

Traffic and Transportation in Kabul City – Proposed Solutions

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Abstract

Urban traffic and transport is a global problem, especially in developing countries where basic transport infrastructure is not sufficiently built. Kabul is the capital of a war-torn country, where transport is among the major problems for the lives of its inhabitants. Kabul is one of the world's fast-growing cities [1]. Central and Local agencies are not capable of meeting such a rapid increase. Traffic congestion affects not only the movement of the city's inhabitants, but also directly affects the health of the residents and causes environmental issues. One of the main causes of transport problem is the lack of public transport in the city. As a result, the number of passenger cars in the city is growing, intersections are not built multilevel, traffic regulations are not observed, land is used illegally ... The objective of this research paper is identification of the main problems, evaluation of the obtained data, proposing possible solutions that will help to reduce the current complications in Kabul transportation system.

Keywords: Traffic Jam, Street Sales, Public Transport, Speed Breakers, Road Blockade, Law Enforcement

Introduction

The traffic of the city is like the artery of a living being. Kabul is the capital of the Islamic Republic of Afghanistan. According to some sources, the population of Kabul city is considered approximately as 5 million people.

Based on researcher's investigation, it is the only capital city in the world that does not have basic urban services such as water and sewage systems, gas and heat distribution and, above all, public transport. The city lies in a mountainous area, where the main arteries must bypass high mountains [2]. There are no tunnels, multi-level junctions, smart traffic signaling systems and other facilities that can help manage the traffic in the city. Sidewalks are used by merchants who sell their goods before trade. Services such as carpenters, blacksmiths, and craftsmen also work on roads and sidewalks. There are no traffic lanes for fast and slow transport. The transport of residents is ensured only by the individuals who operate small and medium-sized vehicles as a taxi service. Due to the lack of bus stops and taxi stands, the drivers halt their vehicles at no parking spots which cause more congestion. The traffic police do not penalize traffic offenses. Armed forces, VIPs, international organizations, governmental buildings block many streets and roads. On the roads, everybody builds speed breakers wherever they wish to and nobody regulates it. Street vendors sell goods in the middle of the road. The transport mix must be as diverse as the city's various activities. For example, if Kabul has 5 million inhabitants (the exact statistics are not available) [3], generally - it is common practice that, the average Afghan family counts as 7.5 people, and then a total of about 660,000 families will currently live in Kabul. If out of these 7.5 family members, only four people will travel for work, shopping and other trips, 2.6 million people travel daily in Kabul. On the other hand, more than one million vehicles [4] are operating in Kabul. The goods are brought from the suburbs to the downtown areas of the city, also known as "Mandawi" area and from there; it's distributed to other adjoining parts of the city on daily bases. This transportation takes places via large and small trucks and cars. Based on the researcher's personal experience (he has been living in Kabul for 18 years and commuting by car every day). He can say that the current situation is at the level of national crisis and strongly disrupts the lives of the inhabitants, even threatening the lives of the inhabitants of the city. Getting into hospitals, work or schools becomes critical and in some cases impossible.

1.2 Challenges and Problems

The concentration of major urban activities such as Government buildings, market places, public authorities, schools and even hospitals in a congested area in the central part of the city is another factor in worsening of the city's traffic situation. Natural barrier – mountain ridge, overloaded junctions, and security measures - closed roads. Misuse of land (abuse) contributes to the above-mentioned problem, such as obstacles, street sales.

Lack of parking spaces in the city, non-compliance with traffic regulations, lack of city traffic lights, narrow roads in some places, absence of multi-level junctions, non-professional drivers and passengers, weak power of the law, lack of awareness and responsibility of citizens and many other factors are contributing in increasing traffic problems in the city.

Absence of transport plans, absence of urban transport planning expertise, poor coordination of all state authorities (Kabul City Council, Kabul Traffic Police Office, Ministries and other related governmental authorities).

Pollution due to low quality cars incl. taxis and private buses low capacity of rolling stock, low comfort of bus transport (overcrowded, slow), deregulated operations with state + private players, Unorganized city stations (stops/stations do not exist), less priority of public transport in the traffic flow, poor conditions for maintenance, cleaning, parking, bad roads and fuel, effort of the state focused to the operation which can be easily privatized, weak planning capacities and many more.

To conclude, all these factors have gained momentum and have brought traffic jams to the city. This in term of impact, the researcher considers as a strong blow to the city's economy and because it is a state metropolis, it has a nationwide impact on economy. This situation strongly infects the environment and creates psychological pressures on drivers, pedestrians and citizens as a whole.

