CO-OPERATIVE UNIVERSITY
(THANLYIN)

DEPARTMENT OF GEOGRAPHY

SPATIAL ANALYSIS OF TRAFFIC ACCIDENT OF THANLYIN TOWNSHIP

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ABSTRACT

Thanlyin Township is located opposite to Yangon City has changed dramatically after the opening of the Yangon – Thanlyin Bridge (1). It lies between north latitudes 16˚40' and 16˚59' and east longitude 96˚13' and 96˚25'. Thanlyin Township is composed of (17) wards and (28) village tracts. Thanlyin township having the population of 248676. According to the traffic accidents records of 2017,136 traffic accidents that caused 225 injuries and 23 death were occurred within Thanlyin Township.The majority of these accidents resulrs from human errors. The human caused accidents are mainly the carelessness of drivers or pedestrians. Most accidents on Township road are caused by speeding, unsafe overtaking, drunk driving and a lack of driving experience. Traffic police has started a new five years program to reduce the number of accident, injuries and deaths on the road by encouraging the four habits: wearing seatbelts, wearing helmets while riding bicycles and motorcycles, not driving after consuming alcohol or other drugs, and not using mobile phones while driving.

Introduction

Road accidents are worldwide and increasing, mainly because the development of transportation infrastructure fails to keep pace with other sectors like industry and real estate.Thus the road traffic accidents are the leading cause of human deaths and illness worldwide. These accedents often result in fatalities, injuries or damage to people around the world. Thanlyin township having the population of 248676. According to the traffic accidents records of 2017,136 traffic accidents that caused 225 injuries and 23 death were occurred within Thanlyin Township. The majority of these accidents results from human errors. The human caused accidents are mainly the carelessness of drivers or pedestrians. Most accidents on Township road are caused by speeding, unsafe overtaking, drunk driving and a lack of driving experience. Traffic police has started a new five years program to reduce the number of accident , injuries and deaths on the road by encouraging the four habits: wearing seatbelts, wearing helmets while riding bicycles and motorcycles, not driving after consuming alcohol or other drugs, and not using mobile phones while driving.

Aims and Objectives

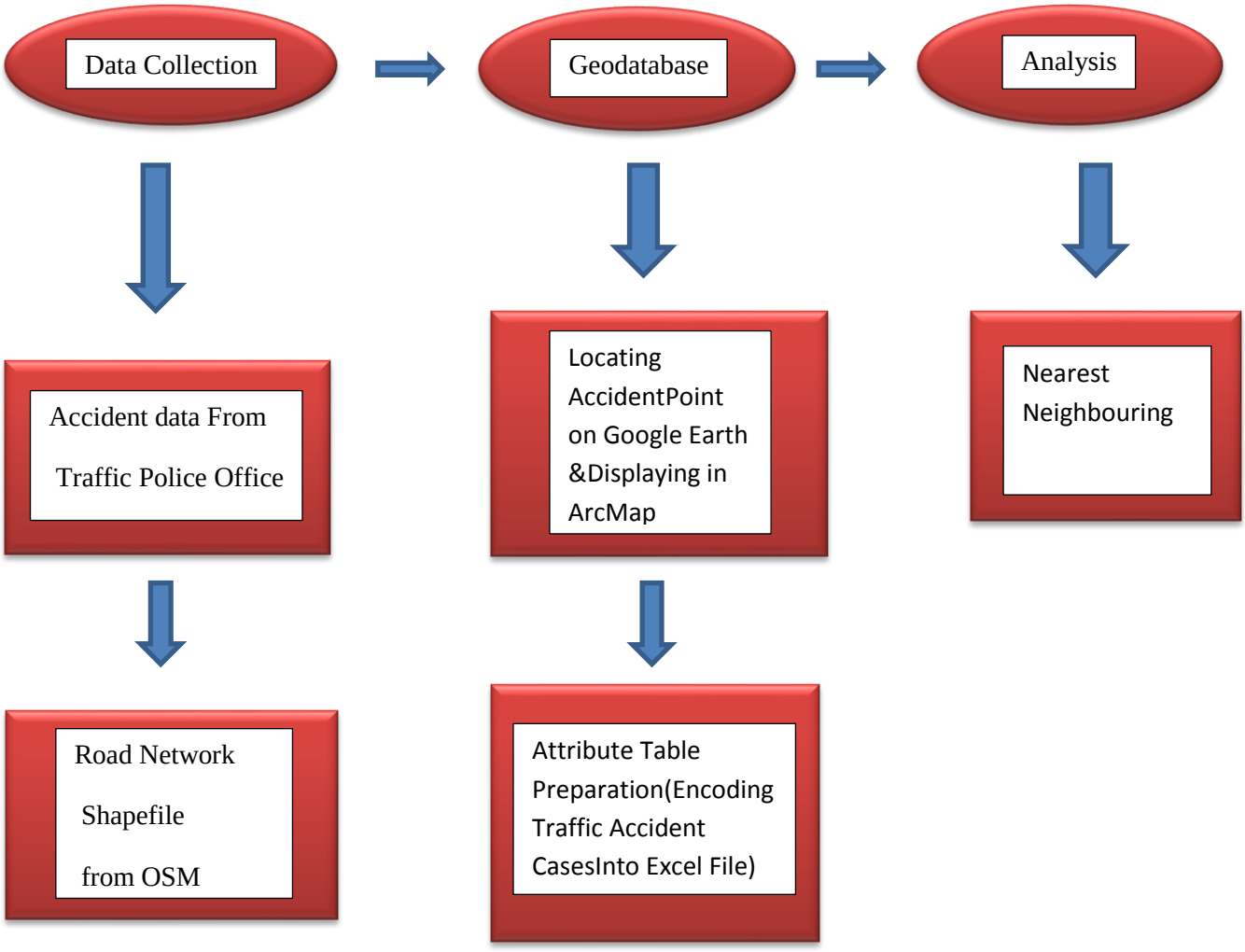
The aims and objectives of the study area are as follow.

(1) To build a Geodatabase System for traffic accidents
(2) To make Nearest Neighbour based on traffic accident cases
(3) To create traffic accident zone map

Data collection

Traffic accident records in the Thanlyin Township were collected from Thanlyin Traffic Police Office Headquarter office located on Bogoke Nay Win street. The records include accident date and time ,accident location, name of respondents, name of victims, number of person death or injuries and so on. Due to the limited time, only 2017 traffic accident data were used for the analysis.

Methodology



1.Geographical Backgroung of Thanlyin Township

(1.6) Location, Size, Shape and Boundary

Thanlyin Township is located in Southern portion of Yangon Region. It is one of the fourty five townships of Yangon Region.It is located on the left bank of Bago River and close to the Yangon City. It lies between north latitudes 60˙40' and 16˙59' and east longitudes 96˙13' and 96˙25'. It is surrounded by Thonegwa Township and Khayan Township on the east, Kyauktan Township on the south, the Yangon River on the west and the Bago River on the north. The total area of Thanlyin Township is 92149 acres (372.9) sq.kilometer and it comprises about 3.8 percent of Yangon Region. This township is 38.6 to kilometers (24) miles long north to south and 20.92 kilometers (13) miles wide from east to west .

Thanlyin Township can be divided into two parts, i.e. urban area and rural area.Thanlyin Town, the urban area, is formed by seventeen wards. The rural area is comprised of twenty eight village traacts. The shape of the township is elongated with a longer axis from northeast to southwest and a shorter axis from southeast to northwest.

Since Thanlyin Township is located facing two rivers, i.e. the Yangon River and the Bago River, its position is naturally favourable for water way transportation. Besides, position of the township indicates two more locational advantages : (1) its opposite position to mega city Yangon, and (2) lying between the great economic capital city and it neighbours plus its hinterland having rich agricultural resources. These locational advantages have made Thanlyin in a collecting and redistribution centre. Consequently these conditions have led to become an attractive population centre and hence to develop land transportation in the area.

