

REVIEW ON TRIP ATTRACTION RATES OF SHOPPING CENTERS

MAZEDAN JOURNAL OF CIVIL ENGINEERING & ARCHITECTURE

e-ISSN: 2583-5904

Article id- MJCEA0201001

Vol.-2, Issue-1(Mar)

Received: 10 Jan 2022

Revised: 20 Feb 2022

Accepted: 25 Feb 2022

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Citation: Sapkal, G. R. (2022). Review on Trip Attraction rates of Shopping Centers. *Mazdan Journal of Civil Engineering & Architecture*, 2(1), 1-3.

Abstract

Background: With the rapid growth of urbanization in the developing world, vehicular traffic is increasing. Travel demand models can be used to manage this increased travel demand.

Statistical Analysis: Trip generation step is an essential step in planning of transportation systems for any city. Various factors including physical features of the study area (sq.ft), parking spaces, number of employees, number of stores & number of people attracted are taken into consideration in the definition of a trip.

Findings: In traditional travel demand modeling, the first step is trip generation. It is essential for a planner to estimate the impact of changes due to the establishment of new facilities like offices, retail outlets, and residential buildings. After work trips, shopping trips account for the second biggest share of trips in the study area. Because of their large share, these excursions have a significant impact on not just individual travel behaviour but also the transportation network. Unlike prior research, this one established business area typologies based on their physical qualities and applied the same to the analysis. These typologies are based on numerous business factors such as floor area, number of stores, and number of employees. Because no major previous studies have been published in assessing trip attractiveness rates in the study area in India, this work may be useful to future researchers. In addition, a thorough literature review while identifying typologies of commercial districts and other parameters for assessing trip rates could aid in accurate trip rate prediction. The planning process is critical in meeting people's current and future transportation requirements. Trip generation must be done correctly and accurately in order to obtain accurate travel demand predictions. In any city or country, shopping trips are usually the second most popular after work trips. Shopping malls are a popular destination for a large number of visitors.

Keywords: Trip attraction rate, Shopping centre, Microscopic & Macroscopic analysis.

1. INTRODUCTION

Urbanization in India began to speed up after independence, because of the country's adoption of any mixed market, which results in rapid growth of the Private sector. Urbanization means an increase in the proportion of individuals living in urban areas in comparison to rural areas. As a country industrializes, the population living in urban areas has a tendency to increase. Some of the causes of urbanization are Industrialization, Job opportunities, education, Infrastructures, transportation and other factors. Rate of growth of buildings, infrastructures are the main concern to be observed and studied in detail to know their impact on environment. This rate results in increment in rate of transportation. Total land area of any city is divided through suitable authorities into zones-based land use or purpose of land use this is called as Zoning. Hence, zoning is a method of land-use making which can be effectively used as a tool for urban planning and utilized by government authorities. Usually, land use for urban area classified into Residential, Commercial, Industrial, Public and semipublic, Traffic and transportation. Public

utilities, Park and open space, Unclassified and Agriculture land. Land which is used for the commercial purposes like building offices, restaurants, shopping centers, resorts, etc., this land use is called as commercial land use. This opposes the construction of residential buildings. Some of the main commercial places are Airport, Business Park, Office building, Stadium, Retail Park, shopping mall/center, Shopping streets and others. These are the places which attracts a greater number of people towards it.

Nowadays, Shopping centers display a huge choice for people. Shops specialized in style, electric home equipment or presents to large buying department shops with multipurpose shops, cinemas or eating places. Purchasers are familiarized with this combination of merchandise, offerings, enjoyment and services. Group of retail shops, commercial establishments which forms a complex. This is planned, established, developed and maintained as a single property. Usually, on-site parking facilities are provided for both two-wheeler and car.

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Shopping Centre consumes large area. Shopping Centre contains different retail shops, theatre, food courts, gaming zones, kid's section and other commercial establishments. Here are the some of the reasons why shopping centers attract people reasons why shopping centers attract people-

- All shops such as Clothing, groceries, food court, theatres and all other shops are housed in unique complex which tends to attract buyers to visit Shopping Centre
- Main advantage of visiting or shopping at Shopping Centre is parking facilities
- Accessibility, Provision of lifts and escalators which enables easy movement for people
- One of the best places for entertainment for people of any age group

Especially in weekends Shopping Centers are overcrowded or more crowded compared to weekdays mainly because of holidays and leisure. These are the sum of main advantages which attracts more people towards it. Therefore, Shopping Centers will be the main choice for costumers for the shopping trips, resulting in increment in number of trips. From the Transport planner's view this will a big impact on road network especially on roads near the Shopping Centers. In order to know the amount of impact done by the Shopping Centers, Impact analysis must be carried out by considering all the factors, which influences the trip attraction, and its analysis, which can be called as "Traffic impact analysis."

