support the small number of flights to and from Pärnu. Consideration could also be given to have flights to and from Tallinn.

Such a solution would obviously create extra passenger volumes for the departure airports and have a positive impact on their profitability while at the same time reducing their dependence on the power of the low-cost carriers.

Short-term		Long-term	
Days airport open for 9 months	270	Days airport is open each year	270
No. of passengers in airplane	32	No. of passengers in airplane	48
Av. capacity utilization in planes	60 %	Av. capacity utilization in planes	60 %
Incoming flights	2	Incoming flights	3
Outgoing flights	2	Outgoing flights	3
Incoming passengers	10 368	Incoming passengers	23 328
Outgoing passengers	10 368	Outgoing passengers	23 328
Total number of passengers	20 736	Total number of passengers	46 656

Table: Estimates of potential traffic volume for Pärnu Airport

4 Organisational assessment

4.1 Staff

Mandatory resources

- Airport manager approved by ECAA
- Airport operation manager
- Security manager
- Electrical manager
- Airport Rescue and Fire Fighting manager
- Airport Rescue and Fire Fighting operators
- Wild life hazard, airport hunter

AFIS

- Supervisors during opening hours

Operators

- Necessary recourses to handle the daily operations (security, airfield operator and electricians)
  - Could be organized in 4-5 teams depending on traffic

Regarding the operational staff, multi competence positions are recommended. The minimum number of staff is mainly regulated in respect to the capacity in Airport Rescue and Fire Fighting (ARFF) requirements. It is possible that the airport here need some additional staff to be able to support also the terminal processes.

Security, ARFF and runway maintenance and baggage loaders staff could most likely be the same staff. For passenger handling like check in and boarding process as well as tourist information staff from the administration could support as well.

The number of staff need to be calculated to the scheduled opening hours and season of opening, winter operation may require more staff. A rough estimate of the number of staff is 25-30 yearly workers including administration and AFIS.

5 Technical assessment

5.1 Overview

The findings in this chapter are preliminary and are based on the on-site visit to the Airport in March 2016 with fruitful meetings with airport management and staff as well as the further review in Sweden of documentation of the Airport's facilities and equipment. Furthermore, the passenger and aircraft movements forecast have been analyzed been provided to the project team.

5.2 Landside aviation facilities

5.2.1 Passenger terminal

Presently the terminal handles one simultaneous scheduled departure and arrival flight with maximum of 10 passengers.

The terminal building is small and worn out but for fills its function at the present level.
It is estimated that the current terminal has a capacity of approximately 50-70 passengers at the time.

Picture: Current departure lounge

For departing passengers there are one check in counter combined with document checks for the security control. Checked in bags are screened at the passenger security control position and then separated from the passenger to a checked in bag room before sent to the aircraft. The passenger security control consists of one x-ray machine and one metal arc. This will reduce capacity and create a manual operation to secure the passenger separation from the passenger. One security flow for the passengers are enough but it is recommended to have at least 2 metal arcs and 2 x-ray machines at the airport.

Travellers to Pärnu will most likely have checked in bags at departure. It its therefore strongly recommended to invest in an additional screening machine and some kind of

transport system for checked in bags, it can be a simple non-motorised solution but it will require some space to install.

Picture: Current baggage sortation area

After the security control there are a waiting room with limited space, there are one restroom, not build for persons with reduced movability.

For flight leaving the Schengen area a document control (passport control) need to be conducted. This include flight to Russia and Great Britain. Flights to Norway is outside EU and will require a custom control at arrival. Passport control can most perhaps be arranged on the second floor but will then require a new staircase/elevator and some additional investments.

Boarding is today simple since there are only one departing flight at the time.

Arriving passengers get their bags directly from the baggage cart and there are no space for indoor waiting. Passengers arriving need to get their bags and leave the controlled area without coming in contact with departing passengers. Most likely the easiest way is to open an airside landside access thru the current conference room (room number 1 on floorplan).

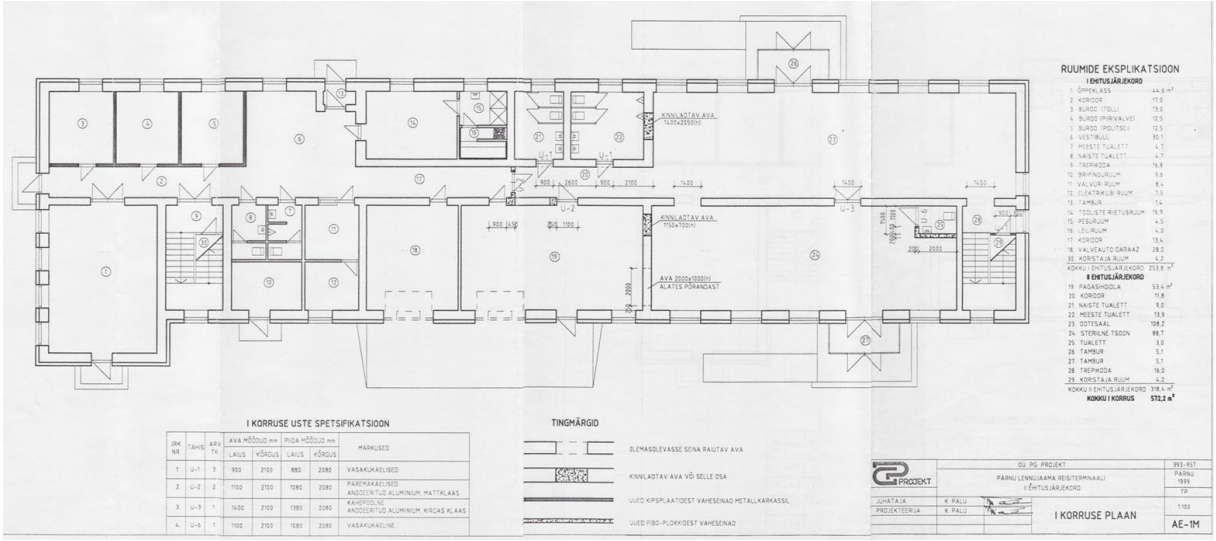
If there are flight to non EU-destinations an immigration process need to be conducted, necessary floor space need to be decided in cooperation with the local authorities. It is hard to see that this process can be solved inside the current passenger terminal building. It should be solved in a later step.

