EVALUATION STUDY ON"GOVERNMENT SUPPORT FOR PRIVATIZATION" SCHEME

2017

Awarded By;

DIRECTORATE OF ECONOMICS & STATISTIC

GOVERNMENT OF MAHARASHTRA

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Acknowledgement

The Indian Institute of Management Calcutta has completed the Evaluation Study on Privatization of BOT Projects under PPP model on Roads in Maharashtra through primary level data collection and use of secondary sources. The Study was awarded by the Directorate of Economics and Statistics, Government of Maharashtra. The report presents the approach & methodology, Key findings and Recommendations. We would like to record our appreciation to officials at the DES, Planning Department, Government of Maharashtra, for their valuable support and close coordination in the preparation of this report.

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The helpful attitude of the Engineers in different divisions deserves mention as it was important in executing a proper inventory survey.

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ACRONYMS

- BOT-Build Operate Transfer
- CC- Concrete
- DES- Directorate of Economics and statistics
- EPC- Engineering Procurement and Construction
- HAM- Hybrid Annuity Model
- HCV- Heavy Commercial Vehicle
- IIMC- Indian Institute of Management Calcutta
- IRC- Indian Roads Congress
- LCV- Light Commercial Vehicle
- MIDC- Maharashtra Industrial Development Corporation
- MTA- Metropolitan Transportation Authority
- MSH- Maharashtra State Highway
- MCV- Medium Commercial Vehicle
- NTPC- National Thermal Power Corporation
- NH- National Highway
- NHAI- National Highway Authority of India
- OD- Origin Destination
- O & M- Operation and Maintenance
- PPP- Public Private Partnership
- PWD- Public Works Department
- SPTPL- Sion Panvel Tollways Private Limited
- SH- State Highway

EXECUTIVE SUMMARY

Below we summarize our assessment of the Objectives of the Evaluation of the Government support of Privatization Schemes. We also develop our recommendations accordingly.

Actual Expenses incurred by the Government in development of Roads through Private Sector Participation
✓ **As per guidelines, in *the Degree of Public sector involvement*, the model of contract is of the BOT form. Considering all parts of O&M, Capital Investment, Commercial risk and Duration, the public sector has no role to play or incur expenses.** ✓ **Even in 'Asset Ownership' the only involvement of the public sector is in acquiring the land.** ✓ **For the six sample roads, there are no specific criteria of land acquisition built into the bid documents. It is assumed that the acquisition took place prior to the sanctioning of the projects. In any event, the specific data should be in possession of the land acquisition department, for viewing by other government agencies, if needed.**
To Take Review of actual length of Road Completed with two lanes with paved shoulders and four lanes.
✓ **Through our inventory survey, we found that all the Private Players developed the total length as per agreement. There was no lapse in length found.** ✓ **However, the pave of most shoulders is in poor condition explained in detail in our report.** ✓ **The effects of improvements in paved shoulders on reduction in accidents are a well-documented fact.[1] In this respect, special note must be made of this objective not being met.**
To Take Review of the Projects where toll collection is in progress regarding actual maintenance carried out by the concessionaries.

[1]Proper shoulder paving has been seen to be associated with a statistically-significant reduction in casualty accident frequencies. See e.g. K.W. Ogden, "The effects of paved shoulders on accidents on rural highways, "Department of Civil Engineering, Monash University, Clayton, Victoria, Australia. https://www.ncbi.nlm.nih.gov/pubmed/9183473

✓ & M is the key nature of involvement required of the Private Player, which is clearly mentioned in the Bid Documents. ✓ Proper guidelines along with other specifications (days and penalty clauses) are not always incorporated into the agreements. ✓ Social audit, which is very badly We required for proper maintenance of roads, is not done. ✓ Physical verification by the Government that should be done at least every fort night for monitoring of work is frequently not done ✓ Immediately after the visit, PWD has not been intimating the private player with documentation (e.g. Photographs of abnormal pockets where repair work is required).
To Take Review of the time and the fuel saved by commuters on the Projects improved under privatization
✓ According to our vehicular traffic survey, commuters are happy about the stretches developed under BOT Projects. ✓ Time and fuel savings can only be determined by doing a comparison survey if the baseline survey was done. As the roads were sanctioned several years back, the difference in commuters, types of vehicles, etc. would make this question meaningless without a baseline survey. ✓ However, an indirect indicator would suggest that at least time savings are not to potential. The average speed of vehicular traffic is substantially below the DMV speed limit in all areas surveyed and for all types of vehicles surveyed. ✓ Due to the absence of a scientific signalling system at cross sections, the fuel consumption is higher than necessary ✓ Due to speed breakers at frequent pockets, the suggested speed cannot be achieved
To Take Review of Social effects of the Privatization of Projects
✓ The inhabitants in areas adjoining the road have benefitted by getting better paved roads, particularly for easy access to other connecting cities as well as the railway

station. They can now easily reach their work place. For example, in a concentrated industrial hub named Mankoli, an Industrial Area where more than 1 lakh employees are working, commuters are benefitting by the developed road. It takes them no more than 15 minutes to commute.[2]

- ✓ **The benefits are especially evident in Sion Panvel, which is the most important Expressway for connecting Mumbai-Pune city.**
- ✓ **However, owing to the negligence of Private Players, the drainage system is not developed, affecting surrounding localities adversely due to water-logging and increase in vector-borne diseases (such as dengue, malaria, West Nile fever) through the expansion in the number and range of vector habitats. Especially the Road between Chinchoti Kaman ajura phata and Mankoli is most affected by such problems.**
- ✓ **In terms of social effects, only some developments indicators surveyed show success.**

To Take Review of the effects of good quality road on transportation and farming

- ✓ **Though the paved condition is not to international standards, with the exception of a few pockets, the road conditions are generally quite good.**
- ✓ **The work on these roads was awarded before 2011 but the renewal work is yet to be completed although the renewal dates are over. These items are explained in detail in our Inventory Survey[3]**

To Take Review of reduction in environmental pollution due to projects improved under privatization

- ✓ **Though this is an important issue, the assessment of Air quality monitoring through auto emission systems is not facilitated either in PWD or done by the Private Player.**
- ✓ **The essential objective of BOT Projects is not properly addressed either at the proposal level or post development.**

[2] Accessibility to different centers and time savings are key community impacts mentioned in the literature. See e.g. http://bca.transportationeconomics.org/benefits/community-impacts

[3] Surveys done on direct benefits to farming involve FMRs. See e.g. :https://www.rappler.com/move-ph/issues/hunger/52218-farm-to-market-roads-food-security-livelihood. There were no FMRs provided for inclusion in our sample.

To Take Review of reduction in wear and tear of vehicles due to quality road.
✓ In the Bid proposal there is no criterion for achieving this. We can assess this objective through indirect indicators. Driving practices that would reduce wear and tear of vehicles are not facilitated by current conditions.[4] ✓ For example, the development of street lights is poor except in some pockets. Commuters reported that due to the absence of street lights, they are facing problems of identifying pedestrians and have to drive at a non-steady pace, which would have deleterious effects on wear and tear of vehicles. ✓ It was also observed that along several stretches, road dividers were absent and frequent turning points made vehicles accident prone. ✓ Due to extremely poor shoulder conditions, pedestrians and non-motorized vehicles are at risk. ✓ There is also a domino effect: If a Heavy vehicle is upside down on the road, and cannot be pushed to a shoulder, that is liable to create further accidents. ✓ Considering the indirect indicators, we would argue that the objective of reduction of wear and tear of vehicles is not adequately met.

[4] 5 of 6 practices suggested are seriously hampered by these conditions. See e.g. http://www.fleetanswers.com/content/driving-practices-reduce-vehicle-wear-and-tear

Recommendations:

Below we have listed a set of recommendations to help achieve the stated objectives of the scheme. Some additional general recommendations are added at the end of the report.

- Selection of roads for application of the PPP model should be made in measured way. Before finalization of road selection, the public works department should engage a consultant who will prepare a feasibility study including traffic projections, baseline speed delay survey and land use map. These items are very important for subsequent evaluations of road projects.

- A quarterly meeting among PWD officials, the toll manager and other stakeholders is essential by for further developmental work. If necessary, the director or private player should also attend those meetings. A separate minute book for those meetings should be maintained properly.

- In most of the places, private players have engaged amateur service providers for maintenance of roads. Professional providers are essential for proper maintenance of the roads.

- In the bid document, it’s very essential to incorporate one schedule for air quality monitoring at specific time intervals for all Roads, and Private Players should execute the same under supervision of PWD/consortium body

- One consortium body should be formed with local representatives and representatives of administration headed by the executive engineer. This is essential for supervision and monitoring of work quality and repair works.

- **Social audit is required to minimize the gap between scope and actual implementation.**

- For appropriate supervision and monitoring, the Public works department should develop a targeted software in which private player can input traffic volume and toll collection on a regular basis. In the software, one option should be ensured for creating expenditures head wise that the private player incurred.

- For repair and rectification, there is no specified time frame in either the bid document or the agreement. This should be should be incorporated. Proper guidelines regarding repairing and maintenance should be developed. As stated in the Annexure, Kalyan Keti Road Pvt. Ltd has provided it in their agreement, and this may be used as a template.

╠For the express highway, the public works department should allow International players to participate. The knowledge transfer and establishment of benchmark would be very useful for domestic players.

╠Signalling system requirements at cross sections should be specified

╠Speed breakers should be installed with careful thought given as to where they are required, and adequate signposts should warn the drivers of the same. ╠A separate fund should be allocated for lighting improvements.

A STUDY REPORT ON EVALUATION OF GOVERNMENT SUPPORT FOR PRIVATIZATION SCHEME UNDER THE PUBLIC WORKS DEPARTMENT IN MAHARASHTRA

1. Introduction

Indian Institute of Management Calcutta conducted a detailed study evaluating government support for privatization scheme under the Public Works Department in Maharashtra. This study provides an opportunity to the officials to better understand the status of this project that is stretched over a span of 25 years (2008-23) for future monetary allocations. The present study was commissioned in 2017.

The objectives included analysing the work done to develop roads using private participation, to build paved shoulders along existing double lane roads or convert them to four lane roads, passing on the O&M work to private players, providing people with travel options consuming lesser time, reducing fuel consumption and providing superior quality roads.

This report provides an analysis and evaluation of the current and prospective profitability, and other financial attributes of the project. The analysis included primary data and secondary data collection, developing questionnaires for vehicular traffic, engineers and private players involved. Other calculations included using past year's data to develop a trend and its analysis under nominal assumptions. All calculations can be found in the appendices. The report finds that the prospects of the work done in its current status are not positive. The major areas of weaknesses require further intervention and remedial action by the government. Detail recommendations are presented at the end of the report.

The report also points out some limitations of the study:
All the data required were not provided, forecasting figures were not provided, neither the nature and type of private player nor the current economic conditions data were known, as not enough information or enough detail i.e. monthly details were known. Finally, results are based on past performances and present conditions. Any current remedial action that has taken place as a result of this study is not included.

In what follows, we evaluate what has been achieved with respect to what has been documented as the objective. This expectation has been spelled out in the boxes in the following sections.

BOT GUIDELINE

REASON FOR PUBLIC-PRIVATE PARTERSHIP

- Migrates and Properly Allocates Risks
- Provides incentives of lowing Cost
- Ensures Value for money
- Attracts the Right Skills and Management Expertise
- Promotes Innovation
- Reduces Corruption and Waste
- Reduces Burden of Tax Payers

THE CONCEPT OF PUBLIC-PRIVATE PARTNERSHIP

- BOT- Built Operate Transfer
- BOO- Build On Operate
- BOOT-Build Own Operate Transfer
- DBF- Design Build Finance
- DBFO-Design Build Finance Operate
- DBO-Design Build Operate
- BTO-Build Transfer Operate
- DBFOM-Design Build Finance Operate Manage
- Leasing
- Joint Ventures
- LROT-Lease Renovate Operate Transfer
- DCMF-Design Construct Manage Finance
- BOOR- Build Own Operate Remove

BUILT- OPERATE-TRANSFER (BOT) AGREEMENT

The BOT is a type of agreement where the Government (Project Sponsor) allows private entrepreneurs (project promoter) to design, finance and build an infrastructure facility.

In return, project promoter is permitted to collect tolls (user fee) and operate the facility for a specified period (called the concession period), during which he is expected to recover all his costs and earn reasonable profit.

DEGREE OF PRIVATE SECTOR INVOLVEMENT

10. PRIVATIZATION
9. BUILT-OWN-OPERATE
8. BUIT-OWN- OPERAT- TRANSFER
7. DESIGN-BUILT-FINANCE-OPERATE
6. DESIGN- BUILT- OPERATE- MAINTAIN
5. OPERATION CONCESSION
4. DESIGN-BUILT
3. MANAGEMENT CONTRACT
2. SERVICE-CONTRACT
1. GOVERNMENT

DEGREE OF PRIVATE SECTOR INVOLVEMENT

Types of Contract	Assets ownership	O &M	Capital investment	Commercial Risks	Duration(years)
Service contract	Public	Private & Public	Public	Public	1-2
Management contract	Public	Private	Public	Public	3-5
Lease	Public	Private	Public	Private	8-15
Concession	Public	Private	Private	Private	25-30
BOT	Private & Public	Private	Private	Private	25-30

SUCCESS AND FAILURE IN BOT PROJECTS

Causes of Failure: An analysis of unprofitable BOT projects in developing nations suggests that these projects failed because of poor planning.

① Tolls set too high:

To recover heavy investments, high tolls must be charged. On the other hand, the toll level has a large influence on transportation demand, which substantially affects the profitability of BOT projects. For this reason, some projects have failed due to insufficient traffic resulting from high tolls.

② Demand projection too optimistic:

Some projects were based on poorly compiled demand projections that differed greatly from actual traffic volumes. These projects were eventually halted.

③ Low profitability:

BOT transportation projects generally are implemented in areas where alternate means of transportation already exist. This may result in large market risks. To ensure consistent profitability, transportation projects should be associated with other profit-earning activities, since the profits from a transportation project alone are limited.

④ Project too big:

Some projects are too large in scale for a single private enterprise to undertake. In the past, these projects failed when fluctuations in business and exchange rates affected their management, forcing BOT enterprises to cease operations before the project could be completed. These are some of the direct reasons why BOT projects have failed. The key factors behind these failures must be considered.

Two main factors explain this failure:

① Participation of private companies without careful consideration

② Hasty government approval of projects without sufficient assessment. In other words, the roles of the public and private sectors were not clearly defined and fully discussed before the project was started.

Reasons for Success

The following may be the reasons for the success of BOT projects in developed nations.

① Consistent demand

Ensuring stable profitability is the greatest factor in the success of transportation projects. BOT road projects are relatively profitable from the beginning when there is active transportation demand. In a number of cases, profitability improves when a project is implemented in the vicinity of a congested road.

② Limited project area

Many BOT projects are successful when they are limited to a certain part of a network, such as a bridge or a tunnel, and are implemented in an area lacking alternative routes. When a BOT project is initiated in an area with alternative routes, the project may suffer from lower-than-projected traffic volume, depending on the convenience of such alternatives.

③ Positive public support

The BOT method is intended to be a means of procuring development resources, including construction funds, from the private sector. As such, the BOT method is absolutely a part of a country's transportation policy. In this respect, the public sector supports BOT projects, including the development of access roads leading to a planned toll bridge. Behind the BOT method is the recognition that roads are both infrastructures and public facilities.

Positive Participation of the Public Sector in BOT Projects

Developing nations are characterized by the following factors:

Steady growth in demand is expected with economic development, but the gestation period before profitability is relatively long.

Economic instability makes these nations extremely susceptible to changes at home and abroad, creating large market risk.

Economic instability also exposes foreign capital to the risk of fluctuating revenues due to exchange-rate fluctuations.

The relatively short history of stable government in these countries generates substantial risk in connection with policy changes. To ensure the success of BOT projects, the public sector should consider participating in BOT projects in a more positive manner. At the same time, the public sector should also improve the business environment.

Significance of public participation

If the government shares the risks with a private company that joins a project considered unprofitable if undertaken by private enterprise alone, then the project will create socioeconomic benefits and fulfill the policy objectives. In addition, such government participation permits the private business to set lower tolls, while maintaining profitability and creating more demand.

Reference ; Guide line for BOT Road Project Development under Public-Private Partnership

2.PPP Model for Highway Projects

A National Highway plays a key role in development of a country. Earlier, the responsibility of building, maintaining and operating roads was primarily with the government. In the past few decades, however, many road projects have been undertaken all around the world using the PPP approach. Through this approach, Governments are able to leverage private capabilities to efficiently construct high quality roads, leaving surplus funds with the government to be deployed in other developmental activities.

The Government of India has adopted the PPP route for development of National Highways. The BOT Annuity Model and the BOT Toll Model are the two PPP models that have been used in National Highway Projects.

According to the report by Sanjeeb Mukharjee, New Delhi published on June 25th 2016, among 600 road projects being implemented by the NHAI, around 250 are under the PPP model. The PPPs, in fact, had become the default option for large road projects.

However, difficulties in land acquisition, environment clearances and low equity base of concessionaires have led to delays and litigation. As a result, PPPs have come to be seen as a flawed model in the Indian context.

The government introduced the HAM in 2016. Under the hybrid model, 40 per cent of the project cost is borne by the government, while the remaining 60 per cent comes from the private party. The 40% is paid to the private sector developer in through 5 annual payments at the outset of the project. The remaining 60% is borne by the developer. The 60% is paid to the developer as variable annuity after the completion of the project over a 15-20 year period. The developer has no toll rights; revenue collection is the responsibility of the NHAI. Maintenance of the roads remains the responsibility of the developer.

In the BOTs, the concessionaire had to bear the entire financial burden as well as the financial risk of rise or fall in traffic on the roads. This led to a failure of many projects. However, under the current model, the traffic risk lies with the government, and the concessionaire gets to make a reasonable profit. The risk of failure (due to lower than estimated traffic) lies with the government, which enables the private party to invest more freely.

