IDENTIFICATION OF BLACKSPOTS ON A STRETCH OF NH52

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Abstract:

In road safety management, an accident blackspot or black spot is a place where road traffic accidents have historically been concentrated. To assess black spot data and identify critical stretch (accidental prone spots) different parameters are such as; nature of accident, classification of accident and causes of accident, daily variation of accidents, timely variation of accidents, gender wise analysis, vehicle wise distribution, age limit variation of accidents and monthly variation of accidents. In this paper the task is to identify where accidents are happening and investigate them to determine the factors involved so that appropriate and effective remedial measures can be applied for a stretch in AURANGABAD city also to collect and analyse the data, identifying the black spots and proposing some remedial measures to reduce the possible accidents. The accident analysis will be done from previous year's data, for that Beed bypass road from Mahanubhav Ashram (T- point of Paithan road) to Zalta Phataa stretch of 13.150 km, this road is a part of NH-52 (NH-211) was taken for study.

Introduction:

In the development of nation many factors play an important role, 'National Highways' are one of them. With the help of these transportation of people, goods etc. becomes easier. National highways are directly connected with people's life; so more convenient they are the safer will be people's life. To develop a nation is cycle i.e., so many things are interconnected with each other and in this cycle the national highways are very important. The drawback of national highways is road accidents. Accidental black spots are the spots where accidents have occurred historically many times. Government of India formulated Accidental Prevention Committee (APC) in year 1997 by identifying accidental prone spots on the rural highways of the state and suggested the suitable remedial measures for reducing the accidents. Road accidents cannot be totally prevented but by suitable traffic engineering and management the accident rate can be reduced to a certain extent. For this reason, systematic study of traffic accidents is required to be carried out. Proper investigation of the cause of accident will help to propose preventive measures in terms of design and control. Road crashes happen in many forms and in many locations. It is neither feasible nor useful to analyse each individual crash in detail. The key is to try and identify locations where an above-average number of road crashes are occurring showing a pattern of road crashes, as these are potentially worthwhile site for investigation and treatment.

Literature Review:

Reddy (2017),Ten accident hot spots /accident-prone locations were identified. Most of the road accidents of vehicles that are getting into a junction wherever a lot of aspect roads. Vehicles liable for most of the accidents are Trucks/Lorries and followed by Auto Rickshaw and Car/Jeep/Van. Most of the road accidents occurred during 9-10am and 4-5pm; it may be due to peak hour traffic. Vehicles approaching intersections are directed to definite paths with appropriate islands and channels, marking etc. Shoulder width, pavement width, sight distance, signal and pedestrian crossing facilities ought to be improved.

John, et. al (2019), The project was aimed to identify, evaluate and improve the accident blackspots in the Westfort-Kunnmkulam road. Analysis was done by Weighted Severity Index method and identification of blackspot was done by Quantum Geographic Information System (QGIS). The characteristic analysis of accident data results the causes for accidents. Major black spots are Amala

junction, in front of Amala hospital, Peramangalam, Mundur, Kaiparmbu junction and in front of the beverage outlet in Kaiparambu. Appropriate remedial measures were suggested in order to reduce the intensity of accidents. The overall methodology was found to be effective by locating the high severe black spots using QGIS.