Location of Study Area

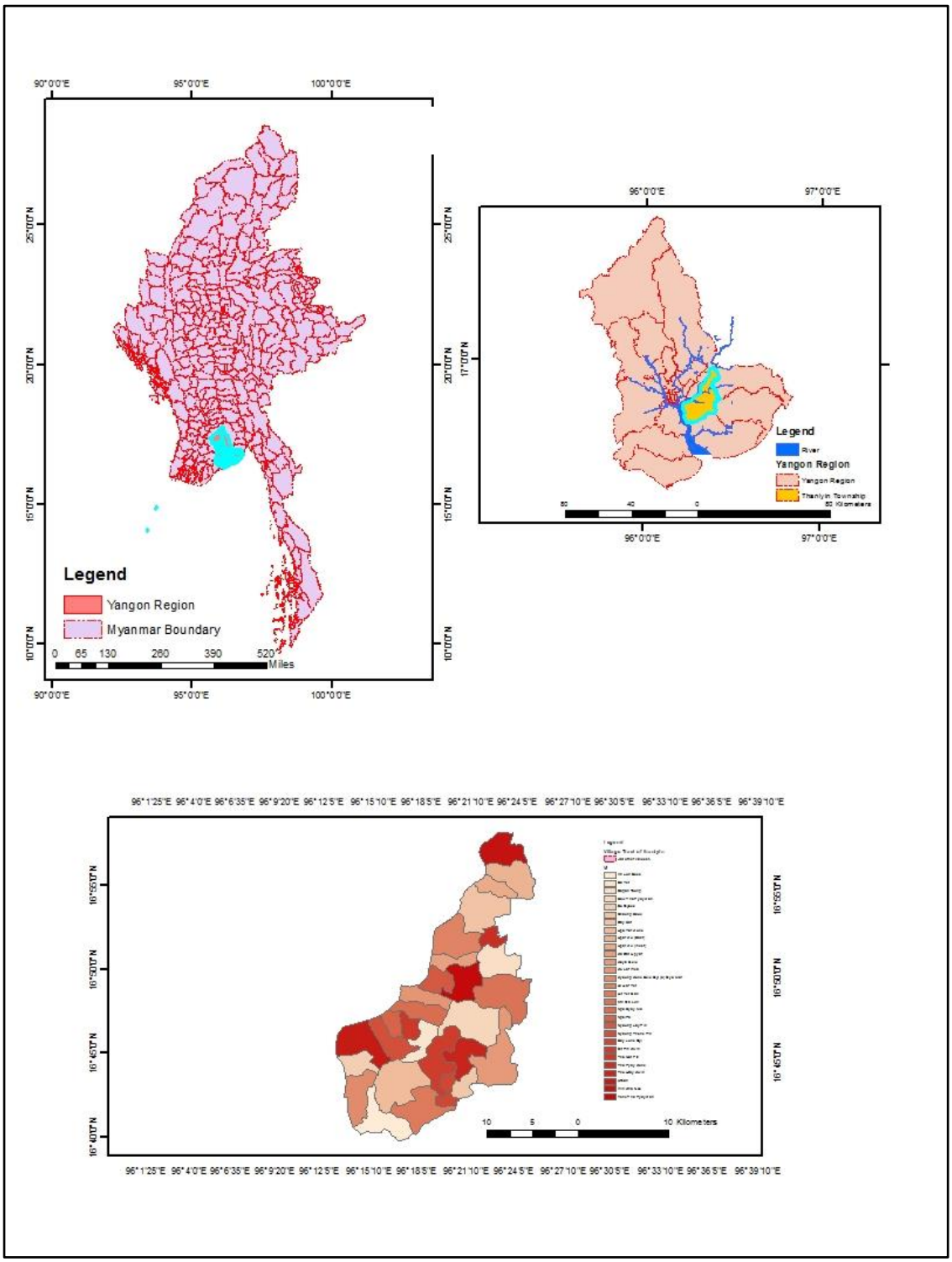


Figure (1.1) Location of Study Area

Source: Based from MIMU (Shape File)

(1.2) Relief and Drainage

As the study area is a part of Irrawaddy deltaic area, topography of Thanlyin Township is generally a flat low land. With the exception of western portion, the whole surface is characterized by flat land of deposition origin. On the west Thanlyin-Kyauktan laterite ridge with low relief run roughly from west-northwest to east-southeast.

Most part of the township is below 10 metres above mean sea level. The lowest portion is the Bago River bank . Within this portion , the lowest plot is around Nyaunglaypin village at the mouth of Khayan Chaung. Some lowlying area south-west of Yangon-Thanlyin bridge and around this bridge, reclaimed for settlement plans in recent year.

Relief and Drainage

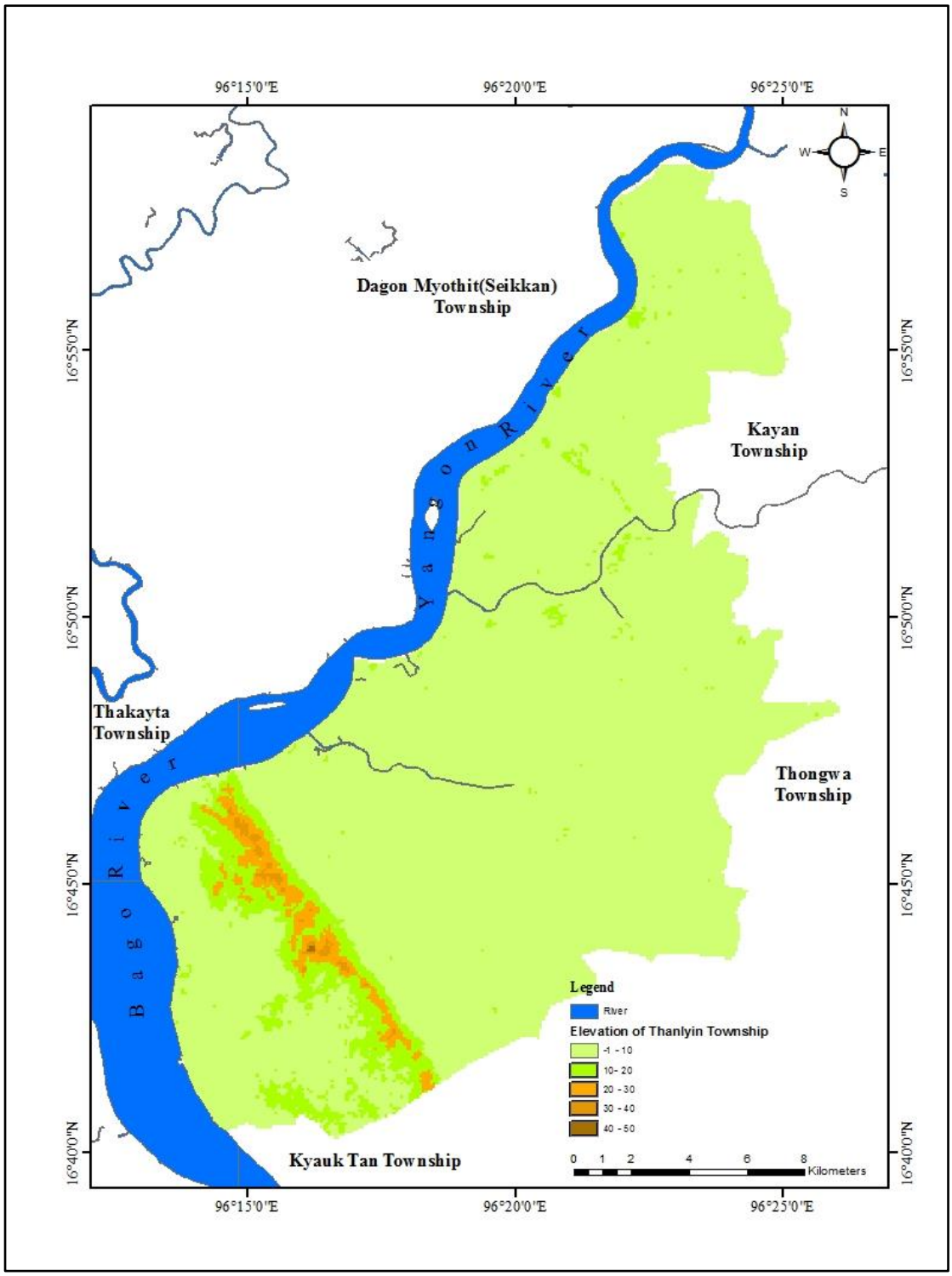


Figure (1.2) Elevation of Thanlyin Township

Source: Based from DEM

(1.3) Climate

As Thanlyin Township is situated in lower Myanmar in low latitudes and close to the sea, general characteristic of climate is humid tropical climate. The area experiences tropical monsoon type of climate like Yangon city.

(1.4) Soil and Natural Vegetation

Soil

On the west of the township, there is a ridge which trends roughtly from northwest to southeast. This ridge is mainly covered by lateriatic soild that is highly eroded. The color of the soil is yellow-red and has small pieces of rust. On moderate slope, brown, lateritic soils are commonly found. Four types of soil are found in Thanlyin Township. (1) Strongly eroded lateritic soil (2) Lateritic soil (3) Meadaw lateritic soil and(4) Meadaw soil.

Natural Vegetation

As the population grow, the natural vegetation has been cleared for settlement and other landuses and cultivation. Various types of bamboos are also found. The dominate species of these forests are Pyingadow, Kanyin and Pyinma. Mangrove and swamp forests occupy the tidal areas in these tidal forests Kanazo, Tayaw, Thinbaung, Lamu, Byu and Dani are the most abundant species.

(1.5) Human Background of Thanlyin township

(1.5.1) Population Distribution and Population Density

Population of the township is unevenly distributed throughout the area. As usual, urban area of the township is densely populated while rural area are sparsely populated. Landuse types of these areas is a major factor that creates different distribution pattern. Majority of the urban land is occupied by residences and giant fractions of the land in rural areas are overwhelmingly used for agriculture.

In 2017, estimated total population was 248676 persons live within the township area. Overall population density of the study area is 667 persons per square kilometer in 2017.As in other, urban area of Thanlyin has denser population than its rural area.

