INTERNATIONAL JOURNAL OF RESEARCH IN COMPUTER APPLICATION AND MANAGEMENT

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JOURNAL AND OTHER ARTICLES
- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

CONFERENCE PAPERS
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- Kumar S. (2011): "Customer Value: A Comparative Study of Rural and Urban Customers," Thesis, Kurukshetra University, Kurukshetra.

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- Garg, Bhavet (2011): Towards a New Natural Gas Policy, Economic and Political Weekly, Viewed on July 05, 2011 http://epw.in/user/viewabstract.jsp

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A STUDY ON THE TRAFFIC PROBLEMS WITH SPECIAL REFERENCE TO NELLORE DISTRICT

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ABSTRACT

Unorganized traffic on the roads creates traffic jams and inconvenience to the people. The present study is aimed to identify various factors that influence the perceptions of different sections of people and the association of perception scores with the personal characteristics of people. Factor analysis technique has been applied for the analysis of perceptions of the people. The results of factor analysis shows that traffic rules are the most important factor followed by movement of vehicles, organization of roads, role of traffic police, road safety, role of vehicle drivers, and the role of passengers. The findings of the Pearson's Chi-square test show that gender, age and occupation have not shown any significant association with the perception scores of people. There are not many published results on traffic problems to confirm or compare the results of the perceptions of the people. The factors developed require further development and empirical testing.

KEYWORDS
Movement of vehicles, organization of roads, perceptions, role of vehicle drivers, traffic rules.

INTRODUCTION

Traffic on roads may consist of pedestrians, ridden or herded animals, vehicles, streetcars and other conveyances, either singly or together. Today's competitive environment forces the automobile and car manufacturers to introduce a new model of their bike or car, keeping the youth in mind. These manufacturers know the purchasing power of the youth and hence, new trendy, fuel efficient and peppy models came on roads. With each passing day a new model adds to the number of vehicles present on the congested streets. It is also a fact that the population has also increased manifold beyond horizon.

As a result of using the public roads for various purposes of travel, heavy and unorganized traffic is possible on the roads causing traffic jams and hence, inconvenience to the people. An organized traffic generally follows traffic laws, which are the laws to govern traffic and regulate vehicles that may have developed over time to facilitate the orderly and timely flow of traffic. An organized traffic has well-established priorities, lanes, right-of-way, and traffic control at intersections. It is formally organized in many jurisdictions, with marked lanes, junctions, intersections, interchanges, traffic signals, or signs.

In the absence of lane markings and traffic control signals on roads, drivers tend to keep to the appropriate side, if the road is wide enough and they frequently overtake others causing uncontrolled traffic problems, and these obstructions are quite common now a days. At the intersection of two perpendicular roads, a traffic jam may result if four vehicles face each other side-on. People face many problems due to the uncontrolled traffic. Except at a few junctions, many of the major junctions with heavy traffic do not ensure pedestrian crossing and traffic signals. This leaves them helplessly running across the road even when vehicles are approaching them from another side. Pedestrians' lives must be cared for, if the government has to encourage more to take to walking instead of zip up swanky vehicles

Traffic is often classified by type: heavy motor vehicle (e.g., car, truck); other vehicle (e.g., moped, auto, bicycle); and pedestrian. Different classes may share speed limits and easement, or may be segregated. Some jurisdictions may have very detailed and complex rules of the road while others rely more on drivers' common sense and willingness to cooperate. To handle this situation we have a limited number of traffic policemen and it becomes virtually impossible for the traffic department to check all vehicles manually whether they are moving as per rules or not.

Nellore is one of the recently developing towns in Andhra Pradesh, also facing the traffic problem. The people in the town are often complaining about traffic problems at various locations and the time they lost and inconvenience they faced during the traffic jams. As against this back ground a survey has been conducted to know the various factors behind the traffic problems. The present survey will help the authorities to develop more appropriate plans to reduce the traffic problems, and these could be incorporated into a well designed set of traffic rules for better performance of traffic.

