CHAPTER VII

FINDINGS, SUGGESTION AND CONCLUSION

The study investigates the problems associated with the transport system, particularly road transportation in the city of Guwahati. Though the transport related problems could be investigated from different angles, here in this study, it is tried to analyse from managerial prospective. The study is based on both the primary and secondary sources of information. After interpreting primary and secondary sources of information, the researcher has made the following observations. The findings of the study are arranged as per the sequence of the objectives of the study.

FINDINGS:

A: “To examine the plan and policy of the Government of Assam related to road transportation in Guwahati city”

1. The length of surfaced road within the city is presently 218 K.M. The major corridors of the city suffer from insufficient space in both the sides of the road due to illegal construction and improper planning and design.

2. In the core orbital plan of the (plan for busy road of the city) city, MG Road - B Baruah Road -Kakoti Road- RK Choudhury Road are included, where as other busy roads are not considered.

3. Non Motorized vehicles are 25% of the total vehicles in Guwahati, but, Non Motorsied Transport facilities are in deplorable condition. The mobility transportation plan targets to enhance 50% of existing NMT trips.
4. Due to topographical problems in the city, there is no wide road connectivity between GS Road with Fatasil Ambari Road. The construction of this type of road will be very expensive and may not be possible; it requires detail feasibility study and plan.

5. The plan for outer orbital road encompasses both the sides of Sraighat Bridge (i.e. including 2nd part of Sraighat Bridge, which is under construction). But the size of the width of the bridge is very narrow.

6. One of the major strategies that identified by the government as a part of the vision is enhancement of the existing share of seats in public transports (modes like cumulative of road, rail and water but excluding Intermediate Public Transport) by 60%. The existing level is 13% of the required seat capacity as projected for the year 2030. In absence of that, the situation will be worsening by the year 2030.

7. There is no separate provision for pedestrian crossing facilities on mobility corridors in the Government’s plan. No space has been identified on streets in the government planning for facilitating pedestrian crossing, but the congestion of vehicles on all the main corridors of the city demand for meticulous arrangement of road crossing for pedestrians.

8. Freight transport management plan is not up to the mark which should includes number of strategies for increasing the efficiency of freight and commercial transport.

9. The transportation modeling plan has indicated that, the goods carriage vehicles at the Outer Cordon, will be approximately 38764 vehicles on an average per day, by the perspective year (GMDA Master Plan). Therefore, the majority of goods vehicles will create hindrance on smooth flow of traffic.
10. The Government has projected a major goods terminal at North Guwahati area in proposed New Town I as a part of the Integrated Freight Complex along with rail depot and truck terminal. This will be rail cum road terminal.

11. A tunnel is proposed in the plan to connect AT road with Fatasil-Ambari road. It will connect the proposed orbital road through Dhirenpara, Kahilipara and Dispur last gate to AT road. It is observed that this link is going to carry substantial amount of traffic. Hence, it is proposed to conduct the feasibility study of this tunnel link immediately as it will reduce substantial amount of travel time and travel cost.

12. To reduce the unnecessary traffic congestion, there is a plan for introduction of a medium capacity rail based system in the government’s policy. It is proposed to plan and develop Medium Capacity Transit System in the city. Three corridors are identified. The proposed technology would include Bus Rapid Transit System or Light Rail Transit System.

13. In Guwahati, 14 major parking areas have been projected by the government. Each accommodates about 300 cars at each individual location, but till now there is less work in progress.

14. The feasibility study of the GMDA has indicated that, by the target year of the master plan 2025, on an average day, 3.47lakh passenger trips by intercity buses are estimated to move into and out of Guwahati. A new bus terminal, along by-pass road, is being developed.

15. Mobility Corridors plan of the government focus only the main public transit systems of the city; it does not encompass all road network of the city.(1)

16. In the state government’s road planning, there is no proper consideration for railway crossing in Corridor 1.
17. As stated in the plan, a sizeable portion of trucks (i.e. 16% of the total truck) are running in the city without carriage or load.

**B: “To examine the transportation lay out of the Guwahati city”**

1. Motor vehicles are increasing rapidly in the transportation layout of the Guwahati city. It has been observed that during period of 2007-08 the growth percentage was seen at 17% which increased up to 24% (2011-12) during the period of the study.

2. The roads in the residential neighborhoods are extremely narrow (lack of proper regulations) and ill maintenance of the roads is creating problems for the both traffic and infrastructure installations.

3. There are approximately 900 buses running in the city, but due to lack of plan for judicious distribution of buses in different routes, the road commuter’s load is very high on few streets. As it is seen that in 10 routes of the city, there is no city buses service. Inhabitant of this area prefers intermediate vehicles for their journey.

4. Some of the main roads in Guwahati which have not been provided central median such as Rehabari Road, Lokhra Road, Manipur basti (AT Road), Baralumukh (GS Road), B Barua Road and NH 37 etc.

5. There is no lane segregation for slow moving vehicles and fast moving vehicles that mean both motorized and non motorsied vehicles are running on same street in most of the busy roads of the Guwahati city.

6. The intermediate vehicles accounted for 44% on the entire streets of Guwahati city. It has been observed that most of the traffic congestions are done by this intermediate vehicle.
7. Public Transit Routes are unregulated; too many buses are running in one route. The number of buses plying on the road goes in competition which results lot of accidents.