2.Traffic Accident of Study Area

(2.1) All Accident Cases of Thanlyin Township

According to data of Traffic Police Office, the total accident of Thanlyin Township was 136 cases in 2007. The current traffic accident of Thanlyin Township can be studied by dividing into (10) major types are –

(1) Motorcycle and Motorcycle Accident Cases

(2) Motorcycle and Bicycle Accident Cases

(3) Motorcycle and Private Car Accident Cases

(4) Motorcycle and Public Transport Accident Cases

(5) Motorcycle and Pedestrian Accident Cases

(6) Public Transport and Public Transport Accident Cases

(7) Public Transport and Private Car Accident Cases

(8) Private Car and Private Car Accident Cases

(9) Private Car and Bicycle Accident Cases

(10) Private Car and Pedestrian Accident Cases

All Accident Cases of Thanlyin Township

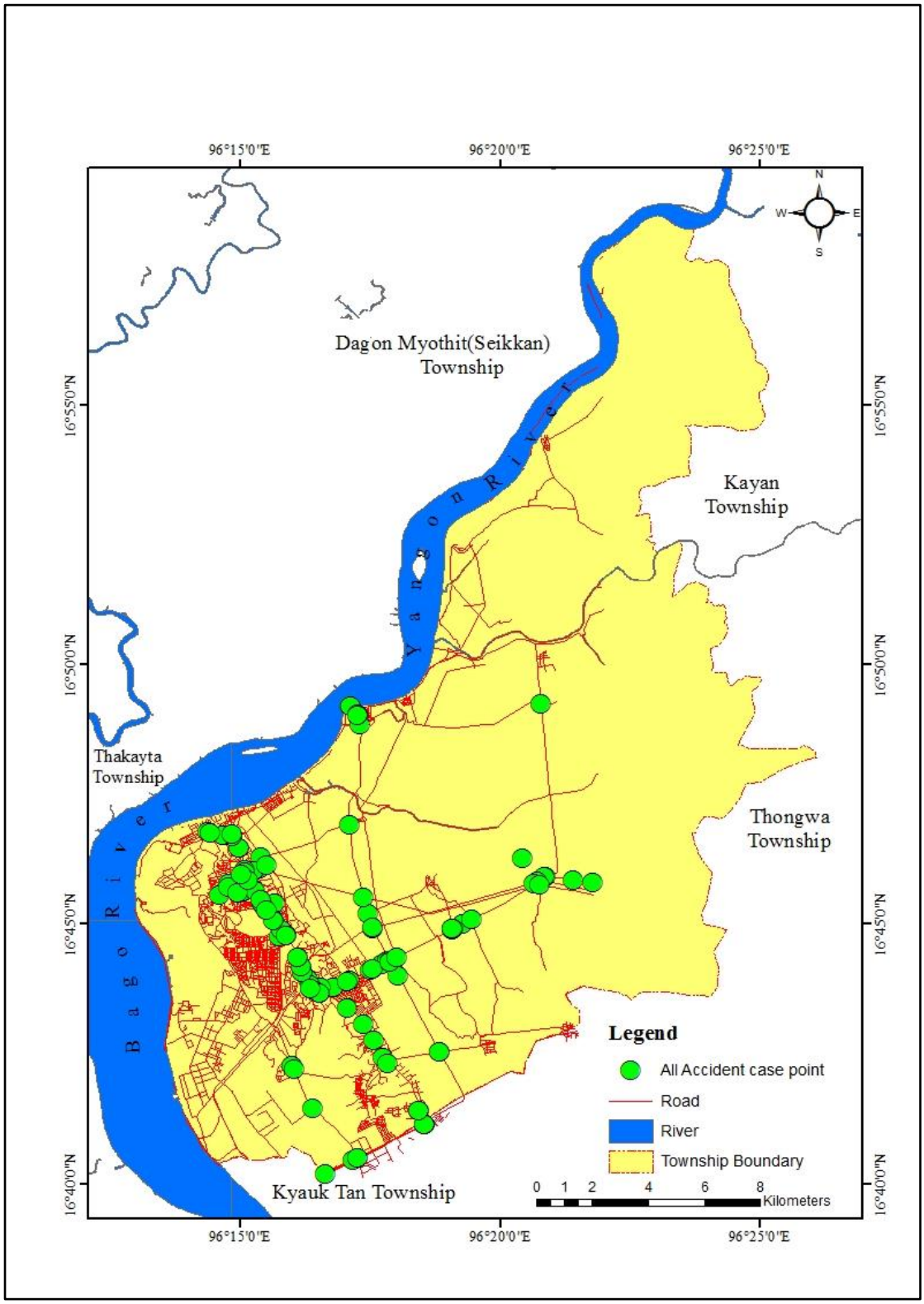


Figure (2.1) All accident case

Source: Traffic Police Office

(1) Motorcycle and Motorcycle Accident Cases

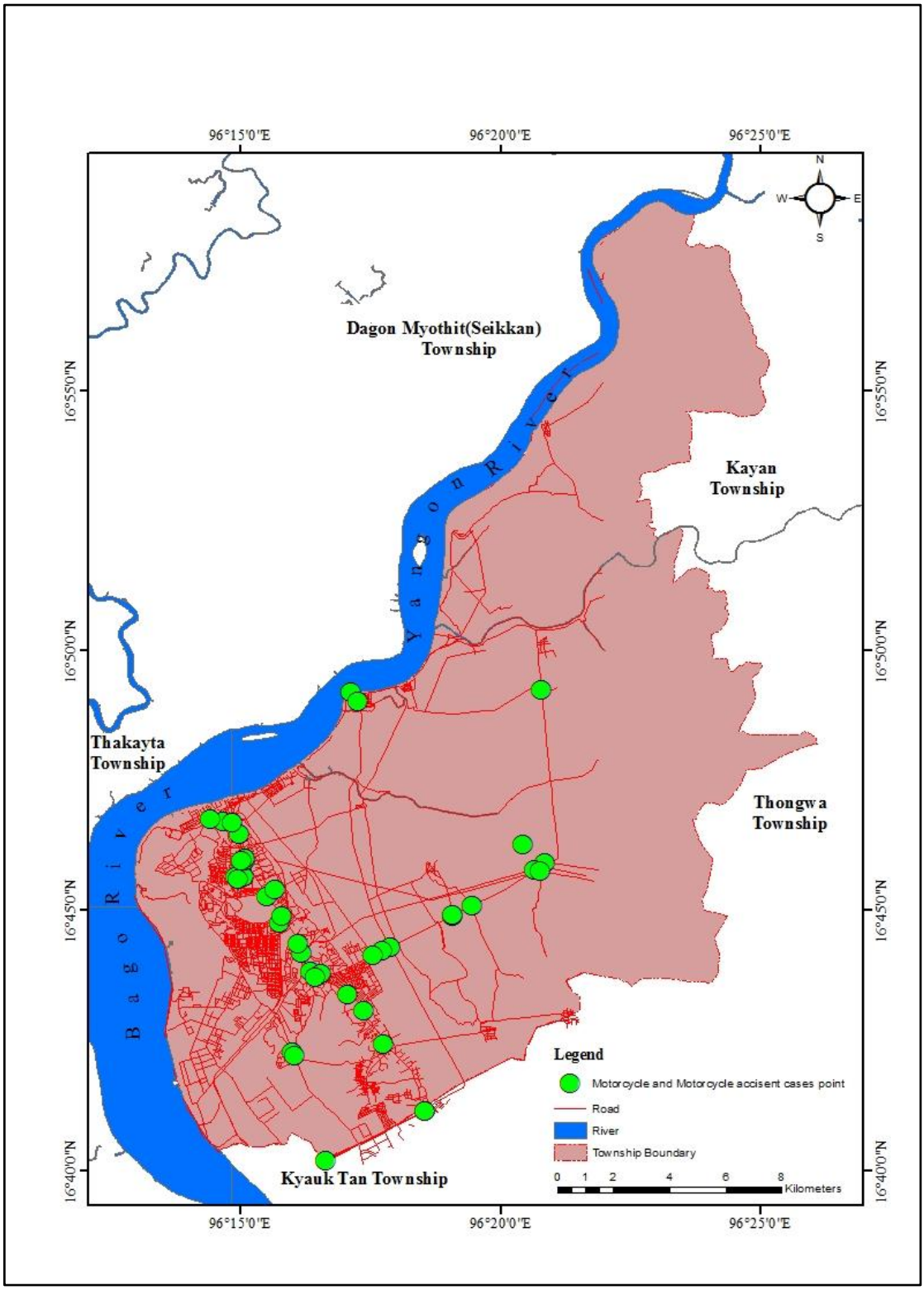


Figure (2.2) Motorcycle and Motorcycle Accident Cases

Source: Traffic Police Office

(2) Motorcycle and Bicycle Accident Cases

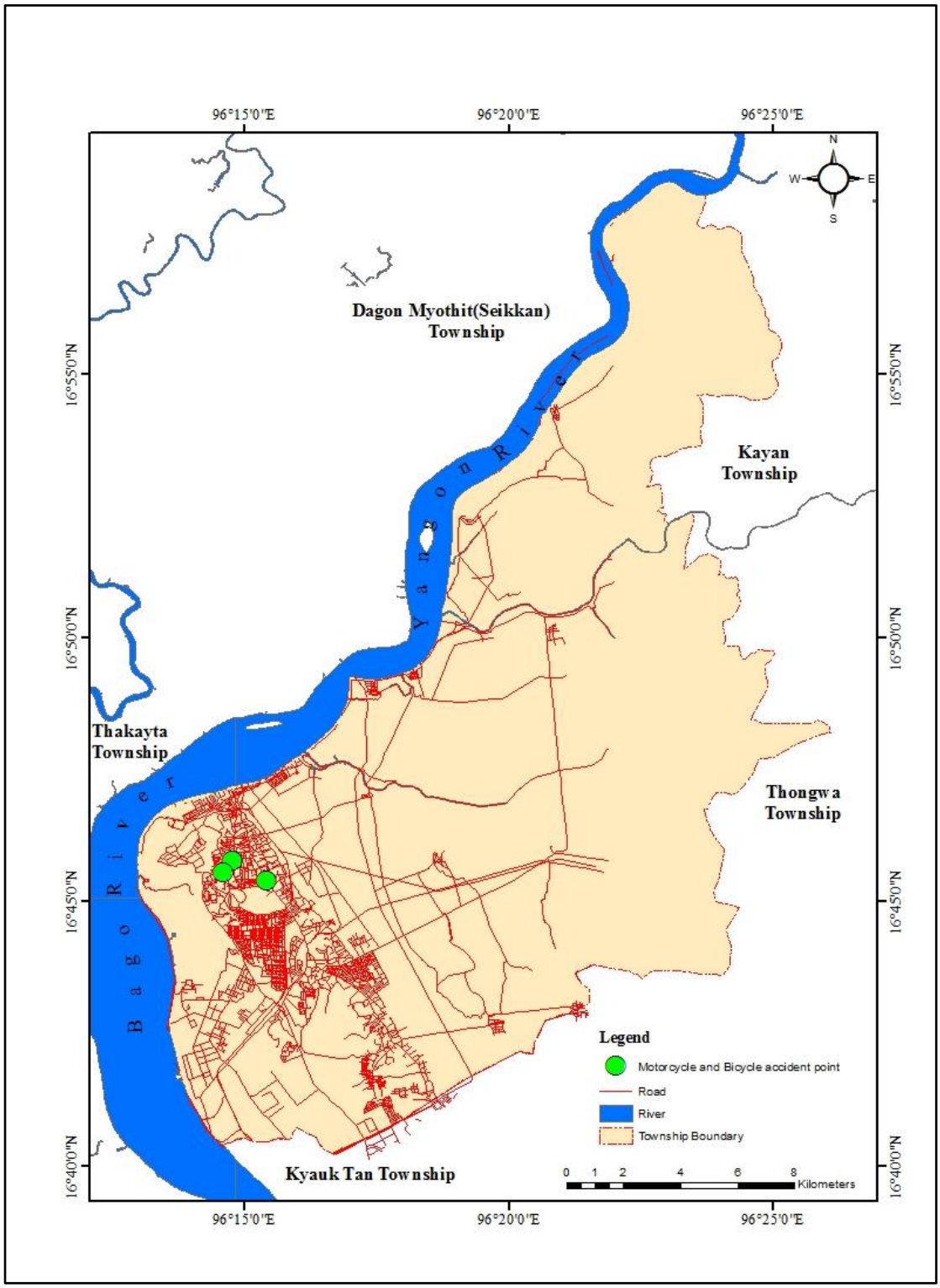


Figure (2.3) Motorcycle and Bicycle Accident Cases

Source: Traffic Police Office

(3) Motorcycle and Private Car Accident Cases

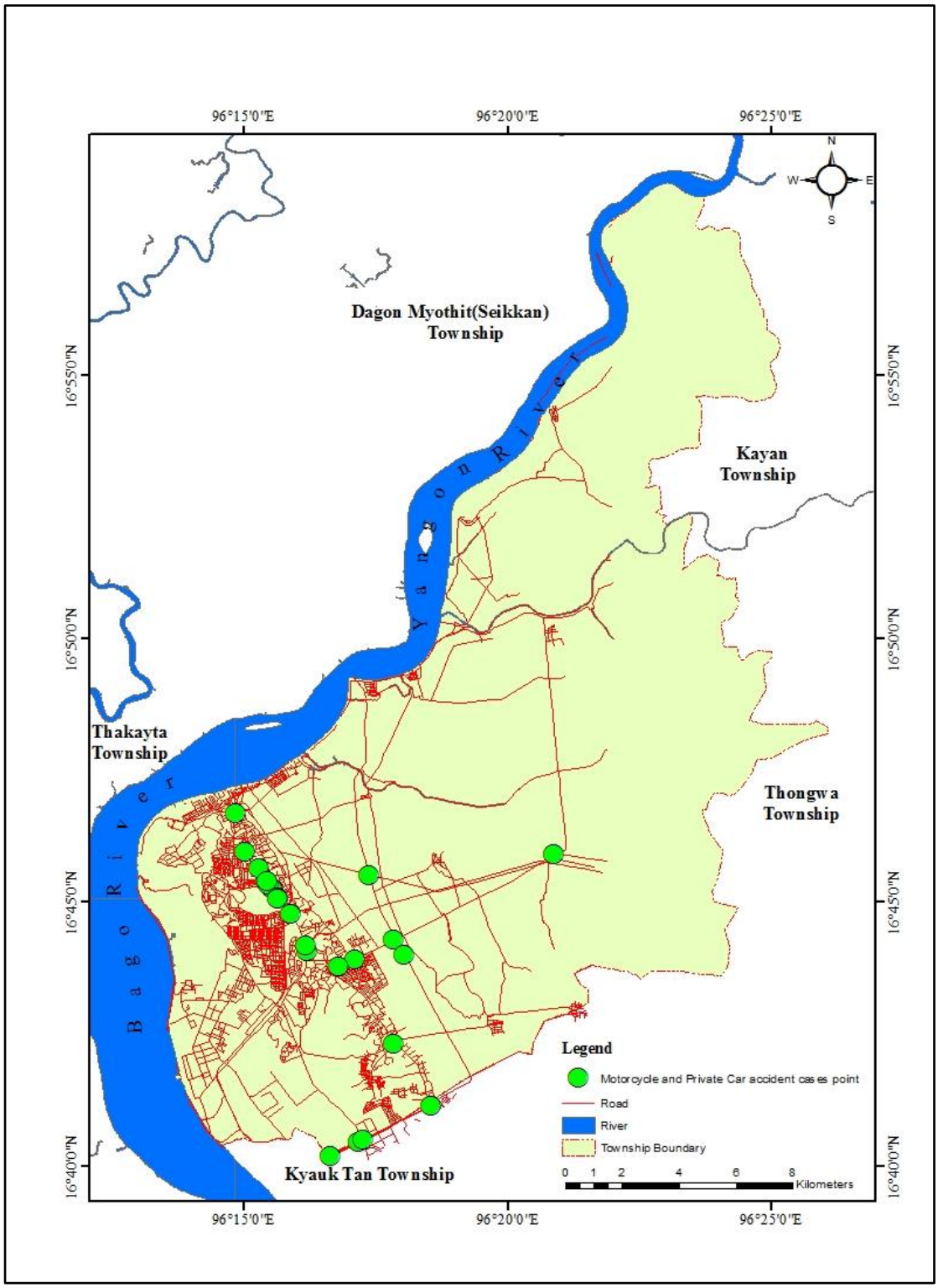