The results of the studies show that the problem of not solving and lax approach of the police against the culprits is due to corruption. There are more than 200 [8] police checkpoints in Kabul where they are bribed by drivers. There are many daily traffic police patrols that also demand money in their pockets and thus allow offenses

In view of the above-mentioned problems, it is necessary to undertake an extensive study in this area and propose effective solutions.

1.3 Aim of The Study and Methodology

This research work was conducted on the basis of collected information from the field work in Kabul city, in collaboration with the Ministry of Urban Development and Housing, Urban Research and Training Center (URTC), Kabul Traffic Police Department and students of faculty of Engineering in Bakhtar University, with the assistance through literature review in the field of urban transportation and urban environment.

1.4 Research Objectives

- To describe the current state of traffic in Kabul,
- To find problem transport nodes
- To investigate and identify negative impacts on human life,
- To suggest possible ways to solve existing problems.

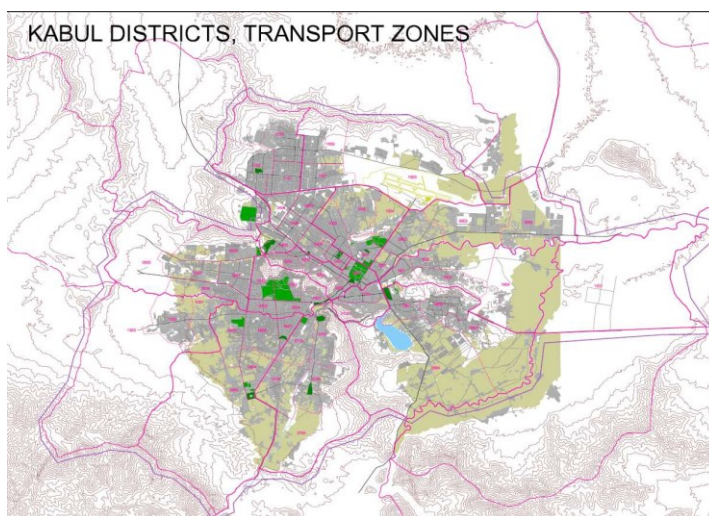
1.5 Main Tasks

- a) Analyses:
 - i. Urban data
 - ii. Population and its distribution
 - iii. Attractions
- b) Traffic:
 - i. Relations
 - ii. Volumes
- c) Infrastructure
 - i. Road scheme
 - ii. Stops and terminals
- d) Public Transportation Organisation, law, economy
 - i. Millie buses
 - ii. Private buses
- i) Minivans
 - i. Taxi
 - ii. Rickshaws

1.6 Preparation Phase

- Primary and secondary data collection,
- Evaluation of collected data - graphically,

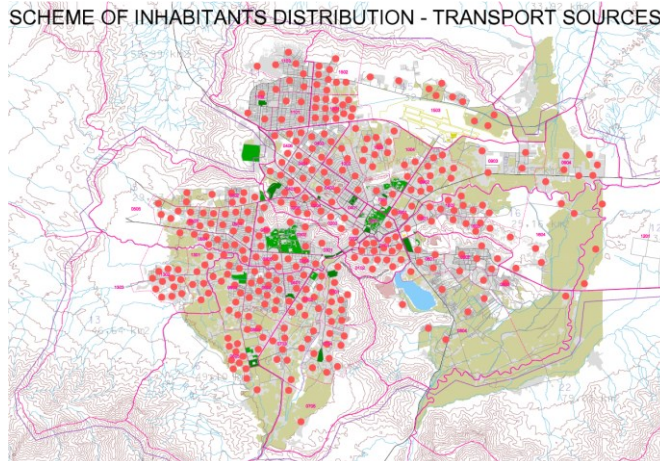
Figure 1: Kabul Districts Transport Zones (15 Districts, 59 Zones [5])



Source: Ministry of Transportation of Afghanistan, (2007).

Figure 2: Inhabitants → Trip Origins [5]

- 1999 - 1,8 mil.
- 2003 - 2,8 mil.
- 2007 - 3,6 mil.
- 2018 – above 5 mil.

