Chapter Four

Analysis of Findings of the Study

The study of toll system in India has given quite revealing findings about the various factors involving toll collection on highways. Some of the observations are enumerated below-

1. National Toll Policy: As against the general impression that toll rates are decided on one on one basis for different projects, the per km toll fee is common for all National Highways irrespective of the project cost, location and the length of the highway. The key parameter for assessing the revenue generation on a particular highway stretch is the traffic density projections. Higher the traffic density more is the revenue generation even for a relatively smaller section of the highway. And accordingly VGF or premium, as the case may be, is decided. The toll rates are decided based on the considerations as discussed in chapter 2. Although the bare rates for all national highways are same but there is a caveat for having different rates for different highways on the basis of having extra structures like, flyovers, bridges, bypasses, tunnels etc. with construction cost of Rs fifteencrore or more. In such cases the base rate is loaded with extra amount as provided in the amended law on toll rates in 2012.

2. State Toll Policy: The National Highway (Rate of Fee) Rules 2008 with latest amendments are mandatorily applicable to all national highways irrespective of construction agency viz NHAI, PWD or NHIDCLbut the state governments are not bound to follow these rules and have the option either to follow the national rules or can have their own policy for framing rules for toll collection. For example Government of

Gujrat has decided to follow the rates as per national policy whereas the Maharashtra Government notifies their own rates for each project independently.

3. Toll Collection Process: Toll collection system is a complicated process and the issues are specific to a particular highway or particular segment of a highway or even a particular toll plaza on a particular segment of highway. For example the main controversial issue on Ahmedabad-Viramgam-Maliya highway toll plaza located at Sanad is related with denial of toll payment by the local vehicle owners whereas on the same stretch on next toll plaza located at Malvan is more of safety and security issues where even two security guards were murdered by local miscreants. The Ahmedabad-Vadodara Expressway is facing a problem of multiple tag issue, as discussed in Chapter three Para 3.1, due to which the reader installed at the toll plaza is not able to recognize the correct tag pertaining to the toll and as a result the amount is collected in cash only even for the tag installed vehicles. As regards Mumbai-Pune Expressway, under reporting of toll collection by concessionaire attracts media attention. Also a demand from LCV owners is gaining momentum for quite some time for exemption from payment of toll.

4.Socio-Economic Impact:It has been observed that the Toll Plazas operating near the urban centers and catering exclusively to urban population are less likely to have operational issues. Examples are Mumbai-Pune Expressway and Ahmedabad- Vadodara Expressway whereas the Plazas having mix users involving users from rural areas also are vulnerable to law and order issues. Examples are Delhi- Gurgaon Expressway and Ahmedabad-Viramgam-Maliya Highway in Gujrat.

5.Slow growth of ETC System: The government has emphasized to implement the ETC for avoiding traffic congestions and to prevent toll fee leakages. Pursuant to government decision NHAI has installed all infrastructure of ETC at all the toll plazas but the user penetration for ETC is far from satisfaction as there is reluctance on the part of users to install RFID tags, particularly on CJV category vehicles and as result the purpose of huge investment on ETC infrastructure seems defeated.

1. The concessionaires operating predominantly in urban centers are suspected of under-reporting of revenue or extending the concession period unethically. Examples are DND and Mumbai-Pune Expressway.

2. Almost hundred percent toll plazas are having facilities of Electronic Toll Collection but the user penetration is negligible.

3. The time consumed in collection of cash and returning changes etc. is in few seconds generally in the range of 3 to 6 seconds but the time starting from the moment vehicle enters a particular lane and exits the same runs into several minutes and typically in the range of 5 minutes. However it depends on the traffic situation at the toll gate.

4. Generally the users are satisfied with the toll rates but show concern about stopping the vehicle at every plaza even if the toll has been paid for the entire length of the highway.

5. The concept of BOT is largely appreciated by the users as the quality and upkeep of the roads is much superior to the earlier system.

