Masters Program in Geospatial Technologies

SPATIAL ANALYSIS OF SUICIDE ATTACK INCIDENCES IN KABUL CITY

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SPATIAL ANALYSIS OF SUICIDE ATTACK INCIDENCES IN KABUL CITY

Dissertation

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Authors Declaration

I hereby declare that this Master thesis has been written independently by me, solely based on the specified literature and resources. All ideas that have been adopted directly or indirectly from other works are denoted appropriately. The thesis has not been submitted for any other examination purposes in its present or a similar form and was not yet published in any other way.

Signature :.....

Date and Place: 28 February 2011, Münster Germany

To

my uncle

Mohammad Monjurul Haque

and

my daughter
Ridhwaana Al Mahjabeen

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First of all I would like to give all credits to almighty Allah (The GOD) for allowing me to write this paper by saving from the suicide attack that occurred on 13th March 2008 at 8.05am, near Kabul Airport, only 15meter away from my car and just 30secounds after passing that incident point. The incident wonders me always to think why I was 30 seconds ahead of the time of that incident? I wish we could scientifically prove "*there is a special purpose of every event on earth and that happens at a particular place on a particular time – in a 4 dimensional time-space*".

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ABSTRACT

In the last two decades, suicide bombings became quite common among some communities in Iraq, Afghanistan, Pakistan, India, USA, and a few African and European countries. The modeling of reported suicide bombings has been the subject of a few studies, but the pattern of incidents turned out to be difficult to assess. Nevertheless, to uncover the bombing patterns in past incident locations is of major importance because it can improve social security and save human lives. The Capital city of Afghanistan, Kabul, has experienced on average around one suicide attack in every month since 2001. The overall objective of this study is to characterize the spatial and temporal patterns of suicide attacks in Kabul City.

This research primarily used last 5 years descriptive spatial information on suicide attacks in Kabul that brought to public by some local and international news paper to generate geographic point data. Suicide attack location points and potential target group establishment point's data analyzed separately to explore inherent spatial point pattern in terms of intensity and interaction. Finally it analyzed spatial tendency between suicide attack location points on target group establishment locations.

It has been explored that both suicide attack locations that occurred from year 2006 to 2010 within the urban habitat of Kabul and target group's establishment locations are characterized by inhomogeneous intensity and clustered interaction pattern at 98% level of significance. Moreover, there is a tendency of choosing location for suicide attacks close to target group's establishment location. Finally some interesting temporal characteristics of suicide attack incidences also presented in this study.

KEYWORDS

GIS Applications

Spatial Analysis

Spatial Point Pattern

Multitype Point Pattern

Spatial Reasoning

Suicide Attack

Suicide Improvised Explosive Device

Temporal Pattern

ACRONYMS

AIMS – Afghanistan Information Management Services

ANA – Afghan National Army

ANP – Afghan National Police

ANSF – Afghan National Security Forces

ANSO – Afghan NGO Safety Office

BBIED – (Suicide) Body Borne Improvised Explosive Device

CP – Checkpoint

HQ – Headquarter

IFGI – Institute for Geoinformatics

IM (F) – International Military (Force)

INGO – International Non-government organization

INKI – Insurgents Killed by the Incident

INWI – Insurgents Wounded by the Incident

ISAF – International Security Assistance Force

ISEGI – Instituto Superior de Estatística e Gestão de Informação

OPKI – Other People killed by the Incident

OPWI – Other People Wounded by the Incident

PBIED – Person Born Improvised Explosive Device

R – Software R

SALP – Suicide Attack Location Point

SPATSTAT – An R Package for Analyzing Spatial Point Patterns

TGEP – Target Group Establishment Point

TPKI – Target People Killed by the Incident

TPWI – Target People Wounded by the Incident

UJI – Universitat Jaume I

VBIED – (Suicide) Vehicle Born Improvised Explosive Device

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CHAPTER 1: INTRODUCTION

1.1 Background and Motivation

A suicide attack is a pre-planned attempt from a suspicious person or group of people intended to kill others (specific target) sacrificing the attacker's own life. Example of suicide attack attempts can be traced from more than 2000 years back in the history and some were treated as brave attempts of a great fighter, while he knew that he might die if he took the risk of war or attacking others, who might be stronger than him. Still there are debates in favour of or against this cruel activity. But practically this is always a brutal threat to all mankind, which kills or severely injures many innocent people and children from the surroundings of the indecent.

Suicide bombings are rare yet extremely destructive events and responses to such events are even rarer, because they require forecasting methods for effective prevention and early detection (Brown et al. 2004). In the last two decades, this violent tactic became quite common among some communities in Iraq, Afghanistan, Pakistan, India, Sri Lanka, USA, and some African countries and even some European countries faced threat for terrorist showdown. Total 472 suicide attacks occurred in 22 countries of the world and killed more than 7000 people and wounded tens of thousands during the years 2000 – 2004 and around 80% of all suicide attacks occurred after September 11, 2001 since the year 1968 (Atran, 2006).

In recent years the suicide attacks are one of the most commonly reported terrorism tactics which are very difficult in understanding and modeling for predicting prevention. The tracking and prediction of the suicide attacks are often misled by voluntary death of the attacker, use of very simple and cheap explosives, social motivation/hypnotization and participation of minor people, especially sometimes women and children (Brown et al. 2004).

For a long time, many researchers have been trying to find out the pattern of suicide bombing throughout the world for improving social security and saving human lives using different statistical methods. However, very little success has been achieved on detecting potential suicide attacks prior to its incident with high accuracy due to many reasons. Crime has an inherent geographical property as it occurs at a particular place

(spatial location) and at a particular time (Chainey and Ratcliffe, 2005). Brown et. al. (2004) considered spatial choice analysis to uncover the bombing patterns in the past incident locations to develop an empirical prediction model for suicide attack in Israel.

Suicide attacks are conceived as most devastating activity which extremely terrifies the general people of any affected city of the world and probably affects mostly the children. Supports for suicide bombing are declining sharply probably because of people's education and experience regarding its extent of fatalities causing mostly to innocent people (**Figure 1**, **Figure 2** and **Figure 3**). A recent public survey revealed that the Muslims of Pakistan expressed the strongest rejection to this kind of violence - 87% treated such acts as "never justified" in the year 2009, where in year 2002, one-third of Pakistani said suicide bombing was often or sometimes justified in order to defend Islam and 43% said it was rarely or never justified (Horowitz, 2009).

Declining Support for Suicide Bombing

Often/ sometimes justified:	2002 %	2004 %	2005 %	2006 %	2007 %	2008 %	2009 %	*02-09 change*
Lebanon	74	--	39	--	34	32	38	-36
Jordan	43	--	57	29	23	25	12	-31
Pakistan	33	41	25	'4	9	5	5	-28
Indonesia	26	--	15	'0	10	11	13	-13
Turkey	13	15	14	'7	16	3	4	-9
Nigeria	47	--	--	46	42	32	43	-4
Palest ter.	--	--	--	--	70	--	68	--
Egypt	--	--	--	28	8	13	15	--
Israel	--	--	--	--	--	--	7	--

Asked of Muslims only.

Figure 1: Statistics of the declining support for suicide bombing

Source: Pew Global Attitudes Project, September 10, 2009

Global concern against suicide attacks and personal close observation as a survivor of such an incident in March 2008 motivated the author to do this research. It has been experienced that there are few security companies that collect/generate some security information, and access to such information is very expensive and may be limited to some foreign companies and upper-class people. But there are no warning systems for the general people.

Figure 2: A police bus, which was completely destroyed, 35 people killed and more than 30 people injured by a suicide attack in Kabul
Source: BBC News, 17.06.2007

Figure 3: People searching victims after a suicide attack struck the heavily guarded Wazir Akbar Khan neighborhood in Kabul.

Source: Pajhwok Afghan News, 15.12.2009

The derived knowledge from the incident spatial pattern analysis could be used to plan for physical and strategic security measures to protect highly endangered Kabul people. This may also influence general Kabul people to avoid most suicide attack occurrence locations (high risk zone) and specific time intervals for choosing their every day travel route throughout the city. The use of danger zone information in daily route choice may also decrease the traffic density near the hotspots what might be an aid in reducing the level of threat in those locations. Moreover during any suicide attack in Kabul, a GIS based real time network analysis could be used for efficient transport of the wounded to the nearest hospitals for saving their lives.

1.2 Objectives

Kabul, the capital of Afghanistan, has experienced on average more than one suicide attack in every month after fall of Taliban regime in 2001. The overall objective of this study is to focus on only spatial and temporal patterns analysis of suicide attacks in Kabul city from a viewpoint of geographical space. The study also intends to produce some sort of geospatial information as an aid to further modeling of suicide attack incidences in Kabul by emphasizing general people's safety concerns.

A number of specific objectives emerge from those general objectives:

- To determine the spatial point pattern of suicide attacks locations in Kabul city from January, 2006 to December, 2010.
- To determine the spatial point pattern of Government establishments, foreign embassies, military bases and major international offices which tend to be attraction of suicide attacks.
- To examine the spatial relationship between suicide attack locations and locations of target groups establishments within urban habitat of Kabul city.

1.3 Research Questions

Following research questions emerged from the objectives of the study:

- Is there any spatial dependence of suicide attack locations in Kabul city?
- Is there any spatial dependence of target group establishments in Kabul City?
- Is there any spatial relationship between suicide attack locations and target groups establishments?

1.4 Study Area

1.4.1 Location and Extent of Kabul City

The Kabul city is the capital and the largest city of Afghanistan. The centroid of Kabul is located at geographic coordinates of 34°31′ N, 69°11′ E (the World Factbook, 2010), where the municipal boundary has lied within a rectangle with geographic coordinate values of 68° 53' 57.7788" W, 69° 29' 3.0732" E, 34° 39' 20.6424" N and 34° 17' 40.1856"S. The average elevation of the city is about 1800m above the mean sea level (Afghan Network, 2010).

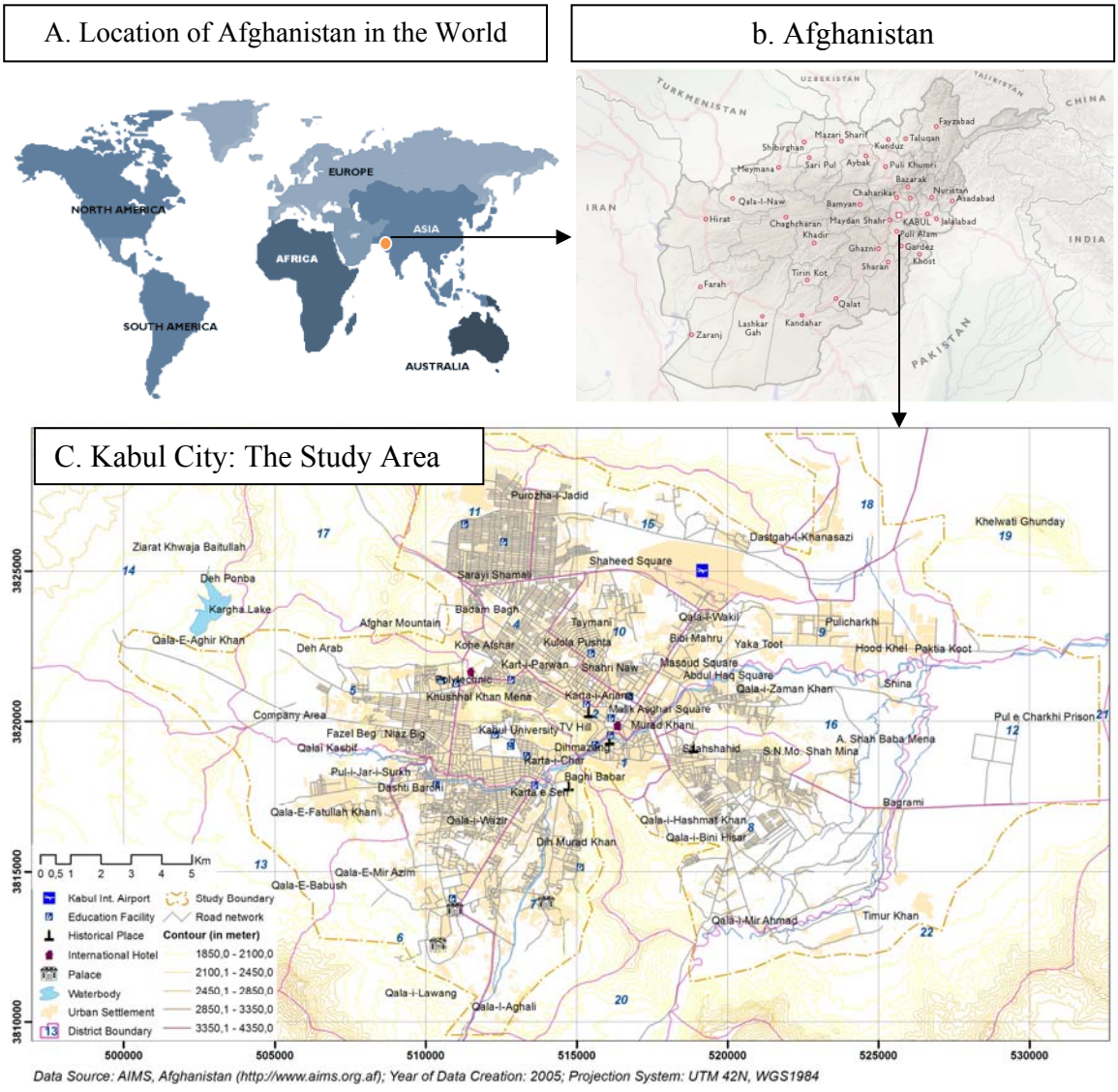

Figure 4: Location of the study area;

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Source:

a. http://www.twizi.com/images/world_map_blue.png
b. http://afghanistan.usaid.gov/en/Provinces.aspx

1.4.2 History and Importance

Kabul is over 3,500 years old settlement where many empires had long fought over the city for its strategic location as well as for its importance as the trade routes of South and Central Asia (Dupree and Kohzad, 1972). The past glory and beauty of this city has been portrayed in many historic scripts, songs and poems where the great Moghal emperor Zahirudeen Babur wished to be buried in Kabul within his immense kingdom. Apart from its importance as an economic, administrative and cultural centre in the current time, the close proximity to Khyber Pass which is an important mountainous pass as a gateway between Afghanistan and Pakistan (Afghan Network, 2010) and Salong-Pass which is a major gateway through Hindu Kush mountain range connecting northern region of Afghanistan added some extra importance to Kabul to be an international and regional business hub of Afghanistan.

1.4.3 Physical Environment

1.4.3.1 Topography

Kabul has a vibrant and extraordinary physical environment for its location at an elevation of 1800m from mean sea level (Afghan Network, 2010) and surrounded by high mountains which gives an impressive lotus view from aerials. The overall topography of the city is undulated and some small to large size hills existed within the city area. Only mentionable stream is Kabul River, flowing through the centre of the city from west towards east. A hilly range composed of Tiger hill, TV hill, Kartae Parwan hill etc. divided the city into north-eastern and south-western part (**Figure 5**).

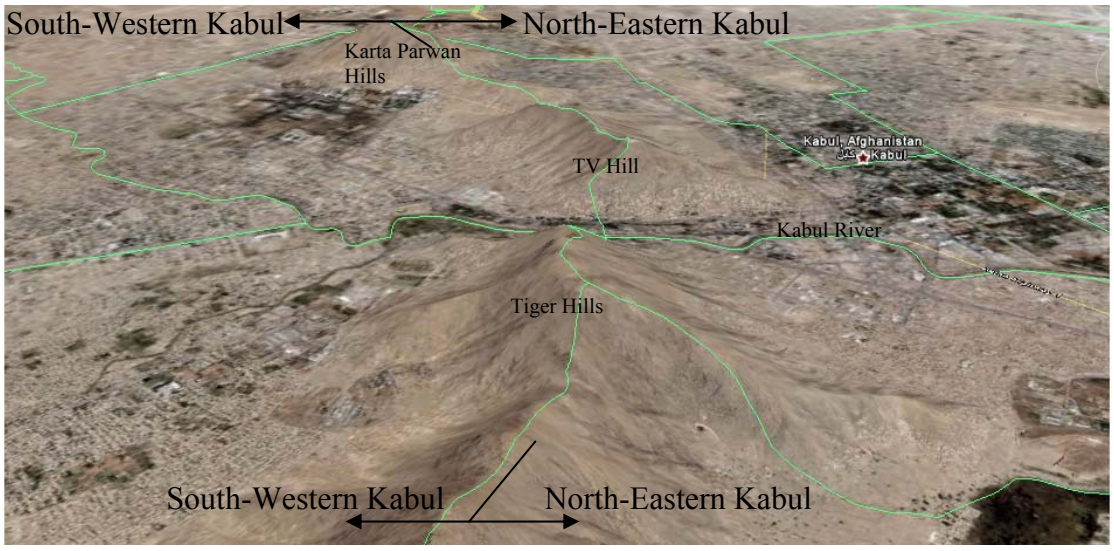


Figure 5: Aerial View of Kabul Topography

Source: Base Data: Google Earth, 15.02.2011

1.4.3.2 Meteorology

The climate of Kabul is semi-arid and strongly continental (Qazi, 2011a). On the basis of meteorological records between 1956 and 1983, Kabul experienced temperatures ranging from a mean monthly low of -7.10C in January to a mean monthly high of 32.10C in July (WMO, 2011). On the other hand most of the precipitation observed during winter season but the highest precipitation was in April as 71.9mm and other months remained comparatively drier. (See **Figure 6**).

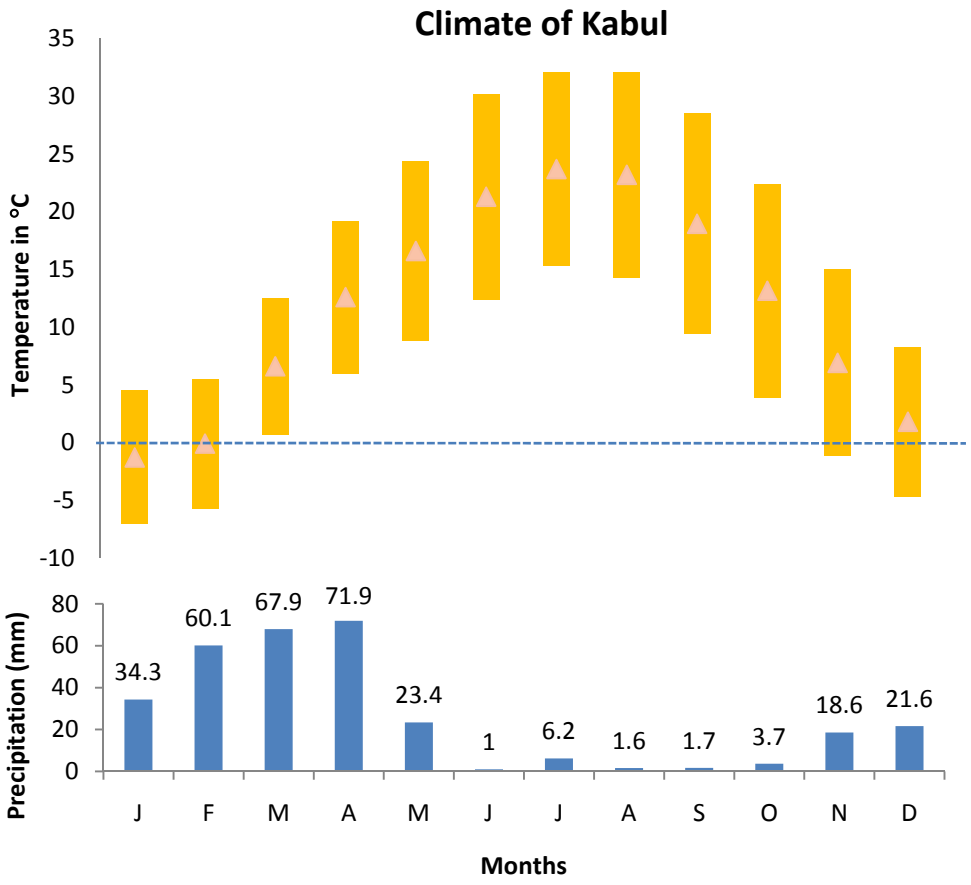


Figure 6: Mean monthly temperature (variation border) and precipitation in Kabul (period 1956-1983)

Source: WMO, 2011

Intensive snow fall are often observed during cold winter from December to February which can be a big factor to influence temporal pattern and strategy of suicide attack in Kabul.

1.4.3.3 Vegetation

A very few deciduous type vegetation is found in Kabul in recent time. The people of Kabul claim that the city was much greener before the civil war started in 1978. Long

time war effect and frequent explosions at current time, use of earthen roads, and extensive use of adulterated fuel to old (majority of more than 10 years) motorised vehicles converted the city to one of the most dangerous air polluted habitat of the world. The visibility declined to less than 100 meter in recent years from unlimited before 1980s (Sediqi, 2010). Due to high elevation, scarcity of water, continental weather and continual political unrest with frequent use of explosives can give very little hope to revive the optimum vegetation required at Kabul in near future.

1.4.4 Urban form and Land Use

The ambient rigid mountainous topography influenced significantly the Kabul city to be fitted in a semi circular shape. The present municipality of Kabul has area about 1030.5 square kilometers including some uninhabitable mountainous land. The city boundary is again subdivided into 22 police districts (AIMS, 2010). The size and shape of municipal/police districts varies extensively. The smallest district (District 1) consists of an area of only about 4.67 square kilometer and the largest district (District 20) consists of about 143.58 square kilometer area. According to Kabul Development Plan 2008-2023, the developed areas are contained within an area of 291 square kilometer. The city appears to be followed a traditional form of a mono centric (Single CBD) as well as concentric-radial pattern.

It has been revealed that only 35% of the urban settlements in Kabul are authorized or planned and rest 65% is either squatter, or built on grabbed land or built on privately owned land but without proper authentication of Kabul Municipality (Gebremedhin, 2005). The recent war that took place from 1978 – 2001 influenced a high rural-urban migration and mostly travelled towards the Capital and settled on freely available hill side stiff slope lands during a gap of proper management of city authority. This massive informal settlement without provisions of utility and proper access ultimately knock downed the urban service system, function and security.

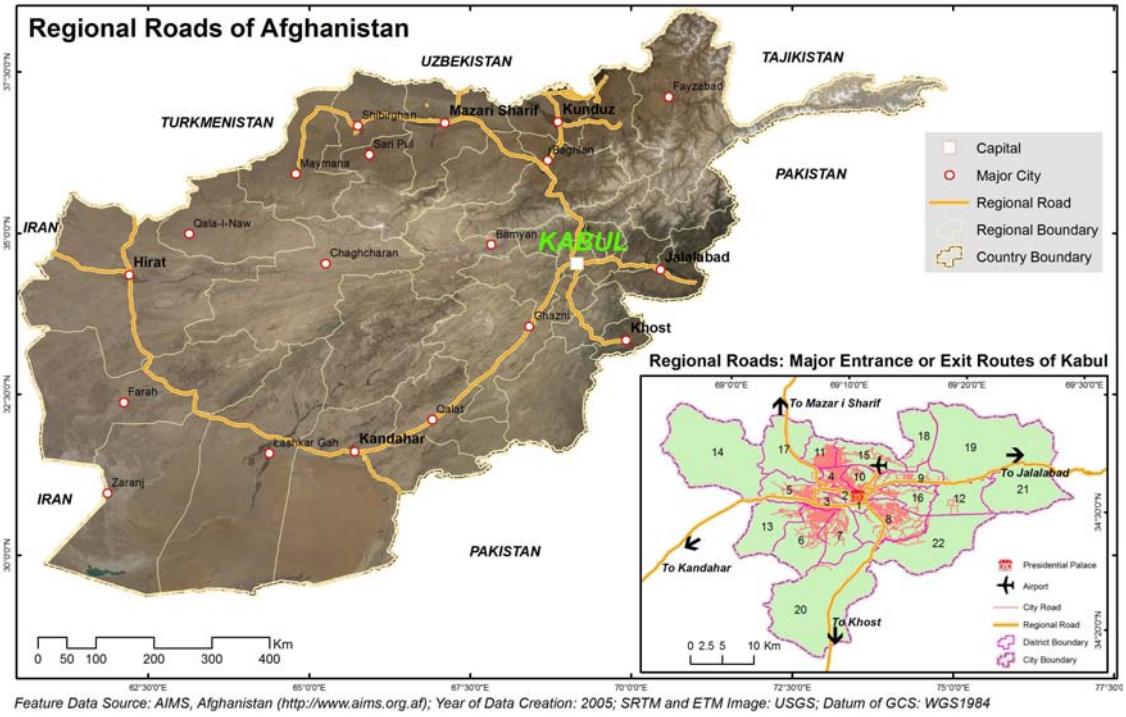
The current land use of Kabul city shows the administrative and commercial core (CBD) in located almost at the centroid urban settlement. The formal and high class residential areas are located in close proximity of the CBD. The informal residential areas are mostly occupied the surrounding hill and mountain slopes and low lands (See **Figure 7**). The Kabul international airport, national and international the military bases and compound of United Nations agencies are located little far and to the east of

the city centre. Most of the ministries and foreign embassies are located in a protected zone surrounding the Presidential Palace at the core of the city.

