

RUNWAYS CONDITIONS IN AFGHANISTAN AIRPORTS

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1. INTRODUCTION

Afghanistan is a landlocked country which around 32 million people are lived in, and there is no major river system that could be used as a cheaper transportation alternative therefore air-transportation is one of the fundamental sectors for the economy of Afghanistan because Afghanistan has one of the longest distances to a seaport, more than 2,000 km, over harsh terrain. Huge portions of Afghan's inhabitants remain physically cut-off with over 80% of the population living in rural areas so it has to solve its transportation needs by means of air and land alone. Furthermore, what meager means of transportation that did exist in Afghanistan were either completely destroyed or rendered useless by decades of war and internal conflict. This issue can discourages international air carriers from identifying Afghanistan as a destination of choice.

Following the civil wars and the involvement of the international community in Afghanistan, the country has sought to become self-sufficient and address its transportation needs as means of poverty eradication and economic development. The restoration of an efficient transport sector is essential to strengthen the unity of the country and promote economic recovery and development, therefore investigating about runways in Afghanistan is an important issues for air-transportation development and this research reveals the result of field inspection visit which were done on four runways (Kabul, Mazari Sharif, Kunduz and Faizabad airports) out of 41 active airports which exist in Afghanistan.



Fig 1. Location of Afghanistan in the World
<http://www.mapsnworld.com/afghanistan/index.html>

2. LOCATIONS OF AIRPORTS

Figure 2 shows the location of airports in Afghanistan. Although, Afghanistan has 62 airports but the operations can be implemented only 41 of them and the rest 20 airports were destroyed or become useless during the civil war and natural disasters. From the 41 active airports; five of them are military based airports that are used by Afghan and International forces, five more are major domestic airports. There are ten regional domestic airports, which short runways are not able for landing heavy aircrafts, but the runways are long enough for medium aircrafts and the last 17 airports are small local airports that are adequate for small aircrafts (carries less than 18 passengers).

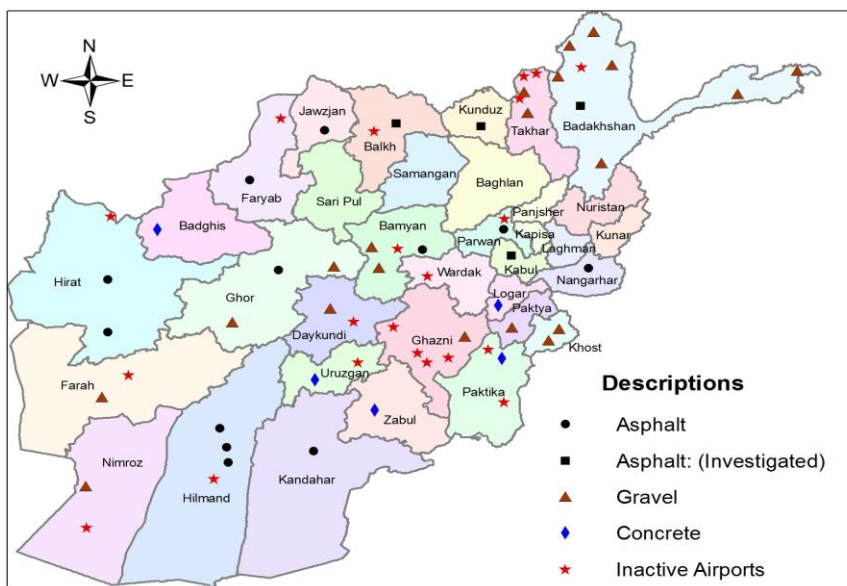


Fig 2. Location of Airports

Keywords: Rule of Air-transportation in Afghanistan, Runways Conditions, Challenges

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The challenges of black square runways in Fig.2 which have been inspected in this research, their deficiencies are discussed in Chapter 4.

3.CONDITIONS OF RUNWAYS

Runway, Taxiway and Apron are the important infrastructures of an airport which play the main rule in air-transportation sector therefore the pavements, marking and lighting of these structures should be equal with internationally set standards such as International Civil Aviation Organization (ICAO), International Air-Transportation Association (IATA), Federal American Association of State Highway and Transportation (AASHTO) and other internationally set standards till can provide a safe and secure air-transportation facilities in Table 1. The Table below shows the dimensions and pavements conditions of the runways.

