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Congestion Analysis with DSS as Supportive Model

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ABSTRACT: In Indian road-traffic the problems like congestion, unpredictable travel-time delays and accidents are taking a serious shape. Due to Urbanization Industrial, Residential & Commercial areas are developed thus causing heavy transportation. As per the requirement heavy traffic causes congestion, bottleneck which is related to cause of Traffic Congestion this calls for the vital need of development and implementation of measures and techniques through positive decisions and methodologies

Different models, tools and methods are available .Among them is DSS desiscion supporting system is used. studies are conducted at different land use zones i.e. commercial ,residential and industrial zones mainly at arterial and sub arterial roads of Himayathnagar, ameerpet, begumpetkukatpally. The collected data is subjected to are DSS decision making tool. The proper road geometrics, time to time maintenances of the infrastructure, Transportation Education, Supportive Infrastructure, proper land use are few such important factors and measures like congestion pricing helps in reducing traffic congestion. The aim of the project is to minimize traffic congestion

KEYWORDS: DECISION SUPPORTING SYSTEM, CONGESTION, TRAFFIC, ESTIMATION

I.INTRODUCTION

Growing urbanization provides both opportunities and challenges from the perspectives of transportation mobility, climate change and air quality. Higher population densities generally support greater levels of transit and can make destinations ore easily accessible by walking or cycling, thus providing increased mobility while allowing reduced usage of passenger vehicles. At the same time, urbanization leads to higher competition for space on roadways and tends to increase surface transportation congestion

Various methodologies are introduced in the present. The different land use zones are traced from the Google Earth from which the surveying points can be allocated Finally the available data & determined probability data are utilized in DSS tool which contains Estimation and Choice software used for multiattribute (multicriteria) decision analysis, where the decision problem is structured hierarchically from the upper level criteria to the lower level sub criteria: Goal - General Parameters - Parameters. ESTIMATION & CHOICE handles the different decision technologies such as Analytic Hierarchy Process (AHP) by T.Saaty, Utility Functions, Simple weighing model, Pareto domination, Benefit-Cost analysis.

This help to prioritize any number of competing objectives (alternatives) and arrive at the best decision .B ased on this recommendations and suggestions are given

II.LITERATURE REVIEW

Decision Support System (DSS) ESTIMATION & CHOICE is a powerful and flexible decision making tool to help people set priorities and make the best decision when both qualitative and quantitative aspects of a decision need to be considered.

You can efficiently use ESTIMATION & CHOICE in such processes as Project Prioritization, Portfolio Management, Vendor selection, Human resource Management, Strategic Planning, Risk Assessment and many others...



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ESTIMATION & CHOICE helps you prioritize any number of competing objectives (alternatives) and arrive at the best decision. The DSS also provides a clear rationale that this decision is the best - by showing not only the final ratings of the alternatives, but also their ratings on separate qualities.

Intuition suggests that traffic volumes on a busy arterial roadway are associated with the type and density of activity built along that roadway

A bottleneck is an event on or near the roadway, or a physical restriction of the roadway, which causes throughput capacity to be reduced from what it is both upstream and downstream of the location in .The American Highway Users Alliance identifies four principal types of bottlenecks

III.DATA COLLECTION

Since the study is based on analyzing congestion delays using DSS with land use, traffic characters, road geometrics, supportive infrastructure details here is the process what are the data collected to accomplish process of study

In urban areas the congestions are observed mainly in commercial areas merged with residential areas and arterial roads, which are also known as express ways and highways. The selected arterial roads are

HIMAYATNAGAR, BEGUMAPET, AMEERPET

The reason for choosing these areas is because of mixture of commercial, residential, educational activities increased heavily thus they carry heavy traffic and stretches are lying in national highway. They are ameerpet, nampally .Their respective land use is changed over space and carries heavy traffic and public transits.

The himayathnagar area is selected for the reason it carries more number of private modes and the intensity of public transit is less.

The begumpet arterial is the road which connects the secunderabad railway station and it has various kinds of land use and R.O.Bs for fast access of vehicles



HIMAYATNAGAR

BEGUMPET



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Speed Studies

Himayatnagar- average speeds of vehicles

area	distance	bikes	autos	cars	bus	lcv	hcv
himayatnagar	500 m	25kmph	21kmph	20kmph	15kmph	14kmph	kmph
begumpet	500 m	26kmph	18kmph	21kmph	17kmph	16kmph	10kmph
ameerpet	500 m	21kmph	17kmph	19	15kmph	16kmph	10kmph
				kmph			

Volume count data

Himayatnagar

Time	Bike	Auto	Cars	Bus	lcv	hcv
10 min	495	92	390	23	13	2

Begumpet

Time	Bike	Auto	Cars	Bus	Lcv	Hcv
10 min	540	102	411	36	18	7

Single Alternative Analysis:

ESTIMATION AND CHOICE provides you with the unique option to analyze every single alternative. To run analysis for the single alternative clicks its name at the page with the results for the group of alternatives. Or you can pick up only one alternative for the analysis on the page "Alternatives and Analysis".

