International Journal of Research in Entrepreneurship & Business Studies
eISSN-2708-8006, Vol. 4, issue. 2, 2023, pp. 1-20
https://doi.org/10.47259/ijrebs.421

Challenges in Chennai City Traffic Control: Insights from Commuters' Road Usage Practices

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Citation: Khan, F.R., Khan, M.M., & Syeda A.R.S. (2023). Challenges in Chennai Traffic Control: Insights from Commuters' Road Usage Practices. *International Journal of Research in Entrepreneurship & Business Studies*, 4(2), 1- 20.
https://doi.org/10.47259/ijrebs.421

Received on 18th Feb. 2023
Revised on 10th Mar. 2023
Published on 11th Apr. 2023

Abstract

Purpose: The objectives of the study were to find out all the entities that cause the road traffic in Chennai City and to analyse the various behavioural attitudes of various entities on road traffic in Chennai City.

Design/methodology/approach: The study was carried out using questionnaires and interviews. The samples were drawn on a random sampling basis from the entire population of Chennai city. 1242 persons were interviewed.

Findings: The study revealed that the respondents observed the civic practices of the pedestrians as they hold phones while crossing the roads or pathways, do not bother to stop at signals, do not cross the roads in the zebra lines;
the civic practices of the 2/3-wheelers as the drivers attend to phones while driving, jumping signals, plying their vehicles on the platform, driving without helmets, and switching on the indicator lights;
the civic practices of the 4-wheelers as cars using high beams within the city limits, not giving way to ambulances, honking near schools and hospitals, plying with one headlight;
the practices of public works department personnel as roads are not laid down properly, roads are laid in patches, the main roads, streets, and infrastructure are not maintained properly;
the practices of traffic police as government vehicles are not fined, and fine is collected by hand and bribery.

Research limitations/implications: The study suggested pedestrians cross the roads only in zebra crossings but with utmost care or pathways to avoid the habit of talking over the phones, pedestrians to cross the road only at the designated places using zebra crossings; Drivers of vehicles must avoid phones while driving; Avoid jumping signals; not to drive in the opposite direction—enough number of Government buses to be plied to avoid the crowd. Ambulances should be given priority and no honking near schools, hospitals, etc. Traffic police should penalize heavy vehicles with fused/not working headlights. RTOs should include signal tests, eye tests in the driving license eligibility tests in India, and re-issuance of driving licenses should be done to check physical fitness. Traffic rules violators must be severely penalized regardless of whether they are Government or private vehicles. To avoid bribery traffic police should not collect fines in hand but rather through online. Drunken drivers should not be left free and fined.

Social Implications: The study suggested how the behaviour of the pedestrians' carelessness while crossing the roads, the vehicle riders' irresponsible driving, and the needed responsibility of RTOs/PWDs/traffic police will change the traffic system into a safe traffic environment.

Originality / Value: This study is the first kind of its own as it examines the behaviours of pedestrians, 2-wheelers/4-wheelers, Public Works Department Personnel, License Issuing Authority/Regional Transport Office, and Traffic Police whose behaviour affects the Chennai city traffic and suggests solutions to overcome.

Keywords: Traffic control management, Road accidents, Pedestrians' Practices, 2-wheelers/4-wheelers' Practices, Public Works Department Personnel's Practices, License Issuing Authority/Regional Transport Officers' Practices, Traffic Police Practices.

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Introduction

Though India is an agriculture-based economy, the population living in urban has grown from 10% (in 1901) to 28% (in 2001) of the total population and is expected to touch 600 million by 2030 (Ghani, 2023). Out of the majority of the population living in urban areas, 38% of them are located in metropolitan cities (i.e. population of 1 million and above) (Velmurugan & Reddy, 2005). The number of registered vehicles two-wheelers, three-wheelers, four-wheelers, and transport vehicles – per thousand persons has increased from 53 in 2001 to 225 in 2019 (Ministry, 2021).

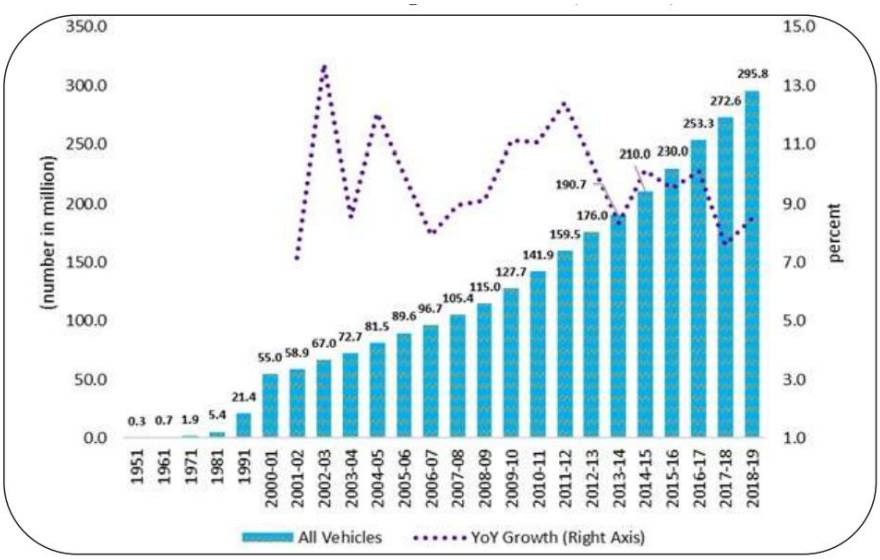

Fig.1 Total number of Registered Vehicles (in Million) in India
Source: Office of the State Transport Commissioners/UT Administration, (Ministry, 2021)

This has resulted in traffic congestion, road accidents, and air pollution due to emissions from vehicles deteriorating the environment. Chennai City, the fourth largest metropolitan city in India, is one such falling under this category with a population of 6.748 million (*Chennai City*, 2021). Chennai is also referred to as the 'Detroit of India' and the 'Gateway to South India' due to its large industrial growth during the last few decades (Bloodgood, 2007) thereby the increase in the population of Chennai has been attributed to the increase in road traffic (Krishnamurthy & Desouza, 2015). As per the Government-commissioned survey, migrant workers are adding traffic to the city as the number keeps increasing daily (Philip, 2016). Further to that, the new advancements in technology with comfort have added new vehicles on the road as people prefer their vehicles rather than public transport thereby increasing road traffic (Kaur, 2017). Traffic management is an integral part of every city and in particular, Chennai needs more reformative measures as the road traffic tremendously increased and contributed to traffic issues (Shanthilal & Sreeya, 2019). The huge traffic causes physical damages to vehicles and humans as well.