Analysis of Comparative Performance of the Three Highways under Study:

The performance of one toll plaza of each of the three highways taken up for study has been evaluated in terms of following parameters as described in Chapter three-

i) Operational Speed i.e. Time range requiredto cross the toll gate and number of vehicles passing through the toll gate in a specified period of fifteen minutes (measured actually on site)
ii) Traffic Density i.e. number of vehicles of different categories, using the toll plaza during a specified period of one month[26]
iii) Toll Collection from various categories of vehicles for a specified period of one month.
iv) Number of dominant category vehicles vis-à-vis toll collection from that category
v) Relative contribution of CJV category to the total toll collection.

Operational Speed at Toll Plazas:

Table 10 below indicates the average time taken by avehicle and number of vehicles passing in 30 minutes, at each of the three toll plazas-

Table 10: Time Range to Cross a Vehicle & Number of Vehicles Passing in 30 Minutes

[26] Data obtained from respective agencies/concessionaires

Toll Plaza	Time range per Vehicle (seconds)		No of Vehicle per 30 Minutes	Number of vehicles with tags per 30 minutes
	Cash*	ETC		
Ahmedabad(Ahmedabad-Vadodara Expressway)	5 to 40	3 to 4	95	9
Talegaon(Mumbai-Pune Expressway)	2 to 120	2 to3	90	7
Sanand(Ahmedabad-Viragam-Maliya Highway)	4to 24	3 to 5	92	9

*cash includes payment made through smart card and vredit/degit card also.

From the table, following is observed-

a. Time taken per vehicle varies over a wide range. The reason for this randomness is mainly due to handling of cash, entering PIN numbers for cards etc. The interesting finding is that number of vehicles crossing the toll booth are in the same range , indicating that, though per vehicle time may vary widely but over a longer duration (30 minutes in this case), the speed of operations is almost uniform.

b. There is similarity at three plazas as regards time taken by ETC lanes for the vehicles with RFID tags.

c. Another similarity is that the vehicles with RFID tags found during the observation period of half an hour at three locations is also in the same range, though Mumbai-Pune has the least among all but the reason explained was that the tags are mainly used by the commercial vehicles using highways on a regular basis and since Mumbai-Pune Expressway is predominantly used by car owners and hence the number of vehicles with tag is relatively low.

Traffic Density& Toll Collection:

Figure 5, below shows a bar chart indicating the number of different categories of vehicles using the toll roads vis-à-vis toll collection against each category at the three toll plazas for a period of one month.

Figure 5A- Ahmedabad Plaza (Ahmedabad-Vadodara Expressway)

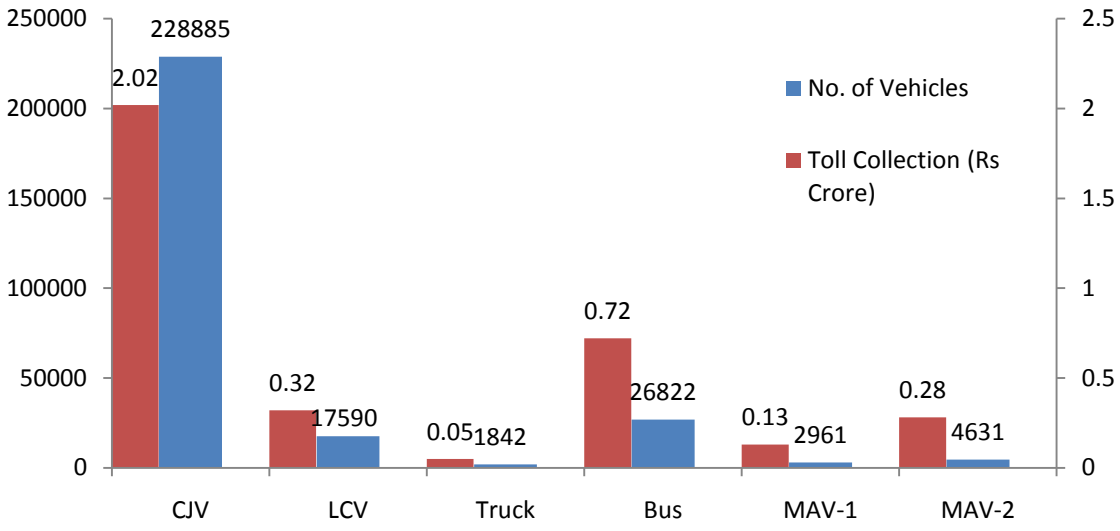


Figure 5 B- TalegaonPlaza (Mumbai-Pune Expressway)