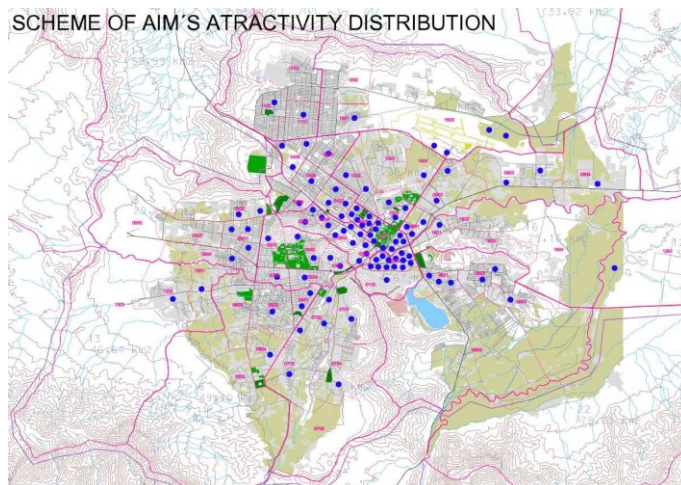


Source: Ministry of Transportation of Afghanistan, (2007).

Figure 3: Working, Shopping → Trip Destinations [5]

58 400 Public Transportation Trips to the centre - morning peak hour.

- Northeast: Microrayoni - 9 500 trips
- East: Qala-i-Zaman Khan - 4 500 trips
- Southeast: Kart-i-Naw&Bini Hisar - 4 500 trips
- Southwest: Dashti Barchi&Kart-i-She - 20 700 trips
- Northwest: Khayr Khana&Taymani - 19 200 trips



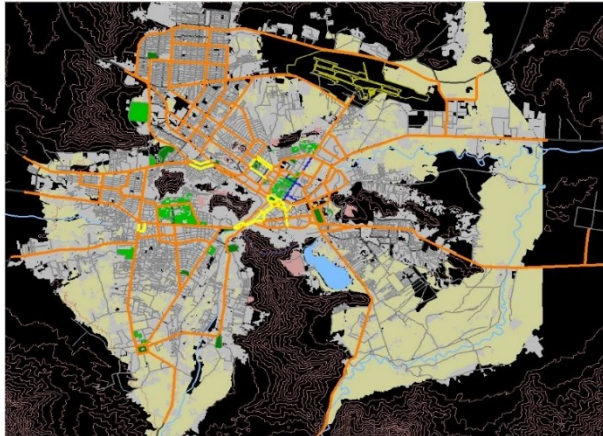
Source: Ministry of Transportation of Afghanistan, (2007).

Figure 4: 58 400 Public Transportation Trips To The Center - Morning Peak Hour, Total Peak Trips (Including Centre): 65 000 → 730 Bus Rides [5]



Source: Ministry of Transportation of Afghanistan, (2007).

Figure 5: Road Scheme of Kabul - Missing roads, City Circle, Tunnel TV hill, Security closures [5]



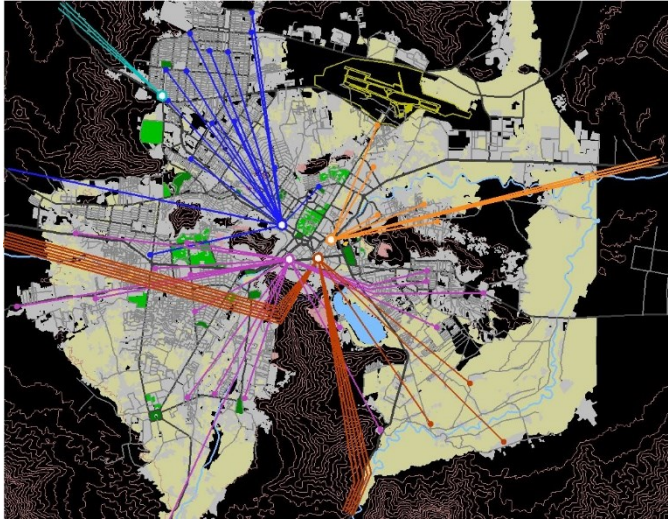
Source: Ministry of Transportation of Afghanistan, (2007).

Figure 6: Kabul Center [5] - A Permanent Clogged Area in The Central Part of the City



Source: Ministry of Transportation of Afghanistan, (2007).

Figure 7: The Main Platform in The City Center and Destination Outside the Center - Millie Bus + Private Buses [5]



Source: Ministry of Transportation of Afghanistan, (2007).

Figure 8: A Common Image of a Kabul Road When There Is Not So Much Traffic Jam [6]



Source: Ministry of Transportation of Afghanistan, (2007).

