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Enhancement of Parking Facility in Main Corridor of M. G. Road, Junagadh City

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Abstract: ***Higher growth of vehicular population plays crucial role in traffic management of any city. Any transportation system contains three major elements which are the vehicles, the way for vehicles movement and the vehicle parking facility. Generally in central business district area of any city has very few space of parking facility which is due to earlier establishment of area in city and which cause parking issues in particular area. If the parking facility is insufficient then it decreases level of service of adjacent road due to insufficient On-street parking. Thus it is required to analyze recent situation technically and provide effective solution of particular problem to overcome from such problem.***
(Key Words: - Enhanced Parking System, M.G.road, Junagadh, Parking Accumulation Analysis, Road width Survey, Road Side Interview Survey)

I. INTRODUCTION

Junagadh is the seventh largest city of Gujarat, India. Located at the foot of the Girnar hills. The population of Junagadh city in the year 2017 was 3, 77,133 lakhs as per Junagadh municipal corporation data. In this research study area is M.G.Road, Junagadh. There are showrooms; commercial complex, educational classes, banks and much small scale business are located at M.G.Road. so that people of Saurashtra region concentrate towards M.G.Road for shopping and business purpose. This rush of people in peak hour needs huge amount of parking requirement which is not sufficient on M.G.Road Thus it is required to analyze existing parking situation and implement proper parking solution for specific study area.

II. OBJECTIV OF THE STUDY

A. To analyze parking accumulation in study area.
B. To design a Multilevel Parking facility using AutoCAD.

III. SCOPE OF THE STUDY

A. To perform parking survey to determine existing parking situation
B. Perform road width survey of M.G.Road
C. Perform parking accumulation analysis to determine parking duration for individual vehicle.

IV. STUDY AREA

Starting point of M.G.Road is from Sardar Patel gate and its end near the Kalwa chowk. M.G.Road of Junagadh city is having length of 2.4 km and width of the road changes with respect to length. There are showrooms, educational classes, banks, commercial complex are located at M.G.Road So that people of Saurashtra region concentrates towards M.G.Road for shopping and business purpose. People who enters in study area are generally buyers and takes more amount of time for purchase. Thus parking on M.G.road should be sufficient to meet the demand but that is not the case. Parking facility which is currently provided is insufficient and thus road users face parking problems. On-street parking is also done in unplanned manner and thus creates parking issues on particular region. Rectangular box in figure below indicates M.G.Road of Junagadh city. Location of M.G.Road in Junagadh city is shown in below figure.

