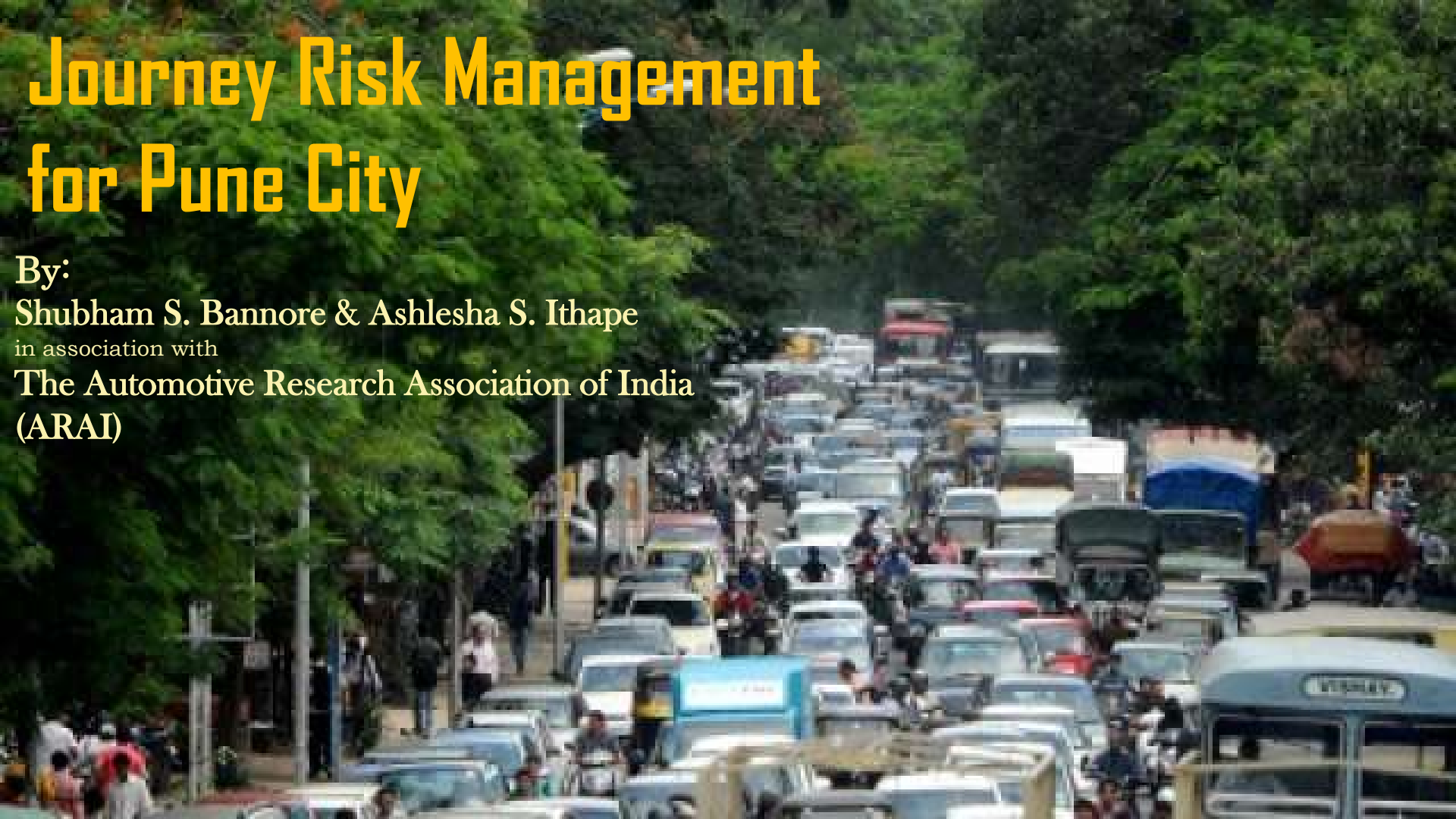# Journey Risk Management for Pune City

By:

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What is Journey Risk Management ?

➢ Journey risk management is a GPS (Global Positioning System) based driver assistance and risk management system for safe and disciplined driving.