8. Most of the time it is seen that truck parking is predominant on the main arterials road of the city, and reducing the road capacity.

9. Motorized vehicles are seen increasing day by day in the Guwahati city. However no additional city routes or widening of existing roads were reported during the period of 2007-08 to 2011-12.

10. It is seen that most of the flyovers of Guwahati are not always properly aligned with traffic flow of the city.

11. Many of the roads in Guwahati are being encroached by the hawkers. These hawkers’ encroachments are hindrance for the movement of people and also reducing the capacity of the roadways. The pedestrians are forced to walk on the carriageway at these locations of encroachments, thereby creating hazardous situations for both pedestrians and the traffic for which many accidents are taking place.

12. It has been observed that there is a narrow road named Dilip Huzuri Path that connects Maligaon and Fatasil areas through the Fatasil Hill, due to which this road is facing severe traffic congestion near and around the Paltanbazar region.

13. The road network system in Guwahati has not grown commensurate to the vehicle growth due to the inadequacy of road links. Because of the lack of connectivity among important roads, the traffic from all the roads from all directions has to pass through the Central Business District.
14. It is seen that bus stoppages are not located at uniform distance. Most of the areas have bus stoppages at 200 to 300 meters which creates problem in smooth flow of road traffic in the city.

15. It was observed that most of the important junction of the city has low speed limit and thereon the passenger vehicle runs at less than the given speed. Hence it causes the traffic jam in such intersections and junction.

16. In case more than 60 percent of the roads have no median. 70 percent of the roads surveyed have footpath but they are mostly inadequate. Only 7 percent have footpaths more than 1.5 meters, and only on one side. The footpaths are generally narrow, disconnected, and undue encroachment makes it difficult for pedestrians to use them effectively. Pavement markings are not located adequately and suitably.

17. The highest number of the vehicles are seen at Chandmari and RG Baruah road of the city which accounted for 17% of the total number of the vehicles selected by the researcher followed by the MG Road, Saraighat Bridge, NH 37, Lokhara, fatasil Ambari, Railway crossing Bharalu and Jayanagar Beltola as 14%, 11%, 10%, 9%, 8% and 7% respectively.

18. It has been observed that there is a sharp increase in the percentage of passengers carried by cycle rickshaws incase of local (streets) roads i.e. 21% in comparison of that in the arterial roads, it was 3%. Similarly, the uses of privately operated vehicle are also increased sharply in the local roads (street) i.e. accounted for 52% in comparison to the arterial (main) roads which accounted for 24%.

19. There are certain peak hours of traffic in a day when maximum traffic congestion takes place and create many inconvenience to the city dwellers. In the R.G. Baruah Road the peak hour of heavy traffic is from 11 am to 12 noon. After 12 noon it decreases a little and rises again from 1 pm and attains the peak around 2 pm., in
the GNB Road, which is one of the most congested roads in the city, the peak hour of traffic starts from 10 am to 8 pm, except a little relief between 12 noon to 1 pm and 3 pm. Similarly, in other busy roads there have minimum of two peak hour of traffic on Sunday and other holidays.

20. It is seen that trekkers are competing with buses in many routes in the Guwahati city, this creates threat for safety of the roads.

C: “To examine the traffic management system”

1. There is lack of parking management in Guwahati city which results in haphazard, and lead to major contributor to congestion on roads in the busy area or central business district area.

2. High Volume traffic is observed in Central Business District area such as Jalukbari, Bharalumukh, Panbazar, Chandmari, Noonmati, Ganeshguri, GS Road, Ulubari, Nepali Mandir and Six mile etc.

3. Due to inadequate water transport facilities, the load on the city roads increases. As well as city buses and other vehicles are overcrowded, hence the traffic congestions become more severe.

4. Lack of balanced attributes of routes, peak number of vehicles, population explosion, location of social infrastructures, rapid urbanization, complex acquirement of lands, habit of construction of shops in front of the roads, encroachment of the roads for shop and parking place etc are the responsible factor for the traffic congestion.

5. Traffic Signals were installed at a number of select junctions in Guwahati, but installed signals are not functioning properly at present, except, the signal installed
at Zoo road junction. In wide-ranging, it has been observed that the traffic signs are found inadequate in city of Guwahati.

6. It is observed that delivery systems of the vehicles is not designed properly by the authority, the numbers of vehicle are seen distributing goods (e.g. using common carriers that consolidate loads, rather than company fleets) at any time during the day time.

7. The parking in the central areas is seen of mixed type such as private vehicles, passenger vehicles and public vehicles, and goods carriage vehicles which are of long term and short term needs. In commercial, warehousing and wholesale market areas are predominantly occupied by the goods vehicles.

8. The overall awareness about the traffic discipline and compliance with the traffic rules by road users in Guwahati is below the desired level. It is seen that the traffic police in Guwahati is not taking any measures to make people responsible and rule abiding road users.

9. It is reported that about 12% of the journey trips in Guwahati are being made by cycles and cycle rickshaws.

10. Speed is an important factor for smooth flow of road traffic jam, if vehicles moves slow than there will be the chance of traffic jam and accidents vice versa. Most people in Guwahati city prefer to go with the speed of 30km to 40km per hour in the centre of the city but due to the overcrowded vehicles the speed of the vehicles comes down to 10km per hour during peak hours. It creates severe traffic problem in the city.