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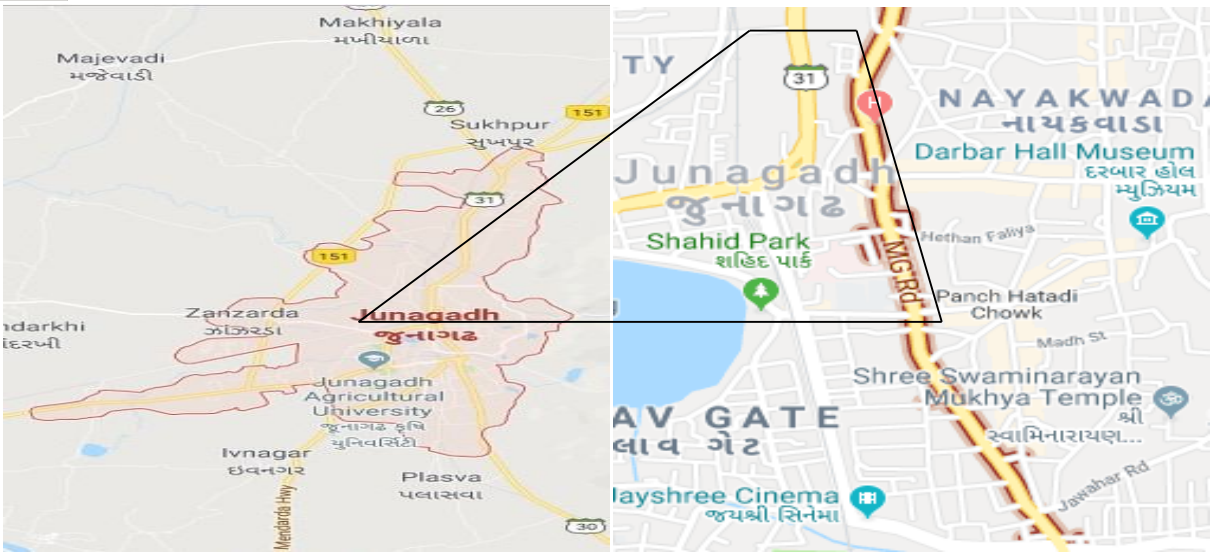
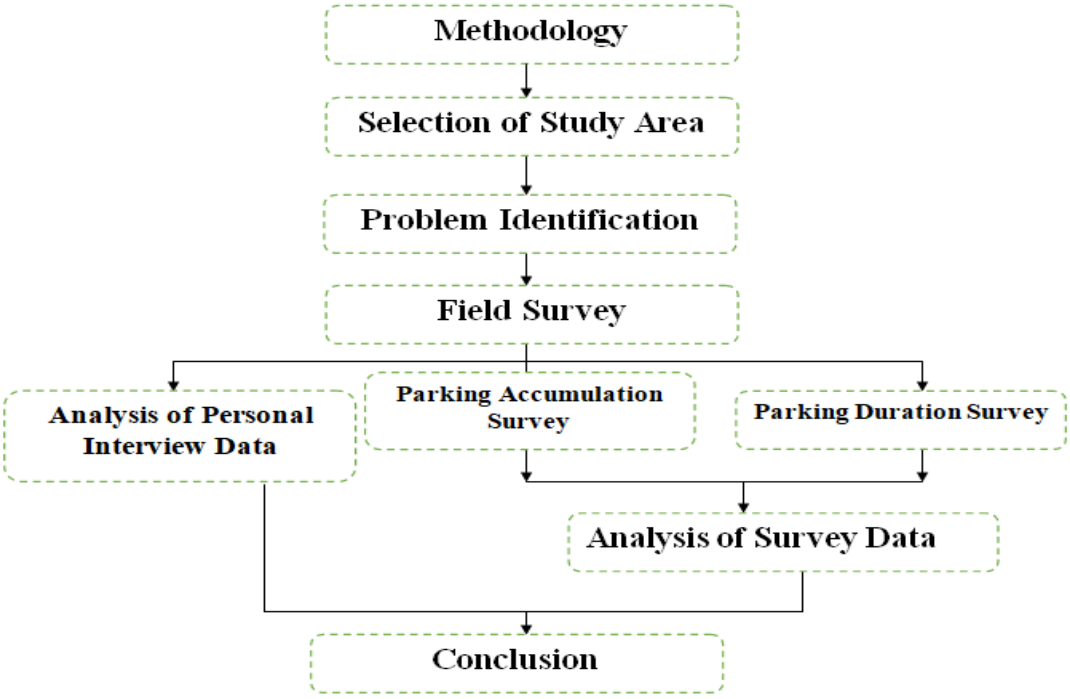


Figure:1:Study Area Map

V. METHODOLOGY



VI. DATA COLLECTION

A. Inventory data of road width and footpath width at each 50m length was collected in total length of 550m of M.G.Road starting from Vanzari chowk to Ambedkar chowk.

B. Road Side Interview survey was conducted and data was collected like shop opening time, shop closing time, average number of buyers per day, number of employees and their vehicles information and willingness to park vehicle in new enhanced parking system.

C. Parking accumulation survey data from M.G.Road was collected by two surveyors using Fix Time Duration Method.

D. Willingness to pay parking charges with respect to cost survey was conducted in which parking charges as per time duration was decided and reviews were collected from vehicle owners.

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VII. DATA ANALYSIS

A. From road width survey it is found that road width of M.G.Road is not varying but there is no footpath provided for pedestrian, so there is need of footpath for safety of pedestrians.

B. From Road Side Interview survey it is found that 62% of shop owners are agree to park their vehicles in new enhanced parking system and 26% of owners are disagree to park their vehicles. And willingness to pay parking charges data is 90% of owners are agree to pay parking charges and 6% of owners are disagree to pay parking charges.

