

PARKING SITE SELECTION BY FEASIBILITY ANALYSIS

¹Yogita S. Fulse, ²R. V. Devalkar

¹PG. Student (Construction and Management), ²PG. Coordinator (Construction and Management)

¹Department of Civil Engineering,

¹Department of Civil Engineering NDMVP's KBT college of Engineering, Nashik, India

Abstract: Transportation is the need of the day today life for the development. The numbers of vehicles moving on the road are increasing which may result into the parking problem. Provision for the parking in the Development control Regulation is very less, which cannot cater the need of increasing vehicle population fully. The decision on the parking lots can affect urban life perspectives such as traffic, crowds, and performance of different land uses. Accordingly, parking management is one of the most important tools for city managers to improve city residents with a good quality of life. Lack of parking space in central city areas involves spending a long time by drivers to find suitable parking space causing them to drive farther distances for this purpose. The surface parking is not sufficient for these increase in the vehicles. To overcome this need proper parking system need to be provided in the crowded areas. In this paper the feasible site is selected for the parking with the help of the feasibility matrix and demand of the parking is calculated.

Index Terms – Feasibility analysis, Parking Study, Traffic

I. INTRODUCTION

Rapid rate of urbanization has led to huge traffic demand (growth in motorization). People prefer using private vehicle rather than public transport which leads to more traffic congestion, pollution, parking, long travel time etc. The current level of parking system does not able to meet the transit demand. Planned and proper parking system is the need of hour. Proving the parking system prove to be an efficient and effective for the parking of private vehicles[1].

The decision on the parking lots can affect urban life perspectives such as traffic, crowds, and performance of different land uses. Accordingly, parking management is one of the most important tools for city managers to improve city residents with a good quality of life. Lack of parking space in central city areas involves spending a long time by drivers to find suitable parking space causing them to drive farther distances for this purpose.

Parking of vehicles along streets, especially in central metropolitan areas causes reduced capacity of the passages, decelerated vehicles, and increased accidents as well as reduce safety at site. The numbers of vehicles moving on the roads are increasing, which ultimately result into parking problems. Provision for parking in Development Control Regulations is less, which cannot cater the need of increasing vehicular population fully[2].

II. EXISTING SITUATION OF PARKING IN NASHIK

The numbers of vehicles moving on the roads are increasing, which ultimately result into parking problems. Provision for parking in Development Control Regulations is less, which cannot cater the need of increasing vehicular population fully. The vehicles are therefore bound to be parked on road-sides which ultimately creates traffic problem. Further the road side parking considerably reduces the effective width of the roads resulting in slow movement of traffic. Places like C.B.S., M.G. Road, Main Road, Canada Corner, College Road, Gangapur Road, Bytco point, Dwarka junction, where there are commercial developments, are facing a problem of parking which results in creation of chaotic condition. Inadequate parking facility and inadequate norms for hospital, mangal karyalaya, public places make the people to park the vehicle on streets, which creates hindrances in regular traffic flow. There are 7 existing Off- Street Parking locations in Nashik and 7 on-street pay and park facilities available in the city[5].

Following issues observed in the Nashik based on reconnaissance survey:

- Lack of Sufficient designated parking places
- Lack of proper enforcement (NMC has designated certain stretches for odd -even parking, which is not properly enforced).
- Lack of man power resources for the parking regulation in few designated places

III. METHODOLOGY

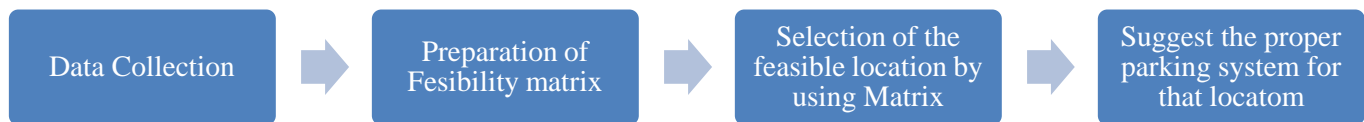


Figure 1: The workflow for the site selection for parking

Data collection

- Nashik municipal corporation
- Site details from the site

Preparation of feasibility matrix

- Preparation of feasibility matrix for the selected site
- Select the feasible location from the given sites

Suggest the proper parking system

- The parking system to be adopted is suggested with the help of feasibility analysis.

IV. DATA COLLECTION AND ANALYSIS

As per the information provided by the Nashik Municipal corporation four site have been recommended for the parking in the traffic congestion area. These are located near Sita Gunfa, Ravivar karanja and Red Cross signal. These sites are located in the most traffic congested areas in the Nashik.

For these four sites the feasibility analysis is carried out with the help of feasibility matrix. Feasibility analysis is carried out with the help of the aspects like Statutory, Physical, Environmental, technical and financial. These parameters are considered for the collection of data from the site.

Table 1 Feasibility Matrix for site selection

| Aspect | Parameter | Feasibility status | | | |
|---------------|-------------------------------------|----------------------|------------------|------------|----------------------|
| | | Rugved Apartment | Sanjay Residency | Sita Gunfa | Yashwant Mandai |
| Statutory | Land use | Not Feasible | Not feasible | Feasible | Feasible |
| | Ownership | Not Feasible | Not feasible | Feasible | Feasible |
| Physical | Existing Structures | Not feasible | Not feasible | Feasible | Conditional Feasible |
| | Encroachment | Conditional feasible | - | Feasible | Feasible |
| Environmental | Existing tree cover | Conditional feasible | Not feasible | Feasible | Feasible |
| Technical | Structural constructability | Feasible | - | | Feasible |
| | Parking system design | - | - | | Feasible |
| Financial | Parking demand vs Possible capacity | - | - | | Feasible |
| | Financial feasibility | - | - | Feasible | Feasible |

From the above feasibility matrix the Yashwant Mandai site at the Ravivar Karanja is selected for the further analysis of the Parking facility.