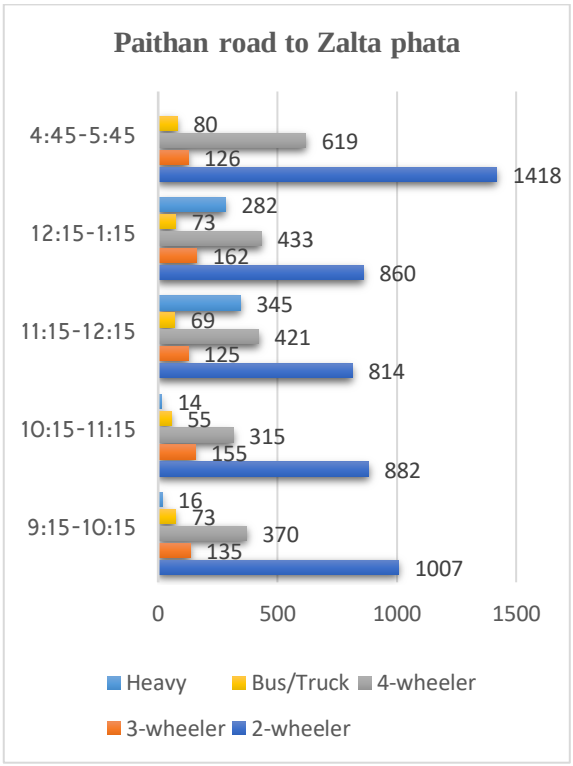
Lad et al , The accident data has been collected from 2008-12 from Sola high court police stations. On the basis of the data collected 5 black spots are declared. Inventory survey was conducted in which the width of the road, footpath, median, and service lane are measured. Analyses are being carried out using Speed studies, Volume studies and Pedestrian studies. It has been concluded that the accidents are happening because of deficiency in geometric design of road like absence of speed breakers, absence of foot path, improper marking of zebra crossing, non-working of traffic signals, and illegal parking of vehicles at intersections. At last no facility was provided to pedestrians to cross the road thus leading to fatal accidents.

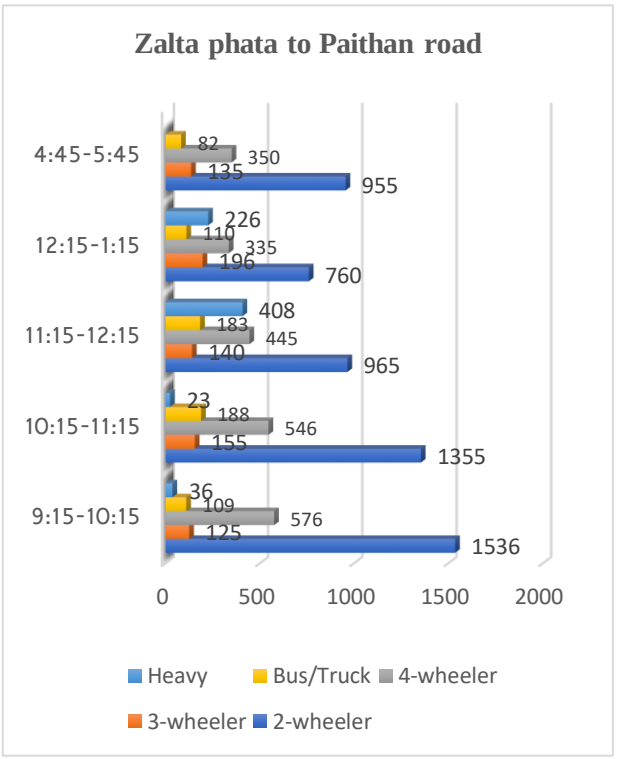
Literature review presents brief idea about most of sever problems and related countermeasures, which can collectively apply to reduce severity of various elements which can further be used for improving safety.

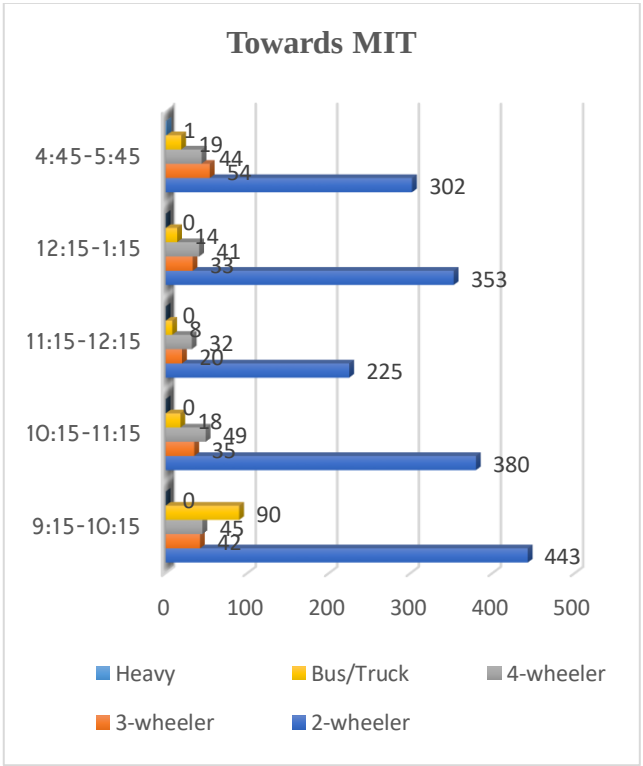
Methodology:

