

Urban Road Encroachment and Congestion- Causing Factors : A Case Study of Kalaburgi Super Market

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Abstract—one of the main difficulties for Indian cities is traffic congestion, which includes overcrowding on the roads, pollution from motor vehicles, and encroachment on major and smaller roads due to improperly parked MVs and NMVs. In this study, and encroachment by narrowing the actual widths of the roadways and erecting obstacles to prevent smooth traffic movement. The fundamental cause of it can attributed to a variety of causes, including poor road design, improper traffic laws, poor maintenance, a lack of adequate roadside infrastructure and parking spaces, etc. owing to the ongoing rise in the population of cities and the unplanned expansion of streets vendors in urban setting, particularly in metropolitan areas has a crucial part in the encroachment on local streets roads as well as collector roads, sub-arterial highways, and arterial roads in India. The hawkers mostly invaded parking lots and spaces beside the roads which are the cause of along the urban road pattern, and setting illegal temporary buildings or structures on pedestrian paths that limit the area available for pedestrian movement. In order to determine the sources and effect of traffic congestion in the Kalaburagi city super market

Keywords—Encroachment , Hawkers ,Traffic Congestion,Road

I. INTRODUCTION

One of the main concern in cities, particularly in metropolitan areas, is traffic congestion. Numerous factors, including improper road pattern design, uneven road alimentation, a lack of awareness of traffic, heavy laws, and encroachment on public spaces, are the core cause of these problems. The primary cause of traffic issues is encroachment, which is essentially defined as the illegal and space, two wheeler route, footpath, or government land is considered encroachment since it occurs when an unauthorized possession of land for personal gain our self interest. The owning or occupying public space ,two wheeler , footpath or government land is considered encroachment since it occurs when an unauthorized land owner lacks the license to use that specific plot of land for self interest and self motive. The unauthorized expansion of informal settlement or a rise of development along various road pattern and hawkers operations on side walks, the main carriageway, roadside areas, and pedestrian paths are the most frequent forms of urban encroachment in cities.

However, these vending areas should be properly planned so that encroachment, particularly on local street arteries and collector roads, can be controlled or reduced to allow for appropriate mobility. The crucial area where the necessity of private

building and large-scale urbanization conflict is planned progress and improvement.

The kalaburagi super market is a place where one may purchase everything from a pin to car, as well as any hardware or software, but they need be prepared for the hectic crowd. The super market appears disorderly, disorganized, and unstructured at first glance. Stores are in both the sides of the roadways and go a certain distance through the streets

II. LITERATURE REVIEW

Sun Ye [2011] [1] Currently, one of the main issues preventing our urban traffic sustainable development is traffic congestion. One practical way to reduce traffic congestion in cities is to implement congestion charges. The purpose, the cost, the extent, the procedure, and the theoretical redistribution of congestion charging are just a few of the important topics that are initially examined in depth in this study. The usage of public transit will be encouraged by the traffic congestion fee. As a result, the complete development of public transportation must be assumed. First and foremost, the public transportation system needs to be able to meet people's needs for comfort, accessibility, and convenience.

Congestion is a serious issue with urban transportation. Poor traffic management increases the risk of accidents caused by traffic congestion, to end traffic accidents and to preserve valuable . Finding a suitable solution to traffic congestion is crucial for human life.

Shekar. Rahane, Prof. U.R.Saharkar [2014][2] his study examines the issue of traffic congestion, identifying its origins and suggesting potential solutions. Additionally, there are a number of indirect effects of congestion, such as its marginal effects on the environment and resources, its effects on quality of life, stress, and safety as well as its effects on users of non-vehicular road spaces like sidewalks and road frontage properties. On the roads, distinct lanes should be marked for various vehicle kinds.

Gaurav S Chauhan, Prabhangini Varshney, Avani Saraswat [2017][3]this research investigates strategies for mitigating the issue of road encroachment. In addition to analyzing the issues causing the encroachments, it offers a remedy that will lessen the problem. Numerous problems, including poor road design, disorganized road maintenance, disobedience to traffic laws, heavy traffic, and encroachments on private property, are to blame. Remedies such as relocation of auto stand, redevelopment of road .

Harcharan Singh, Er. Gurwinder Kaur[2018][4] the issues with traffic congestion are becoming more prevalent as the hawker encroaches on various road patterns, growing in an unpredictable manner. The vendor took a parking space and was positioned at the intersection of the road that causes congestion. The fundamental cause of it can be attributed to a variety of causes, including poor road design, improper traffic laws, poor maintenance, a lack of adequate roadside infrastructure and parking spaces, etc. Relocating hawkers, multi parking space separate NMV and auto rikshaw/E rikshaw terminals are some solutions to reduce congestion.