SIGNIFICANCE OF THE STUDY

The traffic problem is one of the important problems everyone is facing in the present environment, and it is not an exception to the management phase. The free flow of vehicular traffic on the roads gives the feeling of satisfaction with which the people as individuals and as groups get easy and comfortable transportation. It is a state of healthy balance wherein the public make their respective contributions to follow the rules set by the traffic police. With the government policy of privatization and liberalization, a large number of private transport vehicles are entered into the market in addition to individual mode of transportation. Because of the increased income levels of various kinds of people and easy availability of loans from the banks, the demand for individual mode of transport is still on the increasing side. As a result of various modes of transportation, the traffic also increased. The trend in the introducing of various models of new vehicles is still showing an uptrend. In a competitive environment every vehicle manufacturer is interested to improve his position by creating a strong base for its survival. All these factors create a traffic problem to the public. Hence a study has been made to know the factors that are responsible for the effective management of traffic. To study the traffic management and the factors responsible for it, various factors which are directly or indirectly related to the traffic were considered. The need for the study is to ascertain specific problems of travelling public and to find out the ways to overcome them. The present study will helps to develop more appropriate strategies to minimize the traffic problems of the people, and these could be incorporated into a well designed set of rules and regulations, further this study also helps as one of the source for the secondary data for future research on this related area.

OBJECTIVES OF THE STUDY

The purpose of this study is to investigate the perceptions of travelling people towards an effective traffic management. The study may give important factors in managing the traffic at different places. The following are the research objectives formulated to guide the study.
1. To find out the factors affecting the perceptions of people towards traffic management, and
2. To investigate the relationship of perceptions with personal variables of customers.

HYPOTHESIS

This study infers that there is no difference between the perceptions and gender as well as age and occupation of passengers. Against this background, the statement of hypothesis is as follows.
1. H_01: There is no significant association between perceptions and gender of the respondents.
2. H_02: There is no significant association between perceptions and age of the respondents.
3. H_03: There is no significant association between perceptions and occupation of the respondents.

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METHODOLOGY

INSTRUMENT DEVELOPMENT

The instrument used in this study consists of three parts. The first part deals with the demographic profile such as gender, age, and occupation of the respondents. Part two deals with a questionnaire prepared for exploring the perceptions of the travelling public towards traffic management. It consists of 20 questions, each of which is measured on four point Likert's scale, in which, 1 indicated "strongly disagree", 2 indicated "disagree",3 indicated "agree", and 4 indicated 'strongly agree'. Contents and validity of the statements were established by experts consisting of top officials and other important persons on traffic management. Each of the experts on the panel was asked to verify the instrument for clarity, wording, overall appearance and meaning in addition to content and validity. The instrument was pilot tested with a group of people, not included in the sample.

DATA COLLECTION

Personnel interview method was adopted to collect data from the respondents. Data were collected from various occupations of respondents passing on the roads in and around Nellore District in India. A total of 250 respondents were selected randomly and questionnaires were delivered to them. The data were systematically collected during the period between April 2011 and May 2011. Nearly 10 numbers of responses received were with incomplete answers i.e. not answered properly. Hence they were treated as unusable responses and thus eliminated from the study.Thus,a total of 240 responses were received.

ANALYSIS OF DATA

The primary data collected have been sorted, classified and tabulated in a format and analyzed by using statistical package for social sciences (SPSS16.0). Appropriate statistical procedures like Factor analysis, Chi-square tests and averages have been used for analysis and inference. The factor analysis allows for defining the factors affecting the perceptions of people towards traffic management and Chi-square test is applied to find the association between perceptions and personal characteristics of the people.

RESULTS AND ANALYSIS

PROFILE OF THE RESPONDENTS

Of those responding to the questionnaire, it was found that 60.4percent (145) were male while 39.6 percent (95) were female (Table 1). The table further shows that the respondents selected for the study are male dominated. Out of which 15 percent (36) of the respondents are below 25 years of age, 34.16 percent (82) are in the age group of 25 to 35 years, 28.76 percent (69) are in the age group of 35 to 45 years and 22.08 percent (53) respondents are with above 45 years of age. An analysis of the age of the respondents reveals that majority of the respondents are in the age group of 25 to 35 years. Similarly, 27.08 percent (65) of the respondents belongs to students stream, 30.83 percent (74) belongs to employees, 20.43 percent (49) belongs to farmers, 12.5 percent (30) belongs to labour and the remaining 9.16 percent (22) of the respondents belongs to others stream.

TABLE 1: DEMOGRAPHIC PROFILE OF RESPONDENTS

1.Gender	No of Respondents	Percentage
a) Male	145	60.4
b) Female	95	39.6
Total	**240**	**100**
2.Age		
(a) Less than 25 Years	36	15.00
(b) 25-35 Years	82	34.16
(c) 35-45 Years	69	28.76
(d) Above 45 Years.	53	22.08
Total	**240**	**100**
3. Occupation of Respondents		
(a) Student	65	27.08
(b) Employee	74	30.83
(c) Farmer	49	20.43
(d) Labour.	30	12.5
(e) others	22	9.16
Total	**240**	**100**

RELIABILITY

The internal reliability of various items of the questionnaire was verified by calculating Cronbach's alpha. Cronbach's alpha is used to measure the reliability of the instrument that ranges from 0 to 1, with values of 0.6 as lower level of acceptability (Hair et al.1998 & Nunnaly, 1978). The Cronbach's alpha estimated in the present study for computing the perceptions of passengers was 0.712, which is much higher than the acceptable level, the constructs were therefore deemed to have adequate reliability.

