

PROPOSAL PASSENGER FLOW MANAGEMENT AT SELECTED AIRPORTS

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Summary. Final thesis deals with problems proposal passenger flow management at selected airport. The terminal is seen as entry and exit point in the state, respectively city, and therefore is capacitive, the most of loaded place. Analysis of the current situation at the Prague airport is described in the third chapter. At the airport they are trying to solve problems using the Total Airport Management and also by Passenger manager, which is actually a sophisticated tool for monitoring the arrivals and departures flow of passengers and predicting their occurrence in time critical nodes in airport infrastructure.

Keywords: The airport terminal; passenger traffic; critical point; passenger flow measurement; reconstruction of the passport control

1. INTRODUCTION

Air transport has seen in recent years a significant increase in the world but also in the Czech Republic. The increase in air traffic was evident to the largest airport in the Czech Republic. At the Vaclav Havel Airport Prague was in 2014, handled 11,149,926 passengers. This is a 1.6% increase compared to 2013, thus confirming the long-term status of the largest airport in the Czech Republic. The future is expected to further increase in air transport and despite current unfavorable situation caused by the economic crisis.

With the growth of aviation biggest czech airport facing capacity problems. As the Terminal 2 was put into operation in 2005 and still has unused capacity at which airport envisages the further increase in the volume of transported passengers. The problem is Terminal 1, which was built in the late 90s of the 20th century. He has not undergone fundamental changes and therefore at present no longer comply the current needs of the airport.

The aim of this work is to present selected airports, evaluate the current situation and also to reconsider other options which would lead to resolving the issue. Further suggest a possible solution flow management of passengers and the associated benefits that a suitable change could bring the airport.

2. ABOUT THE AIRPORT PRAHA / RUZYNE

Prague airport, Plc. is a subsidiary of Czech Aeroholding, Plc. This company covers the state-owned company operating in the field of air transport and related ground services.

Prague airport, Plc. is the operator of the most important international airport in the Czech Republic, the largest among the new EU Member States. In 2011 it was awarded the Eagle Award from the IATA as the most developing airports in the world. Annually the international airport handles between 11 to 12,000,000 passengers. These have during the year given a choice of about 50 airlines connecting Prague directly line to around 130 destinations worldwide. There also operates five regular cargo carriers and dozen of companies that ensure charter transportation. Vaclav Havel Airport

Prague, which in 2010 managed its billions in profits, employs over 2000 employees with a further estimated more than 15,000 people employed by companies operating at the airport or linked to its operation. [9]

3. THE CAPACITY OF THE AIRPORT TERMINAL

The terminal should be dimensioned so that its capacity to absorb arriving or departing passengers and also accompanying them. Building should speed while ensuring clearance but also sufficient comfort. The building can be divided up into several subsystems. Then these must be dimensioned subsystems to cope with passenger check for a certain time with a certain standard. Some of these subsystems has to be set so as to be able to check in passengers in both directions. Important for the dimensioning of the building is to identify the different sub-systems, where runs flow of passengers. Certain amount of experience and above all an ongoing process of observation and with it the associated simulation processes required for the definition of these subsystems. [1]

3.1. Airport subsystems

Airport buildings and their subsystems can be divided as follows:

Reservoirs - the place and the waiting room, where waiting passengers accumulate

Processors - are places where checks are carried out and checkpoints

Couplings - all devices that allow the movement of passengers (aerial walkways, mobile stairs, elevators, etc.).

Static capacity

It is defined as quantitative potential of a specific device (waiting rooms, halls, stairways, buildings, etc.) or area. It is usually summarized as a number of users (passengers and their entourage), located at some point in the building or area.

Dynamic capacity

This variable indicates the number of passengers who pass through the terminal, respectively subsystems for the moment. The point in time can be defined different values (e.g. hours, minutes and so on.), which is dependent on the implementation of operations.