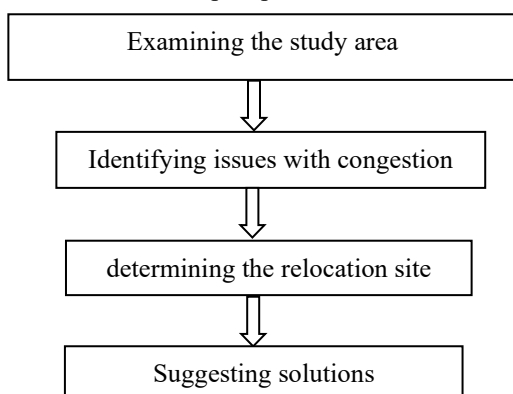
S.Patel [2019] [5]an core for unlicensed activities is K. R. Market. A significant obstacle faced by users is the rise in demand for products offered in unofficial markets as a result of population growth. Due to a lack of infrastructure or amenities, the number of street sellers rises as a result of this increase in demand. This results in busy, chaotic streets that spill over onto major thoroughfares, disrupting local traffic patterns and adding to the already existing congestion. Numerous issues that K. R. Market and the adjacent streets are currently facing have been brought to light by the current investigation. In view of this, the following suggestions for modifications to policies are put forth: It should be recognized that one of the most crucial elements in street vendors' businesses is visibility. This policy suggests that the ground level of the K. R. Market building be entirely renovated to significantly increase porosity, enabling all vendors there to have enough visibility. The market area's layout plans should explicitly include enough, clearly marked locations for vending, according to municipal authorities. The streets should also have a similar, unambiguous layout that distinguishes between traffic and pedestrian routes. All pedestrian streets should allow mobile vendors, with the exception of those designated as no-vending zones.

III. OBJECTIVES

- T.To identify the issues with encroachments and traffic jams.
- U.To recommend corrective actions to move components and lessen traffic on the streets
- V.To rearrange the road to facilitate easy traffic flow.

IV. METHDOLOGY

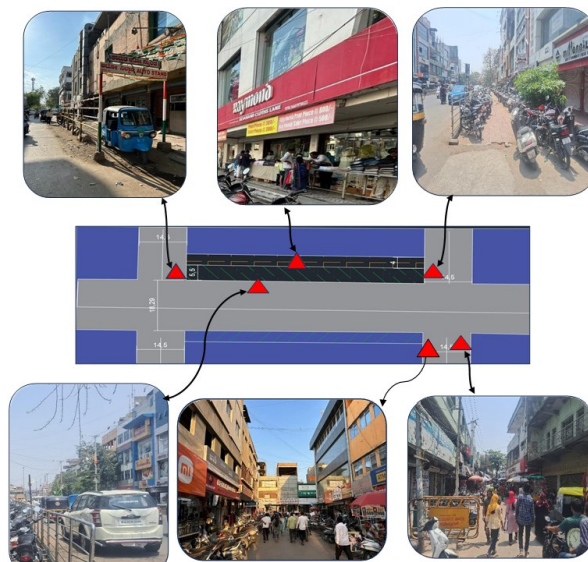
The goal is to get an awareness of the issue and the appropriate norms and regulations for carriage way widths, pedestrian walkways, and road designs, as well as how to incorporate them into the process of urban development in super market areas. The flowchart illustrates the approach used to lessen traffic congestion and make ample space for vehicles to move



V. EXAMINING THE AREA

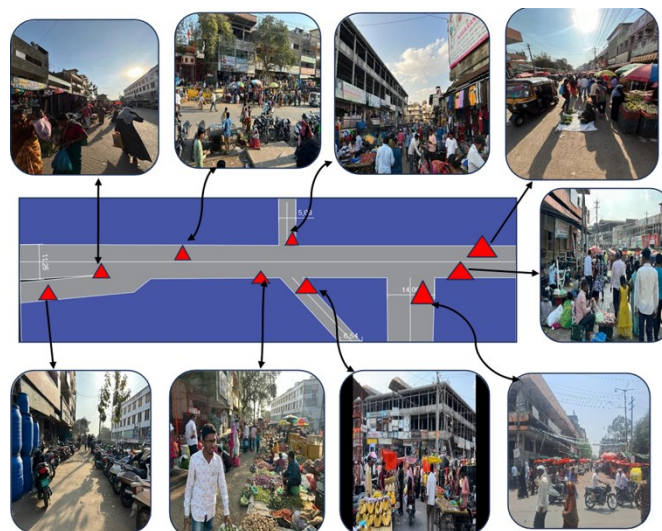
One of the main problems in the area is traffic. It appears unorganized and unstructured . The super market's entire area measures 211701.73 square meters, made up of 16 arterial and sub-arterial collector roads, SH10, and a main route from SB Temple.

