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# Study of commuter problems and opinions in a fast developing coastal city of Mangalore in India: A gender perspective analysis

Edmond Fernandes, Abhay Nirgude, Poonam Naik, Neevan Dsouza<sup>1</sup>, Soumya Shetty<sup>2</sup>

## Abstract:

**BACKGROUND:** Transport and commuting need to be viewed from a more inclusive nature because it adds a very strong gender component. Invariably, gender perspective is never included during road transport authority meetings and naturally gets excluded in the entire transport planning discourse.

**METHODOLOGY:** A cross-sectional study was carried out to assess commuter problem and study the opinion of commuters with regard to public transport and road safety by involving 139 commuters by purposive sampling who travel daily in the coastal city of Mangalore in Southern India using public transport.

**RESULTS:** Among the study participants, 66 (47.5%) were males and 73 (52.5%) were females. The mean age of the respondents was  $28.5 \pm 7.9$  years. One hundred and sixteen (83.5%) feel the roads in the city are unsafe and 69 (49.6%) felt stressed due to travel and 71 (51.1%) felt the public transport are rarely safe for women to travel at night.

**CONCLUSION:** The issue of women and child safety during travel by public transport, the behavior of auto drivers, the need to increase road patrolling during day and night will require sincere investment from policy makers and stakeholders. Perhaps, the time to create a gender sensitive commuter-centric road safety policy requires to be developed.

## Keywords:

Commuter problems, gender, India, road safety

## Introduction

Enrique Penalosa, the then mayor of Bogota in Columbia once said, "A developed country is not where the poor use cars, but where the rich use public transport." Countries like India are dependent on roads as an arterial line for the country. Poor road quality, inadequate patrolling, shortage of traffic police, poor lighting remains a bottleneck and aggravates commuter problems particularly affecting women and children the most. The number of vehicles is also increasing at over 10%/annum.<sup>[1]</sup>

Going by various estimates, the total stock of vehicles will reach up to 2 billion by 2050 and maybe even more, depending on how the ownership trends shape up in countries like India and the People's Republic of China (IEA 2009).<sup>[2]</sup> New Delhi, Mumbai, Kolkata, and Bengaluru have 5% of India's population but 14% of its registered vehicles.<sup>[3]</sup>

Transport and commuting needs to be viewed from a more inclusive nature since it adds a very strong gender component. Invariably, gender perspective is never included during road transport authority meetings and

Department of Community Medicine, Yenepoya Medical College, Yenepoya University, <sup>1</sup>Yenepoya Research Centre, Yenepoya University, Mangalore, Karnataka, <sup>2</sup>BioStats Solution, Center for Health and Development (CHD Group), India

## Address for correspondence:

Dr. Edmond Fernandes,  
Department of Community Medicine, Yenepoya Medical College, Yenepoya University, Mangalore, Karnataka, India.  
E-mail: [edmondvirgo@gmail.com](mailto:edmondvirgo@gmail.com)

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naturally gets excluded in the entire transport planning discourse.

Bus services are overcrowded, uneasy, chaotic, and often dangerous, mainly because of the population dynamics in India. Public ownership and operation of most transport services are greatly decreased.<sup>[4]</sup>

Smeed in October 1967 at the University College London said that "The feeling that something should be done to mitigate the harmful effects of motor vehicles is almost universal, but the opinions on what should be done are wildly conflicting."<sup>[5]</sup>

The needs of women and their interests have largely been under-represented, what some scholars call having a gender-blind approach in India's urban development planning and the benefits of development reaches more to men than women, whereas on the contrary, it should be equal if not more for women.

The objective of this study was to assess commuter problem and to study opinion of commuters with regard to public transport and road safety within Mangalore city from a gender perspective. What we mean by commuting here is largely a referendum to traveling by public transport or private buses to the workplace and we have placed *ad hoc* questions to explore the overall perception of the participants with regard to few road safety concerns.