Permanent (stable) capacity

For a description of the overall capacity of the subsystems that are being used that term. Subsystem determines the variable capacity for a period of time and to maintain a certain level of services. Sustained capacity is a combination of dynamic and static capacity of reservoirs, processors and connection devices. If the subsystems are adequately dimensioned with a predefined level of service, so it can be concluded that the dynamic or static capacity of the terminal thereby not be exceeded.[2]

4. ANALYSIS OF THE STATUS ISSUE

4.1. Total airport management

During the last years, the aviation beginning to make effective use of the principles of the concept called Total Airport Management. Today, the Prague airport performs many essential operating decisions with limited knowledge of complex operational situation and many times on the basis of insufficient or inaccurate data. Most normal operating decisions is carried out in isolation, without contact with components which can and indeed often are directly affected by these decisions, without the possibility to give immediate feedback. The basic prerequisite for eliminating this condition is adopted at all levels of decision-making principles CDM (Collaborative Decision Making). In particular, the airport mainly to share consistent information with the greatest possible data quality.

Within LKPR CDM project was implemented and the project was completely finished in 2014. The basic building block for the future development is undoubtedly an integrated AODB (Airport

Operations Database). Integrated AODB us guarantees that all components have access to a single, and the moment the highest quality information. Currently available sophisticated tool for sharing flight data accessible via a secure web interface. It regards the application of CWI (CAODB Web Interface), made in implementation of the CDM project at LKPR.

How can we decide perceived lack of process optimization at the level of individual organizational units throughout the group ČAH. It is always just a local optimization isolated process and capacity planning based on the limited information sources, without knowing the impact of their own decisions on the environment and mostly without adequate feedback of the outside world.[4]

4.2. Passenger manager

The implementation of the new system RMS, the work team the idea to a sophisticated tool to track the inbound and outbound flow of passengers and the prediction of their occurrence in time critical nodes airport infrastructure. This idea was further developed into subsequent discussions with other interested parties, in particular the security forces, whether LP, Plc. or others acting on LKPR. The primary objective is to have passenger information on individual flights, the number of transfer passengers on flights each and this allows to know predict passenger numbers at a time in different places. This allows the then effective availability plan individual departments and positions.[5]

4.3. From the airport standards

Check-in counters operation

Basic provisions

- All check-in counters, including technological equipment, in addition to the check-in system, are the property of Prague Airport, Plc.
- Operators and system administrators to check in the AFM.
- Planning and allocation of check-in counters in Terminal 1 and 2 performs CDP.
- Planning and allocation of check-in counters in Terminal 3 is under control center CDP/GAV

Planning and allocation of check-in counters

Check-in counters Planning

- Planned short-term rented check-in counters in T1 and T2 CDP ensures that through airport coordination LP sends out individual check-in counters companies plan allocations for another day.
- Carrier or check – in (RAO), respectively Supervisor ground handling companies can sell KP requirements for the allocation of the next working day via e-mail to the CDP not later than 13:00 hour's local time on the day before the date given operational.[6]

Queue management

- QM it is at the Prague airport / Ruzyně secured through a network of fixed posts that are interlocked with each other as needed take-up tape.
- All posts for QM owned by Czech Aeroholding, Plc.
- Before desks security of travel documents in the connection object in the direction T1 - T2 and T2 direction - T1 tapes are combined in the basic configuration.[7]

Central Dispatching Operation (CPD)

The purpose of CPD is to ensure a smooth and complete flow of passengers at the Prague airport Ruzyně. CPD ensures trouble-free operation to accommodate passengers starting cleared at check - in counters, gate, to the boarding. This site has continuous working hours H24.0

4.4 Options clearance at the airport

Vaclav Havel Airport Prague is a modern airport, which uses a number of the most advanced technology and is an attractive environment for passengers. The services provided are of high quality. In connection with the check – in of Vaclav Havel Airport Prague offers multiple options.

Standard check – in

Classic check-in counters are located in the departure halls in Terminal 1 and Terminal 2. The check – in is necessary to bring the flight ticket, possibly reservation code, identity card and visa, if necessary. Check-in counters usually open 2 hours prior to the flight and closes 40 minutes before departure.

Oversized baggage

Check non-standard or oversized baggage such as umbrellas, prams, trolleys, bicycles, skis, surfboards, but also boxes etc. it is necessary to speak with professionals taking care of the passenger check-in counter. These baggages are sent from a special counter which is marked with the inscription - oversized baggage. These counters are located in the departure halls of Terminals 1 and 2.