Existing situation on supermarket main road



the unethical parking of vehicles disturbs the traffic circulation of the road as it shortens the usage of road width. the encroachment by some social elements to build unofficial structures such as auto-stands can also be a key point to reduce the usage of the roads. encroachment by hawkers and vendors disturbs the smooth traffic flow in the market area and cause stress to drivers and passengers.

Existing situation on main CC road



Pedestrians cannot use the pavements which are exclusively made for them, they are bound to use the roads for walking. As now the roads are being used by pedestrians, the movement of vehicles gradually becomes lower, resulting in congestion on roads. There after increasing road accidents. Shopkeepers display most of their items outside the shops which sweep away some portion of roads like utensils shop, mannequins on display moment of four-wheeler is almost impossible on this road at peak hours

Existing situation on arterial roads and collector roads



Encroachment on roadside parking space and carriage width by hawkers.

Most of the parking area in front of shops has been encroached by shopkeepers. Haphazard manner of parking can be seen.

VI. SUGGESTING SOLUTIONS

1. Shifting of the components

Our data analysis indicates that the following nearby villages—Hagargi, Malgathi, Gadlegaon, Jaferabad, Kapnoor, Uplaon, Awrad, Kadbur, Harsur, Shahbad, Ravoor, Ingalgi, Dandhoti, Madbol, Saradgi, Nippani, etc.—come to sell vegetables. These villagers lack proper infrastructure, which in turn causes a rise in the number of street vendors who lack access to suitable facilities. This results in busy, disorganized streets that spill over onto major thoroughfares, causing traffic jams. Therefore, it is imperative that municipal officials create an adequate and well-defined area while maintaining street vendors' visibility.

The following recommendations for change at the policy levels are proposed 1. Vegetables market ground floor should be completely reworked to create greater porosity. 2. Allowing all vendors there to enjoy sufficient visibility municipal authorities should provide adequate, identified areas specifically for vending in the layout plans of the market area and relocating the vendors from footpath and streets to that area. Therefore the area behind market city bus-stand the old jail building can be

designated as vending zone, the area of about 9863.74sqm of open space is vacant which can be provided for these street vendors, as the area is near to bus station it is quick accessible to seller as well as purchaser. 3. A area of 4273.62sqm in front of proposed four wheeler parking zone should be designated for fruit vendors, as we can see most of the fruit sellers encroaching R14 road (road opposite to vegetable market).

2. Widening of roads

The intersection of the super market main road and the state highway is the most congested place. State Highway from Jagat Circle, which is 32.2 meters wide, needs to be arranged properly to allow for a 24 meter carriage width. Widening of the same route that continues to Nehru Gunj (Leg C) is necessary. The current part is crowded in width and not properly aligned. Needed width: 32.2 m Current width is 18.07 Demolition Width = 14.13 m as a result

3. Design of curve

All road intersections should employ the following curve design because curves have the following benefits: Visibility of safety, aesthetics, Calming down traffic, engineering factors.

The maximum design speed is 30 km/h.

Capacity: Intersections are typically intended to handle traffic during peak hours. If peak hour flows are unavailable, it is possible to assume that 8–10% of daily flow occurs instead.

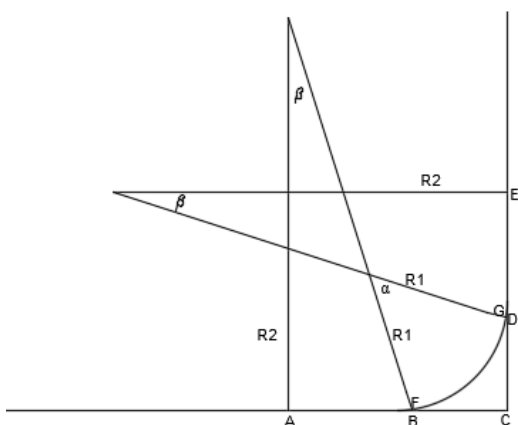
Based on traffic volume count the capacity is predicted.

the maximum capacity, that is, the junction's capacity from leg A to leg C (SH 10)

Peak hour flow = 10% of daily flow i.e. 10% of 10412= 1043 PCU.

Design turning speed (V)	30
Side friction factor (f)	0.27
Assumed minimum super elevation (e)	0.02
Total e+f	0.29
Calculated R min ($R = \frac{V^2}{27(e+f)}$)	24.4
Suggested R min (m)	27

Source: based on policy on geometric design of highways and streets 2011, AASHTO, Washington DC[6]
For street curve angle of turn 90° , we have adopted curve design curve. From AASHTO, after many trials AASHTO has concluded the following design.