FACTOR ANALYSIS

The basic reason for applying factor analysis is to group the variables that are highly correlated. The factor analysis involves extraction of factors from a correlation matrix, deciding how many factors to be interrupted and finally rotating the retained factors. (Alias Radam et al, 2010). The adequacy of data for applying factor analysis has been verified by Kaiser-Meyer-Oklin (KMO) test. Generally, a value greater than 0.5, indicates that the factor analysis is appropriate. (Naresh Malhotra,2009). In the present study the KMO test value is 0.641shows that sample selected for the study is adequate and is statistically significant for factor analysis. Data were subjected to factor analysis and the factors were generated using principle component analysis and varimax rotation. The principal component analysis in data extraction extracted seven factors with Eigen values above 1.0. The Table 2 shows the factor analysis of results.

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TABLE 2: FACTOR ANALYSIS RESULTS

Factor 1(Traffic rules)		Loadings	Mean scores	
S3	Everyone is following the traffic signals	0.702	2.52	Eigen value =3.402
S15	Traffic awareness programme is to be provided to the public	0.811	2.67	Percentage of variance =17.904
Factor 2(Movement of vehicles)				
S9	More problem with auto rickshaws	0.661	3.73	Eigen value =2.746
S10	Heavy vehicles cause traffic problems	0.785	3.57	Percentage of variance =14.453
S14	Share autos cause many problems	0.596	3.86	
Factor 3(Organization of roads)				
S4	White lines at the signals marked	0.835	2.07	Eigen value =2.039
S5	Pedestrian lines are marked	0.838	2.04	Percentage of variance =10.730
S16	Proper organization of road route exists	0.663	2.65	
Factor 4(Role of traffic police)				
S7	Traffic police is available at signals	0.816	2.81	Eigen value =1.619
S17	Need for alternative roads exists	0.521	3.23	Percentage of variance =8.523
S18	At the cross roads and junctions traffic maintained properly	0.426	2.56	
S19	The traffic police is doing duty honestly	0.635	2.25	
Factor 5(Road safety)				
S11	Road dividers exists	0.655	2.78	Eigen value =1.243
S12	Sufficient number of speed breakers exist	0.831	2.72	Percentage of variance =6.543
Factor 6(Role of vehicle drivers)				
S8	Vehicle drivers are not aware of the traffic	0.504	3.13	Eigen value =1.080
S13	Buses pick or drop passengers at the Bus stop only	0.844	2.98	Percentage of variance =5.684
Factor 7(Role of public)				
S1	Traffic signals are functioning well	0.642	3.14	Eigen value =1.005
S6	Customers follow the traffic rules	0.795	2.49	Percentage of variance =5.288
Total Percentage of Variance = 69.125				

The seven factors are namely, traffic rules, movements of vehicles, organization of roads, role of traffic police, road safety, role of vehicle drivers, role of passengers, and the total variance explained is 69.125 percent. According to Hair et al (1998), the sum of square of the factor loadings of each variable on a factor represents the total variance explained by the factor. And, so Eigen values greater than 1.0 are considered significant and a total variance greater than 60 percent is also considered satisfactory. Further, the percentage of variance explained is a summary measure indicating how much of the total variance of all variables the factor represents and the percentage of variance explained statistically useful in evaluating and interpreting the factor (Aaker et al., 2001).

As per the analysis, the most important factor accounting for 17.904 percent of variance is Traffic rules. The statements of this factor are related to awareness about the traffic rules. This factor consists of two variables namely, everyone is following the traffic signals and traffic awareness programmes are to be provided to the public. The item loadings for the statements are 0.702 and 0.811 and the mean values are 2.52 and 2.77 respectively. The mean scores of the factors indicated that customers are more inclined towards 'agree'.

The second factor named,' movements of vehicles' explained a total variance of 14.453%. It consists of three statements and the items are loaded from 0.596 to 0.785. The mean values of the variables showed that customers are somehow strongly agreed with the statements regarding more problems with auto rickshaws (3.73), heavy vehicles cause traffic problems (3.57), and share autos cause many problems (3.86).