Figure 7: Informal housing at mountain slopes (Left side is TV Hill and Right side in Tiger Hill)

1.4.5 Transport network

The natural topography restricted the access from outside of the city to only four major entrances or doorways (ICOS, 2008). The first roads initially leading towards west connected Kandahar, the second largest city of Afghanistan, to the south, through Wardak province and continued to the far west to connect Herat City. The second road towards south connected with Logar and Khost provinces. The third road heading towards east connected Jalalabad, the largest city of the eastern Afghanistan in Nangarhar province and in further connected Pakistan through Khaibar Pass. The fourth road leading towards north which passes through the Salang tunnel and Panjshir valley, the major and cost-effective north-south transport route in Afghanistan, connected Mazar e Sharif City of Balkh Province as well as northern Afghanistan (See **Figure 8**).



Feature Data Source: AIMS, Afghanistan (http://www.aims.org.af); Year of Data Creation: 2005; SRTM and ETM Image: USGS; Datum of GCS: WGS1984

Figure 8: Four regional roads spread out from Kabul

1.4.6 Socio-economic Environment

Kabul has about 2.8 million people and most of them are Muslims (Statistical Yearbook, 2008/09). There are many ethnic groups with their unique culture and traditions where Tajik, Pashtoon, Hazara and Uzbek are most famous. In present days they are living quite peacefully showing honor to each other's tradition. Afghanistan has two official languages one is Dari which is very close to Persian and another is Pashto which is the mother tongue of Pashtoun people (Qazi, 2011b)

1.4.7 Present Conflict and Threat

Afghanistan has a long history of intense fighting between tribes, against invaders and between ideological groups. The country saw frequent dramatic takeover of the throne in last 30 years (http://www.afghan-web.com/history/chron/index4.html). Finally Mujahideen and its allies formed the government in 2002 after removing Taliban government. But the fight continued till now between Taliban militants and the government supported by international forces. Suicide attack has been seen as a major techniques adopted by displaces Taliban militants to effectively target the governmental and international strategic points and personnel. Tactically suicide

attack often takes place at public places as well as mass gathering place such as congested roads, markets/shopping complex, assembly, embassies, residential hotels, airports etc. and affects mostly the innocent civilians compared to their intended targets. All people of Kabul everyday goes out with no hope that he can come back after finishing their work at end of the day. This type of fear from death is affecting extensively the citizen's mental health, trust, social bondage, amenity, economy and development of the country. The International Council on Security and Development (ICOS) researched on the Taliban advance and depicted all international and civilian casualties and kidnappings that have taken place on the basis of publicly available records from January 2008 to November 2008 in Kabul with proportional symbol in **Figure 9** (ICOS, 2008). The map gives an idea of incident pattern comparative affected people of Kabul city though the research team did not mention corresponding numeric value of proportional explosion symbol used for civilian casualty in the map.

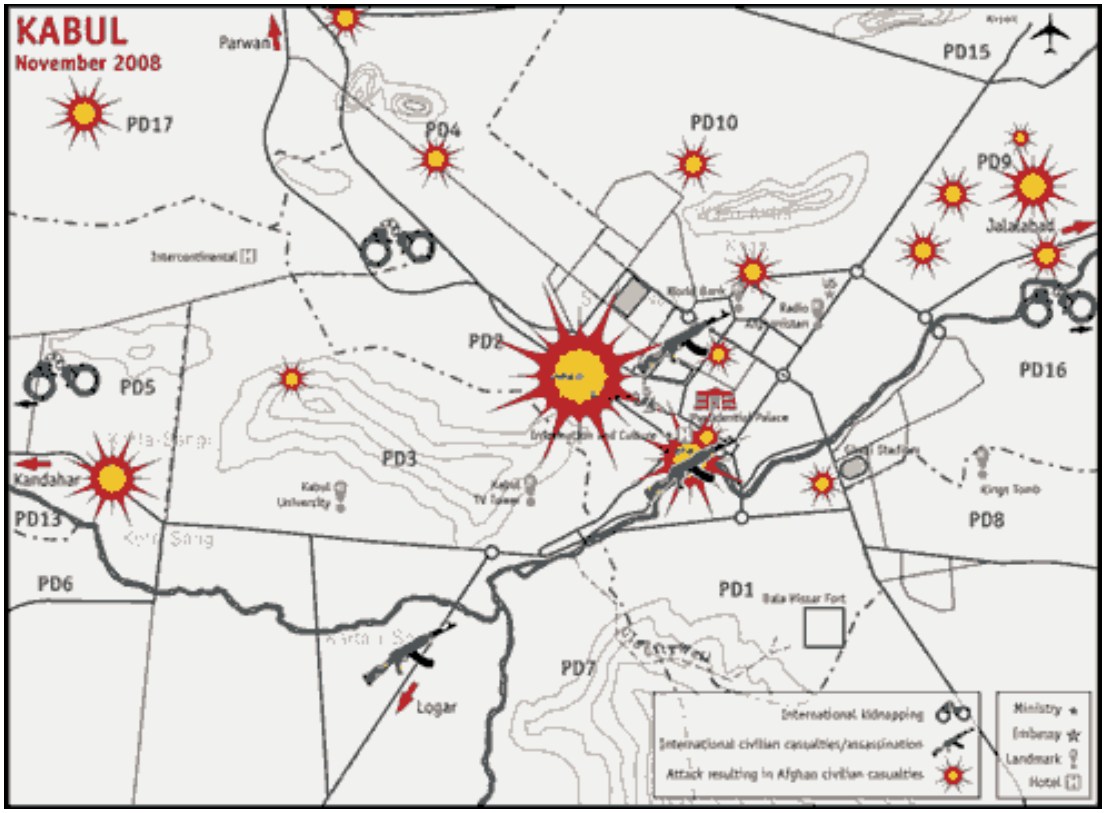


Figure 9: Civilian casualties and kidnappings from January to November 2008

Source: ICOS, 2008

1.4.8 Study Window

Kabul has been selected for the study due to frequent experience of major suicide attacks targeting different strategic important locations and availability of information in the web media. We have selected only 360.318 square kilometer area within a total 1030.5square kilometer municipal boundary. The study window/area covered mainly the settlement area (habitat) and excluded high mountainous-uninhabitable area considering the chances of suicide attacks occurrences. The study area boundary is shown in **Figure 4**.

1.5 Thesis Outline

The full content of this study has been arranged in five chapters. Chapter 1 covers the introduction to the study; chapter 2 elaborates the data used in this study. Chapter 3 sketches the methods of the study. All the analysis and finding are discussed in Chapter 4. Chapter 5 provides some concluding remarks and recommendation for further study. Beyond these all the commands and data spreadsheet are attached in the Annexes.

CHAPTER 2: DATA DESCRIPTION

2.1 Introduction

Variety of data that used in the research are derived from different sources. Most of the geographic data and location attributes of Kabul city and Afghanistan are collected from Afghanistan Information Management Services (AIMS). High resolution Aerial Photographs has been collected from Ministry of Urban development.

Suicide Attack data for the maps and analysis was gathered from few public insurgent activity reports throughout the course of January 2006 to December 2010. These are only publicly recorded attacks that were available in different local and international news papers and other relevant records; the real number of the suicide attacks might much higher as all incidents did not enter to the public domain.

2.2 The Base Map: Basic GIS Feature Classes

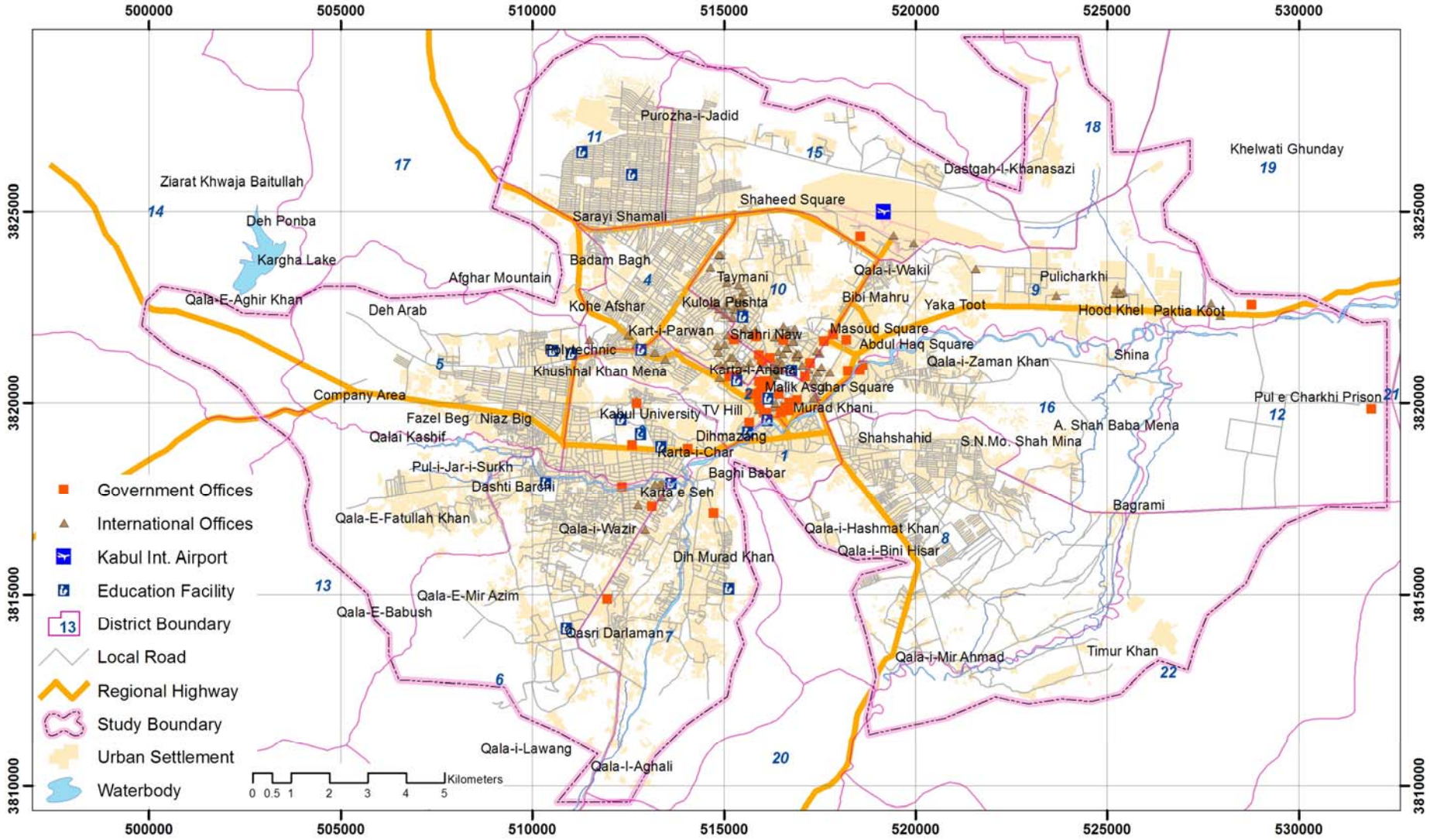
A number of basic GIS feature classes that depicted in all the figures were mainly downloaded from Afghanistan Information Management Services (AIMS) website database (AIMS, 2010). A list of GIS shapefile is given at **Table 1** that were used to Geocode suicide attack points based on visual proximity assessment from the reference locations.

Table 1: List of GIS Feature Data of the Study

Data	Data Type	Source and Creation Year
City Boundary and district Boundaries	Polygon Feature: 22 municipality district boundaries of Kabul city	ISAF, AIMS, 2005
Road Network	Line Feature: digitized on IKONOS satellite imagery (2000-2002) at 1:5,000 scale	AIMS, 2005
River Line	Line Feature: digitized on IKONOS satellite imagery	AIMS, 2005

	(2000-2002) at 1:5,000 scale	
Airport	Point Feature	Digitized on Aerial Photograph of year 2006
Area names, Landmarks, Road Intersection and Education Institutes	Point Feature: digitized on IKONOS satellite imagery (2000-2002) at 1:5,000 scale	AIMS, 2005
Government Buildings: Ministries, Departments, Supreme Court and Presidential Palace) of Afghanistan in Kabul city	Point Feature digitized on IKONOS satellite imagery (2000-2002) at 1:5,000 scale. The accuracy of data may vary up to 30meter from the original building.	AIMS, 2005
Location of International Organization Establishments: Diplomatic Missions, United Nations and International Organizations in Kabul city	Point Feature: collected with GPS and mapped at 1:5,000 scale	AIMS, 2005
Urban Settlement	Polygon Feature: part of Land use data created at 1:5,000 scale on IKONOS image of 200-2002	AIMS, 2005

Beyond the above list the study team also used Google earth, Wikimapia and Russian topographic maps for understanding and knowledge building on environmental setup of every part of Kabul City. Most of the geographic feature that described above is depicted in **Figure 10**.



Data Source: AIMS, Afghanistan (http://www.aims.org.af); Year of Data Creation: 2005; Projection System: UTM 42N, WGS1984

Figure 10: Location of Government and International Establishments within Study Area Extent of Kabul City

2.3 Suicide Attack Location Points (SALP)

In total 64 major suicide attack locations were depicted based on proximity from reference locations described in different security reports and news websites. The accuracy level of some of the suicide attack location points may vary up to ±500m from these locations.

2.3.1 Data Sources and Formats

It was the most challenging part of this research. Collection of suicide attack information was not easy at all. The study team approached to many security companies and national (Afghanistan) and international defense departments but did not receive any fruitful response to get GPS points (x, y format of geographic coordinate values) or any other accurate data of suicide attack locations that occurred in Kabul city from January 2006 to December 2010. After waiting for a considerable time for the response from the authentic data developer like Security Companies, UN, ISAF, MOI etc, the study team decided to carry on the research based on secondary public information published on different news papers and some daily security reports prepared by some private security company (confidential sources) for some NGOs and international companies working in Afghanistan.

News searching was carried out with some key words like: Suicide Attack, VBIED, BBIED, IED etc. different internet search engines. Few news website that generally publish news on Kabul were searched for daily news achieves from 1st January 2006 to 31st December 2010. When any news papers mentioned any suicide attack on a particular day then further web searches was carried out for that day to extract more information of that incident for detailed information and confirmation. Many cases the news from different sources on same incident was contentious and mismatching with each other's statement. News from local newspapers was given more priority than international news by considering scale of spatial information variation. Many news sources were considered for this study and followings are the main sources (but not limited to) of Suicide attack location information beyond limited number of confidential security reports.

The List of Suicide Attack news sources:

i. Pajhwok Afghan News: A Local News Website (URL: www.pajhwok.com)
ii. Tolo News: A Local News Website (URL: www.tolonews.com)

iii. The Afghanistan Ngo Safety Office (ANSO): an independent project to inform and advise humanitarian organizations on safety conditions across Afghanistan, established in 2002. (URL: http://www.afgnso.org)

iv. BBC News: An International News Website (URL: www.bbc.co.uk)

v. Voice of America: An International News Website (URL: www.voanews.com.)

vi. NYDailyNews: An International News Website (URL: www.nydailynews.com)

vii. World Military Forum: International Military News (URL: www.armybase.us)

viii. The guardian: An International News Website (URL: http://www.guardian.co.uk/)

Primarily we found 69 suicide attack information on the above mentioned sources with different level of location description. Most of these suicide attacks, that were affected large number of people and was successful to reach the target, came to the public news bulletin. Evidence found for many suicide attacks that miscarried in many reasons like, missing the aim as detonated before reaching the target, or detonated during preparation at night or on the way mistakenly pressed the button for test etc. which affected only the attacker did not come to the news or received any attention. Moreover, the number of casualty and wounded never matched between two consecutive sources for same incident. In most cases number of affected people was provided based on assumption with range value and very few cases a controversial statement came from the government body. So, it was very difficult to do any detailed and reliable analysis on number of affected people.

2.3.2 Data Categorization

The study team primarily categorized the incident reports that were available on the web on the basis of attack techniques used for each of the explosive attacks. There were many types of attack in Kabul during the study period. The study categorized all the attack reports (for an example see **Figure 11**) on the basis of attack techniques. Two major suicide attack technique, **B**ody **B**orne **I**mprovised **E**xplosive **D**evice technique uses suicide vest to attack generally static targets in a building or in the crowd which is well known as **BBIED** and Vehicle **B**orne **I**mprovised **E**xplosive **D**evice technique fills huge amount of explosives in a Car and used to chase or wait in the road to attack convoy of the target is well known as **VBIED**. There are different IED's based attack techniques that often confuse the reader by using different term in different reports. Especially many reporters write BBIED or VBIED as simple IED and create semantic problem for automatic categorization. So, the author carefully read all the reports and description of incidents for correct categorization of IED based attacks in Kabul. Finally the study considered only

suicide attacks that were caused by BBIED and VBIED and removed all other IED based attack techniques like Remoter control IED, Road Side IED, IEDs made with Grenades etc. In case of multiple suicides attack occurred at same time or very little time difference then two factors was used to categories them. In case of complex attack, if multiple suicide attack happened at same time or within a few minutes difference and at a same place or within a distance of 200meter then it was considered as a single attack. But if the attack happened in different location (distance >~500meter) at similar time then it was considered as separate attack.

2.3.3 Extraction of Spatial Information

The study team extracted spatial information of suicide attack location that described in natural language in different incident reports. We had gone through all the reports in detail and marked the relevant information that required for the study. An example of a suicide attack report that published in an Afghan local news website named Pajhwok Afghan News (www.pajhwok.com) on 27th November 2008 is shown in **Figure 11** where the relevant information required for the research are highlighted with yellow marks. The challenging part was to understand the name reference as many of them were in local aliases like in Dari or Pashto. Some location name was spelled differently in different news. Some were incomplete information and with incorrect reference location. We had compared information from different sources for authenticity and to extract complete information for correct geocoding.

Pajhwok Afghan News

Reflecting the Truth

SECURITY AND CRIME

Four civilians killed in Kabul suicide blast

by *Najib Khilwatgar* on 27 November, 2008 - 13:30

KABUL (PAN): A suicide bomb blew up near the US embassy in the capital Kabul Thursday, killing at least four people and wounding several more, police said.

Mohammad Ismail Kawsi, press information chief of public health ministry told Pajhwok Afghan News that one dead body and 15 injured have been brought to the hospitals in the city.

The blast occurred between Abdul Haq and Massoud squares about 40 meters (yards) from the heavily secured entrance of the US embassy in front of block No: 103 of Micro Ryan residential flats No: 3.

"The information we have so far is that four people have been killed and three wounded. It was a suicide attack," Alishah Paktiawal, Kabul crimes branch chief said.

An eyewitness Amir said the suicide bomber was trying to target a convoy of the foreign forces but failed to hit his target.

Abid Jan Razarwal

Figure 11: Suicide Attack news published in Pajhwok Afghan News on 27.11.2008

2.3.4 Suicide Attack Database

In many cases the spatial reference information in one news paper was not sufficient to depict the location point on map. In that cases the information was accumulated from different sources to geocode the location point quite accurately (see **Figure 12**). This method also benefited the study by evaluating authenticity of published news in different sources for better interpretation of spatial knowledge and reaching to a better decision.

The information displayed in **Figure 12** is self explanatory except few aliases that used to fit the title in the small space. The database fields were maintained some rules that are as follows:

- **Date:** The date of the incident
- **Time_Specific:** The time of incident when the suicide attack occurred

- **Time_Range:** many cases the incident report failed to state specific time and they use categorical time interval. In that case we add the linguistic value of time and interoperable option to convert it to specific average time or vice versa. The Morning- 6.00h to 9.00h, before noon - 9.01h to 12.00h, afternoon 12.1h to 15.00h, evening 15.01h to 18.00h night 18.00h to 6h on next day.
- **Province:** in which Province the suicide attack occurred. The attack must be occurred in Kabul province to enter in this database.
- **District:** in which district the incident occurred among the 22 police district of Kabul municipal boundary.
- **Area_Name:** name of the Area or community.
- **Street:** name or number of the Street where incident occurred
- **Reference:** landmarks or are names that described to refer location of incident.
- **X_Cor_Org:** original X coordinate if stated in incident report
- **Y_Cor_Org:** original Y coordinate if stated in incident report
- **Attack_Technique:** which technique or method (weapon/explosive) was used for the attack
- **Intended_Target:** who were intended target of the attack
- **Quality_of_Execution:** how accurate was the incident to reach the target.
    - Target Missed: only civilian casualty or wounded
    - On the Target: only or maximum intended target casualty or wounded
    - Partially on the Target: both target and civilian casualty or wounded
    - Miscarriage: premature detonation - no harm to others.
- **Target People Killed:** number of target people killed by the incident
- **Target People Wounded:** number of target people wounded by the incident
- **Other People Killed:** number of other people killed by the incident
- **Other People Wounded:** number of other people wounded by the incident
- **Insurgents Killed:** number of insurgents killed by the incident
- **Insurgents Wounded:** number of insurgents wounded by the incident

- **Estimated Time:** inserted mean value of specified time range in case of missing specific time value for temporal analysis
- **Estimated X and Y coordinate:** Generated X, Y Coordinate value for each incident by the research team (see **Section 3.1 below**).

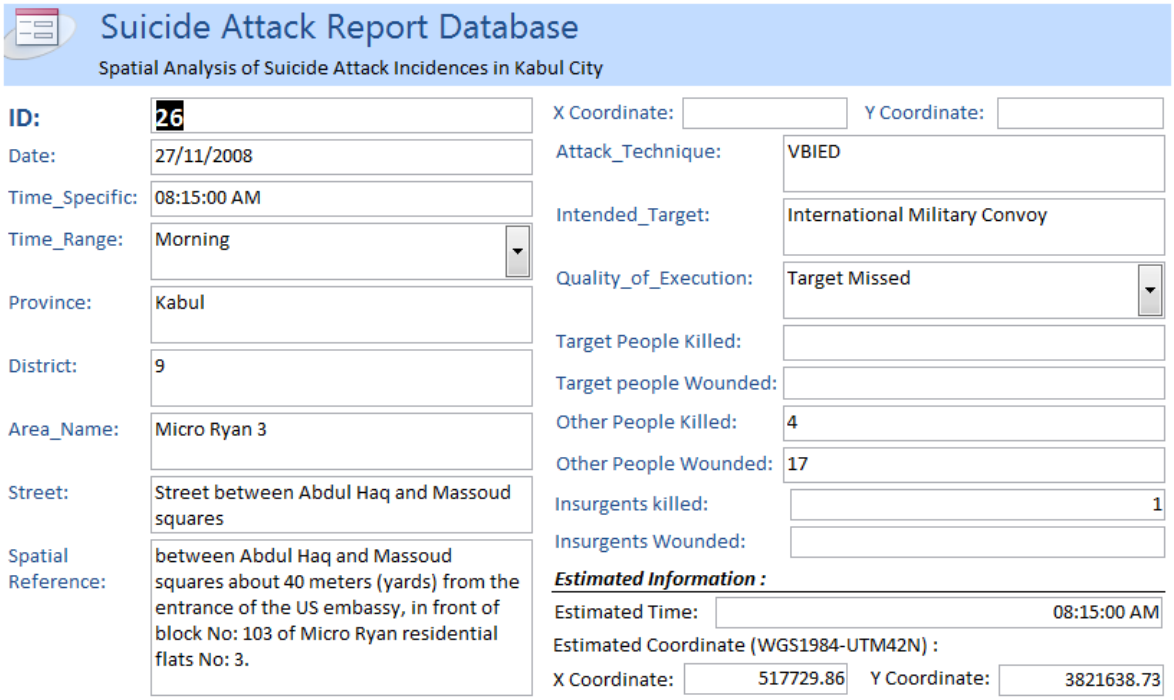


Figure 12: A database form showing extracted information on Suicide Attack of 27.11.2008

In many cases the suicide attack quality was described and on the target and showed photo affected target groups but could not give specific number of affected people from target group. So, that might be counted in the other people killed or wounded group as a mass. The complete suicide attack database as a form view is attached in **Annex I**.