1.7 Fieldwork

In order to plan urban transport in the center of Kabul city, the first step in the preliminary stage was to conduct a traffic survey. With the help of forty engineering student's department of City Traffic Department of Kabul and Ministry of Urban Development and Housing of Afghanistan, Urban Research and Training Center (URTC), on March 12, 2016, during rush (peak) hours (from 7:30 to 9:00 and 3:30 to 16:30) measurements were taken. At first, all the purposes, exploration techniques, and how to fill the tables (forms) were briefly explained to the students and the traffic police.

The survey was conducted in a direct manner on road sections within a radius of (5.0 km) of the center and on the main traffic junctions of the city.

Vehicles were divided into two groups, i.e:

Group – 1: Fast vehicles: two-wheelers, cars, trucks, buses and other vehicles.

Group – 2 - Slow means: "Karachi", bike, towing equipment and other slow means of transport.

For each of these vehicles, based on the volume category, a specified coefficient for the transfer of traffic volume to a passenger car unit (PCU) has been assigned, as shown in the table below. The coefficients considered for PCU are:

Table 1: The Coefficients Considered for PCU

| | |
|-------------------------------------------|-----|
| Fast vehicles: | 1 |
| Trucks - Larry, Trailers: | 2 |
| Motorcycle, bike: | 0.5 |
| "Karachi" towing equipment using animals: | 1 |

Source: Author Compilation.

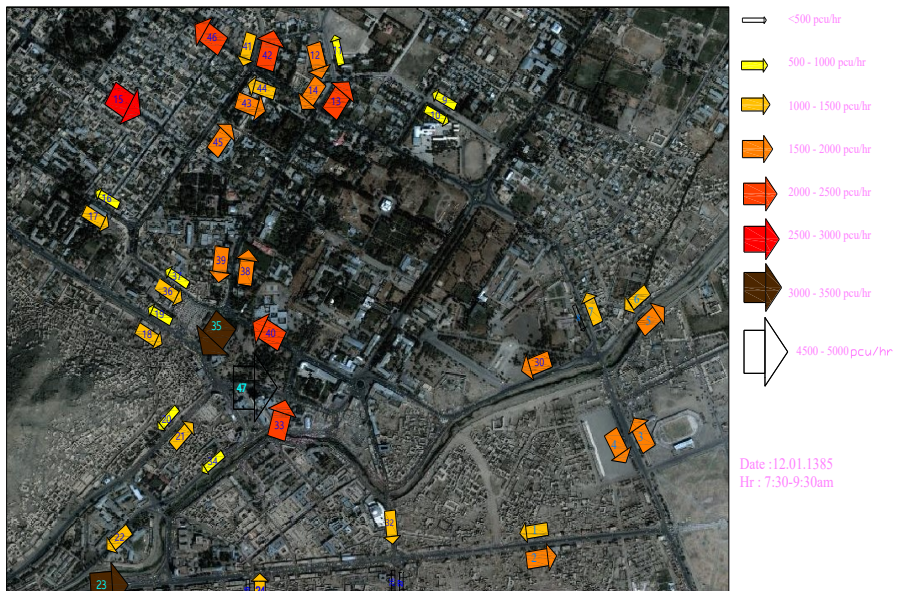
Figure 9: Traffic Volumes Survey in Central Kabul [5]

E. Kabul transportation in numbers:

Rapid increase in motor vehicles (2005: 341,000 motor vehicles, 2010: 1.2 million) [9]

Low mv ownership rates (120 mv/1000 persons) [9].

Low cost, but affordability issues (20Afs for taxi (USD 0.35); 10Afs for bus/coach /rickshaw, for 20-30-minute trip) [9].



Source: Ministry of Transportation of Afghanistan, (2007).

Table 2: Kabul Traffic Survey Form [5]

| Bakhtar University Faculty of Engineering Kabul Traffic Survey Form | | د باختر پوهنتون د سیول انجینیرۍ پوهنځی د ترافیکي حجم د سروی پاڼه | | Sheet number: Place of Survey Position in Crossing | | د پاڼې شمېره د سروی ساحه په څلور لاری کې موقعیت: | |
|-----------------------------------------------------------------------------------------|----------------|------------------------------------------------------------------------|-------|----------------------------------------------------------|--------|--------------------------------------------------------|--|
| Groups leader name | | د ګروپ د مسؤل نوم: | | | | | |
| Surveyer name | | د سروی کونکي نوم | | | | | |
| Date | | نیټه | | | | | |
| Climate | | د هوا حالات | | | | | |
| Hour | | د سروی کړی یا ساعت: | | | | | |
| شماره | موټر تیز رفتار | لاری | کراچی | موټر سایکل | پایسکل | | |
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| Total Vehicles: | | | | | | | |
| | *PCU factors | | | | | | |
| | Total | | | | | | |

* PCU: Passenger Car Unit.