2.1.PPP Model in Maharashtra

Since 1996, the government of Maharashtra has designed and implemented several schemes and circulars to develop roads on a Build-Operate Transfer (BOT) basis. Till 2009, tolls could be levied even on the projects built through state budgetary provision. However, as per the PWD circular regarding privatization of roads, dated 30th July 2009, the government limited levying of tolls only to projects developed by private players. Furthermore, it was decided through the PWD circular regarding privatization of roads dated 31st July 2014, that tolls will only be levied on private sector projects costing more than 200 crores.

Maharashtra has the highest termination rate for Public-Private Partnership (PPP) investment projects among all states. Maharashtra has a 13 per cent share in terminated PPP projects in term of value, followed by Chhattisgarh-10%, Gujarat-9%, Kerala-7% and Madhya Pradesh-7%, according to the finding of a joint study by Assocham and SERI. Another study on 'Information on Geographical Distribution of PPP', also found that Maharashtra, Chhattisgarh and Gujarat were the top three states for terminated PPPs. Close to 32percent of total value of projects that have been terminated in the PPP model fall in these States.

All India, 65 PPP projects with investments worth over Rs.77, 000 crores have been terminated.

2.2. Up gradation of Roads under Consideration

The Maharashtra government has decided to upgrade roads stretching up to 10,000 kilometres in the state, adopting for the first time, a 'hybrid annuity' model along the lines of the Union government. The project is likely to cost the exchequer approximately Rs. 30,000 crores. The state government, which has so far relied on Build-Operate-Transfer model or engineering procurement contracts for infrastructure development works, has decided to opt for the Centre's hybrid annuity model to reduce the initial investment required to be put in by the private players. The state cabinet has approved this decision.

Commenting on the development, a state government official said, "Ideally, roads that are under the state public works department have to be upgraded every five years, but many have been neglected mainly due to lack of funds and need to be repaired urgently. We have decided to adopt the Union government's hybrid annuity model, as the budgeted amount for the upkeep of roads is insufficient to improve the chosen length of 10,000 kilometres of roads". The contractors will be liable to maintain and repair the roads taken up under this project for 15 years. The roads, once improved, will all be 10 meters wide and carpeted with tar. According to sources, the state government plans to start upgrading the roads from March 2017 and complete it in two years.

Maharashtra has a road network of three lakh kilometres in the form of national highways, main state highways, and district roads, other internal and rural roads. Of these, the state public works department looks after a road network of 90,000 kilometres. Of these, the state government has selected those roads under the project that are essential for connectivity to taluka headquarters, district headquarters, agricultural and industrial centres, tourist and pilgrimage places, and those that cater to a large population or are heavily used. The contracts for the 10,000 kilometres of roads will be given out in multiple packages of a minimum length of 100 kilometres at the cost of Rs 250 crores, the state government official said.

The earlier PPP projects in Maharashtra were executed either as Build Operate Transfer (BOT) models, where the private party brings the investment and then recovers it from either toll or payments made by the state, or an EPC model, where the state pays the contractor for execution.

Before launching in to the new hybrid model, the Government of Maharashtra has decided to conduct an evaluation study of existing BOT projects by an independent expert institution.

3. Study Objectives

The Directorate of Economics & Statistics, Government of Maharashtra, Mumbai, awarded the Indian Institute of Management Calcutta the study report on Evaluation of Government support scheme under PWD.

The objectives of these and other such schemes and regulations for roads are:

- To develop roads using private participation with minimal provisions from state budget.
- To build paved shoulders along existing double lane roads or convert them to four lane roads.
- To pass on the O&M work to Private players during the concession period.
- To provide people with travel options consuming lesser time.
- To reduce fuel consumption, air pollution and wear and tear of vehicles through better roads.
- To provide roads with superior quality.

4. Approach and Methodology

After a couple of meetings with the PWD, we have framed the study design to accomplish the required objectives. The design of the study includes development of questionnaires for the key stakeholders and selection of tools for preparing mechanism of study index.

For the purpose of our study, the participation of stakeholders' views was very important in assessing different parameters related to specific BOT projects. The Public Works Department (PWD) has an important role to play in decision making and monitoring of the projects. The Private Player is the key participant in Development and Operation. Users of the road are also key stakeholders as they are the beneficiaries of improved road conditions. Potential benefits to them include lower fuel consumption, smoother rides, reduced accidents, time saving, etc.

The expert team of IIMC designed three sets of questionnaires in consultation with the Directorate of Economics & Statistical Department and Higher Officials of the PWD:

- Questionnaire for Deputy Engineer/ Executive Engineer/Junior Engineer at the PWD
- Questionnaire for Private Players
- Questionnaire for Vehicular Traffic

Further, we undertook extensive mining of secondary data for assessing the operational policy of the Private Player.

On - field assessment of the existing road condition was also a key element of the study.

Finally, the support of all stakeholders has been helpful in taking the study forward.

The research process and method comprises several stages:

√ Contextual and Background Research

√ Pilot Survey

√ Secondary Level Data Collection

√ Primary Data Collection

√ Computerization and Validation

√ Preparation of Charts& Graphs

√ Analysis

√ Preparation of the Draft Report

√ Presentation

√ Preparation of Final Report

5. Sampling Methodology

Pilot Survey for Evaluation Study on PPP model in Maharashtra

(July 1, 2017–July3, 2017)

Immediately after receiving the award letter, the team leader of the Survey team, Mr. Prasid

Chakraborty, made an appointment with Mr. Mule, Deputy Director of Directorate of Economics and Statistics. Accordingly on 18.04.2017 Mr. Chakraborty visited Mumbai and met Mr. Mule and Mr. Aher for ratifying the scope of the project.

Upon their advice, Mr. Chakraborty met with Mr. Rajiv Gaikwad, Superintending Engineer (अधीक्षणअभियन्ता)& Ex-Officio Deputy Secretary, at Mantralaya for preliminary discussions. Mr. Gaikwad provided valuable information that proved to beuseful in fine tuning our approach.

Our consultations with Mr. Gaikwad helped us narrow down for consideration 18 BOT projects that are active in Maharashtra and discard more than 35 projected that were dishonoured from 2014 onwards by the instruction of Honourable Chief Minister. Mr. Gaikwad also provided us the data details of the 18 BOT projects. Following this initial visit, on 19.05.2017, Mr. Gaikwad forwarded us the official letter that was approved by the Department and essential for the field visit. From 1st July to 3rd July 2017, the survey team visited one BOT Project under Thane Division and Thane Circle named 'Reconstruction of four lane Road between Chichoti Kaman Ajura fata and Maankoli'.

During the visit, the team met with superintendent Engineer Mr. N.M.Pawar of Thane Circle and also met with the Executive Engineer Mr.Gangurde, and deputy engineer of Thane Division, Mr. Bhoyee. To improve our understanding of the issues, the team also met with the Assistant Police Inspector Traffic, and Mr. H.Patel, Sarpaanch of Kharbao Panchayat located along the road stretch.

Mr. Chakraborty also met with the Association of Auto-Rickshaws on the route, and had extended discussions for understanding the Post Implementation and Pre-Project scenario of existing roads. The primary aim was to gather their experience as a group of prime stakeholders of the Road.

The survey team also conducted a test O-D Survey by administering few questionnaires to vehicles owners. The aim was to test the usefulness of Origin-destination (O-D) surveys designed by us. They served to provide a good picture of the trip patterns and travel choices of the region's residents. The formats were subsequently finalized.

Key points that emerge from the Pilot Survey are:

- **According to Mr. H.Patel- Sarpaanch of Kharbao Panchayat:**

√ Very angry about the attitude of the Private Player. Along the road side about 10-12 Gram Panchayats with 25 villages are suffering a lot due to the frequent accidents caused by the badly maintained road surface.
√ Extreme water logging during the raining season makes the area waterlogged leading to unhygienic conditions that affects daily life.
√ The Private players do not invest anything for road repairing as per needs.
√ Private Players do not pay any attention to the development of the drainage system, so during monsoons, sanitary articles and garbage is everywhere.
√ Due to the poor condition of the Road divider at several pockets, indiscriminate crossing is encouraged leading to frequent accidents.

- **According to the Auto-Rickshaw Association:**

√ The members of the Association have also lodged complaints against the Private Player.
√ Due to the poor pavement conditions, drivers face a lot of problems, and are not able to drive safely
√ Due to rough driving by larger vehicles, and broken dividers at many points, auto drivers fear for their safety
√ Due to the poor shoulder condition, during evenings, accidents occurred frequently.

- **According to Assistant Inspector of Traffic:**

√ Due to Private Player's unwillingness to do repairs, traffic jams occurred frequently. These were particularly aggravated during the post monsoon season.
√ The monitoring system by Private Players is very poor. Nobody visited the site in the last couple of months. Unless a major chaos is created, nobody visits the field for monitoring the work even after notice has been served by the Police 2-3 times. The authorities also do not take positive remedial action.

√The local people and the Traffic department also used to send official letters to the authorities repeatedly, but no one took responsibility for corrective action.

During the discussion with Higher Officials in the Public Works Department (PWD), we came to know that about 18 BOT Road projects are functioning in Maharashtra. In years of 2014 and 2015, about 30 and 9 BOT respectively projects have been terminated by official declaration of the Chief Minister. Therefore, the method of sample selection has been framed by geographical presence of the 18 BOT projects, which are:

Table 1 – List of PPP BOT projects

Project Name	Region	Circle	Division	Lengthof Rd(Km)	Date of commencing toll tax	Tax closure date as per tender
Construction of bridge at South and North Kalshi on Thane-Bhiwandi-Vadpe road, km 0/000 to 8/090 under privatization	Mumbai	Thane	Thane	8.09	17/11/11	27/11/32
Reconstruction to 4 lane road between Chichoti kaman anjura fata and maankoli, km 0/000 to 26/425under privatization	Mumbai	Thane	Thane	26.425	20/01/12	27/11/33
Reconstruction to 4 lane and Development of road between Manor to Wada and Wada to Bhiwandi to km 89/070 (total length 64.320 km) under privatization	Mumbai	Thane	Thane	72.22	2/3/2013	10/4/1939
Reconstruction of road between Ahmadnagar and Aurangabad, km 120/200 to 155/600 to 4 lane and km 155/600 to 162/000 to 3 lane under privatization	Nashik	Ahmadnagar	Ahmadnagar	41.8	4/5/2018	18/12/2018
Reconstruction to 4 lane road between Ahmadnagar and Aurangabad, km 162/000 to 224/600 (Aurangabad to Wadala circle) under privatization	Nashik	Ahmadnagar	Ahmadnagar	62.6	2/3/209	12/12/2031
Reconstruction to 4 lane road between Kopargoan and Ahmadnagar, km 120/000 to 175/530 under privatization	Nashik	Ahmadnagar	Ahmadnagar	55.53	23/09/11	28/06/19

Reconstruction to 4 lane and strengthening of road between Pune and Ahmadnagar (Shirur to Ahmadnagar), km 64/000 to 120/400 under privatization	Nashik	Ahmadnagar	Ahmadnagar	58.6	16/01/10	19/04/26
Improvement of road between Malegoan-Manmad-Kopargoan, km 95/00 to 170/600 under privatization	Nashik	Nashik	Nashik	75.6	12/07/07	11/10/2025
Reconstruction to 4 lane road between Aurangabad Jalna road (km 10/400) and Zalta Walan road (km 00/000 to 1/850) and Beed Walan road (km 292/500 to 305/650)	Aurangabad	Gabad	Aurangabad	65.8	28/07/09	31/07/30
Reconstruction of road between Nanded and Narsee, km 264/000 to 307/000 to 4 lane and Narsee-Deglur to state border, km 307/000 to 341/700 to 2 lane under privatization	Aurangabad	Nanded	Nanded	77.7	4/6/2013	2/1/11/36
Reconstruction of road between Shirur Tajbandh-Narsee to 2 lane and Narsee-Biloli to state border, km 0/00 to 105/200 to 2 lane with paved shoulder under privatization	Aurangabad	Nanded	Nanded	105.2	18/01/14	17/11/36
Reconstruction to 4 lane of road Jalna Watur, km 69/000 to 114/300 under privatization	Aurangabad	Gabad	Jalna	45.3	11/01/11	19/11/39
Reconstruction to 2 lane of road Malkapur-Buldhana-Chikli in Buldhana district under privatization	Amravati	Kola	Buldhana	70.67	25/07/08	28/05/26

Reconstruction to 4 lane of road Jaam-Warora-Chandrapur-anjura, km 0/000 to 40/000 under privatization	Nagpur	Chandrapur	Chandrapur	40	26/07/12	4/4/1941
Reconstruction to 4 lane of road Warora Chandrapur Vamni, Warora to Chandrapur km 40/000 to 83/400, Chandrapur to Vamni km 94/000 to 107/800, Chandrapur Walan road km 0/000 to 5/200 and state road under privatization	Nagpur	Chandrapur	Chandrapur	64	26/12/14	2/1/1941
Strengthening and improvement of road Sion Panvel, km 140/690 to 115/800 under privatization	Mumbai	Chembur	Kurla	23.09	6/1/2015	30/10/28
Improvement of road Prakasha-Chadvel-Samoda-Vinchur (Dahiwel to Chandwad km 80/000 to 139/700 and 154/200 to 174/400 and Bhabadbari to Saogras fata km 00/000 to 7/000) and Satana Dahiwel side road construction under privatization	Nashik	Nashik	Malegoan	86.9	22/05/05	18/12/21
Reconstruction of road Nashik-Nifad-Yewla-Waijapur-Aurangabad to 4 lane (km 155/300 to 179/000) and km 235/00 to 251/300 to 2 lane with paved shoulder and additional railway bridge construction at Shilapur under privatization	Nashik	Nashik	Nashik	40	21/01/10 (Shilapur) 23/04/12 (Andarsul)	16/12/37

For the sample survey, we have selected one BOT road project from each region. Within each region, we have selected the road that is closest in length to the average road length within that region. Thus, 5 roads in 5 regions have been chosen for primary survey. As an example, in the Mumbai Region, four roads feature in the above list with lengths 8.09 KM, 26.42 KM, 72.22 KM and 23.09 KM. The mean road length is 32.5 KM. Hence, the project road named 'Reconstruction to 4 lane road between Chichoti Kaman Anjura Fata and Maankoli, km 0/000 to 26/425under privatization' under the Thane Circle with a length of 26.42 is selected. The remaining 4 roads have been selected using the same rationale.

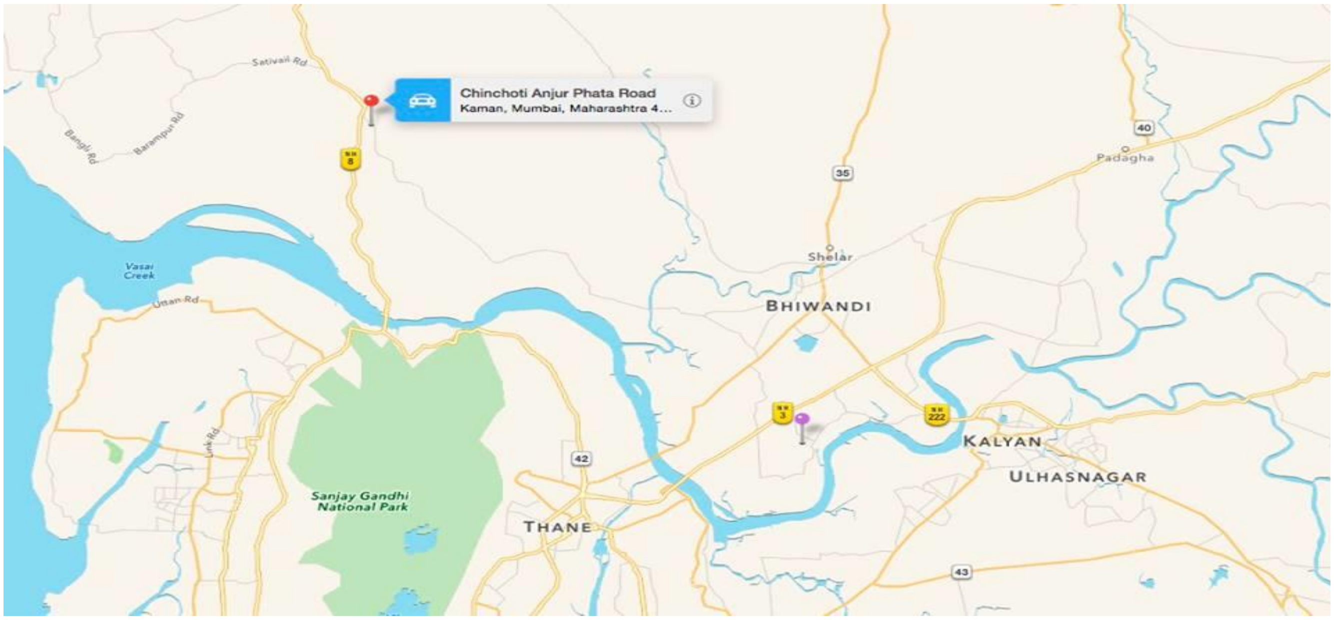
Besides, on request by the department, we are also considering a sixth road, namely 'Strengthening and Improvement of road Sion Panvel, km 140/690 to 115/800 under privatization' under the Chembur Circle.

