

# Chapter 7

## Analyzing Airport Capacity by Simulation: A Mexican Case Study

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### ABSTRACT

*Air transportation has grown in an unexpected way during last decades and is expected to increase even more in the next years. Traffic growth tendencies forecast an expansion in the demand and greater aviation connectivity, but also higher workload to the different airspace users, especially for airport and services. Therefore, it is essential to employ strategies designed to use efficiently valuable corporate resource. Airport authorities around the world are investing in large capital projects, including new or improved runways, terminal expansions, and entirely new airports. However, this effort is sometimes limited due to their geographic location. In this work, two main objectives are pursued: first, to highlight the importance of the industry by exposing the current situation and future trends all over the world focusing in the Mexican industry; and second, to introduce a simulation model which can be used as a decision making tool for the upcoming demand. The analysis of the scenarios illustrates how to develop strategies to cope with the different airspace user's needs.*

### INTRODUCTION

The air transportation industry plays an essential role for global business and tourism but also in the economic growth worldwide. It enables countries to participate in the global economy by increasing access to international markets and, at the same time, allowing globalization of production, among many other benefits. The air transportation industry is a team effort, each time an airplane is in the air, there

DOI: 10.4018/978-1-4666-9779-9.ch007

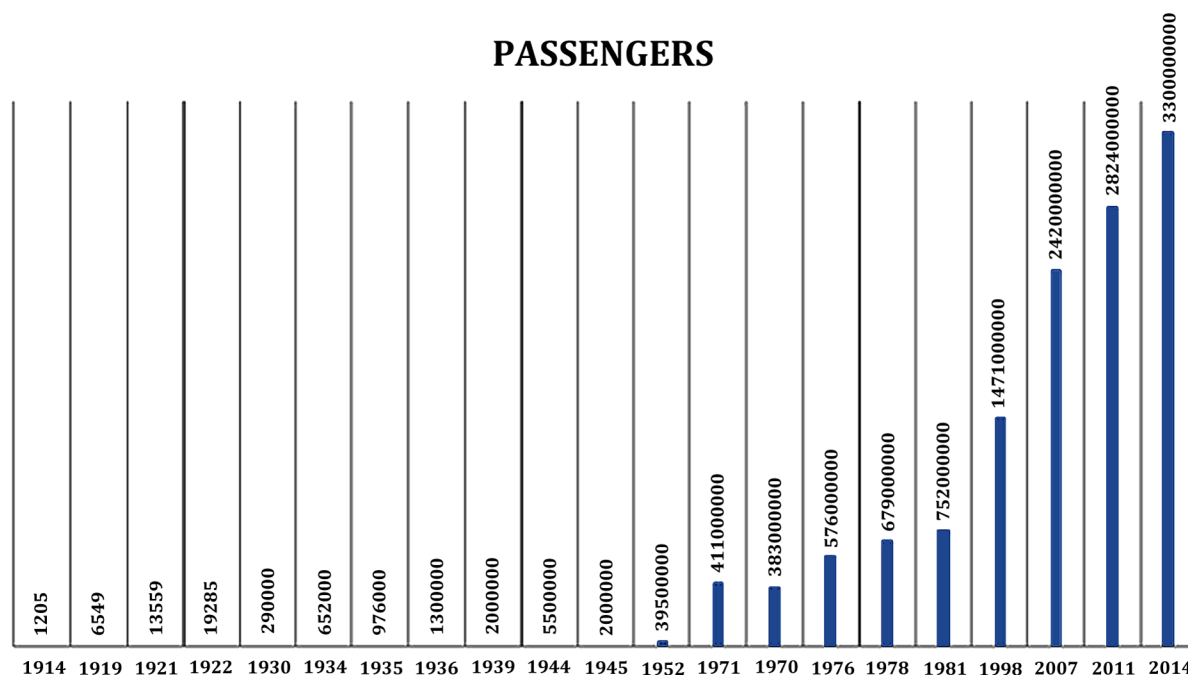
is needed a coordination and interaction across a complex chain of partners, from airports, airlines, air navigation service providers (ANSPs), fuel suppliers, ground handlers, systems providers, catering companies, travel agencies, security screeners, and many more.

The air transportation has grown in an unexpected way during last decades and is expected to increase even more in the next years. The industry is wide, and with an innovative and excellent increasing perspective. Investments, business operations and efficiency, around the world are encouraged by air connectivity. The industry is evolving with several organizational and technical restructuring created by the globalization itself, the constant growing economic environment, and the development of new technologies, among other factors.

The first commercial passenger flight took place on January 1st, 1914 with a single passenger on it. Since then, the industry has not stopped growing. Twenty years later, 652 000 passengers were transported on commercial flights, reaching almost 40 million in 1952. Nowadays, around 3.3 billion people are safely transported, see Figure 1. The year of 2014 was outstanding for the transportation industry; passenger traffic as measured by revenue passenger kilometers (RPK) was up nearly 6% than 2013, and capacity was up nearly 5.8%. Lower oil prices were one of the key factors for airlines profits; they accounted around 20 billion USD; but also 2014 was a record year for manufacturers such as Boeing and Airbus; over 1490 airplanes were delivered and 3680 were ordered by airlines. The air transportation business activity generated around 2.4 trillion USD.

In 2014, the air transportation industry generated around of 58 million jobs in the world; around 9 million direct jobs: airlines, air navigation service providers and airports directly employed 7.6 million people. The civil aerospace manufacture sector employed more than 1 million people. It has been

*Figure 1. Evolution of Passengers carried by airlines Source (IATA, 2014)*



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