11. The majorities of the intersections are not proper in Guwahati City and requires lots of improvements. In Guwahati all the intersections are controlled manually by
Traffic police. It has been observed that most of the road accidents are taking places in the intersections where in safety measures are relatively less at intersections than at other part of the road.

12. A total of 107,819 vehicles enter and exit in the Guwahati at the Outer Cordon (OC), on an average per day as seen in the peak hour volume from 8am to 6pm. Out of which 13,128 are of goods vehicles which moves into and out of Guwahati every day.

13. A total of 255,118 vehicles cross the inner cordon on an average day as stated in the plan. Motorized modes ranged between 41% and 91% at different count stations along the Inner Cordon. Nearly 50% of the vehicles at Inner Cordon had a trip length up to 15 km.

14. Around 30 percent of the total passengers normally go out of their residence for once in a day and came back to their respective residence. Around 26 percent of the passengers travel twice a day for various purposes. Similarly 20 percent move out for three times and rest leave their residence four of more times within a day.

15. Most of the people in the city (around 76 percent) move out mainly for the purpose of education, business and to reach their respective work places. 30 percent of them move for education, 26 percent and 20 percent are for business and to reach their working places. The rest of the people use to travel in the city for the purposes like social works, shopping, recreation, health etc.

16. Waiting for a bus or any means of traveling is a tedious job. It has been found here in Guwahati that around 46 percent of city bus passengers get bus within five minutes while waiting for bus at stoppages. Around 30 percent passengers have to wait for 5 to 10 minutes, around 15 percent for 10 to 15 minutes and nearly 10 percent passengers have to wait for more than 15 minutes for getting a bus at
stoppage. In certain stoppages passengers have to wait more than one hour. On the
other hand during the day hours the passengers get buses less than in 2 minutes in
the stoppages between Bharalumukh to Chandmari.

17. Around 26 percent of the commuters in the city travel by the buses, 23 percent use
car jeep and office vehicles, 22 percent use scooters and motor cycles and the rest
travel either by other means transport or on foot.

18. Out of the total city bus passengers, 29 percent travel less than 2 kilometers in one
journey. In case of two wheelers passengers 24 percent travel less than 2
kilometers in single trip. Considering all the means of transport available in
Guwahati; and the travel distance covered in various trips, it has been found that
around 50 percent of people travel less than 4 kilometers in single trip.

19. From the trip generation analysis of traffic in Guwahati, it has been observed that
location advantage of the city is the main attraction of traffic not only from the
other parts of the state but entire North Eastern states. In addition to that, the city
provides the specialized goods and services to the people of entire region, which
acts as a pull factor. Moreover, non-availability of some important facilities like
higher education, specialized medical services in few neighboring areas of the city
and the state push people to Guwahati. In this way more trips have been generated.

20. From the trip distribution analysis, it has been found that non-uniformity of travel
trips create congestion and many other inconvenience in certain parts of the city.
This variation is created mainly due to the concentration of office establishment,
educational institutions, recreation centers, and market and business
establishments. The worth affected areas are Guwaahti club, Silpukhuri,
Chandmari, Ullubari, Ganeshguri, Bhangagarh, Paltabazar and Fency bazaar.
21. 5278 goods vehicles crossed the inner cordon on an average day. Of them Light Commercial Vehicles were 30.7%, 2 Axle trucks were 37.1% and 3 Axle trucks were 0.6% and MAVs were 1.6%.

22. The movement of goods vehicles external to internal (i.e. 44.8%) and internal to external (i.e. 42%) creates the traffic congestion on the major roads of the city.

23. The numbers of passengers coming to Guwahati are Businessman, Students and Employments. These are known as floating passengers, which populates the Guwahati city during peak hour.

24. The percentage of motorcycle/scooter out of the total vehicles is 72.7% to 79.96%. This information imply the necessity of the government intervention on issuing of liscence for aforesated two wheelers.

25. The trucks were increased by 6.2 times, similarly, LMV Goods vehicles, Buses, Commercial Passenger Vehicles were increased by 1.1 times, 2.2 times, 1.6 times and 4.7 times respectively in the period of 2007-08 to 2011-12.

26. Major portion of vehicles run on the street of the city are mainly non commercial vehicles (i.e Pvt. Car, Scooter, Motor Cycles, Jeep etc) and LMV Goods Vehicles (eg. Tata DI, Tata Magic, Private carriage auto van etc.)

27. The percentage of motor cycles and scooter out of total number of non commercial vehicles registered under Guwahati Transport Authority are 37.88% to 42.04% and 34.97% to 38.22% respectively.

28. In 2007-08, the numbers of non motorized registered vehicles were seen more than motorized registered vehicles. The percentage of non motorized vehicles in 2007-08 was 54%, whereas the percentage of motorized vehicles was 46%. After that the population of non motorized vehicles started declining.
29. In period of the study, the proportion of non motorized vehicle became 35% to 47%. In the same years; the proportion of motorized vehicles was 53% to 65%.

30. The number of non motorized vehicles was reduced by 33% in 2007-08 to 2011-12. In the same period the number of motorized vehicles were increased by 44%.