Table 1. Runways Dimensions

Airports in Afghanistan						Airports in Afghanistan					
NO	International Airports	Province	ICAO	Runway Dimensions (m)	Pavement Conditions	NO	Regional Domestic Airports	Province	ICAO	Runway Dimensions (m)	Pavement Conditions
1	Kabul	Kabul	OAKB	3500x60	Asphalt	1	Chakhcharan	Ghor	OACC	2001x30	Asphalt
2	Kandahar	Kandahar	OAKN	3200x55	Asphalt	2	Feizabad	Badakshan	OAFZ	1844x33.5	Asphalt
3	Herat	Herat	OAHR	3014x45	Asphalt	3	Maimana	Faryab	OAMN	3000x30	Asphalt
4	Mawlana Jalalodin Balkhi	Mazari sharif	OAMS	3200x45	Asphalt	4	Qala-l-Naw	Badghis	O AQN	1981x25	Concrete
Military Airports						5	Farah	Farah	OAFR	1833x33.5	Gravel
1	Bagram	Parwan	OAIX	3602.4x45.7	Asphalt	6	Tereen Kot	Uruzgan	OATN	2225x27.5	Concrete
2	Shindand	Herat	OASD	2417x28	Asphalt	7	Khost/Chapman	Khost	OAKS	1859x27	Gravel
3	Bastion	Helmand	OAZI	3500x46	Asphalt	8	Bost	Helmand	OABT	2000x30.5	Asphalt
4	Dwyer	Helmand	OADY	2439x36	Asphalt	9	Gardez	Paktiya	OAGZ	1960 x30	Gravel
5	Shank	Logar	OASH	2093x27.5	Concrete	10	Sheberghan	Jawzjan	OASG	2500x22	Asphalt
Major Domestic Airports						Inactive Airports					
1	Bamyan	Bamyan	OABN	2200x23	Asphalt	1	Oruzgan	Uruzgan			
2	Jalalabad	Nangarhar	OAJL	1975x27.5	Asphalt	2	Qara Tapa	Takhar			
3	Kunduz	Kunduz	OAUZ	1996x45	Asphalt	3	Khvej ghar North	Takhar			
4	Ghazni	Ghazni	OAGN	2200x45	Gravel	4	Khvej ghar South	Takhar			
5	Zaranj	Nimroz	OAZJ	2500x60	Gravel	5	Besud	Wardak	OABS	700x30	
Small Local Airports						6	Andkhoi	Faryab	OAAK		
1	Qalat	Zabul	OAQA	1500x35	Concrete	7	Sherber Too	Bamyan		2000x60	
2	Salerno	Khost	OASL	1219x27	Gravel	8	Sharestan	Daikondi	OAST	500x20	
3	Sharana	Paktika	OASA	1300x19	Concrete	9	Yangi Qala	Badakshan	OAYQ	610x35	
4	Rustaq	Takhar	OART	2100x25	Gravel	10	Helmand	Nimroz			
5	Taluqan	Takhar	OATQ	1500x35	Gravel	11	Tepa	Farah			
6	Darwaz	Badakshan	OADZ	654x32	Gravel	12	Ajrestan	Ghazni			
7	Sheghnan	Badakshan	OASN	750x30	Gravel	13	Jaghori	Ghazni	OAJG	800x30	
8	Khwahan	Badakshan	OAHN	1000x30	Gravel	14	Band e Sardeh Dam	Ghazni			
9	Kret	Badakshan	OAKR		Gravel	15	Charikar	Parwan			
10	Little Pamir	Badakshan	OALP		Gravel	16	Dostmohammad khan Kalay	Helmand			
11	Yawan	Badakshan	OAYW	600x30	Gravel	17	Dehdadi	Mazri sharif			
12	Razer	Badakshan	OARZ		Gravel	18	Mukur	Ghazni	OAMK	1265x35	
13	Yakawlang	Bamyan	OAYL	1800x30	Gravel	19	Toorghondi	Herat	OATQ		
14	Panjao	Bamyan	OAPJ	700x30	Gravel	20	Urgoon	Paktika	OAOG		
15	Lal	Ghor	OALL	700x30	Gravel	21	Sarhawdza	Paktika			
16	Nili	Daikondi	OANL	1400x35	Gravel						
17	Teh Warah	Ghor	OATW	582x44	Gravel						

4. CHALLENGES

The challenges which have been determined during the investigation on Kabul, Mazar e sharif, Kunduz and Faizabad airports, mostly cracking, subsidence and low compaction were specified on their runways and its shoulders. However the Taxiway and apron of Kabul International Airport has been built recently, but in one point of the apron about five centimeter was settled (Photo 1) and also some small cracks (Photo 2) have been occurred.