## Methodology

### Study setting

The study was conducted in the coastal city of Mangalore located in the state of Karnataka lying between the Arabian Sea and the Western Ghats and having an area of 132.4 km. The population of Mangalore in 2011 was 488,968; of which male and female were 242,512 and 246,456, respectively. Average literacy rate in Dakshina Kannada District in 2011 was 88.57, which is the highest in the state. Mangalore city has 413 public transport buses and 594 service buses as per the information available with the Deputy Commissioner for Road Transports, Dakshina Kannada District as on September 2016. The total amount of driving license holders as on September 2014 mentioned is 547,480. The city is hub to education institutes, banks, hospitals, and heavy industries and rapid urbanization continues to define Mangalore's geography.

### Study period

The study was conducted from June 1, 2015 to October 25, 2015.

### Study design and sample

A cross-sectional study was carried out by involving 139 commuters by purposive sampling who travel daily.

Those individuals who use public or private bus or auto to reach their respective destinations to work were included for participating in the study.

### Sample size calculation

Assuming 50% of males and 75% of females commute by public transport, an expected response rate of 90% and after applying continuity correction, the study would require a sample size of 69 for each group. Thereby, giving a total sample size of 138, assuming, equal sizes to achieve a power of 80% for detecting a difference in proportions of 0.25 between the two groups at a two-sided  $P = 0.05$ .<sup>[6]</sup>

### Study tools

A predesigned, pretested, validated, structured questionnaire was administered to the participants to elicit information relating to their daily commute, the time spent in travel, and their opinions on traffic congestion, road conditions, and road safety. Anonymity of the study participants was maintained and confidentiality was ensured.

### Statistical analysis

Data were analyzed using Statistical Package for Social Sciences for windows, version 22 IBM Corporation (Armonk, NY: IBM Corp.). Descriptive statistics was summarized in percentages and proportions. Chi-square test was used to study the association between gender and various factors such as travel stress, congested roads, travel during rains, safety of women and children, sign boards during travel. The value of  $P < 0.05$  is considered statistically significant in this study.

### Ethical approval

Ethical approval was taken from the Institutional Ethics Committee. Participants were explained the objective of the study and detailed participant information sheet was provided to them. Participation was voluntary and written informed consent was obtained from the participants.

## Results

Among the study participants, 66 (47.5%) were males and 73 (52.5%) were females. The mean ages of the respondents were  $28.5 \pm 7.9$  years. It was observed that 70 (50.4%) participants traveled by public transport. Majority of the participants 103 (74.1%) travelled 15 min to 1 h daily. In-spite of 93 (66.9%) feeling that Mangalore city is rapidly developing, on a regular day, 57 (41%) spend about 16–30 min (As seen in Figure 1) in traffic jam and 104 (74.8%) reported that traffic problem has become worse now.

Of the participants, 93 (66.9%) felt Mangalore city is developing rapidly. Eighty-five (61.2%) respondents

**Table 1: Gender wise distribution of commuter responses regarding traffic**

	Gender			$\chi^2$	P
	Male (n=66) (%)	Female (n=73) (%)	Total (n=139) (%)		
Traffic problem has become worse?					
Yes	50 (75.8)	54 (74)	104	1.181	0.554
No	4 (6.0)	8 (11)	12		
Can't say	12 (18.2)	11 (15)	23		
Time spent in traffic (min)					
0-15	23 (34.8)	28 (38.4)	51	0.517	0.915
16-30	29 (43.9)	28 (38.4)	57		
31-60	11 (16.7)	14 (19.2)	25		
>60	3 (4.5)	3 (4.1)	6		
You think the city's roads are safe?					
Yes	1 (1.5)	1 (1.4)	2	0.005	0.997
No	55 (83.3)	61 (83.6)	116		
Can't say	10 (15.2)	11 (15.1)	21		
Do you get angry when the bus drivers honk?					
Yes	39 (59.1)	52 (71.2)	91	4.302	0.231
No	4 (6.1)	5 (6.8)	9		
Always	21 (31.8)	16 (21.9)	37		
Never mind	2 (3)	0	2		
Do you think road users in Mangalore follow traffic rules and road discipline?					
Sometimes	38 (57.6)	47 (64.4)	85	2.912	0.232
Rarely	27 (40.9)	22 (30.1)	49		
Never	1 (1.5)	4 (5.5)	5		
Have you participated in any road safety campaign?					
Yes	6 (9.1)	6 (8.2)	12	0.833	0.855
No	60 (90.9)	67 (91.8)	127		
Do you think the traffic police should be held responsible for your problems on the roads?					
Yes	23 (34.8)	22 (30.1)	45	0.645	0.724
No	17 (25.8)	23 (31.5)	40		
Can't say	26 (39.4)	28 (38.4)	54		

