

PROPOSAL FOR INCREASING THE EFFECIENCY OF AIRPORTS WITH AIRPORT COLLABORATION DECISION MAKING SYSTEM

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Collaboration decision-making at airports based on cooperation represents a solution for improving the efficiency of airports and discusses cooperation at the operational level and how the different elements. The text focuses on the analysis and description of capacity issues, performance and productivity airport throughput and energy efficiency of airports. Subsequently described a system of cooperation ingredients involved in the operation under manual Eurocontrol. The last part is devoted to pointing out joint decision-making at the airport in Munich.

Key words: Capacity, efficiency, airport, Airport Collaboration Decision Making

1 INTRODUCTION

By the year 2030, scheduled passenger traffic around the world is expected to be more than double. With the increase in number of passengers, airports require expansion of infrastructure in order to cope with increasing traffic volumes. Airport CDM project will facilitate decision-making and allows more predictability. Text is structurally divided into four chapters. In the first chapter, I focused on capacity issues associated with the operation and growth of traffic volume. The second part discusses the cooperation system components that are involved in the operation, characteristics of the system for introducing and conceptual elements. The third part is devoted to the manual of the European Civil Aviation Conference. In the last part of the text point out that the system at the airport in Munich.

2 AIRPORT CAPACITY

With the development of air transport in the world began to show most international airports capacity problems. Total capacity can be defined as the capacity of the weakest areas of the airport. Since the total capacity describe depending on capacity of individual areas at airports, comprising:

- Capacity movement areas,
- terminal capacity,
- capacity of air traffic control services,
- capacity of TMA,
- capacity of airport car parks,

- capacity of access roads and airport transport system city.

Airports in terms of achieving the capacity constraints of the runway system, the capacity of the terminal or aircraft stands or boarding bridges. Solution the lack of runway capacity is constant with respect to the solution of ecological problems and the scale of the area, the most complex. Many airports are in their further development limited legal impossibility increase runway capacity.

2.1 Supply and demand

Effectiveness of passenger and aircraft between airports is essentially dependent on the actual interests of airlines and passengers (demand) and actual capacity airport (bid). In general, we can determine the capacity as the maximum number of operations that the system is able to serve in a given time interval. Be taken into account forecast not only in the development requirements of passengers, but equally important is to look at developments in aircraft technology and the requirements for their security at airports, which is expensive and very difficult. Given the weather that still affect air travel, is to each airport, the weather conditions restrict airport operations, therefore, equip, staff and operating procedures that enable smooth operation even in zero visibility.

2.2 Capacity of airport's parts

The internal organization the terminal and operation of the various activities appreciably affect the fluidity of clearance. The capacity of the airport terminal is a figure which measures the degree of permeability to air terminal in applying the analysis represents. The terminal will work at different degrees crowd and delays, but its capacity should be asked regarding the level of service provided. According to the parameters airport weakest link, in addition to the capacity of the terminal capacity also movement areas. This is made up of runway capacity, taxiway capacity and capacity stands at apron.

Runway capacity is the limiting factor, it is usually not possible to gradually increase its capacity, but usually requires reconstruction of the construction of a new runway. Maximum use of the runway system can achieve and maintain as long as aircraft have spare runway capacity.

The basic parameters affecting the capacity of the runway system include:

- The arrangement of the runway and their number
- traffic on the runway.

When arranging the runway known airports with one runway and airports with a developed railway systems, appreciating developed parallel runway system intersecting runway system and open "V" - foreshortened system paths.

If the airport runway is more important to their arrangement. The highest capacity have airports with parallel runway system, which use two or more parallel runways, thus achieving maximum capacity of the runway system. Airport capacity is largely affects the capacity and throughput of the terminal and its layout, number and arrangement of the runway, as well as the mode of operation and other characteristics. Equally important is the setting process management and coordination. In order to control traffic at the airports included for coordination of airport operations. The basic tool is the free allocation of slots to air carriers at the airport. Free airport time is the time of take-off or landing, which is available or allocated to an aircraft movement on a specific day of the international public airport.

2.3 Increasing the efficiency of airport

Currently, the economic efficiency becomes a crucial competitive advantage. Large impact on the success of the production company has a way of organizing and managing production. Ability to produce higher quality and deliver faster than the competition, reliably and repeatedly agreed terms in the required quality and quantity have become determining factor of customer satisfaction. Efficiency is an economic category, which reflects certain objective conditions for the development of society.

In a market economy can increase business efficiency especially by:

- Defending quality certificates
- obtaining other necessary certificates,
- accurate and consistent planning service
- optimization of cost structures with a positive impact on the economic results of the company,
- effective use of marketing in the operation of aerodromes,
- customers, particularly through satisfying their needs and requirements and increasing service offerings,
- ensure the production of profit,
- creating and maintaining an attractive work environment and professional growth of employees and there by maintaining employment levels, to ensure conditions for achieving maximum efficiency of all components of the airport and the like.