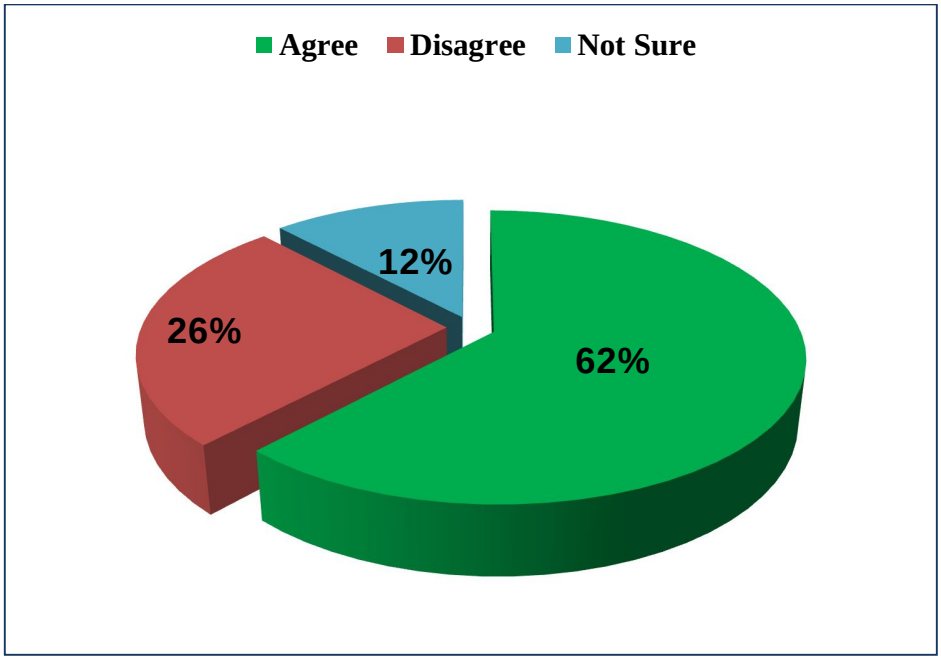


Figure: 2: Willingness to Pay Parking Charge

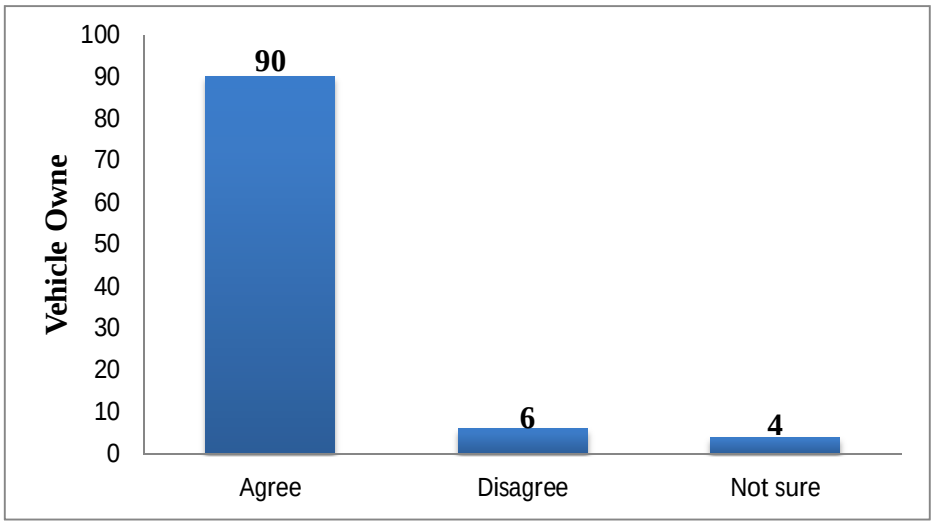


Figure: 3: Willingness To Park Vehicle In New Enhanced Parking System

C. From Parking Accumulation survey graphs of vehicle parking accumulation can be derived for two zones of study area. Each zone is analyzed by individual surveyor. Here :-

1) Study area zone 1 is Vanzari chowk

2) Study area zone 2 is Ranavav chowk.