Driving in the city has become difficult and complicated compared to rural, semi-urban cities (Angel et al., 2019). In particular, Chennai city is facing more than a dozen road accidents daily including fatal ones which are caused mostly by bad driving behaviour and negligence (Sundaram, 2022a). To reach their destination rapidly, people use vehicles on the road and drive them in faster mode without following the traffic rules resulting in road accidents (Dhoble & Khode, 2016). A good driving pattern and behaviour by the drivers can result in good control of the fuel consumption, and health safety on the road (Arokiaraj & Banumathi, 2014).

Grace and Sharma (2015) claimed that road traffic accidents are major causes of deaths and injuries and are the prime social problems in Chennai impacting the socio-economic development of the society. Every year the number of deaths due to road accidents keeps increasing and becoming a big concern that needs to be addressed on a priority basis (Padmavathy, 2022). The causes for highway accidents can be identifiable to an extent such as a blind curve or road crossing whereas in city accidents it is not so easily identifiable (Chandran, 2023). As an international focus, most global city officials and planners are working hard and planning to have a clear, evidence-based strategy for reducing such accidents (Nicholas & Kuss, 2022).

Rationale behind the Study

Road commuters and travellers in the city are heterogeneous. They can be classified basically into 4 categories, viz.

i. Pedestrians
ii. 2-wheelers (bikes, scooters, bicycles)
iii. 3-wheelers (Motor driven carts, Auto rickshaws, hand carts)
iv. 4-wheelers (Buses, motor cars, trucks, tractors, trolleys, lorries, and multi-axle commercial vehicles etc.)

The study was to identify strategies through finding out the behaviour of the commuters and travellers in the city as it is important to understand the civic behaviour of the people involved therein.

Research Questions

1. Who are all the entities that cause the road traffic in Chennai City?
2. What sort of behaviour is caused by various entities on road traffic in Chennai City?

Research Objectives

1. To find out all the entities who cause the road traffic in Chennai City
2. To analyse the various behavioural attitudes of various entities on road traffic in Chennai City

Review of Literature

Road accidents are mostly caused by pedestrians, vehicle drivers, and the road infrastructure (Budzynski et al., 2019).

Pedestrians

Pedestrian-friendly corridors and streets with restricted vehicle access always seem to have helped the communities in the cities (Bliss, 2021). Most of the accidents are caused by pedestrians as they neglect the traffic rules while crossing the roads (Budzynski et al., 2019; Smirnov et al., 2020). Pedestrians put their lives at risk by walking while distracted or crossing the roads in unsafe places not watching for the cars crossing (Alexander, 2017). Pedestrian behaviour plays a crucial role in road accidents due to illegal road crossings at signalled or non-signalled intersections (Jay et al., 2020). Pedestrian behaviour in crossing the roads is affected by the type of road, traffic flow, and traffic control (Papadimitriou et al., 2016). Pedestrian behaviours vary according to the socio-demographic traits of individuals. It is found that males violate more rules at pedestrian crossings, than females (Tom & Granié, 2011).

Urinating in public and spitting on the sidewalks are the most irritating and uncivilized behaviours that occur daily in urban environments (Chaurand & Brauer, 2008). Even though strict anti-spitting rules prevail, some people (even in the US too) have the habit of spitting in the subways and along sidewalks (O'Connor, 2015). The uncivilized behaviour of the public especially the pedestrians spitting on the already encroached narrow pavements, is creating a greater impact in the urban areas (Han et al., 2023). Pedestrian movement is also significantly affected by the two-wheeler movements, vendor encroachment on sidewalks, and live-stock interruptions (Singh & Singh, 2021).

The safety of pedestrians on the road is a challenge because the infrastructure is usually designed keeping in mind the motor vehicles whereas very little attention is paid to the safety of the pedestrians (Shinar, 2012). Pedestrian discipline can be enhanced only by providing countdown timers at the signal crossing for pedestrians (Keegan & O'Mahony, 2003).

2-wheelers/3-wheelers

The driving style and the behaviour of the drivers are related to road traffic and this factor is very much related to human safety (Dhoble & Khode, 2016). Hassan et al. (2017) explored the factors such as cell phone usage, negligence of vehicle examination and drunken driving significantly influence the risky driving behaviour of two-wheeler drivers. Education of the drivers, gender, age, and driving experience influence the speed compliance of drivers (Yadav & Velaga, 2021). Dandona et al. (2006) confirmed that most two-wheeler drivers violate traffic rules by jumping the signals, speeding, not wearing helmets, and being without rearview mirrors. Shukla et al. (2019) claimed that the number of fatality accident cases of 2-wheelers was observed to be very high with those who do not wear helmets. Kavitha (2012) claimed that the majority of the 2-wheelers met with accidents during nighttime due to improper vision as the vehicles from the opposite direction use high beams.

Transporters accept gaps when the lead vehicle is a two-wheeler but they do not if it is a car or an auto-rickshaw as it is observed that the two-wheelers do not leave gaps if the lag vehicle is a car (Asaithambi et

al., 2016**)**. It is observed that the autorickshaw (3-wheeler) drivers in Chennai are notorious for their behaviour and reckless driving (Natarajan & Abdullah, 2014; Tech Admin, 2010).

Further, under-18-year-old boys have no license but have fancy bikes and do overspeeding, wheeling, and acrobatics. This is one of the reasons for causing accidents in the City (Chandran, 2023).

4-wheelers

Driving in the opposite direction of the flow of traffic, changing lanes without due care and risky overtaking were the main causes for getting into accidents (Natarajan et al., 2020). Overspeeding, driving without a valid license, and uncontrolled road junctions also cause road accidents (Balasubramanian & Sivasankaran, 2021). Indian commuters try to drive in such a pattern keeping in mind that they prefer to improve fuel efficiency and environmental protection (Menon & Mahanty, 2016), does not mean that they can drive rapidly and their rash driving pattern mostly ends in fatal road accidents (Dhoble & Khode, 2016).

Kamal and Dhanaraj (2019) confirmed that road accidents are mostly caused by either drunk driving or aggressive driving. Kavitha (2012) & (Mary et al., 2016) claimed that the majority of the 4-wheelers met with accidents due to not wearing their seat belts; which leads to seat belts not activating and might cause serious injury (Amarnathkumar, 2022). Further, most heavy vehicles take any lateral position on the road whereas two-wheelers penetrate the gaps between heavy vehicles creating complex situations for other commuters (Kanagaraj et al., 2015).

