King Abdulaziz International Airport: Meeting the Challenges of the 21st Century

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Abstract. King Abdulaziz International Airport (KAIA) is the busiest airport in the Kingdom in terms of passenger traffic. Since the first day of operation, the need for expansion became necessary due to the new circumstances that increased the volume of air traffic transportation. Many studies have been done to accomplish this goal but none have been implemented. Therefore, the capacity problem persists and is becoming worse day by day. As a result, the need to do a new major development has become unavoidable. The issue is not just quantitative, but also requires qualitative improvements as well.

Our aim in this thesis is to provide the future vision of KAIA in the year 2020 A.D. in different aspects, such as operation, economy and environmental performance. KAIA is the gateway of the holy city Makkah Al Mukarramah, which is used by millions of Muslims every year around the world. Also, it is the Kingdom passage to more than one hundred destinations in the world.

KAIA is located in the northern side of Jeddah city. In 1981, it was about nineteen kilometers away from the populated area. Nowadays, it is surrounded by populated residential and light industry districts from all four sides.

The terminals Master plan of KAIA was completed in 1966 and its design concept was based on mobile lounges. Nowadays, this type of transportation has created an extra factor for deterioration of airport operations, it has also increased the passengers processing time, and it can not meet the demands of KAIA.

The landside components of KAIA are working at their full capacity and often over their designed capacity. Terminals are working at...
more than 110% of their capacity. Ground access is working at its full capacity and has become a major challenge for KAIA operations, although airside configurations are working below their capacities, the apron need an expansion especially for the hajj terminal aprons.

The economic performance of KAIA does not reach a satisfactory level in terms of its revenue and its benefit from each passenger. This is due to design or policy controversy. Most of the terminal amenities were inserted into the terminal design in the previous years; Saudia airlines is manipulating the airport service at no charges and affecting the airport potential opportunity for other airlines.

The security systems in KAIA are old and they need to be replaced with new systems that are capable of providing better aid for security personnel.

KAIA has different impacts; some of them are positive and some are negative. They are classified into environmental, economic and social impacts. The most significant ones are the noise impact in the KAIA environs and the economic impacts of KAIA at the local and regional levels. Several new investigations were conducted during this study to fully understand the true impacts of the airport, these were:
1. Preliminary noise study
2. Preliminary land value study
3. Preliminary traffic movement study

KAIA is a unique airport, it is expected to enjoy an increase in traffic volume of passenger and cargo in the coming years, it is expected that the traffic will be up to 23 million passengers per year, in 2020. And has a significant role to the kingdom and the Islamic world due to its location near the holy city of Makkah Al-Mukarramah. Despite its importance, the quality of airport services is inadequate.

KAIA development programs must consider different concepts rather than one concept in developing it as a transportation center. Economy, entertainment and commercial aspects must be considered as well in the master plan. The world trend is toward airport privatization, which is a necessity because of the economic recession that most countries are facing, including Saudi Arabia.

The developers of KAIA should consider new large aircraft (Those with wing spans more than 65 meters), which are estimated to enter service in 2006. This requires modifications to both the airside and landside components to accommodate those aircraft. This is especially important during hajj season when the large aircraft become very useful due to their remarkable capacity. Major developments are recommended to be implemented as soon as possible. These include improvement in terminal building, airport ground access and aircraft aprons.