Here are resultant graphs of analysis of each study area zone given below:-

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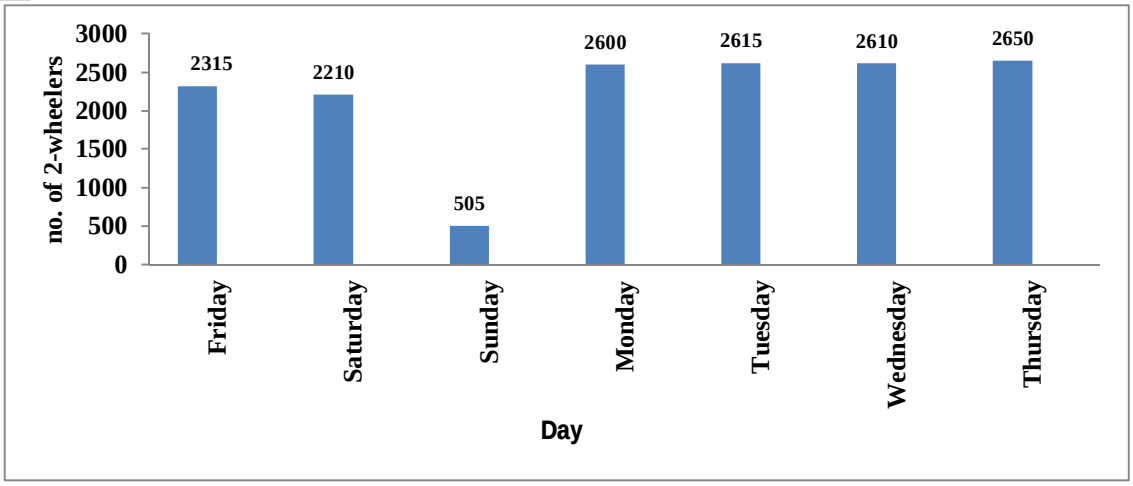


Figure: 4: Parking Accumulation Graph of Study Area Zone 1 Jenily Shopping Center

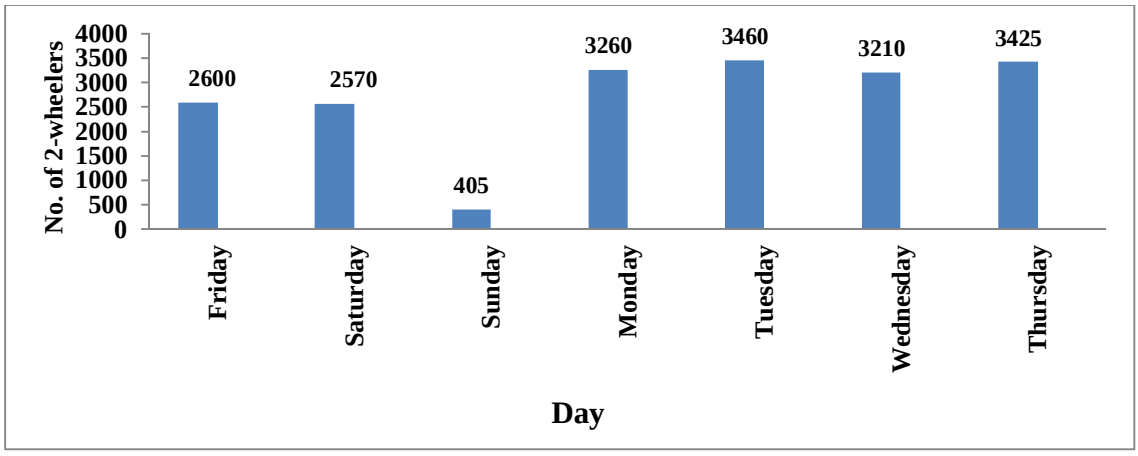
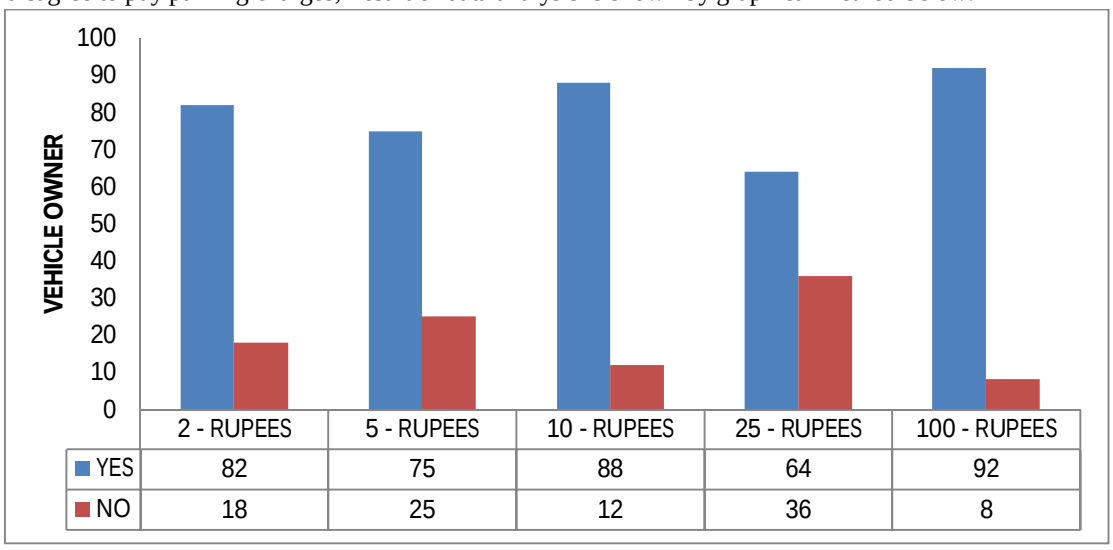