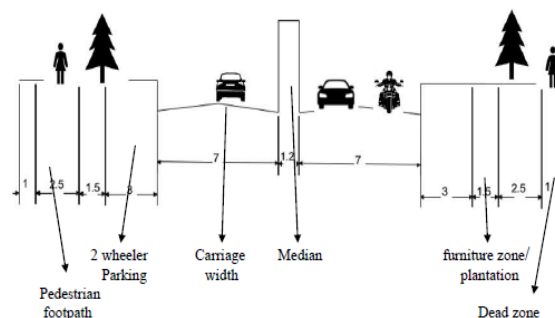
The designed of curve for street lane

R1	R2	β	α	AC/CE	AB/DE	BF/DC
9	27	18°	54°	15m	8°	1.22

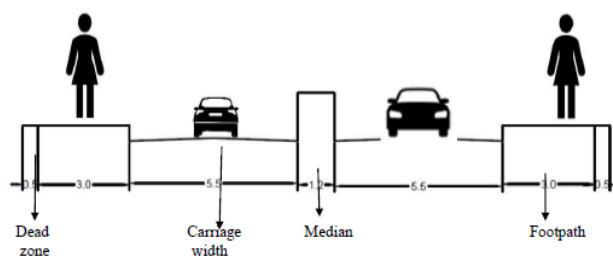
Source: based on policy on geometric design of highways and streets 2011, AASHTO, Washington DC[6]

4. Reorganization of the current road will be planned
Reorganizing a road should incorporate street characteristics and design suggestions that adhere to norms and standards. Within the super market region, there are 18 road networks with the designations R1, R2,... R18. The road has adequate width throughout, but it is not organized effectively; the carriage width provided is not in accordance with IS regulations, and there are no pedestrian amenities. As a result, there is more encroachment by vendors and shopkeepers, and there are more issues with illegal parking, which causes more congestion.

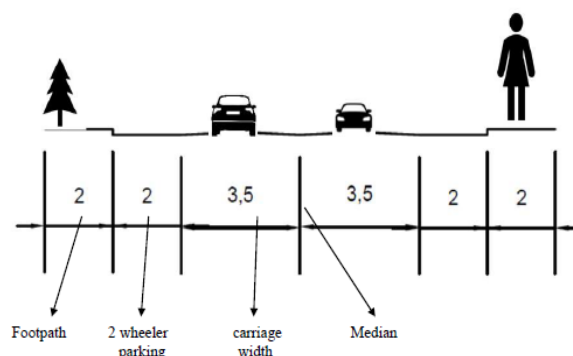
We have a existing width of 32.2m which can be organized as follows,



Similarly, R2 SB temple road whose existing width is 18m which can be organize as follows,

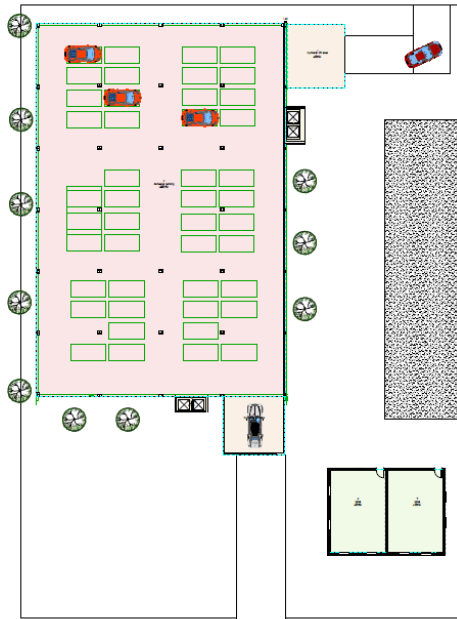


Other collector roads are designed as follows,



5. Multi-level car parks

There are now more automobiles on the road. lacking a parking facility in the area. Cars are parked on the sidewalks, green spaces and sides of the roads. Frequent traffic bottlenecks brought on by irregular parking. Four-wheeler vehicle parking in area provided is not sufficient. Therefore, multi-story parking needs to be built in order to provide the parking space. The area of the building is 16936 sqm. All floors are designed to accommodate 46 vehicles. The plan for this building was prepared using Revit software.



VII.CONCLUSION

In order to alleviate traffic and transportation issues in cities, such as road encroachment, congestion, and traffic jams, it is necessary to address the main underlying causes of these issues, which obstruct smooth traffic flow movement within the urban area. Due to shopkeepers and hawkers encroaching on 60–80% of the streets. Thus, by designating a designated area for vending, this issue can be resolved. Parking cars on the street in an immoral manner disrupts traffic flow and narrows the width of the road, making it necessary to provide adequate space for two-wheelers to park along the side of the road in accordance with on-street parking regulations. To solve the parking issue, a multi-story parking structure is created, as the surface area designated for parking four-wheelers is insufficient to handle the cars. Installing the appropriate turning curve at every road intersection to serve the purposes of aesthetics, traffic calming, safety, and visibility. As a result, detailed planning minimizes traffic congestion causes that impede traffic movement on the various levels of urban roadways.

The supermarket street layout model following is suggested.



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