3 A – CDM

A typical sign of the economy airport is a close connection between capacity and cost business. Infrastructure costs are in some way dependent on the performance at airports. The role of management is to ensure the optimal use of airport capacity and also to organize its growth relative to demand. Competition is growing unstopably and practice applicable regulatory mechanisms in key activities such as ensuring the flow of passengers, baggage, cargo, mail from aircraft to aircraft. On the fifth session of the ECAC in 1997 in Copenhagen, adopted a strategy for Air Traffic Management and subsequently

discussed strategy for 2000 + ("ATM Strategy 2000 +"), which led to the objectives of air traffic across Europe. According to this strategy the main characteristics that a new concept was guided by:

- Strategic organization and better predictability,
- flight control " gate to gate ",
- increase flexibility and efficiency,
- collaboration decision-making,
- management capacity and meet demand,
- airspace management.

Airport CDM project and CDM elements directly or indirectly supports these characteristics, thus facilitating decision-making and allows more predictability.

Collaboration Decision Making was first successfully introduced in the U.S. to tackling the severe constraints on airport capacity, mainly because of transport connections to the airport and poor weather conditions. Testing was carried out at the international airport in San Francisco in January 1998. Delays caused by ground handling processes in the course of the test period decreased by 15 %. CDM be extended to any airport in the U.S. and is fully functional today.

CDM airport system deals with partners ie airport operators, airlines, ground handling services, air traffic control, CFMU services and aeronautical information services that work more efficient and transparent manner. The aim is to increase the overall efficiency of operations at the aerodrome, focusing on processes prior to departure. The more airports will use and implement this system, it will multiply the benefits for aviation network.

Among the common objectives of the CDM include:

- Improving predictability,
- improving performance,
- cost reduction ground handling
- optimize / increase of utilization of ground equipment,
- increasing the use of resources - stands, waiting rooms, terminals, etc.,
- improve compliance with traffic flow management
- pre-flight planning,

- reducing apron and taxiways loads.

3.1 Benefits A – CDM

Improving the efficiency of airports using the transmission of information is how airport operators, ground handlers, aircraft carriers, air traffic service provider and service traffic flow management cooperation at an operational level. Of course, the cooperation between the various partners in aviation to some extent always existed. Up to now, however, focused on the cooperation of people, especially in the cases of fault. The airport CDM is a culture that emphasizes the importance of global cooperation in the planning and management of air traffic.

To achieve enhance common situational awareness, the Airport CDM culture requires the following:

- Agreed relevant data should be shared between all partners involved at the right time,
- data shared should be of sufficient quality to facilitate improved traffic predictability and planning capabilities for all partners involved,
- decisions should be made by the partner best placed to make them,
- decisions made should be shared with all other partners.

3.2 Conceptual elements

The order of element implementation is stressed since the elements depend heavil on each other. At the airport of implementation many specific issues can be decided locally, in order to be flexible based on the unique conditions in which an airport operates.

1. A – CDM Information Sharing - Sharing information is the first element of A - CDM, which is the basis for all other functions.

2. The Milestone Approach for the turn-round proces - In this step, watching a series of downstream events from the time of initial planning through land clearance to take off the essence of the moment. The main objective is to raise awareness on the situation of the partners in the phases of flight.

3. Variable taxi times - Calculating the variable-taxi time is another element of A - CDM. Used to predictability exact time of arrival at stand and exact time of take-off.

4. Pre-departure Sequencing – Pre-departure sequence sets the order of departure of aircraft for take - off taking into account the preferences of operators and operating restrictions.

5 Airport CDM in adverse conditions - CDM function in adverse conditions is to enable the layout capacity most optimal way and allow a rapid return to normal mode once unfavorable conditions no longer exist.

6 Collaborative Management of flight updates - improves the quality of reception and transmission of information exchange between the Centre orderly flow of air traffic and airport.

4 CONCEPT EUROCONTROL

This module is an airport system for improving the efficiency maximizing airports through transfer of information, the concept of the system and, of course, risks associated with the transition to this system. This form of the model is part of the e - learning course, which focuses on all operating airport employees. Incorporating airport operators, air traffic controllers, aircraft operators, ground staff, pilots and ground handling services. One of the main components involved in the formation of groundhandling.

4.1 Risks of A – CDM

Implementation of the system is not as simple as it first appears, because it takes into account many different partners and the associated culture change necessary for successful implementation of CDM. All plans face a number of common and clearly identifiable risks. Some risks are related only by the introduction of the CDM, but some are characteristic for the other projects, but within the A - CDM attract special significance. The basic risks include: Passivity, lack of awareness, conflict of interest, the partner's withdrawal from the project, disagreements

between partners, data collection unsatisfactory like.