The following is the list of the roads selected

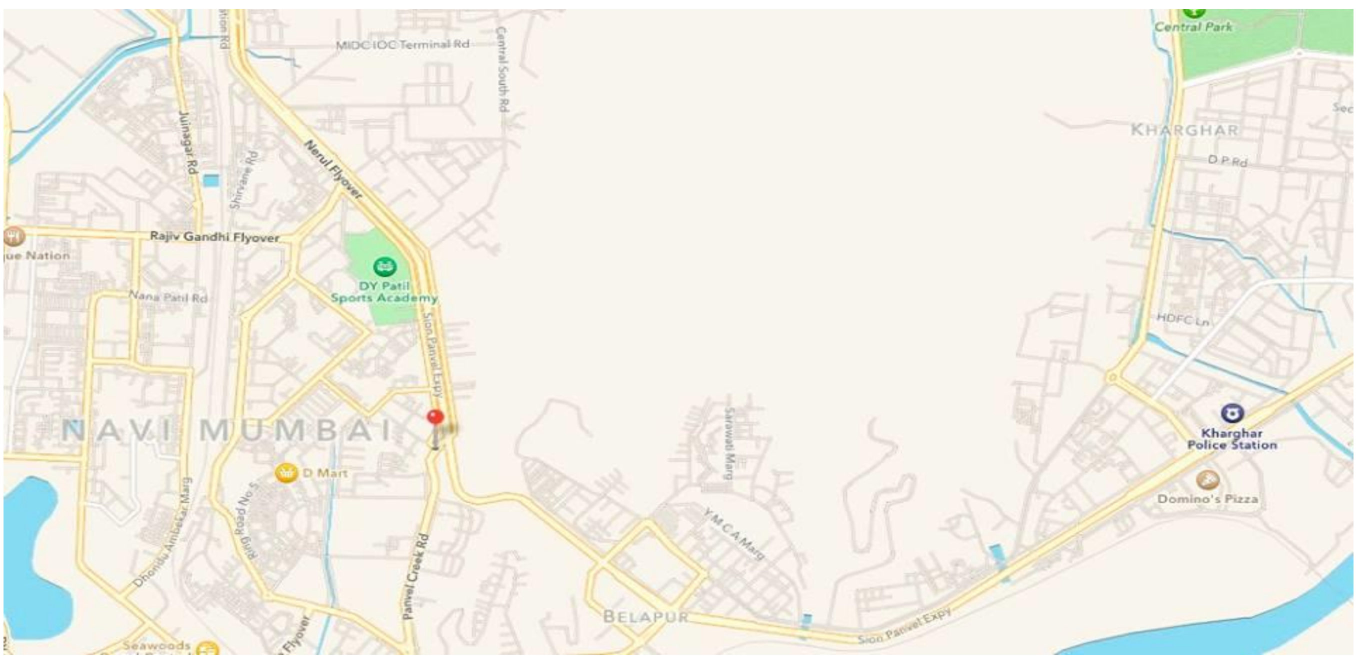
1. Road A: Road between Chichoti Kaman Anjura Fata and Maankoli
2. Road B: Sion Panvel Road
3. Road C: Malkapur-Buldhana-Chikli Road
4. Road D: Road between Ahmadnagar and Aurangabad
5. Road E: Road between Nanded and Narsee
6. Road F: Wrora-Chandrapur-Vamni Road

MAPS

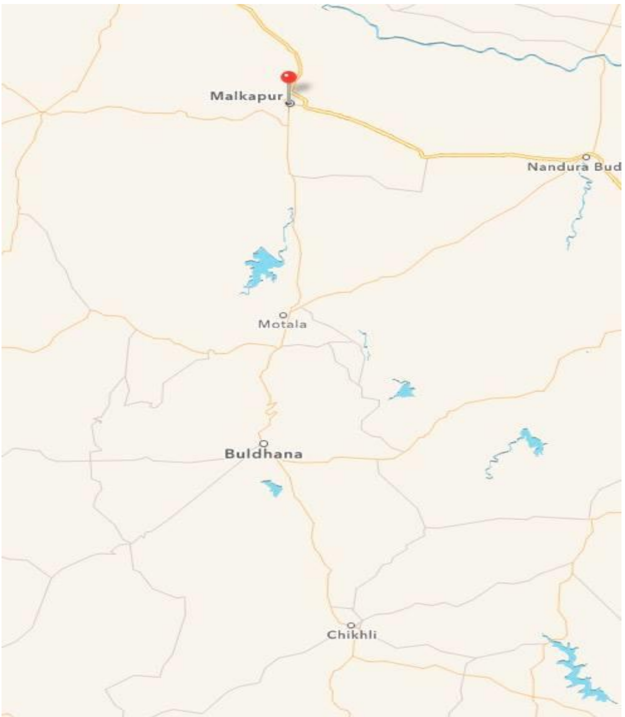
Road A



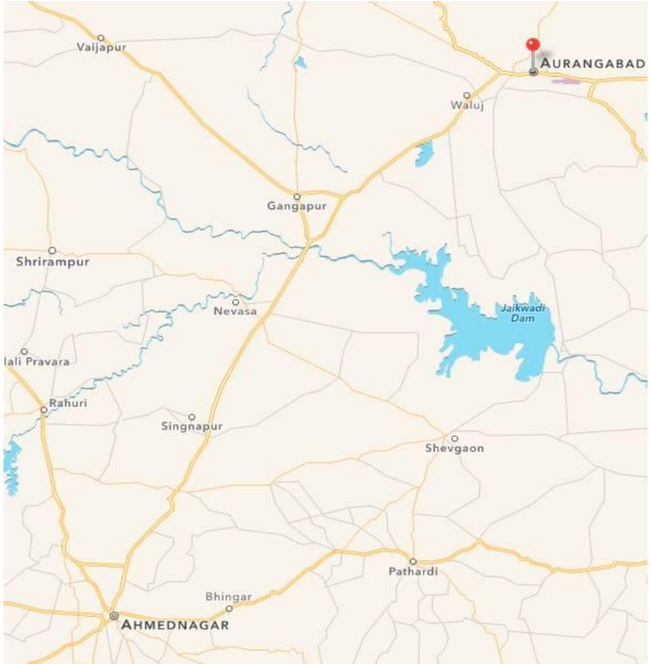
Road B



ROAD C:


Malkapur
Nandura Bud
Motala
Buldhana
Chikhli

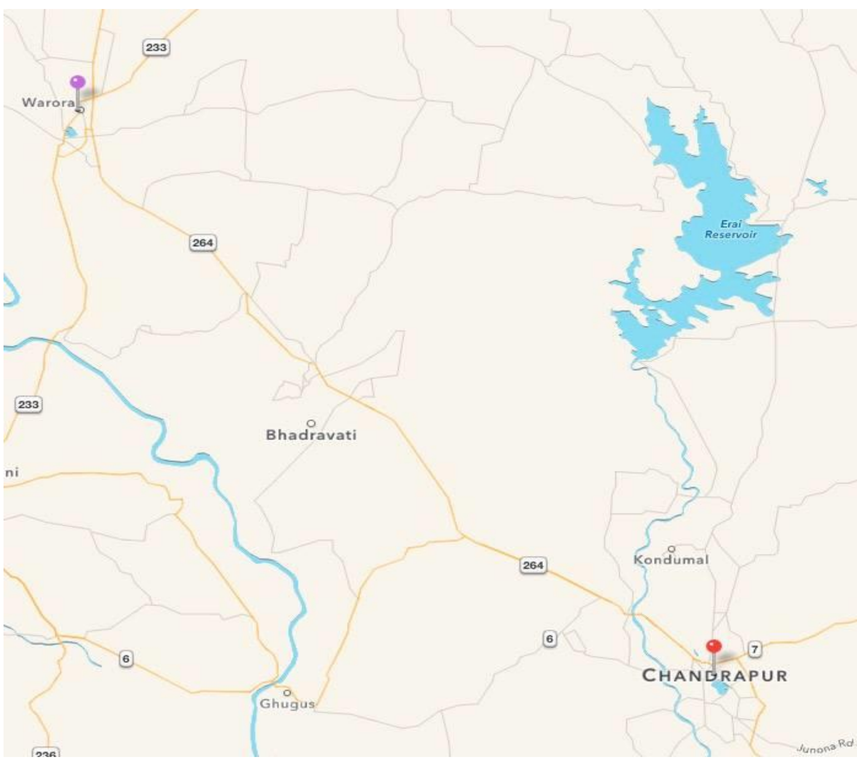
ROAD D:


Vaijapur
AURANGABAD
Waluj
Gangapur
Shrirampur
Nevasa
Jaikwadi Dam
lali Pravara
Rahuri
Singnapur
Shevgaon
Pathardi
Bhingar
AHMEDNAGAR

ROAD E:

Sinnar
Shirdi
Jalna
Hingoli
Palghar
Igatpuri
Vada
Gangapur
Kalamnuri
Shrirampur
Ambad
Partur
Jintur
Sangamner
Nevasa
Maharashtra
Shahapur
Singnapur
Shevgaon
Basmath
Parbhani
Thane
Kalyan
Gevrai
Pathri
Mudkhed
Ambegaon
Junnar
Pathardi
Majalgaon
Navi Mumbai
Ahmednagar
Nanded-Waghala
Sonpeth
Parner
Bid
Mumbai
Uran
Dharur
Parli
Khalapur
Shirur
Ashti
Patoda
Pen
Kaij
Ambajogai
Ahmadpur
Mukher
Alibag
Shrigonda
Pune
Karjat
Kallam
Mulshi
Daund
Bhum
Latur
Roha Ashtami
Haveli

ROAD F:



233
Warora
264
Erai Reservoir
233
Bhadravati
Kondumal
264
6
7
6
Chandrapur
Ghugus
Junona Rd

6. Survey Findings

For the purpose of the study, we evaluated the existing condition of roads through an Inventory survey.

For financial assessment, we tried to assess the financial attributes of the Private Players according to their Bid proposals and the employment they generated as a result of the project.

We also sought to understand the views of public officials and private players on BOT projects through a pre-designed questionnaire. Our assessment reflects the data provided to us.

6.1. Road A: Road between Chichoti Kaman Anjura Fata and Maankoli

Table 2.1 – Project details for Road A

Cost of Project (Rs. Crores)	120.51
Duration	24 yrs. 3 months
Date of Approval by Govt	19-06-2008
Date of work order	28-08-2009
Date of completion	07-01-2012
Date of commencement of Toll	20-01-2012
Tax closer date as per tender	27-11-2033

State Highway connects NH8 at the location name 'Chinchoti' which is the northern end point of the stretch. And at the southern side, the sample road connects to NH3 (Nashik – Mumbai National Highway) at Mankoli Junction. The stretch length is 26.425 km. Along both sides of the sample stretch (Major Road High way IV), it is mostly hilly area with nearly 25 villages. Due to hilly area, the primary occupation of village dwellers is day labour.

Before 2012, the sample road had two lanes. Presently, the Maharashtra Government has awarded the Private Player 'Suprime Infrastructure Ltd' for converting it to a 4 lane and for maintenance & Operation till 2033under the scheme of PPP model. Previously, it was under control of another player 'IRB', then 'Bul Infrastructural Pvt. Ltd and finally 'Suprime' is in operation from April2013and is also allowed to collect toll in accordance with the notification by PWD on 19th January 2012. In this regard, the private player introduced 4 collection counters across both sides of the traffic. As per the official order, all private vehicles are exempted from paying toll since June 2015; only goods vehicles pay tax for travelling the stretch.

In addition to the sample road (MSH4), another State Highway (SH84) also goes parallel to Road A with good pavement condition, but the length is nearly 80 km as it zigzags the distance. It is narrower than the sample road and passes through densely populated localities. The distance of zero point on NH8is about 10 km away from Road A's zero point. Further, there is parallel road that is further away from Chinchoti (about 50 km away) and its length is nearly 100 km. Its surface condition is poor.

6.1.1. Pavement Condition of Road A

In the II Phase, the widening of 10.50 meter C.C. pavement to 4 lane C.C. pavement i.e. 15.00 meter carriageway is to be done from Ch. Km.22/600 to 26/425(Anjurphata to Mankoli Junction) *(Reference : page 24,, Section-IV, form- P, Volume-II)*

Except for a 150 m concrete stretch under construction, the remaining is a bituminous road; frequent patch work is found. Due to an unnecessary curve, the particular stretch becomes narrow-about7 meters in width at two locations. From 0 point to 'Anjuphata' the road has4 lanes but for the remaining stretch from 'Anjuphata to 'Maankoli' junction, the pavement condition is very poor and the road is quite narrow with only a 7 m width. Road A's surface condition is not good, and this directly affects vehicles, as accidents occur at different pockets.

6.1.2. Existence of Shoulders and Lane Marking

In terms of shoulder, the private player has not constructed the road edges on both sides. Due misalignment of the road, the width of shoulder becomes unnecessarily large as it overlaps the road pavement. For a certain stretch, in the absence of a shoulder, the edge of road surface is broken and therefore prone to accidents. Lane marking is very important for vehicles. For 0 point to Toll Plaza, lane markings are not properly visible and at certain stretches, they have either vanished or have not been done. However the stretch to the north of the Toll Plaza is quite good.

1.50 meter width compacted with hard murum. 5% camber to be provided for the side shoulders. *(Reference: page 13, Section-IV, form- P, Volume-II)*

6.1.3. Road Divider and Speed-Breaker

The condition of the road divider is very poor. The average height of divider is not more than 2 feet and average width is 3 to 3.5 feet. In the southern part of the road stretch (from toll collection point to 0 point) the divider is broken at 100 m intervals (on average) and so the vehicles take U-turns unofficially and indiscriminately, whereas, in the northern part of the road the condition of the divider is quite good. Though divider is constructed with concrete, the input materials are not up to the mark. Where the village road connects with Road A, 3 speed-breakers are present, but are not done properly as per the IRC S772-PP project guidelines. Smoothness of speed breakers and their alignment is highly inconsistent at various locations; height is very low, so vehicles may pass through with a 40 kmph speed.

Nothing specific is mentioned in the Bid document/ proposal.

6.1.4. Distance Pole and Notification of Speed Limit

Except in 3 locations in the northern part of the stretch, Distance poleis absent all throughout the stretch, and the private player has not provided distance markers anywhere.

According to guidelines of IRC, a speed limit notice is essential before a populated zone, but speed limit notices are not found except in 2 locations on the northern side where the road is slightly curved.

Not specified in the scope but Cautionary Boards/ Mandatory sign Boards=200 Numbers including all notifications. *(Reference: page 23, 27, Section-IV, form- P, Volume-II)*

6.1.5. Drainage Facility along the roadside

In the absence of a drainage system, the adjunct villages suffer heavily during the rainy season. We have identified piped drains at few locations but the condition is very poor. There is no scope for water to pass through as they are full of waste. The private player has not engaged sweepers for cleaning the drains on a regular basis. Also, some pockets of road side are being used as dustbin where habitants throw waste articles, creating epidemics.

There are total 8 nos. of existing slab drains at different change, proposed to be widened to 21 meters and length 52.15 in different section. The P.C.C. M-10 grade 15 cm thick shall be provided for foundation concrete. The grade of concrete shall be C.C. M-20 for abutments and piers and R.C.C. M-30 for slabs, caps, kerbs*(Reference: page 14, Section-IV, form).*

6.1.6. Street Light and night vision Camera

Except where other roads connect on both sides of Road A, the entire stretch has no street lights, though electric pillars are available everywhere.

Inside the toll plaza, night vision camera is present but the number plates of some of the vehicles are not clearly visible due to powerful head-lights of vehicles which disturb the photography. Therefore, addition streetlights are essential before the entry point.

Shifting of electrical poles along with supply lines transformers etc. for both the section (1) Chinchoti-Anjurphata Km.22/600 to 26/425(about 115 Poles) is to be done *(Reference: page 21, Section-IV, form- P, Volume-II)*

6.1.7. Other Notifications

Around 1000 mt ahead of the toll plaza, a notice saying 'Toll Plaza Ahead' is visible. Also just before 50 mt from Toll Plaza, a notice Board about toll charges by vehicle type is clearly seen at the both side of the road.

The notification of 'Accident Pone area' is not found in spite of frequent accidents occurring within the stretch as reported by local people.

Section-1 Km.0/00 to 22/600, a) Road information Board=40 Numbers, b) Junction Boards=32 Numbers c) Cautionary Boards/ Mandatory sign Boards=200 Numbers, d) Route Marker Board=07 Numbers, in addition as per requirement boards may be provided where the height of embankment is more than 2.50 meter as per relevant I.R.C. Code *(Reference: page 23, 27, Section-IV, form- P, Volume-II).*

6.1.8. Essential Facilities near Toll Plaza

In accordance with the tender, private players have to have the essential facilities near the office site – such as ambulance, crane, toilet and drinking water facility, first-aid box and other essential phone numbers. But unfortunately, the survey team didn't find an ambulance or a crane near the office location. The toilet facility is unhygienic. The facility of drinking water is not for public use (only for office). No specific sign board was found that would help a person to locate these facilities near Toll Plaza.

Existing Toll Plaza at Ch.13/600 near Malodi village shall be demolished. The Concessionaire shall construct New Toll Plaza as per model Toll Plaza booklet published by P.W.D. Govt. of Maharashtra at Ch.13/600. The concessionaire shall make necessary arrangements for electrification of Toll Plaza, Water supply, sanitary facility, Telephone lines and Computerization at his own cost.*(Reference: page 21, Section-IV, form- P, Volume-II)*

6.2. Road B: Sion - Panvel Road

Table 2.2 - Details of Road B

Cost of Project (Rs. Crores)	**1220**
Duration	**17 yrs. 5 months**
Date of Approval by Govt	**09-08-2010**
Date of work order	**30-05-2011**
Date of completion	**29-09-2014**
Date of commencement of Toll	**06-01-2015**
Tax closer date as per tender	**30.10.2028**

The Private Player Sion Panvel Tollways Pvt. Ltd was awarded by the State government in 2010 for strengthening and improvement of this road with 23.09 km under supervision of two sub-divisions as 'Road Development VIII' and MBC sub-division I. This is a major connecting express highway, named Mumbai-Pune highway from Chembur to Pune. The Highway starts from the B.A.R.C junction on northern side and at the southern side the road ends at Kamboli Junction. There is no alternative road for Road B. So traffic pressure is very high as compared to other BOT project roads in Maharashtra. There are around 10 important intersections on the road like Nerul, C.M.L.R, Sanpada, Vashi, etc. along this stretch.