The drivers must give way to an ambulance coming with a siren by moving to the left side of the road which is normally not done and lethargic (Dhianeswar et al., 2018).

Bus drivers in Chennai halt the buses in the middle of busy roads avoiding the bus bays (Haque, 2016; Sundaram, 2022b). Buses seem to jump signals and run out of control (TNN, 2023). Government Buses do not seem to have indicators and brake lamps leaving the motorist confused (Chakraborty, 2013). Further, it has also become a daily scene in the city buses are loaded with school children and college students doing stunts on the roads (Anbuselvan, 2022).

License Issuing Authorities

Roy et al. (2021) found that unawareness of road rules was observed to be one of the reasons for road accidents. In India Driving license eligibility test is conducted on an empty ground/track which goes for a very long time and does not assess the real driving skills of a person practically on the road (Jagati & Raja, 2022). The prevailing driving license test does not support strict exclusion of colour-deficient individuals from driving so colour blindness tests and signal tests should be included in the driving test (Tan et al., 2023). Licenses should be issued based on the proficiency acquired by the learners from nominated driving schools and minimum educational qualification should be fixed (Gopalakrishnan, 2012). The license issuing authorities should enforce strict rules for suspension and revocation of license based on periodic medical checkups (Ghosh et al., 2017). Road safety specialists indicate that the eligibility driving test to obtain driving licenses, in some cases, requires applicants to merely show up at their Regional Transport Offices (Sundaram, 2022a).

The public has been complaining to RTOs to penalize drivers for irresponsible driving, overspeeding, deteriorated cars, etc. (Mahalingam, 2006). Vehicles emitting carbon monoxide are checked by the pollution control centres established by the Regional Transport Offices (RTOs) only when the vehicle obtained a fitness certificate for commercial purposes, which is also not done periodically (Rajaram & Babu, 2010; Suvitha Vani et al., 2020). The rules and procedural formalities to be followed by the RTOs related to end-of-life vehicles are so complicated and need proper amendment (Venkatesan & Annamalai, 2017).

Infrastructure Providers (Public Works Department)

Cities around the world are uncertain about accommodating heavy vehicles at the expense of different modes of transportation (Lefkowitz, 2021). Ensuring safe traffic is difficult due to the combination of slow and fast-moving vehicles, sharing the same carriageway (Padmavathy, 2022). Fast growth in urbanization leads to an increase in the number of vehicles on the road, which leads to an imbalance between infrastructure and mobility (Singh & Singh, 2021). Orders have been passed by the Chief Minister of the State, to look into the bad roads in Chennai and its suburbs as it was cited that the infrastructure work such as constructing drains, water pipelines, and sewage lines and lack of maintenance for the reason behind the poor condition of the roads (Chandrababu, 2023).

The road planners have not laid down the roads properly, and the pedestrian junctions were not available in many places (Narayanan, 2020). Road infrastructure is insufficient and fails on basic safety standards such as proper marking, pedestrian crossings, pavements, etc. (Budzynski et al., 2019). More than 20 pedestrians who tried to cross the Chennai-Trichy Highway – GST road, met with accidents and died within one year, due to the missing pedestrian crossing junction (Sundaram, 2024). Pedestrians often cross a road in the wrong place due to the inadequate location of crosswalks (Smirnov et al., 2020). Repeated biker deaths prompted transporters in the city to demand action against engineers and contractors attached to the National Highway Authority of India (NHAI) as traveling on unfinished milled roads (the top surface scraped off) on national highway stretches bordering the city is proven to be dangerous (Sundaram, 2023). The two-wheeler community has urged the NHAI to construct a median in Anna Salai, the prime highway in the city (Swaminathan, 2018). Balasubramanian and Sivasankaran (2021) showed that single-lane roads, the presence of central dividers, and sufficient lighting will help transporters avoid accidents.

Due to bad laying of roads pitfalls are seen on many roads in a short period after laying (Sekar & Perumal, 2021). Unplanned laying of roads and buildings blocks the natural hydrological system of the city and the infrastructure, especially during rainy days (Manohar & Muthaiah, 2016). Further to that the biggest problem with the growing transport population is the inadequate parking (Kuriakose, 2015). Car owners who do not own private parking use in a planned way in enhancing Donald Appleyard's work in using the streets (Alcaˇ ntara De Vasconcellos, 2004).

Signal patrolling is achieved by radar in the signal junction needs to be patrolled by radars to avoid accidents (Sridhar & Srinivasan, 2022).

Traffic Police

The working nature of the traffic police is extremely tiring and stressful (Sawmya & Krishnan, 2023) and when they are away from the junctions even for a short time, the drivers do not stop the vehicles at the intersections (Rajan, 2007). Poor implementation of traffic rules results in higher traffic violations by drivers (Behl et al., 2018). Considering the different speeds of the vehicles and the varied physical dimensions, imposing lane discipline and managing road traffic is difficult in India compared to developed countries (Kanagaraj et al., 2015). Dandona et al. (2006) confirmed that most of the two-wheeler drivers who violated traffic rules either paid the fine or bribed and escaped from the traffic punishment. Various authorities such as police officials, environmental activists, and mental health experts have opined that the traffic rule violators do not realize the seriousness of it as they are fined with not an impressive pecuniary punishment (TNN, 2016b). The nature of punishment for a traffic violation is not severe as the offenders get away most of the time with pecuniary fines and repeat the offense they think it was 'just fines' (Halder & Shetty, 2017).

Lobo (2019) reported that traffic police had been taking bribes from commuters. There are allegations of cops demanding higher bribes in place of false cases booked or heavy traffic fines levied on motorists, taxis, and rickshaws on various occasions (Thomas, 2003; TNN, 2016a). Therefore, Chennai traffic police have decided to go for cashless fines to avoid bribery and misbehaviour (Narayanan, 2018). Further, diplomatic cars/government cars were not fined for going in the wrong direction violating traffic rules getting privileges for parking, etc. (TNN, 2022; Zabyelina, 2016). Police are reported to be involved in the removal of obstructive parking and encroachments (ROPE) but only during peak hours (Shailaja et al., 2022). However, political congregations and public meetings are hindering the traffic which will be beyond the control of the traffic police (Arabindoo, 2011).

After going through the above literature, it was identified that it was not only enough to study the four groups of commuters and travellers but also essential to study the behaviour of the other entities involved viz. the license issuing authorities, the traffic police, and the infrastructure providers (public works department).