Picture: Current check in desk

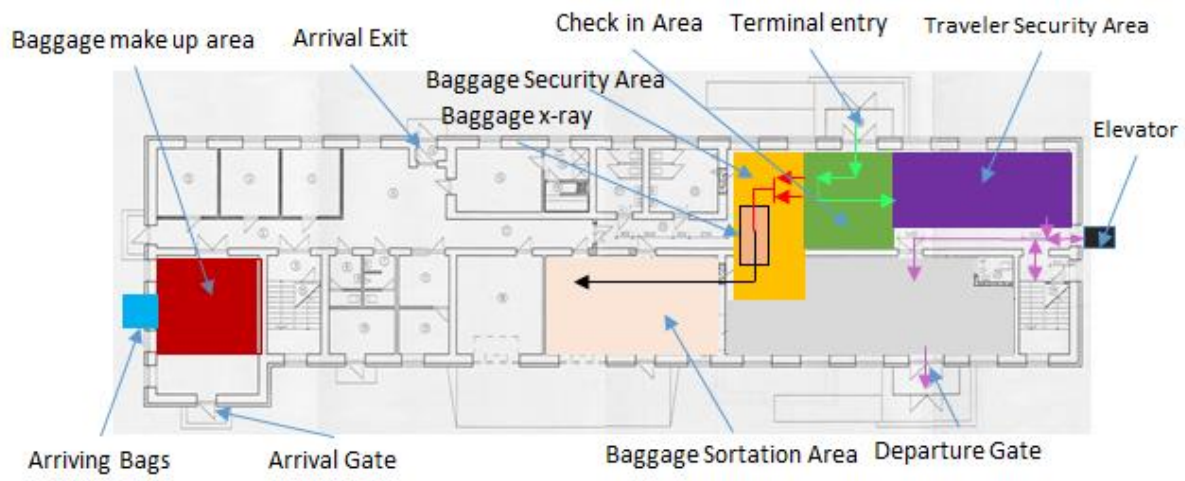
If a charter carrier begins operations the peak hour passenger volumes may be more than the terminal can handle. It is also required that the terminal, equipment, check-in, security and ground handling must be able to handle a turnaround in approximately 30 minutes.

Main problem areas of improvements:

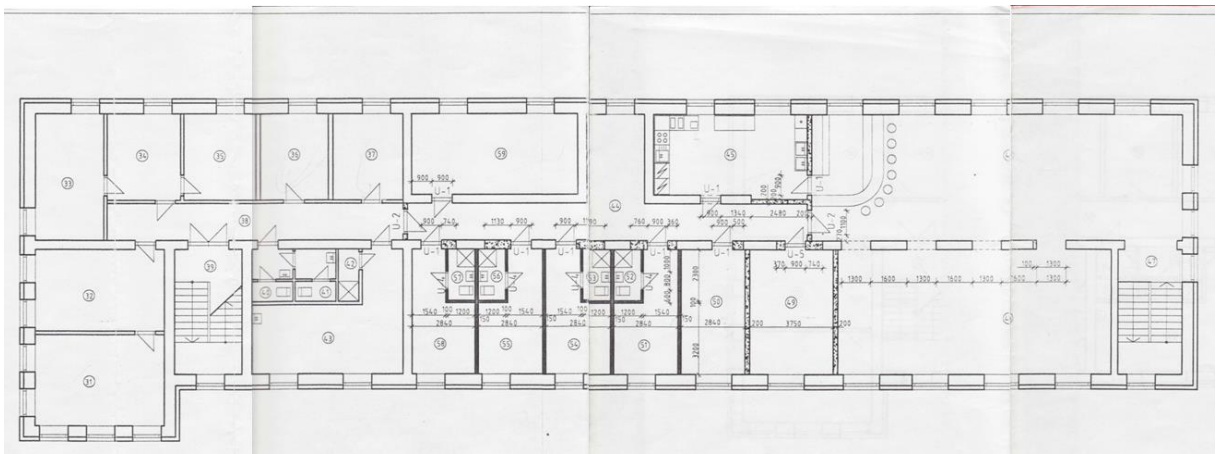
- Passenger flow and spaces in the departure hall, screening area and gate lounge.
- Departing baggage handling system is completely manual and the x-ray machine is combined with passenger security.
- No arrival hall with indoor bag claim
- Extended need of restrooms and orientation for passengers with reduced mobility.
- IT-system and automatization needs



Picture: Current floor plan, ground level



Picture: Schematic proposal for reorganization of the ground floor



Picture: Current floor plan, second floor

5.2.2 Security and security equipment.

The current status of the security equipment requires some investments. An additional x-ray screening machine to achieve redundancy in the process and also to achieve a faster and less time consuming process for checked in bags. The status of the current x-ray screening machine need to be checked with the Estonian Civil Aviation Authority (ECAA).