In 2016-17, the PWD spent around one crore rupees, for maintaining the road during the post monsoon session from the 'Risk and Cost of concessional M/s. SPTPL' fund due to wilful negligence by entrepreneur, and since during this financial year PWD has carried out / is carrying out pre-monsoon and monsoon activities, the expected expenditure would be around 7 crores. The total project cost is 1220 cores but till today the expenditure incurred by Private Player INR 941 crores as reported by PWD.

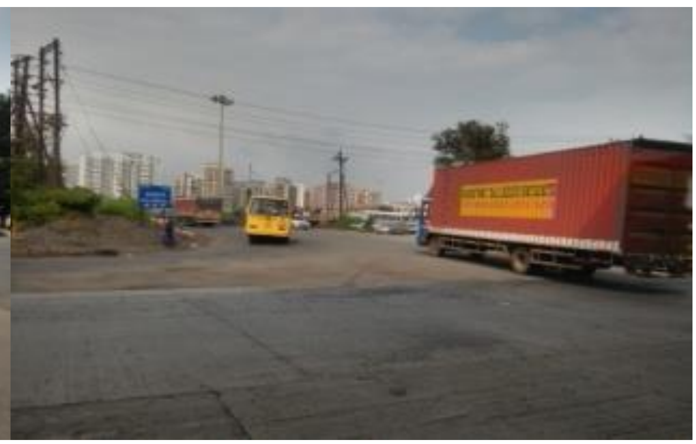
As there is a legal conflict regarding the repair and maintenance of Sion Panvel road by private player SPTPL (the two scam cases under jurisdiction of the Bombay high court), the agreement copy has not been provided to our research team by PWD officials. A proposal for the Navi Mumbai Municipal

Corporation (NMMC) to take over a 14 km stretch out of the 26 km of express high way for maintenance and repair works is under consideration. Further, officials have reported that 96 accidents in this stretch till July 2017 have occurred due to the poor road condition. Yet, no action has been taken by SPTPL in this regard.

About 20% of goods traffic (estimated) uses a service road for avoiding SPTPL toll. There are two roads that make this possible - one goes towards port via Uran which is much closer from Vashi toll plaza (about 10 KM away) and another one is very close to SPTPL toll.

6.2.1. Pavement Condition of Sample road

At the Chembur junction, Ch-0/000, the pavement condition is very poor; it has deep potholes.



6.2.2.Existence of Shoulders and Lane Markig

For around 40% of the stretch, no Shoulder is found; otherwise, most of the stretch has a Shoulder in good condition. But as far as lane marking is concerned, it is absolute hazy at frequent stretches. It is also noticed that there is no bus bay near to the bus stand.

6.2.3.Road Divider and Speed-Breaker

Everywhere the condition of Road divider is fine as per CC articles. The average width of divider is about 3 ft.

6.2.4.Distance Stone and Notification of Speed Limit

Distance stones along the road side are found at proper locations and notification of speed limit is also posted at several places. However, no speed limit notifications were observed near road crossings and accident prone areas.

6.2.5.Drainage Facility along the roadside

Due to existence of creek pockets along the road side under the forest department, there is no such scope to develop a drainage system. Otherwise, the remaining parts of the stretches are covered by slab drain.

6.2.6.Street Light and night vision Camera

All along the Express way, light posts are installed 50 at meter intervals. CC cameras are also installed at entry points of all toll plazas.

6.2.7. Other Notifications

There is one hospital along the road side but there is no notification for it anywhere on the road stretch. Other indicators required as per the norms, such as those for road crossings, sharp turns, speed breakers, etc. are also absent.

6.2.8.Essential Facilities near Toll Plaza

All essential facilities are available at the toll plaza. Ambulance, crane, separate toilets and drinking water facility are available, but notifications of such facilities by which public can identify them easily are not properly visible. The first aid box is also well equipped.

6.3. Road C: Malkapur-Buldhana-Chikli Road

Table 2.3 - Project details for Road C

Cost of Project (Rs. Crores)	42.81
Duration	19 yrs. 8 months
Date of Approval by Govt	28.7.2006
Date of work order	29.9.2006
Date of completion	17.7.2008
Date of commencement of Toll	25.7.2008
Tax closer date as per tender	28.5.2026

Nearly 2 km from the Taluka Malkapur, one part of Road C connects with NH6 at Malkapur and other part of sample stretch connects at the junction of Chikli. Malkapur is at the northern end of the road and is a populated city; Chilki is that the southern end of the road. Earlier, the sample road had1.5 lanes and it was converted into 2 lanes with 14 m width on both sides. The stretch length is 70.67 km. Nine villages are located on both sides of the road. Along the road, there are 13 Educational Institutions and 3 Hospitals. The primary occupation of village dwellers is cultivation. Before 2008, the Public Works Department had invited a tender for development of these roads but no professional player had participated. Fortunately, the 'Buldhana Urban Cooperative Credit Society Ltd' showed an interest in taking up the project, in spite of its lack of experience in this field.

The said Society has a lot of experience in construction of godowns for farmers, development of educational institutes, health facilities and other social development works across the country. The society also gives loans to farmers at 14% interest rate.

6.3.1. Pavement Condition of Sample Road:

Apart from the sample road (MSH13176), another major highway from Jalna to Nagpur (shorter than the sample road) has been recently developed and paved. So, a certain amount of traffic uses MH12. Today, the project road is announced named as NH753A.

Expect in two pockets, (CH-1.500 to 1.850 & from CH-24.600 to 27.000), the pavement of bituminous road is satisfactory with a smooth surface. At the certain stretch, the road expands into 4 lanes at Malkapur and Buldhana from CH-2.130 to 3.230 and CH-45.000 to 50.000. An approximately 5 km stretch, where the road goes through hills, the surface of the road is extremely good.

5.50 mtr x 5, 7 mtr x 58.28, 10 mtr x 2, 14 mtr x 2, 14 mtr x 6.39-Black Toping Road. *(Reference: page* 2 in brief note*)*

6.3.2. Existence of Shoulders and Lane Marking

Due to adjunct villages at both sides of the road, the Shoulders have been constructed by murum at some stretches but at most of the locations, Shoulders are not properly constructed. Except near the toll plaza, bay marking is not found along the 4 lane pockets; even in the 2 lanes stretch, about 30% of the length is not marked properly.

Hard murum blanketing-15 cm thick compacted. 1.50 meter width compacted to hard murum.*(Reference: page* 2 in brief note*)*

6.3.3. Road Divider and Speed-Breaker

The road divider is present along the stretch from Malkapur City to Wakodi Phata (1.44 km).The stretch is of 4 lanes and another stretch of 5 km length in Buldhana city divides the road length (15 mt) by concrete divider. It is also seen that most of pockets are broken and are under poor condition. There are frequent breaks in the divider; vehicles can take U-turns within 50m length of the road. This is unnecessary and increases the probability of accidents. The average height of the guard wall of divider is very low (1.5 feet).

More than 60 speed-breakers have been identified at different locations. Speed breaker at the entry points of villages and junction points did not have any bay markings.

6.3.4. Guard-Wall

For about 5 km road moving upon the hill, the guard covers about 80% of length. At all turning points along the said stretch, the guard wall is being constructed properly. The average height of the wall is about1.5. mt.

Guard Wall with average height: 1.50 m; Length: 20130 m; Foundation: M-10 Grade Concrete 150 mm thick; Retaining Wall: M-10 concrete as per detailed drawing with holes in PVC pipe of 100 MM diameter. (Ref: Brief note MAL-BULD-CHIKH ON DT 25-04-2014, page 4).

6.3.5. Distance stone and Roadway Indicators

Distance stones have been found at 2 km intervals but a few stones have not been properly observed as they are covered with tree heaps.

Turnings are well indicated throughout the stretch. Also only 4 indicators of 'Speed Limit' were found before intersections and in populated areas on the entire stretch, which is not adequate, given the total number of intersections and populated areas on the stretch. Not a single indication of Accident Prone Area was identified throughout the stretch. The proper indicators for road intersections and for U-turn were not found except at two or three locations. Other than these, some curve indicators and other subjective indicators are found along the road.

√ Road marking with thermo plastic materials as per IRC Specifications.

√ All requisite cautionary & mandatory sign boards, roads hazard marker with reflective symbols, roads junctions & information boards etc. as per IRC specifications.

√ 5 th Km stones, Km stones, 200 mtr stones Guard stones, Boundary Stones with pedestals to be provided.

√ Roadway indicator made of M.S. Hollow pipes of size 98 mmx48mm of 3.00 mtrs with two coats of zink chromate stoving primer and two coats of Black colour stoving finish with 3 bands of Retro-Reflective Length 1070 Rmt.

√ 16 numbers busbays.*(Reference: page* 5 in brief note*)*

6.3.6. Drainage Facility along the road side

Drainage facility was found to be partially constructed for a 200-300m stretch near the toll plazas. Since there is plantation on the embankment on both sides of the road, there is no such scope for channelling drainage facility. Also, there are encroachments on both sides of road in and around areas where there is habitation. The private player and PWD have never attempted to remove these for further development.

R.C.C. drains-3000 meters on Buldana-Chikhali and 1500 at Ajanta Road. Excavated drains are to be provided wherever required. *(Reference: page* 3 in brief note*)*

6.3.7. Street Light and night vision Camera:

Street lighting is present throughout the entire road stretch. In a few pockets of Buldana & Malkapole city, the municipal corporation has introduced electric poles on the road dividers. Also a few electrical poles were seen just before the toll plaza.

The Toll Plazas have night vision cameras at every entry road. However, CCTV cameras were not found anywhere on the road during the physical visit. All Electric & Telephone Poles within the land width have been removed and shifted by Entrepreneur with the permission of concerned department.

Reference: Page 6 in brief note

6.3.8. Other Notifications

There are no indicators for accident prone areas. Notices indicating 'village ahead' are not found anywhere; even curve marking is not properly implemented along the road side. More than 10 education institutes are located adjoining the road. Notifications of speed limit and other indicators are absent throughout the stretch and are urgently required.

√ All requisite cautionary & mandatory sign boards, roads hazard marker with reflective symbols, roads junctions & information boards etc. as per IRC specifications.*(Reference: page* 5 in brief note*)*

6.3.9. Essential Facilities near Toll Plaza

According to work scope, the private player provides all supporting amenities i.e. ambulance, crane, first-aid box, separate toilet and drinking water facility near toll plaza.

It is also noticed that the private player has planted more than 3000 trees along both sides of the road, which makes the soil on the embankment stronger.

Nothing specific is mentioned in the Bid document/ proposal.

6.4. Road D: Road between Ahmadnagar and Aurangabad

Table 2.4 - Project details for Road D

Cost of Project (Rs. Crores)	**190.21**
Duration	**24 yrs. 8 moths 17 days**
Date of Approval by Govt	**21.11.2006**
Date of work order	**15.03.2007**
Date of completion	**26.02.2009**
Date of commencement of Toll	**2.3.2009**
Tax closer date as per tender	**12.12.2031**

The project road is a part of the total stretch of SH60 which starts from Aurangabad in North, and in southern side, the road connected with highway goes towards Ahmadnagar /Pune. Previously the title of project road was SH60 but recently it has been changed to MSH5 under the jurisdiction of World Bank Project Sub-Division-II, of PWD, Nashik.

The total length of SH60 is 104.2 km, eventually distributed between two private players for improvement of 4 lanes. The southern part of the total stretch under 'Ashok Build Con' is about 42 km from DSP Chak to Vadala village. The remaining part, which is selected as sample, is under 'KT Infrastructure (I) Ltd'. It starts from "Vadala" village (CH-162.000) and ends at Ahmadnagar crossing (about 62.2 km). Both stretches have been developed in 2007 and the renewal year was 2016. In all respects, the northern part of the stretch under Ashok Build Con' is much better rather the than sample stretch.

Within the sample stretch, there are 4 intersections with heavy goods traffic bifurcated. One major cross road is 'Link road', which is very a important roadway from Mumbai to Nashik. After using part of the sample road, most of the goods traffic turns towards Mumbai port at a point around 5 km from Toll of 'Ashok Build Con'.

6.4.1. Pavement Condition of Sample Road

At points of the chainage- 203.500 and 206.500, location-Dehegeon and Solagaon, the pavement condition is poor, otherwise it is good. The entire stretch is a bituminous road. Even though the renewal period expired in 2016, about 26.7 km stretch is yet to be renewed. There are around8 villages on both sides of sample road. The primary occupation of the villagers is farming.

6.4.2.Existence of Shoulders and Lane Marking

In a few stretches, the shoulder is not visible, tall grass has grown the shoulders. From the ch-173.00 to 174.00, there is no shoulder found. As in most of places the shoulder is full of mud, it becomes an adverse situation for pedestrians. Also, the shoulder is abnormally pressed down from the edge of the pavement. Bay marking is not found even at crossings. In a few sections, a hazy marking is observed. Marking on the edge of the side lane is entirely absent throughout the stretch.

6.4.3.Road Divider and Speed-Breaker

At most of the locations, the road divider is broken and unnecessary breaks for turning are found. The height of the divider is maximum 6 inches made of concrete.

About 10 speed breakers are found throughout the stretch and are in good condition. But unfortunately, there are no markers along the speed breaker, which makes it troublesome for drivers to identify them in the dark at night.

6.4.4.Distance Stone and Notification of Speed Limit

Inside the city stretch, distance stone was not found easily, but in remaining predominantly rural stretches, distance stones are found. The notifications of speed limit are rarely found; they are not adequate and not in proper locations.

6.4.5. Drainage Facility along the road side

Near the toll Plaza, for about 200 m, an underground drain is observed (Cg-177/400 to 177/600), but the remaining part of road has no drains along the sides.

6.4.6.Street Light and night vision Camera

The entire road stretch has no street lighting. Only few poles have been seen near the toll plaza but with dim lighting. Also a few city stretches have street lights. Inside the toll plaza, CCTV cameras are present at every entry point but the quality of CC cameras is not good, so the quality of recording is very poor especially in night time.

6.4.7.OtherNotifications

There are adequate and well placed indicators giving names of locations. Approaches to bridges have notifications about the bridges. In evening time, there is heavy congestion on the stretch from Sirco junction to end point of projected road (towards Aurangabad). It takes at least 15 minutes to cross the intersection. Signalling system at the Sirco Intersection is being regulated properly. Overall, indicators and notifications are fairly good but not up to the mark.

6.4.8.Essential Facilities near Toll Plaza

Ambulance and crane are not available near toll plaza. Drinking and toilet facility is available at one toll plaza. There is no electronic scroll board in place. A police tent was identified near the toll plaza, but not a single police personnel was present during the field visit.

6.5. Road E: Road between Nanded and Narsee

Table 2.5 - Project details for Road E

Cost of Project (Rs. Crores)	**238.79**
Duration	**25 yrs.**
Date of Approval by Govt	**1.1.2011**
Date of work order	**3.11.2011**
Date of completion	**27.4.2013**
Date of commencement of Toll	**4.6.2013**
Tax closer date as per tender	**21.11.2036**

The stretch of 43 km between Nanded to Narsee is 4 lane and remaining length of around 34.7 km is 2 lane upto state borders. The entire stretch is a bituminous road. There are toll plazas at Barbada Ch-287.400 and Khanapur Phata Ch-333.200 which have a 3 entry lane at each plaza. There are 37 villages that have quite a number of households located on both sides of the road. Naigaon junction and Narsee road junction are most important intersections where traffic congestion causes long vehicles queues. One famous Shrine named Bidar is situated at the Ch-324.000. An important Industrial complex 'Khanapur MIDC' has been developed at Ch-333.700 and Krishnoor SEZ Ch-293.400 to 295.800. Three major bridges, 19 minor bridges and 10 slabs culverts are found along the stretch.

6.5.1.Pavement Condition of Sample road:

The pavement condition of the sample is good except in 2 or 3 pockets where the curve edges are broken. The carriage way is 7.5 m on both sides with 4 lanes and a 2 m wide road divider. Within the length of sample road, a bridge name 'Kakandi' at Ch-271.400 is in poor condition but it is not under the scope of work. This needs to be developed immediately. In the 2 lane stretch from Ch-307.500 up to Ch-341.700 from Narsee to Deglur state border(34 km), the pavement condition is quite good. Overall the pavement condition is moderate as the road was constructed only 3 years ago.

The paved carriageway shall be 15 meters wide excluding the rest median of 2.0 meter. Except the 4 town ship – Nanded Ch-Km 264/000 to Km 266/000, Naigaon Ch-Km 302/500 to Km 303/700, Narsi Ch-Km 307/350 to Km 308/300, Degloor Ch-Km 338/900 to Km 340/100 with 30 mt carriageway including 2.00 m median and 1.5 m RCC cover drain-Bituminous pave.*(Reference: page* 18,Schedule-B Proposal of Kalyan Keti*)*

6.5.2.Existence of Shoulders and Lane Marking:

Throughout the stretch, the Shoulder condition is not good at all. The shoulder length is 2.5 meter all through the 4 lane road and shoulder height is 0.30 meter. In a very small portion, the shoulder is totally absent. For 2 lanes, shoulders width is 2 mt, made of earthen articles. From Ch-332.000 to 333.000, the shoulder is specified for 2.4 mt near Bidar Village.

Lane marking is properly visible along the 4 lane stretch but the 2 lane stretch has not edge markings at all. In the dark, it is not possible for a driver to identify the edge of the road. Only along the stretch where the road curved, edge marking is found properly.

2.5 m x 2, Earthen Shoulder-length 77.7 km *(Reference: page* 21, Schedule-B Proposal of Kalyan Keti*)*

6.5.3.Road Divider and Speed-Breaker

Throughout the 4 lanes stretch, road divider is found by concrete articles. The average height of divider is 0.30 mt. It is also seen that a small portion of the divider is broken. So, the villagers turn their vehicles for easy communication.

At frequent locations (23 in numbers), speed-breakers cause accident due to their abnormal height. Unfortunately, not a single notification or marking is found for early notice.

The paved carriageway shall be 15 meters wide excluding the rest median of 2.0 meter.*(Reference: page* 18, Schedule-B Proposal of Kalyan Keti*)*

6.5.4.Distance Stone and Notification of Speed Limit

Distance stones in some locations are not properly executed by Private Player as per IRC guideline. Further, some stones are broken and not clearly visible especially in the dark.

