

A GIS APPROACH TO CRIME MAPPING & MGT. IN NIGERIA: A CASE STUDY OF VICTORIA ISLAND LAGOS



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Abstract

- Crime analysis using the GIS as a tool is now necessary in Nigeria as the rate of crime is on the increase.
- Crimes have situational relevance, hence GIS can be used to display and apply spatial analysis to data, which reside in large databases, in order to yield a strong visual appreciation of the patterns of crimes.
- This paper is concerned with the utilization of GIS in the mapping and management of crimes in Nigeria using Victoria Island, Lagos as a case study.

Introduction

The traditional and age-old system of intelligence and criminal record maintenance has failed to live up to the requirements of the existing crime scenario. Manual processes neither provide accurate, reliable and comprehensive data round the clock nor does it help in trend prediction and decision support. It also results in lower productivity and ineffective utilisation of manpower. The solution to this ever-increasing problem lies in the effective use of Information Technology.

A Geographic Information System (GIS) as a tool can be used by police personnel to plan effectively for emergency response, determine mitigation priorities, analyse historical events, and predict future events.

OBJECTIVES

- To produce a digital map of Victoria Island with a view of aiding the police to map out the scene of a crime and its environment, and to facilitate quick response to distress calls.
- To have a capability to carry out road network analysis which can assist the police force get to a crime scene through the shortest possible route hereby facilitation quick intervention.
- To carry out a detailed analysis on the type of crime, location, time or period e.t.c. in Victoria Island with a view of making useful suggestions as to the reason for the prevalence of such crimes and proffer solutions.

Scope of the study

- Use of GIS technology to map crime is a rapidly expanding field
- In Nigeria, it is still in a developmental stage
- A number of technical and ethical issues remain to be resolved.
- This paper will only give an overview of how GIS can be used as a potential analytical tool to reduce crime rate in Nigeria, using Victoria Island as a case study.

Methodology

DATA ACQUISITION

➤ Spatial Data Acquisition

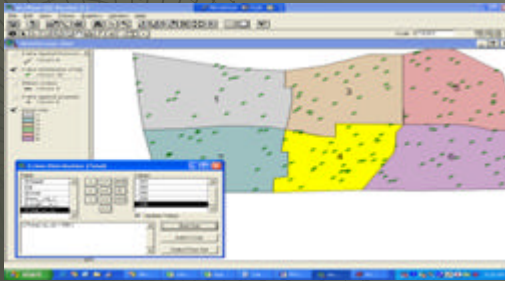
The spatial data was obtained by taking GPS observations

➤ Attribute Data Acquisition

The bulk of the attribute data were obtained directly from the field and police formations.

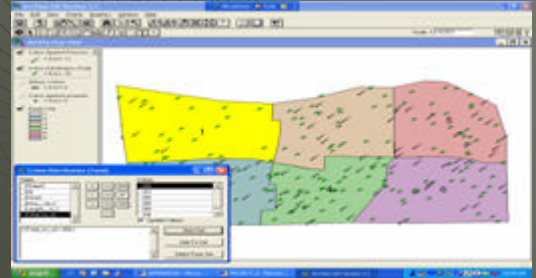
Query 4

In this case, we wish to determine the zone with the highest total no. of reported crime incidences (2001).



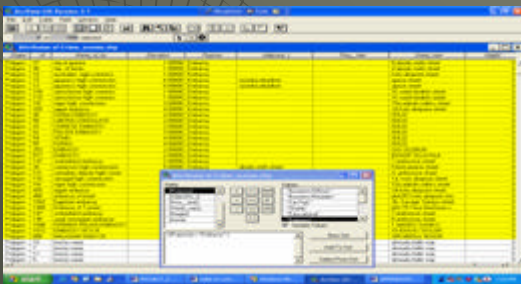
Query 5

In this case, we wish to determine the zone with the lowest total no. of reported crime incidences (2001).



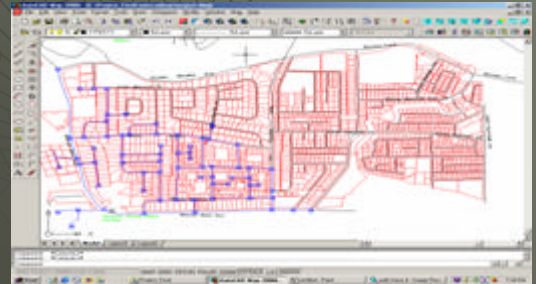
Query 6

In this query, we wish to identify the attributes of all embassies in the crime scene attribute table.