31. In fact, declining trend of NMV is due to non renewing of licence by the Guwahati Municipal Corporation. Among all types of NMVs, cycle rickshaws were reduced more i.e by 41%. Ice cream vans were reduced by 33% in the period of the study. These types of decreasing trend of Non Motor Vehicles and increasing trend of Motorised Vehicles definitely affect the transportation flow on the streets of Guwahati City.

32. The proportions of bicycle and Rickshaw out of the total Non Motorised Vehicles are 32.15% to 40.36% and 32.29% to 39.33% respectively. The percentage of Thela is 12.48% to 14.98% of total number of Non Motorised Vehicles. In comparison to these three categories of non motorised vehicles, the proportions of other non motor vehicles viz, Hand Cart, Ricshaw Van, Ice Cream Van and Kerisin Oil Van were very less. The percentages of each category of these 7 types of vehicles are less than 7%.

33. It has been observed that the pressure of the vehicles is more in G.S. Road in all three select hours (i.e*) of the day. Other than other non motorized vehicles, numbers of all vehicles were found more in the G.S roads in comparison to other select two roads in the field survey. Another noticeable fact is that total number of car/jeep/trekkers on these three roads increased by 6.7 times from the 5a.m to 11a.m.
34. The proportions of Scooter/Motor Cycles, Buses/Truck and Bicycles out of total vehicles transported on the G.S. roads in select hours of the day were 13% to 24%, 12% to 22% and 13% to 22% respectively.

35. It has been observed that 28% vehicles in inner cordon are basically car/jeep/trekkers and 26% vehicles are two wheelers. It indicates that major portion (i.e. 54%) of total vehicles is belonging to the categories of two wheelers and Car/Jeep/Trekkers.

36. In case of outer cordon, 44% of total vehicles travelling daily on outer cordon of the city are under the category of Car/Jeep/Trekkers and two wheelers.

37. The majority of the sample drives (i.e. 81%), opined that major causes of traffic jam are accident/breakdown of vehicles, Police checking and poor driving practices of LMV drivers. Only 14% drivers of vehicles believe that narrow shape of road with increased number of vehicles is the cause of traffic jam.

38. In Jalukbari, average 30% of the total vehicles parked are stopped for less than half an hour. In other places of the select list, 62% to 98% of the total vehicles parked are stopped for less than 30 minutes. But, it is mentionable that more than 70% of total vehicles parked were parked in Jalukbari Chariali for more than half an hour.

39. 65% vehicles involved in road accidents are heavy vehicles. The proportions of Motor cycle, car and Auto Rickshaw are 10%, 9% and 8% respectively in this case.

D: “To examine the problem faced by the commuters of the road transportation in Guwahati city.

1. There is no bus bays system at many bus stoppages in Guwahati for which roads gets blockade while stopping buses.
2. Foot over bridge exists at the height of high volume, which is not at all good for movement of the commuters.

3. There is lack of pedestrian crossings. It is seen that in many of roads there is no zebra crossing and pedestrian crossing signals which is posing safety hazards to the pedestrians in Guwahati city.

4. Most of the foot path in Guwahati are being encroached by the street hawkers hence the pedestrians are using main roads for their walking.

5. Poor roads and insufficient street lighting along with limited road space and lack of traffic sagacity both to pedestrians and drivers increase the occurrence of accidents. Mostly they are caused due to the casual approach of the road commuters towards driving rules, safety regulations and precautions.

6. It is seen that both natural and artificial drains are not capable of carrying the storm water due to their shallowness and narrowness.

7. Concentration of rainfall only in two three months and occurrences of heavy rainfall in a few hours cause more run-offs and aggravate water logging in many parts of the city.

8. Indiscriminate cutting of hills for constructing houses, roads and other infrastructures cause heavy soil erosion and filling up of road-side drains. As a result, water retention capacity of the drain is lost and cause spill over water to road. Many unscrupulous people of the hills are responsible for more soil erosion in Guwahati.

9. It is seen that there is discontentment of majority of the traffic police of Guwahati on controlling measures for road transportation. 68% stated that the engagement of the traffic police is not sufficient for controlling the traffic of the Guwahati city.
per the Police report there are 442 sanctioned posts for city traffic police but there are only 370 traffic policemen in the city.

10. The major portion of the police personnel (i.e. 51% of the total respondents) stated that the responsibilities assigned to them are beyond the manageable limit.

11. The investigation of the researcher on this issue reveals that in case of majority police personnel (i.e. 60% of the sample traffic polices) transferring of job is very frequent, whereas the frequent transfer is not sound practice, as it may affect their duty.

12. It has been observed that 50% of the sample truck drivers were imposed penalty more than 5 times and in case of sample drivers of buses, the percentage is 46% for violating the traffic norms.

13. It is also noticeable fact that major portion of motorcycle riders are young boys and college going students.

14. From the observation of majority of traffic police (i.e. 68%) that pedestrian creates traffic congestion problem in the city. Only 32% of the total respondents gave opinion reversely.

15. According to 73% of the sample inhabitants, foot over bridges is tall enough and not scientifically constructed which cause inconvenience for pedestrians. Therefore they do not prefer to use foot over bridge.

16. The majority inhabitants, i.e. 59% of the total sample respondents believe that the violation of traffic norms are generally done by good carriage and heavy vehicles and creates traffic congestion.