Figure: 5: Parking Accumulation Graph of Study Area Zone 2 Ranavav Chowk

D. From willingness to pay parking charges survey, on an average 80% of vehicle owners are agree to pay parking charges while 20% are disagree to pay parking charges, result of data analysis is shown by graphical method below:-



	2 - RUPEES	5 - RUPEES	10 - RUPEES	25 - RUPEES	100 - RUPEES
YES	82	75	88	64	92
NO	18	25	12	36	8

Figure: 6: Willingness to Pay Parking Charge With Respect to Cost

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VIII. RECOMMENDATION

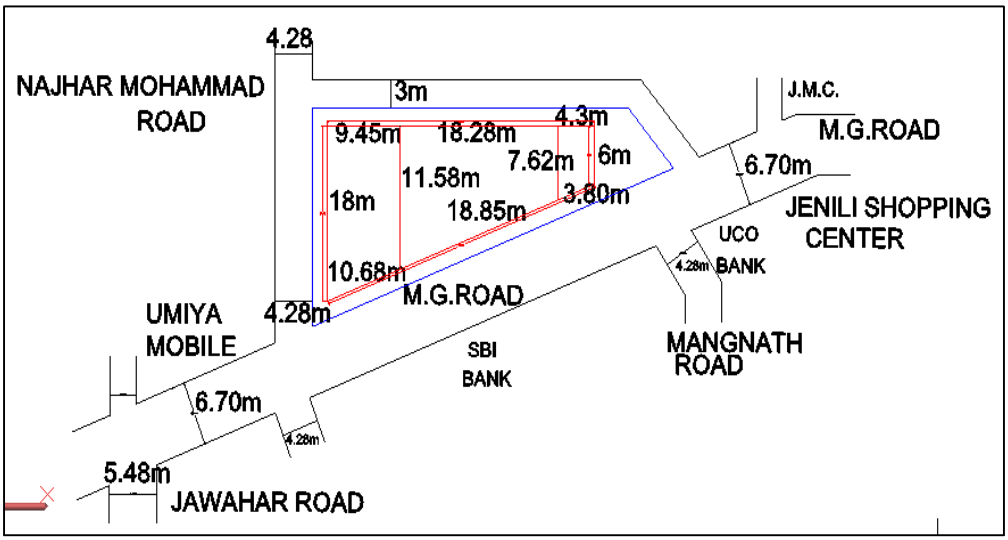


Figure: 7: Availability Of Trapezoidal Ground At Ranavav Chowk For Multi Story Parking

Here it is recommended to develop multi-story 2-wheeler parking having 3 stories as below:-

A. Underground floor 1 (for 2-wheeler) – 160 parking lots for 2-wheeler
B. Ground floor (for 2-wheeler) – 160 parking lots for 2-wheeler
C. First floor (for 2-wheeler) – 160 parking lots for 2-wheelers