Internet check-in

If passengers have an electronic ticket is for some airlines the opportunity to check-in electronically from home and 48 hours to 3 hours before departure according to the rules of a particular airline.

Self check - in kiosk

The most modern form of checking in at the airport self-service check-in kiosks (i.e. Self check - in), located in the departure hall of Terminal 1 and Terminal 2. [8]

5. DESIGN AND IMPLEMENTATION OF SOLUTIONS FOR AIRPORT

In the summer of 2014 I joined a three-month Erasmus her internship at the Vaclav Havel Airport Prague. Strain I was assigned to the organizational unit SRP - strategy and development operations. However, during the internship I completed visits to all focal operational workplaces. The fundamental business of SRP is continuous optimization of airport processes to meet current trends.

One of the few projects that I participated in during the internship was the solution's capabilities check – in Terminal 1. Terminal 1 current form dates from the late 90s of the 20th century, when the terminal was issued in response to the growth in air traffic and the increasing interest in traveling in the region. Newer Terminal 2, which was commissioned in 2005 already project- respond to current trends in the flow of passengers and especially after the legislative requirements in aviation.

5.1. Measurements made at the airport

During the internship, I performed a number of measurements at several critical points in Terminal 1. Measurements in the handling at the drop - off counters. More precisely, the number of passengers and the time for which they have been checked.

I further measurement performed on self-service check-in facilities – kiosk.

Measuring time intervals and the number of passengers who arrive at the following intervals to passport control in the departure hall in Terminal 1.

These results are subject to further and more detailed measurements. These are the results of measurements which were carried out at passport control at arrivals and also for the departuresv. Tables contain intervals, which include data on passenger numbers, open counters that are available for passengers and also the time for which they have been able to passport control these passengers processed.

5.2. Solution proposal

Based on all these findings, it is clear that the ideal solution is the reconstruction of the airport passport control in the departure hall of Terminal 1. Currently passport control counters are unable to effectively manage inbound passengers and are formed long queues especially at peak hours.

Currently passport control in the departure hall offers passengers 11 counters, which are able to carry out passport control. These two counters serve as Fast Track. This passport control has a capacity of about 1200 people per hour. Unfortunately limiting factor in this reconstruction will definitely space. Passport control is located approximately midway departure hall, deployed between the commercial spaces. It must take account of these business premises because of them also have

significant benefits for airport and are in some comfort for passengers. Location passport control desks in the terminal building do not afford major reconstruction and expansion of essential critical point. It is also important to take account of continuous operation, it is therefore appropriate to seek a place where it will be possible to realize the event itself, and entered into operation without the slightest impact on passenger comfort. It would therefore appear an ideal space to the left of the current position. There are offices and facilities staff handling companies. The width of the area appears to be approximately 32 m compared to the original 20 m.