17. As per the opinion of 40% select Truck Drivers, the traffic Police rarely checks the Capacity of the Vehicles. 35% of them straightly replied about no police checking
on the capacity of the heavy vehicles. It indicates that the checking of the capacity of the vehicles is rare.

18. The number of buses were increased by 2.2 times whereas the number of cars increased by 1.8 times and the number of scooters increased by 1.5 times in the period of the study. It indicates that the transport department could not exercise control in giving licencing for vehicles, which were more responsible for traffic jam in the city.

19. As per the opinion of the officials of the GMDA, the widening of the road is always disturbed due to undue construction of the building nearby streets.

20. The preference of times for journey of majority respondents is in between 9.30a.m. to 10.30 a.m. Therefore, it is seen that 9.30. a.m. to 10.30 a.m. is the peak and busiest time.

21. The releasing of carbon monoxide is more (i.e. 88% of total emission of carbon monoxide by the diesel vehicles) in case of diesel vehicles during the time of traffic jams.

22. It is seen that 89% of the sample drivers of the select vehicles had experience of giving bribe to traffic police as they do not carry proper documents and violate the traffic norms.

23. The average of 81% drivers of the different vehicles uses mobile phone while driving.

24. As per the sample survey, average 63% sample drivers overtake the other vehicles on street in the time of driving.

25. It has been observed that 65% of the sample trekker’s cross the speed limit of the city.
26. The sizeable portions (i.e. 40% and 35%) of sample drivers of truck and trekkers have driving experience of less than 5 years. Therefore, it becomes one of the causes for more involvement in road accidents by these vehicles.

27. 46% of the sample drivers of the select vehicles check the machinery part of the vehicles very frequently, whereas, majority drivers of the sample study (i.e. 54%) check the vehicles less or rarely or not at all.

28. It has been observed that, out of the total diesel vehicles tested, average 81% vehicles violated the norms of carbon emission. The violation of norms related to carbon emission is more in Adabari and Beltola (N.H.by pass). It is also seen that carbon emission is more in diesel vehicles in comparison to the petrol vehicles.

29. The proportions of regular users of upper and deeper lights among sample drivers of trucks and buses are lesser than the same of the trekkers, hence not using of upper dipper at night leads to road accident.

30. A sizeable portion of dwellers of the city have more than one vehicle in the family. There is no restriction in registering more than one vehicle against one’s name. This scenario creates severe traffic problem in the city, as the number of vehicles are increasing tremendously on the streets.

31. The city of Guwahati has witnessed mushrooming growth of private schools over the last few years and which has added lot of school buses on the roads of the city and the situation is now so acute that during school hours, the traffic condition in almost the whole city becomes more severe.

32. Water Logging is the major problem during rainy season in the Guwahati, for which city dwellers are encountering with smooth less flow of traffic and traffic jam.
SUGGESTIONS:

Looking at the ongoing road related problems of the city, the researcher has sought some of the following measures and solutions to decongest and to solve some of the problems faced by the city. The several traffic management schemes and measures are of low cost solutions and therefore it must be used at fullest before other measures are taken up to cope with growing congestion. Considering the problems of the city transport, the following points are suggested and brought to notice of the concerned authorities:-

1. Looking into the present state of road condition of the city, public transport means should be preferred for inhabitant’s trips as to reduce the congestion and other inconvenience. Big city buses, school buses and trucks should be prohibited during the peak hours.

2. The government of Assam has to formulate certain strategies relating to road design, safety and convenience for the Mobility Corridors.

3. In Guwahati the radial network of road is present but the network should be upgraded to mobility corridor standards. This network should be widened at least 30 meter ROW (Right of Way) as suggested in the GMDA Master Plan.

4. The inner roads which are connected directly with the central area can be linked through bypass. Thereby the road congestion of the city in core area may be reduced.

5. The inner and core rings roads should have a minimum of 30 meter ROW (Right of way) in size.

6. One of the major strategies identified as a part of the vision of the Government of Assam is to enhance the public transport share (modes like cumulative of road, rail
and water but excluding IPT) by 60%. For this purposes, number of alternatives
technology in public transportation need to be considered.

7. The major problem of the transportation lies in unregulated routes system of the
city. Therefore, as a part of this situation, the Government of Assam should focus
more on regulating all the roads of the city.

8. The bus fleet system of the city need to be controlled by a central authority and
also will need to substitute the part of the existing bus fleet with modern buses.
The bus services offered should be appropriate for various segments and services
along with ITS applications.

9. The bus fleet augmentation should be focused on modern buses where choice of
bus technology is important, as it will strongly influence the system’s performance
and commuter perceptions. Vehicles have direct impact on speed, capacity,
environmental friendliness and comfort.

10. The public transportation strategy focuses on expansion of a public transit corridor,
along with additional mass transit corridors of the city, the AT Road Corridor
should be upgraded to the higher order mass transit corridor.

11. To make certain a comprehensive permanence to the corridors proposed by the
Government, other mass transportation corridors has to be recognized by the
Government.

12. The corridors 2, 3 and 4 are projected to have peak hours to load of about 5000
PPHPD. Depending on this, a bus speedy transit system will be advantageous.