The third factor is the 'organization of roads' recorded 10.730% of total variance and it consists of three statements. These items are loaded from 0.663 to 0.838. The mean values of the statements are white lines at the signals marked (2.07), pedestrian lines are marked (2.04), proper organization of road route exists (2.65). The analysis of the overall mean value of the factor shows that the respondents are more inclined towards 'disagree'.

The role of traffic police being the fourth factor recorded 8.523 % of total variance. This factor consists of four statements and their factor loadings are ranging from 0.406 to 0.816. The mean values of the statements are traffic police is available at signals (2.81), need for alternative roads exists (3.23), at the cross roads and junctions traffic maintained properly (2.56), the traffic police is doing duty honestly (2.25). The analysis of the overall mean value of this factor shows that the respondents are more inclined towards 'agree'.

The fifth factor named road safety recorded 6.543 % of total variance. This factor consists of the statements such as road dividers exist and sufficient number of speed breakers exists. The factor loadings of the two statements are 0.655 and 0.831 and the corresponding mean values are 2.78 and 2.72 respectively. The overall mean value of this factor is more inclined towards 'agree'.

The sixth factor is the role played by the vehicle drivers. This factor recorded a total variance of 5.684 %. This factor consists of two statements such as Vehicle drivers are not aware of the traffic and buses pick or drop passengers at the bus stop only. The factor loadings of the two statements are 0.504 and 0.844 and the corresponding mean values are 3.13 and 2.98 respectively. The overall mean value of this factor is more inclined towards 'agree'.

The seventh factor named role of public recorded a total variance of 5.288 %. This factor also consists of two statements such as traffic signals are functioning well and customers follow the traffic rules. The factor loadings of the two statements are 0.642 and 0.844 and the corresponding mean values are 3.14 and 2.49 respectively. The overall mean value of this factor is also inclined towards 'agree'. This factor is the least important factor explaining only 5.288 % of total variance. The overall mean score of the factors shows that movement of vehicles on the roads ranked the first response. Similarly, the role played by the vehicle drivers and the role of the customers are the other factors occupied second and third best responses.

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SCHEMATIC DIAGRAM OF TRAFFIC MANAGEMENT

FIG 1: THEORETICAL FRAME WORK OF TRAFFIC MANAGEMENT
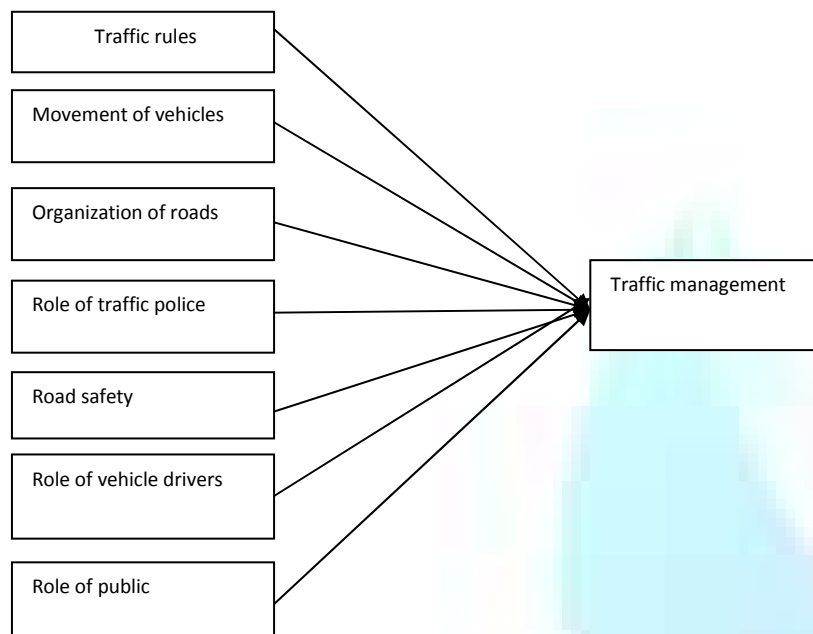
A theoretical frame work for the solutions to traffic problems is developed based on the objectives of the study. The model is developed in consistence with the various factors that represent the traffic related problems. The development of this model will provide a sound base and will helps in further examination as to what extent can these factors influence the solutions to traffic problems.

TEST OF HYPOTHESIS

To satisfy the one of the objectives of the study and to test the association between the perceptions and the personal characteristics of the respondents, such as gender, age and occupation, Pearson's Chi-square test has been applied. Based on the data obtained from the respondents, the perception scores have been calculated.

The perceptions of the customers may be Low or Normal or High. The highest possible score by the individual is 80 and the lowest possible score is 20. On the basis of the perceptions of the sample respondents, they were divided into three groups i.e. Low, Normal and, High (Table.3). Those who scored between 20 and 40 are identified as having Low perception, between 41 and 60 are identified as having Normal perception, and between 61 and 80 are identified as having perception at High level.