Research Methodology

The study was carried out with a mixed approach using questionnaires and interviews. The samples were drawn from the entire population of Chennai city on a random sampling basis from the entire Chennai city irrespective of whether the respondents belong to Chennai or not. To assess the knowledge of traffic rules and public behaviour students and unemployed were also included. 1242 persons were interviewed and their opinion was sought in the form of observations made about the behaviours of pedestrians, 2-wheelers/3-wheelers, 4-wheelers, the license issuing authorities/RTOs, public work department personnel, and traffic police in Chennai. After confirming their identity and the information shared, people came forward to share their observations about the behaviour of the identified groups viz. pedestrians, 2-wheelers/3-wheelers, 4-wheelers, the license issuing authorities/RTOs, public work department personnel, and traffic police.

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Findings

Table 1. Demographic Table of the Respondents

		Frequency	%
Gender	Male	636	51.2
	Female	606	48.8
Education	Illiterate	273	22.0
	High School	670	53.9
	Graduate & above	299	24.1
Native	Belongs to Chennai	410	33.0
	Out of Chennai	832	67.0
Working	Yes	822	66.2
	No	420	33.8
Designation	Not working	420	33.8
	Own Business	249	20.1
	Public/Government Servant	236	19.0
	Others	337	27.1
Age	<18 years	181	14.6
	18 years – < 25 years	236	19.0
	25 years - < 35 years	336	27.0
	35 years - < 50 years	264	21.3
	50 years and above	225	18.1
Own a vehicle	Yes	1021	82.2
	No	221	17.8
Vehicles Type owned	Do not own a vehicle	221	17.8
	2-wheeler/s only	286	23.0
	Car/s only	174	14.0
	1 car & 1 two-wheeler	220	17.7
	1 car & >1 two-wheelers	176	14.2
	>1 two-wheelers & >1 cars	165	13.3

Source: Questionnaire

Table 2. Practices of the Pedestrians

#	Observed Civic Practices	Observed Risks/Suggestions	%
1	*Pedestrians don't cross the roads in the zebra lines.*	Pedestrians ignore the risk. They cross the road in a zigzag way. They cross at any place across the road which they feel is convenient especially, where it is not good for crossing. Fines are the easy way to correct the people. The number of pedestrian crossings should be increased.	51.1
2	*Pedestrians should be given priority by the vehicles while crossing.*	No vehicle stops, rather pedestrians stop in the middle of the road leading to further disturbances to traffic.	52.3
3	*Pedestrians don't bother to stop at signals and rush to cross the road* without minding the speed of the vehicles plying on the road.	Vehicle drivers also do not care for the pedestrians crossing the road – they don't reduce their speed. Speed reduction boards should be laid near the Pedestrian crossing.	67.3
4	*Few pedestrians have the habit of spitting on the pathways.*	People who follow spitters, to avoid stamping such dirt, walk in a haphazard way causing trouble to others. People spitting on the road should be fined by the Traffic Police. Campaigns against this bad habit of spitting in public places should be taught.	58.7

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		Levying fines like in Singapore only can make the country clean.	
5	*Some pedestrians have the habit of climbing over the medians to cross over the other side of the road.*	This is highly dangerous and can be fatal to both the pedestrians and the drivers of the approaching vehicles.	39.9
6	*When friends/family members walk together on the road, they walk parallel, not one after another.*	They walk all in a row without bothering about the traffic/the persons who cross them – without giving space for those coming behind them or coming in front. Police can fine or advise such people.	62.6
7	*Some people urinate at the corner of the street/on the pavement which causes pedestrians to get down from the pavement and walk on the road.*	The number of public conveniences should be increased and such erring persons should be fined.	40.1
8	*Pedestrians hold phones or wear headphones while crossing the roads or pathways, talking over the phones, or using WhatsApp or Instagram, etc.*	People endanger their lives while crossing the roads and walking on the roads by ignoring the vehicles or people around just listening to the music or attending to phone calls, using social media, WhatsApp, Instagram, etc. Fines are the quick remedy.	78.1

From Table. 2, it is observed that among the Observed Civic Practices of the Pedestrians, 'Pedestrians hold phones or wear headphones while crossing the roads or pathways, talking over the phones, or using WhatsApp or Instagram, etc.' ranked first (78.1%) followed by 'Pedestrians don't bother to stop at signals and rush to cross the road without minding the speed of the vehicles plying on the road' ranked second (67.3%) followed by 'When friends/family members walk together on the road, they walk parallel, not one after another' ranking third (62.6%); 'Few pedestrians have the habit of spitting on the pathways' ranked fourth (58.7%). 'Pedestrians should be given priority by the vehicles while crossing' (52.3%) ranked fifth. 'Pedestrians don't cross the roads in the zebra lines' ranked sixth (51.1%).

Table 3. Practices of the 2/3-Wheelers

#	Observed Civic Practices	Observed Risks/Suggestions	%
1	*Most of the drivers jump signals or without waiting for the signal to become green, start before that.*	Many feel that the traffic signals are a nuisance rather than a lifesaver. This mentality needs to be changed. They jump the signals and then cross the road even after the signals become red.	72.2
3	*Most of the Auto drivers spit on the road,* without caring about the passengers/vehicles who follow them.	Travelers have formed their communities and follow their own rules of convenience.	45.3
4	*2/3 wheelers don't care to stop with enough space for traffic on the right or ahead in Junctions.*	2-wheelers try to penetrate even if there is a small gap between heavy vehicles/four-wheelers without waiting for their turn or realizing that they are endangering themselves.	39.2
5	*People have the habit of driving in the opposite direction against the flow of traffic.*	If the commuters' destination is on the same side of the road, they don't go along and bother to take a U-turn to come back to the road. They dare to travel on the side of the flow of the traffic in the opposite direction.	62.6