➢ Journey risk management describes the routine risks and outlines a plan to address those risks, as well as methods to assess risk.

➢ It includes a prescribed procedure that requires route assessments which contains transportation-related hazards, analysis of data collected from route assessment which decides the severity of risks and a procedure for managing and minimizing, driving and environmental risks.
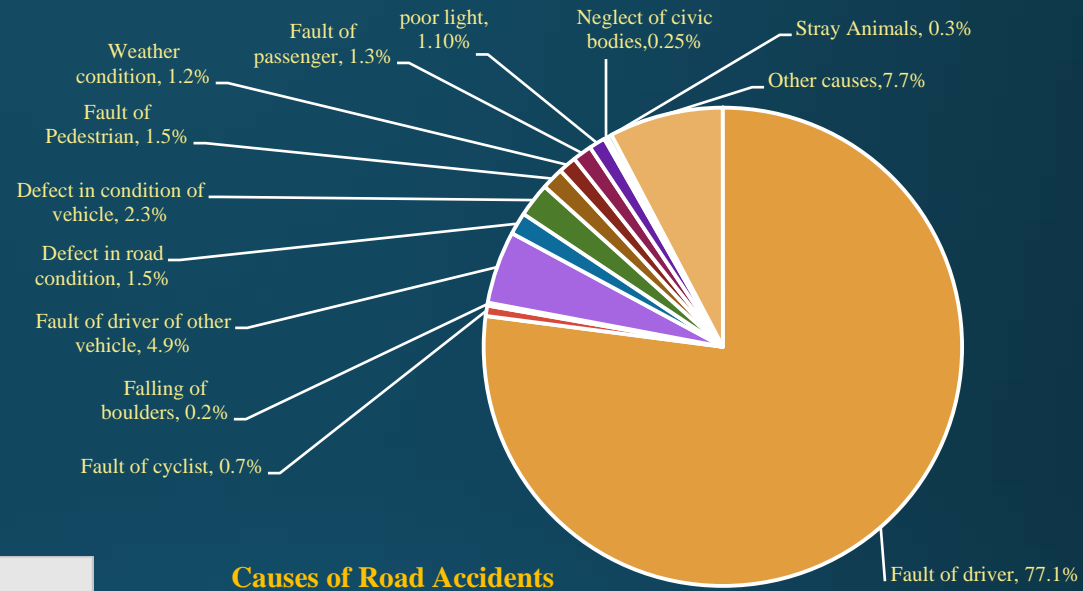
Need of JRM in India

➢ As per the statistical data of India, there is death observed in every 4 min due to Road Accidents.

➢ There has been substantial rise in Road Accident Fatality Risk from year 2003 to 2013.