Additionally, equipment for liquid explosive detection need to be installed as well as a bomb and explosive tracer detector. Preferably, this kind of equipment should be redundant, there are different systems on the market and redundancy can be solved with a simple solution.

There is also a system for airside access control in use at the Airport. This is performed partly by manpower and partly by video surveillance.

There are many passages between the terminal and airside in use. They are controlled by keys and by ID cards.

The video surveillance system consists of some cameras The video surveillance system is controlled from one office at the ground floor of the terminal. This should be moved to a more controlled position.

The ID card system (badge) operates on contactless access system. All employees at the Airport have the ID cards.

Findings concerning areas of improvements:

- The x-ray machine is old and probably worn out but is functioning at the present level.
- The metal arch fully functional.
- Separation of passenger security and baggage security is important and will improve redundancy in the system.
- Perimeter fence: No intrusion or CCTV detection.
- Perimeter fence: Some gates needs to be replaced. All gates couldn't be inspected during the site visit due to snow but the gate in south east to the former airport area may need to be upgraded.

Recommendations:

- Perimeter fence: Needs a road for vehicle patrolling and it need to be patrolled more often. Installation of intrusion and/or CCTV detection along the fence is also suggested.
- The Airport should consider to invest in one or two more metal detectors.
- The Airport should invest in one or two new x-ray machines and a connected "baggage belt" (in the screening area) plus install transparent plastic glass along the baggage belt. This hinders passengers to collect their screened items premature and decreases passenger's congestion before and after x-ray screening.

The Airport is recommended in the future to invest in a combined command & surveillance/CCTV central located in another part of the Airport. In the event the Airport faces some type of threat, fire etcetera, and terminal needs to be evacuated.

5.2.3 IT systems

No IT system to support the passenger handling is identified. IT-systems for passenger and staff information, the check in and boarding process.

As long as flights are point to point a simple solution can be used. If the airlines be network based there will be higher demands om the IT system and connected devices as bag tag-printers. IT-supports for check in process can be arranged either with an airport controlled IT-system or via a system from the flight operator. Since the number of aircraft operators are limited a first solution should be to request the airline to support with the IT-system and bag-tag/boarding card-printers. Similar software can be used for the boarding system. An option is to invest in a similar system at the airport of use a current one at for example Tallinn Airport.

The airport also need to arrange a high speed internet-connection. An internal network needs to be installed at the airport accordingly.

Findings concerning areas of improvements:

- IT-hardware seemed to be old and worn out.
- Bad internet connection in general

5.2.4 Cargo terminal

No dedicated cargo terminal exists at the airport. Development of cargo traffic at the airport should be a subject for a business plan.

5.2.5 Access road and means of transportation to the airport

A small access road connects the Airport with the main road to Pärnu city. The road is built in concrete and are bad standard. To enhance traffic safety and accessibility to the Airport a wider access road should be considered.

Today all transportation to and from the airport is carried out by car. A bus service to Pärnu City and to the adjacent hotels should be considered if the in-charter traffic starts.

5.2.6 Vehicle parking

The vehicle parking area is located just outside the main terminal building. The number of parking lots is less than 100 which is sufficient for today's traffic. In a future with an increased passenger flow the parking area needs to be developed.

5.2.7 Fuel farm

The fuel service facilities at the airport is situated inside of the airport perimeter fence, directly connected to apron. The fuel service is operated by Helmcoil AS and consist of Avgas-fuel, this kind of fuel is used for piston engine aircraft.

Today jet fuel (Jet A1) is stored in a mobile tanker vehicle and there are no fuel farm for this kind of fuel. When the traffic increases a fuel farm need to be built, there are plenty of space to build it.

Picture: Current fuel truck

A higher capacity fuel equipment and a fuel truck should be considered in order to handle an increased traffic area. Most likely a 30 cubic meter fuel tank is enough. The tank need to have leakage protection and local regulations can require that the area used for filling the fuel-truck has an oil separation connection.

Existing fuel service facilities at Pärnu Airport.

Picture: Current fuel farm for Avgas 100 LL

The fuel farm can be positioned anywhere at the airport since the fuel truck will be used for filling the aircraft. The fuel farm should be monitored by security and it need to have good evacuation roads.

An approximate cost for the fuel farm EUR 75 000

5.3 Airside aviation facilities

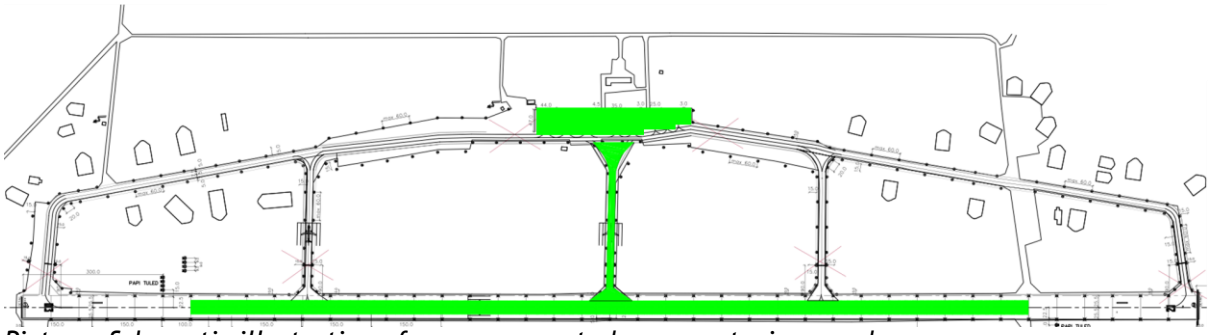
With the forecasted aircraft movements at Pärnu Airport a parallel taxiway is not needed, a parallel taxiway will give better capacity but will cost a significant amount of money. The most reasonable solution will be to build a new asphalt taxiway connecting the apron and the runway. The exact location for the taxiway need to be decided with respect to geology and a detailed study of the apron.