Speed limits are clearly indicated on curves in the road, but on the rest of the road, there are no indicators except at 2 points.

Nothing specific is mentioned in the Bid document/ Proposal.

6.5.5.Drainage Facility along the road side

During the field visit, the team found no more than200 m drainage close to the toll plaza. Drainage system is absolutely absent on the rest of the road. Maximum stretch of sample road is adjoining the village end.

4 lanes by Concentric widening with CC drain (5.35km) and 2 lanes strengthening by B.T overlay(72.35 km)*(Reference: page* 21, Schedule-B Proposal of Kalyan Keti*)*

6.5.6.Street Light and night vision Camera

Barring the urban areas of 'Naigaon Takula', 'Narsee Road Crossing' and 'Sankar Nagar' where street light provided by local municipal authority, there is no street lighting on the highway.

CCTV cameras are present at all entry points to the toll plazas; otherwise no street cameras were found on the road.

Not specified in the above said documents.

6.5.7.Other Notifications

A few signs marking towns /villages are found. Signs indicating phone number of nearest Police station and signalling system are also in place. However signs indicating speed limits and turning points are absent.

According to High way norms, Overhead signboards and Overhead Portal signboards nos.2 are proposed along the project road *(Reference: page* 38, Schedule-B Proposal of Kalyan Keti

6.5.8.Essential Facilities near Toll Plaza

Facilities such as restrooms for drivers, drinking water, ambulance, crane and first-aid box are available near the toll plaza. The team also identified a prominent signboard indicating availability of these facilities.

Ch-287/400 near village Barbada Phata and Ch-333/200 near village Khanapur Phata, At Toll Plaza Lighting, Water Supply Communication, Fire Lighting, medical and security arrangement *(Reference: page* 37, 38, Schedule-B Proposal of Kalyan Keti*)*

6.6.Road F: Warora-Chandrapur-Vamni Road

Table 2.6 - Project details for Road F

Cost of Project (Rs. Crores)	**449.25**
Duration	**30 yrs.**
Date of Approval by Govt	**25.8.2009**
Date of work order	**3.1.2011**
Date of completion	**18.8.2014**
Date of commencement of Toll	**26.12.2014**
Tax closer date as per tender	**2.1.2041**

The total stretch of this sample road is divided into two parts. One part of the stretch was developed by the municipality (Ch-83/400 to 94/000). The northern part of the stretch starts from Bami junction, then 5 km of the road is developed by municipality and finally, the southern part of sample road has been introduced again upto Chandrapur- Walan Road. The length of the northern stretch is 43.400 km by ch-40/000 to 83/400.Whereas, the southern portion is 20.20 km (Ch-0.0 to 5/200 for bye pass, and Ch-94/000 to 107/800 and additional 1.2 km). Within the ch-43.400 km ch-40/000, only 0.6 km is CC road and at other Chainage 3 km CC road have been found. The junction called 'Bengali Camp' is a congested T intersection from where the connecting road goes towards Janona Phata-I and the other part goes to Babupit. The other stretch goes towards south, where the sample road started. Within the stretch, two industrial areas under MIDC are being developed as per ch-77/200 that has high potential for good traffic movement.

6.6.1.Pavement Condition of Sample road

At the point of ‘Bhadravati’ junction Ch-62/600, a major sectional rutting has been found, and at the other junction near Chandrapur, a big pothole causes traffic jam. The edge alignment of the road is not good, increasing the probability of accidents. At the approach section of Tadali Bridge Ch-77/200, the pavement condition is very poor.

In the remaining areas, the pavement condition is good enough. A few pockets have been identified by the administration as accident prone zones, namely, ‘Tarki Point Crossing section’, ‘NTPC Gundawar Petrol pump-Vadrabati’, Chinira Phata Warora, MTA colony Bhadravati and other 4/5 points. These are the places where the curve in the road is not properly constructed or there is absence of street lighting.

6.2 Km. widening for 4 lane road by between as treatment and 3.600Km under C.C. pavement. The paved carriageway shall be 70.50 meters width excluding the raised median of 1.20 meter *(reference –page 187 of concession agreement)*

6.6.2. Existence of Shoulders and Lane Marking

Especially at the particular stretch which goes into thecity, the shoulder is not properly constructed and broken at frequent points. The entire shoulder is constructed by earth as most of pockets are broken and big holes create stagnant water and mud, which makes it difficult for pedestrians to move easily but stretch-94.00 to 107/800 is better in comparison with the northern part of road. About two thirds portion of road, embankment is full of mud in disordered layer. Basically, throughout the stretch of 2 lanes, lane marking is not properly drawn. Even bus bay is not found at some points. Marking of speed breakers were not properly identified during site visit. Except the turning curve, at the other part of the stretch, carriage way is not properly marked as vehicles are usually laid down at Shoulder.

> 1.50 meter x 2 for paved shoulder and 1.00 meter x 2 for hard murum shoulder and karb shyness is 0.25 meter *(reference –page 191 of concession agreement)*

6.6.3.Road Divider and Speed-Breaker

Other than a stretch of 500m from the toll plaza, where is there no road divider, the Road F has a road divider as required. However, at certain locations, trees of more than 1.5 m height lean on to the passing vehicles.

Speed breakers are not present at all points of entry into villages and highly populated city areas. In some places, the speed breakers are broken.

> The paved carriageway shall be 70.50 meters width excluding the raised median of 1.20 meter *(reference –page 187 of concession agreement)*

6.6.4.Distance Stone and Notification of Speed Limit

Distance stones recognized present, but in most places they are hidden by roadside bushes.

Indicators marking Turnings are in good condition everywhere. Speed limit signs are present in some locations, but they are absent at critical points of entry into villages and populated urban areas.

No specific documentation is found in Concession agreement about Distance stone.

6.6.5.Drainage Facility along the road side

Slab drains are present on both sides of roads near the toll plazas. At the junction of Bamni Camp and Chandrapur, a section of the slab is breaking due to heavy encroachment. Other than these specific sections, there is no drainage system on the remaining part of Road F.

No specific documentation of road side drainage facility in Concession Agreement. In the agreement the detailing of Culverts stated exclusively in page 200 in Concession Agreement

6.6.6.Street Light and night vision Camera

There are no signals at major intersection. Under municipal areas, certain stretches are equipped with street lights. Also the area near the toll plaza has adequate lighting. The remaining part of the road has no street lighting. It is essential to introduce street light at the points of entry into villages for the convenience of pedestrians.

CCTV cameras are present inside toll booths, but are not in perfect position, so, the quality of picture is hazy. Other than the toll plazas, there are no other CCTV cameras on the road.

Highway lighting shall be provided on central road divider at locations specified in Annex-I, schedule-C page-194, Volume-III of RFP document the poles shall be spaced at 30mtr. C/C. The poles shall have decorative brackets cross type having innovative design with twin marker y. adequate lighting shall also be provided.

6.6.7.Other Notifications:

There are no signs indicating presence of colleges, industrial areas and so on. Speed breaker markings are also absent at some places near the villages. Notification of road crossing, Notification of Accident

Prone Area, Notification of Drive slow, that are required as per the Guideline of IRC, are not found anywhere.

√Bus bays-13, √Pick-up shape-17, √Road Divider with light cutter-63.8Km, √C.C. gutter with footpath-15.99Km *(Reference –page 186 of concession agreement)*

6.6.8.Essential Facilities near Toll Plaza

Though the toll plaza is well decorated, electronic scrolling notification had been mal-functioning for more than 2 weeks. The PWD had not sent any notice to private player for repairing the equipment. The Police administration informed the team that the private player doesn't have ambulance and crane (though one ambulance was noticed during visit). The Toilet facility is available for office use for the toll plaza; it is not open to public. A temporary synthetic water tank with capacity of 25 litres was noticed for office use purpose. The first-Aid Box does not have all the essential items in it.

√300 sq.mtr. the cover area for functional base camp, for administrative, operational, maintenance work. √Equipments and necessary for operational and maintenance work √Workshop √General garbage & repair shop √Parking space for minimum of 4 number of large retail √First-aid (*reference –page 209 & 210*

*The above sections record the observations of the IIMC survey team on the six sample roads. The boxes contain the **requirements** as outlined in the Bid document.

7. Summary Exercise on Observation

According to inventory survey, the research team developed a scale on basis of performance of roads' amenities. The scale has been developed into 5 points like 'Very good' (performance is up to the mark or beyond), 'Good' (Performance is not up to the mark but hopeful) 'Average' (Performance is not good or not bad) 'Bad' (Performance is not in proper) 'Very Bad' (Performance is to be treated as non-performing). Therefore, a table has been developed for understanding the performance rate at a glance of all amenities which have been described above.

Table 3 - Performance rating of existing amenities of sample road-'Major High Way IV'

Amenities	Road A	Road B	Road C	Road D	Road E	Road F
Pavement condition	Bad	Good	Average	Average	Average	Good
Shoulders Condition	Bad	Average	Average	Bad	Bad	Bad
Lane marking	Good	Bad	Average	Bad	Average	Average
Road divider	Bad	Very Bad	Bad	Bad	Good	Bad
Speed – Breaker	Bad	Bad	Bad	Very Bad	Very Bad	Good
Distance Poll	Bad	Very Good	Good	Average	Good	Good
Notification of Speed-Limit	Bad	Very Good	Bad	Bad	Bad	Good
Drainage Facility	Bad	Very Good	Average	Bad	Bad	Bad
Street Light	Very Bad	Very Good	Good	Very Bad	Very Bad	Average
Notice Board regarding Toll Charges	Average	Very Good	Bad	Good	Good	Good
Notification of Accident Pone Area	Very Bad	Bad	Very Bad	Very Bad	Very Bad	Bad
Ambulance Facility near Toll Plaza	Very Bad	Good	Very Good	Very Bad	Very Good	Very Bad
Crane facility near Toll Plaza	Very Bad	Good	Very Good	Very Bad	Very Good	Very Bad
Toilet and Drinking water facility near Toll Plaza	Average	Very Good	Very Good	Average	Very Good	Average

*Road A: Road between Chichoti kaman anjura fata and maankoli, Road B: road Sion Panvel, Road C: road Malkapur-Buldhana-Chikli, Road D: road between Ahmadnagar and Aurangabad, Road E: road between Nanded and Narsee, Road F: road Warora Chandrapur Vamni.

8. Vehicular Traffic Survey- OD

Initially, the proposal was to survey both Passenger Traffic and Goods Traffic. But we could not survey the Passenger cars as there was no way to stop them anywhere within the stretch even at the Toll Plazas. There was a separate lane for Passenger cars at each Toll Plaza for passing through. Therefore, the survey team was not able to take interview from Passenger vehicles. With the help of people at Toll Plaza, we accessed only Goods Vehicles for the OD Survey. Altogether, the team administered pre-designed format (vide Annexure)of about 130 in number among Goods vehicular traffic at the particular stretches in different time periods and dates.

For the sample road of Chandrapur, the vehicular traffic responded at about 20 km stretch only from Chandrapur to Ballalpur as the sample road is divided into two parts in different sections. Another part of the road leads to another section which is from Warara to Bamni. Therefore, we consider the road length of 20 km for the OD Survey according to drivers' perceptions.

8.1.Table showing distribution of Sample

Table 4.1 - Distribution of sample from each road

Road A	Road B	Road C	Road D	Road E	Road F
20	20	20	20	30	20

*Since the road names are lengthy, we are mentioning their codenames here and henceforth, in the manner we have already mentioned before.

We have analysed the key points of the interviews to keep up with our study scope. Therefore, some merger tables, graphs and charts are stated as under. The individual scenario of each road is included in the Annexure.

Table 4.2 - Distribution of Sample by Category

Road	LCV	MCV	HCV	Total
Road A **(**Road between Chichoti kaman anjura fata and maankoli)	8	1	11	**20**
Road B (road Sion Panvel)	6	6	8	**20**
Road C (road Malkapur-Buldhana-Chikli)	10	10	0	**20**
Road D (road between Ahmadnagar and Aurangabad)	7	7	6	**20**
Road E (road between Nanded and Narsee)	3	10	17	**30**
Road F (road Warora Chandrapur Vamni)	7	12	1	**20**
Total	**41**	**46**	**43**	**130**

8.2. Table showing Average time taken by Vehicular traffic for using the sample roads

Table 4.3

Sample Road	Stretch Length (km)	Average time taken to cover entire stretch altogether (mins)	Average time taken by Vehicles type (mins)		
			LCV	MCV	HCV
Road A	26.4	66.25	55	60	75
Road B	23.09	50.7	21.6	37.5	82.5
Road C	70.67	131.7	121.5	142.0	
Road D	62.6	283.5	218.5	317.0	320.0
Road E	77.7	156	90.0	151.0	170.0
Road F	20.0	26.8	23.5	28.0	30.0

From the above table, we can see that for roads with shorter stretch, the average time taken to cover it by all types of vehicles together is less than the average time taken to cover roads with longer stretch. Also, the average time taken by each vehicle type, that is, LCV, MCV and MCV are in increasing order, for each road.

8.3. Table showing Average Speed by Type of Vehicles at sample roads

Table 4.4

Sample Road	Stretch Length (km)	Average Speed by Vehicles type		
		LCV	MCV	HCV
Road A	26.4	28.8	26.4	21.12
Road B	23.09	64.14	36.94	16.79
Road C	70.67	34.90	29.86	*
Road D	62.6	17.19	11.85	11.74
Road E	77.7	51.80	30.87	27.42
Road F	20.0	51.06	42.86	39.99

*Average speed is calculated as Total Length of sample road divided by Total time taken to cover the stretch.

*HCV vehicles passing through Road C are so less in number that the team could not take data from any HCV vehicle in that stretch.

From the table above, we can see that the average speed for LCV, MCV and HCV are in decreasing order, for each sample road. We can also see that average speed of LCV, MCV and HCV is maximum in Road B, Road F, and road F, respectively, and is minimum in Road D.

8.4. Table showing Average fuel consumption by type of vehicles

Table 4.5

Average fuel consumption = Total fuel consumption/ Length of sample road

Sample Road	Stretch Length (km)	Average fuel consumption (altogether)	Average fuel consumption by Vehicles type (litres)		
			LCV	**MCV**	**HCV**
Road A	26.4	5.6	4.0	6.0	6.6
Road B	23.09	7.5	3.5	7.0	11.0
Road C	70.67	13.6	9.0	18.0	*
Road D	62.6	24.0	14.0	29.0	30.6
Road E	77.7	16.6	12.0	14.0	19.0
Road F	20.0	5.0	3.8	5.8	5.0

*HCV vehicles passing through Road C are so less in number that the team could not take data from any HCV vehicle in that stretch.

From the above table, we can see that average fuel consumption by all types of vehicles together is maximum for Road D and minimum for road F.

We can also see that average fuel consumption of LCV, MCV and HCV vehicles is in increasing order, for each sample road.

Table 4.6

Amenities	Road A	Road B	Road C	Road D	Road E	Road F
Pavement condition	Bad	Good	Average	Average	Average	Good
Road divider	Bad	Very Bad	Bad	Bad	Good	Bad
Speed – Breaker	Bad	Bad	Bad	Very Bad	Very Bad	Good

The average fuel consumption in road D is maximum because 26.7 km stretch of the road is yet to be renewed as per 2016 guidelines and is presently in a bad condition. The average fuel consumption in road F is minimum as the condition of pavement and speed-breaker is good here compared to the other sample roads.

8.5. Table showing Availability of adequate parking space, toilet facility and drinking water facility reported by vehicles driver

Table 4.7

Sample Road	Sample Number	Positive Response on availability		
		Parking Space	Toilet Facility	Water Facility
Road A	20	16	0	0
Road B	20	16	1	2
Road C	20	20	2	0
Road D	20	1	1	3
Road E	30	30	1	0
Road F	20	20	0	0
Total	130	103 (79.20%)	5 (3.84%)	5 (3.84%)

The above table reveals that for the particular road named 'Ahamednagar-Aurangabad', parking space is not available along the road side as reported by Vehicles' drivers. In respect of Toilet and Drinking water facilities, mere percentages (3.8%) of drivers either enjoyed or are aware that toilet facility is available. The critical scenario found for Thane and Chandrapur is that there are no facilities available as far as Toilet and Drinking water are concerned.

8.6. Table showing Distribution of sample by incident of accidents and theft

Table 4.8

Sample Road	Sample Number	Occurrence of accidents and theft (No.of	
		Accidents	Theft
Road A	20	2	2
Road B	20	0	0
Road C	20	0	0
Road D	20	0	5
Road E	30	0	0
Road F	20	0	0
Total	130	2	7

It can be understood from the table that the incident of theft occurred frequently as reported by 25% of drivers at the sample road of Ahamednagar-Aurangabad due to lax on part of administration and insufficient streetlight, otherwise, rest of the roads are having security of a peaceful stretch with enough administrative monitoring.

As far as accidents are concerned, only the road Thane, 10% of drivers reported that they faced accident.

9. Financial Analysis

For the purpose of the study, the survey tools have been designed for financial assessment of the present traffic scenario and income from Toll. In this regard, we used data provided by PWD in connection with traffic projection and cash flow. Apart from this, we also used income-expenditure statement and one-year traffic volume along with Toll collection from private players- Suprime Infrastructure, Buldhana Urban Cooperative Credit Society Ltd., Wrora Chandrapur Ballalpur Toll Road Ltd. and M/s. SPTPL.

From June 2015, the passenger vehicles were exempted from Toll by Official order of Chief Minister but as per agreement, the Government provides that amount exempted for cars and jeeps to the private players.