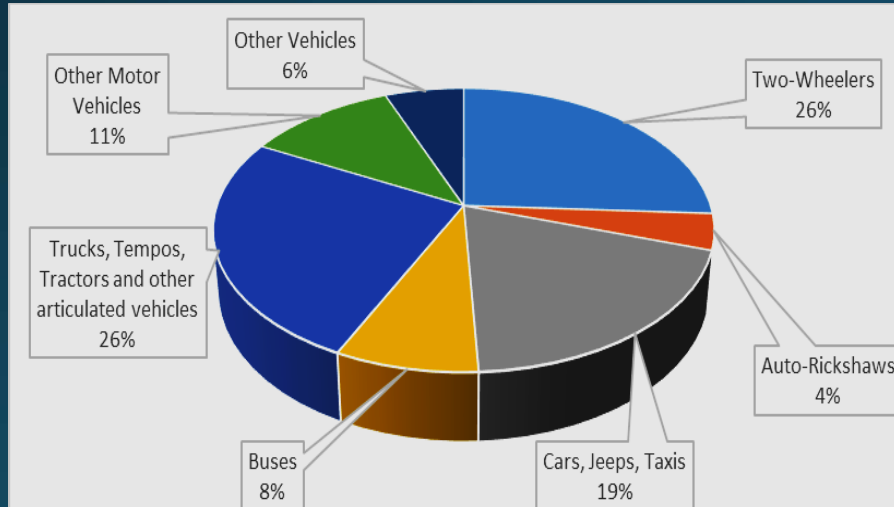*Analysis is from Road Traffic Accidents in India: Issues and Challenges
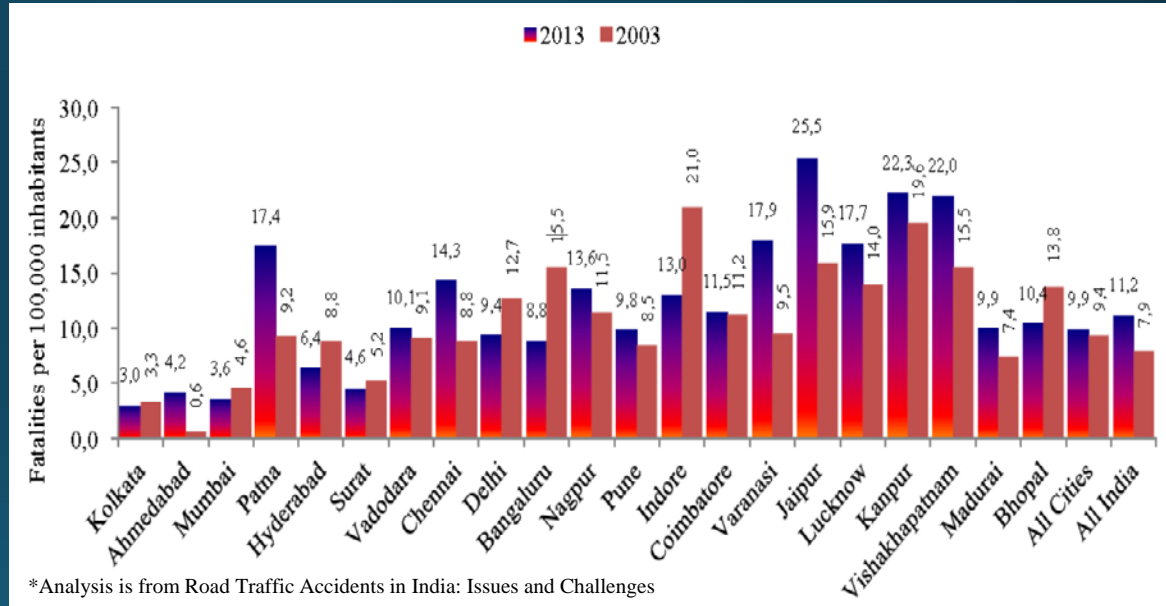
Road Accident Fatality Risk in Selected Indian Metropolitan Cities in 2003 2013.

➤According to the survey by Government of India in 2015, 77.1% of Accidents were caused by the fault of drivers.

Causes of Road Accidents

* Analysis shown is from Road accidents in India-2015 Ministry of rural development

Weather condition, 1.2%

Fault of passenger, 1.3%

poor light, 1.10%

Neglect of civic bodies,0.25%

Stray Animals, 0.3%

Other causes,7.7%

Fault of Pedestrian, 1.5%

Defect in condition of vehicle, 2.3%

Defect in road condition, 1.5%

Fault of driver of other vehicle, 4.9%

Falling of boulders, 0.2%

Fault of cyclist, 0.7%

Fault of driver, 77.1%

Other Vehicles 6%

Other Motor Vehicles 11%

Two-Wheelers 26%

Trucks,Tempos, Tractors and other articulated vehicles 26%

Auto-Rickshaws 4%

Buses 8%

Cars, Jeeps, Taxis 19%

➤Total number of road accidents based on the different types of vehicles in the year 2015.

What is Risk?

1) Weather Condition:

2) Road Condition:

3) Light Conditions:

4) Traffic Conditions:

5) Vehicle handling issues: poor vehicle maintenance, new driver allocation, lack of knowledge about vehicle, etc.

6) Driver: lack of experience, training, fitness for duty, fatigue exposure, visibility, poor health condition, consumption of alcohol, disturbance while driving, etc.