Picture: One of the old military hangars on the airport area

5.3.1 Runway

At one time the runway was 2480 meters, completely build in concrete. Due to poor reinvestments and maintenance, the status of the entire runway is bad. In 2013 parts of the old runway was renovated and the current dimensions are 799m x 23m. The thresholds in both runway ends are displaced. Declared distances in meters according to AIP are TORA/TODA = 799 and ASDA = 859 m and LDA = 799 m for both runways. This is not sufficient for most light to medium size airliners expected to serve the Airport in the future.

During the site inspection the requirements for the airport was discussed. According to this discussion our recommendation is to aim at category 3C according the ICAO classification. The maximum size of a 3C runway is 1799 meters long and minimum 30 meters wide.



Picture: Schematic illustration of a new renovated runway, taxiway and apron

This length will allow the largest turbo prop aircrafts, smaller jet aircrafts with a wing span up to 36 meter and many smaller business jet aircrafts.

The runway can furthermore be installed with clearways and stopways to allow larger aircrafts.

The width of the runway shall be minimum 30 meter. Since the runway once has been 45 meters wide with runway lights, it could be a cheaper alternative to do the runway 45 meter wide instead.

Pictures: Examples on the current status of the runway and apron area.

A new runway will require a new environmental permit. Since the airport haven't had traffic for some years there can be problem with noise pollutions and opening additional runway may require systems for taking care of storm water for the apron and runway. A new environmental permit can be a costly and time consuming process.

Runway lighting has been installed but are now removed. It is assumed that the complete electrical installation need to be removed and a new system needs to be installed. However, parts of the cable graves can most likely be reused. Airport lightning is not mandatory but should be installed to allow night and less viability landings.

Recommendations:

- Start with the environmental assessment as soon as possible
- Find a cost effective solution to reuse parts of the old runway
- Install a simple AGL-system

5.3.2 Taxiway and apron

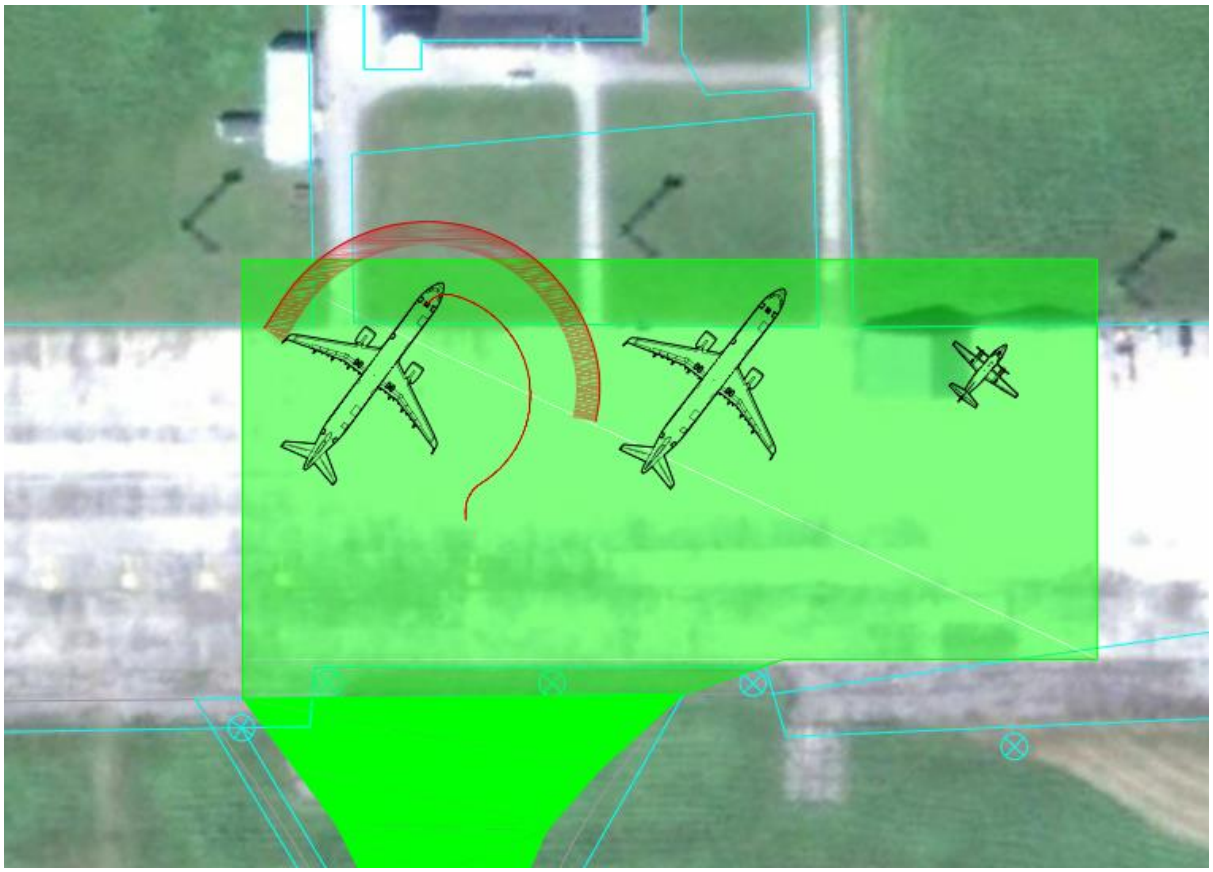
Before 2013 the airport had a large taxiway system consisting of a parallel taxiway with 5 connections to the runway. This is too much for the forecasted use of Pärnu Airport. Parts of the taxiway system was renovated in 2013. The renovated parts can be used also after a renovation of the runway but there are investments additional investments needed to be done also on the taxi way system.