2.4 Target Group Establishment Points (TGEP)

The location of government and international organizational establishment data collected from AIMS were categorized by incorporating local and international military establishments and appended in one shapefile and considered as "Target Group Establishment Points (TGEP)". The list of considered national and international establishments is attached in **Annex II**.

CHAPTER 3: METHODOLOGY

3.1 Geocoding Suicide Attack Location Points

3.1.1 Spatial Reasoning

Almost all of the suicide attack reports were provided with a mix of qualitative and quantitative approximate spatial information of the incident location described in natural languages. This research required to generate a point data from the descriptive news reports to use in spatial analysis. The suicide attack location points were generated from local knowledge and relative proximity from reference point location described in the news reports with considerations of approximate spatial reasoning techniques (Dutta, 1991) and qualitative distances (Hernandez et al., 1995). **Figure 13** shows the process graphically.

A. Method of Data Extraction **B. Method of Spatial Reasoning**

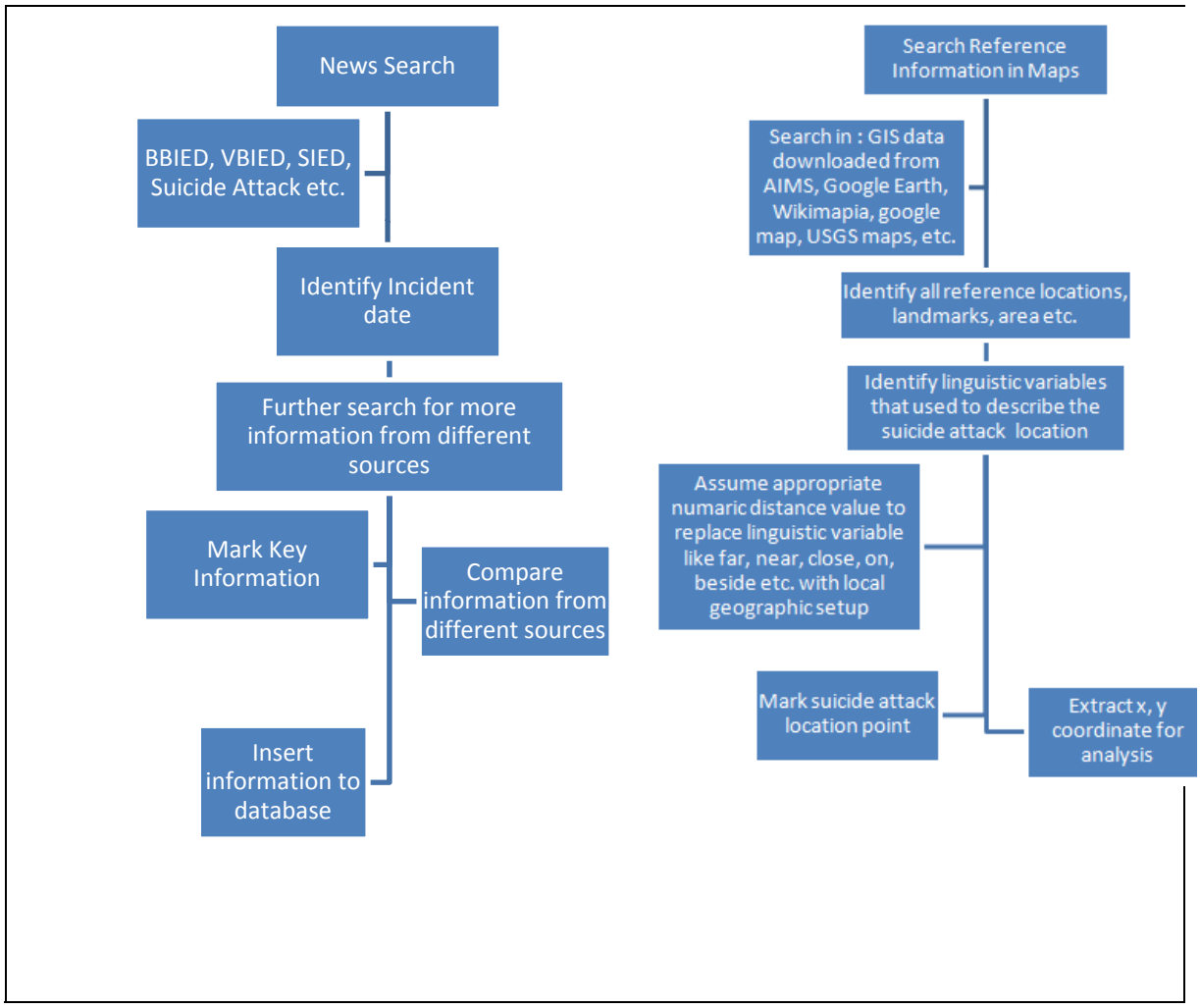
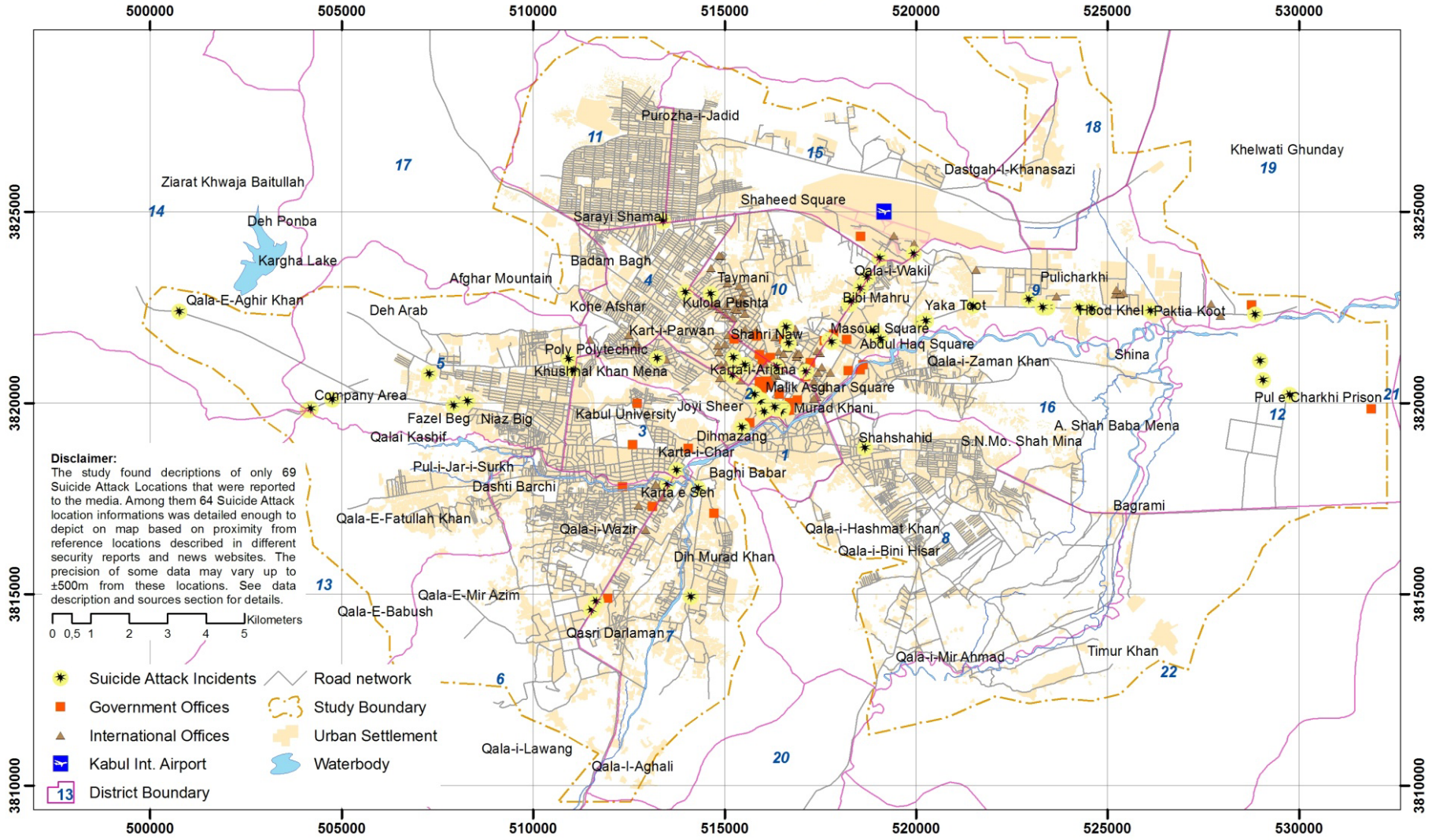


Figure 13: Method of data extraction and geocoding

3.1.2 Data Accuracy

Some of the news reports provided with detailed descriptive spatial information pointing towards nearby landmarks which could be used to generate points with 5 to 10 meters of accuracy. But some spatial information was not detailed enough, either the geographic data of reference locations mentioned was unavailable or in some cases reference point was indicated with Persian name and spelling was not matching with the GIS data available to the team for geocoding at similar accuracy. The original location of those incidents may vary up to 500meter from the point that geocoded in the map. Primarily 69 suicide attack incidents information were captured from various sources (described in **Section 2.3**) but finally the team was successful to geocode 64 suicide attack location points within the study boundary to use for spatial analysis (**Figure 14**).



Data Source: AIMS, Afghanistan (http://www.aims.org.af); Year of Data Creation: 2005; Projection System: UTM 42N, WGS1984

Figure 14: Major Suicide Attack Locations Occurred in Kabul City from 2006 to 2010.

3.2 Data Conversion and processing

Spatial point pattern analysis of suicide attack location required to import 4 dataset in SPATSTAT package supported data formats from the original GIS data format (**shapefile**).

The maps were produced in ArcGIS and spatial point pattern analysis done in SPATSTAT package (Baddeley and Turner, 2005; Baddeley 2008) of Software R.

3.2.1 Create Observation Window from polygon shapefile

Considering the implication of observation widow or frame of reference on point pattern analysis, the study area **shapefile** was created in ArcGIS software environment. The Study area covered only the urban settlement and nearby area where suicide attack can be occurred within vast Kabul municipal boundary (see **Figure 14**) to put emphasis on randomness of the suicide attack probability. The study area from shapefile format was converted to "**SPATSTAT**" following the techniques described by Baddeley (2011) in few steps.

Step 1: Read shapefile using maptools

Step 2: Detection of spatial object class

Step 3: Converting data to **SPATSTAT** format

Step 4: Declare polygon data as window

3.2.2 Convert SALP data to SPATSTAT

The Suicide Attack Location Points (SALP) which were primarily created in GIS file format (shapefile), converted to the **SPATSTAT** package of Software-R in few standard steps (Baddeley, 2011).

Step 1: Read shapefile using maptools

Step 2: Detection of spatial object class

Step 3: Converting data to **SPATSTAT** format

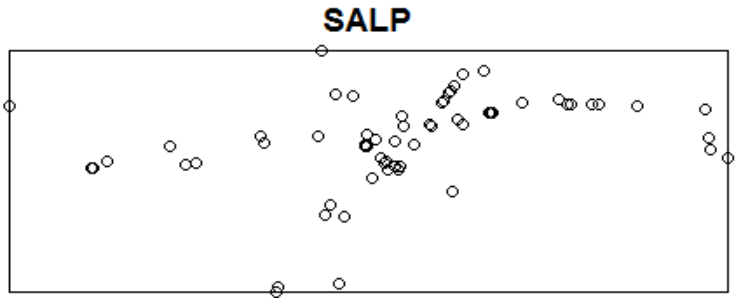


Figure 15: Suicide Attack Location Points in the automatic data extent window

Step 4: Apply Window from W="owin" Class

Step 5: Unmark the Point data

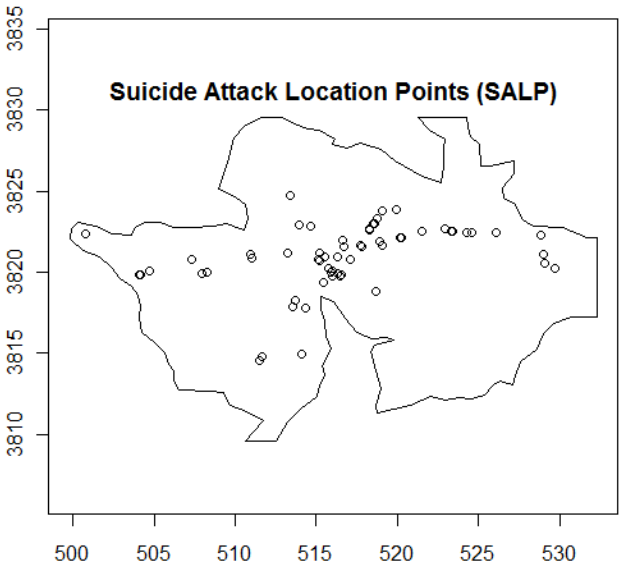
Step 4: Update Unit as Meter

The primary data does not show any particular measurement unit and needed to declare appropriate measurement unit (meter for this data) for proper interpretation.

Step 5: Changing Scale and Unit to Kilometer

Considering the fact of having only few numbers of suicide attack location points (64) within the study area, it was decided to round the measurement unit to kilometer for better understandable statistics.

Step 6: Display SALP data



* The grid distance units is in kilometer

Figure 16: Suicide Attack Location Points in the City Habitat Window

3.2.3 Converting TGEP data to SPATSTAT

The Target Group Establishment Point (TGEP) which were primarily created in GIS file format (shapefile), converted to the **SPATSTAT** package of "R" by similar steps that were followed in section 3.2.2. Only difference was to keep the embedded marks with the TGEP data which could differentiate government establishments from international establishments.

3.3 Spatial Point Pattern Analysis

The spatial point pattern analysis of this research carried out in 3 stages. Suicide attack location points (SALP) and target group establishment point (TGEP) were analyzed separately in two consecutive stages and explored spatial patterns. Finally it analyzed covariate effect whether the location of SALP depends on TGEP.

3.3.1 Estimates of Spatial Pattern

Both SALP and TGEP were analyzed separately by following methods.

3.3.1.1 Test of Intensity

First of all the point data were checked to decide whether they are uniform (constant) or non-uniform (inhomogeneous) by observing average density, quadrate count and kernel density methods.

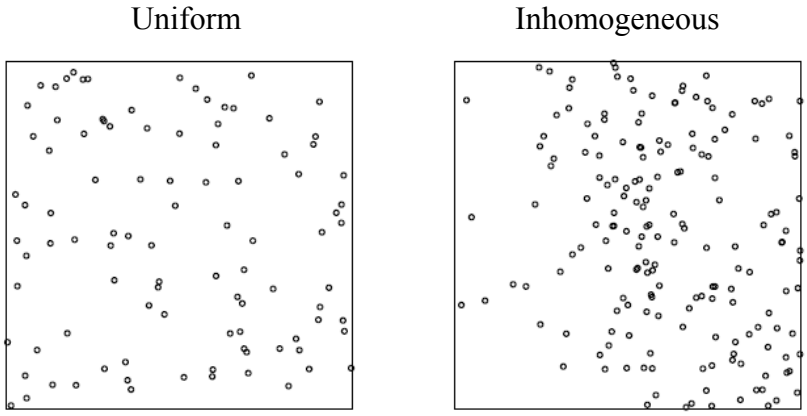


Figure 17: A sample of uniform and inhomogeneous point pattern

Source: Baddeley (2008)

3.3.1.2 Test of Interaction

In this stage the point data were tested for complete spatial Randomness (CSR) test using Envelops over K function and G function to decide whether the data are random or there were some sort of interactions among those points. The Envelops established on the basis

of maximum and minimum values of K(r) or G(r) for each value of distance r(pairwise distance/ nearest neighbor distances) of some simulated realizations (100 simulation for our study) of CSR with same intensity. If the test result rejects the test of CSR then next step is to decide the nature of the pattern either regular or clustered (See **Figure 18**).

If the simulated line of each observed value of distance variable r become greater than the theoretical value of K(r) or G(r) of CSR then the it is decided the point pattern as clustered or point located closely to each other. In case of observed K(r) or G(r) < theoretical K(r) or G(r) then the pattern is decided as regular or dispersedly located from each other.

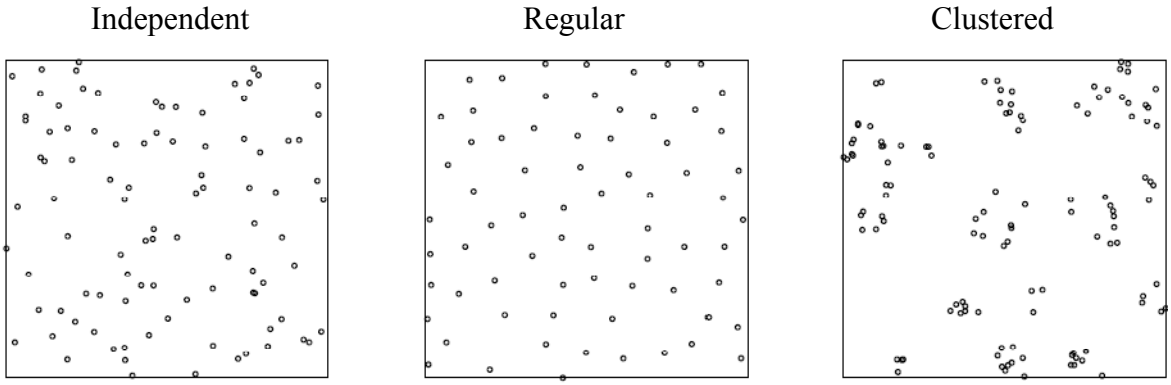


Figure 18: A sample of different types of interaction pattern

Source: Baddeley *(2008)*

3.3.2 Analysis of Covariate Effects

In this stage the study tried to check whether the intensity of suicide attack location points (SALP) depends on target groups establishment locations (TGEP) by Marked Point Pattern Analysis techniques described by Baddeley (2008) in his SPATSTAT manual.

3.4 Justification of Accuracy Impact

Some of the suicide attack location inherited with low accuracy, which varies up to 500 meter. The study generated the suicide attack location points again by considering its possible positional error by moving the point to a different place arbitrarily within its error extent. The simulations were carried out again based on this new dataset and results were compared to draw the final inference of this study.

CHAPTER 4: RESULTS AND DISCUSSION

4.1 Introduction

To fulfill the requirement of the general objective and three specific objects that aimed for the study we did point pattern analysis of the suicide attack location points and target group's establishment points to revel spatial pattern of these two types of point's location with respect to the Kabul city study boundary. Then we approached to reveal interdependency between suicide attacks location points and target group establishment location by marked point pattern analysis. Finally we esteemed to revel some spatial and temporal analysis considering other relevant spatial and social factors like, who are the targets of the suicide attacks, where the suicide attack happens mostly, what time, which months and which year how many suicide attack happened in Kabul from 2006 to 2010.

4.2 Analysis of Suicide Attack Location Points (SALP)

The study contained 64 major (excluding some miscarriage and unreported incidents) suicide attack location points that occurred in last 5 years from January 2006 to December 2010 within the urban settlement limit of Kabul City.

4.2.1 Investigation of Intensity

Intensity is the average or mean value of points distributes in a single unit of the specified area. This value can determine whether the point pattern is uniform/constant or inhomogeneous over the space.

4.2.1.1 Uniform Intensity

The estimated average intensity of suicide attack points is 0.178 points per square kilometer. Now this value could be used as a parameter to prove these points distribution is homogeneous i.e. it exists same intensity in all parts of the study area or intensity varies over space for an inhomogeneous distribution.

4.2.1.2 Inhomogeneous Intensity

I. Quadratcount

The study area was divided into 6 x 3 quadrate cells and measured the points in each of the quadrate to evaluate its intensity pattern and found the pattern is inhomogeneous (See **Figure 19**).

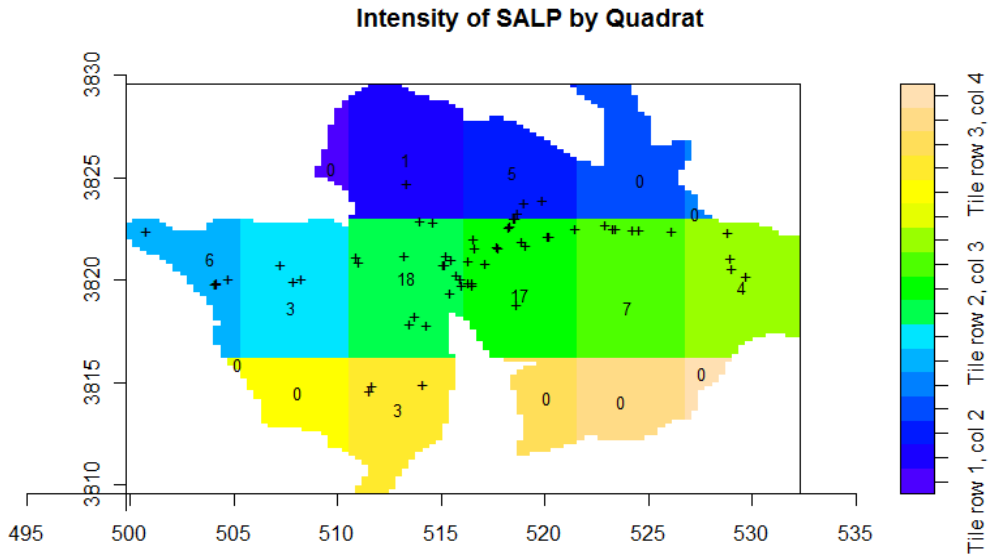


Figure 19: Intensity of suicide attack incident by 6x x 3y quadrates of the Kabul City

It was also found that the central area experienced more suicide attacks than other areas though there were also some sort of linear patterns originated in the center and approached outwards (especially to the ease and west) the city which might followed some major roads.

II. Kernel Density Estimation

The kernel density estimation using an isotropic Gaussian kernel with a radius of 2 kilometer (δ=2km) was implemented in **SPATSTAT** for SALP data. The result is presented in **Figure 20**, which strongly proved the dataset to be inhomogeneous pattern i.e. the distribution is not same in all parts of the city.

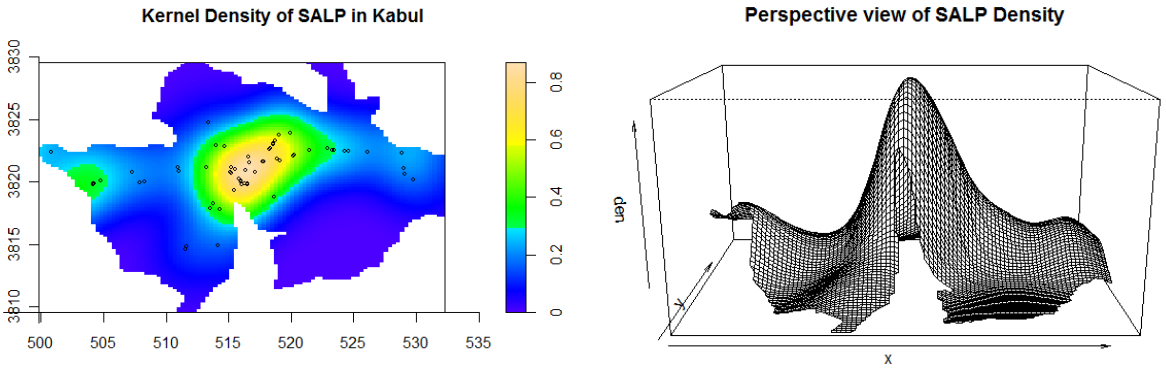


Figure 20: Graduated color plot (left) and perspective view (right) of Kernel density of suicide attack location points in Kabul City with sigma = 2km

4.2.2 Investigation of Interaction

The test of complete spatial randomness (CSR) was done by two distance based functions to decide whether the dataset is completely random or there exists some interaction between points. First we tested the nature of interaction by an envelope over pairwise distance (the K function) and then envelop over nearest neighbor distances function (the G function) with 100 simulated realization of CSR to decide the pattern to be completely random or not. If the line of K-function or G function estimated from SALP lies outside the typical range value of K/G function for a completely random pattern then we would reject the data point pattern to be completely spatial random and approach towards deciding whether the data is clustered or regular pattern by observing whether the observed value of K/G function is greater or smaller than the typical theoretical value of CSR.

