



Fig1: Tehran's spatial Units



Fig2: Spatial structure of Tehran

Research Objectives and Study Area

The objective of this study is to investigate spatial pattern and hotspot of accidents relation to urban structure and time. Tehran Metropolitan Area is the study area which has exhibited an accelerated rate of urban growth especially over the last three decades and urban traffic accident.

Data and Source (2011)

Data Type	Source
Accident data base (point data)	The Police Department of the Islamic Republic of Iran, Tehran
Population data	Landsat Data
Land use data	Google Earth and Geodigitizing Data
Socioeconomic data	The Statistic Organization of Iran, Tehran

Urban Zoning

Central Business District (CBD)
Urban Zones (or inner city)
Outside Zones (or transition zone)

Frequency of the Accidents

Place of death		Fatal by sex		Injured by sex	
urban	suburban	Male	Female	Male	Female
1200	385	1329	280	24930	9091
Relative frequency		Relative frequency		Relative frequency	
2.24	0.72	2.51	0.01	47.25	17.23

Density of the Injured Accidents (A) and Fatal Accidents (B)

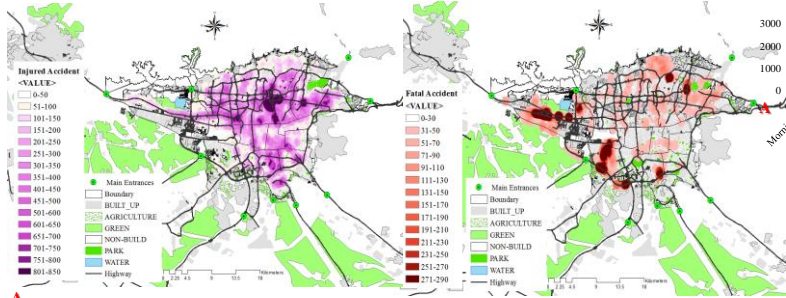
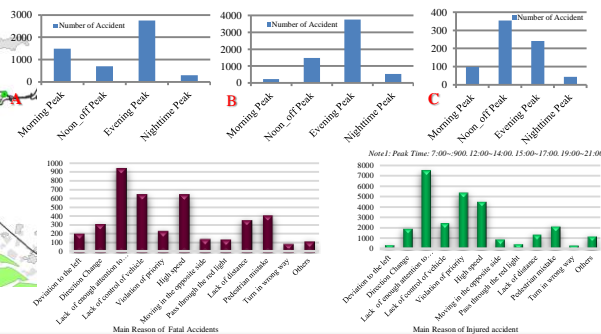


Fig3: Tehran's injured accidents density

Fig4: Tehran fatal accidents density

Hourly Variation of Accidents in Tehran Suburban (A) Urban (B) and CBD (C)



Spatial Analysis of Accidents in Relation to Spatial Organization of Centers of Work & Activity

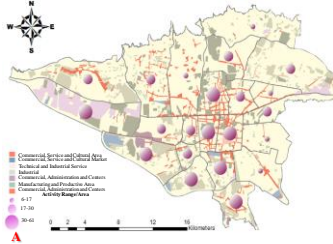


Fig5: Tehran centers of works and activity

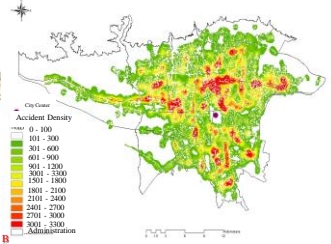
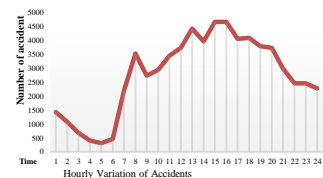


Fig6: Tehran hot spot of accident's map

Accident Data Set	Number of hot spots in Tehran		
	CBD	Urban Zone	Suburban Zone
All	29	148	59
Accidents by time periods			
Morning Peak	10	22	21
Noon off-peak	12	41	8
Evening Peak	6	64	23
Night-time	1	21	7



Accident Density and Built-up Density sq/km

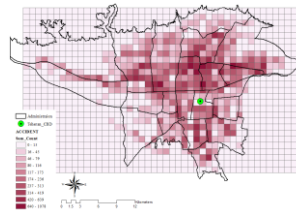


Fig7: Tehran's accidents sq/km

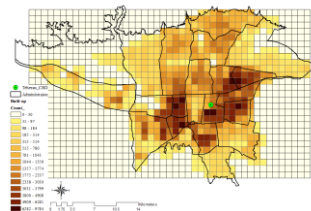


Fig8: Tehran's built-up density sq/km

Accident's Main Factors			
Road Type	Land use type	Main Reason	Time
Highway-Freeway	Industry Land use	Lack of enough attention to the forward - Overtaking and high speed	14:00 - 6:00
			23:00
Residential Road	Residential Land use	Sudden left shift - Lack of priority	8:00 - 18:00
			19:00
Primary Road	Administration Land use	Lack of priority - Lack of enough attention to forward	9:00 - 14:00
			15:00

Most Dangerous Land use by Accidents Rate

Landuse Category	Accident	percent
ADMINISTRATION	2639	4.1
AGRICULTURE	137	0.2
COMM	4069	6.3
CULTURAL	11	0.0
DIPLOMATIC	61	0.1
EDUCATION	418	0.6
EQUIPMENT	31	0.0
GREEN	380	0.6
HEALTH	571	0.9
INDUSTRY	5054	7.8
MILITARY	16	0.0
NON-BUILD	1180	1.8
PARK	1765	2.7
RECREATION	97	0.2
RELIGIOUS	247	0.4
RESIDEN	46259	71.7
SPORT	137	0.2
TRANSPORT	1355	2.1
Unknown	45	0.1

Conclusions

- Urbanized, more densely populated areas, with traffic limitation boundary will tend to have fewer dangerous accidents.
- The times with the most occurrences of accidents are completely different in urban and suburban area as the urban structure pattern.
- Land use category, urban dense and increased road length was associated with increased serious injuries.