Figure (2.4) Motorcycle and Private Car Accident Cases

Source: Traffic Police Office

(4) Motorcycle and Public Transport Accident Cases

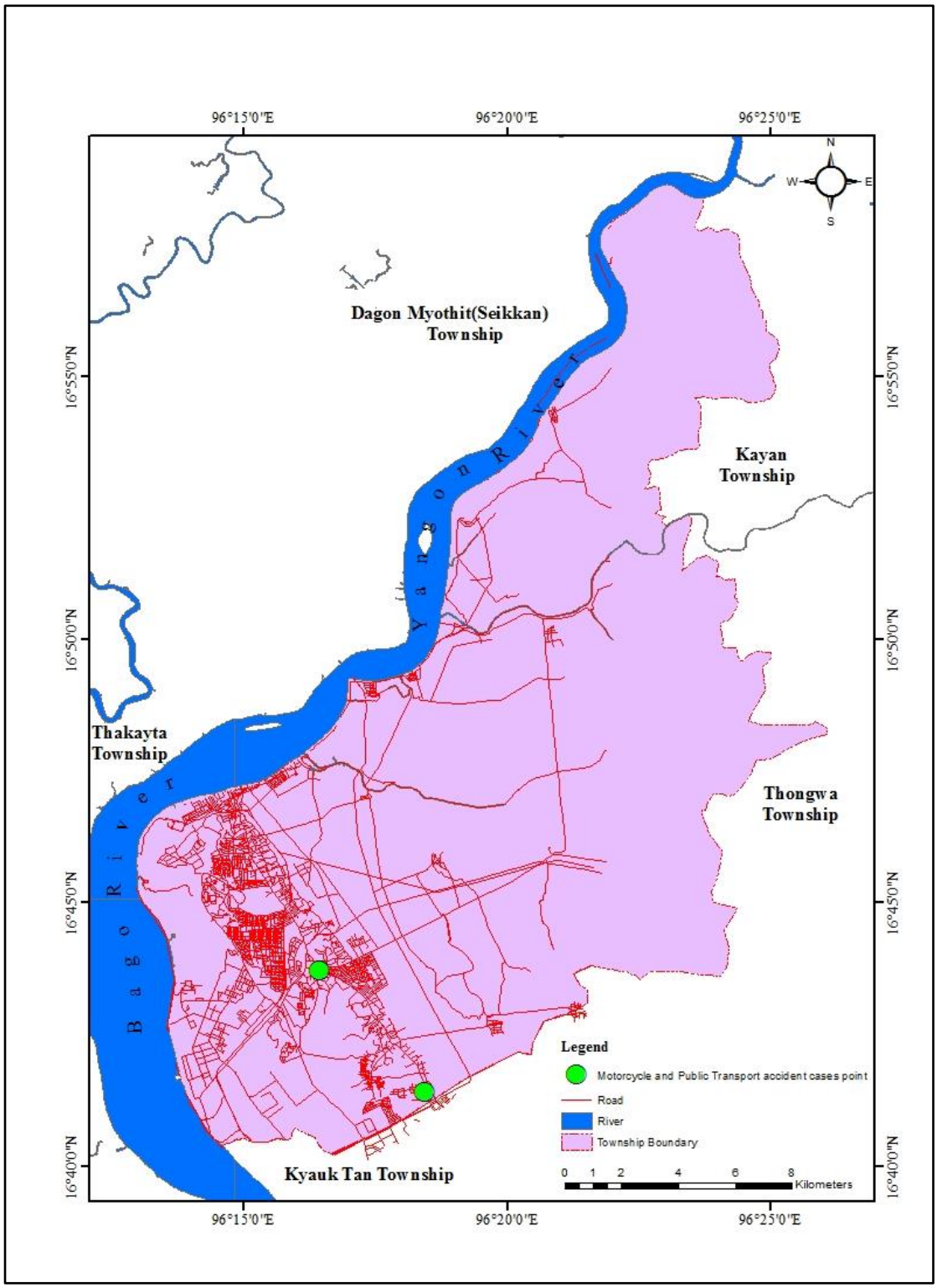


Figure (2.5) Motorcycle and Public Transport Accident Cases

Source: Traffic Police Office

(5) Motorcycle and Pedestrian Accident Cases

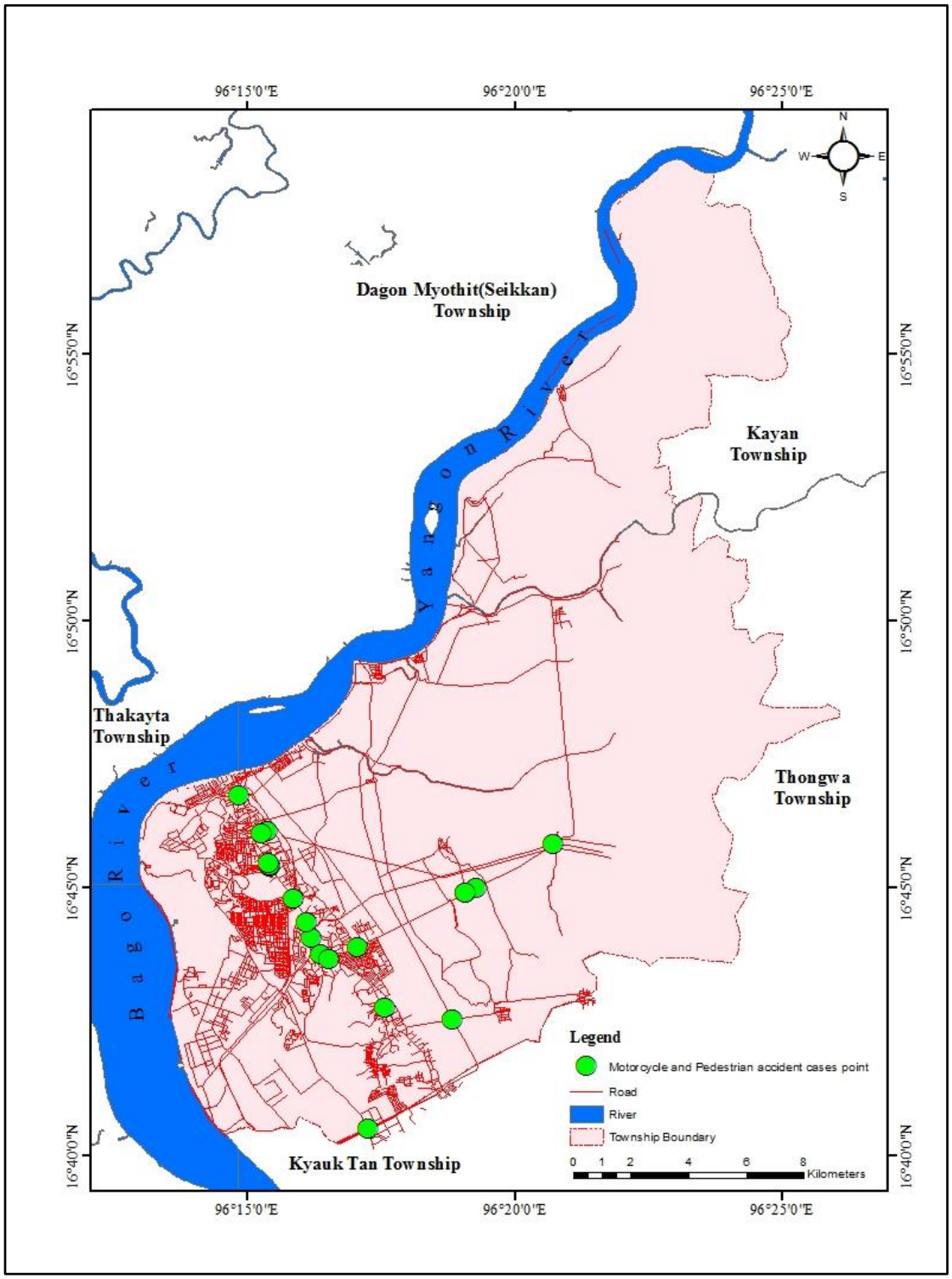


Figure (2.6) Motorcycle and Pedestrian Accident Cases

Source: Traffic Police Office

(6) Public Transport and Public Transport Accident Cases

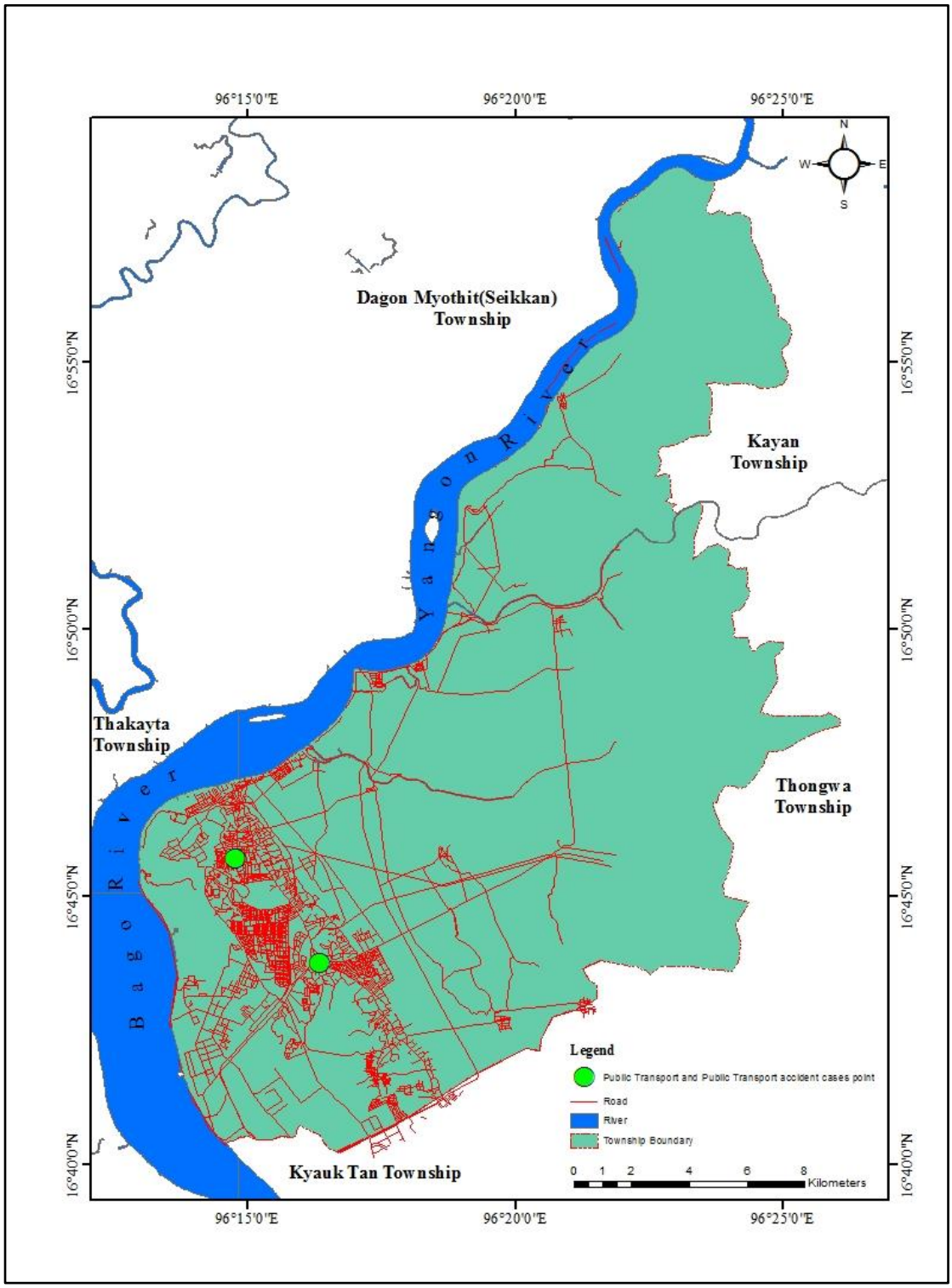


Figure (2.7) Public Transport and Public Transport Accident Cases

Source: Traffic Police Office

(7) Public Transport and Private Car Accident Cases

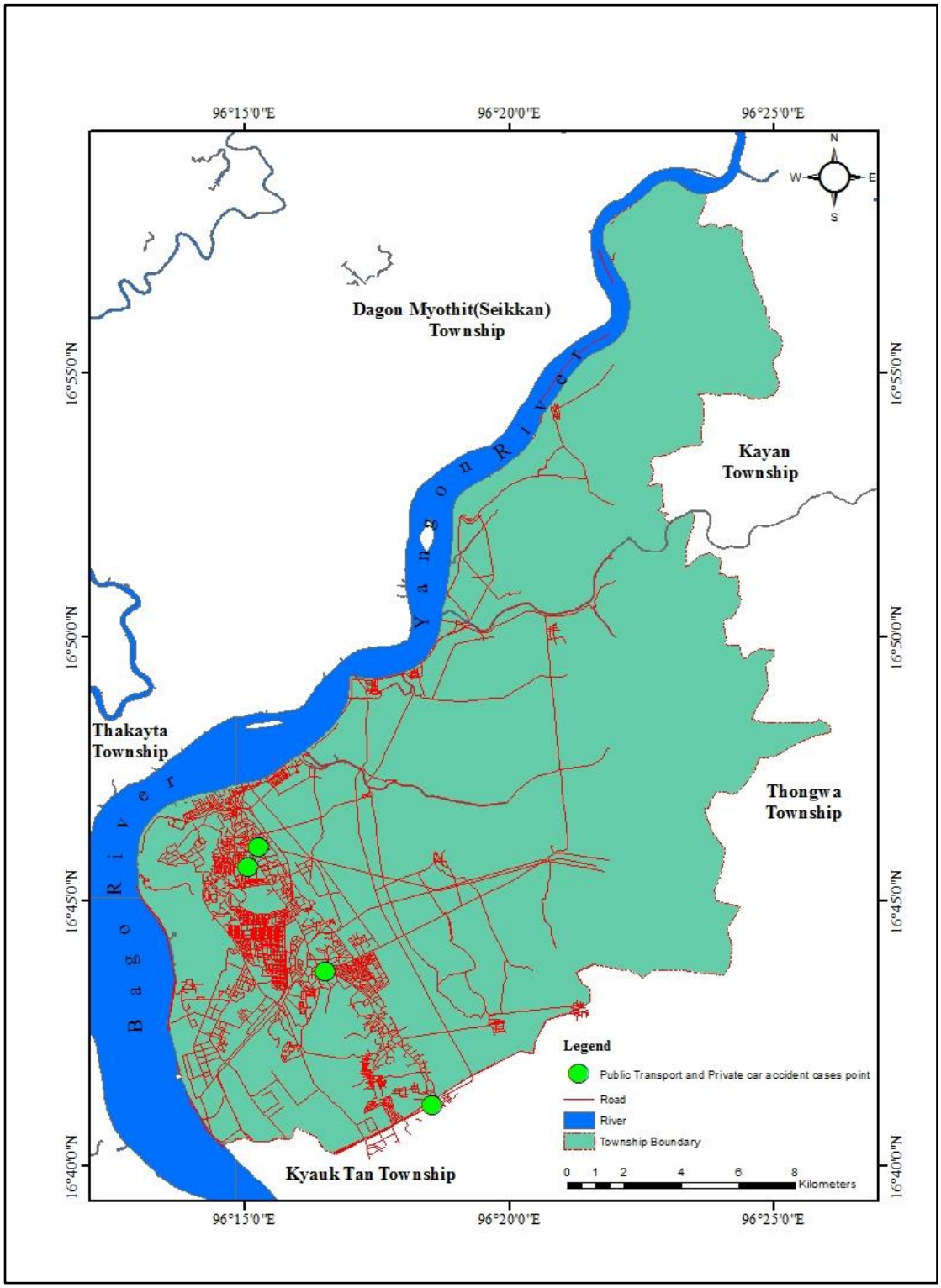


Figure (2.8) Public Transport and Private Car Accident Cases

Source: Traffic Police Office

(8) Private Car and Private Car Accident Cases

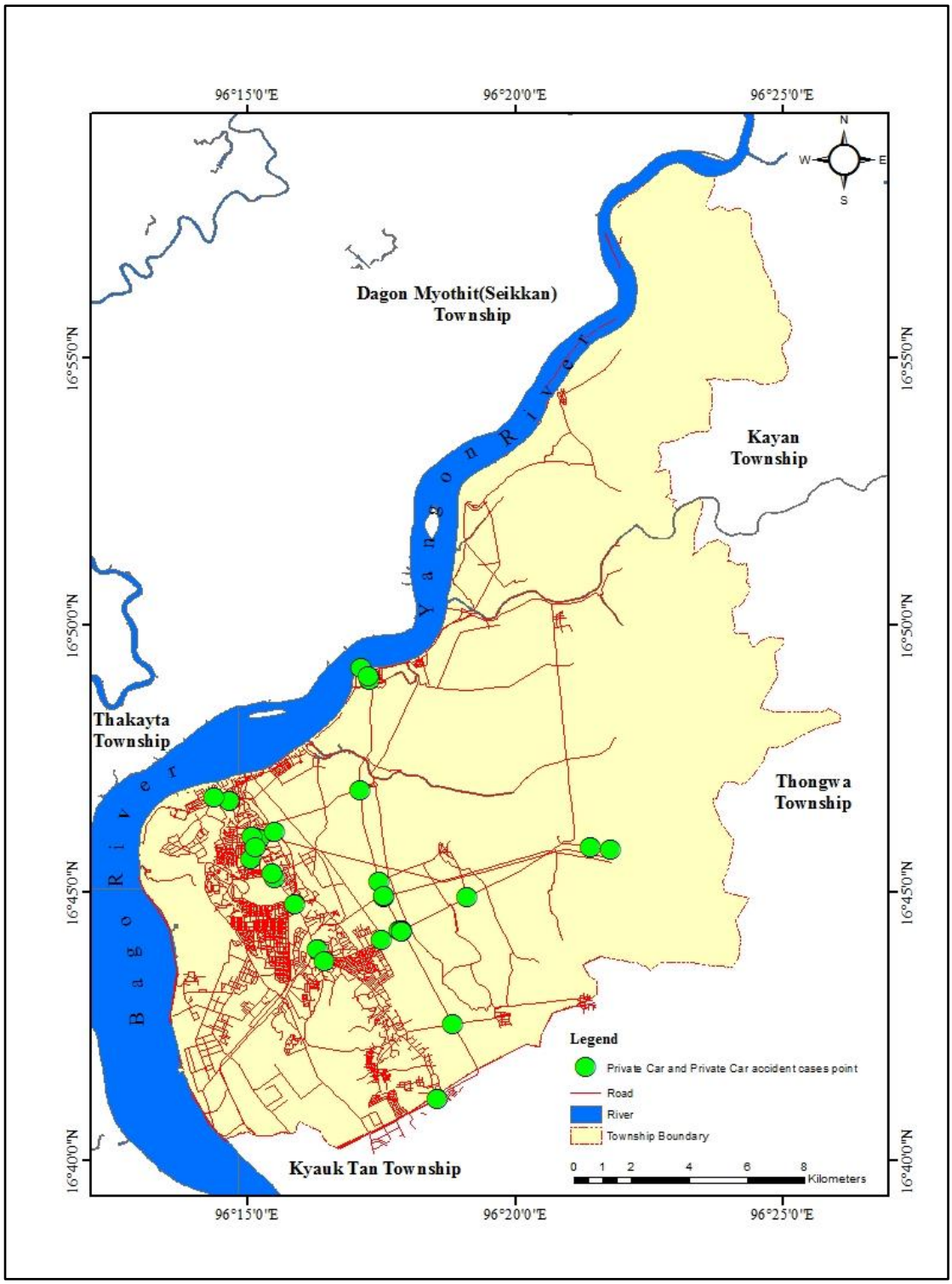


Figure (2.9) Public Transport and Private Car Accident Cases

Source: Traffic Police Office

(9) Private Car and Bicycle Accident Cases

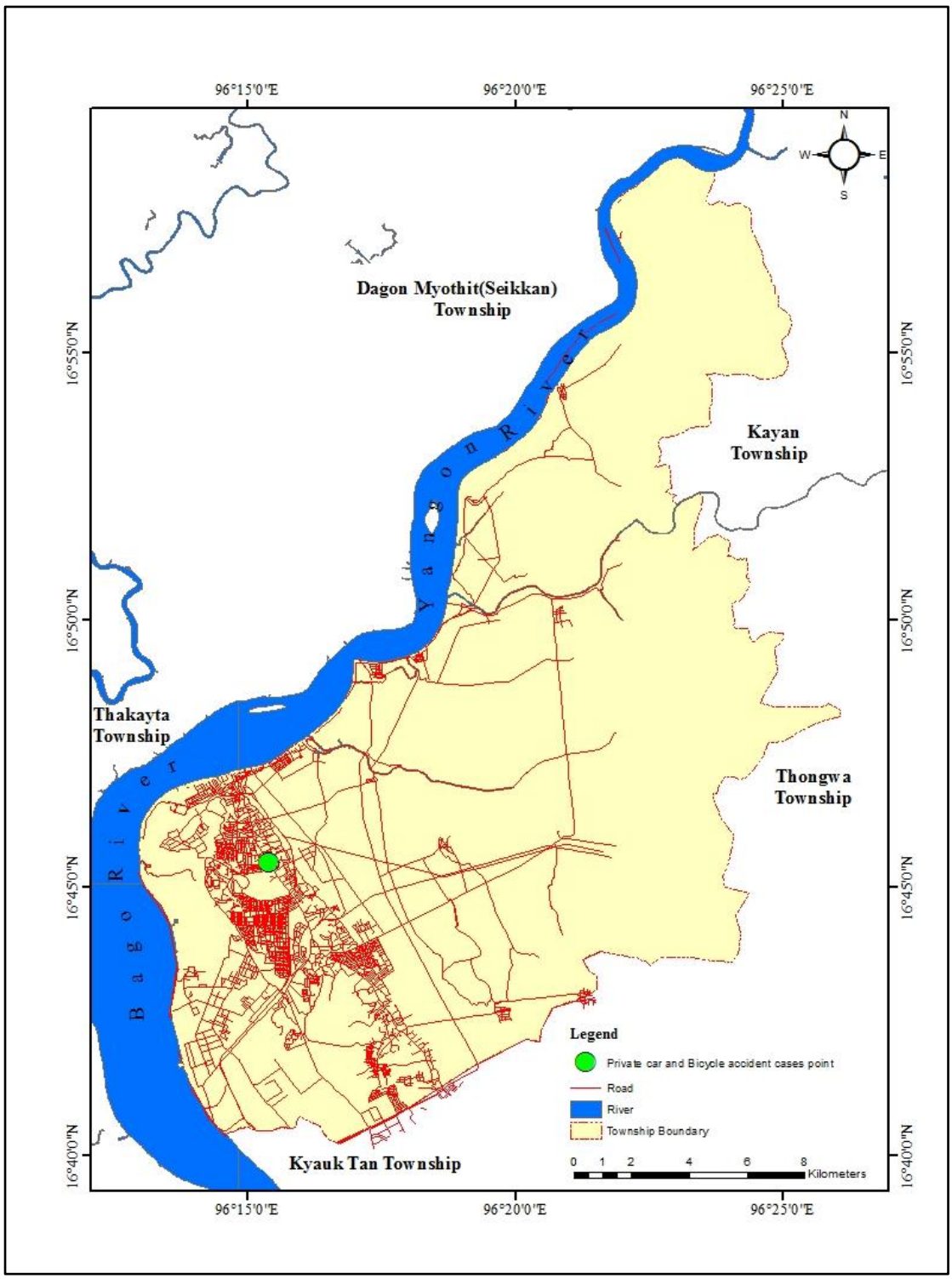


Figure (2.10) Private Car and Bicycle Accident Cases

Source: Traffic Police Office

(10) Private Car and Pedestrian Accident Cases

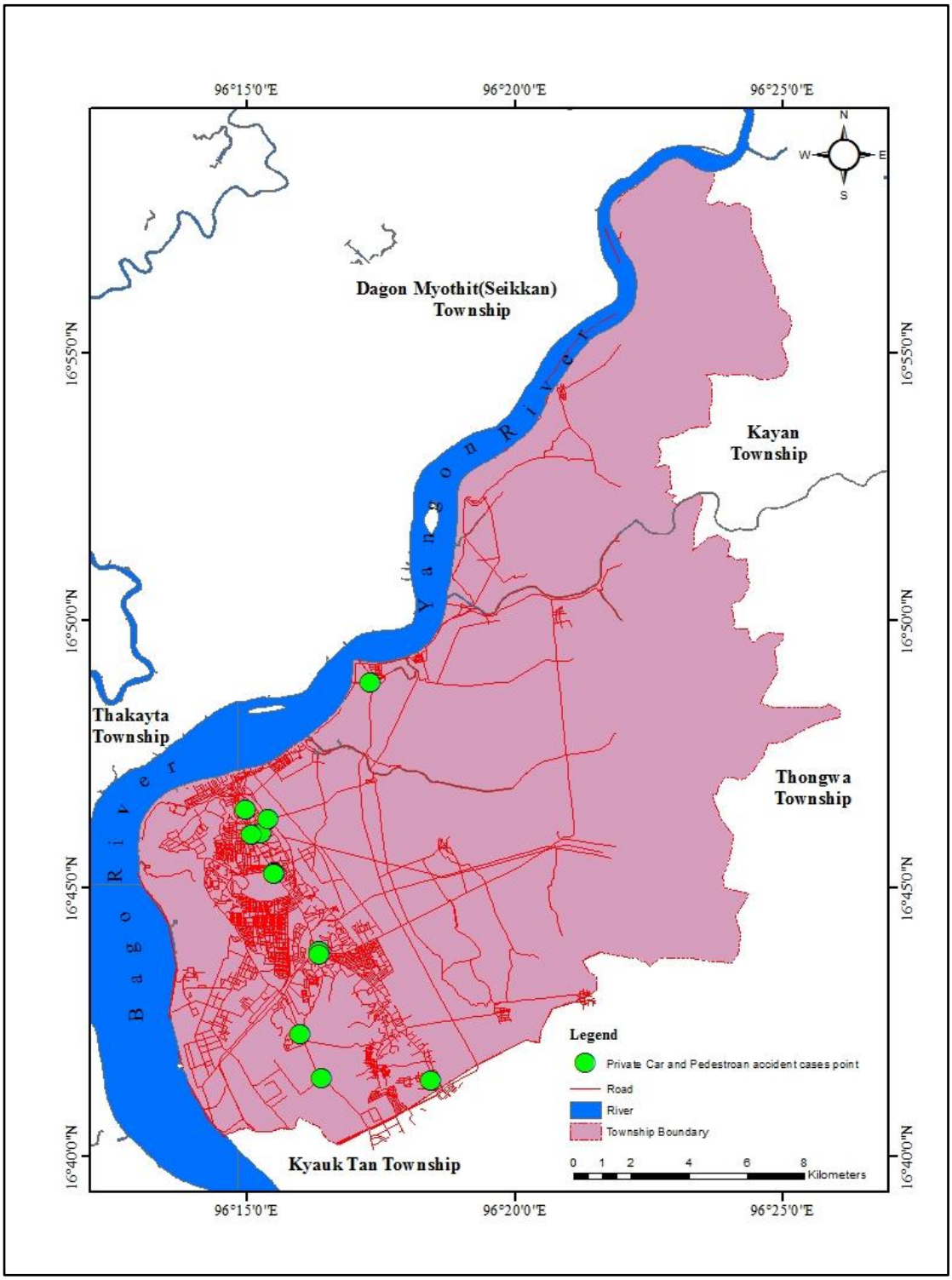


Figure (2.11) Private Car and Pedestrian Accident Cases