4.2.2.1 Envelop for Pairwise distances and the K function:

The outputs of the K function test for 100 simulated realization of CSR are as follows,

Table 2: Result of Envelop over K Function for SALP

Pointwise critical envelopes for K(r)
Edge correction: "iso"
Obtained from 100 simulations of CSR

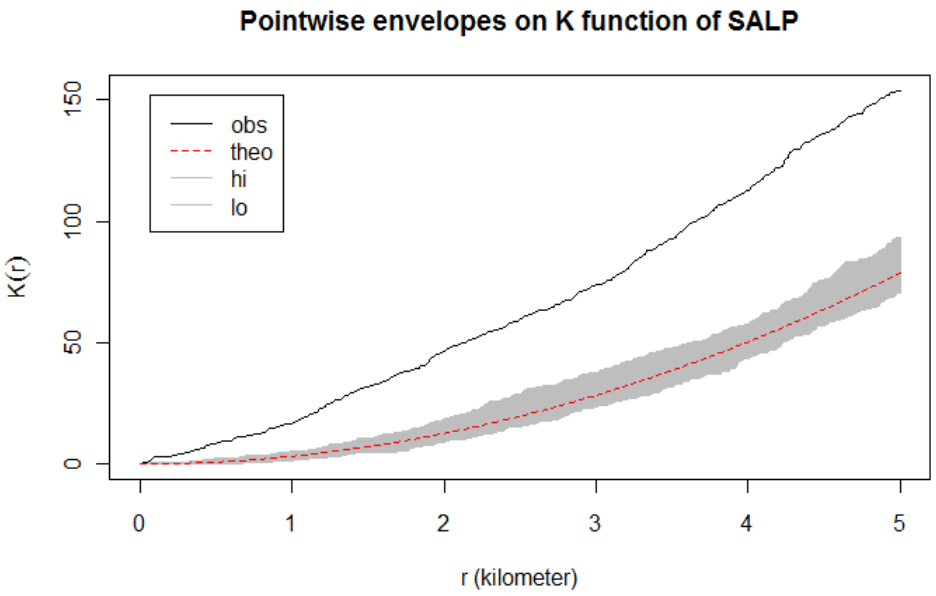
Significance level of pointwise Monte Carlo test: 2/101 = 0.0198

Data: SALP
Function value object (class 'fv') for the function r -> K(r)

Entries:

id	label	description
r	r	distance argument r
obs	obs(r)	observed value of K(r) for data pattern
theo	theo(r)	theoretical value of K(r) for CSR
lo	lo(r)	lower pointwise envelope of K(r) from simulations
hi	hi(r)	upper pointwise envelope of K(r) from simulations

Default plot formula:
. ~ r
Recommended range of argument r: [0, 5]
Available range of argument r: [0, 5]
Unit of length: 1 kilometer



	lty	col	key	label	meaning
obs	1	1	obs	obs(r)	observed value of K(r) for data pattern
theo	2	2	theo	theo(r)	theoretical value of K(r) for CSR
hi	1	8	hi	hi(r)	upper pointwise envelope of K(r) from simulations
lo	1	8	lo	lo(r)	lower pointwise envelope of K(r) from simulations

Figure 21: Envelope for pairwise distances and the K function for SALP data

A. Decision of Randomness

The Observed line of K Function in **Figure 21** lied completely outside of envelope, i.e. for every arguments of pairwise distances (r) which constructed an observed line that lied far away (significant difference) from the theoretical line of CSR and both of the upper and lower point-wise envelope limit of K(r) from 100 simulations of same intensity of points. Hence, according to the Monte Carlo test principals (Baddeley, 2008), we rejected the null hypothesis of the SALP point pattern to be random or independent pattern with high level of significance (Significance level of point-wise Monte Carlo test is 0.0198 or ~98% level of confidence). So, we can say the point data is either regular or clustered.

B. Decision of Clustering or Regularity

We also observed (in **Figure 21**) that for every argument of pairwise distance ´r´ the observed value of K(r) for the SALP data pattern are always greater than the theoretical value of K(r) of CSR. This indicates SALP data set as a clustered point pattern that means there exists some sort of interactions among the points.

4.2.2.2 Envelop for nearest neighbour distances and the G function

The results of the envelop over G function computations for the point-wise distances are as follows,

Table 3: Result of Envelop over G Function

Point-wise critical envelopes for G(r)
Edge correction: "km"
Obtained from 100 simulations of CSR

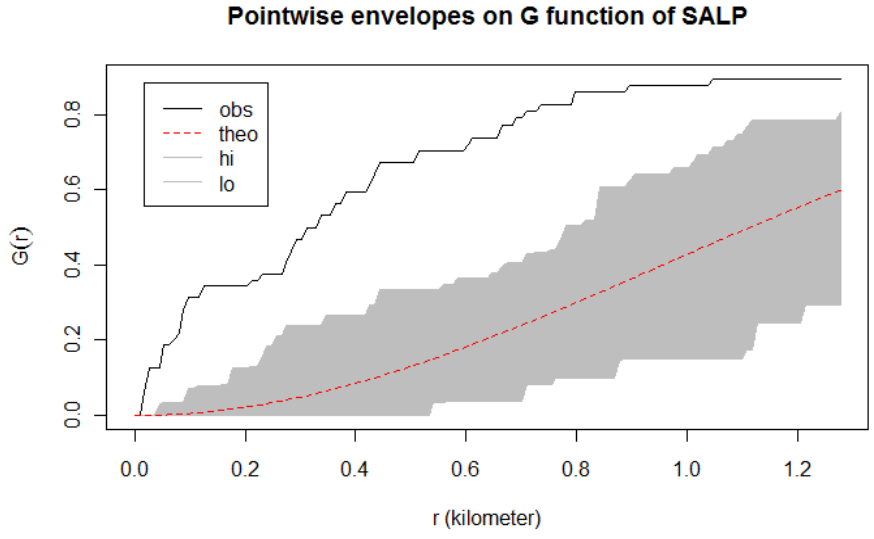
Significance level of point-wise Monte Carlo test: 2/101 = 0.0198

Data: SALP
Function value object (class 'fv')
for the function r -> G(r)

Entries:

id	label	description
r	r	distance argument r
obs	obs(r)	observed value of G(r) for data pattern
theo	theo(r)	theoretical value of G(r) for CSR
lo	lo(r)	lower pointwise envelope of G(r) from simulations
hi	hi(r)	upper pointwise envelope of G(r) from simulations

Default plot formula:
. ~ r
Recommended range of argument r: [0, 1.2775]
Available range of argument r: [0, 4.5422]
Unit of length: 1 kilometer



	lty	col	key	label	meaning
obs	1	1	obs	obs(r)	observed value of G(r) for data pattern
theo	2	2	theo	theo(r)	theoretical value of G(r) for CSR
hi	1	8	hi	hi(r)	upper pointwise envelope of G(r) from simulations
lo	1	8	lo	lo(r)	lower pointwise envelope of G(r) from simulations

Figure 22: Envelope for G function test of SALP

A. Decision of Randomness

The Observed line in **Figure 22** lied completely outside of the envelope formed by 100 simulated realizations of CSR with the same intensity, over G function graph. So, for every arguments of observed value of G(r) of the data pattern formed a line, that lied far away (significant distance) from the theoretical line of CSR and as well as outside of both upper and lower point-wise envelope limit of G(r) of the 100 simulations. Hence, from the Monte Carlo test principles (Baddeley, 2008), we rejected the null hypothesis of being the SALP point pattern as random or independent pattern significantly (**Table 3**). So, at this stage it was decided that the data is not rand and it might be either regular or clustered.

B. Decision of Clustering or Regularity

For every argument of distance (r) for the observed value of G(r) were always greater than the theoretical value of G(r) of CSR (**Figure 22**). Thus the Suicide attack location point pattern is proved to be clustered.

4.3 Analysis of Target Groups Establishment Points (TGEP)

The study used 153 point location of government and International strategic establishments (building or compound) that seems to be targets of the suicide attack within the urban settlement limit (window area =360.32 km^2) of Kabul City.

4.3.1 Investigation of Intensity

The study investigated the point pattern with the measure of intensity. It was carried out to decide whether the point pattern is homogeneous or inhomogeneous.

4.3.1.1 Uniform Intensity

It was found that the average intensity of target group establishments was 0.425 points per square kilometer. In case of homogeneous pattern, every corner of the study window should have similar number of establishment per unit area. If not then the pattern is not uniform. For this we had investigated inhomogeneous intensity.

4.3.1.2 Inhomogeneous Intensity

I. Quadratcount

The study area was divided into 6 x 3 quadrate cells and measured the number of points in each of the quadrate to evaluate its intensity distribution and found the pattern is inhomogeneous (See **Figure 23**). It seems the target group establishments points are more

concentrated to the core of the city or central area compared to the suicide attack location distribution (visual comparison of **Figure 19** and **Figure 23**).

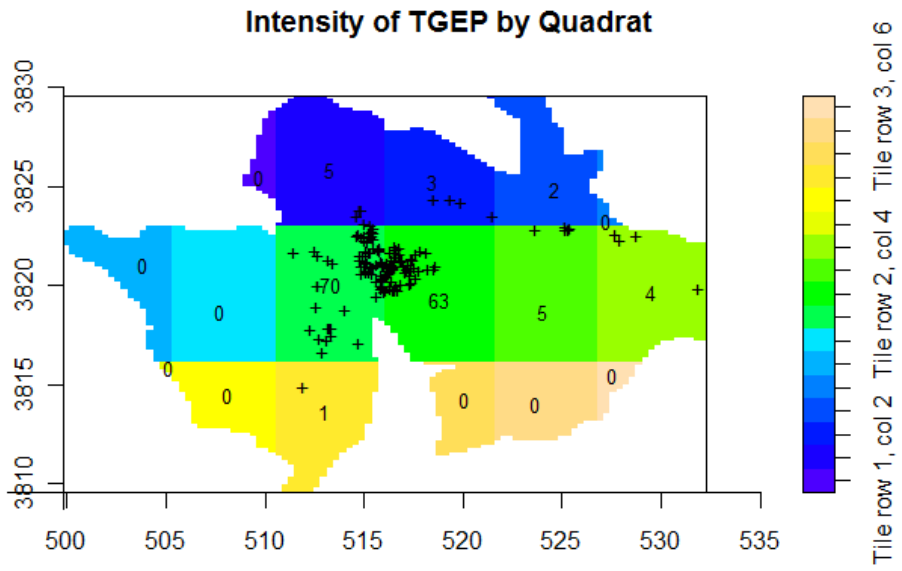


Figure 23: Intensity of target group establishments by 6 x 3 quadrates within the study window

II. Kernel Density

The kernel density estimation used isotropic Gaussian kernel with a radius of 2 kilometer (δ=2km) and implemented in **SPATSTAT** on TGEP data. The result is presented in **Figure 24**, which strongly proved the dataset as inhomogeneous pattern.

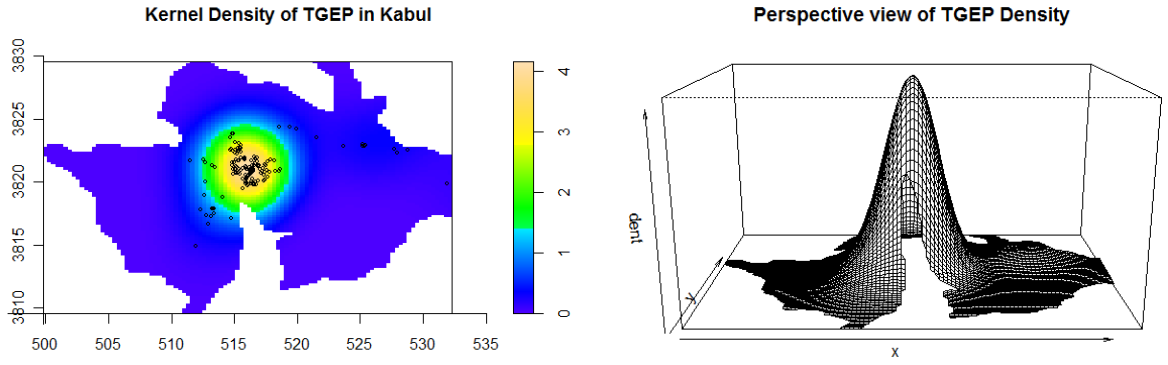


Figure 24: Graduate color plot and perspective plot of Kernel density of Target Group Establishment Point (TGEP) in Kabul City with sigma = 2km

4.3.2 Investigation of Interaction

The investigations of interaction among the points were done by two distance based functions. First we tested the nature of interaction by an envelope over pairwise distance (the K function) and then envelop over nearest neighbor distances function (the G functions).

4.3.2.1 Envelop for Pairwise distances and the K function

The output of the K function test is illustrated in **Table 4** below,

Table 4: Result of Envelop over K Function for TGEP

Point-wise critical envelopes for K(r)
Edge correction: "iso"
Obtained from 100 simulations of CSR

Significance level of point-wise Monte Carlo test: 2/101 = 0.0198

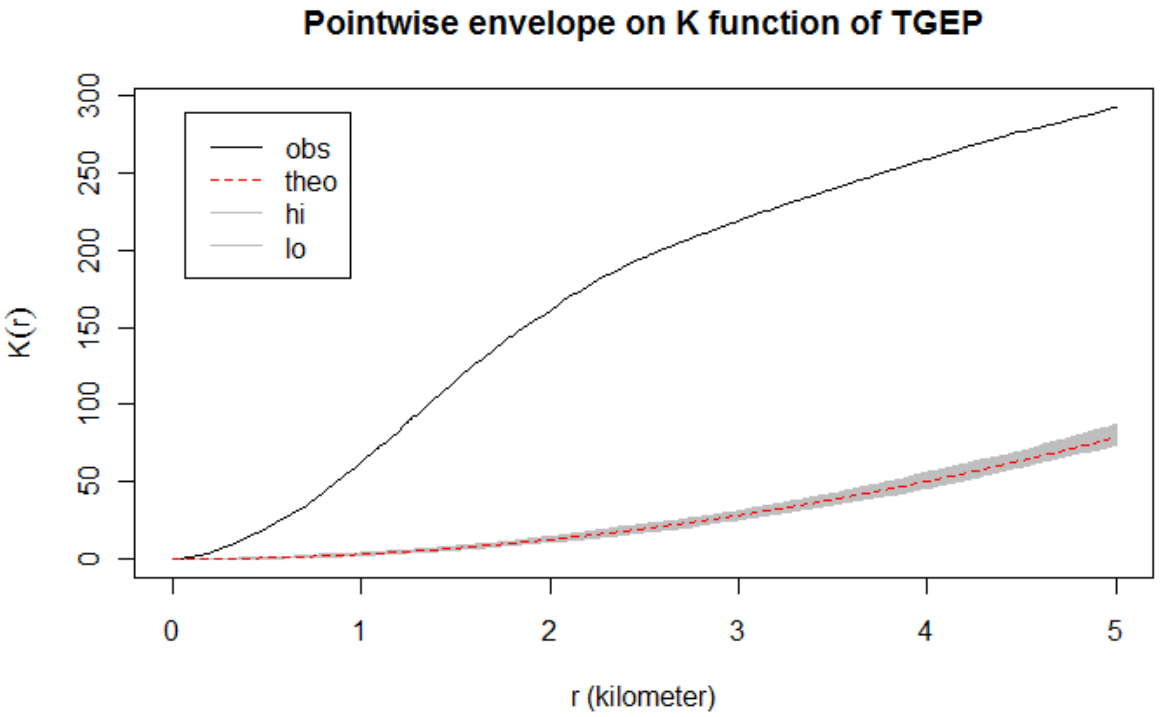
Data: TGEP
Function value object (class 'fv') for the function r -> K(r)

Entries:

id	label	description
r	r	distance argument r
obs	obs(r)	observed value of K(r) for data pattern
theo	theo(r)	theoretical value of K(r) for CSR
lo	lo(r)	lower point-wise envelope of K(r) from simulations
hi	hi(r)	upper point-wise envelope of K(r) from simulations

Default plot formula:
. ~ r

Recommended range of argument r: [0, 5]
Available range of argument r: [0, 5]
Unit of length: 1 kilometer



	lty	col	key	label	meaning
obs	1	1	obs	obs(r)	observed value of K(r) for data pattern
theo	2	2	theo	theo(r)	theoretical value of K(r) for CSR
hi	1	8	hi	hi(r)	upper pointwise envelope of K(r) from simulations
lo	1	8	lo	lo(r)	lower pointwise envelope of K(r) from simulations

Figure 25: Envelope for pairwise distances and the K function for TGEP data

I. Decision of Randomness

The observed line in **Figure 25** lied completely outside of envelop, i.e. for every arguments of r that constructs an observed line laid far away (significant difference) from the theoretical line of CSR and both of the upper and lower point-wise envelope limit of K(r) from 100 simulated realization of CSR for distance r. Hence, from the principles of Monte Carlo test (Baddeley, 2008), we rejected the null hypothesis of being the TGEP point pattern as random or independent with high level of significance (significance level of point-wise Monte Carlo test: 2/101 = 0.0198 or ~98% level of confidence). So, the data is declared as either regular or clustered.

II. Decision of Clustering or Regularity

The (**Figure 21**) argument of distance (r) for the observed value of K(r) for data pattern are always greater than the theoretical value of K(r) of CSR. This indicates TGEP data set as a clustered point pattern that means there exists some sort of interactions among the points.

4.3.2.2 Envelop for nearest neighbour distances and the G function

The results of the envelop over G function computations for the point-wise distances are illustrated in **Table 5** below,

Table 5: Result of Envelop over G Function for TGEP data

Point-wise critical envelopes for G(r)
Edge correction: "km"
Obtained from 100 simulations of CSR
Significance level of point-wise Monte Carlo test: 2/101 = 0.0198019801980198

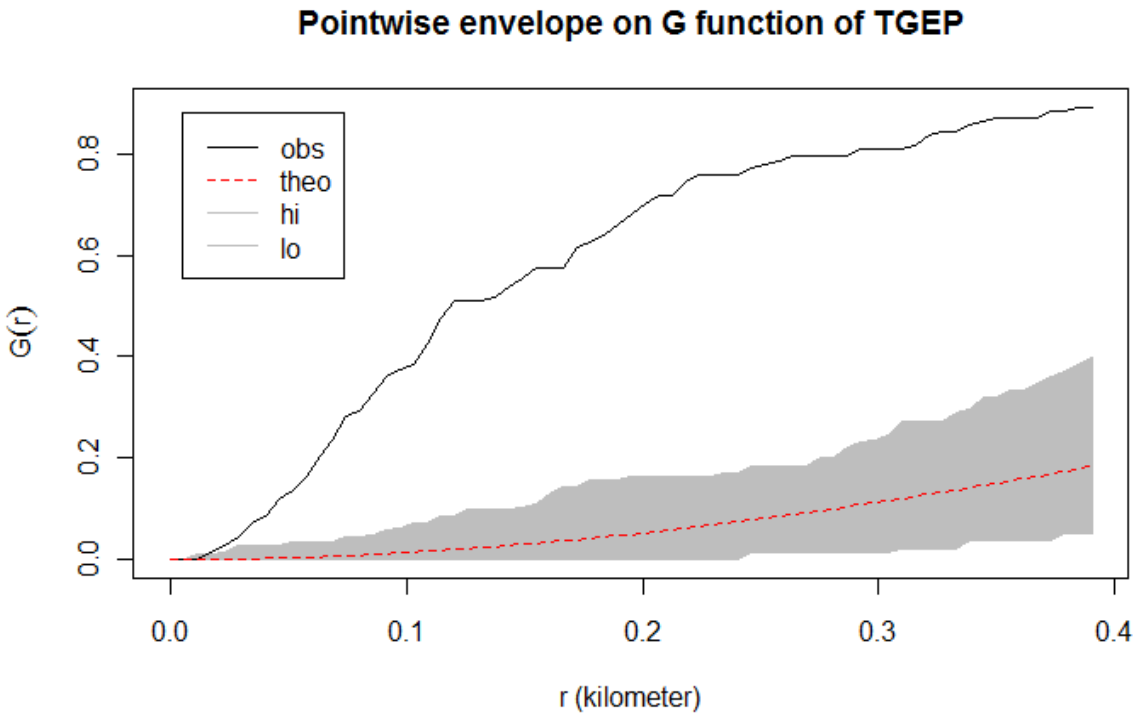
Data: TGEP
Function value object (class 'fv') for the function r -> G(r)

Entries:

id	label	description
r	r	distance argument r
obs	obs(r)	observed value of G(r) for data pattern
theo	theo(r)	theoretical value of G(r) for CSR
lo	lo(r)	lower point-wise envelope of G(r) from simulations
hi	hi(r)	upper point-wise envelope of G(r) from simulations

Default plot formula:
. ~ r

Recommended range of argument r: [0, 0.39017]
Available range of argument r: [0, 2.9378]
Unit of length: 1 kilometer



	lty	col	key	label	meaning
obs	1	1	obs	obs(r)	observed value of G(r) for data pattern
theo	2	2	theo	theo(r)	theoretical value of G(r) for CSR
hi	1	8	hi	hi(r)	upper pointwise envelope of G(r) from simulations
lo	1	8	lo	lo(r)	lower pointwise envelope of G(r) from simulations

Figure 26: Envelope for G function test of TGEP

I. Decision of Randomness

The observed line in **Figure 26** was found completely outside of the envelope, created by 100 simulated realizations of CSR with the same intensity, over G function graph. Hence, from the Monte Carlo test principles (Baddeley, 2008), we rejected the null hypothesis of being the TGEP point pattern as random or independent pattern significantly. So, at this stage it was decided that the data is either regular or clustered.

II. Decision of Clustering or Regularity

For every argument of ´r´ for the observed value of G(r) were always greater than the theoretical value of G(r) of CSR (**Figure 26**). Thus the Suicide attack location point pattern was proved as clustered.

4.4 Investigation of the Relationship between SAP and TGEP

The previous investigation on suicide attack location points (SALP) and Target group establishment points (TGEP) separately revealed that both data pattern were inhomogeneous and clustered. So, Multitype (categorical marks) point pattern analyses were done to reveal inherent relationship or dependencies of SALP on TGEP. We also considered TGEP as covariate and SALP as dependent on the TGEP for our analysis.

4.4.1 Creating dataset and Inspecting General Pattern

One single point data file was created inserting all suicide attack location points marked as SALP and target group establishment points marked as TGEP as simple categorical label value. The summary function of **SPATSTAT** explored that there was total 217 points indicated as marked planar point pattern in the dataset where 64 points were marked as SALP and 153 point marked as TGEP. **Figure 27** displayed the location of both TGEP and SALP within the study window where central part of the city looks clumsy due to high density of point.

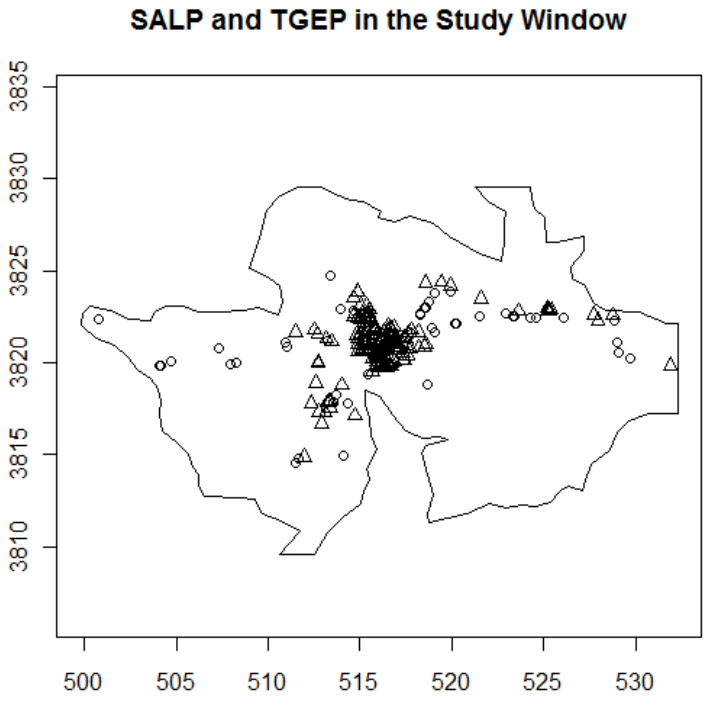


Figure 27: Simple plot of Suicide Attack Location Points and Target Group Establishment Point in SPATSTAT (the distance unit is Kilometer)

4.4.2 Test of Intensity

Intensity is the simplest and prime tool to explore point pattern. The summary function is SPATSTAT revealed that the average intensity was 0.602 point per square kilometer for

the combined point dataset (217 points consisting both SALP and TGEP) with respect to the study area window of 360.318 square kilometer. It also revealed that the mark SALP consisted 64 points which was 29.5% of the point population had an intensity of 0.178 points/ km^2 where TGEP consisted 153 points covered 70.5% of the point population with intensity of 0.425 points/km^2.