Thus total capacity of multi story parking will be 480 2 – wheelers. Here are detailed design of each floors of multi story parking given below:

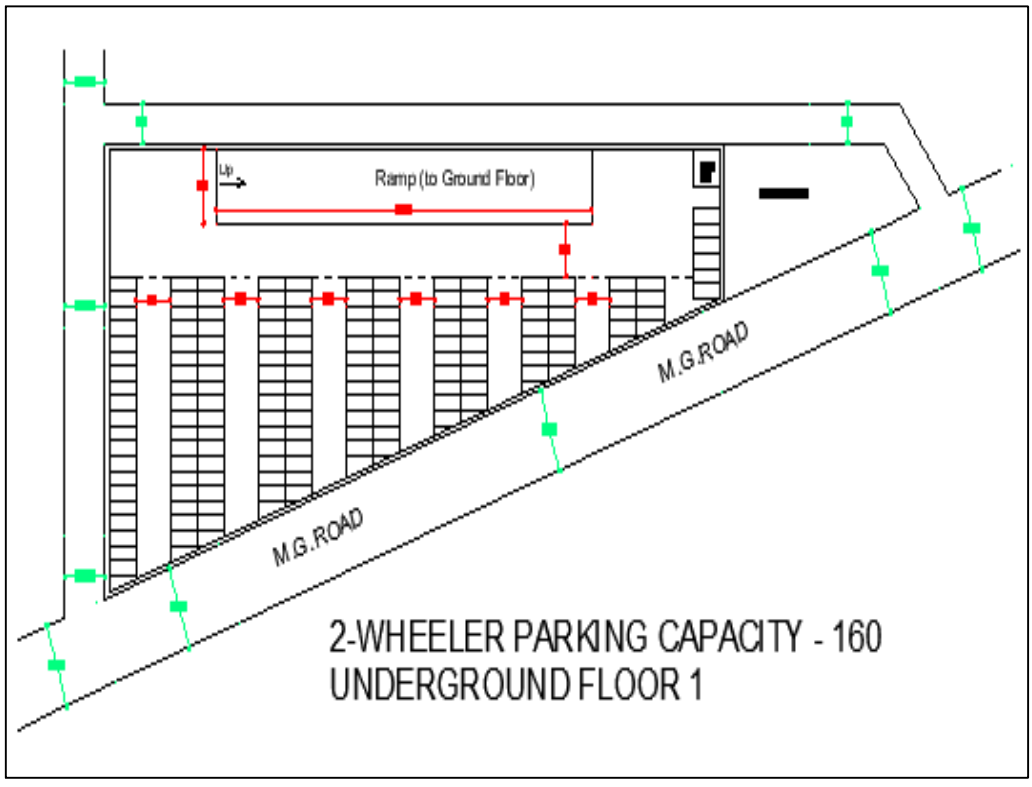


Figure: 8: Underground Floor 1 with Parking Capacity of 160 for 2-Wheeler

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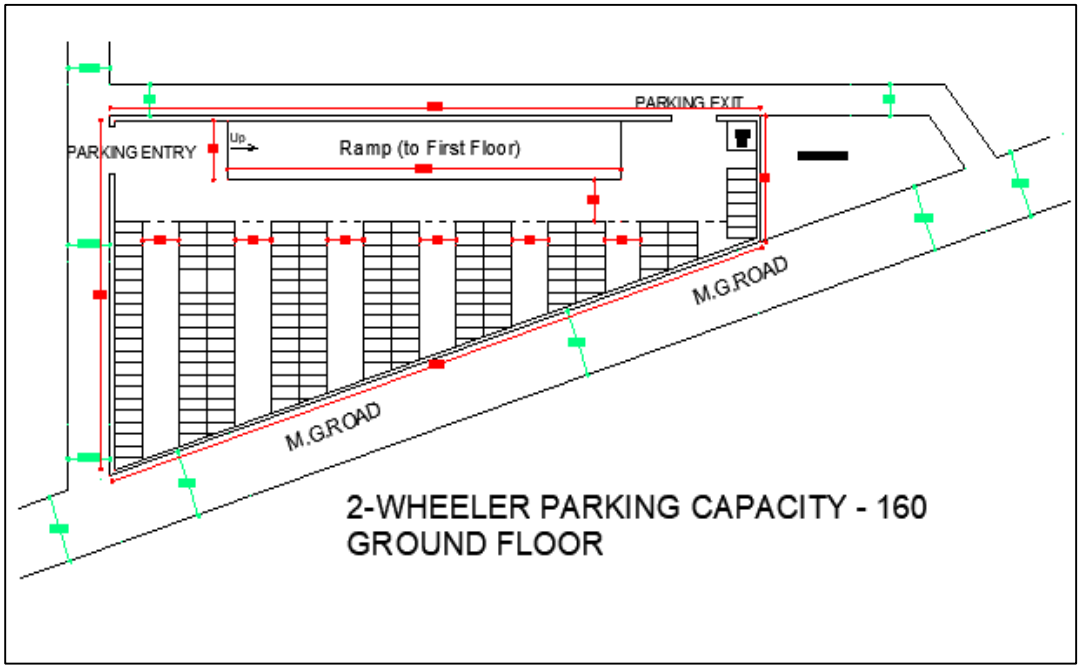