Benefit/Cost Analysis

Sometimes it may be not enough to create the hierarchical structure of the Plan of Analysis, assign weights and the Utility Functions and calculate ratings of alternatives. If your decision problem may be described in Benefit/Cost terms, it is more reliable to use Benefit/Cost Comparisons at the final stage of the analysis.

QUESTIONNAIRE

- 1. Do you feel traffic congestion is a major problem in your route
- (1) Strongly (2) Agree (3)Neutral (4)Disagree (5) Strongly Disagree
- 2. Please specify the type of Traffic under various time zones.
- 3. Time sample-1: 8 am- 11 am.

 Public Vehicles:
 %

 Private Vehicles:
 %

 Pedestrians:
 %

 4. Time sample-2: 12 Noon-4 P.M.

 Public Vehicles:
 %

 Private Vehicles:
 %

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Pedestrians:	%
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5. Time Sample-3: 4 P.M-8 P.M.

Public Vehicles:____%

Private Vehicles: ____%

Pedestrians :____%

6. Suggests measures to control traffic congestions?

(1)Strongly (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

7. Convert two way to one way

(1)Strongly (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

8. Restrict Parking on roads

(1)Strongly (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

9. Specific stoppage and constant check of Public transport system.

(1)Strongly (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree



The above graph indicates the public response in various zones, it shows the real time situation and helps to give real time solutions to improve traffic flow and ease the congestion.

ZONE 1	HIMAYAT NAGAR
ZONE 2	AMMERPET
ZONE 3	BEGUMPET

Alternative	Final Results		accessibility			speed			
	Rang	Rating	Dom	Rang	Rating	Dom	Rang	Rating	Dom
zone 2	1	0.495	В3	1	0.400	А	2	0.590	C3



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zone 1	2	0.465	B1	2	0.230	В	1	0.700	A1
zone 3	3	0.375	C3	2	0.230	С	3	0.520	C3

Final Rating: 0.467 Good

Weight	General Parameter	Rating	Verbal Estimation
0.310	accessibility	0.400	Almost good
0.170	speed	0.590	Very good

Details for General Parameter: speed

Weight	Parameter	Value	Rating	Verbal Estimation
0.800	traffic characteristics	7.0	0.600	Very good
0.200	supportive infrastructure	3.5	0.550	Very good

Final Rating: 0.396 Almost good

Plan of Analysis: congestion analysis

Weight	General Parameter	Rating	Verbal Estimation
0.310	accessibility	0.230	Mediocre
0.170	speed	0.700	Almost excellent

Details for General Parameter: accessibility

	Parameter	Value	Rating	Verbal Estimation
0.610	land use	residential	0.230	Mediocre
0.290	traffic characteristics	4.0	0.000	Minimally acceptable



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r	Parameter	Value	Rating	Verbal Estimation
0.100	supportive infrastructure	5.5	0.000	Minimally acceptable

Final	Rating: 0.333	Quite satisfactory	
Weight	General Parameter	Rating	Verbal Estimation
0.310	accessibility	0.230	Mediocre
0.170	speed	0.520	Good

Weight	Parameter	Value	Rating	Verbal Estimation
0.610	land use	industrial	0.230	Mediocre
0.290	traffic characteristics	5.0	0.000	Minimally acceptable
0.100	supportive infrastructure	2.0	0.000	Minimally acceptable

Details for General Parameter: accessibility



The above graph shows the huge variation in DSS analyzed data and factual data and indicates the parameters' to be improved with the help of decision supporting system as tool to analyze quick and affective way



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IV.CONCLUSION

The study of congestion study is directed towards the quality of road right of way in the precept of road user using Decision supporting model like traffic characteristics, supportive infrastructure, land use.

Poor public transport facilities. During peak hours the public transport vehicle is seen overloaded i.e. carrying people more than its capacity. Due to which many of the transit users shift their mode to private transportation. The public transit users wait for the buses on the carriage way which is creating bottle neck effect. The history of Decision Support Systems covers a relatively brief span of years, and the concepts and technologies are still evolving. Today it is still possible to reconstruct the history of Decision Support Systems (DSS) from retrospective accounts from key participants as well as from published and unpublished materials

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