felt that only sometimes road users in Mangalore follow traffic rules and road discipline. On further probing, 112 (80.6%) feel the roads are bad in the coastal city (As seen in Figure 2), 97 (69.8%) feel the roads have now become congested and the pollution levels have increased, but 130 (93.5%) have reported that getting stuck in traffic affects their work which requires serious attention. About 75.8% among male commuters found that traffic problems have become worse and about 74% of female commuters shared the similar thought. There were 83.6% of female commuters who felt the city's roads were unsafe and 71.2% of female commuters got angry when bus drivers honked. Road users in Mangalore do not follow traffic rules and this was felt was 64.4% of females and 57.6% of males. Participation in road safety campaigns was not seen among 91.8% of females and 90.9% of males. The time spent in traffic did not differ significantly between males and females ( $P=0.915$ ). Males and females did not differ significantly in their opinion whether traffic problem has become worse, city's roads are safe, get angry when the bus drivers honk, whether

road users in Mangalore follow traffic rules and road discipline, participated in any road safety campaign, and whether traffic police should be held responsible for your problems on the roads [Table 1].

Among the participants, 116 (83.5%) feel the roads in the city are unsafe. Of those who answered, 69 (49.6%) felt stressed due to travel and 71 (51.1%) felt the public transport are rarely safe for women to travel at night. While traveling 98 (70.5%) of the respondents have experienced getting stuck in traffic sometimes. Furthermore, sometimes 77 (55.4%) have faced road blocks while commuting to their place of work. Commuting during rains becomes a problem was perceived by 77 (55.4%). Fifty-five (39.6%) feel that sign boards are inadequate on the city's roads. In addition, 49.3% females found commuting difficult during rains and 62.1% males found commuting difficult. about 72.6% females found auto drivers rude sometimes and 43.9% males felt road patrolling happened at nights. public transport travel at night was not found safe by

52.1% of female commuters and 50% men also found public transport unsafe for women. The male and female commuter response differed significantly ( $P=0.037$ ) when asked whether "public transport is safe for children to travel without adult accompanied" [Table 2]. Other questions opinion did not vary significantly between the males and females ( $P>0.05$ ).

### Discussion

Many studies have pointed out that the travel needs of women are different when compared to men in both public and private transport.<sup>[7]</sup> Gender sensitive policy responses are needed in developing countries.<sup>[8]</sup> Indian policy makers should also channel their thinking which

should factor in this dimension. Travel related problems remain part and parcel of low and middle-income nations.

Mangalore city is peculiar with regard to commuter movement by public transport because public transport in Mangalore city is operated by private owners who are regulated by their association rather than direct government controls. The association sets the time gap and time limit of reaching destinations rather than the transport department. Mangalore city, in particular, has a very high literacy rate, and there should be little doubt why women should not go to work with the existing literacy rate. However, not all working men and women can afford private vehicles, and they will take to public