An alternative to renovate the current taxiway is to build a new shorter connection directly the apron area. A cost benefit analysis need to be concluded. It is recommended to build an 18-meter-wide on the strait parts of the taxiway from the runway to the apron. If aircraft Dash

8, Q400 will be used there could be a need for slightly wider taxiway (approx. 1 meter extra). But this is also a discussion topic with the regulator.

Taxiway lightening should be installed to allow for night operations.

Parts of the apron was also reconstructed in 2013. The current apron need to be rebuild to allow power in and out stands for minimum two code C aircraft at the same time and some smaller ad hoc planes. If a new taxiway is build the apron will be approximately 13 300 square meter. If the old taxiway is renovated the apron will be slightly larger. A solution for push back aircraft should be available at the airport to make sure a wrongly parked aircraft can be moved.



Picture: Example of the proposed apron

Guidance to the pilot in parking the airplane can be done with assistance from a marshaller. After renovation all signs need to be according to the mandatory instruction according to ICAO requirement.

Recommendations:

- Install a fixed underground aircraft support system for all aircraft stands.
- Investment in a push back tractor to allow more efficient use of the apron.
- Install vertical signs on the movement area in accordance with ICAO standards, see pictorial representation below.

5.3.3 Electrical power system

The complete electrical system need to analyzed and upgraded to modern standard. This cold require new connections to the city power network.

Parts of the airport has been connected to a back-up power supply of diesel engines, the status of the diesels are unclear and need to be evaluated, it is however no requirement to have back up power as long as the airport don't have an instrument arrival system.

Electrical connections to ground power units, aircraft heaters and electrical movers need be installed accordingly.

A broad mix of investments concerning more or less most of the equipment needs to be replaced by new or updated equipment.

5.3.4 CNS and ATM systems

AFIS service is available for the airport and is provided by Tallinn Airport Ltd. Paper strips are created locally from received flight plans by AFTN or voice. Arrival and departures are coordinated with adjacent sectors by voice. The current equipment is sufficient and no replacement is foreseen for the near future.

Tallinn Airport Ltd is reasonable for the maintenance of the CNS equipment at Pärnu Airport. If the airport will change owner it's still considered to be the best option to continue using Pärnu Airport Ltd for at least the second line maintenance.

For a remote TWR operation the airport need to invest in equipment at the airport and a Remote TWR centre is also required. The only certified centre in the world today is in Sundsvall, Sweden. To build a remote centre in Estonia is an investment that needs several airports to be financial feasible. Using Sundsvall centre for Pärnu could be a possibility but we can foresee a rather large work to get a cross border regulatory approval. We see this would probably change in the coming years.

At this stage we therefore recommend to not invest in a remote operation but to carefully monitor the development and make a new assessment later on.

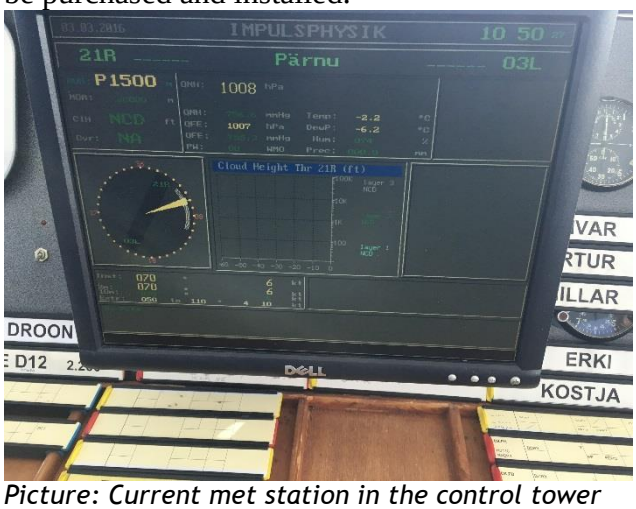
5.3.5 Navigation, communication and metrology

The airfield lighting system is removed but has previously consisted of a ILS Cat 1 approach for runway 21. Runway edge lights and taxiway edge lights. The former runway lighting system is removed. Navaids and instrument approach procedures

The VOR/DME equipment from Thomson-CSF is switched of and has not been used for the last 2 years. Spares will be difficult to find with associated high maintenance costs. A new modern VORDME should be installed for navigation for commercial traffic with larger aircrafts. An ILS system could be considered for regularly larger commercial flights.

For Air ground communication a JOTRON VHF receivers/transmitters is used. No replacement is foreseen for the near future.

MET
The current met equipment is old and spares are not available. New met equipment needs to be purchased and installed.



Picture: Current met station in the control tower

The table below gives a budget estimate for proposed investments.

System	Estimated cost (EUR)
Met system	95 000
Automatic weather observation system (AWOS)	42 000
VOR/DME	650 000
ILS CAT II	750 000

Table: -Investment cost for navigation, communication and metrology

5.3.6 Drainage system

The airport drainage system consists of a drainage system for the runway, taxiway and apron is not inspected.
No facilities for treatment of contaminant water such as aircraft and runway de-icing agents are available. There are no means of colleting left over de-icing agents on the apron after an aircraft has been deiced. Apart from the environmental issues, left over deicing agent can also have an impact on the “on time” performance on arriving and departing traffic.