13. For Corridor 1, the preliminary solutions need to be developed by having a Bus
Rapid Transit (BRT). Beside this, it has also been recommended that a monorail
should be installed to reduce the unnecessary traffic load of the road users.
14. It has been observed that a monorail system may be feasible at some of the corridors like Corridor 4 (from Khanapara to Paltan Bazaar), Corridor 5 (from Jalukbari to New Town III), 6 (Paltan Bazar to Lakhra) and 8 (from Airport road to New Town III via Jalukbari).

15. Footpath is to be installed on the anticipated mobility corridors and also on the secondary arterials, at a lowest amount of requirement. It needs to be installed in all the residential roads, where possible.

16. A minimum functional width of 1.5 meters should be provided for footpath. It is advantageous to have a footpath breadth of 2.0 meter for all roads. Obstructions on footpath must have to be relocated. The footpath should be clean and even of comfortable to walk on. Two wheelers should be prohibited on footpath.

17. Pedestrian Crossing should be provided at the railway level crossing as per the warrants suggested by Indian Roads Congress.

18. To encourage and accommodate the trips generated by the bi-cycle, the lanes must be provided in the city. The non-motorized vehicle lanes should be separated and form a smooth flow network. The cycle lanes need to be provided on all mobility Corridors of the city and those roads that have high share of bi-cycle traffic in the city.

19. Need to restrict the goods delivery times in main (central) business districts and at important Corridors especially the truck traffics need to be restricted at A.T. Road, M.G. Road and GS Road of the city. Therefore the authority should change delivery times to reduce traffic congestion.

20. To use the proportionate number of small and medium size of vehicles with modern emission controls system in it, it is therefore recommended that a pre
viability study of the Integrated Freight Complex (IFC) should be conducted and incorporated with the plan and program of accomplishment.

21. The projected bridge across on the mighty river Brahmaputra might be a rail-cum-road bridge or there can be two separate bridges. Techno economic viability study should be carried out to make a decision for the location of the bridge(s), alignment of the rail line and the alignment of the peripheral by-pass Road of the city.

22. The movement of goods traffic modes on the road network of the city needs to be rationalized. Goods modes may be grouped into three types as under for smooth flow of road transportation as: Small sized vehicles like pickups, Medium sized vehicles like LCVs and large size vehicles like 2/3 Axle Trucks, Truck Trailer & MAVs. Small size vehicles like ‘Pick up vans’ performs an indispensable distribution function.

23. A comprehensive engineering study need to be conducted for all of the intersections to draw closer up with detailed design solutions for reducing road accidents.

24. Traffic controlling signals that are to be accurately designed, operated, located, and maintained which would have many advantages. These traffic signals, phasing, spacing, offsets need to be optimized for all types of traffic on the different corridors to ensure a prompt throughput.

25. It is suggested that proper signs need to be installed at suitable locations.

26. In order to reduce accident menace and enlarge the level of service, the central medians should be provided on these congested roads. On Street parking should be designed for rearranging road space proficiently on all the Mobility Corridors.

27. The Area Traffic Control Systems shall be linked with various elements of Intelligent Transportation Systems as surveillance cameras, vehicle actuated traffic
signals, enforcement cameras etc., and facilitating decision makers to recognize and respond to a confrontation in a timely mode depending on the real-time data.

28. The following short term options must be measured for implementation by the government to improve the safety of the road commuters: the path hole spot at the major roads must be identified along with specific improvements must be projected at those locations. A Road Accident Analysis System (RAAS) require to be developed on the basis of the average accident database.

29. Parking models of the main city area must be integrated with the Development Plan and implemented with the public transportation and non motorised transport.

30. The growing demand and varied needs of parking places in Guwahati can only be met and prepared in the structure of a comprehensive Parking Policy. Therefore the parking policies need to be moved from ‘non-restrictive’ to ‘restrictive’ policy. ‘Restrictive’ policy encompasses the prohibition of parking from non restrictive space and introduction of restricted provision with pricing of parking spaces and regulation.

31. Provision or planning of parking areas should be done through multi pronged strategies by providing parking areas at three levels such as On-street, Public off-street spaces and Private off-street spaces.

32. On the other hand arterial and sub arterial road, on-street parking may be provided only, if in case the road is 6-lanes or more wide in nature. In case of collector streets, on street parking may be provided if the size of road is 4-lanes without median. Parking is prohibited on footpaths or on all links roads.

33. The private entrepreneur may be given opportunity for developing and maintaining parking faculties in select busy places.
34. On-street parking spaces should to be clearly defined by lane markings. Adequate and suitable signage need to be installed at all places at the select street network to recognize ‘parking’ and ‘no parking’ areas. Off-street parking areas should to be clearly recognized by signs distinguishing marks.

35. However it is practical to adopt ‘partial-penetration’ approach and move towards ‘no-penetration’ approach over the years. Therefore the location of off-street parking facilities should to be carefully determined so that they may be incorporated with the traffic management plans of the city. The blueprint of capability should be flexible in the use of this capability.

36. Besides generating revenues, parking pricing must be used as an efficient tool for demand management of the road transportation.

37. To avoid traffic congestion it is suggested that new routes should be introduced for increased number of vehicles in the city.