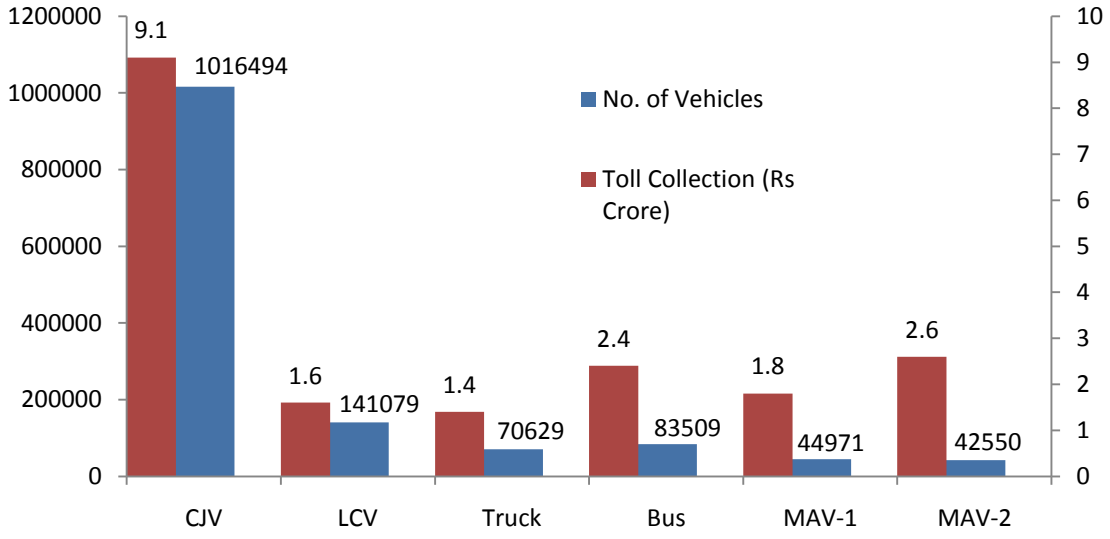
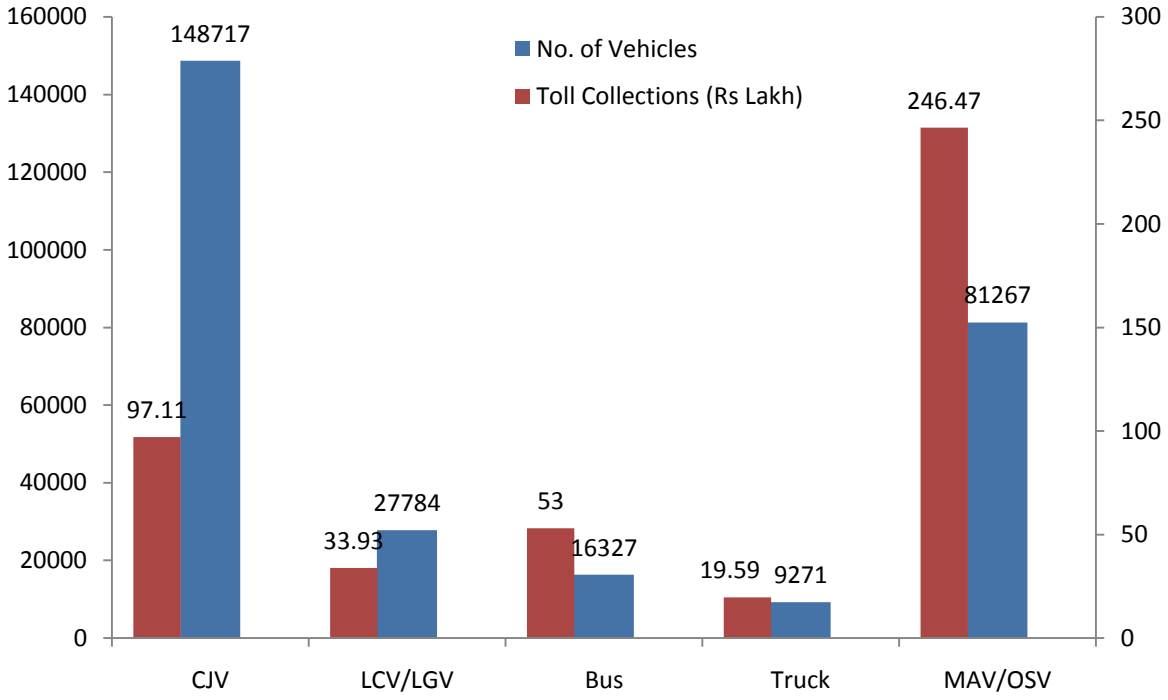