V. SITE DETAILS OF YASHWANT MANDAI

The site area is at Ravivar Karanja and close to Ashok Stambh. The site is surrounded by the retail commercial shops and high dense residential areas. The site is in Old Nashik Bazaar, people from villages and towns surrounding the city visit for shopping in Old Nashik. At present, the vicinity of the Yashwant Mandai is a core commercial hub It is a commercial complex operated by Nashik Municipal Corporation.

The streets in the core area are narrow and congested. Thus, the demand for the parking has increased leading to parking irregularities. On-street parking is observed on all the roads occupied by parked cars and two wheelers are seen parked on either side of the roads. Both angular as well as parallel type of parking can be noticed on almost all the stretches of the roads. Presently, there are no authorized dedicated parking on street and off street parking in the vicinity of the building.

Land Ownership of Yashwant Mandai is of Nashik Municipal Corporation.



Figure 2: Site details of Yashwant Mandai Site



Figure 3 Present situation of Yashwant Mandai site

VI. PARKING DEMAND AND SUPPLY GAP ANALYSIS

Presently Yashwant Mandai is not used as Off Street parking space. It is not possible to calculate demand based on Off Street parking survey. Hence analysis for Demand-Supply Gap is carried out for Yashwant Mandai in two aspects. Firstly, primary On Street Parking survey of all adjacent streets to assess direct demand at present location. Secondly, study of the activities in surrounding area and their land use which generate traffic. Analysis for Demand-Supply Gap is carried out for Yashwant Mandai Parking in two aspects. Existing and future parking demand & supply gap analysis has been carried out for Off-Street parking.

The parking survey was conducted for 3 days from 09:00 AM to 09:00 PM. 4 adjacent roads of were identified for on street. Survey was carried out for 2 weekend days and 1 working day

Table2 Stretch wise parking data accumulation

| Stretch | Total Volume/day | ECS | Peak Hour volume | Demand | Peak Hour |
|------------------------|------------------|-----|------------------|--------|--------------|
| Ashok Stambh to RK | 1637 | 528 | 205 | 66 | 4:30 to 5:30 |
| RK to red cross signal | 1302 | 420 | 186 | 60 | 5:00 to 6:00 |
| RK to Holkar Bridge | 744 | 240 | 124 | 40 | 5:00 to 6:00 |
| RK to Bhadrakali | 2530 | 816 | 316 | 102 | 4:30 to 5:30 |

From the above table the total demand for the parking is 268 ECS. Yashwant Mandai site is located at the center of the core city. Further provision of Off Street Parking at Yashwant Mandai will provide more free space on narrow streets of Old City. It will also improve traffic flow in core city area.

Existing plot area for the surface parking is not sufficient for accommodating parking demand at Yashwant Mandai. Hence it is required to accommodate parking demand by developing multilevel car parking facility.

Advantages of fully automated parking system that can help to efficiently use available space to accommodate need of 212 ECS of Car Space at Yashwant Mandai, assessment of the financial feasibility of the project and the proposed project structure for execution of the project.

VII. CONCLUSION

From the above study the need for the parking in the city area is analyzed. The feasibility analysis for the most congested areas is calculated. The feasibility matrix gives the proper site location for the parking.

The demand for the parking can be reduced with the help of the multilevel car parking system.

Table 3 Demand and Supply for the Site

| Stretch | Demand | Supply | Gap |
|------------------------|--------|--------|-----|
| Ashok Stambh to RK | 66 | 0 | 66 |
| RK to red cross signal | 60 | 0 | 60 |
| RK to Holkar Bridge | 40 | 0 | 40 |
| RK to Bhadrakali | 102 | 0 | 102 |
| Total | 268 | 0 | 268 |

VIII. ACKNOWLEDGMENT

With all respect and gratitude, I would like to thank all people who guided me. Special thankful to the Mr. R.V. Devalkar PG coordinator, Dr. M. P. Kadam HOD Civil Department who guided me in this work. I'm also thankful to the Junior engineer of town planning department at the Nashik Municipal Corporation for their guidance and help.

REFERENCES

- [1] Ruichun He and Changxi Ma, Yinzhen Li. 2015. Site selection of public parking lot in the new district. Journal of wireless and mobile computing, Vol.8.
- [2] Sasan Kazazi Darani, Alireza Akbari Eslami, Mona Jabbari, Hossein Asefi. 2018. Parking Lot Site Selection Using a Fuzzy AHP-TOPSIS Framework in Tuyserkan, Iran. Journal of Urban planning and development, vol. 144.
- [3] He Bao-hong, HE Yan, LI Zhen-hui. 2016. Parking Fees: A Key to the Success of Proposed Park and Ride. Vol. 10, pp 89-95.
- [4] Sylvain Belloche. 2015. On-street parking search time modeling and validation with survey based data. Transportation research procedia Vol.6, PP 313-324.
- [5] Comprehensive traffic and transportation plan for Nashik, 2017
- [6] Development control and promotion regulation for Nashik, 2017