4.4.2.1 Intensity from comparative point plot

We found the way of examining the sub-point pattern of different types separately quite sensible to avoid clumsy display by splitting marks and displayed points side by side (see **Figure 28**).

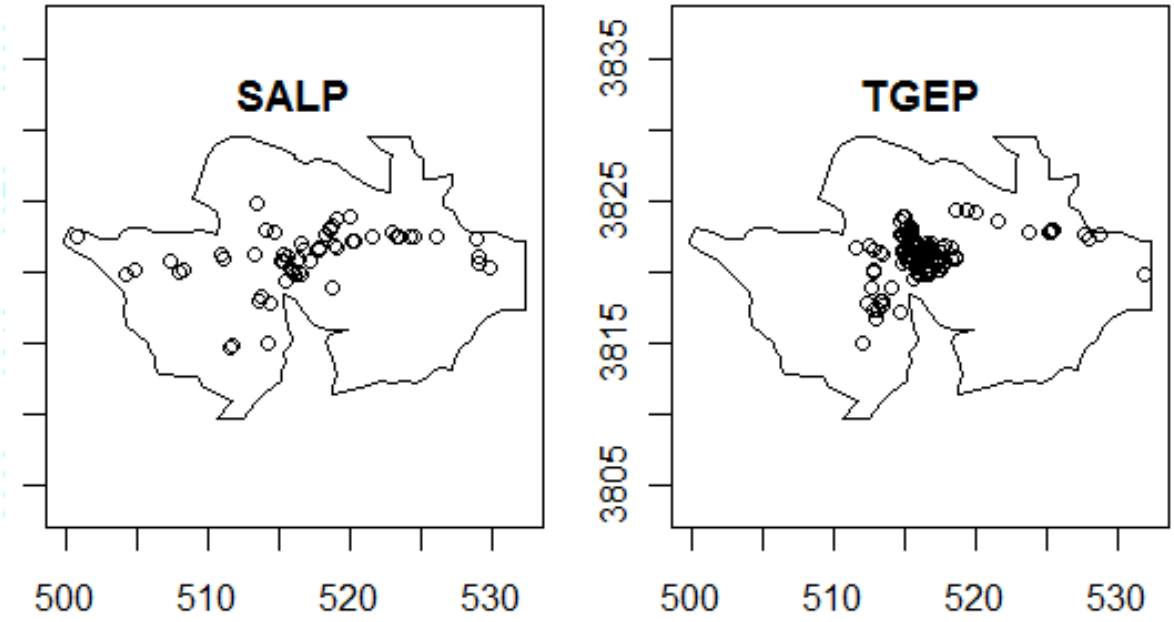


Figure 28: Suicide Attack locations are placed beside Government and international Target locations

The above side by side plot of points marked with SALP and TGEP in separate window given quite clear impression that, the target group establishments are highly concentrated in the core of the city, where suicide attack locations formed an interesting star or radial shape but they also focused at the center of the city.

4.4.2.2 Intensity from comparative point density display

In further, the side by side density plot of suicide attack location and target groups establishment locations separately reestablished our general idea on intensity and distribution pattern that concentrated in the city center (see **Figure 29**). In Addition, the density plot highlighted an interesting aspect of SALP pattern by displaying another small

area with high density of suicide attacks in the western side apart from its main concentration at the central part of the city.

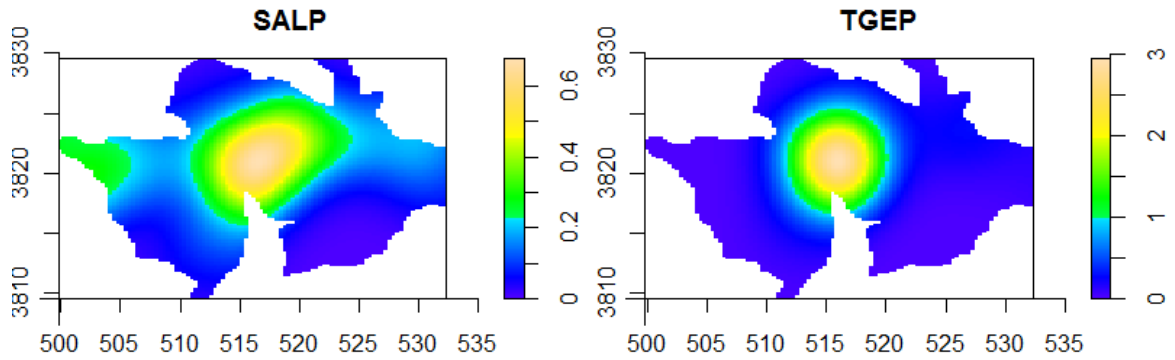


Figure 29: Comparative Intensity pattern of SALP and TGEP (distance unit is kilometer)

The above figure have confirmed that the pattern of SALP and TGEP are inhomogeneous but still it demanded for some sort of statistics to quantify the combined intensity pattern.

4.4.3 Test of Interaction

The study had approached to reveal a concrete evidence of intensity pattern of Multitype points marked by SALP and TGEP by applying pairwise distances function (K function) and nearest neighbor distances function (G function).

I. Nearest neighbor distances and the G function

This function reveals that for any pair of type TGEP and SALP, the nearest neighbor distances $G_{ts}(r)$ considered as the distribution function of the distance from a point of type TGEP to the nearest point of type SALP (Baddeley, 2008). The basic assumptions for this test are:

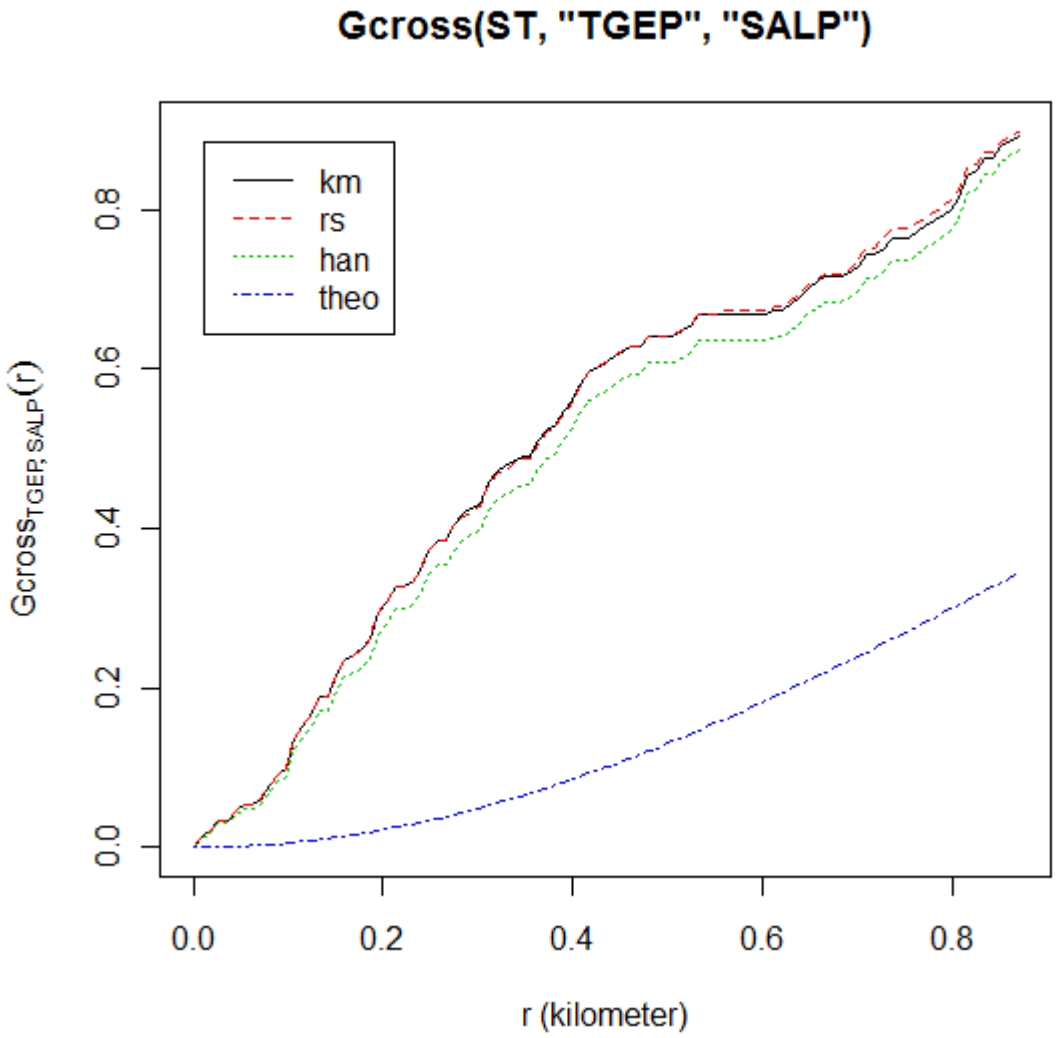
a. The Multitype point process ST is stationary.

b. ST_s: denote the subtype of points of type SALP with intensity of λ_s

c. ST_t denote the subtype of points of type TGEP with intensity of λ_t

The depicted result of nearest neighbor distance function (G function) of distances from a target group establishment location point (TGEP) to suicide attack location point (SALP) merely proved that the point pattern was clustered (**Figure 30**). It explored that (in the Figure 30) the Kaplan-Meier estimate of Gcross["TGEP", "SALP"](r) are greater than

theoretical Poisson Gcross["TGEP", "SALP"](r), i.e. $G_{ts}(r)>1-\exp(-\lambda_s \pi r^2)$ (Baddeley, 2008).



Legend

```
km       Kaplan-Meier estimate of Gcross["TGEP", "SALP"](r)
rs   border corrected estimate of Gcross["TGEP", "SALP"](r)
han           Hanisch estimate of Gcross["TGEP", "SALP"](r)
theo          theoretical Poisson Gcross["TGEP", "SALP"](r)
```

Figure 30: G function of distances from TGEP to SALP

So, the nearest neighbour distances function (G function) also proved the Multitype point pattern as dependent by rejecting the null hypothesis of being uniform Poisson process (CSR) and .independent (according to Baddeley, 2008, pp. 170).

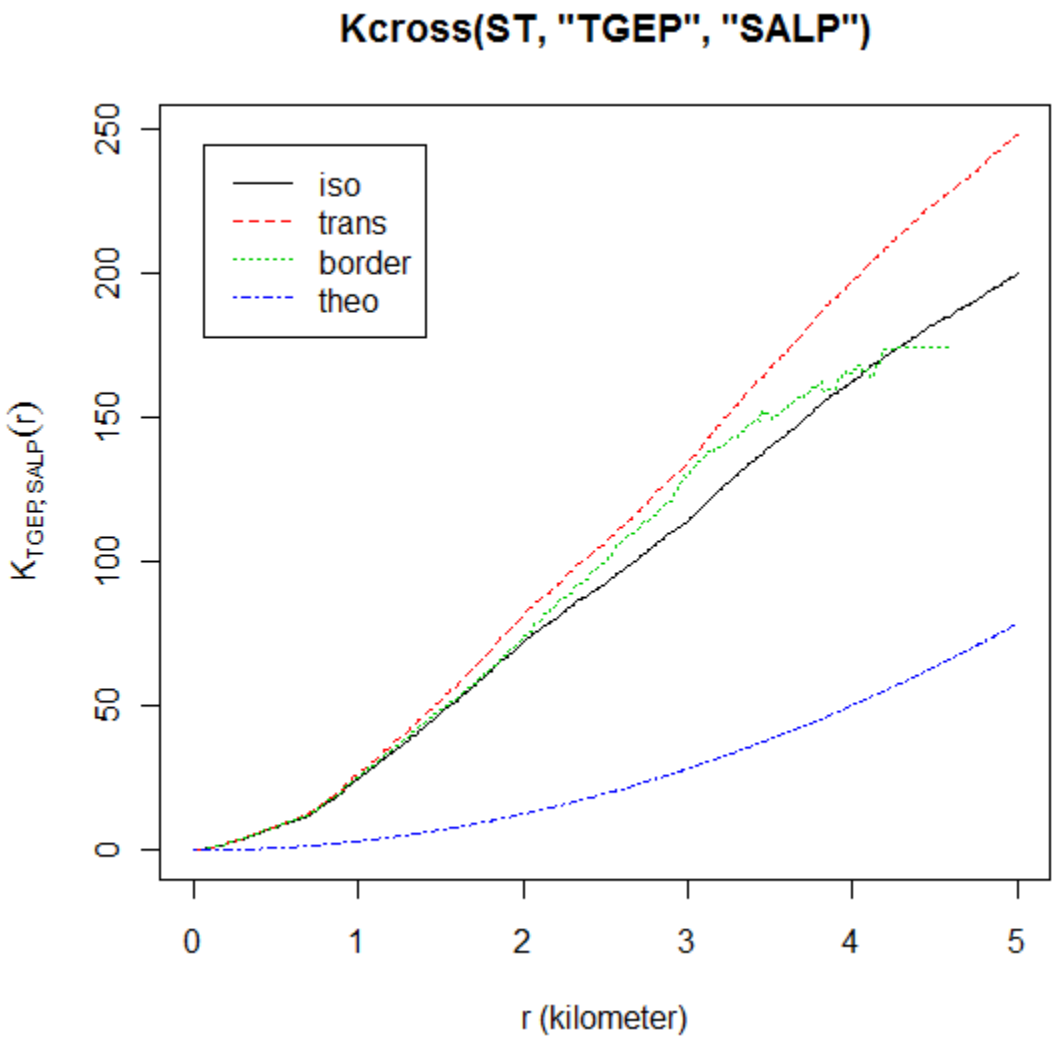
II. Pairwise distances and the K function

This function reveals that for any pair of type TGEP and SALP, the pairwise distances $K_{ts}(r)$ is $1/\lambda_s$ times the expected number of points of type SALP within a distance of r of a typical point of type TGEP (Baddeley, 2008). The basic assumptions for this test are:

a. The Multitype point process ST is stationary.

b. ST_s: denote the subtype of points of type SALP with intensity of λ_s

c. ST_t denote the subtype of points of type TGEP with intensity of λ_t



Legend

```
iso     Ripley isotropic correction estimate of Kcross["TGEP", "SALP"](r)
trans         translation-corrected estimate of Kcross["TGEP", "SALP"](r)
border             border-corrected estimate of Kcross["TGEP", "SALP"](r)
theo                        theoretical Poisson Kcross["TGEP", "SALP"](r)
```

Figure 31: K function of distances from TGEP to SALP

The result of pairwise distance function (K function) explored that (see **Figure 31**) the ***Ripley isotropic correction estimate of Kcross["TGEP", "SALP"](r)*** are greater than ***theoretical Poisson Kcross["TGEP", "SALP"](r)***, i.e. $K_{ts}(r) > \pi r^2$ (Baddeley, 2008).

So, the the null hypothesis of being a point pattern as uniform Poisson process (CSR) and .independent pattern rejected (Baddeley, 2008, pp. 170). Thus, it proved the Multitype point pattern (TGEP-SALP) as dependent again.

4.4.4 Exploration of Correlation

The confirmation of clear dependency of suicide attack location points on target group establishment location points inspired the study to approach towards exploring nature of spatial relationship between these two types of spatial point data (Multitype spatial point). The pattern of relationship between SALP and TGEP explored by application of marked correlation function techniques for categorical marks (Multitype point pattern) (Baddeley, 2008).

It was assumed ST (SALP-TGEP) a stationary point process for measuring dependence between SALP and TGELP with distance factor (r) by "mark correlation function" ρf(r).

The equation of mark correlation function adopted from the quation stated by Mr.. Baddeley as,

$$\rho f(r) = \frac{E[f(S1,T2)]}{E[f(\ddot{S},\ddot{T})]} \quad \text{…… ……(Baderely, 2008).}$$

Where,

- S1 and T1 are marks attached to two points process respectively as SALP and TGEP separated by a distance r
- $\ddot{S}\ and\ \ddot{T}$ are independent realizations of the marginal distribution of marks. And
- f is a function for Multitype point patters as f(S1,T1)=**1**{S1=T1}

This correlation function $\rho f(r)$ can take only positive real value and not exactly alike the usual statistical correlation. Instead of showing high correlation by value 1, it would represent no correlation.

The result of the correlation function for marked point pattern displayed in **Figure 32** revealed a nonlinear correlation between SALP and TGEP with distances. Still it was quite

clear that most of the suicide incidents occurred in close proximity of the target group's establishment location (**Figure 32**). The degree of correlation declined with increase of distance between suicide attack location and target group establishment location. When the distance between a pair of points composed by a suicide attack location and a corresponding nearby target group establishment location approximately exceeds 2.8kimometer then there would be negative correlation between that pair of points.

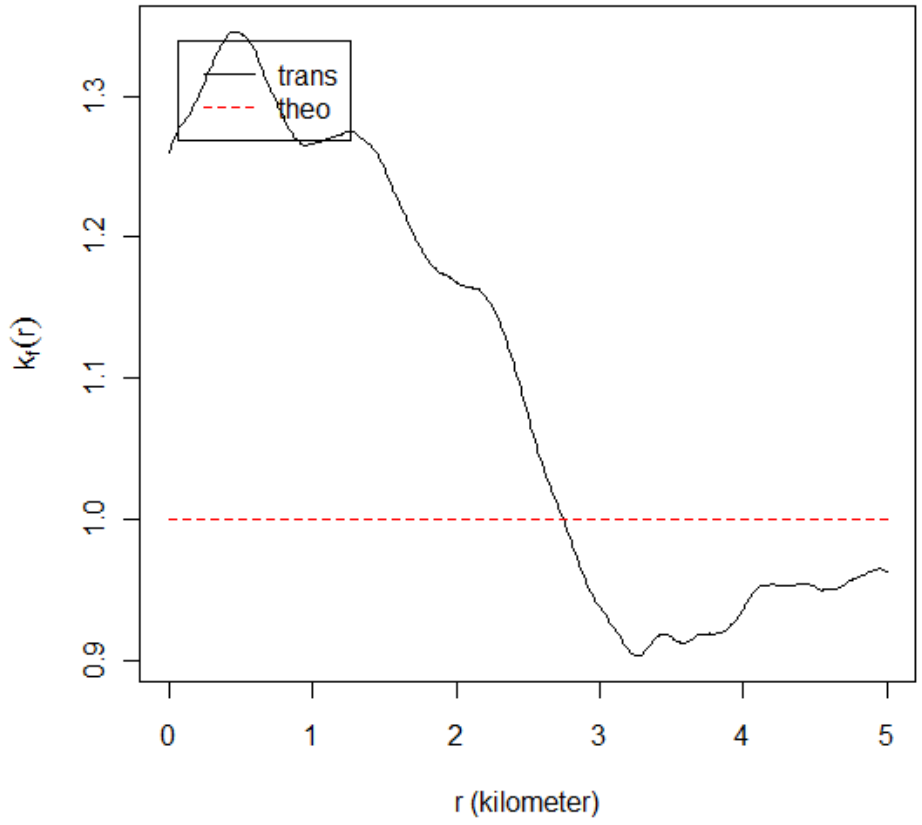


Figure 32: Realization of mark correlation function between SALP and TGEP

4.4.5 Summary of the Point Pattern Analysis

The findings of spatial point pattern analysis of suicide attack location inspired us to draw some general spatial scenario in Kabul city.

This spatial point pattern analysis, in support to three specific objective, results explored that,

- There is a general tendency to locate Government administrative establishments in a cluster in the center of the Kabul city.

- The location of International organizations also concentrated in the city center in a cluster.

- The suicide attack locations are little scattered compared to the pattern of target group establishment locations. But still their concentration is higher in the city centre and represents inhomogeneous and clustered pattern.
- There is a nonlinear distance relationship between suicide attack location points and target group establishment location points, where maximum suicide attack occurs in close proximity of target group establishment location with higher degree of positive correlation.

We hope the above findings of this research might be a base to continue further advanced spatial analysis on top of this for modelling suicide attack for inventing and introducing appropriate protective measures to save Kabul from such devastating incidences.

4.5 Overall Suicide Attack Scenarios in Kabul

It has been noticed that the news about only major suicide attacks that incurred high casualties were publicly available. Few interesting general observations about the suicide attack in Kabul city revealed from spatial analysis are described in this section.

4.5.1 Who are the targets

It is quite clear that maximum intended targets were mainly international military convoy and high profile government employees (see **Table 6** and **Figure 33**). Some complex attacks (multiple suicide attacks in a group) were coordinated to target ministry buildings, foreign embassies, military bases and residents of high profile international employees. This thesis explored spatial dependence between suicide attack locations and location of target group's establishments (offices/work places, residents and Military bases).

Table 6: Target Group of Suicide Attack in Kabul

Target Group	Number of Attack*	Attack Percentage	Rank
International Military	29	45.31	1
National Defence and Security	11	17.19	2
Government Body	10	15.63	3
International Expatriate	5	7.81	4
Foreign Diplomatic Mission	4	6.25	5
Private Security Company	1	1.56	6
Unknown**	4	6.25	*Not Applicable*
Total Attack	64	100.00	

** The number of Suicide attack that were publicly available from the year 2006 to 2010.*

***The unknown target has been removed from the ranking.*

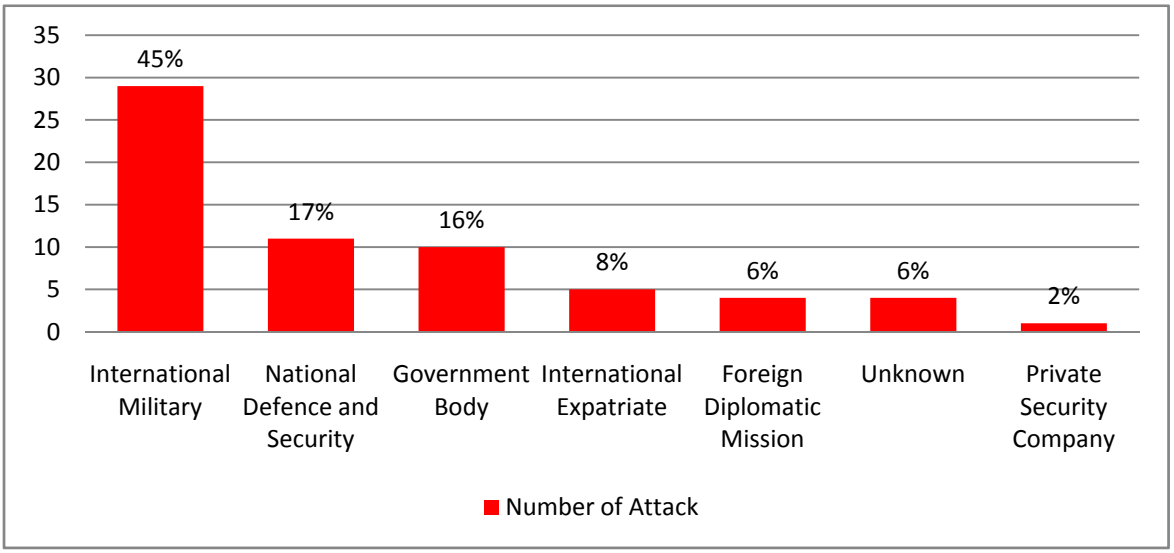


Figure 33: Number of attack by target group

4.5.2 How many suicide attacks happen in a month or a year

Our study found total 69 suicide attack incidents description from different sources that occurred from January, 2006 to the December, 2010. It is interesting that not all the cases among these incidents were covered by all of the sources. International news sites only reported high number of casualties and attacks to the high profile groups. Local news media published suicide attack news with good quality spatial information and sometimes published some details about miscarriage or premature suicide attacks as well. So, it is very difficult to say exactly how many suicide attacks occurred within this period. On average more than one (1.15/month) suicide attack occurred in every month. But temporal choices for suicide attacks are not so smooth. Sometimes, in few months there were no attacks and suddenly Kabul experienced 3-4 days with consecutive attacks in a row.

The Figure 34: Monthly Distribution of Suicide Attacks of years from 2006 to 2010.

The Figure 35: Daily Distribution of Suicide attacks occurred in Kabul with respect of months of years from 2006 to 2010. We did not find any considerable variation on choice of weekdays for suicide attacks in Kabul. Only on Friday, which is holyday in Afghanistan, there has been little low frequency of suicide attacks.

The Figure 36: Hourly Distribution with respect of week days of Suicide attacks occurred in Kabul from 2006 to 2010. It was found that morning time, when maximum people travels for work and all roads remain busy, is the most favorite time for the attackers to attack on target.

