

Application of GIS in transportation planning

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ABSTRACT

Transportation plays an important role in facilitating economic, social, and many other activities in our daily lives. Since transportation is deeply related to locations, places, interactions, timings the geographic information systems (GIS), which are designed for managing geographic data, performing geographic analyses, and visualizing geographic relationships and patterns which are useful for transportation applications. Geographic information systems for transportation (GIS-T) defined to the application of geographic information technologies in managing transportation systems and solving transportation problems.

Key words transportation, GIS, maps, planning

INTRODUCTION

Transportation planning includes deciding future policies, goals, investments and designs for the future needs for movement of people and goods.

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Transportation network is to be connected with many parameters such as travel time, speed, turning movements etc. GIS proves itself as a very useful tool for solving such network problems. GIS software can be used to give solution for problems like best route from one origin to many destinations with an objective to minimize travel distance, travel time and traffic congestion. GIS is seen to be a better tool for generating solution of such complex and network based problems accurately.

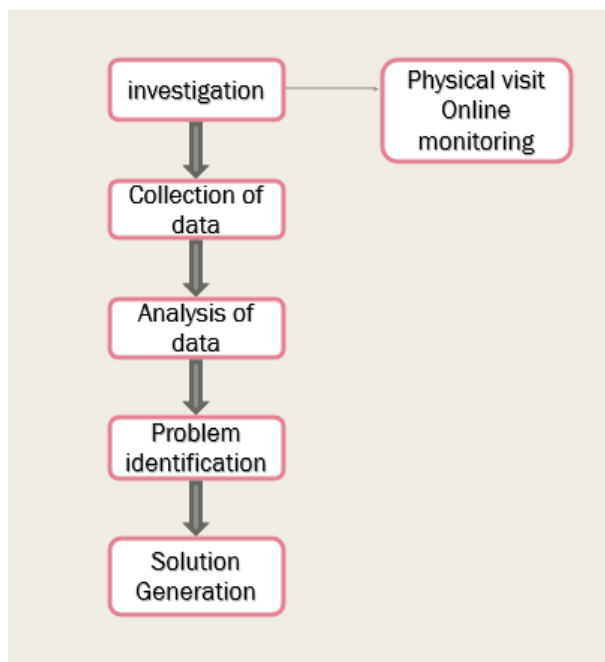
Routes are the main factor which decides the travel time and cost. As the travel time is reduced the cost of travel can also be reduced. GIS is significant because it produces visual representation by combining the traditional database with the digital map. Through GIS spatial modelling can be done which accounts for the distance between two places. GIS is used to manipulate spatial data. These are the data which contain details about a place.

SCOPE OF WORK

The scope for our work can be stated as below:

1. Citizens can have information about the road network of the city.
2. Residents can choose their route according to their needs and convenience.
3. Emergency vehicles can be guided to the least congested and the shortest road.

METHODOLOGY



Investigation/location of study

The study area is Surat city in Gujarat. Locations at which traffic congestion is more and at place where the road network needs to be developed for efficient movement of vehicles were selected.

Surat is the tenth largest city which has the estimated population count of more than 40 lakhs plus in the current scenario. Population growth of 76.02% was observed in the past decade. Due to increase in the population and rapid industrialization the transportation in the city increased to a great extent but inn want of efficient transit system the number of vehicles on the road also increased.

The gigantic growth in textile, diamond, and other industries in the city and large industries in Hazira resulted in increase in trade and commercial activities. It also uplifted the living standards of the people.

Corridors in Surat City

- Kamrej Varachha corridor
- Olpad Rander Corridor
- Hazira Adajan Corridor
- Sachin Udhna corridor
- Kadodara Sahara corridor
- Dumas Athwa corridor

These corridors have various activities observed and hence mixed type of traffic is seen in these corridors.

Road Map of Surat City:



Area:	326.515 sq.km.
Population:	44,66,826 (Census 2011)
Density:	13680 Persons/Sq.Km. (Census -2011)
Location:	Latitude : 21.112°N
Longitude:	72.814°E
Establishment of SMC:	1852 AD
Establishment of corporation:	1966 AD

Data collection:

Data collected is in the form of satellite images related to the study area in the surat city. The area selected for study were chosen under following constraints:

- Recent developments
- Scope of expanding road network
- Scope of modification
- Scope of new development

Areas for which data has been collected:

- Athwagate
- Katargam
- Vesu
- Airport area
- Pal
- Dumas road

This data shows the development in the area since the year 2000. Through this data we can recognise the area where the development and modification can be done.

RESULT

The results that were obtained were related to the road network in the city. It was found that the congested places in the city required some modification in its layout and also its use pattern. At various places traffic jam occurs due to narrow roads because of illegal construction and improper planning of road network.

CONCLUSION

From the result analysis we found that alternate routes can be provided to reduce the traffic congestion on the roads. Different alternate routes were suggested for commuting in city from one place to other. Different public transport routes were suggested that can help to reduce the load on road transport.

Widening of roads was suggested at places where illegal construction have taken place along the road.

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