Recommendations:

- Begin an environmental assessment study

5.3.7 Aircraft hangars

No hangars for aircraft maintenance are available at the Airport. A smaller hangar 10 seater aircraft are available.

5.3.8 Maintenance buildings

Some of the old military grass buildings are used as shelter for ground support equipment. No vehicle workshop has been inspected and most likely maintenance can be arranged in the city.

The upgrading of the electrical power supply system will include construction of new facilities for the technical installations and electrical generating systems.

5.3.9 Estimate of technical investments

• Passenger terminal rebuild approx. 500 m2	EUR 500 000
• Airport security Equipment	EUR 500 000, including fencing
• IT-system	EUR 200 000
• Electrical system approx.	EUR 800 000 – 1 500 000
• Access road and car park, future investment	EUR future investment
• Fuel farm.	EUR 75 000
• New meteorological system	EUR 95 000
• Automatic weather observation system	EUR 42 000
• VOR/DME	EUR 650 000
	Approx. EUR 3 600 000

Table: Estimate for technical investments

5.4 Ground Support Equipment

At the site inspection a four-wheeler was seen, this machine was used for snow removal and transportation of bag carts. Bag carts was seen in the baggage sortation room as well as in an external storage facility. This will be enough for the forecasted traffic.

It is recommended that the apron is designed to allow for aircraft power out (no need for a push-truck to reverse the aircraft), this require a larger apron but limits the operational costs and makes the process faster.

Ground power units (GPU) are used to connect to support aircrafts on the ground. GPUs can be connected to the local power system or powered by diesel engines. In this case we recommend the airport to install diesel powered GPUs. There are two standards for electrical connections to aircraft. Most GPU supports booth.

If passenger traffic will be conducted during winter months' aircraft heaters may be requested. If the aircrafts make short stops it can use its internal heating system, but this is not environmental friendly and created additional noise. However, a heater will not be a first priority.

Equipment for communication with aircraft, radios etcetera may also be required.

Many turbo prop aircrafts are installed with internal stairs for passengers. If aircrafts don't have internal stairs there need to be a stair connectable to an aircraft available. Different aircrafts have different heights of the floor level, therefore a stair need to be changeable in height to allow multiple aircrafts.

The following ground support equipment is currently available at the Airport:

No.	Type of equipment	Current units	Estimated need	Approx cost (EUR)
1.	Ground power unit	0	2	75 000
2.	Air starter	0	0*	-
3.	Aircraft deicing unit	0	1	200 000
4.	Runway friction testing equipment	0	1	200 000
5.	Belt loaders	0	1	50 000
6.	Water service equipment	0	1	10 000
7.	Lavatory service equipment	0	1	20 000
8.	"FOLLOW ME" vehicle	?	0	-
9.	Forklift truck	0	0	-
10.	Tractor	?	0	-
11.	Servicing stairs	0	0*	-
12.	Aircraft stairs	0	3	20 000
13.	Aircraft tow bar	0	1	15 000
14.	Wheelchairs	?	3	2 000
15.	Baggage truck	1	3	40 000
16.	Baggage dolly cart	4	4	0
				632 000

** may be necessary in the future*

Table: Estimates and cost for ground support equipment

5.5 Airfield maintenance and firefighting equipment

Presently there is no equipment for measuring the wet friction of the runway according to ICAO standards.

Two old snow removal equipment is available but looks outdated and needs replacement. It is therefore suggested that new snow removal equipment shall be included in the upgrading of ground support equipment. Two sweepers and one blower will be necessary in order to clear the runway in short time.

Current airport classification requires no firefighting equipment, when upgrading to a code a longer runway and larger airplanes there will be new need for new firefighting equipment and trained staff.

International regulations set the minimum liters of fluid and foam in the truck and the number of fighter fighter staff to be present within 180 seconds. Staffing is decided by many things, one is the length of the aircraft.

Picture: Current equipment for ice and snow removal

Status of the current capacity is questionable, one new, or used, fire truck need to be bought and staff need to be train on the new machines. The

There is no fire station at the airport, the minimum need is a location for maintenance of the material. This building need to be close to the passenger terminal to be able to schedule staff to work as fire fighter and for example security officer or baggage loader

If larger aircrafts will operate the airport and extra capacity is temporally needed this can most likely be arranged with the city fire brigade located in the city.

Status of emergency access roads could not be inspected during the site visit and the status is therefore unclear.

The Airport does not have equipment for aircraft removal

No.	Type of equipment	Current units	Estimated need	Approx cost (EUR)
1.	Fire fighting truck	0-2	Min 1	500 000
2.	Command fire fighting vehicle	0	1	75 000
3.	Guard patrol car	0	1	30 000
4.	Plow, blow and sweep machine	0-2	2	700 000
5.	Deicing fluid collection truck	0	1	250 000
6.	Wheel loader	0	1	200 000
7.	Lorry	0	1	150 000
8.	Tractor	0	1	150 000
				2 050 000

Table: Investment for airfield and firefighting equipment

5.6 Landside non-aviation facilities

5.6.1 Public transportation

There is no public transport to the airport. It´s reasonable to assume there will be charter bus traffic to and from the hotels in the city center when flights are coming. The current car and bus parking facilities are small but will allow busses.