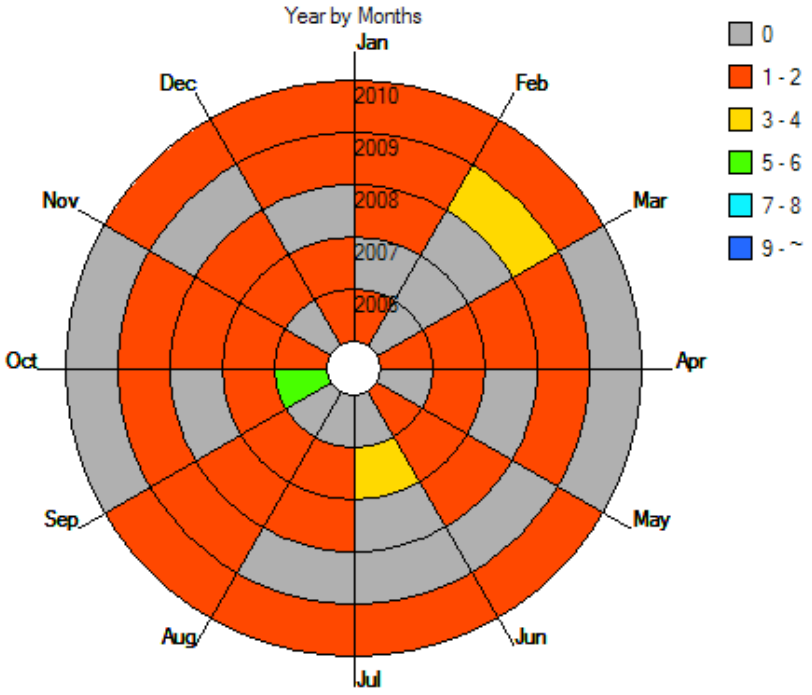


Figure 34: Monthly Distribution of Suicide Attacks of years from 2006 to 2010

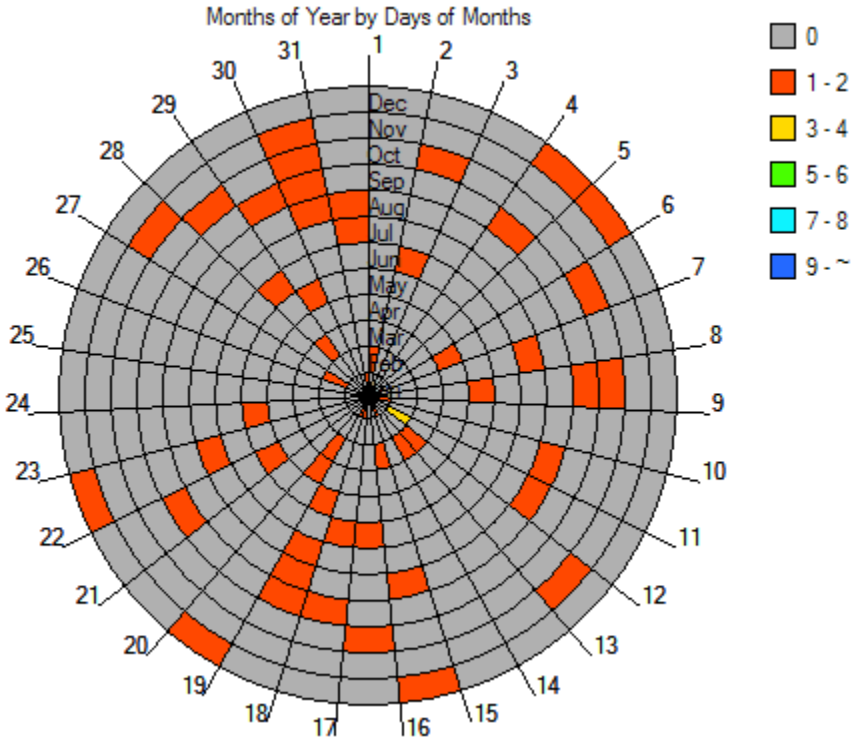


Figure 35: Daily Distribution of Suicide attacks occurred in Kabul with respect of months of years from 2006 to 2010

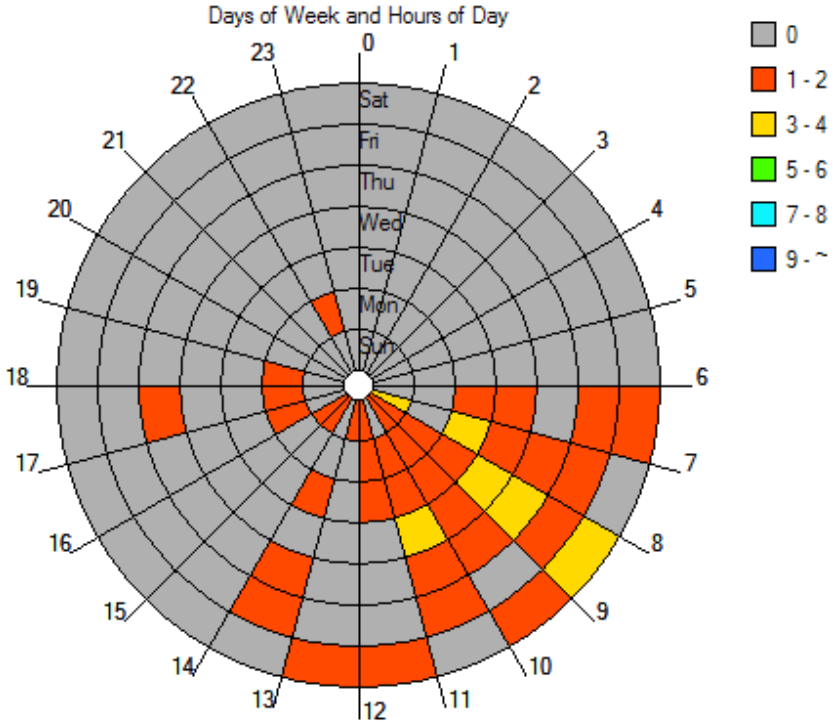


Figure 36: Hourly Distribution with respect of week days of Suicide attacks occurred in Kabul from 2006 to 2010

4.5.3 Where the suicide attack happens

Suicide attacks were happened in almost all parts of the city including very highly secured strategic points of Kabul city, except few completely residential areas and uninhabitable mountains (see **Figure 14**). Maximum suicide attack locations were found on the road which incurred higher number of civilian casualties than harm done to the target group (Annex: I). In many cases the attackers missed the target and did harm to the civilians only.

Primarily it was difficult to understand the suicide attack concentration from a simple map like **Figure 14**. As repeated suicide attack in same location or close by points were going underneath of the point on top. So, we used event counting technique using 200meter snapping distance from each point location to aggregate nearby suicide attack locations within a distance of 200 meter and count the number of incidents. The result of the event count by snapping distance of 200meter of each suicide attack location are depicted in **Figure 37** with graduated symbols sizes.

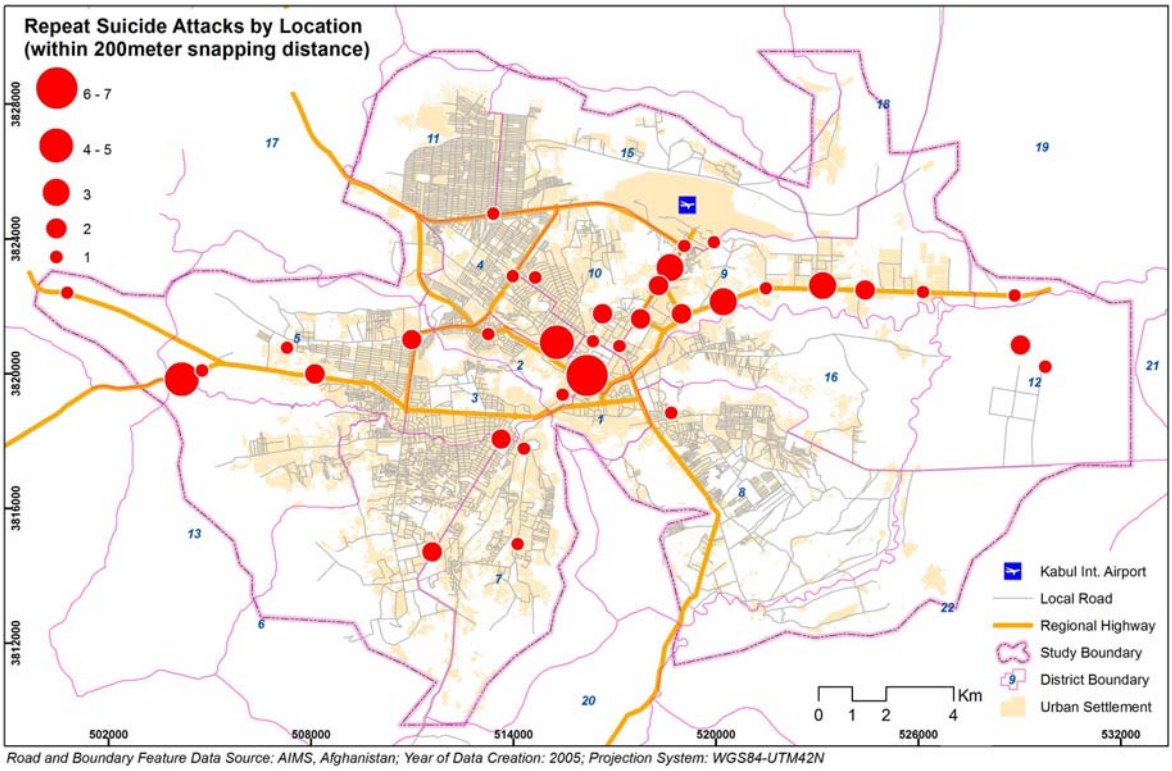
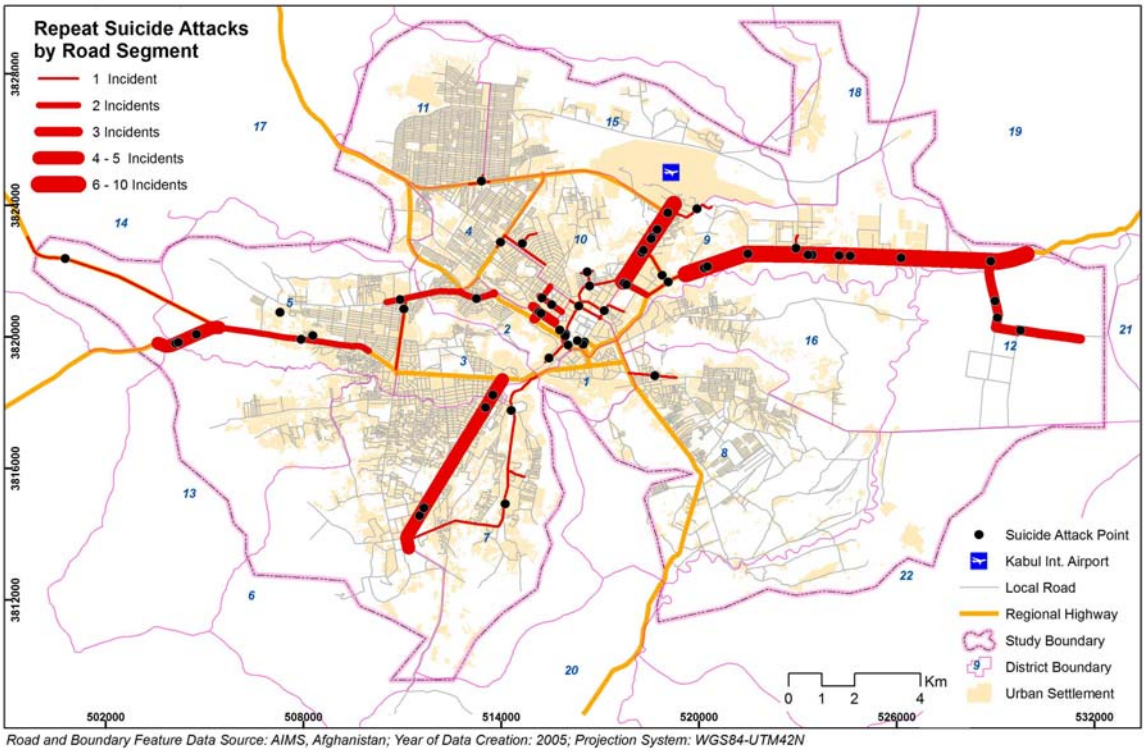


Figure 37: Repetition of suicide attacks by location

The above map of repeated suicide attacks by location displayed the high and low concentration of suicide attack clearly.

The point pattern analysis has given an expression of linear tendency of suicide attack locations which might follow few major roads. So, we selected all the road segments that experienced suicide attacks on or within a distance of 50meter and counted number of repeat incidents. The result of quarry for on the road and nearby suicide attacks with number of repeat on same segment is displayed in **Figure 24**.



Road and Boundary Feature Data Source: AIMS, Afghanistan; Year of Data Creation: 2005; Projection System: WGS84-UTM42N

Figure 38: Repetition of suicide attacks by road segment

The above figure displaying 4-5 road with very thick red line with 4 to 10 suicide attack in that segment within last 5 years. The thickest road to the east is the main road connected Jalalabad city with Kabul and which is also serves the purpose of Asian Highway to connect Pakistan, India and so on through Khaibar Pass as a route of business and communication.

The result of previous analysis was interesting and demanded in-depth investigation to those hotspots. From the result of repeat suicide attack by location (**Figure 37**), we selected points where 3 or more suicide attacks occurred in last 5 years for further investigation. We found total 6 locations where 3 or more suicide attacks occurred within 200meter snapping distance from each other. Then we drew 4 zone rectangles at a scale of 1: 80,000 to 1: 130,000 depending upon spread of impact area and density to cover surroundings of 6 selected locations for identifying their nearby influence.

The **Figure 39** displaying one overview map of all repainting suicide attacks nearby for 3 or more times in last 5 years. In the bottom there are 4 zone maps with corresponding scale, showing surrounding important structures.

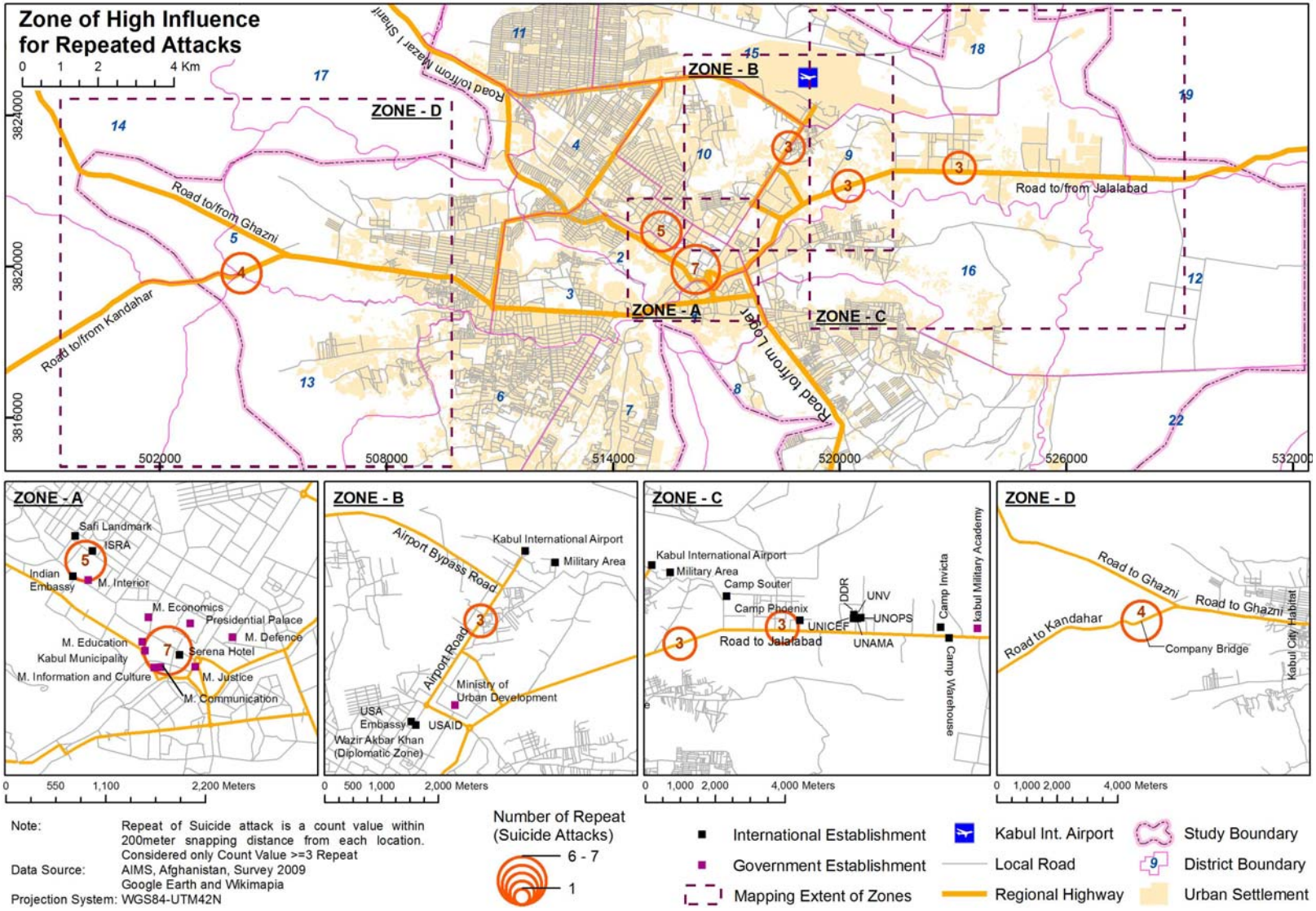


Figure 39: The zones of high influence for repeated attacks

Zone A is located in the heart of the city, where 7 suicide attacks occurred very close to many ministry building and presidential palace. The second red circle with 5 suicide attack is located in the middle of Indian Embassy and ministry of Interior and near to Safi Landmark international hotel.

Zone B framed USA Embassy, USAID, Kabul International Airport and a military Camp beside the airport. The red circle of 3 suicide attack is located in the middle of USA Embassy and Kabul international airport on the connecting road.

Zone C covered the Jalalabad road which was indentified with thickest read line with highest number of suicide attack incident repeat within last 5 years (**Figure 38**). It was found that most of the national and international military camps are located beside this road. 5 United Nation's department also located in a fortified compound also located nearby. The suicide attackers easily target the military convoy with VBIED in this road hiding in the crowd.

The Zone D is located to the west of Kabul city outside of the city habitat containing a crowd of 4 repeated suicide attacks on a road leading towards Kandahar. The close view explored that there is a road Bridge named Company Bridge which was used to trap the target convoy to execute successful suicide attack (**Figure 39**).

CHAPTER 5: CONCLUSION AND FUTURE WORK

5.1 Conclusion

This research generated some important quantitative information which is a foundation to go one step forward to defend suicide attack in Kabul scientifically. There is a general tendency to locate Government administrative establishments in a cluster in the center of the Kabul city. The location of international organizations is also concentrated in the city center as a cluster. The suicide attack locations are little scattered compared to the pattern of target group establishment locations. But still their concentration is higher in the city center and represents inhomogeneous and clustered pattern. There is a nonlinear distance relationship between suicide attack location points and target group establishment location points, where maximum suicide attack occurs in close proximity of target group establishment location. It does not prove yet that specific suicide attack that is targeted to a specific group (particular government office or international office or military base etc.) is just adjacent to that group's establishment points.

The spatial and temporal analysis at the end explored some valuable information on suicide attacks in Kabul. The result and observation explained how a group of high profile targets attracts the suicide attackers to come nearby for successful attack. It identified some areas and specific road with high risk of suicide attacks and recommends to the citizen of Kabul to avoid those areas as much they can. It was also fund that morning hours from 7am to 9 am are most dangerous for travelers. The risks of being affected by the suicide attack increases in case of travel through dangerous roads or pass through dangerous areas from 7am to 9am.

This research produced some important maps that could support the city planning authority of Kabul to describe complex consequences of suicide attacks that takes place over the space and time. The maps and described areas need more concentration for structural and strategic measures to defend suicide attacks and save public property and valuable lives.

5.2 Recommendation

We have some recommendations for future work approach, some of them we felt necessary but could not manage within the stipulated time and some are our realization from study findings that could bring different kind of inference.

i. Pattern analysis can be an aid to modeling suicide attacks and successful prediction

ii. Particular suicide attack location could be paired with the location of corresponding establishment of the intended target for better outcome. But it needed more detail information on every incident.

iii. Spatial choice analysis and modeling (why that particular location was selected by the attacker for that particular incident) considering multiple variables on spatial aspects of suicide location could be studied in advanced stage.

iv. High density areas should be carefully considered in the city planning unit for introducing physical measures to improve security

v. Network analysis could be interesting to find the weak points of the existing secured zones that might used by the attacker to penetrate inside the secured zone like the suicide attack on 15.08.2009 (See **Annex I-6**).

vi. Measure of traffic density was very important for assessing risk level of any road for suicide attacks.

vii. Distance from road intersection can be an interesting analysis, as it was found that many cases the suicide attacker waits for target prior of the attack to hit on the target at right moment during traffic congestion. So, nearby road connection and its profile analysis could be valuable.

viii. High official and military convoy should avoid civilian crowd and should select alternative routes.

ix. Afghan Government should take initiative to collect and preserve all the incident location point data with high accuracy GPS devices.

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Suicide Attack Report Database

Spatial Analysis of Suicide Attack Incidences in Kabul City

ID:	**1**
Date:	19/12/2010
Time_Specific:	07:00:00 AM
Time_Range:	Morning
Province:	Kabul
District:	19
Area_Name:	Pul-e-Charkhi
Street:	Kabul-Jalalabad highway
Spatial Reference:	on Kabul-Jalalabad highway, Pul-e-Charkhi area, outside the Kabul military training center, in the eastern part of capital Kabul

X Coordinate:	Y Coordinate:
Attack_Technique:	BBIED
Intended_Target:	Afghan National Army
Quality_of_Execution:	On the Target
Target People Killed:	5
Target people Wounded:	9
Other People Killed:	
Other People Wounded:	
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 07:00:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 528855.33 Y Coordinate: 3822312.5

ID:	**2**
Date:	12/11/2010
Time_Specific:	
Time_Range:	Afternoon
Province:	Kabul
District:	6
Area_Name:	Darulaman Road
Street:	Darulaman Road
Spatial Reference:	on the Darul Aman Road, Near an IM Installation; at the same area where attack happened on 18 may 2010

X Coordinate:	Y Coordinate:
Attack_Technique:	VBIED
Intended_Target:	International Military Convoy
Quality_of_Execution:	Target Missed
Target People Killed:	
Target people Wounded:	
Other People Killed:	
Other People Wounded:	1
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 01:30:00 PM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 511524.28 Y Coordinate: 3814578.48

ID:	**3**
Date:	10/08/2010
Time_Specific:	11:55:00 AM
Time_Range:	Morning
Province:	Kabul
District:	4
Area_Name:	Taimani
Street:	9 Street
Spatial Reference:	In the Vicinity of a Private Security Company Villa, 9 Street, Taimani

X Coordinate:	Y Coordinate:
Attack_Technique:	BBIED
Intended_Target:	Private Security Company
Quality_of_Execution:	Partially on the Target
Target People Killed:	2
Target people Wounded:	
Other People Killed:	
Other People Wounded:	
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 11:55:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 514638.72 Y Coordinate: 3822852.95

ID:	**4**
Date:	18/07/2010
Time_Specific:	11:55:00 AM
Time_Range:	Beforenoon
Province:	Kabul
District:	9
Area_Name:	Macroryan 4
Street:	
Spatial Reference:	near to a clinic named Shino Zada, in 4 Macrorayan, District 9

X Coordinate:	
Y Coordinate:	
Attack_Technique:	BBIED
Intended_Target:	International Military Convoy
Quality_of_Execution:	Partially on the Target
Target People Killed:	
Target people Wounded:	2
Other People Killed:	3
Other People Wounded:	20
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time:	11:55:00 AM
Estimated Coordinate (WGS1984-UTM42N) :	
X Coordinate:	518884.63
Y Coordinate:	3821881.54

ID:	**5**
Date:	02/06/2010
Time_Specific:	09:45:00 AM
Time_Range:	Beforenoon
Province:	Kabul
District:	5
Area_Name:	Polytechnic University
Street:	
Spatial Reference:	few hundred meters to the south of the venue of National peace conference held at Polytechnic University, District 5

X Coordinate:	
Y Coordinate:	
Attack_Technique:	BBIED
Intended_Target:	Political People
Quality_of_Execution:	Miscarriage
Target People Killed:	
Target people Wounded:	
Other People Killed:	
Other People Wounded:	
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time:	09:45:00 AM
Estimated Coordinate (WGS1984-UTM42N) :	
X Coordinate:	511043.6
Y Coordinate:	3820863.05

ID:	**6**
Date:	29/05/2010
Time_Specific:	12:45:00 PM
Time_Range:	Afternoon
Province:	Kabul
District:	9
Area_Name:	Industrial/Commercial area on the Old Bagram Road
Street:	Old kabul-Bagram Road
Spatial Reference:	Outside of a military caterer. East of capital, close to supreme supermarket, within the Industrial/Commercial area along Old kabul-Bagram Road in vicinity of the ISAF's Camp Phoenix

X Coordinate:	
Y Coordinate:	
Attack_Technique:	BBIED
Intended_Target:	Unknown
Quality_of_Execution:	Miscarriage
Target People Killed:	
Target people Wounded:	
Other People Killed:	
Other People Wounded:	
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time:	12:45:00 PM
Estimated Coordinate (WGS1984-UTM42N) :	
X Coordinate:	522945.07
Y Coordinate:	3822711.32

ID:	**7**
X Coordinate:	
Y Coordinate:	

Date:	18/05/2010
Time_Specific:	08:00:00 AM
Time_Range:	Morning
Province:	Kabul
District:	6
Area_Name:	Darul Aman
Street:	Darulaman Road
Spatial Reference:	on Darul Aman road, close to the Afghan National Army Counter Insurgency Academy, ANA Recruitment Center and two Ministries; north of Darul Aman Palace.