Source: Traffic Police Office

(2.2)Accident Case Of Thanlyin Township

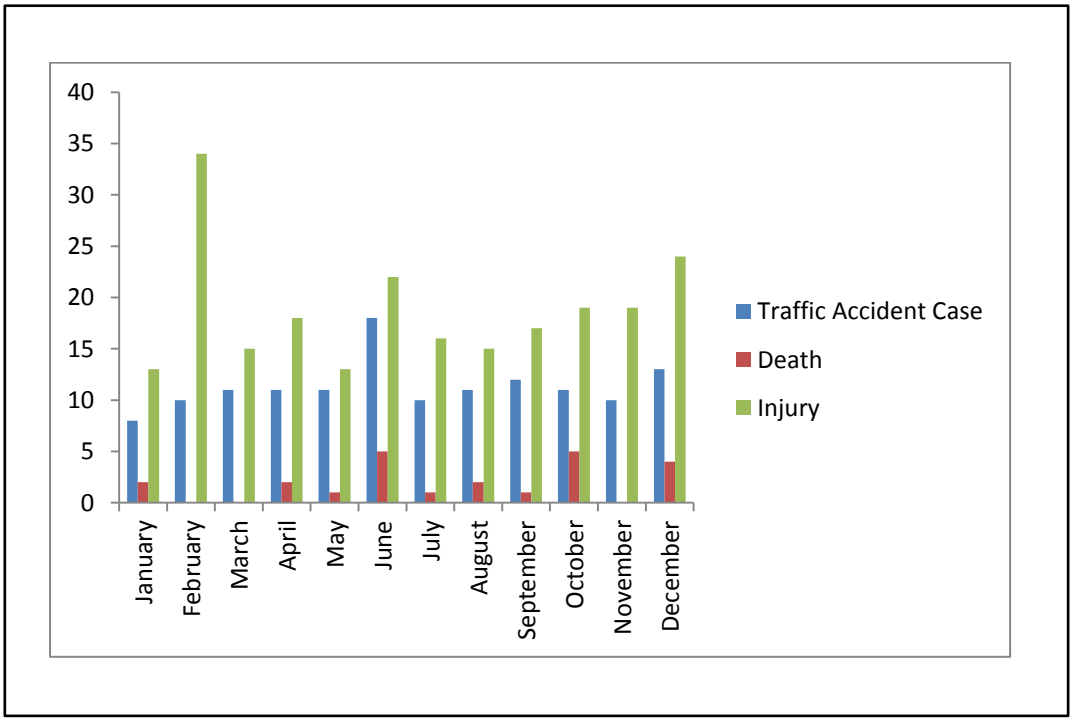
Thanlyin Township is getting developed in accordance with the features of civilization. The most important characteristics of the civilization, transportation still needs to be developed.Thanlyin Township is 92149 acres wide. By 2017, the number of accident happened in this township is 136 cases. These accidential cases are caused based on the essential needs of civilization process.Although Thanlyin seems pretty small, there are the infrastructures of the town like modern hospitals, stste high, middle and primary school, universities, the governmental offices, private business sectors. Consequently, a considerable number of cars commuting to these places is getting more and more increased, in Thanlyin Township. It is crowded with the cars from this township and from another townships as well.As a result, the accidents of these different types of vehicles happen daily in this area. The drivers of such vehicles as buses of Yangon Bus Services, the school buses of states school, mini buses of companies,taxis and motorcycle need to obey the traffic rules and regulations. The most frequently happened accidents are caused by motorcycles. In addition, the second most frequently cases are due to private cars.