Figure 5 C-Sanand Plaza (Ahmedabad- Viramgam-Maliya Highway)

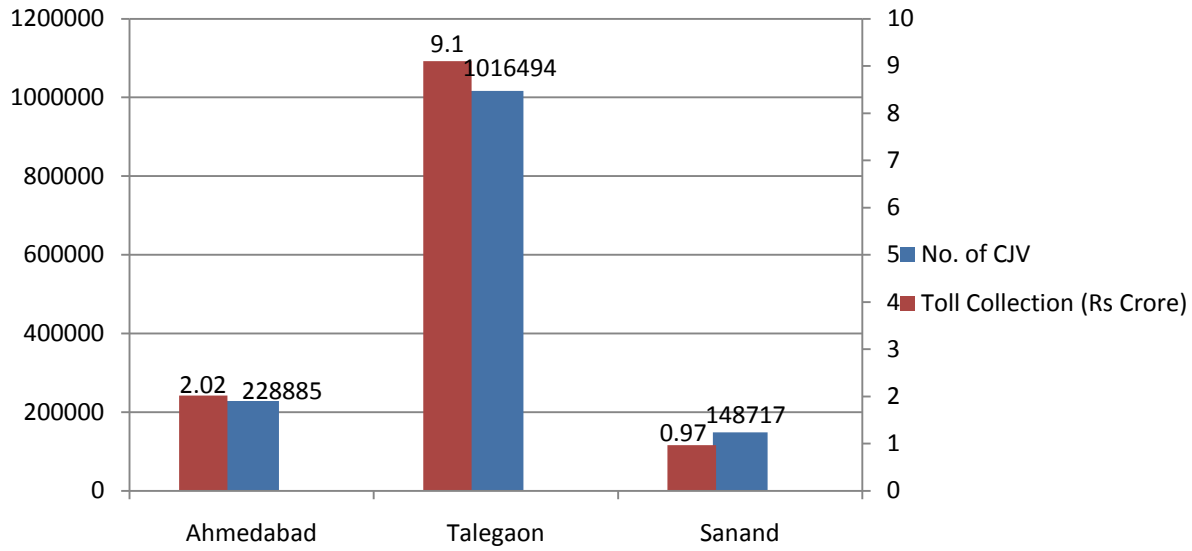


From the above three bar charts following can be derived-

1. There is a similarity, though with varying degree, between Ahmedabad and Talegaon as regards traffic density and toll collection.
2. The operational performance at Sanad shows a contrast pattern from the other two plazas.
3. The principal reason for this variation is that the first two expressways cater to largely the urban population whereas the last one operates in the rural milieu.
4. In the first two plazas cars are the dominant contributors to the total toll collection whereas at Sanad, MAV/OSVs are the main contributors, as it connects to the two major ports in Gujarat.
5. The overall performance of Talegaon Plaza is better than the other two plazas, in terms of traffic density and revenue collection.

Toll Collection from dominant category of vehicles (CJV):For a comparative depiction, the figure 6, below indicates the number of cars/vans/jeeps vis-à-vis toll collection from the CJV category at the three plazas.