Attack_Technique:	VBIED
Intended_Target:	International Military Convoy
Quality_of_Execution:	On the Target
Target People Killed:	6
Target people Wounded:	3
Other People Killed:	14
Other People Wounded:	45
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 08:00:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 511652.36 Y Coordinate: 3814811.82

ID:	**8**
Date:	26/02/2010
Time_Specific:	06:45:00 AM
Time_Range:	Morning
Province:	Kabul
District:	4
Area_Name:	Shar i Naw area
Street:	
Spatial Reference:	Infront of Hamid guest house and Park Residence Hotel, near Safi Landmark Hotel (City Center Shopping Complex) at Share Naw

X Coordinate: Y Coordinate:

Attack_Technique:	VBIED
Intended_Target:	Indian Nationals, embassy officials
Quality_of_Execution:	On the Target
Target People Killed:	9
Target people Wounded:	
Other People Killed:	8
Other People Wounded:	38
Insurgents killed:	5
Insurgents Wounded:	

Estimated Information :

Estimated Time: 06:45:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 515238.58 Y Coordinate: 3821195.35

ID:	**9**
Date:	18/01/2010
Time_Specific:	09:45:00 AM
Time_Range:	Morning
Province:	Kabul
District:	2
Area_Name:	Pashtunistan Square, Malik Aghar Square and Cinema Pamir area
Street:	
Spatial Reference:	1 PBIED near the entrance to the Presidential Palace; near Pashtunistan Square; 2 PBIED inside Feroshgah Market

X Coordinate: Y Coordinate:

Attack_Technique:	BBIED
Intended_Target:	Presidential Palace, Ministry of Justice, Ministry of Finance and the Afghanistan
Quality_of_Execution:	On the Target
Target People Killed:	4
Target people Wounded:	28
Other People Killed:	4
Other People Wounded:	28
Insurgents killed:	6
Insurgents Wounded:	

Estimated Information :

Estimated Time: 09:45:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 516527.04 Y Coordinate: 3819853.65

ID:	**10**

X Coordinate: Y Coordinate:

Date:	18/01/2010
Time_Specific:	11:30:00 AM
Time_Range:	Beforenoon
Province:	Kabul
District:	2
Area_Name:	Malik Aghar Square
Street:	Malik Aghar Square
Spatial Reference:	at the Malik Aghar Square, in front of the Gulbahar Centre and close to the Ministry of Education

Attack_Technique:	VBIED
Intended_Target:	Ministry of Education
Quality_of_Execution:	Partially on the Target
Target People Killed:	
Target people Wounded:	2
Other People Killed:	
Other People Wounded:	3
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 11:30:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 515964.92 Y Coordinate: 3820082.81

ID:	**11**
Date:	15/12/2009
Time_Specific:	10:50:00 AM
Time_Range:	Beforenoon
Province:	Kabul
District:	10
Area_Name:	Wazir Akbar Khan area
Street:	corner of 14th and 8th Street
Spatial Reference:	Corner of 14th street and Lane 8, in front of Heetal Hotel, in Wazir Akbar Khan area

X Coordinate: Y Coordinate:

Attack_Technique:	VBIED
Intended_Target:	International Hotel
Quality_of_Execution:	On the Target
Target People Killed:	5
Target people Wounded:	
Other People Killed:	
Other People Wounded:	10
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 10:50:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 516605.72 Y Coordinate: 3821984.91

ID:	**12**
Date:	28/10/2009
Time_Specific:	06:00:00 AM
Time_Range:	Morning
Province:	Kabul
District:	4
Area_Name:	Shar-i-Naw locality
Street:	
Spatial Reference:	Bakhtar guest house, at Shar-i-Naw locality of Kabul city

X Coordinate: Y Coordinate:

Attack_Technique:	BBIED
Intended_Target:	UN Guest House
Quality_of_Execution:	On the Target
Target People Killed:	5
Target people Wounded:	7
Other People Killed:	3
Other People Wounded:	
Insurgents killed:	3
Insurgents Wounded:	

Estimated Information :

Estimated Time: 06:00:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 515531.89 Y Coordinate: 3820988.7

ID:	**13**

X Coordinate: Y Coordinate:

Date:	08/10/2009
Time_Specific:	08:27:00 AM
Time_Range:	Morning
Province:	Kabul
District:	2
Area_Name:	Sher I Naw
Street:	Interrior Ministry Street
Spatial Reference:	outside wall of the embassy, in front of the Indian embassy, on Interrior Ministry Street

Attack_Technique:	VBIED
Intended_Target:	Indian Embassy, Kabul
Quality_of_Execution:	Partially on the Target
Target People Killed:	2
Target people Wounded:	
Other People Killed:	15
Other People Wounded:	63
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 08:27:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 515153.13 Y Coordinate: 3820766.1

ID:	**14**
Date:	17/09/2009
Time_Specific:	
Time_Range:	Afternoon
Province:	Kabul
District:	9
Area_Name:	Bibi Mahro Area
Street:	Airport Road
Spatial Reference:	on Kabul's airport road, about 1.5 kilometres (one mile) from the US embassy gates, at Bibi Mahro area.

X Coordinate: Y Coordinate:

Attack_Technique:	VBIED
Intended_Target:	International Military Convoy
Quality_of_Execution:	On the Target
Target People Killed:	6
Target people Wounded:	4
Other People Killed:	10
Other People Wounded:	12
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 01:30:00 PM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 518265.77 Y Coordinate: 3822571.63

ID:	**15**
Date:	08/09/2009
Time_Specific:	08:30:00 AM
Time_Range:	Morning
Province:	Kabul
District:	9
Area_Name:	Kabul Airport
Street:	Airport Road
Spatial Reference:	Near the Entrance of the Kabul Military Airport, at the eastern entrance of Kabul International Airport.

X Coordinate: Y Coordinate:

Attack_Technique:	VBIED
Intended_Target:	International Military Convoy
Quality_of_Execution:	Partially on the Target
Target People Killed:	
Target people Wounded:	
Other People Killed:	4
Other People Wounded:	14
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 08:30:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 519944.04 Y Coordinate: 3823902.45

ID: **16** X Coordinate: Y Coordinate:

Date:	18/08/2009
Time_Specific:	01:00:00 PM
Time_Range:	Afternoon
Province:	Kabul
District:	9
Area_Name:	Camp Phoenix Area
Street:	Kabul-Jalalabad highway
Spatial Reference:	Camp Phoenix Area, District 9, on the Jalalabad road, east of Kabul

Attack_Technique:	VBIED
Intended_Target:	International Military Convoy
Quality_of_Execution:	On the Target
Target People Killed:	2
Target people Wounded:	1
Other People Killed:	7
Other People Wounded:	50
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time:	01:00:00 PM		
Estimated Coordinate (WGS1984-UTM42N) :			
X Coordinate:	523430.49	Y Coordinate:	3822504.64

ID:	**17**
Date:	15/08/2009
Time_Specific:	08:00:00 AM
Time_Range:	Morning
Province:	Kabul
District:	10
Area_Name:	Shash Darak
Street:	Street between US Embassy and Presidential Palace
Spatial Reference:	outside the Nato headquarters, next to the US embassy, in the same street as the presidential palace.

X Coordinate:		Y Coordinate:	
Attack_Technique:	VBIED		
Intended_Target:	NATO Headquarter		
Quality_of_Execution:	On the Target		
Target People Killed:			
Target people Wounded:			
Other People Killed:	7		
Other People Wounded:	91		
Insurgents killed:	1		
Insurgents Wounded:			

Estimated Information :

Estimated Time:	08:00:00 AM		
Estimated Coordinate (WGS1984-UTM42N) :			
X Coordinate:	517132.84	Y Coordinate:	3820811.19

ID:	**18**
Date:	19/04/2009
Time_Specific:	
Time_Range:	
Province:	Kabul
District:	9
Area_Name:	outside Camp Souter, Jalalabad Road
Street:	Kabul-Jalalabad highway
Spatial Reference:	outside Camp Souter, Jalalabad Road

X Coordinate:		Y Coordinate:	
Attack_Technique:	BBIED		
Intended_Target:	International Military Convoy		
Quality_of_Execution:	Miscarriage		
Target People Killed:			
Target people Wounded:			
Other People Killed:			
Other People Wounded:			
Insurgents killed:	1		
Insurgents Wounded:			

Estimated Information :

Estimated Time:	12:00:00 PM		
Estimated Coordinate (WGS1984-UTM42N) :			
X Coordinate:	521482.46	Y Coordinate:	3822532.52

ID:	**19**	X Coordinate:	Y Coordinate:

Date:	15/03/2009
Time_Specific:	
Time_Range:	Morning
Province:	Kabul
District:	5
Area_Name:	Kampany locality, Lisa Kashif Area
Street:	
Spatial Reference:	in front of a school in Kampany locality, Lisa Kashif Area, District 5, southwest of Kabul city

Attack_Technique:	VBIED
Intended_Target:	Unknown
Quality_of_Execution:	Target Missed
Target People Killed:	
Target people Wounded:	
Other People Killed:	2
Other People Wounded:	14
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 07:30:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 504756.74 Y Coordinate: 3820090.08

ID: 20

Date:	11/02/2009
Time_Specific:	10:10:00 AM
Time_Range:	Beforenoon
Province:	Kabul
District:	11
Area_Name:	Lab-e-Jar, in Khairkhana
Street:	
Spatial Reference:	at the entrance gate and inside of the building of the Prison Directorate, Lab-e-Jar Area, in Khairkhana

X Coordinate: Y Coordinate:

Attack_Technique:	BBIED
Intended_Target:	Building of the Prison Directorate
Quality_of_Execution:	On the Target
Target People Killed:	6
Target people Wounded:	29
Other People Killed:	
Other People Wounded:	
Insurgents killed:	2
Insurgents Wounded:	

Estimated Information :

Estimated Time: 10:10:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 513402.12 Y Coordinate: 3824750.51

ID: 21

Date:	11/02/2009
Time_Specific:	10:20:00 AM
Time_Range:	Beforenoon
Province:	Kabul
District:	2
Area_Name:	Malik Asghar Square
Street:	
Spatial Reference:	at the gate of Ministry of Education

X Coordinate: Y Coordinate:

Attack_Technique:	BBIED
Intended_Target:	Ministry of Education
Quality_of_Execution:	Target Missed
Target People Killed:	
Target people Wounded:	
Other People Killed:	
Other People Wounded:	
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 10:20:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 515943.97 Y Coordinate: 3820036.41

ID: 22

X Coordinate: Y Coordinate:

Date:	11/02/2009
Time_Specific:	10:30:00 AM
Time_Range:	Beforenoon
Province:	Kabul
District:	2
Area_Name:	Pashtonistan Square
Street:	Pashtonistan Square
Spatial Reference:	Inside the premises of the Ministry of Justice, near Pashtonistan Square, District 2

Attack_Technique:	Gun Fight and BBIED
Intended_Target:	Ministry of Justice
Quality_of_Execution:	On the Target
Target People Killed:	6
Target people Wounded:	
Other People Killed:	
Other People Wounded:	8
Insurgents killed:	4
Insurgents Wounded:	1

Estimated Information :

Estimated Time: 10:30:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 516492.53 Y Coordinate: 3819779.94

ID:	**23**
Date:	01/02/2009
Time_Specific:	
Time_Range:	Morning
Province:	Kabul
District:	5
Area_Name:	Company area
Street:	Kabul-Ghazni Highway
Spatial Reference:	on Kabul-Ghazni Highway, near Company Bridge

X Coordinate: Y Coordinate:

Attack_Technique:	VBIED
Intended_Target:	International Military Convoy
Quality_of_Execution:	Target Missed
Target People Killed:	
Target people Wounded:	
Other People Killed:	
Other People Wounded:	2
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 07:30:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 504140.84 Y Coordinate: 3819817.59

ID:	**24**
Date:	17/01/2009
Time_Specific:	09:50:00 AM
Time_Range:	Beforenoon
Province:	Kabul
District:	10
Area_Name:	Wazir Akbar Khan
Street:	15th Street
Spatial Reference:	at Zanbaq intersection, near German embassy, Camp Eggers of coalition forces and United Nations Mine Action Center for Afghanistan (UNMACA)

X Coordinate: Y Coordinate:

Attack_Technique:	VBIED
Intended_Target:	International Military Convoy
Quality_of_Execution:	Partially on the Target
Target People Killed:	
Target people Wounded:	6
Other People Killed:	3
Other People Wounded:	14
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 09:50:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 516353.03 Y Coordinate: 3820952.77

ID: **25** X Coordinate: Y Coordinate:

Date:	30/11/2008
Time_Specific:	02:30:00 PM
Time_Range:	Afternoon
Province:	Kabul
District:	7
Area_Name:	Darul-Aman road
Street:	Darulaman Road
Spatial Reference:	near Habibia high school, on Darul-Aman road (road to the Afghan parliament)

Attack_Technique:	BBIED
Intended_Target:	Diplomatic convoy
Quality_of_Execution:	Partially on the Target
Target People Killed:	
Target people Wounded:	
Other People Killed:	2
Other People Wounded:	3
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 02:30:00 PM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 513520.81 Y Coordinate: 3817864.11

ID:	**26**
Date:	27/11/2008
Time_Specific:	08:15:00 AM
Time_Range:	Morning
Province:	Kabul
District:	9
Area_Name:	Micro Ryan 3
Street:	Street between Abdul Haq and Massoud squares
Spatial Reference:	between Abdul Haq and Massoud squares about 40 meters (yards) from the entrance of the US embassy, in front of block No: 103 of Micro Ryan residential flats No: 3.

X Coordinate: Y Coordinate:

Attack_Technique:	VBIED
Intended_Target:	International Military Convoy
Quality_of_Execution:	Target Missed
Target People Killed:	
Target people Wounded:	
Other People Killed:	4
Other People Wounded:	17
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 08:15:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 517729.86 Y Coordinate: 3821638.73

ID:	**27**
Date:	30/10/2008
Time_Specific:	10:40:00 AM
Time_Range:	Beforenoon
Province:	Kabul
District:	1
Area_Name:	Ministry of Information and Culture
Street:	
Spatial Reference:	in the international meeting room on the first floor of the offices of the Ministry of Information and Culture

X Coordinate: Y Coordinate:

Attack_Technique:	BBIED
Intended_Target:	Ministry of Information and Culture
Quality_of_Execution:	On the Target
Target People Killed:	5
Target people Wounded:	10
Other People Killed:	
Other People Wounded:	
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 10:40:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 516036.04 Y Coordinate: 3819766.73

ID:	**28**

X Coordinate: Y Coordinate:

Date:	30/08/2008
Time_Specific:	11:05:00 AM
Time_Range:	Beforenoon
Province:	Kabul
District:	Paghman District
Area_Name:	Qala-e Haidar Khan Area
Street:	Paghman highway
Spatial Reference:	On the paghman highway of Qala-e Haidar Khan Area, Paghman

Attack_Technique:	VBIED
Intended_Target:	International Military Convoy
Quality_of_Execution:	Target Missed
Target People Killed:	
Target people Wounded:	
Other People Killed:	
Other People Wounded:	
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 11:05:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 500770.01 Y Coordinate: 3822394.72

ID: **29**

X Coordinate: Y Coordinate:

Date:	11/08/2008
Time_Specific:	04:30:00 PM
Time_Range:	Evening
Province:	kabul
District:	9
Area_Name:	Paktia Kot area
Street:	Kabul-Jalalabad highway
Spatial Reference:	Paktia Kot area, on Jalalabad Road, of eastern part of Kabul city, Within District 9

Attack_Technique:	VBIED
Intended_Target:	International Military Convoy
Quality_of_Execution:	Partially on the Target
Target People Killed:	
Target people Wounded:	2
Other People Killed:	3
Other People Wounded:	17
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 04:30:00 PM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 526129.2 Y Coordinate: 3822415

ID: **30**

X Coordinate: Y Coordinate:

Date:	22/07/2008
Time_Specific:	06:30:00 AM
Time_Range:	Morning
Province:	Kabul
District:	7
Area_Name:	Bagh-e-Babar/ Babur's Garden
Street:	
Spatial Reference:	outside of the boundary of Bagh-e-Babar

Attack_Technique:	BBIED
Intended_Target:	Afghan National Army Bus
Quality_of_Execution:	Target Missed
Target People Killed:	
Target people Wounded:	
Other People Killed:	5
Other People Wounded:	
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 06:30:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 514308.04 Y Coordinate: 3817771.25

ID: **31**

X Coordinate: Y Coordinate:

Date:	07/07/2008
Time_Specific:	08:30:00 AM
Time_Range:	Morning
Province:	Kabul
District:	4
Area_Name:	Shar e Naw
Street:	Street between Ministry of Interior and Indian Embassy
Spatial Reference:	In front of Indian Embassy gate at Shar e Naw

Attack_Technique:	VBIED
Intended_Target:	Indian Embassy
Quality_of_Execution:	On the Target
Target People Killed:	2
Target people Wounded:	
Other People Killed:	38
Other People Wounded:	141
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 08:30:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 515145.22 Y Coordinate: 3820771.47

ID:	**32**
Date:	29/05/2008
Time_Specific:	08:20:00 AM
Time_Range:	Morning
Province:	Kabul
District:	12
Area_Name:	Pul-i-Charkhi
Street:	Kabul-Jalalabad highway
Spatial Reference:	near the Pul-i-Charkhi Jail, near the Pul-i-Charkhi neighbourhood, on the eastern outskirt of Kabul; between Zanabad and Qala Wazir areas;

X Coordinate: Y Coordinate:

Attack_Technique:	VBIED
Intended_Target:	International Military Convoy
Quality_of_Execution:	On the Target
Target People Killed:	
Target people Wounded:	2
Other People Killed:	3
Other People Wounded:	12
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 08:20:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 529061.72 Y Coordinate: 3820594.46

ID:	**33**
Date:	08/05/2008
Time_Specific:	05:45:00 PM
Time_Range:	Evening
Province:	Kabul
District:	5
Area_Name:	Niaz Beg or Fazel Big
Street:	Niaz Beg or Fazel Big
Spatial Reference:	Niaz Beg or Fazel Big

X Coordinate: Y Coordinate:

Attack_Technique:	VBIED
Intended_Target:	International Military Convoy
Quality_of_Execution:	Target Missed
Target People Killed:	
Target people Wounded:	
Other People Killed:	
Other People Wounded:	5
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 05:45:00 PM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 507925.53 Y Coordinate: 3819934.21

ID: **34** X Coordinate: Y Coordinate:

Date:	13/03/2008
Time_Specific:	08:00:00 AM
Time_Range:	Morning
Province:	Kabul
District:	9
Area_Name:	Qali Wakil
Street:	Airport Road
Spatial Reference:	near the Kabul International Airport

Attack_Technique:	VBIED
Intended_Target:	International Military Convoy
Quality_of_Execution:	Partially on the Target
Target People Killed:	
Target people Wounded:	4
Other People Killed:	6
Other People Wounded:	20
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 08:00:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 518570.69 Y Coordinate: 3823039.7

ID:	**35**
Date:	31/01/2008
Time_Specific:	07:20:00 AM
Time_Range:	Morning
Province:	Kabul
District:	4
Area_Name:	Taimani neighborhood
Street:	road between Taimani and Sarsabzi squares
Spatial Reference:	on the road between Taimani and Sarsabzi squares

X Coordinate: Y Coordinate:

Attack_Technique:	VBIED
Intended_Target:	Afghan National Army Bus
Quality_of_Execution:	Target Missed
Target People Killed:	
Target people Wounded:	
Other People Killed:	1
Other People Wounded:	2
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 07:20:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 513977.33 Y Coordinate: 3822894.1

ID:	**36**
Date:	14/01/2008
Time_Specific:	06:15:00 PM
Time_Range:	Night
Province:	kabul
District:	2
Area_Name:	Faroshgah
Street:	
Spatial Reference:	at Serena Hotel, Faroshgah neighbourhood, Kabul City

X Coordinate: Y Coordinate:

Attack_Technique:	BBIED
Intended_Target:	International Hotel
Quality_of_Execution:	On the Target
Target People Killed:	4
Target people Wounded:	6
Other People Killed:	
Other People Wounded:	
Insurgents killed:	2
Insurgents Wounded:	

Estimated Information :

Estimated Time: 06:15:00 PM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 516313.21 Y Coordinate: 3819890.88

ID:	**37**

X Coordinate: Y Coordinate:

Date:	05/12/2007
Time_Specific:	07:00:00 AM
Time_Range:	Morning
Province:	Kabul
District:	7
Area_Name:	Chehilsutoon/ Takhnikam
Street:	Takhnikam road
Spatial Reference:	on Takhnikum road, at Chehilsutoon area, within District 7

Attack_Technique:	VBIED
Intended_Target:	Afghan National Army Passenger
Quality_of_Execution:	On the Target
Target People Killed:	6
Target people Wounded:	7
Other People Killed:	7
Other People Wounded:	10
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time:	07:00:00 AM		
Estimated Coordinate (WGS1984-UTM42N) :			
X Coordinate:	514122	Y Coordinate:	3814929.5

ID:	**38**
Date:	04/12/2007
Time_Specific:	
Time_Range:	Morning
Province:	Kabul
District:	9
Area_Name:	Qala-i-Wakil
Street:	Airport Road
Spatial Reference:	close to the Kabul International Airport, at Qala-i-Wakil area, within District 9

X Coordinate:		Y Coordinate:	
Attack_Technique:	VBIED		
Intended_Target:	International Military Convoy and ANA Bus		
Quality_of_Execution:	Target Missed		
Target People Killed:			
Target people Wounded:			
Other People Killed:			
Other People Wounded:	10		
Insurgents killed:	1		
Insurgents Wounded:			

Estimated Information :

Estimated Time:	07:30:00 AM		
Estimated Coordinate (WGS1984-UTM42N) :			
X Coordinate:	518544.85	Y Coordinate:	3822993.94

ID:	**39**
Date:	27/11/2007
Time_Specific:	07:40:00 AM
Time_Range:	Morning
Province:	Kabul
District:	10
Area_Name:	Wazir Akbar Khan
Street:	Street 14
Spatial Reference:	close to a mosque on the 14th Road, at Wazir Akbar Khan area, within District 10

X Coordinate:		Y Coordinate:	
Attack_Technique:	VBIED		
Intended_Target:	International Military Convoy		
Quality_of_Execution:	On the Target		
Target People Killed:			
Target people Wounded:			
Other People Killed:	2		
Other People Wounded:	4		
Insurgents killed:	1		
Insurgents Wounded:			

Estimated Information :

Estimated Time:	07:40:00 AM		
Estimated Coordinate (WGS1984-UTM42N) :			
X Coordinate:	516677.95	Y Coordinate:	3821559.75

ID:	**40**

X Coordinate:		Y Coordinate:	

Date:	24/11/2007
Time_Specific:	
Time_Range:	Morning
Province:	Kabul
District:	Paghman District
Area_Name:	Chashma Bulbul
Street:	Istahkaam Bridge
Spatial Reference:	Istahkaam Bridge, Chashma Bulbul area of Paghman