2. LITERATURE REVIEW

Forecasting travel demand is critical to the suggested model's data design for estimating trip attraction. Shinya kikuchi et al. 2004. Here Shopping centers in Northern new castle which is a part of Delaware State of U.S are considered. Shopping centers are classified into 4 classes based on the size of the Shopping center and other factors. Details of shopping centers required for analysis was collected by respective authorities of shopping centers. Numbers of people coming to the shopping center were counted. To know the weights of each shop, data collected from the costumers. 2 types of analysis were done to know the relation among trip attraction and factors. First, Microscopic analysis which involves finding weights of each shop in a shopping center. Using these weights and the number of trips, model has been generated. Second, Macroscopic analysis this includes correlating the total number of trips and the factor affecting the trip attraction. This is done by calculating trip attraction rates and regression equations are generated. Neha P. Bali et al. 2017, in this total 7 shopping centers in Vadodara city are selected for the study. Primary data which includes information about the study area like physical features and others are collected from the mall authority and Municipal Corporation of Vadodara city. Number of trips attracted to the shopping centers is counted from the opening time to closing time to know the variation of trips and the peak hour. By using TransCAD software, study area is defined and the peak time is identified. Similar to other studies totally 4 trip attraction rates are found out. Multiple regression analysis is done to know relation between the

trip attraction and the factors affecting the trip attraction. Multicollinearity is obtained among the various variables 10 which affect the trip attraction. R2 value obtained showed a good relation among the variables. K. M. RAHMAN et al. 2017, Kaptai Road, a major and busy road in Chittagong, was investigated to assess the trip generation of nearby commercial land uses. Multiple linear regression models and commercial land use trip rates were used to estimate the trip generation scenario. They concluded the weighted average rates of the shopping centers are 9.32 trips/ 1,000 sq. ft./hr. Khaled Al-Sahili et al. 2018 established trip generation rates for the different land-use considering the most appropriate independent variables. Local trip generation rates were found to be generally diverse (greater, comparable, or lower). This is due to the fact that travel behaviour, as well as socioeconomic and land use features, differ from one another. F. Akter et al. 2016 focused on estimating the trip attraction rate of a mega shopping mall and a school of Dhaka City using a trip rate analysis method. The major Trip rate analysis results found are average peak hour person trip attraction rate 3.91trips/1000ft²/hour and average peak hour car trip attraction rate is 1.76 trips/10000 ft²/hour for Bashundhara City. They emphasis the need of doing a trip rate analysis before erecting any giant structures in Dhaka, since new structures will have an impact on the surrounding area's typical trip generation by attracting a huge volume of traffic. Alexandre A. Amavia et al. 2014 introduced advanced generation/attraction models considering spatial correlation, and their improvements concerning. Previous models that did not take into account spatial correlation are examined. A study conducted by Parikh M. S. and Dr. H. R. Varia; they were created to investigate how trips are generated in residential metropolitan areas. Few academics have attempted to create a model of a trip-generating retail event for India's urban areas. Uddin et al.2012. Using trip rate research, we assessed the attractiveness of retail malls in the Dhanmondi region of Dhaka City. They related the appeal of the shopping centre to its exterior aspects. Major activity centres of various land use yield distinct trip rates, which are very important values used in estimating the future attractiveness of other developments, which in turn is used to predict the requirement for infrastructure and city transportation systems in demand modelling. The new development will increase the demand for travel by also increasing the number of vehicles so that it is necessary to know the attractions of this development. The trip attraction is related very strongly to land use characteristics. To accurately plan the need for city transportation facilities and infrastructures, there is a need for an accurate estimate of trip attraction rates. Further trip rates vary from site to site and city to city. Improving the accuracy of the trip model is essential to get a better result of the trip predictions. In such a way, the demand for trips in a given future scenario can be precisely estimated by knowing the explanatory variables in that scenario.

3. CONCLUSION

The trip attractiveness rate is a significant factor in the planning of transportation facilities, as it affects all road networks and traffic control around the retail centre. The

Trip Rate is important for knowing the number of individuals entering a region at a certain time, which is helpful for traffic planning and monitoring. The trip attraction rates of shopping centers were calculated in this study, with these trips having a significant impact on the transportation network. The trip attraction rate is calculated by taking into account various physical elements of shopping malls. Each model and data set should be useful in assessing the influence of traffic volumes and the effect of traffic near a new shopping centre. The results suggest that the GFA and personnel count are strong indicators for estimating trip rate. In addition, the trip rate technique produces more accurate findings than regression.

The restricted number of analysed retail centres and characteristics considered for the study are the main limitations of such studies. The type of stores in the shopping centre would be ignored by the macroscopic model. It exclusively examines the physical characteristics of shopping centres as a function of their trip attractiveness rate. If two shopping centres with distinct store compositions have physical similarities, it will cause complications. The model also takes into account the retail centre's food court, restaurant, and office space, which does not accurately reflect gross floor area. To improve the model's accuracy, the number of persons that visited each store should be counted, and visible factors should be taken into account. Because there have been few studies on the trip attraction rate of shopping centres, such studies will be useful for future research.

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