6	*Lane regulations are not abided by.*	On many occasions, wherever there is no median, vehicles come on the other half of the road blocking the entire road due to which the traffic gets jammed.	54.5
7	*During peak time, 2-wheelers ply their vehicles over the pavement/platform.*	During peak hours, two-wheelers ply their vehicles on the platform, troubling the pedestrians walking on the pavements and putting their lives in danger.	67.7
8	*2/3-wheelers do not care to check their vehicles before they start.*	Whether the vehicle is in good condition – break, lights, signal indicators, horn, etc.? Quite often 2-wheelers seem to break down in the middle of the road.	47.3
9	*Drivers carry children standing in the front side of the 2-wheelers.*	They overload children on their vehicles as a routine – taking their wards to drop them at schools and travel without taking any safety measures.	44.7
10	*While joining from a small street/narrow road, 2-wheelers do not slow down.*	While joining main roads/highways, (at the signal-less junctions) 2-wheelers simply join with the same speed. They do not slow down without looking for the other vehicles.	38.5
11	*Drivers attend to phones while driving, either holding phones in one hand or between their shoulders and ears.*	This is the most dangerous habit and easily vulnerable to traffic accidents. The new trend as a fashion is to wear headphones and drive 2-wheelers listening to music. The newly designed helmets provide space and comfort between the ear and jawline area. This is misused by two-wheeler drivers as a Mobile phone place and to attend calls.	79.5
13	*When more than two 2-wheelers travel together, they ply the vehicles side by side in a row, troubling others.*	They do not bother about the traffic/the other drivers who cross them – without giving space for those coming behind them or coming in the front side.	36.1
14	*Drivers while driving, hold their helmets either on the petrol tank or on their back without wearing them.*	Though, it is commonly seen, it is a very dangerous practice. Not only the rider, the pillion rider also does not wear a helmet. Most of the time during accidents, the pillion rider gets serious injuries and endangers his/her life.	61.8
15	*Some drivers don't keep side mirrors that enable them to watch the approaching vehicles from the back.*	A new trend is catching up among drivers where they purposely remove the side mirrors as a fashion and neglect safety measures.	46.1
16	*Anyone starting the vehicle from a static parked position does not see behind through the rear-view mirror whether vehicles are coming or not.*	Instead, they start the vehicle and suddenly plunge into the road allowing chance to the vehicle coming from behind to collide easily, which may become fatal. This is a part of the Licensing test abroad.	39.3
17	*Some drivers forget to turn off the indicator lights while driving.*	Thereby misleading the people behind, disturbing them to overtake and go ahead. They turn the indicator light on while turning and then keep driving without switching off such lights.	55.3
18	*Drivers take U-turns anywhere on the road when there is no median.*	Drivers of the 2/3 wheelers take U-turns on the road wherever they like without noticing the vehicles coming on the back or front ending up with serious accidents.	55.7
19	*People forget to switch off the indicators even after turning.*	It is quite often noticed that drivers leave the light indicators on, confusing the followers.	58.9

20	*Drunken driving.*	Though hefty fines are levied, some drivers are still drunk and escape from death & cops.	45.8
21	*Drivers overtake from the same sides of the cars overtaking.*	2-wheelers tend to overtake the cars from the side through which the cars are overtaking. There are many instances in which the 2-wheelers come close to the wheels of the cars.	54.9

From Table. 3, it is observed that among the Observed Civic Practices of the 2/3-wheelers, 'Drivers attend to phones while driving, either holding phones in one hand or between their shoulders and ears' ranked first (79.5%) followed by 'Most of the drivers jump signals or without waiting for the signal to become green, start before that' is ranking second (72.2%); 'During peak time, two-wheelers ply their vehicles on the platform' ranking third (67.7%). 'People have the habit of driving in the opposite direction against the flow of traffic' ranked fourth (62.6%). 'Drivers while driving, hold their helmets either on the petrol tank or their back without wearing' ranked fifth (61.8%). 'People forget to switch off the indicators even after turning' ranked sixth (59.9%).

Table. 4 Practices of the four-wheelers

#	Observed Civic Practices	Observed Risks/Suggestions	%
1	*In the narrow streets, vehicles are not parked on the side, almost in the middle of the road.*	Most of the auto/saloon car owners don't have parking at their houses and they park their cars outside the houses on the streets.	46.4
2	*Public transport – Buses stop at bus junctions amidst the road; not nearer to the bus stopping or in the allotted bay (built for that purpose).*	Public Transport can stop close to the platform and allow other vehicles to ply. But, whenever a bus stops, all the vehicles playing behind will be stranded and delayed by 5–10 minutes.	44.2
3	*Buses never go by the left side of the road.*	They always stick to the medians.	49.2
4	*Buses never use any signals or indicators while turning.*	Govt. bus drivers have formed their community and following their own rules of convenience. This practice is very much prevailing with the shared autos and Tata Magic cars who turn their vehicles without looking behind who is following them, whenever anyone shows a signal/hand signal for alighting.	42.3
5	*Bus transports considering themselves as Governmental authorities, drive at their convenience.*	They suddenly turn either to the right or left without caring whether there is any bus or 2-wheeler following or not.	48.3
6	*Whenever a 4-wheeler is stranded on the road, police (civil defence personnel) rather than helping comes taxing them and shouting at them.*	People also do not come to the rescue; they shout and leave the vehicle amidst the road.	47.6
7	*Whenever an Ambulance comes with a siren, either no vehicle gives way to them or delay in giving way.*	They take their own time ignoring the importance and emergency. Sometimes, drivers misuse the siren take advantage, and try to overtake other vehicles. It is noticed that most of the time, they chase/tailgate the Ambulance.	67.4
8	*Whenever any vehicle is stranded, drivers don't have the habit of using emergency signals.*	Drivers of the 4-wheelers stop the vehicle in the middle of the road calling someone for rescue ignoring the disturbance to other commuters.	36.4
9	*Bus jumps the signals – without looking whether it is green or red.*	As they are Government transport, the Police ignore them.	37.1

International Journal of Research in Entrepreneurship & Business Studies
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https://doi.org/10.47259/ijrebs.421

10	*Cars stop the vehicles amidst the road while allowing someone to get down.*	Those who get out of the cars open their doors without bothering to look behind whether the vehicles are following – endangering their life.	53.9
11	*The cars use high beams even within the city limits during evening time*.	Cars using high beams cause high disturbances to the vehicles coming in the opposite direction giving them inconveniences in driving.	57.1
12	*Most of the autos/Tata Magic cars don't have rear-view mirrors in their vehicles.*	This is observed in most of the cars like Maruti 800 like cars as well.	48.9
13	*None of the public transport like autos, have their fare price meters working.*	due to which people prefer to travel in public transport buses – which not cleaned regularly & daily and plight is taken just to fulfil the trips.	32.9
14	*Timings are never taken care of by public transport.*	No bus drivers seem to maintain their timings.	37.4
15	*Heavy vehicles ply their vehicles with one of their headlights not working*	4-wheelers with one headlight or without headlights endanger the vehicles coming in the opposite direction as it appears like a 2-wheeler is coming. This has to be considered as a serious issue.	55.8
16	*Some vehicle drivers keep honking near schools, hospitals, and banned areas unnecessarily/continuously.*	They are using the horns for fun in a rhythmic way quite often diverting the attention of other drivers.	52.1
17	*Buses fully loaded with school/college students traveling standing on the footboard or hanging in the windows, but conductors do not say anything.*	Almost it is a daily scene.	76.3
18	*Autos suddenly turns to the left side and stops without any indication as soon as they see the passengers.*	The sudden movement of the autos causes the following vehicles to get into applying sudden brakes and meet in a collision.	55.8