5.6.2 Office facilities

Presently there are no office facilities available for external tenants at the Airport. It is suggested that space for on-airport office facilities shall be allowed in the airport master plan.

5.6.3 Car rental facilities

Car rental service facilities are not available due to low passenger numbers. It is suggested that space for on-airport car rental facilities shall be allowed in the airport master plan.

5.6.4 Recreational infrastructure

There are no facilities for recreational activities at or near the Airport. Although not a top priority for the Airport, providing recreational facilities for waiting passengers, visitors or personnel such as an outdoor park or restaurant/cafeteria will increase the attractiveness of the Airport. This is not part of the short-term investment plan but it is suggested that space for on-airport recreational infrastructure shall be allowed for in the airport master plan.

5.6.5 Other commercial facilities

There are many old aircraft hangars at the airport, most of them are located on airside, it could be possible to change the fence and have these areas on landside.
It is suggested that space for on-site commercial facilities shall be allowed in an airport master plan.

6 Documentation

6.1 Master Plan

A strategic development and investment plan including a Master Plan, should be considered. It is reasonable to set the Master Plan time horizon to 20 years. The plan should outline the general development direction and determines the basic polices strategies and parameters which will lead to least cost improvements within financial constraints.

A long-term plan often considers:

- Overview and current status
- Products and Services
- Marketplace Analysis
- Marketing
- Operations
- Development
- Short-term Investment program
- Supply and partnership management

Furthermore, the long term strategy is dealing with three stages to cope with different needs during these stages:

Stage 1; **"Preparing for the upswing"**
Laying a foundation and structure for the future
Detailed plans for draining system, fresh water system and sewage
necessary constructions and operational manuals

Stage 2; **"Delivering the contribution"**
Deliver result for the region and the airport after initial investments
Cost calculations and business plan

Stage 3; **"Expanding the airport – detailed planning"**
Construction plan and schedule

Stage 4; **"Growing the contribution"**
Expanding the business and utilizing the full value of the airport.

6.1.1 Airport Vision

General Strategy
Deciding on product strategy (how to gain competitive advantages) is in principle a choice between Cost effectiveness and Superior and highly differentiated service and capabilities. An alternate strategic choice is to focus on a specific segment only, however not applicable for the Airport relative to its mission to serve the entire air transport sector to and from Pärnu. A strategy based on cost effectiveness or cost leadership is more common in mature markets with standardized product and where product development has come to a position when most competitors have the same or very close to same performance on their products or services.

A strategy based on differentiation on the other hand means that value is created for the customer by unique features, high customer service, superior quality, prestige or exclusivity and rapid innovation.

A cost leadership strategy would for the Airport possibly optimize revenues in the short term by providing only basic and standardized products like Take- off and landing, ground handling, passenger handling etc. However, this strategy would not support or form a foundation for the expected growth.

To apply a differentiation strategy would on one hand have negative impact on costs in the first and second stage, but would on the other hand create a potential for huge growth during phase three where revenue generation is expected to be high.

Passenger Strategy
Focus on establishing the Airport as a reliable, secure and effective airport in stage 1. Make sure to work intense with optimizing this during phase 2, creating an organizational body that supports the strategy and an Airport Manual that contains relevant information about the tactics and operational issues to achieve this.

The associated investments to achieve and implement the strategy are:

- refurbishment of existing terminal
- passenger flow optimization
- increase of passenger service levels
- emphasize on airport security
- extension of passenger terminal

Passenger airlines Strategy
Passenger airlines are very sensitive to reliable and effective operation at the airport. Initially, of course, focus will also be on safety and security, the importance of this cannot be over estimated.

It will therefore be of utmost importance that the Airport can offer:

- Effective approaches (Standard Approach Procedures, STAR) and departures (standardized Instrument Departure Procedures, SID)
- Reliable all-weather equipment and systems for precision approaches (ILS)
- Power supply system with standby power, including Uninterrupted Power Supply (UPS)
- Fully operational and implemented Safety Management System
- Established Maintenance procedures
- Efficient turn around procedures with state of the art equipment and facilities
- In addition to technical/ operational concerns, the airport also needs to focus on
- Branding of the Airport to make it the passengers preferred choice in the surrounding regions.
- Competitive prices

To summarize: The strategy will be differentiation, with an additional “Sales pitch” by initially offering low cost

Commercial
There has been a paradigm shift in airport business. Airports are turning from governmental provided infrastructure to commercially operated businesses. This has lead to a significant change in revenue distribution. Beyond the basics of terminals and runway, many of the largest airports now derive as much as 50% of their revenue from sources not directly related to aviation, like shopping areas, restaurants etc. Also industrial parks, offices and entertainment centers are often located in the adjacent of airports, forming "Aerotropolis".

This is the value chain with the highest profit potential (concluded to be "Very High")

This gives implication on the strategy for Land and Facility tenants. The Airport should, after having established a thorough physical master plan, define, develop and communicate differentiation parameters for tenants to choose to be on the airport.

6.2 Aerodrome Manual

An Aerodrome Manual is normally developed with ICAO doc 9774 AN/969 and fulfils the requirements stipulated from ICAO.

The structure of an Aerodrome Manual, is shown below. It includes seven appendixes which are manuals from different departments at the airport. These appendixes are as follows:

1. **Organisation manual**
   This manual should cover the organisational structure of personnel at the airport. It should also cover responsibilities, delegations as well as function descriptions for personnel with key roles in the organisation. *The manual is not mandatory according to ICAO doc 9774*. Although not a demand, this is a core manual in order to operate the airport safely and with a high level of security.