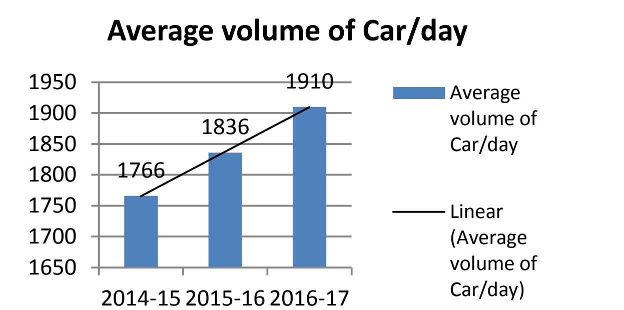
According to agreement, in 2016-17, the Government of Maharashtra has refunded the respective amounts against the volume of Car and Jeep as per present Toll rate which is clearly stated in the Schedule of Tender though the private players get such benefits at regular intervals.

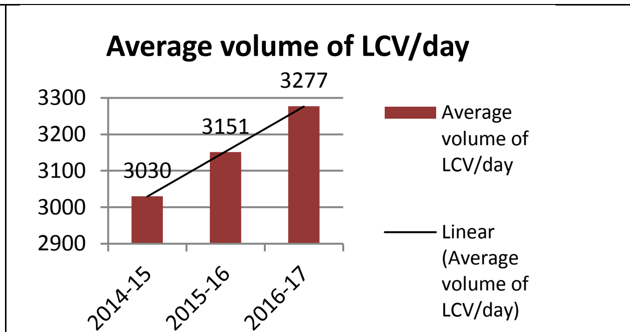
We have carried out financial analysis for Thane Road, Buldhana Road, Chandrapur Road and Sion Panvel, based on information we had.

9.1.Graphical Presentation of Traffic projection in last 3 financial years

9.1.1. Road A:Road between Chichoti kaman anjura fata and maankoli

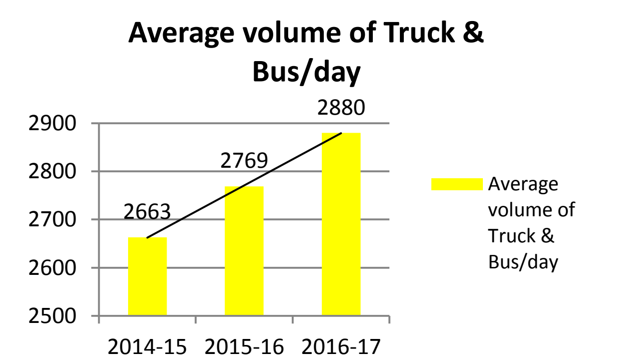
Table 5.1.1

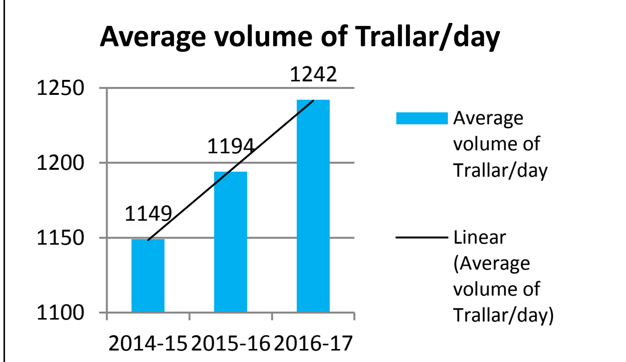




Annual growth rate per year estimated from projection: 4%

Annual growth rate per year estimated from projection: 4 %



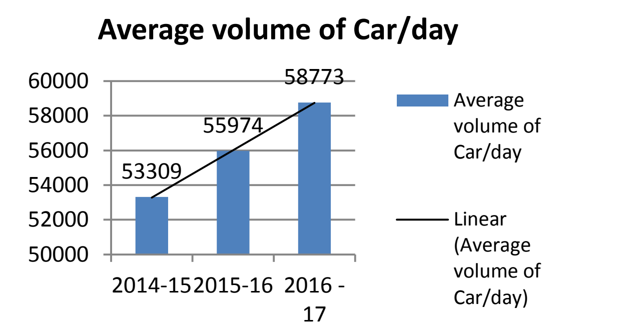


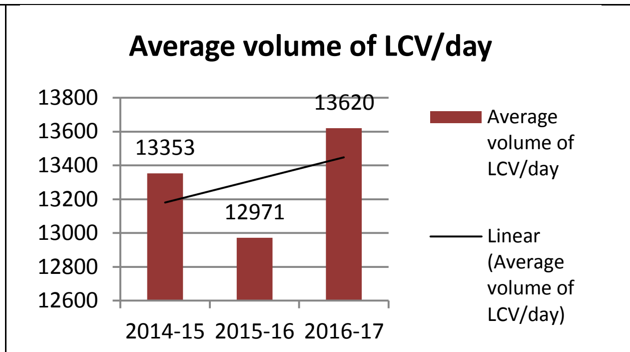
Annual growth rate per year estimated from the projection: 4%

Annual growth rate per year estimated from the projection: 4%

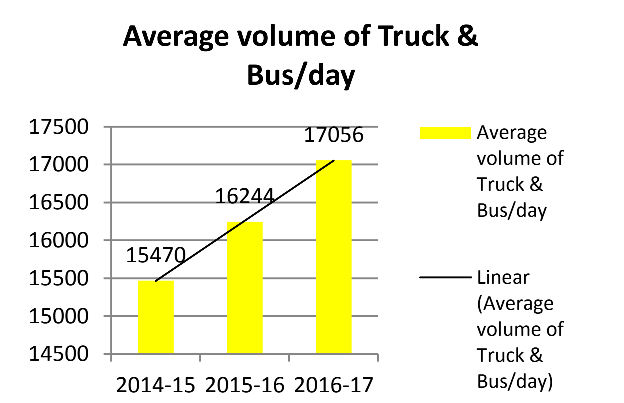
9.1.2. Road B: Road Sion Panvel

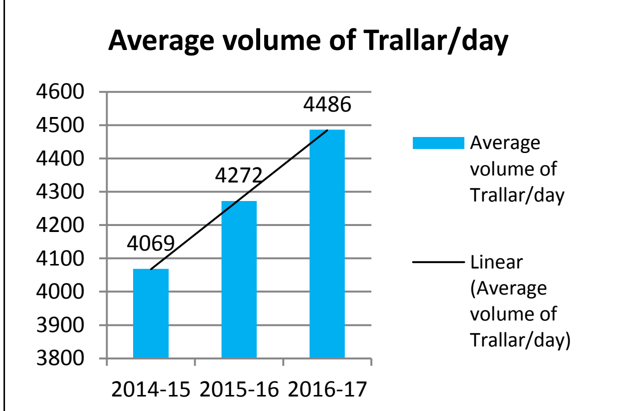
Table 5.1.2





Annual growth rate per year estimated from the projection: 5%	Growth rate in 2014-15 to 2015-16: -2.9%& growth rate in 2015-16 to 2016-17: 5%, estimated from projection.

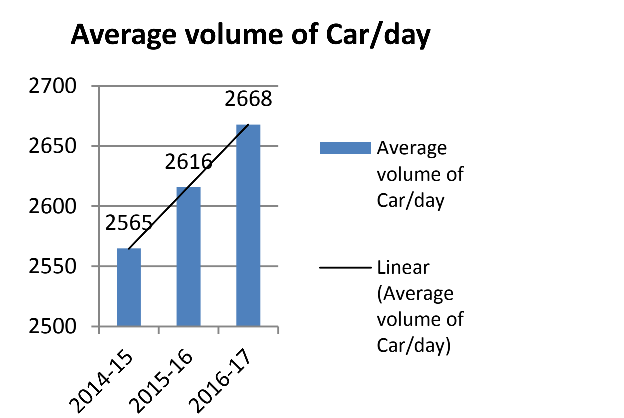




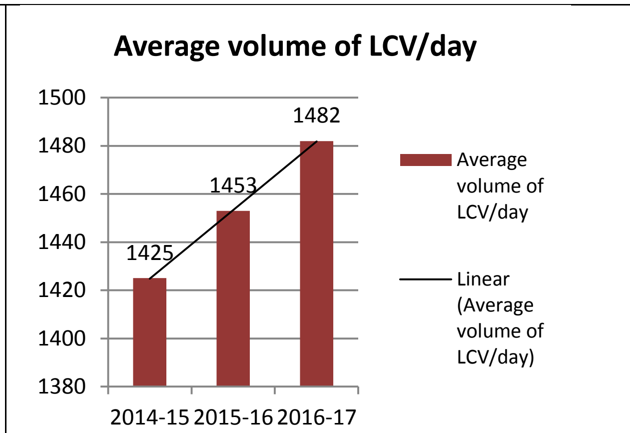
Annual growth rate per year estimated from projection: 5%	Annual growth rate per year estimated from projection: 5%

9.1.3. Road C: Road Malkapur-Buldhana-Chikli

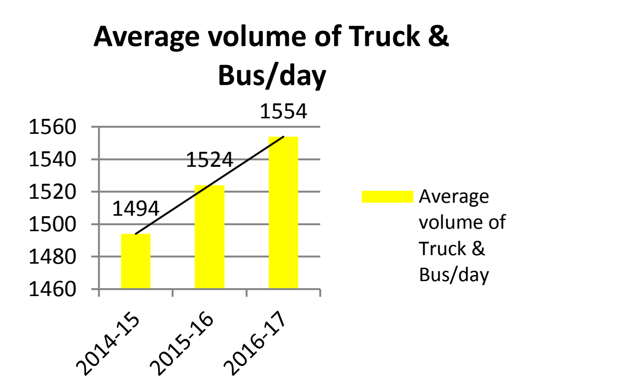
Table 5.1.3



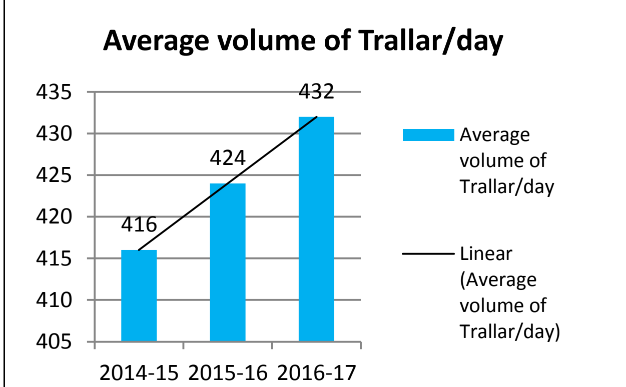
Annual growth rate per year estimated from projection: 5%



Annual growth rate per year estimated from projection: 5%



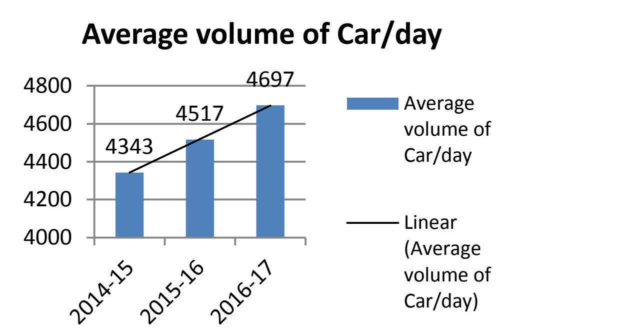
Annual growth rate per year estimated from projection: 2%



Annual growth rate per year estimated from projection: 2%

9.1.4. Road F: Road Warora Chandrapur Vamni

Table 5.1.4

<table>
<tr>
<td>
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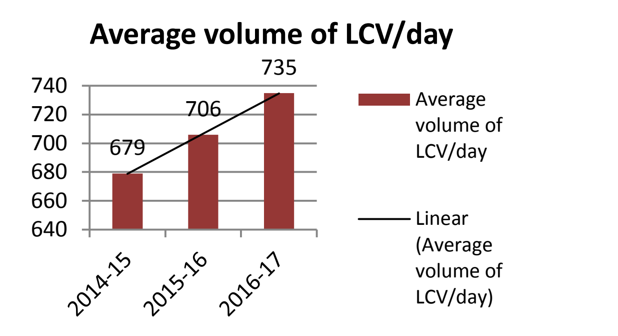
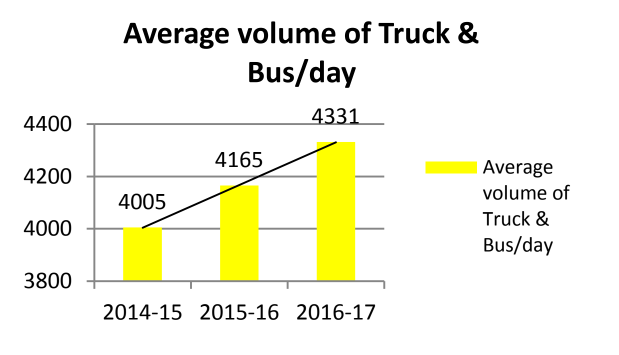
<td>
</td>
</tr>
<tr>
<td>Growth rate in 2014-15 to 2015-16: 4.5%& growth rate in 2015-16 to 2016-17: 4%, estimated from projection.</td>
<td>Annual growth rate per year estimated from projection: 2%</td>
</tr>
<tr>
<td>
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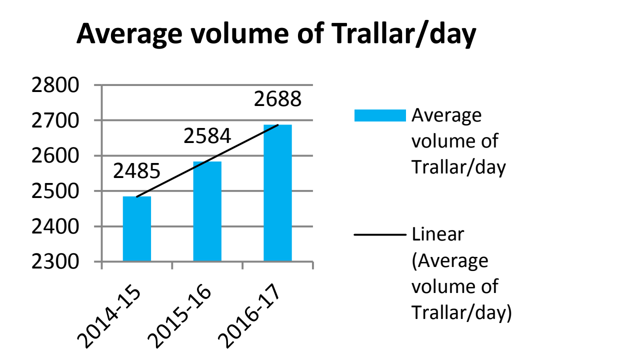
<td>
</td>
</tr>
<tr>
<td>Annual growth rate per year estimated from projection: 4%</td>
<td>Annual growth rate per year estimated from projection: 4%</td>
</tr>
</table>

9.2.Table showing growth rates of average Volumes of Car, LCV, Truck & Bus and Trallar per day in different financial years according to projection submitted by Private Player along with the Proposal

Table 5.2

Sample Road	Growth rate of average volume of Car/day		Growth rate of average volume of LCV/day		Growth rate of average volume of Truck & Bus/day		Growth rate of average volume of Trallar/day	
	2014-15 to 2015-16	2015-16 to 2016-17	2014-15 to 2015-16	2015-16 to 2016-17	2014-15 to 2015-16	2015-16 to 2016-17	2014-15 to 2015-16	2015-16 to 2016-17
Road A	4%	4%	4%	4%	4%	4%	4%	4%
Road B	5%	5%	-2.9%	5%	5%	5%	5%	5%
Road C	5%	5%	5%	5%	2%	2%	2%	2%
Road F	4.5%	4%	2%	2%	4%	4%	4%	4%

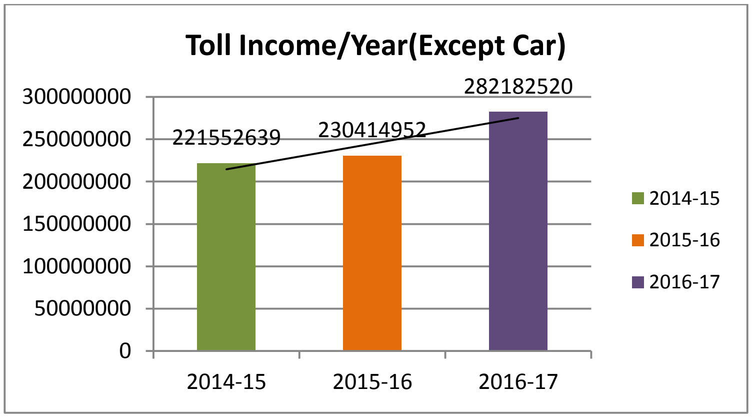
The above table shows that growth rates of Passenger vehicles and Goods vehicles are similar which were estimated in regards to Traffic projection in schedule D.

In the Bid document, the estimation of traffic flow done by a private engineering concern seems to be an underestimate/overestimate of percentage of the growth rates. Comparing this to the Economic Survey Report of Maharashtra, in 2014-15, industry grew at 6.9% and in 2015-16 it pegged a growth at 7.5% in Maharashtra. The industrial sector accounts for 33.8 per cent of the state's economy. Talking about population, the growth rate of population in the state in 2014-15 was 0.33%, in 2015-16 was 0.75% and in 2016-17 was 0.90%.

9.3.Graphical Presentation of projected Toll Collection submitted by Private Player along with Proposal

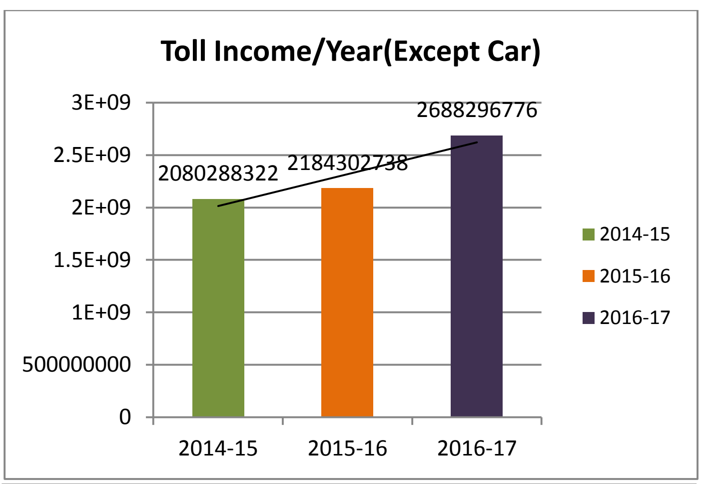
Table 5.3

Road A: Road between Chichoti Kaman Anjura fata and maankoli



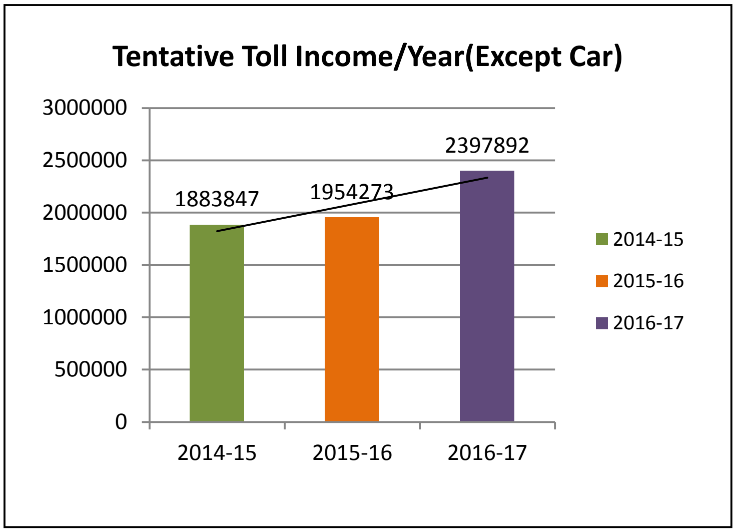
Growth rate in 2014-15 to 2015-16: 4%& growth rate in 2015-16 to 2016-17: 22%, estimated from projection.