5 APPLICATIONS A – CDM IN MUNICH AIRPORT

The airport is named after the German politician Franz Josef Strauss and located across four cities. Oberding (terminals , Erding District) Hallbergmoos, Freising and Marzling (district of Freising). The airport is experiencing a big boom, only between 1992 and 2012 the number of passengers tripled, from 12 million to 38 million annually. After Frankfurt Airport is the second most used airport Lufthansa. In 2013, received the award for best airport in Central Europe. Prices are evaluated on a vote of more than 12 million air passengers. Despite the difficult conditions, which the aviation in 2012 faced, 38.4 million passengers used the services of the Munich airport. This result represents an increase in passengers of 1.6% and puts the airport before the results of industrial production.

5.1 CDM in Munich Airport

On 7 June 2007, the one-year trial operation of the CDM at Munich airport CDM completed and has been integrated into normal operation, so the Munich airport is the first in Europe that the system performs as a standard procedure . The airport CDM is focused on the optimal use of available capacity and operational resources at the airport, thereby increasing the efficiency of each step in the process. In 2012, it carried nearly 400,000 movements, which on average is around 1,600 movements per day. One hundred and one carriers operate regular services from Munich to 242 destinations , a total of 22 domestic and 222 international in 68 countries.

5.3 Results

The results of 2012 are based on:

- Key performance indicators Airport CDM Munich,
 - monthly performance monitoring evaluations,
 - monthly report on Airport CDM Munich,

– measurements and evaluations by efficiency.

Traffic figures

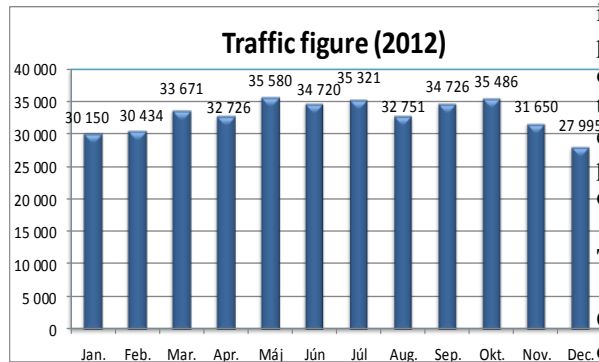


Fig.1 Traffic Figure (2012)

The total number of IFR aircraft movements at Munich Airport decreased by 2.98% in 2012. Airlines have reduced the number of flights, especially in off-peak hours.

Waiting time on runway

Again, there has been an improvement in the year under review compared with the previous year. August saw an absolute peak value with 2 minutes and 10 seconds, but it has to be kept in mind that the traffic volume and the negative external effects on operations were less significant during the review period than during the previous year.

Impact of arrival delays on departure delays

For this indicator, there has, again, been an improvement in the year under review compared with the previous year. Percent of delays decreased by 1.68% over the previous year 2011. This result is even more remarkable considering that poor weather conditions such as thunderstorms and snows requiring aircraft de-icing prevailed more than on average and strongly affected operations.

Target Start Approval Time accuracy

Although the average overall outcome of this indicator over the last three years is the most favorable but is not in any way satisfactory. To improve this situation, it is necessary that all partners involved in airport traffic increased level of work in accordance with the procedures that the time between authorization to run the engine and exit the aircraft from the stands as short as possible and in the case of the largest percentage of the aircraft.

Take Off Blocks Time accuracy

Outcome of the evaluation period in 2012 is about one percent lower than in 2011 and 2% compared to 2010.

Flight update message quality

Delay can be affected by many factors, due to mechanical repairs, the problems encountered prior to loading the luggage, adverse weather conditions and the like. Currently there is a delay due to factors associated airspace congestion problems and motion control aircraft on which it is more difficult to determine the actual time of arrival. Values at Munich Airport show that regardless of the duration and all pre-flight operations within a span of 20 to 180 minutes before landing, the values correspond to actual landing time, with a maximum deviation of +14 / - 8 minutes.

Air Traffic Flow Management delay development

The results show that, since the introduction of data exchange with the NMOC, the ATFM delay for departures from the CDM Airport Munich has been shorter than for departures from airports without A-CDM. However, this difference decreased significantly during the past 3 years. This is mainly due to the fact that there are distinctly fewer restrictions in European airspace because of the general decrease in air traffic combined with a more efficient airspace utilisation.

6 CONCLUSION

On this basis, we can conclude that A - CDM is a system of cooperation airport operators, airlines, ground handling services, air traffic control, CFMU services and aeronautical information services focused mainly on addressing capacity constraints and efficiency improvements. The airport CDM is a culture that emphasizes the importance of cooperation in the planning and management of air traffic.

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