Research Methodology

Route Data Collection → Route Analysis → Performance Index → Risk Score Calculation → Risk Assessment

Route Analysis

➢This data is collected for analyzing the risk factors faced by the drivers. This will help us to manage or eradicate the accidents occurring in a journey.

➢Along with the route analysis, the risk factors raised by vehicle and driver is also taken into consideration.

Route: Kothrud depot to Swargate depot
Bus No: MH 12 EQ 8279   **Route No.:**#VJR3
Start Time: 6:12 pm

1. Kothrud Depot Arrival Time:6:12 pm
      Traffic signa
2. Kothrud Bus Stop Arrival Time:6:13 pm
3. BharatiNagar Bus Stop Arrival Time:6:14 pm
      Traffic signal
      Kachara Depot
4. Kachara depot Bus Stop Arrival Time:6:16 pm
      Parallel Parking
      Gas pump station
      Circle intersection
      Square intersection
      Traffic signal(closed)
5. Vanaj company Bus Stop Arrival Time:6:17 pm
      Parallel parking
      Hospital (Sahyadri hospital)
      Circle intersection
      Traffic signal
6. Vanaj corner Bus Stop Arrival Time:6:20 pm
      Square intersection
      Circle intersection
7. Pratik Nagar Bus Stop   Arrival Time:6:21 pm
8. Jai Bhavani Nagar Bus Stop Arrival Time:6:22 pm
9. Anand Nagar Bus Stop Arrival Time:6:22 pm
      Traffic signal
      4 wheeler parking
      Traffic signal
      T-Intersection
10. More Vidyalaya Bus Stop Arrival Time:6:24 pm
      School (More vidyalaya)
11. MIT college Bus Stop Arrival Time:6:25 pm
      Parallel parking
      College(Smt.SudhataiMandake Commerce College)
      Traffic signal
12. PaudPhata Bus Stop Arrival Time:6:27 pm
      Traffic Signal
      College(S.N.D.T Women University)
      Y-Intersection
13. Anand Nagar Bus Stop Arrival Time:6:29 pm
      Traffic signal
14. Nal Stop Bus Stop Arrival Time:6:34 pm
      Petrol pump
      Petrol pump
      Traffic signal

15. Karve road Rulawal plaza Bus Stop Arrival Time:6:35 pm
      T-intersection
16. Galaxy hospital Bus Stop Arrival Time:6:36 pm
      T-intersection
      Parking
      Traffic Signal
      T-intersection
17. Garware college Bus Stop Arrival Time:6:36 pm
      Hospital(Sahyadri Hospital)
      School(Mrs. VimalabaiGarwareprashala)
      Square intersection
18. Deccan Corner Bus Stop Arrival Time:6:37 pm
      Traffic signal
      Traffic signal
      School(MaharshiKarve School)
      Bridge(Sambhaji Bridge)
      Traffic signal
      T-intersection
      College (Ashok Vidyalaya)
      Traffic signal
19. Sahityaparishad Bus Stop Arrival Time:6:45 pm
Maharashtra SahityaParishad
      Traffic signal
      Square intersection
      Even-odd parking
20. Maharashtra mandal Bus Stop Arrival Time:6:48 pm
      Maharashtra Mandal
      Traffic signal
      Traffic signal
      Hospital(Ramkrushna hospital)
      T-intersection
21. S.P. College Bus Stop Arrival Time:6:52 pm
      Traffic signal
      Temple
22. Madiwale Colony Bus Stop Arrival Time:6:54 pm
Circle traffic signal
23. Hirabaug Bus Stop Arrival Time:6:55 pm
      Hospital(Madhavbaug hospital)
      Traffic signal
      Even odd parking
      Petrol pump
      Traffic signal
24. Swargate Bus Stop Arrival Time:6:58 pm
25. Swargate Depot Arrival Time:7:02 pm

End Time: 7:02pm   **Total Time: 50 mins**

Performance Index

➤The data from the GPS server and the route analysis will account for performance index and travel behavior of the particular bus driver.

➤The performance index from the data of control room will signify the driving quality accordingly counseling will be provided to the driver.

Route Checklist

Bus Authority: _____.   Date: /   /

Route being assessed: _____to_____ Starting Time: _____.