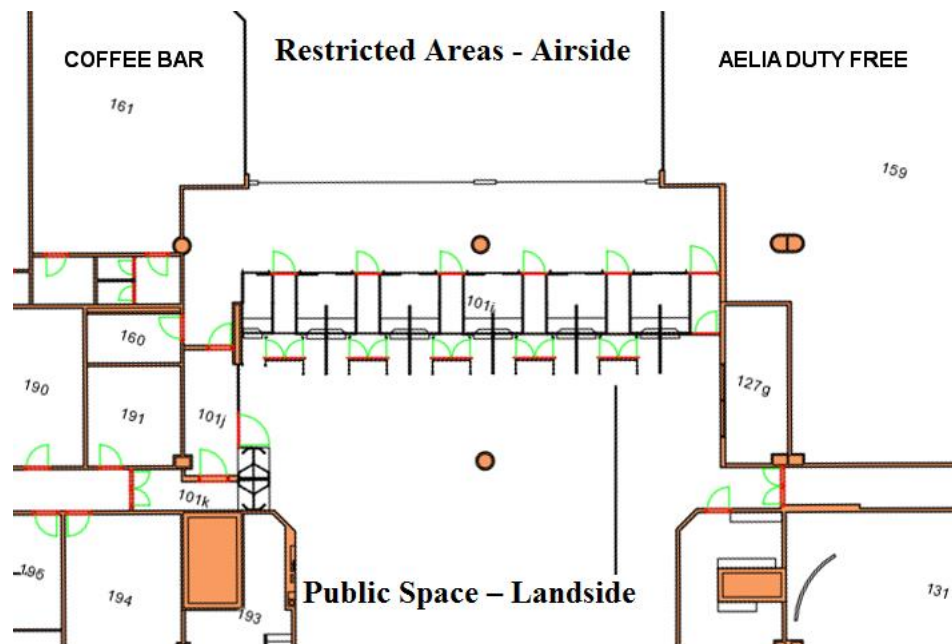


Figure 1 Ground plan current passport control in the departure hall of Terminal 1

Reconstruction of the passport control the airport offering a total of 21 passes. More specifically, 13 counters for all passengers. Before such unit shall build queue management, which will slow stream of travelers coming to the passport control and thus contributing to the continued burden of habitat, minimizing the moments where there is congestion of impact this critical point. For added convenience, disabled passengers will have two special panels that contribute to the comfort to accommodate passengers with reduced mobility. These two panels also serve as a fast track check-in counters, as well as Fast Track for passenger check with the carriage. There will be six other self-service gates, which are exclusively for passengers who are European Union citizens a biometric passport. These gates should further speed up the flow of passengers. One passenger handling time can be ten to twelve seconds, will noticeably shorter queues. The premises of passport control, passengers will receive through the turnstiles to allow entry only to passengers with a valid boarding pass. This is due to the entry of passengers in non-public areas of the airport. This system will facilitate and expedite the work of members of the Border Police at passport control. This enhancement capacity increases on counters for 1800 people and a self-service gateway will also their capacity to 1800 people per hour. Together, this will be an approximately 3600 people per hour, representing three times the original capacity.

Airport modernization of these spaces will increase throughput at this critical point, improving the transition passengers stop to create long lines, more effective use is made of available space and thus enhancing the comfort of passengers. The airport may also gain first served passengers to their faster transition through passport control they spend their time shopping in Duty Free stores, of which the airport reception, specifically a certain percentage of sales of these stores.