From Table. 4, it is observed that among the Observed Civic Practices of the 4-wheelers, 'Buses fully loaded with school/college students traveling standing on the footboard or hanging in the windows; but conductors do not say anything*'* ranked first (76.3%) followed by 'Whenever an Ambulance is coming with siren, either no vehicle gives way to them or delay giving way' ranking second (67.4%); 'The cars use high beams even within the city limits during evening time' ranking third (57.1%). 'Heavy vehicles ply their vehicles with one of their headlights not working' and 'Autos suddenly turns to the left side and stops without any indication as soon as they see the passengers' both ranked fourth (55.8%). 'Cars stop the vehicles amidst the road while allowing someone to get down' ranked fifth (53.9%). 'Some vehicle drivers keep honking near schools, hospitals like banned areas unnecessarily/continuously' ranked sixth (52.1%).

Table. 5 Practices of the License Issuing Authorities

#	Observed Civic Practices	Observed Risks/Suggestions	%
1	*There is no signal test included in the driving test in India.*	Even people who have obtained licenses are not aware of many of the signals; some are colour-blind as well.	78.6
2	*Licensing tests are at a very primitive level.*	Mere application of horns, breaks and to make '8' kind of sign will not suffice in issuing licenses.	64.3
3	*There is no eligibility medical Test included in obtaining a driving license.*	Physical fitness and mental maturity/fitness are required for obtaining a driving license.	59.3

4	*Traffic Inspectors need to check the fitness of the vehicles on an annual basis – if not, on a 5–10-year basis.*	Some of the vehicles which are not in good condition/damaged/with dust and dirt are plying on the road.	58.9
5	*Traffic rules violators need to be severely penalized.*	Traffic violators with a first and second warning and leading to a lifetime seizure of license for the 3-time erring people in driving.	72.4
6	*School children – minors (below 18 years) driving bikes should be banned/severely punished.*	When there is an age limit of 18 to issue licenses, how do these minors drive vehicles? The vehicle owners and their parents should be warned/punished.	66.3
7	*People riding bikes with 3 persons, putting their lives at risk should be warned and severely punished.*	3 persons are not permitted to ride on a 2-wheeler. The driver who violates should be severely punished and all three should be penalized with fines.	59.3
8	*Licenses are issued on a lifetime basis which is not correct. No strict rules to revoke or suspend based on periodic medical checkups.*	A license holder may become physically unfit due to accident/ sickness or may become insane; holding a lifetime license is meaningless. Periodical fitness needs to be obtained.	62.5

From Table. 5, it is observed that among the Observed Practices of the License issuing authorities, 'There is no signals test included in the driving test in India' ranked first (78.6%) followed by 'Traffic rules violators need to be severely penalized' ranking second (72.4%); 'School children – minors (below 18 years) driving bikes should be banned/severely punished' ranking third (66.3%). 'Licensing tests are at very primitive level' both ranked fourth (64.3%). 'Licenses are issued on a lifetime basis which is not correct. No strict rules to revoke or suspend based on periodic medical checkups' ranked fifth (62.5%). 'There is no eligibility medical Test included in obtaining a driving license' ranked sixth (59.3%).

Table. 6 Practices of the Public Works Department Personnel (Infrastructure Providers)

#	Observed Practices	Observed Risks/Suggestions	%
1	*People drive zigzag ways to avoid the holes, pitfalls, manholes, and uneven and non-metaled roads.*	due to which many collisions and chances of vehicles hitting each other a regularly noticed scenes on the roads. So, to avoid such incidents roads are to be properly maintained. PWD plays an important role in maintaining the same.	71.1
2	*The main roads and streets are not well maintained. The roads are not laid down properly.*	whenever they lay the roads, they don't lay in full – they cover the road in patches. The stones with tar and other mud components come out easily –after rain or after a heavy vehicle (- a lorry or bus) runs over it.	68.9
3	Mostly road laying takes place only during the rainy season.	No one has substantiated the reason for this.	55.3
4	*There is no coordination between the departments like PWD, Water and sewage, Electricity Cables layers, and Telephone Dept.*	One will dig the road and the holes will be left open for 2-3 months. After all the public making complaints on the nuisance, the road will be laid. Immediately within a month or two, the next department will dig the road, and will be lying without care for a month or two. The story continues the whole year. Why there is no coordination between these departments with PWD?	63.7
5	*Though there are some bridges (like the one which connects New College and Mount Road) that are meant for public use are hardly used due to non-usability.*	Public opinion/poll should be formed before building a bridge or subways whether it is warranted at that juncture. There are places like Avichi School and Vadapalani where traffic is held new bridges are to be constructed.	51.3

International Journal of Research in Entrepreneurship & Business Studies
eISSN-2708-8006, Vol. 4, issue. 2, 2023, pp. 1-20
https://doi.org/10.47259/ijrebs.421

6	*None of the small streets/roads have a stop line drawn by the PWD when it joins as a junction to the main road.*	This is an international requirement. This is missing in our roads. Nobody is bothered about it, due to which all the drivers quickly try to join the main road without slowing their vehicles putting their lives in trouble.	55.7
7	*The majority of the roads are without medians.*	At the time of a traffic jam on one side of the narrow lanes/streets/roads without medians, vehicle drivers cross the lanes hindering the traffic from jamming further and stopping traffic to pass in the other direction. This is becoming a regular scene nowadays.	61.9
8	*Roads are not evenly laid. Roads are laid in patches.*	In most places water logs. This happens when the other departments dig the lanes and fill it just with mud unevenly giving room to water logging. The rainy season causes huge traffic jams at these places, and many vehicles jump into these places, splashing water on the people/vehicles passing by. The 2-wheeler skids at these spots lead to fatal accidents as well.	67.0
9	*Infrastructure remains poor.*	A person who used to own a cycle has graduated to a scooter, a scooter owner has now a car and rich ones have numerous cars. With Vehicle registrations becoming very high our infrastructure remains poor. The accountability and responsibility are shifted to one or the other as a chain action when a question is raised.	69.3
10	*Parking facilities are inadequate in the city compared to the number of vehicles on the streets/roads.*	Many cars are parked in small streets on either side of the street restricting the residents from going to the hospital during nighttime in case of emergencies.	62.4
11	*Contractors leave the milled roads for a long time and delay road laying, due to which 2-wheelers meet with accidents.*	PWD personnel do not fix a deadline for their contractors due to which road work gets delayed and left as milled roads causing road accidents.	63.7