The reasons why these accidents happen in this area are the increasing number of vehicles in the narrow roads which are not compatible with these vehicles, the reckless drivers who do not want to abide by the rules and regulations of the traffic police, and the buses trying to get the passengers competing with other buses.

Table (2.1) Traffic Accident Case during 2017

Month	Traffic Accident Case	Death	Injury
January	8	2	13
February	10	-	34
March	11	-	15
April	11	2	18
May	11	1	13
June	18	5	22
July	10	1	16
August	11	2	15
September	12	1	17
October	11	5	19
November	10		19
December	13	4	24

Source: Traffic Police Office



Figure(2.12) Traffic Accident Case during 2017

Source: Based on Table 2.1

3.Analysis Of Traffic Accident

3.1 Nearest Neighbour Analysis

All the point of the traffic accident can be summarized by " Average Nearest Neighbour". Average nearest neighbour summery provides information of how the points are distributed over the point summarizing into three general patterns : (1) clustered , (2) random, (3) dispersed.

The means value of all distances between two nearest points along the all accident is ($\bar{x}$) 189.31 meters expected mean distance of a pair of points is 597.53 metres with neighbour ratio of 0.316. Thus, the calculated z-score is – 15.241 at p value of 0.00. Therefore, there is a less than 1% likelihood that this clustered pattern could be the result of random chance.