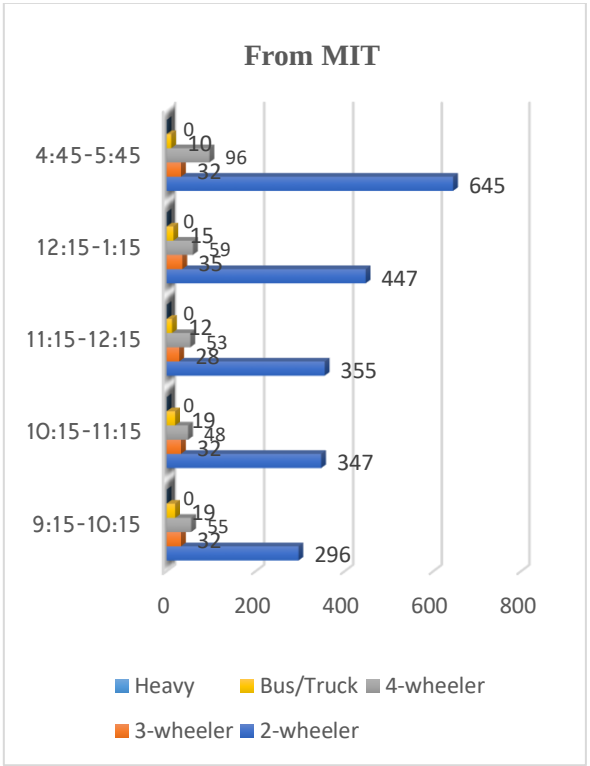
The total study is carried out into 7 steps.
Step 1: Investigate Background Data
Step 2: Screen Network for Blackspots
Step 3: Prioritise blackspots for further investigation
Step 4: Analyse Crash Types and Patterns
Step 5: Site Investigation
Step 6 Final Diagnosis
Step 7 Summarise the results of the analysis.

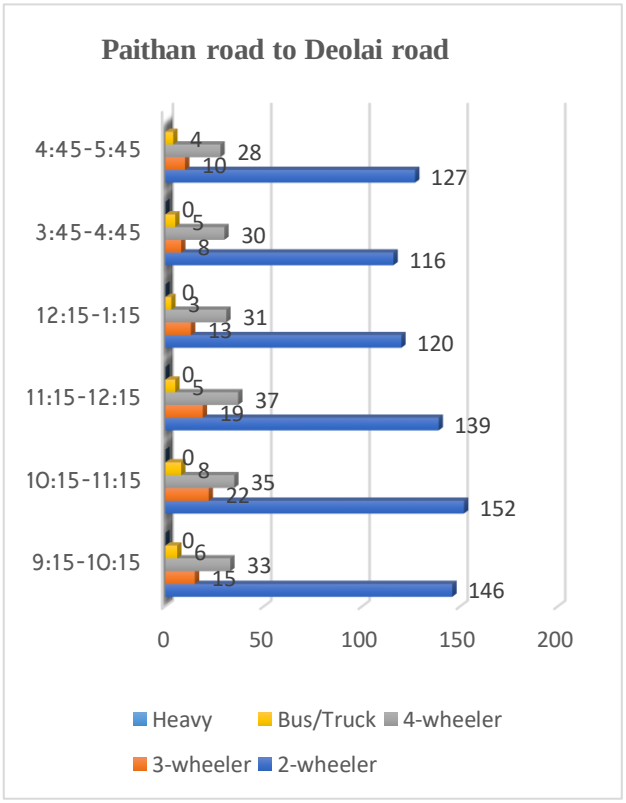
First accident record on Beed bypass road taken of last 5 years. Then accidents are classified to Type and Traffic Violation. After this the major issues on Beed Bypass Road are studied as well as checklist for MIT chowk, Deolai chowk and traffic volume also studied. Collected data is shown with the help of graph.