The major deficiencies were affected in Kunduz Airport. Subsidence (Photo. 4), surface fatigue (Photo 5) and low compaction have been occurred along the runway which was looked wavelike, and due to low compaction, some plants

had grew up on both sides of the shoulder (Photo 3). Cracking has occurred only in some part of the apron.

In the runway of Faizabad Airports, almost all part of the runway has cracked even some parts were repaving by asphalt (Photo 7,8,9) And in the runway of Mazari Sharif Airport, only a thin cracking in the shoulder were considered. The following photos disclose the failures of investigated airports.



Photo 1. Subsidence of Apron in Kabul International Airport



Photo 2. Cracking of Apron in Kabul International Airport



Photo 3. Low Compaction of Runway in Kunduz Airport



Photo 4. Subsidence of Runway in Kunduz Airport



Photo 5. Surface Fatigue of Runway in Kunduz Airport



Photo 6. Runway of Mazari Sharif Airport. (No Failure)



Photo 7, 8,9. Cracking of Runway in Faizabad Airport

The U.S. State Department performed an inspection of Kabul International Airport in June 2012 by Paul Friedman and Stephen Powell Advisors in FAA Section (Federal Aviation Administration). The inspection revealed that the airport is deficient in every major category of standards and recommended practices defined by the International Civil Aviation Organization (ICAO) in ICAO Annex 14, Volume 1, aerodromes. While there are several complex, institutional reasons for why some of the deficiencies exist, there are at the same time several actions that can be taken by the Government of the Islamic Republic of Afghanistan (GiROA) Ministry of Transportation and Civil Aviation (MoTCA) and the other airport operating entities that could help the airport not only meet standards, but significantly surpass them. A major deficiency affecting the areas of airport design, infrastructure, visual aids, and obstructions to air

navigation can be attributed to the irregular development of the airport over several generations of war and foreign occupation. The airport was never designed to handle the frequency of aircraft and helicopter operations or the different types of large, heavy aircraft currently operating at the facility 24 hours a day. Compounding this problem, and related to the previous issue of a lack of State authority to control airport design standards and procedures, whenever construction was performed to enhance the capability of the airport, the work was often of poor quality and the projects were not built to recognized international standards. Construction Quality Assurance / Quality Control (QA/QC).

A consolidated QA/QC construction process should be developed for the airport. MoTCA should also assign a staff person or arrange for a qualified individual or company to observe all construction activities to ensure that the provisions of the future QA/QC plan (and the terms for quality detailed in the construction contracts) are being met. Maintenance and repair plan should be developed to correct deficiencies such as: lips; holes; cracks/surface variations; and insufficient drainages. Moreover the markings and lightings should be modified during the next major runways rehabilitation projects.

5. CONCLUSION

Currently, Afghanistan has one of the worst air-transportation systems in the world, and a nascent, yet not fully functional, rail system. Among landlocked developing countries, Afghanistan has one of the longest distances to a seaport, more than 2,000 km, over harsh terrain. Therefore air-transportation has the priority for the government and people of Afghanistan.

Among 62 airports which exist in Afghanistan, only 41 of them are utilized by domestic and international airlines and the rest 20 airports have been completely destroyed or become useless during the internal conflicts and natural disasters. From the 41 active airports, field inspection visit were done on four runways which all of them were asphalted (Kabul, Mazari Sharif, Kunduz and Faiz Abad airports). Cracking, subsidence, surface fatigue and low compaction are the deficiencies which have determined as a result of this research. Lightings, markings, holes, surface variations, lips and insufficient drainages were recognized during the inspection of Kabul International Airport on 2012 by U.S. State Department as well.

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