**Table 2: Gender wise distribution of commuter problem and opinion**

	Gender			$\chi^2$	P
	Male (n=66) (%)	Female (n=73) (%)	Total (n=139) (%)		
During rains, does commuting become a problem					
Always	41 (62.1)	36 (49.3)	77	4.152	0.125
Sometimes	19 (28.8)	33 (45.2)	52		
Rarely	6 (9.1)	4 (5.5)	10		
Do you feel the auto drivers are rude?					
Always	18 (27.3)	16 (21.9)	34	0.612	0.740
Sometimes	44 (66.7)	53 (72.6)	97		
Rarely	4 (6.1)	4 (5.5)	8		
Do you feel safe while travelling?					
Always	15 (22.7)	15 (20.5)	30	4.403	0.221
Sometimes	32 (48.5)	61 (37)	93		
Rarely	7 (10.6)	11 (23.3)	18		
Never	12 (18.2)	14 (19.2)	26		
Is the public transport bus/auto safe for women to travel during day?					
Always	16 (24.2)	18 (24.7)	34	4.032	0.258
Sometimes	38 (57.6)	41 (56.2)	79		
Rarely	3 (4.5)	9 (12.3)	12		
Never	9 (13.6)	5 (6.8)	14		
Are the public transport bus/auto safe for women to travel at night					
Always	7 (10.6)	3 (4.1)	10	2.502	0.475
Sometimes	12 (18.2)	17 (23.3)	29		
Rarely	33 (50.0)	38 (52.1)	71		
Never	14 (21.2)	15 (20.5)	29		
Is the public transport bus/auto safe for children to travel without adult accompanied?					
Always	12 (18.2)	9 (12.3)	21	8.503	0.037*
Sometimes	22 (33.3)	19 (26)	41		
Rarely	5 (7.6)	19 (26)	24		
Never	27 (40.9)	26 (35.6)	53		
Do you think there is adequate patrolling on the road at night					
Always	2 (3)	3 (4.1)	5	1.184	0.757
Sometimes	29 (43.9)	29 (39.7)	58		
Rarely	28 (42.4)	29 (39.7)	57		
Never	7 (10.6)	12 (16.4)	19		

\* $P<0.05$  significant

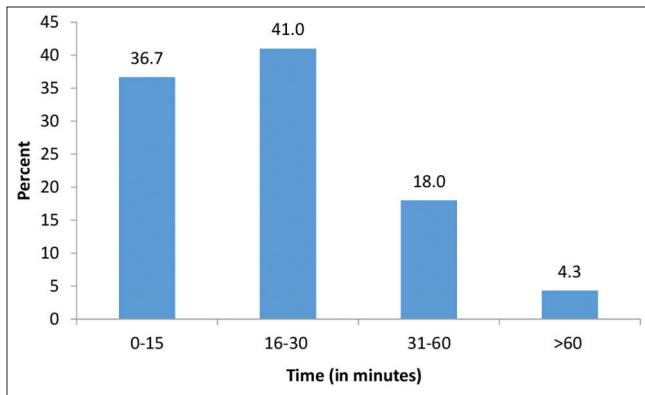


Figure 1: Distribution of time spent in traffic by commuters

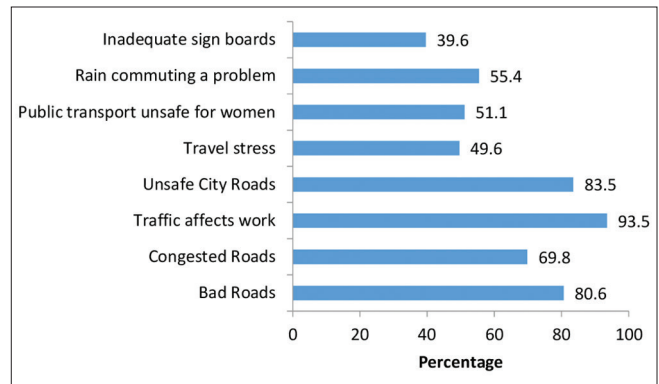


Figure 2: Distribution of the problem faced by commuters

transport. Bus systems are an important asset in the developing city dynamics due to their flexibility.<sup>[9]</sup>

Public transport ought to be efficient to cater to growing number of commuters who travel for work and personal reasons so that travel-related stress is reduced. Scientific literature previously has pointed out that an inverse relationship exists between health status and commuting; productivity and commuting; work-readiness and commuting.<sup>[10-12]</sup>

It has been established that travel by both public and private transport can lead to the reasonable amount of stress.<sup>[13,14]</sup>

In this study also, we found that 130 (93.5%) felt that getting stuck in traffic affected their work and 69 (49.6%) felt stressed due to travel by public transport.