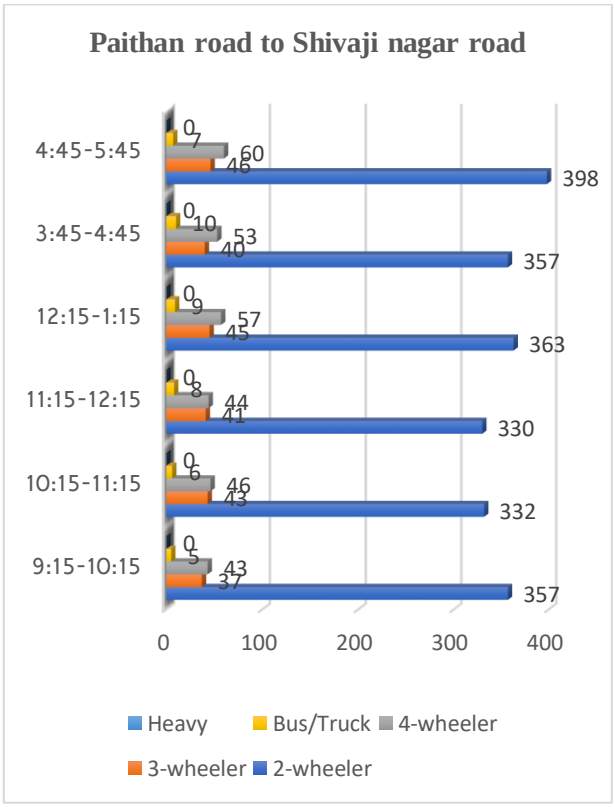

Paithan road to Zalta phata
4:45-5:45
80
619
126
1418
12:15-1:15
282
73
433
162
860
11:15-12:15
345
69
421
125
814
10:15-11:15
14
55
315
155
882
9:15-10:15
16
73
370
135
1007
0
500
1000
1500
Heavy
Bus/Truck
4-wheeler
3-wheeler
2-wheeler

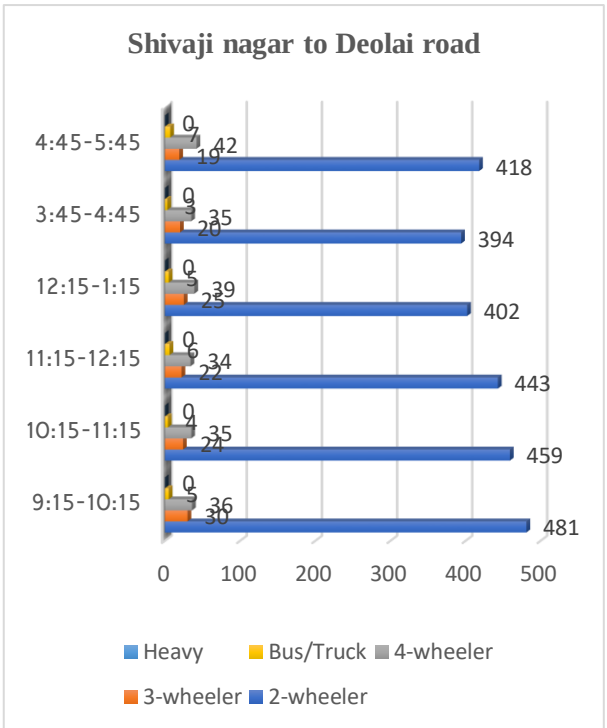

Zalta phata to Paithan road
4:45-5:45
82
350
135
955
12:15-1:15
226
110
335
196
760
11:15-12:15
408
183
445
140
965
10:15-11:15
23
188
546
155
1355
9:15-10:15
36
109
576
125
1536
0
500
1000
1500
2000
Heavy
Bus/Truck
4-wheeler
3-wheeler
2-wheeler