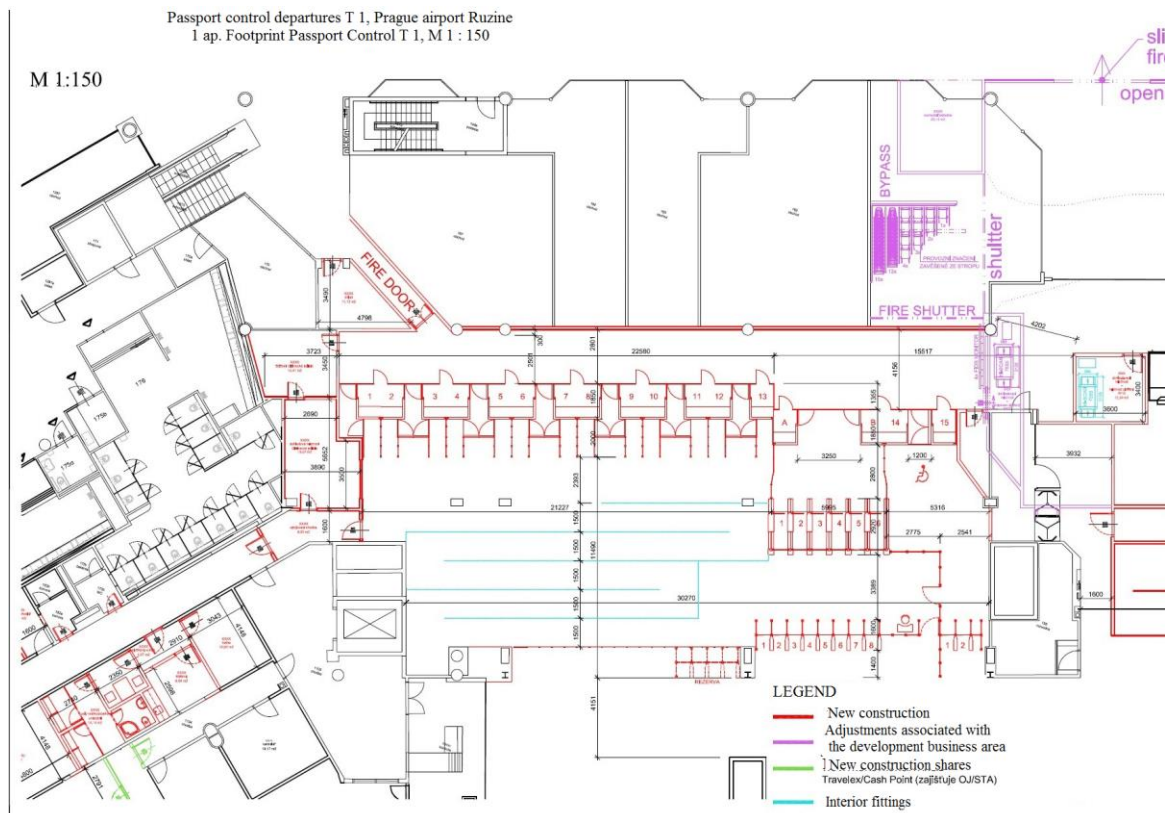


Figure 2 Ground plan of the design of the passport control reconstruction in the departure

6. CONCLUSION

The purpose was to evaluate the capacity of the terminals. Lack of capacity bottlenecks bus terminals would mean slowing development and possibly a complete stop to the largest airport in the Czech Republic.

The current capacity of Terminal 2 is sufficient because the terminal was put into operation in 2005. Its capacity has been dimensioned with respect to the future development of the airport, so now this terminal does not use its total capacity. Unlike Terminal 1, this was built in the first half of the 90 years of the 20th century and no longer meets the current situation in aviation. Precisely for this reason, the capacity of Terminal 1 must be immediately addressed.

So in conclusion, the capacity of Terminal 1 is currently almost completely exhausted. One solution, which is less costly and which, in my view at present the most ideal, is the adjustment passport control in the departure hall in Terminal 1.

7. LITERATURE LIST

- [1] Žihla, Z. a kolektiv. Letecká Doprava I. Praha: VŠO, 2007 ISBN 80 – 86841 – 049
Žihla, Z. et al. Air transpor I. Prague: VŠO, 2007 ISBN 80 – 86841 – 049
- [2] Kerner, L. – Kulčák, L. – Sýkora, V. Provozní aspekty letišť. Praha: ČVUT, 2003
ISBN 80 – 01 – 02841 – 0

Kerner, L. – Kulčák, L. – Sýkora, V. Operational aspects of airports. Prague: ČVUT, 2003
ISBN 80 – 01 – 02841 – 0

- [3] História Letiště Václava Havla Praha [online]. Dostupné na internete:
<www.letenky.sk/letisko-praha>
History Vaclav Havel Airport Prague [online]. Available on the Internet:
<www.letenky.sk/letisko-praha>
- [4] Metodické příručky Letiště Václava Havla Praha, Total airport management
Methodological manuals Vaclav Havel Airport Prague, Total airport management
- [5] Metodické příručky Letiště Václava Havla Praha, Passenger manager
Methodological manuals Vaclav Havel Airport Prague, , Passenger manager
- [6] Letiště Václava Havla Praha, Riadiace dokumenty, Prevádzka odbavovacích pultov
Prague airport Vaclav Havel , management documents , check-in counters Operation
- [7] Letiště Václava Havla Praha, Riadiace dokumenty, Queue management
Prague airport Vaclav Havel , management documents , Queue management,
- Letiště Václava Havla Praha, Riadiace dokumenty, Centrálny prevádzkový dispečing
Prague airport Vaclav Havel , management documents , Central operational control
center
- [8] Možnosti odbavenia na letisku Praha/Ruzyně [online]. Dostupné na internete:
Options clearance at the airport Praha / Ruzyne [online] . Available on the Internet:
<<http://www.prg.aero/cs/odbaveni-cestujcich/odbaveni-cestujcich/dalsi-moznosti-odbaveni/>>
- [9] O spoločnosti Letiště Václava Havla Praha [online]. Dostupné na internete:
The Office Vaclav Havel Airport Prague [online]. Available on the Internet:
<<http://www.prg.aero/cs/o-letisti-praha/o-letisti-praha/>>