Source: Ministry of Transportation of Afghanistan, (2007).

2 Conclusions after Data Analyzing

Based on these measurements and the analysis of available routes and major traffic hubs, we have graphically identified bottlenecks in the city.

Figure 10: Two Major Corridors for Traffic Around the Central TV Mountain of Kabul Circed in Blue [4].



Source: Ministry of Transportation of Afghanistan, (2007).

2.1 Proposed Solution to Kabul Traffic and Transportation

After analyzing and collecting measurements of the traffic volumes in central Kabul, it can be concluded that a bypass road should be designed around the central part of Kabul so that the central and remote traffic quickly move from the center without moving from one point to the other. It is needed to build multilevel junctions, to implement traffic regulations and to main the rule of law. Clean roads from dealers. Do not let pedestrians into the road and increase the culture of the inhabitants in the city. There are many solutions to address the current serious transport complications in Kabul. There is a comprehensive solution to this problem. Solving one problem in transport will not help; we should solve all problems as a complex [2]

In terms of Environmental issue, Kabul is the world's most polluted city, to many times exceed permitted limits for harmful gases, smoke, and drinking water [11], [12].

For more details, see below Metamorphosis (Metrix) [6] of obstacles, problems and solutions:

Table 3: Metamorphosis (Matrix) of Obstacles, Problems and Solutions in the Traffic and Transportation Sector of Kabul City Center [6]

| S/N | Problem and obstacles | How to solve the problem | Responsible organization | Comment |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|---------------------------------|---------------------------------------|
| 1 | Location of government buildings (Ministry of Justice, Central Bank, Ministry of Education, Ministry of Finance, Ministry of Telecommunications, Ministry of Culture, Ministry of Defense, ...) in the central part of the city | If these government buildings are relocated, this problem will be partially solved | Government | |
| ۲ | Concentration of major urban activities such | Relocation of these wholesalers (Mandawi) outside | Kabul Municipality, Ministry of | In some cases, Kabul Municipality has |

| | | | | |
|---|--------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| | as major "Mandawi", public authorities, schools and even hospitals in a small area in the central part of the city | the central part of the city - in the outer zone of the city | Public Health, Ministry of Education | already created these out-of-town wholesale stores on the outskirts of Kabul, but the old ones still work in the central part of the city |
| 3 | Land misuse (Land abuse) | Roads and sidewalks used by street vendors must be cleaned. Identify points of sale for these persons and give them urban culture training. | Kabul Municipality, Kabul traffic department, Ministry of interior. | |
| 4 | Lack of car parking areas and lack of rules for parking | <ul style="list-style-type: none"> • Multi-stage parking design • Road parking should be managed and paid for | Kabul Municipality | |
| 5 | Failure to comply with traffic regulations by drivers and pedestrians | Take the matter seriously by creating traffic jams from the traffic police | | Use of the mass media, radio and television and social media, in cooperation with Kabul traffic for public awareness |
| 6 | Absence of traffic signaling devices | Installing traffic lights as a single system in the city | Kabul Municipality, Kabul Traffic Department | |
| 7 | Roadblocks due to security issues etc. arbitrarily | This problem should be resolved in cooperation with the Kabul traffic department, Kabul Municipality and other relevant departments | Kabul traffic department, Kabul Municipality, Ministry of foreign affairs and other | |

| | | | |
|----|-----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| | | | relevant departments |
| 8 | Extra and unnecessary speed breakers | Sometimes runners or institutes have created arbitrary, non-technical roadside breakers that reduce speed. These breakers should be removed | It should be removed by the Kabul traffic dep. and the Kabul municipality |
| 9 | Lack of proper bus station | Regular bus stations around the city center to be created | Kabul Municipality |
| 10 | Lack of standard public transportation system in the city | Metro bus, Underground, Rail way, Tram, ... | Kabul Municipality, Ministry of transportation |

Source: Author Compilation

3 Conclusion

In this study, we confirmed that the traffic situation in Kabul is already unbearable. It requires an expedited and professional solution. The current situation is deteriorating day by day, both for the movement of the population and for human health; it is a source of harmful gas production and also damages the soil and drinking water in the city. The proposed solutions require a strong political will of the state and state institutions. The proposed solutions also require high costs, professional institutions and precise planning. Building standard public transport means (trains, metro, tram and other means of transportation), building multi-level junctions, establishing a rule of law are the cornerstones of success in this area.

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