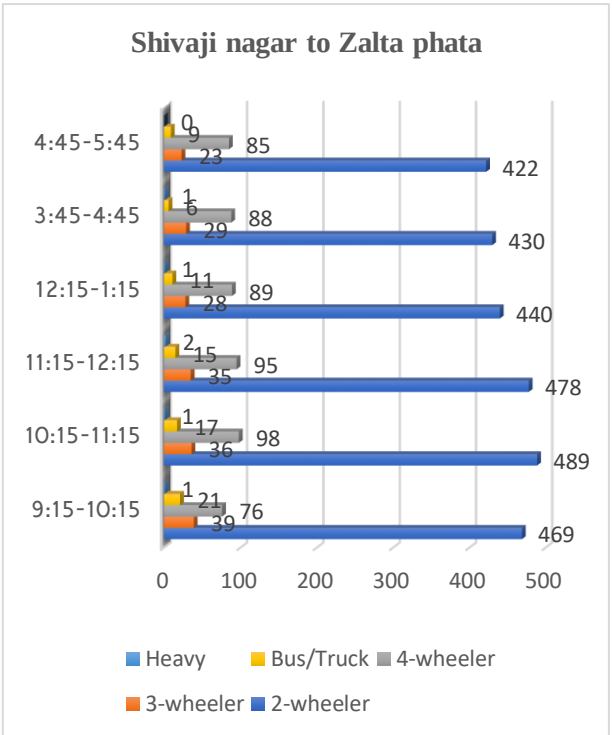

Towards MIT
4:45-5:45
1
19
44
54
302
12:15-1:15
0
14
41
33
353
11:15-12:15
0
8
32
20
225
10:15-11:15
0
18
49
35
380
9:15-10:15
0
90
45
42
443
0
100
200
300
400
500
Heavy
Bus/Truck
4-wheeler
3-wheeler
2-wheeler

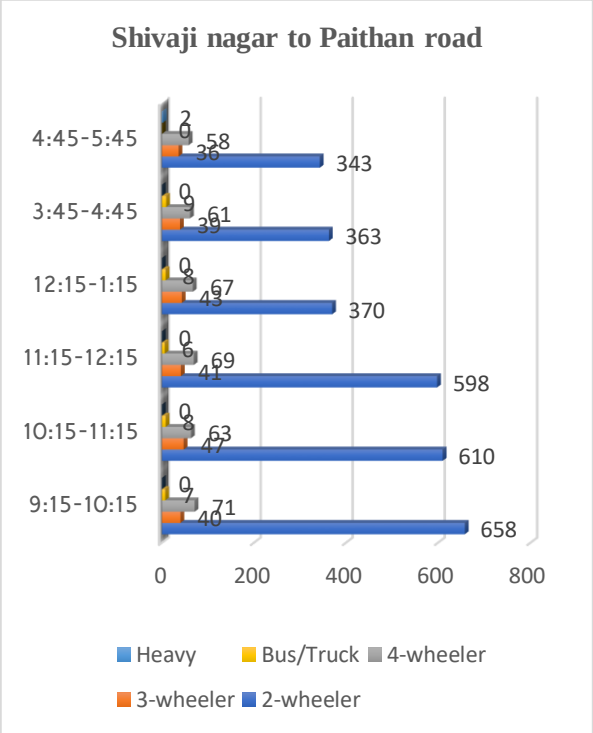

From MIT
4:45-5:45
0
10
96
32
645
12:15-1:15
0
15
59
35
447
11:15-12:15
0
12
53
28
355
10:15-11:15
0
19
48
32
347
9:15-10:15
0
19
55
32
296
0
200
400
600
800
Heavy
Bus/Truck
4-wheeler
3-wheeler
2-wheeler