Figure: 9: Ground Floor with Parking Capacity of 160 for 2-Wheeler

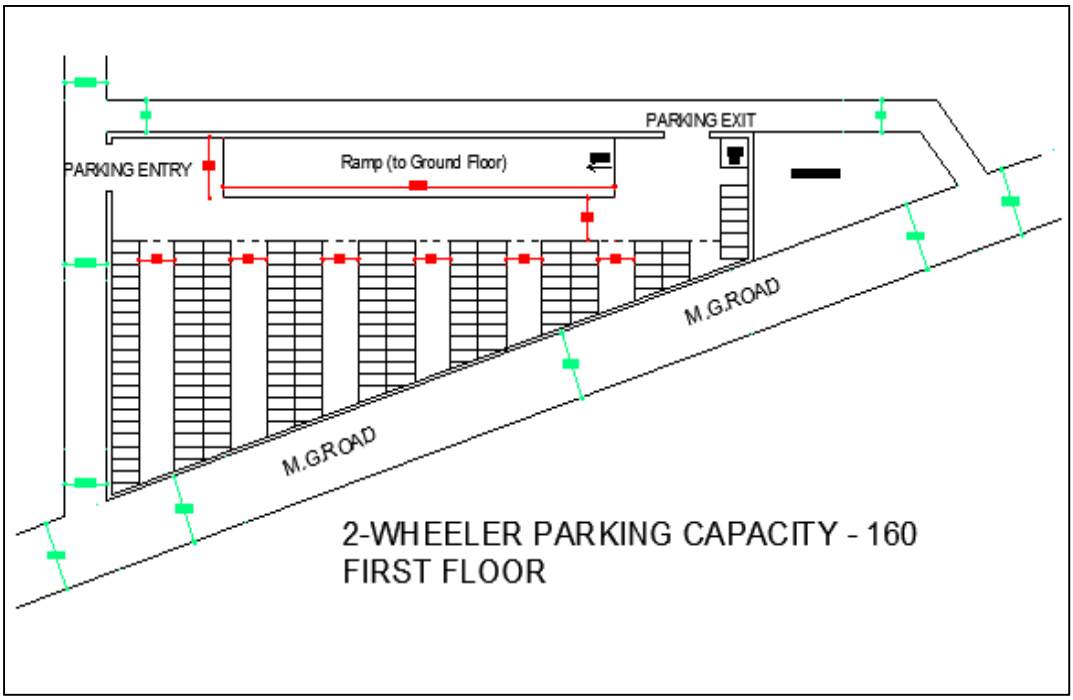


Figure: 10: First Floor with Parking Capacity of 160 for 2-Wheeler

Here IT based solution can be provided further to work that system as enhanced parking system which stays integrated with parking system and electronic vehicle based transportation system can be given as recommendation for accessibility from parking lot to particular destination and also suitable parking policy can be developed and whole enhanced parking system can work through it. Parking assessing system based on Barcode Technology. As barcode system enables vehicles to check-in and check-out under fast, secure, and convenient conditions and records the data such as time, date. MSE technique can be used to determine and two images are nearly identical or not in a parking lot to find a parking space availability.