2. **Security manual**
   This manual contains routines and procedures for an airport. Responsible for the manual is the Director of Security.

3. **Air traffic services manual**
   Routines, procedures and responsibilities for Air Traffic Services. Responsible for the manual is the AFIS Manager

4. **Safety management systems manual**
   Routines, procedures and responsibilities for the strategic safety work at the airport. It should also contain a description of the occurrence reporting system and the safety goals for the airport. Responsible for the manual is the Manager SMS.

5. **Maintenance manual**
   This manual contains routines and procedures for planned and emergency maintenance and repair work on the aerodrome lighting system and navigation aids. It also contains routines for civil works on airside. Responsible for the manual is the Technical Manager.

6. **Airport rescue and fire fighting manual**
   This manual contains routines and procedures for the fire fighting brigade. It also

contains the emergency plan for the airport as well as procedures for handling of disabled aircraft. Responsible for the manual is the Manager of Airport Fire fighting and Rescue department.

7. **Ground Operations manual**
   This document contains the most important routines for a safe and efficient operation of airside, including routines for handling of aircraft during ground stop. Some of the airside routines are to be written when the new airport is taken into operation. In the document these routines are marked as headlines. The manual can be extended with landside routines, e.g. check in routines and baggage handling routines etc. Responsible for the manual is the Director Operations

6.3 Environmental Impact Assessment (EIA)

An Environmental management plan is a living document that identifies both risks and legal obligations.

Due to that the environmental legal status, laws and regulations, in Estonia are pending, the plan should therefore be based on expert judgment what should be done rather than on legal documents.

The aeronautical and non-aeronautical operations including passenger terminal, runway, and related facilities in relation to suggested traffic forecast needs to been subject to an environmental impact assessment in accordance with the Estonian law with its current status.

An impacts assessment normally includes noise, atmosphere, surface and underground water, landscape, waste, and urban environment. Public consultation can be a part of the EIA process.

Another purpose is to find a cooperation between the Airport and the city and find an:

Environmental awareness and commitment
Design to minimize the environmental impact
Achieve and maintain sustainable development
To plan in time to prevent environmental impact

The process used to carry out the additional EIA included the following:

- Screening of the developments with the use of one screening checklist
- Scooping including coverage and detail of the EIA, i.e., firstly identified the potential impacts of the developments and secondly selected those which are likely to be significant and required most attention.
- Impact analyses including prediction of impact and assessment
- Reviewing of the EIA and conclusions.
- The methods used to carry out the additional EIA included:
- Meetings and consultation with local environmental officials
- Meetings and consultation with airport management
- Site visits to the Airport with close surroundings
- Standardized Check-lists (2 different ones)
- Application of professional knowledge and experience.

6.4 Estimate of documentation cost and time

- Master Plan
  - Including
    - environmental assessment analysis
    - Sewage system analysis (no rebuild costs)
    - Fresh water system analysis (no rebuild costs)
    - Airport development
  - Appriximat cost of EUR 200 000
- Aerodrome manual – ICAO doc 9774
  - Cover most necessary documents
  - Approximately 4 months work at a cost of EUR 100 000, require support from the airport
- New approval from Estonian CAA to operate the airport
  - 2-3 months deepening on CAA. Approximately EUR 50 000
- Environmental permit according to Estonian law
  - Depending on the regulating authority. Approximately EUR 50 000

7 Operation costs and maintenance

7.1 Staffing

Staffing needs are always hard to estimate. As a benchmark, a Swedish airport with 100,000 - 200,000 passengers per year has approximately 100 employees. It is reasonable to expect that the staffing in Pärnu Airport could be kept smaller, since the forecasted traffic is quite low the number of employees will be lower than the Swedish benchmark. It is also possible to get staff on a

7.2 Maintenance

Before restarting commercial traffic att Pärnu Airport heavy investments are needed. The Investments will have a major impact on the financials of the Airport during the initial years; however, the majority of the investments are essential in order for the Airport to attract carriers. With new investments follow large maintenance, spare part and training costs. These costs are needed in order to avoid or to mitigate the consequences of equipment failures but also in order to prolong the equipment's physical life. In general, investments in aviation equipment/systems/technology are spread over several cost segments and over time; the actual equipment, maintenance, spare parts and training costs. That is, the contracts with suppliers include not only the initial investment (the actual equipment/system) but also training and maintenance for the next 5-10 years. This implies relatively low initial costs; however, the costs covering maintenance and spare parts are relatively large and are spread over the years following the actual investment.

Each new investment the maintenance and spare part cost can be calculated as a certain percentage of the initial equipment cost, the same counts for training costs. These costs occur the year following each specific investment, assuming that the investments are taken into operation one year after initiated implementation.

- During the first two years the maintenance and spare part cost can be 15% of the initial investment amount.
- The following 5 years the maintenance and spare part cost can be 25% of the initial investment amount.
- The years that follow, until the end of each investment's economic life the costs for maintenance and spare parts are assumed to be equal to 5% of the initial amount invested.

Consequently, impact on the Airport financials will be significant in the coming years.

7.3 Other operating expenses

This cost item includes expenses for transportation, advertising, fairs, research, post services, representation, membership fees, insurance fees, consultant fees.

8 Investment cost summary

System/equipment	Estimated EUR x1000
Infrastructure investments	2 775
Ground handing equipment	630
Vehicles	2 055
Navigation equipment	787
Documentation and permits	400
Summary	**6 650**

Cost calculations are based on experience from similar airports
Cost summary includes investigations for new sewage and fresh water system, construction costs are not included
Costs for Ground handling equipment are based on new equipment.