Road B: Road Sion Panvel



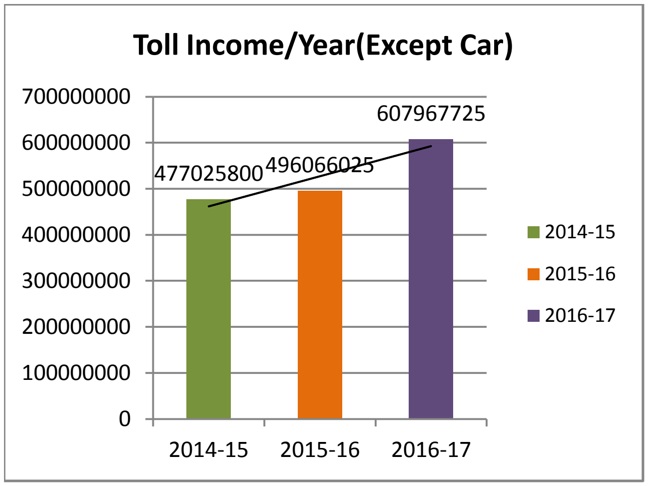
Growth rate in 2014-15 to 2015-16: 5%& growth rate in 2015-16 to 2016-17: 23%, estimated from projection.

Road C: Road Malkapur-Buldhana-Chikli



Growth rate in 2014-15 to 2015-16: 3%& growth rate in 2015-16 to 2016-17: 22%, estimated from projection.

Road F: Road Warora Chandrapur Vamni



Growth rate in 2014-15 to 2015-16: 4%& growth rate in 2015-16 to 2016-17: 23%, estimated from projection.

9.4. Table showing growth rates of average Toll income in different financial years

Table 5.4

Sample Road	Growth rate of Toll income/year	
	2014-15 to 2015-16	**2015-16 to 2016-17**
Road A	4%	22%
Road B	5%	23%
Road C	3%	22%
Road F	4%	23%

9.5.Table showing Annual growth rate of average per day traffic volume Vis-à-Vis annual growth rate of per year Toll income

Table 5.5

Sample Road	Growth rate of average volume of Car/day	Growth rate of average volume of LCV/day	Growth rate of average volume of Truck & Bus/day	Growth rate of average volume of Trallar/day	Growth rate of Toll income/year
	2015-16 to 2016-17	**2015-16 to 2016-17**	**2015-16 to 2016-17**	**2015-16 to 2016-17**	**2015-16 to 2016-17**
Road A	4%	4%	4%	4%	22%
Road B	5%	5%	5%	5%	23%
Road C	5%	5%	2%	2%	22%
Road F	4%	2%	4%	4%	23%

From the above table we can see that the growth rates of per year toll income are higher than the annual growth rates of average per day traffic volume because the toll rates increased per year by the same percentages.

Considering available financial data, we tried to estimate profit percentage/Gap analysis based on Actual Toll collection compared with Traffic & Cash Flow. The following table reflects gap between Projected and actual figures.

10. Gap Analysis

10.1. Road F

The Gap analysis is estimated based on the availability of Month wise break up of Toll Collection in the last financial year of 2016-17 and Toll Income that have been calculated (day toll income x 365 days) on Toll Income /day in Traffic Projection.

Table 6.1

(in Rs. lakh)

Yearly Toll Income in Actual (A)	2706.96
Government supported the amount of exempted Car/Jeep in accordance with Traffic Projection and Cash Flow by year wise (B)	942.92
Yearly Toll Collection C (A + B)	3649.88
*Calculated Yearly Toll Collection as per Traffic Projection and Cash Flow (In Rs.) (D)	6079.68
Profit / Loss compare with Traffic Projection and Cash Flow (In Rs.)	2429.8
Gap as percentage	(-)40%

** Day traffic multiplied by 365 days*

10.2. Road C

We have estimated the gap analysis of Volume of Traffic, based on information we had. The estimation is developed on Average Traffic Volume per day in Projection and average Traffic Volume per day in actual field.

Table 6.2

(in Rs. lakh)

Average Traffic Volume per day- Actual (A)	716
Government supported for exempted Car/Jeep in accordance with Traffic Projection and Cash Flow by year wise (B)	2722
Average Traffic Volume/day C (A + B)	3438
Average Traffic Volume per day as per traffic Projection (D)	6260
Gap between Actual and Projection E (D – C)	2822
Gap as percentage	(-)45%

10.3. Road B

The existence of traffic volume and toll collection in the traffic projection and cash flow is enough to estimate the gap analysis because the actual figure in last 7 days of volume and toll collection was supplied by private player.

Table 6.3

(in Rs. lakh)

Average Toll Income per day in Actual (A)	20.74
Government supported the amount of exempted Car/Jeep per day in accordance with Traffic Projection and Cash Flow by year wise (B)	20.57
Toll Collection per day C (A + B)	41.43
Toll Collection per day as per Traffic Projection and Cash Flow (In Rs.) (D)	73.65
Profit / Loss compare with Traffic Projection and Cash Flow (In Lakh)	32.22(Loss)
Gap as percentage	(-)44%

10.4. Road A

The private Player provided Traffic volume and Toll Collection in last financial year and Traffic Projection & Cash Flow is supplied by PWD Office. Therefore, the following estimation is correlated with data provided by PWD as well Private Player.

Table 6.4

(in Rs. lakh)

Yearly Toll Income in Actual (A)	2806.92
Government supported the amount of exempted Car/Jeep in accordance with Traffic Projection and Cash Flow by year wise (B)	306.25
Yearly Toll Collection C (A + B)	3113.17
Yearly Toll Collection as per Traffic Projection and Cash Flow (In Rs.) (D)	2821.82
Profit / Loss compare with Traffic Projection and Cash Flow (In Rs.)	291.35
Gap as percentage	(+)10.32%0

From the above tables it is clearly understood that there is huge gap between Projection and present collection of about 40 to 50% towards negative trend. One sample road in Thane circle shows that the gap is about 10% upwards.

Both Projection and Cash Flow were estimated based on information we had.

11. Questionnaire Feedback by Engineers

Out of the 6 sample roads, only one road under the Thane Circle is out of analysis. Altogether, 12 responses have been gathered from other circles. Two executive Engineers under Aurangabad and Nagpur region didn't participate in the survey. The following tables reflect the participant details by their designations

Due to lengthy road names, we are using codes as ROAD A= Between Chinchoti to Anjura fata and maankoli, ROAD B= Sion-Panvel, ROAD C=Between Malkapur-Buldhana-Chikli, ROAD D= Ahmadnagar and Aurangabad, ROAD E= Between Nanded and Narsee and, Narsee to Deglur state border, ROAD F= Warora Chandrapur Vamni, Warora to Chandrapur.

11.1. Participants in the Survey

Table 7.1

Region	Road Name	Participant by designation			
		Executive Engineer	Divisional/Deputy Engineer	Junior Engineer	Sectional Engineer
Mumbai	Sion Panvel, km 140/690 to 115/800 under privatization	√	√	√	
Amravati	Between Malkapur-Buldana-Chikli	√			√
Nashik	Ahmadnagarand Aurangabad	√	√		√
Aurangabad	Between Nanded and Narsee and, Narsee to Deglur state border		√		√
Nagpur	Warora Chandrapur Vamni, Warora to Chandrapur		√	√	

11.2. Staffing Pattern under Executive Engineer

Table 7.2

Sample Roads	No. of Executive engineers who responded	Present Staffing Pattern		Shortage of Staff	
		Technical	Non-Technical	Technical	Non-Technical
ROAD B	1	0	0	0	0
ROAD C	1	5	15	0	0
ROAD D	1	10	7	3	5
TOTAL	**3**	**15**	**22**	**3**	**5**

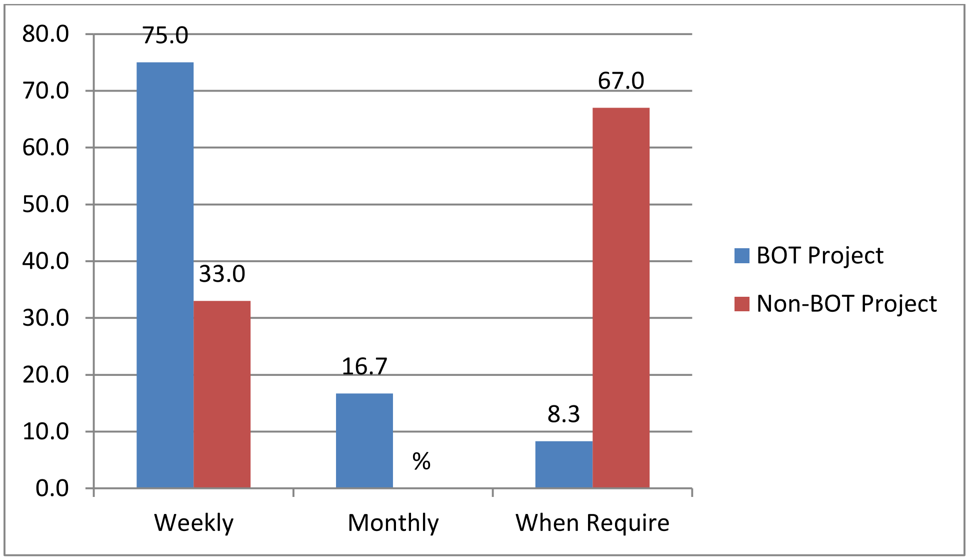
11.3. Number of vehicles in Concerned PWD Offices

Table 7.3

Sample Roads	No.of vehicles
ROAD B	0
ROAD C	2
ROAD D	1
ROAD E	1
ROAD F	1

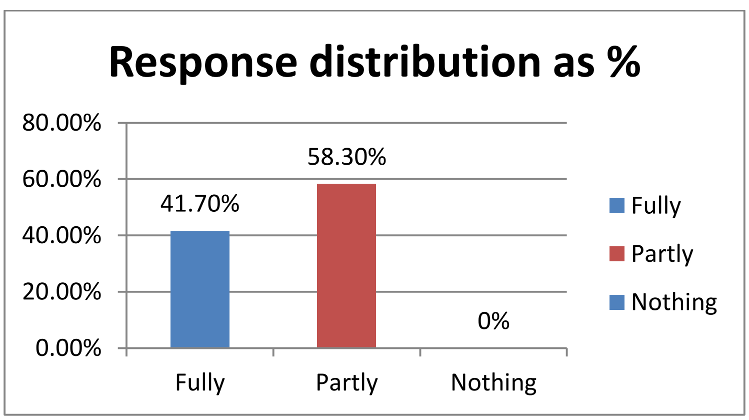
11.4. Frequency of visit at Project site by Engineers

Table 7.4



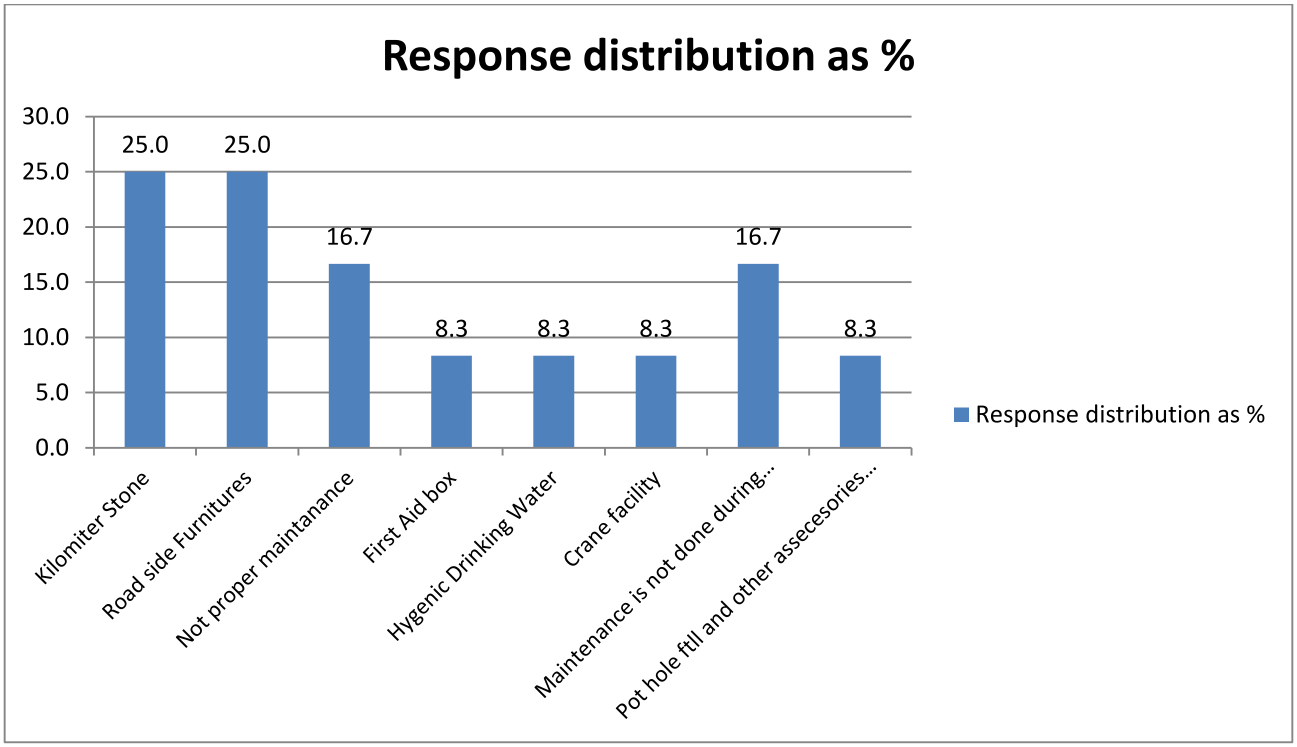
11.5. Facilities Provided by Private Players as per number of Responses

Table 7.5



11.6. Facilities not provided at site by Private Player reported by Respondent

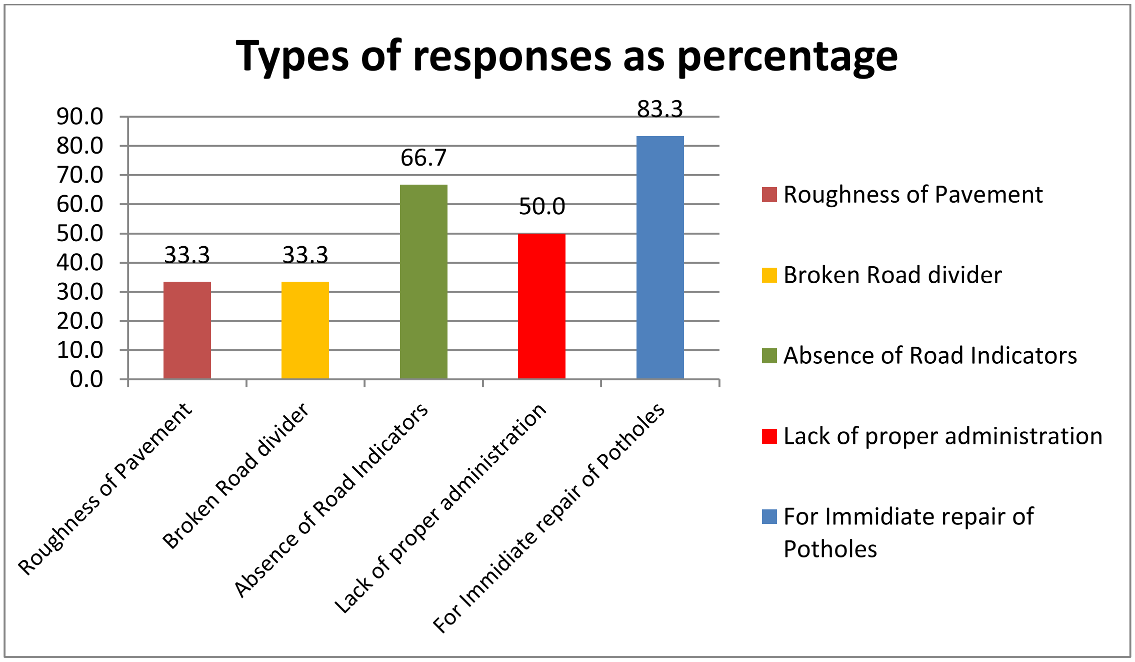
Table 7.6



** It is also reported by Engineers that from Planning to Execution takes time minimum 2 months and maximum 4 years.

11.7. Type of Complaint lodged from different sources as reported by Engineers

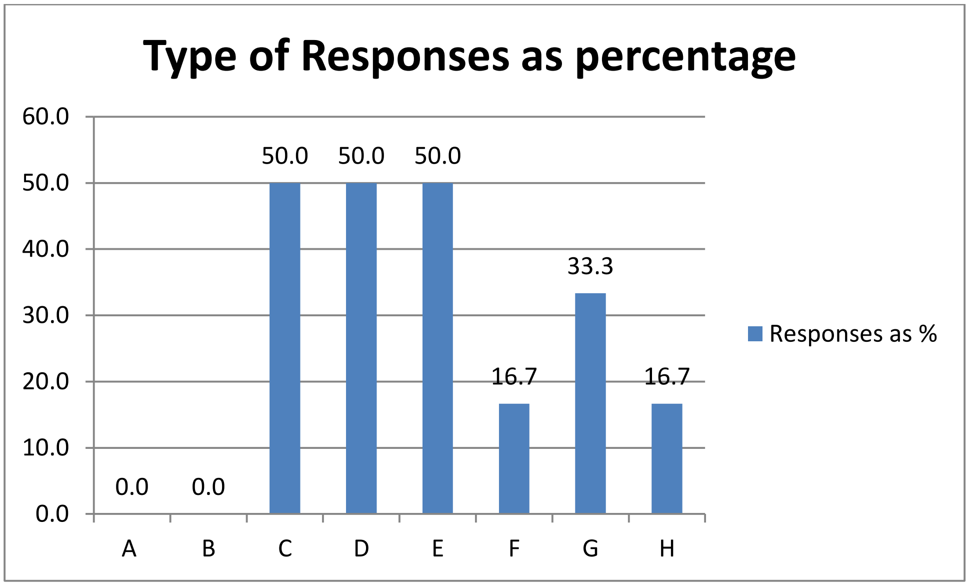
Table 7.7



Out of 12 Participants, 6 engineers mentioned the specific number of complaint received in the last year and one engineer also responded but did not mention number of complaint. Therefore we made the above chart on the basis of 6 responses.