Motivational deficiency and low productivity are seen due to the lack of punctual public transport and traffic congestion. Negative effects of commuting affect females more than males.<sup>[15,16]</sup>

Importantly, public transport will also need to be safe for women and children to travel without fear during any time of the day because more women depend on public transport and transit systems than men do making them more vulnerable with regard to security and safety concern.<sup>[17]</sup> In this study also we found that 71 (51.1%) felt that public transport in Mangalore city was rarely safe for women to travel at night and 116 (83.5%) felt the roads were unsafe. Similar incidences have been pointed out from Guwahati, Assam were 39% felt unsafe with public transport, and 49% stated they faced sexual harassment on the roads.<sup>[18]</sup>

In Mangalore city, constant road repair work and concretization, traffic diversion, unscientific speed-breakers, the mixed traffic on the road, dangerous turns, hilly terrains and the absence of police personnel for patrolling contribute to the build-up for public health problems with regard to commuting. Reynolds said

that congestion was a universal phenomenon in the developed nations of the world and it was rare for him to note that these cities did not have problems of their own, but what he interestingly pointed out was that even fewer among them had any idea of how to solve it.<sup>[19]</sup>

Commuter problem aggravates due to population migration to urban dwellings, job opportunities which inspire people to move to and fro, increased civilian movement for a variety of reasons and using public transport due to the rapidly proliferating economy and the greater demand to reach on time. It adds a significant impact on the health of the commuters which causes heightened stress besides other issues. The average time spent commuting depends largely on the type of the road network, the origin, and destination, and other factors. To put transport on a sustainable path and to decode commuter concerns, current trends must be changed substantially. Strong policies are needed to shift long-term trajectories to meet interim goals.<sup>[2]</sup>

The mobility of men and women pushes policy makers to address gender needs in public transportation more seriously. Transport facilities act as a social capital which also provides social justice. Good public transport systems will improve quality of life, elevate the happiness quotient, save time and provide better safety measures and respect individual freedom.<sup>[20]</sup>

Many participants in this study observed that sign boards are inadequate. The absence of sign boards will not provide a smooth ride for new entrants in the city, and they may have to be dependent on passers-by and global positioning system which may sometimes lead to road crashes because of driver distraction. In a developing city like Mangalore which does not have rail connectivity for daily commuting to work place, commuters must depend on the roads by any means to reach their destination. There are limited government buses, and the sizeable road stake is controlled by public buses owned by private individuals who come under the bus operators association. Private sector institutions have their own

buses for their staff. For the rest of the population, bus, car, and auto-rickshaw remain the mode of transport. In the absence of a policy for commuting, this segment of the population deserves attention. Often so the buses are overcrowded beyond the norms laid down by the manufacturers. Forced compulsions to take the bus make life difficult. The years ahead will certainly not be a joy-ride if we do not take steps now. In this study, we found that 52.1% of the female participants felt that public transport bus is rarely safe for women to travel at night. After nearly seven decades of independence, women's safety not being guaranteed is nothing but sign of a society still struggling to make its existence, and arguably so, many societies and nations are still making attempts to secure safer travels for women at night. To combat the security concern of women in Zhengzhou, central China, women only bus services have been introduced since April 2016. However, such solutions have their own repercussion, and it was labeled by Chinese men as a sexist attempt and many elderly couples increased their voices complaining that this kind of approach would mean, they wait for the next bus to be able to travel together.<sup>[21]</sup>

This study found that 72.6% of the female participants felt that sometimes the auto drivers behave rudely. Similar patterns exist around the country with regard to auto-drivers behavior. In the light of this, Nashik regional transport officer had conducted a campaign to change the attitude of auto-drivers.<sup>[22]</sup>

It is interesting to note that 91.8% of the female participants and 90.9% of the male participants have never really participated in any road safety campaign and have remained ignorant about the same. This indicates that there is a paucity of road safety campaigns in Mangalore region and this also holds true for other parts of the country guided by observations. Advocacy, safety nets and increased investment into road safety and traffic issues will need to be escalated to a new level.

## Conclusion

Commuter problem from a gender perspective is not given the attention it deserves. The issue of women and child safety during travel by public transport, the behavior of auto drivers, the need to increase road patrolling during day and night will require sincere investment and honest dedication from policy makers and stakeholders.

## Recommendations

Creating gender sensitive commuter-centric road safety policy requires to be developed.

Sensitization of public transport drivers, including auto drivers regarding safe driving practices and effective communications must occur regularly.

Road safety campaigns need to be strengthened with Information, Education & Communication activities (IEC) activities.

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## Conflicts of interest

There are no conflicts of interest.

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