From Table. 6, it is observed that among the Observed Practices of the Public Works Department Personnel, 'People drive zigzag way to avoid the holes, pitfalls, manholes, uneven and non-metaled roads' ranked first (71.1%) followed by 'Infrastructure remains poor' ranking second (69.3%); 'The main roads, streets are not well maintained. The roads are not laid down properly' ranking third (68.9%). 'Roads are not evenly laid. Roads are laid in patches' both ranked fourth (67.0%). 'There is no co-ordination between the departments like PWD, Water and sewage, Electricity Cables layers and Telephone Dept' and 'Contractors leave the milled roads for a long time and delay road laying, due to which 2-wheelers meet with accidents' ranked fifth (63.7%). 'Parking facility is inadequate in the city compared to the number of vehicles on the streets/roads' ranked sixth (62.4%).

Table. 7 Practices of the Traffic Police

#	Observed Practices	Observed Risks/Suggestions	%
1	*Traffic police let the drivers of the Government vehicles or buses go even while they commit mistakes.*	Traffic police should be given full authority to punish/spot fine the erring drivers even if they ply the Government vehicles or buses.	69.5
2	*No cameras/RADARS to capture the signal jumping and overspeeding.*	Automatic cameras/RADARs should be placed at traffic signals to capture the number of vehicles that jump the signals. Fines should be tagged to their salaries or businesses.	74.3

3	*Traffic Police collect fines by hand.* *No traffic violation fines should be by the traffic police by hand.*	Even heavy fines – on-the-spot fines have to be levied with receipts.	67.2
4	*The immoral practice of bribery should be avoided.*	Heavy spot fines of INR 1000 and above or not collected by the traffic police rather they collect lesser amounts in the name of bribes and let the drivers go. This practice is unacceptable.	62.7
5	*Traffic Police do not wear their identity badges and number plates.*	Traffic police are observed to wear their identity badges or number plates but they do not, due to which the public is not able to identify the erring police person in case they want to complain to the higher-ups.	42.6
6	*The number of traffic police and traffic patrolling squads is less.*	When ministers and political leaders visit, the entire traffic police is diverted to patrol them leaving other roads unnoticed.	51.5
7	*Drunken drivers are let free with simple fines.*	Drunken drivers should not be let out and arrested and kept behind bars for 24 hours with a warning notice. Anyone obtaining 3 warning notices should be impounded with a license seizure for a lifetime. And no further licensing should be initiated.	65.8
8	*The low salary of the Traffic Police persons is the main reason which tempts them to indulge in bribery.*	Considering the accountability of Traffic police, their salary should be increased so that the question of bribery never arises.	58.4
9	*Processions (political party related & others), Strikes, and Congregations lead to Traffic Jams and Police can't do anything to curb or curtail them.*	It is observed that during the time of processions, strikes, or traffic jams Traffic police should get the upper hand and deploy extra policemen in the jammed area to release the traffic jam by taking war footing measures. In an electronically /technologically developed era, traffic diversion measures can be taken easily and traffic police control department should take more initiatives on these matters. They can use FM radio and TV channels to telecast the traffic jam announcement through the help of public media – to divert the traffic and request the public to avoid such routes.	54.3

From Table. 7, it is observed that among the Observed Practices of the Traffic Police, 'No cameras/RADARS to capture the signal jumping and over speeding' ranked first (74.3%) followed by 'Traffic police let the drivers of the Government vehicles or buses to go even while they commit mistakes' ranking second (69.5%); 'Traffic Police collect fines by hand. No traffic violation fines should be by the traffic police by hand' ranking third (67.2%). 'Drunken drivers are let free with simple fines' both ranked fourth (65.8%). 'Immoral practice of bribery should be avoided' ranked fifth (62.7%). 'Low salary of the Traffic Police persons is the main reason which tempts them to indulge in bribery' ranked sixth (58.4%).

Summing up the above findings, the following are the frequently observed behaviours of pedestrians, 2-3-wheelers, 4-wheelers, public works department personnel, license issuing authorities, and the traffic police.

It was found that the respondents have observed the following civic practices among the pedestrians viz.

i. Pedestrians hold phones or wear headphones while crossing the roads or pathways, talking over the phones, or using WhatsApp or Instagram, etc.
ii. Pedestrians don't bother to stop at signals and rush to cross the road without minding the speed of the vehicles plying on the road
iii. When friends/family members walk together on the road, they walk parallel, not one after another
iv. Few pedestrians have the habit of spitting on the pathways
v. Pedestrians should be given priority by the vehicles while crossing

vi. Pedestrians don't cross the roads in the zebra lines.

It was found that the respondents have observed the following civic practices among the 2/3-wheelers viz.

i. Drivers attend to phones while driving, either holding phones in one hand or between their shoulders and ears
ii. Most of the drivers jump signals or without waiting for the signal to become green, start before that
iii. During peak time, two-wheelers ply their vehicles on the platform
iv. People have the habit of driving in the opposite direction against the flow of traffic
v. Drivers while driving, hold their helmets either on the petrol tank or on their back without wearing
vi. People forget to switch off the indicators even after turning.

It was found that the respondents have observed the following civic practices among the 4-wheelers viz.

i. Buses fully loaded with school/college students traveling standing on the footboard or hanging in the windows, but conductors do not say anything
ii. Whenever an Ambulance comes with a siren, either no vehicle gives way to them or delayed giving way
iii. The cars use high beams even within the city limits during evening time
iv. Heavy vehicles ply their vehicles with one of their headlights not working and Autos suddenly turns to the left side and stops without any indication as soon as they see the passengers
v. Cars stop the vehicles amidst the road while allowing someone to get down
vi. Some vehicle drivers keep honking near schools, hospitals, and banned areas unnecessarily/continuously.