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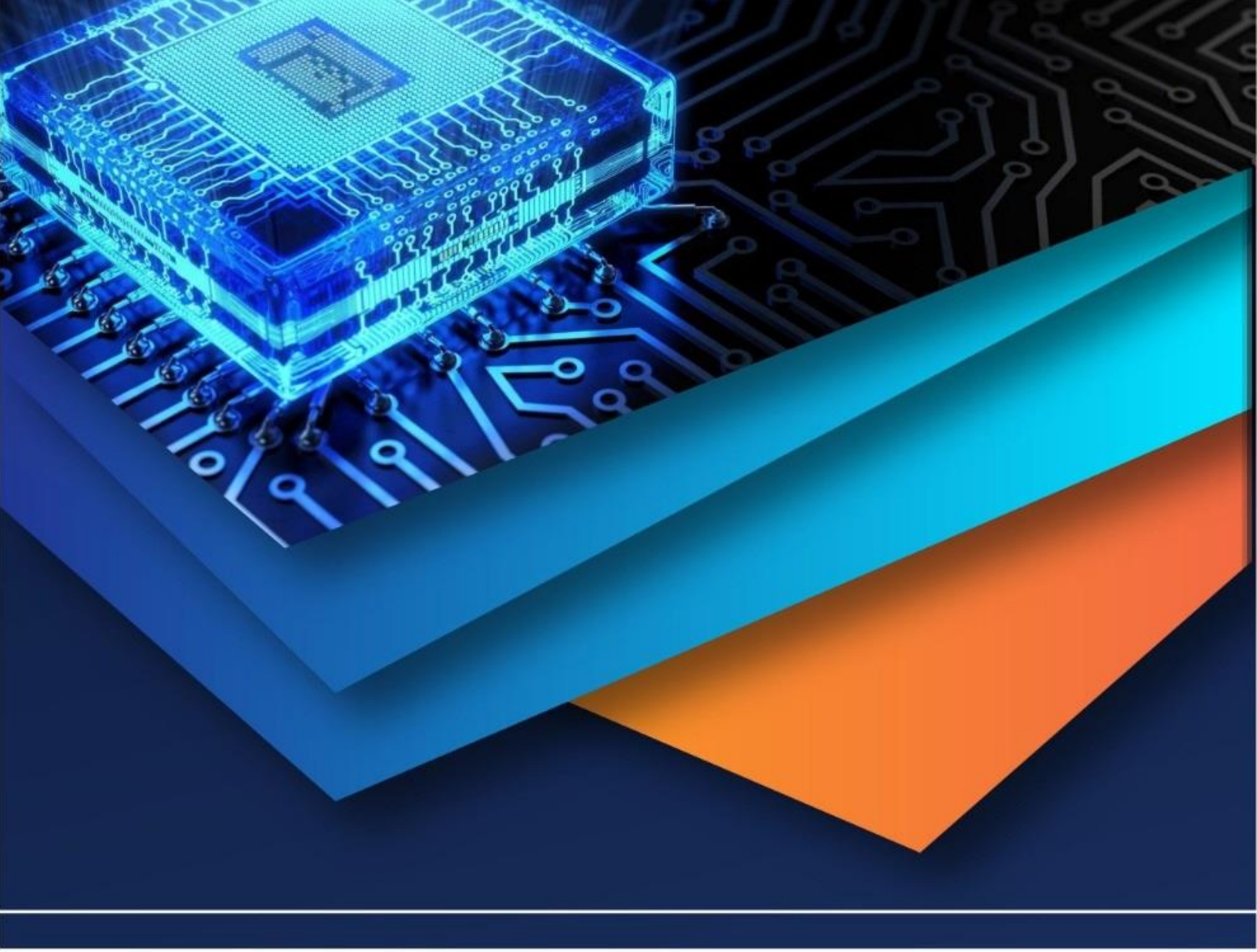
IX. CONCLUSION

From this research it can be concluded that it is possible to develop an enhanced parking system for congested Central business district area M.G.Road, Junagadh by using transportation engineering methodologies and various different data analysis and after that analysis an efficient transportation system can be provided like parking integrated electric vehicle transportation.

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