Figure 6: Toll collection from CJV category

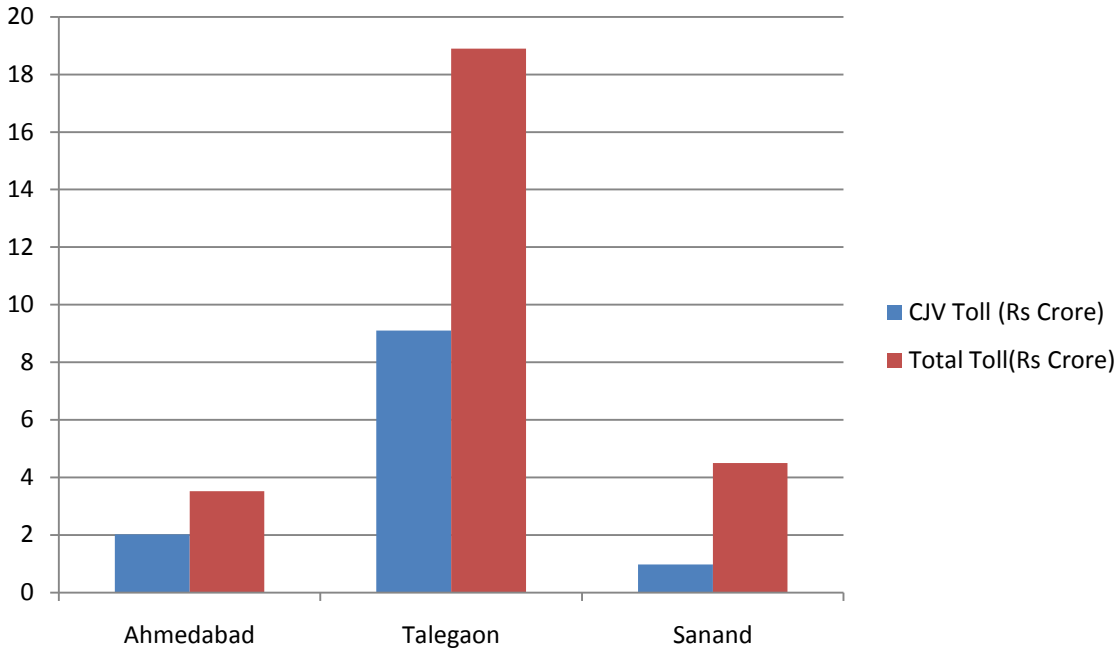


As could be seen from the above chart the relative collection of toll in respect with CJVs is highest at Talegaon and lowest at Sanad. The reasons for this deviation can be attributed to two factors, first the large number of CJVs is exempted at Sanad and secondly the toll rates are significantly higher on Mumbai-Pune Expressway compared to the other two highways.

Relative share of CJV toll collection to the total Toll Collection:

Figure 7, below shows a bar chart depicting the relative contribution of CJV toll collection to the total toll collection at the three toll plazas.

Figure 7: Toll Collection from CJV and Total Toll Collection



From the above chart it is seen that the share of toll from CJVs at Ahmedabad and Talegaon is to the tune of 50% of total toll collection whereas that in case of Sanad is less than 25%. The reasons for that are three folds as under-

1. Both the Expressways i.e. Ahmedabad- Vadodara and Mumbai-Pune have another highway running parallel and which caters significantly to the heavy traffic.
2. Being under state government, majority of CJV category vehicles are exempted from toll on Ahmedabad-Maliya Highway.
3. Third and most importantreason is that Ahmedabad-Viramgam-Maliya highway connects major cities of Gujarat and the hinterland to two major ports namely

Kandla and Mundra and hence main toll contribution comes from MAV/OSV category of vehicles on this highway.

[**Disclaimer**: In all the above bar-charts, the figures used for number of vehicles and toll amount are collected in an unofficial but reliable way and may vary from the official figures. The toll collection amount is derived with certain assumptions empirically as the direct & exact figures are not readily available. However for analysis purpose these figures represent the practical position in an adequate manner]