It was found that the respondents have observed the following practices among the license-issuing authorities

i. There is no signal test included in the driving test in India
ii. Traffic rules violators need to be severely penalized
iii. School children – minors (below 18 years) driving bikes should be banned/severely punished
iv. Licensing tests are at a very primitive level
v. Licenses are issued on a lifetime basis which is not correct. No strict rules to revoke or suspend based on periodic medical checkups
vi. There is no eligibility medical Test included in obtaining a driving license.

It was found that the respondents have observed the following practices among the public works department personnel viz.

i. People drive zigzag ways to avoid the holes, pitfalls, manholes, uneven and non-metaled roads
ii. Infrastructure remains poor
iii. The main roads and streets are not well maintained. The roads are not laid down properly
iv. Roads are not evenly laid. Roads are laid in patches
v. There is no coordination between the departments like PWD, Water and sewage, Electricity Cables layers, and Telephone Dept and Contractors leave the milled roads for a long time and delay road laying, due to which 2-wheelers meet with accidents
vi. Parking facilities are inadequate in the city compared to the number of vehicles on the streets/roads.

It was found that the respondents have observed the following practices among the traffic police viz.

i. No cameras/RADARS to capture the signal jumping and overspeeding
ii. Traffic police let the drivers of Government vehicles or buses go even while they commit mistakes
iii. Traffic Police collect fines by hand. No traffic violation fines should be by the traffic police by hand
iv. Drunken drivers are set free with simple fines
v. The immoral practice of bribery should be avoided
vi. The low salary of the Traffic Police persons is the main reason which tempts them to indulge in bribery.

Conclusion

The observations highlight various civic practices that contribute to road safety concerns and overall traffic management issues. These observations provide valuable insights into the behaviors and practices that need attention and improvement. Here's a breakdown of the identified civic practices:

Pedestrians
1. **Phone Usage While Crossing**: Holding phones while crossing roads or pathways.
2. **Disregard for Signals**: Ignoring traffic signals.
3. **Failure to Use Zebra Crossings**: Crossing roads without using designated zebra crossings.

2/3-Wheelers
1. **Phone Use While Driving**: Drivers attending to phones while operating 2/3-wheelers.
2. **Signal Violations**: Jumping traffic signals.
3. **Platform Riding**: Plying vehicles on platforms.
4. **Helmet Non-Compliance**: Driving without helmets.
5. **Improper Indicator Usage**: Inappropriate use of indicator lights.

4-Wheelers
1. **High Beam Usage**: Using high beams within city limits.
2. **Ambulance Right of Way Issues**: Not giving way to ambulances during emergencies.
3. **Honking Near Sensitive Areas**: Honking near schools and hospitals.
4. **Vehicle Lighting Issues**: Plying with one headlight, possibly indicating malfunction.

Public Works Department Personnel
1. **Road Quality Issues**: Roads laid improperly, in patches, and not adequately maintained.
2. **Infrastructure Maintenance Concerns**: Lack of maintenance for main roads, streets, and infrastructure.

Traffic Police
1. **Selective Enforcement**: Not fining government vehicles.
2. **Manual Fine Collection**: Collecting fines by hand, potentially leading to bribery concerns.

Addressing these civic practices requires a multi-faceted approach, combining public awareness campaigns, stricter enforcement, and improvements in infrastructure and civic services. Here are potential actions based on the identified issues:

1. Pedestrians
- Conduct public awareness campaigns on responsible road-crossing practices.
- Install additional signage and markings to encourage the use of designated crossings.

2. 2/3-Wheelers
- Enforce stricter penalties for phone use while driving.
- Increase surveillance at signal points to deter signal violations.
- Conduct awareness programs on proper helmet use and indicator etiquette.

3. 4-Wheelers
- Implement and enforce regulations on high beam usage.
- Educate drivers on the importance of giving way to ambulances.
- Strengthen penalties for honking violations near sensitive areas.
- Encourage regular vehicle maintenance through awareness campaigns.

4. Public Works Department
- Improve road construction and maintenance standards.
- Implement regular checks and repairs for main roads and streets.

5. Traffic Police
- Ensure uniform enforcement, including government vehicles.
- Transition to online fine collection to minimize bribery opportunities.

Overall, a collaborative effort involving law enforcement, government agencies, and public participation is essential to address and rectify these observed civic practices for a safer and more efficient traffic environment. Regular monitoring and continuous public engagement will be crucial for the sustained success of these initiatives.

Suggestions

Implementing these measures could contribute significantly to reducing road accidents and fostering a safer traffic environment. Some key points to highlight and further discuss:

1. **Pedestrian Safety**
   - Emphasizing the use of designated crossings and pathways for pedestrians is essential.
   - Encouraging responsible pedestrian behaviour, such as avoiding distractions like phones, is crucial.
2. **Driver Responsibility**
   - Discouraging the use of mobile phones while driving is a significant safety measure.
   - Strict enforcement against traffic violations like signal jumping and driving in the wrong direction can deter risky behavior.
3. **Public Transportation**
   - Increasing the number of government buses is a good initiative to ease congestion and promote public transport usage.
   - Prioritizing ambulances and discouraging honking near sensitive areas like schools and hospitals contributes to a more considerate road culture.
4. **Traffic Police and RTOs**
   - Regular checks on vehicle conditions, such as headlights, and incorporating signal and eye tests in driving license eligibility tests are proactive measures.
   - Conducting online transactions for fines can enhance transparency and reduce the likelihood of bribery.
5. **Deterrence for Drunken Driving**
   - Strong measures against drunk driving, including immediate arrest and license seizure, serve as a powerful deterrent.
6. **Changing Perceptions**
   - Addressing stereotypes about road accidents is essential, shifting the focus from blaming one party to understanding the specific circumstances of each incident.
7. **Awareness Initiatives**
   - Commending initiatives like the 'Super Kutty Cop' and similar awareness drives is important, as they play a significant role in changing attitudes towards traffic rules (Chandran, 2023).
8. **Education Initiatives**
   - Continuing educational campaigns for adults, as suggested by (Mary et al., 2016), is crucial for maintaining a high level of awareness and knowledge.
9. **Government Support**
   - Recognizing the support from government officials, such as the Commissioner of Police, is crucial for building a collaborative approach to road safety.
10. **Long-Term Measures**
    - Implementing measures to prevent recurring violations, such as lifetime license suspension for repeat offenders, adds a layer of severity to discourage reckless behaviour.

Sustainable change in road safety culture requires a combination of legal measures, infrastructure improvement, and continuous awareness campaigns. By addressing these aspects comprehensively, there's a higher likelihood of creating a safer and more responsible road environment.

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