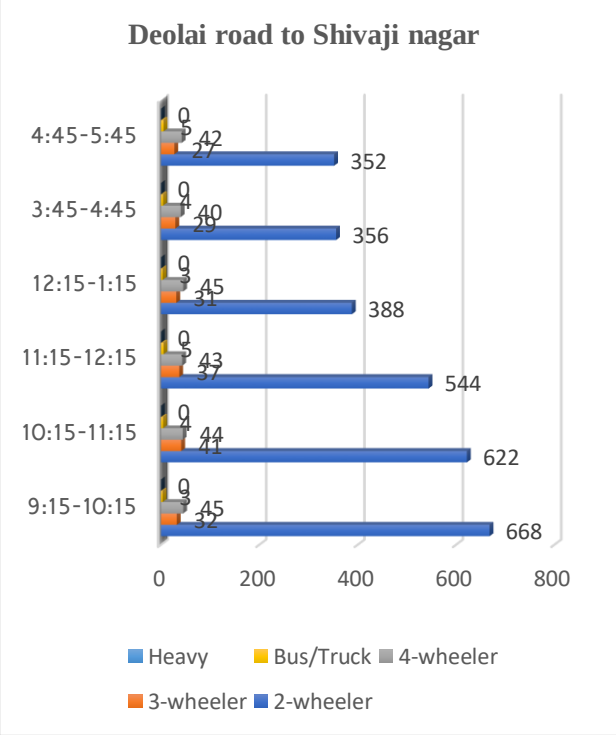

Paithan road to Deolai road
4:45-5:45
3:45-4:45
12:15-1:15
11:15-12:15
10:15-11:15
9:15-10:15
4 28 10 127
0 5 30 8 116
0 3 31 13 120
0 5 37 19 139
0 8 35 22 152
0 6 33 15 146
0 50 100 150 200
Heavy
Bus/Truck
4-wheeler
3-wheeler
2-wheeler

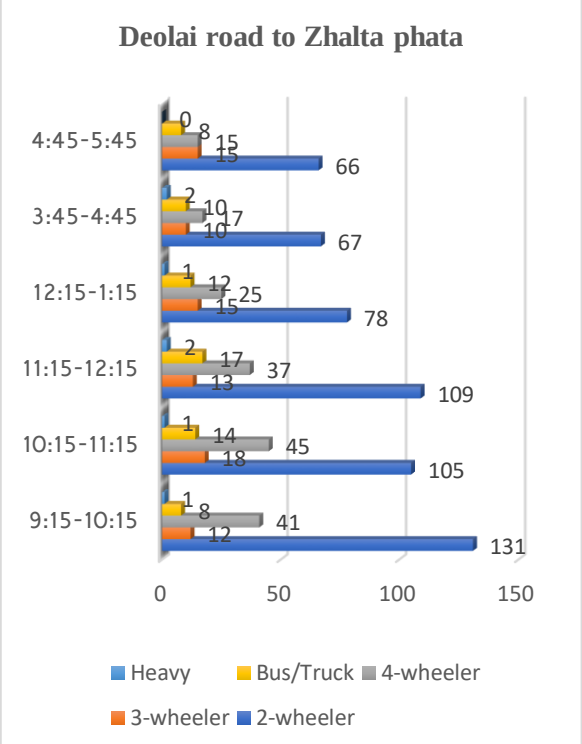

Paithan road to Shivaji nagar road
4:45-5:45
3:45-4:45
12:15-1:15
11:15-12:15
10:15-11:15
9:15-10:15
0 7 60 46 398
0 10 53 40 357
0 9 57 45 363
0 8 44 41 330
0 6 46 43 332
0 5 43 37 357
0 100 200 300 400
Heavy
Bus/Truck
4-wheeler
3-wheeler
2-wheeler