TABLE 3: PERCEPTION SCORES OF SAMPLE RESPONDENTS

Perception	No of Respondents	Percentage
Low (20-40)	55	22.91
Normal (41-60)	123	51.25
High (61-80)	62	25.84
Total	240	100.0

It is clear from Table.3, that the majority of respondents i.e., 51.25 percent are having normal perception about the traffic, followed by 25.84 percent of the respondents with high perception and 22.91 percent of the respondents with low perception.

TESTING OF HYPOTHESIS 1

Null hypothesis: There is no significant association between perceptions and gender of the respondents.

Alternative hypothesis: There is a significant association between perceptions and gender of the respondents.

TABLE 4: GENDER AND PERCEPTIONS OF RESPONDENTS

Perception Scores	Gender		Total
	Male	Female	
Low	31	24	55
Normal	75	48	123
High	39	23	62
Total	145	95	240
Df = (r-1)(c-1) =2.		Chi Square value is 0.7728	

Interpretation 1: For 2 degrees of freedom, Chi square value at 5 % level of significance is 5.9915. The calculated value of Chi square is 0.9317, which is less than the table value. Therefore the association between gender and the perception is not significant. Thus, the null hypothesis is accepted.

TESTING OF HYPOTHESIS 2

Null hypothesis: There is no significant association between perceptions and age of the respondents

Alternative hypothesis: There is a significant association between perceptions and age of the respondents

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TABLE 5: AGE AND PERCEPTIONS OF RESPONDENTS

Perception Scores	Age				Total
	Less than25	25-35	35-45	Above 45	
Low	10	15	15	15	55
Normal	12	44	37	30	123
High	14	23	17	8	62
Total	36	82	69	53	240
Df = (r-1)(c-1) =6.				Chi Square value is 9.5065	

Interpretation 2: For 6 degrees of freedom, Chi square value at 5 % level of significance is 12.592. The calculated value of Chi square is 9.5065, which is less than the table value. Therefore the association between age and the perception is not significant. Thus, the null hypothesis is accepted.

TESTING OF HYPOTHESIS 3

Null hypothesis: There is no significant association between perceptions and occupation of the respondents

Alternative hypothesis: There is a significant association between perceptions and occupation of the respondents

TABLE 6: OCCUPATION AND PERCEPTIONS OF RESPONDENTS

Perception Scores	Occupation					Total
	Students	Employees	Farmers	Labors	Others	
Low	16	16	11	5	7	55
Normal	32	38	25	16	12	123
High	17	20	13	9	3	62
Total	65	74	49	30	22	240
Df = (r-1)(c-1) =8.					Chi Square value is 3.0606	

Interpretation 3: For 8 degrees of freedom, Chi square value at 5 % level of significance is 15.507. The calculated value of Chi square is 3.0606, which is less than the table value. Therefore the association between age and the perception is not significant. Thus, the null hypothesis is accepted.

CONCLUSION

The customer's perceptions towards traffic problems have been studied to determine a solution to the traffic problem. The results of factor analysis technique shows that traffic rules is the most important factor followed by movement of vehicles, organization of roads, role of traffic police, road safety, role of vehicle drivers and role of public. Therefore traffic management authorities must give utmost importance to these factors to overcome the traffic problems faced by them as all these factors contribute to the positive perceptions of customers towards traffic management.

Chi-square test has been used to study the relation of perception scores and the personal characteristics of the respondents. The results of Chi-square test show that there is no significant relation with gender, age and occupation of the respondents. Factors mean score values indicate that traffic rules recorded the lowest response among other factors. The reason for the poorest response may be due to non awareness about the traffic rules and absence of proper follow up. Organization of roads is the next lowest response factor. The reason for getting dissatisfaction on this factor may be due to absence of white lines at the signals points and no pedestrian lines. The next poorest response is related to the role of traffic police. It may be due to non availability and dishonest on the working of police people at the traffic areas. On the other hand, the respondents have given first response to vehicles movement factor. The reason may be due to more disturbances faced by the customers with auto movers and sudden stopping of their vehicles at different traffic areas. The next best response factors are the role played by the vehicle drivers, followed by the role of public, shows that the attitude of the vehicle drivers and public plays a majority role in minimizing the traffic problem.

The analysis of this research paper and the results obtained will provide a strong base to the traffic control authorities on various factors to be taken into consideration, to minimize the traffic problems and to focus attention on the factors for the effective management of the same.

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