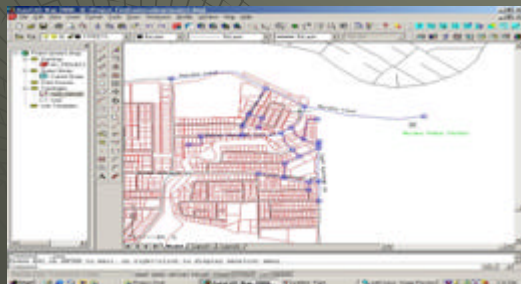
Query 7

In this query, a "flood trace analysis" was carried out to display all routes (in blue) within the extent of 2000m from the Victoria Island Police station



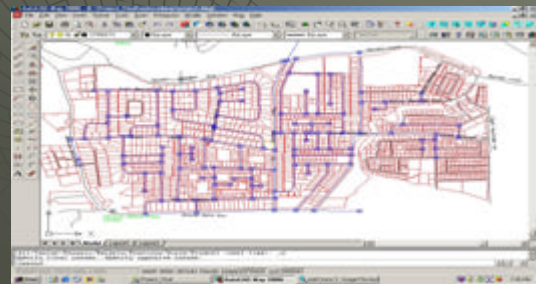
Query 8

Shows a flood trace analysis carried out to display all routes (in blue) within the extent of 2000m from the Maroko Police station.



Query 9

Shows a flood trace analysis carried out to display all routes (in blue) within 2000m extent from a centrally located part of Victoria Island i.e at the junction where Adeola Odeku and Akin Adesola streets intercept.



RESULT AND ANALYSIS

From the crime statistics obtained from the Victoria Island police station, the bar charts below (see Fig 14 - 16) were plotted using Microsoft Excel to show the relationship between the number of crime occurrences and the period of occurrence (i.e. month and years) for the years 2000 and 2001.

FINDINGS

Fig 14: Bar Chart Showing Crime Occurrences reported in Victoria Island Police Station for 2000

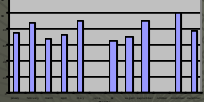


Fig 15: Bar Chart Showing Crime Occurrences reported in Victoria Island Police Station for 2001

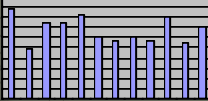
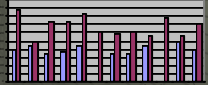


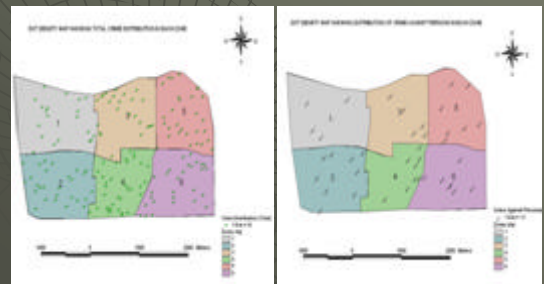
Fig 16: Bar Chart Showing Crime Occurrences reported in Victoria Island Police Station for 2000 & 2001



Analysis

- ❑ VI police station is not centrally located ([see the map below](#))
- ❑ The Maroko police station is nearer to zone 5 and could be the fastest point of call in case of emergency ([see query 3](#))
- ❑ that zone 4 which has the largest concentration of residential and business/office areas has the greatest proportion of the total crime incidences especially crimes that relate to properties ([see query 4](#))
- ❑ Zones 2 and 4 also have the largest number of crime incidences against persons ([see the map](#)). This could be attributed to the fact that this areas covers the bar beach area which serves as a leisure resort and tourist attraction; as a result a lot of miscreants and prostitutes.
- ❑ Zone 1 has the lowest incidences of reported crime. This may be attributed to the fact that it has the least structures in terms of business and residential purposes; it could also be due the military presence in that area.

PLAN SHOWING AREA WITHIN 1000M FROM POLICE STATIONS



Conclusions

- ❑ Cases of crime incidences in VI is to a large extent a factor of the population and structures/facilities in the community
- ❑ Given the right atmosphere and cooperation from all relevant authorities, GIS can be used to map and analyze crime occurrences with a view to determining factors leading to such crimes.
- ❑ With GIS, the police and other law enforcement agents could produce maps showing the scene of crimes and the route(s) leading to scene areas by performing simple queries.
- ❑ Queries can be performed to display the shortest route to the scene of the crime.
- ❑ The analysis carried out using dot density map could be used to forecast and map out strategies for combating crime.

Recommendations

- ❑ At least two additional police post are needed in order to effectively cover the VI
- ❑ One of the addition can be located somewhere in zone 4 or 5 ([see query 7](#))
- ❑ The second additional station can be located at the junction of Adeola Odeku and Akin Adesola streets [Query 8](#)
- ❑ With the support of government, Law Enforcement Agencies should embrace GIS technology in order to reduce crime rate