38. To reduce the demand of vehicular travel and congestion, a congestion charging policy can be introduced within the Central areas of Guwahati. The congestion operating hours can be taken as from 9:00 AM to 7:30 PM, Monday through Friday, excluding public holidays. A stipulated fee can be charged as congestion charge for those driving within the restricted central area.

39. As part of the city road network system, an orbital road around the CBD has been identified and proposed to be developed as a high speed urban corridor with good level-of-service. The traffic management measures needs to be encouraged to move along the orbital road and enter Central Area at entry points near to their destination.
40. The existing bus system needs to be modernised and expanded to meet the travel needs in the coming years. There is a need to improve its image and the quality of service. Modern, high capacity urban buses are to be introduced.

41. A study on City Bus System Planning and Route Rationalization is initiated to enable reorganization of bus route service pattern and development of bus related infrastructure.

42. The spacing of bus stops should be in the range of 500 to 600 meters. Bus shelters need to be well designed to provide shelter to the passengers and add aesthetics to streetscape.

43. Due to the presence of railway crossings, traffic flow to and from AT Road face congestion and safety hazards. Therefore adequate numbers of rail over bridges are to be recommended.

44. Special plan for traffic drives is to be framed by the traffic police and the public need to be aware of the traffic policy and rules.

45. The government should focus on widening the size of the road of busy areas so that the city buses can run at the given average speed.

46. The prudent control is highly required on the non commercial vehicles and LMV Goods vehicles which may contribute to the management of the transportation system of Guwahati.

47. There is need of the government intervention for executing policy related to the parking of the vehicles. The state government may decide for construction of more multistoried parking in select area of Guwahati. However the private entrepreneur may be involved in this type arrangement of parking system.
48. It is also mentionable fact that in some busy places of the city the traffic jam is very frequent. Therefore, the managing authorities of the road transportation should pay attention on parking of heavy vehicles on these places.

49. The traffic policies should have effective device to detect the drivers of heavy vehicles with alcohol and driving with wrong overtaking and to impose penalty in these cases.

50. The traffic Police authority need to pay special care in driving of motor cycle, car, Auto Rickshaws and other heavy vehicles, as these vehicles are seen major traffic violator. It is suggested that there may have special training and awareness camp for the drivers of the aforesaid vehicles.

51. The state government should deploy more traffic police to reduce the traffic congestion problem in the Guwahati city.

52. The government should formulate specific plan and policies in relation to issuing driving license for students. The state government may impose huge penalty for any sort of violation of norms by the motorcycle riders.

53. Footbridge should be comfortable and attractive. The state government may consider for application of electronic stair cases as escalator for the foot over bridges of Guwahati city.

54. The GMDA’s campaigning against illegal building construction is very important for the interest of smooth transportation on public road.

55. The traffic police authority should identify the peak hours and formulate policy for controlling traffic congestion in the city.

56. The government should pay first priority to solve the problems related to traffic jam. The government requires critical reviewing of the reasons for traffic jam in the city.
57. The government should discourage the issues of paying bribe to the police by the drivers and take stern action against such police personnel.

58. The government should be strict enough to monitor the carbon emission of vehicles.

59. **Encourage Pedestrianization**: In case of very busy areas the government should encourage pedestrianisation to reduce the traffic load. In such zones the government should introduce the concept of ‘no vehicles zone’.

60. **Improve Pedestrian facilities**: Declaring a zone vehicle-free will not be enough to encourage pedestrians in the areas. To encourage pedestrian movement wide footpaths, necessary road furniture, dustbins and streetlights should be mandatory.

61. As the population growth in the city is very high, the transport planning should be done in such a way where it can cope up with the growth of population.

62. Widening of some extremely busy roads like GNB road, GS road is an urgent need.

63. Road surface should be maintained properly, repairing works should be done promptly so that traffic flow is not hampered and the vehicles are not damaged.

64. As the water logging create many problems in the city transport system, measures should be taken to reduce water logging by restricting hill cutting and filling up of wetlands and low lying areas in the name of infrastructure development.

65. One way road operations are very helpful in increasing the roadway capacity and reducing the intersection conflicts paving the way for reduced delay to traffic and increased safety. For successful one-way operations, availability of complementary parallel roads are essential.
66. Based on the delineation of Hawker Zones, hawkers need to be management to minimize encroachment on the capacity of the roads and making the footpaths usable for pedestrians.

67. Emphasis should be given to improve efficient public transport system mainly to minimize private vehicles on roads just to reduce traffic volume and fuel wastage. As the city bus is the most economic public transport means in the city the number of buses should be increased in certain routes.

68. It is felt necessary to impose ban on the movement of slow moving vehicles like hand cart and pony carts etc on select busy roads like GNB road from Guwahati club to Bamunimaidam.

69. Many of the city bus stoppage are opposite to each other for up and down traffic; hereby restricting the road width and causing traffic congestion. This need to be rectified and core should be taken so as to remove all such stoppages at the road interaction which adds to the traffic congestion.

70. Guwahati Traffic Police should make mandatory for all drivers to use dipper light of the vehicles in the night within the city. The upper headlight at night has caused innumerable fatal accidents in certain roads.

71. All Traffic Police points should be installed with electronic lighting system and manual regulation should be stopped.