Attack_Technique:	BBIED
Intended_Target:	International Military Convoy
Quality_of_Execution:	On the Target
Target People Killed:	1
Target people Wounded:	3
Other People Killed:	7
Other People Wounded:	15
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 07:30:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: Y Coordinate:

ID:	**41**
Date:	06/10/2007
Time_Specific:	08:10:00 AM
Time_Range:	Morning
Province:	Kabul
District:	9
Area_Name:	Airport Road
Street:	Airport Road
Spatial Reference:	on the road leading to Kabul International Airport

X Coordinate: Y Coordinate:

Attack_Technique:	VBIED
Intended_Target:	International Military Convoy
Quality_of_Execution:	Partially on the Target
Target People Killed:	
Target people Wounded:	1
Other People Killed:	1
Other People Wounded:	8
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 08:10:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 518729.55 Y Coordinate: 3823279.96

ID:	**42**
Date:	02/10/2007
Time_Specific:	07:10:00 AM
Time_Range:	Morning
Province:	Kabul
District:	5
Area_Name:	Char Rahi Qambar
Street:	
Spatial Reference:	Char Rahi Qambar area in the western part of the city

X Coordinate: Y Coordinate:

Attack_Technique:	BBIED
Intended_Target:	ANP
Quality_of_Execution:	On the Target
Target People Killed:	6
Target people Wounded:	
Other People Killed:	5
Other People Wounded:	8
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 07:10:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 507289.58 Y Coordinate: 3820758.02

ID: **43**

X Coordinate: Y Coordinate:

Date:	29/09/2007
Time_Specific:	06:40:00 AM
Time_Range:	Morning
Province:	Kabul
District:	2
Area_Name:	Baharistan Cinema
Street:	
Spatial Reference:	opposite of the Baharistan Cinema, District 2

Attack_Technique:	BBIED
Intended_Target:	Afghan National Army Bus
Quality_of_Execution:	On the Target
Target People Killed:	28
Target people Wounded:	21
Other People Killed:	
Other People Wounded:	
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 06:40:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 513248.67 Y Coordinate: 3821170.96

ID:	**44**
Date:	21/09/2007
Time_Specific:	
Time_Range:	Morning
Province:	Kabul
District:	5
Area_Name:	Company area
Street:	
Spatial Reference:	near the Company Bridge in district 5, East of kabul; same area of the blast on 16 June 2007 in Kabul

X Coordinate: Y Coordinate:

Attack_Technique:	VBIED
Intended_Target:	International Military Convoy
Quality_of_Execution:	On the Target
Target People Killed:	1
Target people Wounded:	
Other People Killed:	2
Other People Wounded:	5
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 07:30:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 504186.69 Y Coordinate: 3819837.01

ID:	**45**
Date:	31/08/2007
Time_Specific:	07:33:00 AM
Time_Range:	Morning
Province:	Kabul
District:	9
Area_Name:	Kabul International Airport
Street:	Airport Road
Spatial Reference:	Entrance to the Kabul International Airport; in front of the airport gate

X Coordinate: Y Coordinate:

Attack_Technique:	VBIED
Intended_Target:	International Military Convoy and ANA
Quality_of_Execution:	Partially on the Target
Target People Killed:	1
Target people Wounded:	7
Other People Killed:	
Other People Wounded:	8
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 07:33:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 519058.68 Y Coordinate: 3823784.16

ID: **46** X Coordinate: Y Coordinate:

Date:	31/07/2007
Time_Specific:	09:00:00 AM
Time_Range:	Morning
Province:	Kabul
District:	9
Area_Name:	Hutkhel
Street:	Kabul-Jalalabad highway
Spatial Reference:	In the vicinity of Camp Phoenix on the Jalalabad road, Hutkhel area, within District 9

Attack_Technique:	VBIED
Intended_Target:	International Military Convoy
Quality_of_Execution:	Partially on the Target
Target People Killed:	
Target people Wounded:	3
Other People Killed:	1
Other People Wounded:	
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 09:00:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 523310.24 Y Coordinate: 3822500.95

ID: 47

Date:	18/07/2007
Time_Specific:	08:00:00 AM
Time_Range:	Morning
Province:	Kabul
District:	5
Area_Name:	Company Bridge
Street:	Main Ghazni Road
Spatial Reference:	near Company Bridge on the main Ghazni Road

X Coordinate: Y Coordinate:

Attack_Technique:	BBIED
Intended_Target:	International Military Convoy
Quality_of_Execution:	Partially on the Target
Target People Killed:	
Target people Wounded:	1
Other People Killed:	
Other People Wounded:	1
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 08:00:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 504121.46 Y Coordinate: 3819811.67

ID: 48

Date:	06/07/2007
Time_Specific:	01:00:00 PM
Time_Range:	Afternoon
Province:	Kabul
District:	Deh Sabz district
Area_Name:	Khwaja Zanboor Wali mausoleum
Street:	
Spatial Reference:	near the Khwaja Zanboor Wali mausoleum, east of the capital, in Deh Sabz district of Kabul

X Coordinate: Y Coordinate:

Attack_Technique:	VBIED
Intended_Target:	International Military Convoy
Quality_of_Execution:	Partially on the Target
Target People Killed:	
Target people Wounded:	2
Other People Killed:	
Other People Wounded:	
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 01:00:00 PM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: Y Coordinate:

ID: 49

X Coordinate: Y Coordinate:

Date:	28/06/2007
Time_Specific:	09:00:00 AM
Time_Range:	Morning
Province:	Kabul
District:	12
Area_Name:	Arzan Qimat
Street:	road that leads to the Puli Charkhi Prison
Spatial Reference:	on the road that leads to the Puli Charkhi Prison District 12, Arzan Qimat Area; Ahmad Shah Baba Mena on the eastern outskirts of Kabul

Attack_Technique:	VBIED
Intended_Target:	American Contractor
Quality_of_Execution:	Partially on the Target
Target People Killed:	2
Target people Wounded:	3
Other People Killed:	
Other People Wounded:	
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 09:00:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 528991.27 Y Coordinate: 3821098.46

ID: 50

X Coordinate: Y Coordinate:

Date:	17/06/2007
Time_Specific:	08:00:00 AM
Time_Range:	Morning
Province:	Kabul
District:	2
Area_Name:	Police HQ
Street:	on route to the police academy
Spatial Reference:	at District 2, near Police HQ in Kabul

Attack_Technique:	BBIED
Intended_Target:	ANP
Quality_of_Execution:	On the Target
Target People Killed:	22
Target people Wounded:	46
Other People Killed:	
Other People Wounded:	5
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 08:00:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 515782.52 Y Coordinate: 3820223.41

ID: 51

X Coordinate: Y Coordinate:

Date:	16/06/2007
Time_Specific:	08:45:00 AM
Time_Range:	Morning
Province:	Kabul
District:	5
Area_Name:	Company area
Street:	Kabul-Wardak-Kandahar Highway
Spatial Reference:	on the main Wardak Highway, Company area, west of kabul City

Attack_Technique:	VBIED
Intended_Target:	International Military Convoy
Quality_of_Execution:	Partially on the Target
Target People Killed:	
Target people Wounded:	1
Other People Killed:	4
Other People Wounded:	2
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 08:45:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 504202.43 Y Coordinate: 3819845.15

ID: 52

X Coordinate: Y Coordinate:

Date:	23/05/2007
Time_Specific:	08:30:00 AM
Time_Range:	Morning
Province:	Kabul
District:	9
Area_Name:	Yakatoot Area
Street:	Kabul-Jalalabad highway
Spatial Reference:	on Jalalabad Road, at Yakatoot Area, District 9

Attack_Technique:	VBIED
Intended_Target:	ANP (police contingent)
Quality_of_Execution:	Partially on the Target
Target People Killed:	1
Target people Wounded:	2
Other People Killed:	
Other People Wounded:	4
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time:	08:30:00 AM		
Estimated Coordinate (WGS1984-UTM42N) :			
X Coordinate:	520236.46	Y Coordinate:	3822131.05

ID:	**53**
Date:	06/04/2007
Time_Specific:	
Time_Range:	Morning
Province:	Kabul
District:	3
Area_Name:	Serai Alauddin area
Street:	Darulaman Road
Spatial Reference:	on Darulaman Road, in the Serai Alauddin area, of District 3

X Coordinate:		Y Coordinate:	
Attack_Technique:	VBIED		
Intended_Target:	ANP		
Quality_of_Execution:	Partially on the Target		
Target People Killed:	1		
Target people Wounded:			
Other People Killed:	5		
Other People Wounded:	4		
Insurgents killed:	1		
Insurgents Wounded:			

Estimated Information :

Estimated Time:	08:00:00 AM		
Estimated Coordinate (WGS1984-UTM42N) :			
X Coordinate:	513749.5	Y Coordinate:	3818242.8

ID:	**54**
Date:	28/03/2007
Time_Specific:	08:00:00 AM
Time_Range:	Morning
Province:	Kabul
District:	2
Area_Name:	Joi Sher
Street:	Aasmayee road
Spatial Reference:	on Aasmayee road, in the Joi Sher locality, District 2

X Coordinate:		Y Coordinate:	
Attack_Technique:	BBIED		
Intended_Target:	NDS		
Quality_of_Execution:	Partially on the Target		
Target People Killed:			
Target people Wounded:	1		
Other People Killed:	2		
Other People Wounded:	5		
Insurgents killed:	1		
Insurgents Wounded:			

Estimated Information :

Estimated Time:	08:00:00 AM		
Estimated Coordinate (WGS1984-UTM42N) :			
X Coordinate:	515452.96	Y Coordinate:	3819366.09

ID:	**55**	X Coordinate:	Y Coordinate:

Date:	19/03/2007
Time_Specific:	09:00:00 AM
Time_Range:	Morning
Province:	Kabul
District:	9
Area_Name:	Yaka Toot
Street:	Kabul-Jalalabad highway
Spatial Reference:	in the Yaka Toot locality, east of the city, on Kabul - Jalalabad highway

Attack_Technique:	VBIED
Intended_Target:	US Embassy Convoy
Quality_of_Execution:	Target Missed
Target People Killed:	
Target people Wounded:	1
Other People Killed:	1
Other People Wounded:	3
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 09:00:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 520159.14 Y Coordinate: 3822111.43

ID:	**56**
Date:	21/01/2007
Time_Specific:	02:10:00 PM
Time_Range:	Afternoon
Province:	Kabul
District:	Char Asiab district
Area_Name:	Kabul - Gardez Highway
Street:	Kabul - Gardez Highway
Spatial Reference:	in Char Asiab district of Kabul, on the Kabul - Gardez Highway, some 15 kilometres south of Kabul

X Coordinate: Y Coordinate:

Attack_Technique:	VBIED
Intended_Target:	International Military Convoy
Quality_of_Execution:	Target Missed
Target People Killed:	
Target people Wounded:	
Other People Killed:	
Other People Wounded:	
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 02:10:00 PM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: Y Coordinate:

ID:	**57**
Date:	22/12/2006
Time_Specific:	10:00:00 AM
Time_Range:	Beforenoon
Province:	Kabul
District:	8
Area_Name:	Shah Shaheed area
Street:	
Spatial Reference:	near the Shah Shaheed area, some 150 metres away from Karta-i-Naw, within District 8

X Coordinate: Y Coordinate:

Attack_Technique:	VBIED
Intended_Target:	Member of Parlament
Quality_of_Execution:	Partially on the Target
Target People Killed:	
Target people Wounded:	3
Other People Killed:	1
Other People Wounded:	2
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 10:00:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 518665.64 Y Coordinate: 3818828.98

ID: **58** X Coordinate: Y Coordinate:

Date:	16/10/2006
Time_Specific:	11:30:00 AM
Time_Range:	Beforenoon
Province:	Kabul
District:	9
Area_Name:	Qala-i-Khayat, Bibi Mahro area
Street:	Airport Road
Spatial Reference:	in the Qala-i-Khayat area and Bibi Mahro area, on the Kabul airport road. near the school

Attack_Technique:	VBIED
Intended_Target:	Unknown
Quality_of_Execution:	Miscarriage
Target People Killed:	
Target people Wounded:	
Other People Killed:	
Other People Wounded:	
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 11:30:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 518319.13 Y Coordinate: 3822650.22

ID:	**59**
Date:	02/10/2006
Time_Specific:	10:00:00 AM
Time_Range:	Beforenoon
Province:	Kabul
District:	9
Area_Name:	Banayee
Street:	Kabul-Jalalabad highway
Spatial Reference:	in the Banayee area, east of the city, on Kabul-Jalalabad road

X Coordinate: Y Coordinate:

Attack_Technique:	VBIED
Intended_Target:	International Military Convoy
Quality_of_Execution:	Partially on the Target
Target People Killed:	
Target people Wounded:	3
Other People Killed:	
Other People Wounded:	3
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 10:00:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 519071.52 Y Coordinate: 3821678.31

ID:	**60**
Date:	30/09/2006
Time_Specific:	08:00:00 AM
Time_Range:	Morning
Province:	Kabul
District:	4
Area_Name:	Shar-i-Naw >Pejantoon Area
Street:	
Spatial Reference:	at the third gate (west gate) of Ministry of Interior building, Shar-i-Naw

X Coordinate: Y Coordinate:

Attack_Technique:	BBIED
Intended_Target:	Ministry of Interior Building
Quality_of_Execution:	On the Target
Target People Killed:	12
Target people Wounded:	16
Other People Killed:	
Other People Wounded:	
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 08:00:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 515210.35 Y Coordinate: 3820728.1

ID: **61** X Coordinate: Y Coordinate:

Date:	18/09/2006
Time_Specific:	05:30:00 PM
Time_Range:	Evening
Province:	Kabul
District:	9
Area_Name:	Hodkhel ~ Uhd Kheyl area
Street:	Kabul-Jalalabad highway
Spatial Reference:	Kabul city, District 9, Uhd Kheyl, Jalalabad Road, near Camp Phoenix and about 1 km west of the UNOCA compound

Attack_Technique:	VBIED
Intended_Target:	ANP
Quality_of_Execution:	Partially on the Target
Target People Killed:	3
Target people Wounded:	2
Other People Killed:	4
Other People Wounded:	8
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 05:30:00 PM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 524588.41 Y Coordinate: 3822469.01

ID:	**62**
Date:	17/09/2006
Time_Specific:	03:30:00 PM
Time_Range:	Evening
Province:	Kabul
District:	12
Area_Name:	Medium Wave area, Puli Charkhi area
Street:	On a dirt road that leads toward the Central Prison of Pulicharkhi
Spatial Reference:	Kabul city, District 12, Medium Wave area, Puli Charkhi area, north of Kabul Jalalabad road, on a dirt road that leads toward the Central Prison of Pulicharkhi

X Coordinate: Y Coordinate:

Attack_Technique:	BBIED
Intended_Target:	International Military Convoy
Quality_of_Execution:	Partially on the Target
Target People Killed:	
Target people Wounded:	2
Other People Killed:	
Other People Wounded:	2
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 03:30:00 PM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 529755.49 Y Coordinate: 3820206.54

ID:	**63**
Date:	08/09/2006
Time_Specific:	10:45:00 AM
Time_Range:	Beforenoon
Province:	Kabul
District:	10
Area_Name:	Massoud Roundabout, 3rd Macro Ryan
Street:	Street between Abdul Haq and Massoud squares
Spatial Reference:	quite opposite to 29 Block of the 3rd Macro Ryan; about 100 metres of American embassy; 20 metres of Massoud Roundabout

X Coordinate: Y Coordinate:

Attack_Technique:	VBIED
Intended_Target:	International Military Convoy
Quality_of_Execution:	On the Target
Target People Killed:	3
Target people Wounded:	13
Other People Killed:	
Other People Wounded:	29
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 10:45:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 517801.16 Y Coordinate: 3821602.35

ID: **64** X Coordinate: Y Coordinate:

Date:	04/09/2006
Time_Specific:	10:30:00 AM
Time_Range:	Beforenoon
Province:	Kabul
District:	9
Area_Name:	Yaka Toot area, Qali Wazir
Street:	Kabul-Jalalabad highway
Spatial Reference:	Yaka Toot area, Qali Wazir, on Kabul-Jalalabad road

Attack_Technique:	VBIED
Intended_Target:	International Military Convoy
Quality_of_Execution:	On the Target
Target People Killed:	1
Target people Wounded:	3
Other People Killed:	1
Other People Wounded:	4
Insurgents killed:	2
Insurgents Wounded:	

Estimated Information :

Estimated Time: 10:30:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 520258.3 Y Coordinate: 3822143.97

ID:	**65**
Date:	02/08/2006
Time_Specific:	08:00:00 AM
Time_Range:	Morning
Province:	Kabul
District:	8
Area_Name:	Sangai Naweshta
Street:	Kabul-Logar main road
Spatial Reference:	Kabul-Logar main road, near Sangai Naweshta area, within District 8

X Coordinate: Y Coordinate:

Attack_Technique:	VBIED
Intended_Target:	Unknown
Quality_of_Execution:	Miscarriage
Target People Killed:	
Target people Wounded:	
Other People Killed:	
Other People Wounded:	2
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 08:00:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: Y Coordinate:

ID:	**66**
Date:	21/05/2006
Time_Specific:	11:15:00 AM
Time_Range:	Beforenoon
Province:	Kabul
District:	9
Area_Name:	Ud Kheyl Village Area (Jalalabad Road)
Street:	Kabul-Jalalabad highway
Spatial Reference:	in the area of Camp Phoenix, Near Hoot Kheil Bazar, Ud Kheyl Village Area (Jalalabad Road)

X Coordinate: Y Coordinate:

Attack_Technique:	VBIED
Intended_Target:	International Military Convoy
Quality_of_Execution:	Target Missed
Target People Killed:	
Target people Wounded:	
Other People Killed:	2
Other People Wounded:	2
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 11:15:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 524255.44 Y Coordinate: 3822484.45

ID: **67** X Coordinate: Y Coordinate:

Date:	02/05/2006
Time_Specific:	08:30:00 AM
Time_Range:	Morning
Province:	Kabul
District:	Deh Sabz District
Area_Name:	Shineh area
Street:	Bagram-Kabul road (new road)
Spatial Reference:	on Bagram-Kabul road (new road), in the Bakhtiaran area, Shineh area, Deh Sabz District

Attack_Technique:	VBIED
Intended_Target:	International Military Convoy
Quality_of_Execution:	Target Missed
Target People Killed:	
Target people Wounded:	
Other People Killed:	1
Other People Wounded:	
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 08:30:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: Y Coordinate:

ID: 68

Date:	12/03/2006
Time_Specific:	09:30:00 AM
Time_Range:	Beforenoon
Province:	Kabul
District:	5
Area_Name:	Polytechnic University
Street:	Kabul-Qargah Road
Spatial Reference:	in front of Polytechnic University, near Police Academy, on the main road between Kabul and Qargah, west of Kabul city

X Coordinate: Y Coordinate:

Attack_Technique:	VBIED
Intended_Target:	Member of Parlament
Quality_of_Execution:	Partially on the Target
Target People Killed:	2
Target people Wounded:	
Other People Killed:	2
Other People Wounded:	4
Insurgents killed:	2
Insurgents Wounded:	

Estimated Information :

Estimated Time: 09:30:00 AM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 510932.78 Y Coordinate: 3821144.46

ID: 69

Date:	09/01/2006
Time_Specific:	10:30:00 PM
Time_Range:	Night
Province:	Kabul
District:	5
Area_Name:	Niaz Baig
Street:	
Spatial Reference:	in Niaz Baig, west of the city

X Coordinate: Y Coordinate:

Attack_Technique:	VBIED
Intended_Target:	Unknown
Quality_of_Execution:	Miscarriage
Target People Killed:	
Target people Wounded:	
Other People Killed:	
Other People Wounded:	
Insurgents killed:	1
Insurgents Wounded:	

Estimated Information :

Estimated Time: 10:30:00 PM

Estimated Coordinate (WGS1984-UTM42N) :

X Coordinate: 508289.82 Y Coordinate: 3820043.74

ANNEX II

Name of Government Institutes Considered for Analysis

Ministry-Agriculture
Ministry-Border and Tribal Affa
Ministry-Transportation
Ministry-Communication
Ministry-Commerce
Ministry-Defence
Ministry-Education
Ministry-Finance
Ministry-Foreign Affairs
Ministry-Haj (Pilgrimage)
Ministry-Higher Education
Ministry-Information and Cultur
Ministry-Interior
Ministry-Justice
Ministry-Martyrs and Disabled
Ministry-Economics
Ministry-Public Health
Ministry-Public Works
Ministry-Mines and Industeries
Ministry-Rural and Rehabilitati
Ministry-Labour and Social Affa
Ministry-Urban Development
Ministry-Women's Affairs
Palace-Presidential Palace
Department-Traffic
Supreme Court-Chief Justice
Department-Fire Station
Ministry-Anti Narcotics
Ministry-Energy
Ministry-Refugee Repatriation
Department-Geological Survey
Department-Central Statistic Offi
Department-AGCHO
Department-Academy of Science
Department-Kabul Municipality
Department-Passport Office
VPO-Vice Presedent Office
Department-Islahate Edari
Ministry-Youth
Department-Afghan Tourist Organization

Department-Afgan Independent Human Rights Commission
Kabul Military Academy
Pul e Charkhi Prison
Polica Academy
National Military Academy

Name of Government Institutes Considered for Analysis

NAME	TYPE
NRC	INGO
Concern	INGO
ANCB	INGO
Swiss Peace	INGO
ACBAR	INGO
ACHR	INGO
ActionAid	INGO
Caritas_Germany	INGO
DACAAR	INGO
GAA	INGO
HI	INGO
HNI	INGO
INTERSOS	INGO
ISRA	INGO
JEN	INGO
Madera	INGO
MCI	INGO
Medair	INGO
NAC	INGO
Oxfam(GB)	INGO
SNI	INGO
Solidarites	INGO
SCA	INGO
TDH	INGO
UMCOR	INGO
AERO	INGO
SOZO	INGO
CoAR	INGO
COOPI	INGO
ACF	INGO
AKDN/FHA	INGO
FRCRCS	INGO
IMC	INGO
IRC	INGO
AINA	INGO
UNAMA	United Nations
UNICEF	United Nations
UNOPS	United Nations

UNV	United Nations
DDR	United Nations
AIMS	United Nations
FAO/ILO	United Nations
UNESCO	United Nations
UNDP	United Nations
UNIFEM	United Nations
UNODCP	United Nations
UNAMA Pillar2	United Nations
WFP	United Nations
UNMACA	United Nations
UNHCR	United Nations
WHO	United Nations
UNFPA	United Nations
World Bank	Int-Organization
IOM	Int-Organization
CRS	INGO
ICRC	Int-Organization
CARE	INGO
MCPA	INGO
ACTED	INGO
AKDN	INGO
USAID	Int-Organization
AREU	INGO
RI	INGO
IAM	INGO
SC-S	INGO
SC-UK	INGO
AREA	INGO
Afghan Aid	INGO
ADA	INGO
AMI	INGO
CHA	INGO
Germany	Embassy
Libya	Embassy
Bulgaria	Embassy
Japan	Embassy
France	Embassy
UAE	Embassy
Turkey	Embassy
Iran	Embassy
China	Embassy
Neitherland	Embassy
India	Embassy
Pakistan	Embassy
Suadia Arabia	Embassy

USA	Embassy
Russia	Embassy
Canada	Embassy
IFRC	Int-Organization
EC	Int-Organization
ADB	Int-Organization
MSH	INGO
Uzbekistan	Embassy
Tajikistan	Embassy
Camp Phoenix	International Military Camp
Camp Souter	International Military Camp
Military Area	International Military Camp
Camp Invicta	International Military Camp
Camp Warehouse	International Military Camp
ISAF HQ	International Military Camp
Camp Eggers	International Military Camp
Safi Landmark	Int. Hotel
Park Palace	Int. Hotel
Heetal Hotel	Int. Hotel
Serena Hotel	Int. Hotel
IMF	International Military Camp
Hotel Park	Int. Hotel
Hotel Intercon	Int. Hotel
Kabul Airport	Kabul International Airport

Masters Program in Geospatial Technologies

SPATIAL ANALYSIS OF SUICIDE ATTACK INCIDENCES IN KABUL CITY

Mohammad Ruhul Amin

Dissertation submitted in partial fulfilment of the requirements for the Degree of *Master of Science in Geospatial Technologies*

UNIVERSIDADE NOVA ISEGI
UNIVERSITAT JAUME I
WESTFÄLISCHE WILHELMS-UNIVERSITÄT MÜNSTER