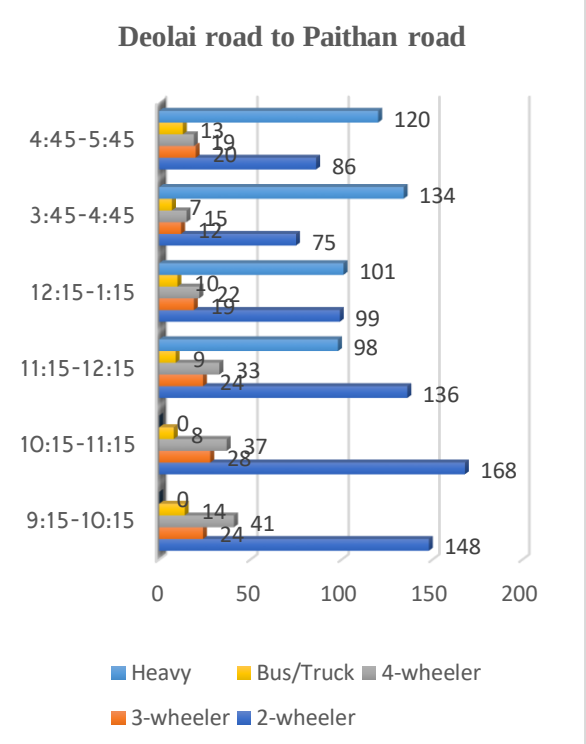

Shivaji nagar to Deolai road
4:45-5:45
3:45-4:45
12:15-1:15
11:15-12:15
10:15-11:15
9:15-10:15
0 7 42 19 418
0 3 35 20 394
0 5 39 25 402
0 6 34 22 443
0 4 35 24 459
0 3 36 30 481
0 100 200 300 400 500
Heavy
Bus/Truck
4-wheeler
3-wheeler
2-wheeler


Shivaji nagar to Zalta phata
4:45-5:45
3:45-4:45
12:15-1:15
11:15-12:15
10:15-11:15
9:15-10:15
0 9 85 23 422
1 6 88 29 430
1 11 89 28 440
2 15 95 35 478
1 17 98 36 489
1 21 76 39 469
0 100 200 300 400 500
Heavy
Bus/Truck
4-wheeler
3-wheeler
2-wheeler









Based on site observations, traffic survey and accident data following conclusions are drawn.

1. MIT chowk and Deolai chowk are identified as black spots
2. It is observed that negligent driving, rules violation, over speeding of heavy vehicles and avoiding safety gears like seat belts and helmets are the prominent reasons forthe accidents.

Conclusion:

The stretch between Beed bypass road from Mahanubhav Ashram (T- point of Paithan road) to Zalta Phata is a heavy traffic flowing region. Frequent accidents are observed due to various reasons: Head-to-head collision, over speeding, Not maintaining the vehicle, Ignorant pedestrians, Intersection crossing, Wrong side driving etc. The severity score between Ch.2250 to Ch.3000 is 85 and hence should be prioritized for treatment over other crash locations. This study is applied to the risks outside the framework of standards and codes. There are two types of countermeasures: Long term and Short term. Long term measures required large sum of money so it should be understood in proper context in highway development of the country and hence provision should be made for its implementation in the foreseeable future. Short term measure requires lesser money and it gives straight away benefit. From meticulous research and observation, it is found that the accidents are increasing because of the following reasons: Inadequate sight distance, Road condition, Poor visibility at night, Driver's negligence etc. It is suggested to construct speed brake or road humps before pedestrian signals as there is lot of pedestrian deaths despite of provision of Zebra crossing and pedestrian signals mainly due to high speed of vehicles.

Recommendations:

1. Provide the speed breaker at MIT & Deolai chowk.
2. Hazard marker to be provided wherever they are missing.
3. Shrubs in shoulders to be removed. Shoulders to be dressed to proper slope.
4. Repairs of railing on culverts to be carried out.
5. Pavement marking is to be provided.
6. Median gap is to be closed.
7. Drainage needs to be improved.
8. Fallen shoulders to be restored.
9. Speed breaker shall be extended to full width of the pavement and shall be marked.
10. No. of electric poles close to the road need to be shifted. Shall be provided withhazard marking to highlight their position to the drivers.
11. Provide pedestrian way.
12. Provide street light at MIT junction.
13. Green time should be extended up to 45 – 50 seconds at MIT chowk of road Paithanto Zalta Phata & vice versa during 11am to 5pm.
14. Plantation at the junctions should be removed so that approaching vehicle can see theclear view of traffic.
15. Branches of trees projecting over the road at a height less than 7 m should beremoved.
16. Pot holes and ruts should be repaired.
17. Traffic rules should be strictly followed.

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