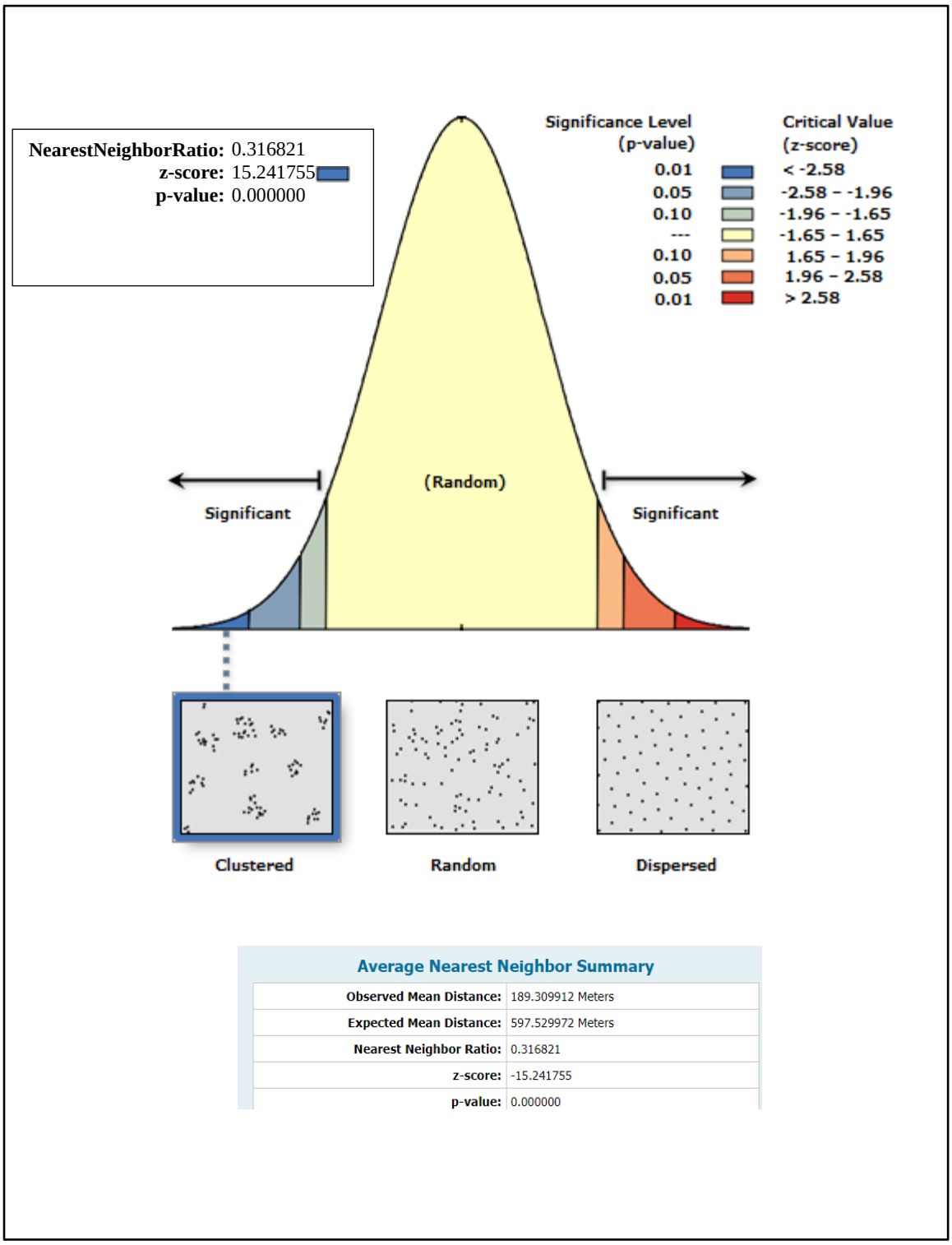


Figure (3.1) Average Nearest Neighbour Summary

(Motorcycle&Motorcycle)

Sourcce: Result

FINDINGS AND SUGGESTIONS

Findings

After analyzing the accidential cases happened in Thanlyin Township, the most frequent accidents are caused by the motorcycle and their cases are (41) in 2017. The second most frequent cases are among private cars and (28) times can be found in this year. The third one is caused by collision between private cars and motorcycles, which is proved with (24) cases. The place where most accidents happened is the junction at the traffic lights. The second place is the college bus stop which is most used by the students of Co-opperative University and other pedestrian. The third one is the junction of (18^{th}) hill near Kyeik Kauk Pagoda due to the bumper-to-bumper traffic.

Suggestion

In (21^{st}) century , we can witness the traffic accidents everywhere because the vehicles of various types are being used more than before. The educated talk should be held so as to educate the public about the rules and displines of the traffic users and pedestrians. The roads need to be extended. If the drivers of the private cars and motorcycles come to the transport office and extend their licence, they need to be informed about the traffic rules that they will not break these again. In this township, the highest cases of accident is happened by the motorcycles. In this case, these motorcycles have their respective time span for licence, there is the lack of discipline abided by the traffic rules. The most possible causes of the traffic accidents of the motorcycles are driving without wearing helmet, riding them with over passenger, the too young drivers, riding with over weight, overtaking the vehicles during traffic congestion in a wrong way, riding between the queue of cars. Therefore, the traffic police in this township need to take action of the reckless drivers of motorcycles at their assigned place, carefully.

The second most frequent accident happening type of vehical is between private cars and it is really important to take controlled measure. It is essential to suggest the drivers of various vehicles to drive the vehicles within limited miles, to drive the respective vehicles only if they

have driving licence, to wear belt, to set up the front and back camera , not to drive if they drink alcohol and beer, to abite by the traffic rules. In these ways the accidents will fade out and the lives of the public will be saved.

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