Maximum Speed: 65kmph

Sr. No:		Speed limit	Remark
01.	Bus Stop	--	Wait foratleast 10 secs
02.	Traffic Signals	--	Wait according traffic signal timer. Wait before Zebra crossing.
03.	Hospitals	30-35 kmph	No horn
04.	Schools/Colleges	20-25 kmph	Drive in 1st lane. Don't overtake
05.	Petrol Pumps	30-35 kmph	Drive in 1st lane. Don't overtake
06.	Malls/ Shopping Markets	30-35 kmph	Drive in 1st lane. Don't overtake
07.	Flyover junction	40-45 kmph	
08.	Intersections(T,Y,+), Turns	30-35 kmph	
09.	Speedbraker	25-30kmph	
10.	Bridge	40-45 kmph	
11.	Temple	30-35 kmph	
12.	Parking	20-25 kmph	
13.	Diversions	20-25 kmph	
14.	Dividers	40-45 kmph	
15.	2-way Road	50kmph	
16.	4-way Road	60kmph	

Risk Score

Risk Score = Exposure x Probability x Severity.

➢ **The Frequency of Exposure** – how often and for how long public are exposed to the hazard.

➢ **The Probability of Occurrence** – the likelihood that a motor vehicle incidents will occur.

➢ **The Severity of Consequences** - the magnitude of loss, negative consequences or impacts.

Hazard Category	Hazard / Contributing Factor	Frequency of Exposure	Probability of Occurrence	Severity of Consequences	Risk Score	Rank
journey	avoidable and unnecessary driving is NOT avoided	5	5	5	125	LOW
journey	poor scheduling - unrealistic time allowed, inefficient route selection, avoidable delays not eliminated	9	9	9	729	HIGH
journey	route includes intersections or roads with known high crash frequency; uncontrolled railway crossings	8	9	8	576	MEDIUM
vehicle	improperly adjusted seat and headrest - MSI strain, visibility	7	8	9	504	MEDIUM
vehicle	safety features absent or inoperable	8	8	7	448	MEDIUM
vehicle	vehicles not regularly inspected	9	10	9	810	HIGH
driver	insufficient orientation or training: driver lacks necessary competencies or is unfamiliar with procedures to operate vehicle	8	9	7	504	MEDIUM
driver	does not recognize driving hazards or hazardous conditions and/or adapt driving accordingly	8	9	8	576	MEDIUM
driver	failure to pay attention to driving responsibilities; complacency	5	9	9	405	MEDIUM

Risk Assessment

➢ Based on the risk score the suitable rank and color is given to the hazards.

➢The Red color is for range 485-729 (HIGH);
the Yellow color is for range 244-486 (MEDIUM);
the Green color is for range 1-243 (LOW).

Time	Area	Overall Risk
5:40 am to 8:00 am	--	Low
8:00 am to 10:00 am	Tilak Road, Sambhaji Bridge, Karve Road, Paud Road.	High
10:00 am to 12:00	Swargate, Karve Road, Paud Road.	Medium
12:00 to 2:00 pm	Swargate, Sambhaji Bridge, Tilak Road.	Medium
2:00 pm to 4:00 pm	Tilak Road, Sambhaji Bridge.	Medium
4:00 pm to 6:00 pm	Tilak Road, Paud Road, Karve road, Sambhaji Bridge.	High
6:00 pm to 8:00 pm	Swargate, Sarasbaug Road, Tilak Road, Paud Road, Karve road.	High
8:00 pm to 10:00 pm	Swargate, Tilak Road, Sambhaji Bridge.	Medium
10:00 pm to 11:00pm	Swargate.	Low

Future Scope

➢ JRM is carried on mostly in foreign countries for logistics companies, the above analysis has shown us the need of JRM in India.

➢ JRM will more useful if it is used in public transportation.

➢ JRM for PMPML Buses has shown that if it is done for school buses, companies vehicle, trains, goods carriers, etc it will help to reduce the traffic, accidents and other journey related problems.

➢ This will facilitate us for transport planning or scheduling, travel demand modeling, Sustainable transportation, intelligent transport system.

Thank You!!