72. Local train service should be introduced between Jalukbari and Narengi atleast at an interval of 30 minutes.

73. City Traffic Police should be vested with power to impose fine and other penal provisions on the spot.
74. In the city there are 157 traffic junctions out of which 75 are named. Therefore the traffic police at any cost should name such point and act as the important traffic point of the city with an immediate effect.

75. Truck entry to the city should be restricted at any cost to reduce the traffic congestion. Trucks should be restricted on the main corridors from 9 AM to 9 PM. Similarly, Trekker should be restricted on the corridors where there is adequate number of buses.

76. Installation of quick communication facilities to attend any sort of emergencies, equipping traffic police with high capacity cranes, mobile vans and ensuring quick availability of breakdown maintenance services are to be arranged.

77. Traffic Police must be well equipped with advance communication system and powerful and well maintained vehicles to stop the practice of wrong overtaking and unsafe driving practice. Installation of high-speed detection system at appropriate points is needed.

78. There is need of provision for providing space for breakdown vehicles and well designed shoulders on the side of pavement.

79. Overtaking should not be allowed on two-lane roads. For four-lane roads, the lane near the centre needs to be kept for fast moving vehicles and edge lane is for slow vehicles.

80. Strict checking of fitness certificates, vehicle over loading, pollution characteristics and maintenance requirements is highly needed.

81. The traffic police should monitor the headlamp condition of the vehicles and dipper use in the night.
82. Thorough checking of road signs across the entire section of highway is needed. Checking should be done keeping in mind of the appropriate distance before the occurrence of the conditions related to road curve, crossing, etc. The size of the letter, language of the sign, visibility of obstruction, growth of trees and installation of bill boards, etc are to be monitored for road management.

83. The government should think for erecting fences at appropriate place to avoid entry of stray animals and making lighting arrangement along the national highway at accident prone zones.

84. The concern PWD department should maintain a uniform road width and strengthening side lanes to avoid traffic congestion in the city.

85. The police and MVI should play the role of facilitating better traffic flow and not be a hindrance to it. While checking they should not harass the drivers.

86. Medical attention should be given to accident victims at the earliest.

87. Checking of the vehicles by Traffic Police should be done at some specific points there should be certain point for this purpose. It would be better if these points be located at the entry or exit of a city with separate space for this purpose adjacent to the NH. Imposing heavy punishment for the violation of traffic rules; especially by LMV drivers.

88. There is high need of construction of truck lay bay on both the sides of NH-37 near Balaji Temple, as the truck drivers usually stop there to clean the trucks and to take bath.

89. There should be an equal distribution of city buses on all routes to ease the traffic flow. Similarly, the share taxi routes are also needed to be distributed properly.
90. Mobility Corridors plan of the government focus only the main public transit systems of the city, it should encompass all road network of the city.

91. The government has plan for building a corridor just like circumference of a ring for road transportation of Guwahati. All the roads and subways will have connection with the radius of this circumference. The government needs to invest adequate fund for the same and at the same time this idea requires to be simplified for understanding of all the stake holders and agencies related to road transportation management of the city.

92. The inner orbital roads connecting GS Road with Fatasil Ambari Road need to have smooth linking with AT Road, near Maligaon which would be completed in the shape of a ring and would reduce the road congestion for easy connectivity of Maligaon with the other parts of Lower Assam.

93. The frequency of ASTC bus movement on the streets of the city may be rationally distributed.

94. There should have special plan of the government for Corridors 4, 5, 6, 7and 8, as in the peak hour, the load of passenger and vehicles is very high in these roads.

95. The core rail line to Guwahati runs on the west of the projected zone. It is recommended that a rail branch linkage from this main line need to be extended up to the IFC.

96. The existing roads are proposed to be upgraded in terms of ROW, capacity and other geometrics. The new roads need to be planned and designed for a higher level of service from their entry into GMA to their meeting with the CBD orbital Road.
97. The government should stop registering more than one vehicle in one’s name and should think on imposing some restriction on keeping more than one vehicles in the family to reduce traffic congestion in the city. The government should also think on reducing the registration capacity of the vehicles in the DTO. This will subsequently reduce the rapid growth of the vehicles in the city.

98. The government should direct the concerned authorities to examine the pros and cons of the school buses on the roads of Guwahati city and should reduce the number of school buses for the greater interest of the public.

99. High degree of co-ordination between all the agencies engaged in traffic management particularly, Traffic Police, PWD, DTO and NHAI is urgently needed.

100. The government should develop the idea of speedy water transportation facility on the river mighty Brahmaputra and other basins connected to Brahmaputra for reducing the load of surface road transportation.

CONCLUSIONS:

Guwahati is facing severe problems related to road transportation which are increasing day by day. The governments should take the remedial measures to solve these traffic problems without delay; otherwise this will be worsening in future. For this, an attempt has to be made by all concern departments collectively. To get proper direction and planning, an acceptable model has to be evolved considering the present situation and the trend of change in last few years. To come up with the solution, a strong database is required, which is not yet generated by any department at any level. The road commuters should be literate enough with the government policy and regulation related to road
transportation. There should have sense of coordination of all stake holders related to transportation management.

Along with the government effort, there is acute need of involvement of professional bodies of transportation system and voluntary organization in all quarters of the city for providing helping hand to the traffic management.

It is the time to think for the state government for promoting water transportation as alternative means of communication.