11.8. Table 8: What Kind of Action is taken by PWD Authority against Complaints

Table 7.8



A=Official Letter served, B= Field visit as soon as complain received, C=Served notice to call representative of P.P at PWD Office, D= Arrange meeting with all stakeholders, E= Pursue the complain letter to Higher authority, F=Work done by PWD from Concessionaires Risk & Cost fund, G= Others, H= Not mentioned.

After the meeting with other official staffs, most of the respondents reported that for BOT projects usually, they arrange meeting every day or weekly. But there are no official documents registering the occurrence of the meetings. So, it is clearly understood the official meetings were not held in proper time. Verbal discussion among PWD officials took place.

11.9. Major constraints for execution of BOT Project reported by Respondents (reported 9 persons)

Table 7.9

Constraint	Response as %	Constraint Rank
Project Monitoring Consultant is not present in every project	22.2	***
Availability of land and acquisition	44.4	*
Shift in aim of utility of projects	33.3	**
Concessionaire is willingly neglecting the work	11.1	****
Timely identification of hurdles and immediate actions to solve the problems	11.1	****
Delay in completion of project	11.1	****
Scope of work demand in agreement is vague	11.1	****
Unnecessary claims	11.1	****
BOT operator's responsibilities, accountability needed to be clearly described in clause that causes unnecessarily delay of execution	11.1	****
There is no audit from time to time during constructions	11.1	
Variations from Bid in civil work/constructions	22.2	***
Because of negligence from entrepreneur it becomes awkward for department to handle chaotic situations created by public	22.2	
Change in scope	11.1	
Irresponsible mentality of residents near roadside	22.2	***
Financial closure often leads to time delay.	11.1	****
Environment clearance	11.1	
Irresponsible mentality of residents near roadside, irrespective of encroachment	22.2	***
Due to BOT project no other fund comes to carry the work.	11.1	****
(reco) Novices are engaged in implementing work.	11.1	****
Question of Initiation of Exe.Engineer	11.1	****

One star: Constraints as reported by 44.4% of respondents; Two stars: Constraints as reported by 33.3% of respondents; Three stars: Constraints as reported by 22.2% of respondents; Four stars: Constraints as reported by 11.1% of respondents. The private players should try to overcome the constraints with one star first, followed by those with two, three and four stars, respectively.

The constraints may be overcome by engaging experienced clients in implementing work and by forming a single consortium body along with local representatives and representatives of administration headed by the executive engineer. This is essential for supervision and monitoring of work quality and repair works. A regular social audit may also be maintained.

11.10. Major constraints in Policy level for BOT Project reported by Engineers (8 responses)

Table 7.10

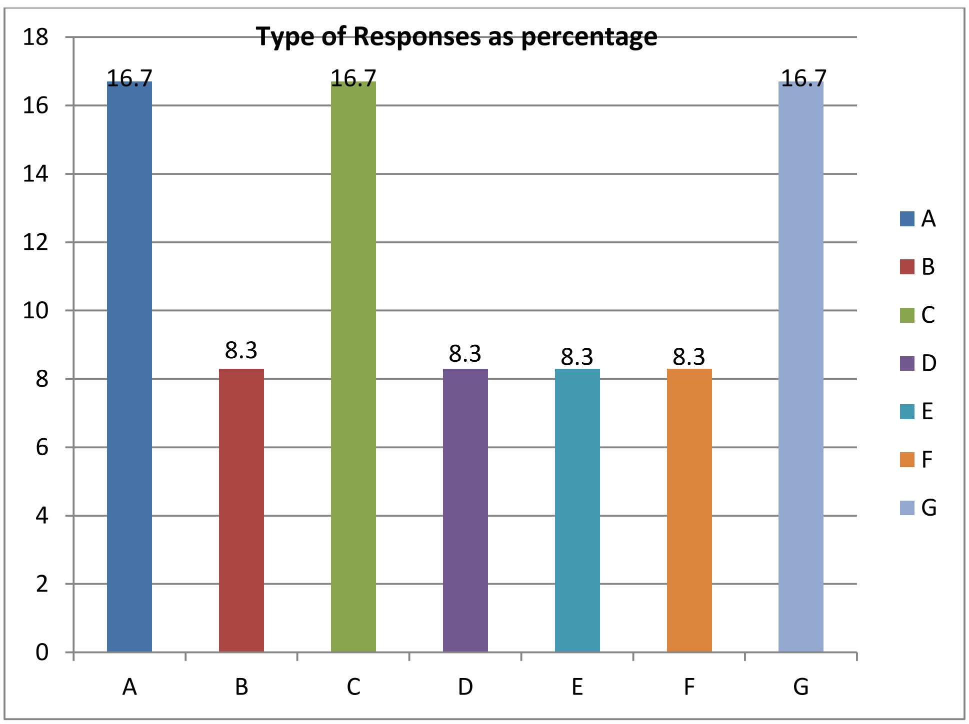
Constraint	Response as %	Constraint Rank
No financial valuation with completion certificate is done.	12.5	**
Major constraint is regarding encroachment along highway	12.5	**
Land acquisition	25.0	*
Private players sometime refuse to maintain norms.	12.5	**
Dynamic toll collection show traffic data collection is not systematically instrumentalised. (reco: need to be systematically instrumentalised for effective	12.5	**
Determination of toll rates	12.5	**
There is no provision of finalising the cost of project at end of completion	12.5	**
No proper tools are present with department to take action against entrepreneur	25.0	*
No separate fund for emergency work.	12.5	**
There is no proper accountability of concessionaire towards operation and maintenance for post execution.	12.5	**
Determination of traffic volume as per norms	12.5	**
Project execution/construction /security leads to default/ failure/delay of project.	12.5	**
There is no strong guide line for O & M	12.5	**

One star: Constraints as reported by 25% of respondents; Two stars: Constraints as reported by 12.5% of respondents. The private players should try to overcome the constraints with one star followed by those with two stars.

Strong guidelines with respect to operation and maintenance for proper and timely action may be made in order to overcome the policy level constraints. There should be proper law to stop encroachment and regulate land acquisition. Proper action against entrepreneurs may be taken if needed. No toll collection may be started before projects are completed by entrepreneurs. In addition, a separate fund for emergency work may be maintained.

11.11. Key positive points of PPP model reported by respondent (8 responses)

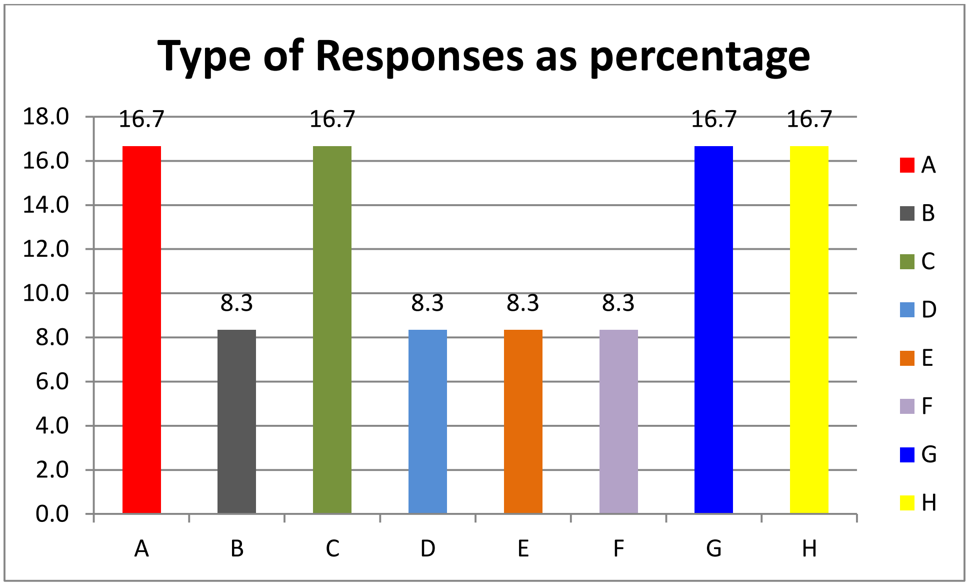
Table 7.11



A=Saving in travel time, B= Road condition is excellent since last couple of years, C=Infrastructure development in the service of nation, D=New techniques and various new ideas will be available. E=PPP project is as same as international standard, F= Less wear & tear of vehicles. G= Four lane facility for district and state communication

11.12. Key negative points of PPP model as reported by respondents

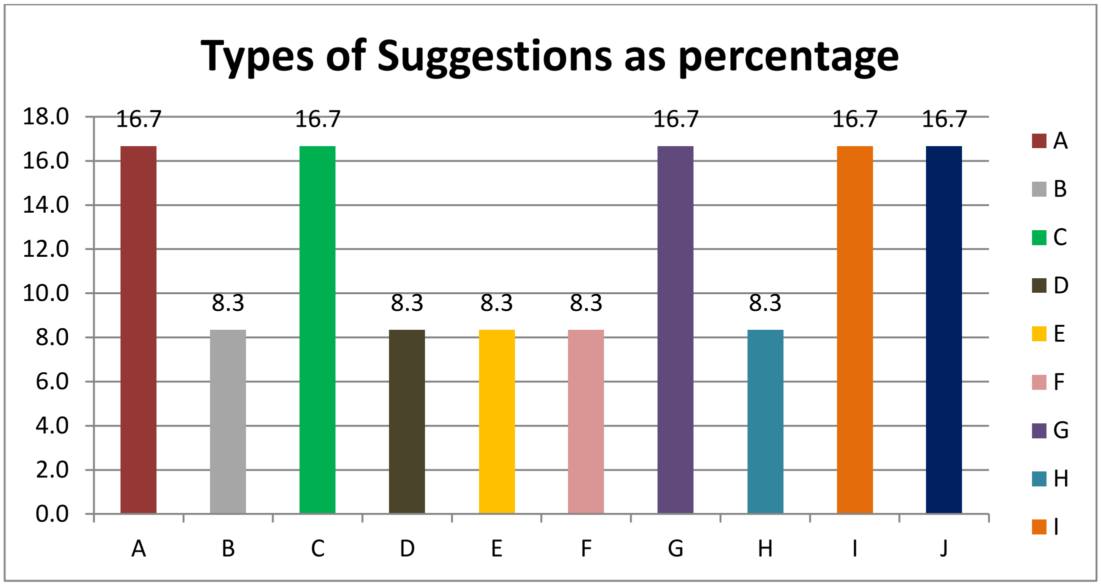
Table 7.12



A=If properly executed and proper control on the project by Government then there are no negative points in PPP mode. B= There is no provision for encroachment remove along the highway. C= Land acquisition, D=For PPP projects only one contractor/entrepreneur is available for big stretch of work. If he neglects the project then whole project will suffer in large scale. E= Due to engagement of uneducated persons, maintenance is not done properly, F=Post execution activities are not done properly. G= Undue harassment of Govt. officials due to various RTI applications and court cases which leads to demoralization of Govt. H= No suggestions

11.13. Suggestions for further developments in Policy, Execution and Operation level by respondents

Table 7.13



A=State Roads should be developed so that they are comparable to National Highways. B= Tender should be renewed for every year. C= Quick decision expected, D= Proper financial feasibility is required. E= Proper financial feasibility study incorporating dynamics of toll collection, traffic volume & trends of technology has to be made easily available under the proposal of concession against with open end towards traffic safety based important of project consider & similar approach for O and M throughout the concession period. F= Proper co-ordination between department and concessionaire at the time of execution., G= Immediate technical decision should be given at the time of actual execution. H= Instant action for non creation on part of entrepreneur is required to save the face of the department. I= Proper response from entrepreneur is needed in respect of smooth operation and maintenance. J= No suggestions.

12. Repair and Maintenance

It is very unfortunate that regarding repair and maintenance, a brief statement has been stated both in Tender copy and in Agreement copy. For example, for the road 'Warora Chandrapur Vamni, Warora to Chandrapur km 40/000 to 83/400, Chandrapur to Vamni km 94/000 to 107/800, Chandrapur Walan road km 0/000 to 5/200 and state road under privatization' in article number 19 of Concession Agreement, the clauses of Monitoring and operation maintenance are

not described properly. The agreement copies of other sample roads are also as same as above road except for Narsee- Nanded road.

As a result, due to lack of proper guidelines for repair and maintenance, the private player makes delay in doing such work even after a notice is served by the PWD.

The most authentic and proper guidelines regarding repairing and maintenance should be developed as Kalyan Keti Road Pvt. Ltd has mentioned in the agreement as stated in the Annexure.

13. Recommendations

╠It is concluded from inventory survey that all toll managers and other respective employees are not aware of the proposal and key features of the agreement. Therefore, no one is properly aware of the scope of work and what is to be done. Proper information dissemination is key to obtaining results.

╠During repair and maintenance work, there should be a tie up with PWD in terms of supervision.

╠During execution of work, progress reports should be developed and disseminated every month.

╠A completion certificate is required to forward to the higher authority along with the progress report by the executive engineer. The executive engineer and other engineers should go to the site for preparing a useful progress report.

╠In the tender document specific guidelines about supervision and monitoring should be developed.

╠A single window system is essential for getting clearance. In particular, the PWD department, the forest department, the rural/urban development department and the administration should come together under one umbrella for getting easy clearance.

╠ Bid documents should be universal for all PPP models. An accompanying note with all essential points of schedule is required, and a copy should be kept under the custody of the toll manager and PWD divisional engineer.

╠The IRC guidelines should be attached with the agreement along with the official seal and sign of the private player.

╠The guidelines regarding private player termination should be clear in bid documents and the reasons for termination should be attached with the award letter.

╠For lengthy stretches of roads, the public works department should not allow only one player to operate. Award should be restricted to a maximum of 25km stretch under one divisional engineer for easy monitoring and supervision.

╠Lastly, for understanding recurring issues of the public, complaint boxes should be placed at different locations with appropriate signboards.

14. Annexure

Annexure 1: Toll Rates and Yearly Projection of traffic and cash flow

Chandrapur Cash Flow Projection

Year		Toll Rate in Rs. (Actual)				Traffic/day				Toll Income /day in Rs. (Actual)				Tentative Toll Income/Year (Rs. Actual)
From	To	Car	LCV	Truck/Bus	Trallar	Car	LCV	Truck/Bus	Trallar	Car	LCV	Truck/Bus	Trallar	
2007	2008					3,146	492	2,901	1,800					
2008	2009					3,303	517	3,046	1,890					
2009	2010					3,468	542	3,198	1,985					
2010	2011	37	53	101	174	3,642	570	3,358	2,084	134,754	30,210	339,158	362,616	316,359,370
2011	2012	37	53	101	174	3,824	598	3,526	2,188	141,488	31,694	356,126	380,712	332,157,300
2012	2013	37	53	101	174	4,015	628	3,702	2,297	148,555	33,284	373,902	399,678	348,727,935
2013	2014	45	65	130	220	4,176	653	3,851	2,389	187,920	42,445	500,630	525,580	458,649,875
2014	2015	45	65	130	220	4,343	679	4,005	2,485	195,435	44,135	520,650	546,700	477,025,800
2015	2016	45	65	130	220	4,517	706	4,165	2,584	203,265	45,890	541,450	568,480	496,066,025
2016	2017	55	80	150	260	4,697	735	4,331	2,688	258,335	58,800	649,650	698,880	607,967,725
2017	2018	55	80	150	260	4,885	764	4,505	2,795	268,675	61,120	675,750	726,700	632,269,425
2018	2019	55	80	150	260	5,032	787	4,640	2,879	276,760	62,960	696,000	748,540	651,254,900
2019	2020	65	95	180	310	5,183	810	4,779	2,965	336,895	76,950	860,220	919,150	800,523,475
2020	2021	65	95	180	310	5,338	835	4,922	3,054	346,970	79,325	885,960	946,740	824,533,175
2021	2022	65	95	180	310	5,498	860	5,070	3,146	357,370	81,700	912,600	975,260	849,329,450
2022	2023	80	115	215	370	5,663	886	5,222	3,240	453,040	101,890	1,122,730	1,198,800	1,049,907,900
2023	2024	80	115	215	370	5,833	912	5,379	3,337	466,640	104,880	1,156,485	1,234,690	1,081,383,675
2024	2025	80	115	215	370	6,008	940	5,540	3,438	480,640	108,100	1,191,100	1,272,060	1,113,943,500
2025	2026	90	130	260	440	6,188	968	5,706	3,541	556,920	125,840	1,483,560	1,558,040	1,359,391,400
2026	2027	90	130	260	440	6,374	997	5,878	3,647	573,660	129,610	1,528,280	1,604,680	1,400,223,950
2027	2028	90	130	260	440	6,565	1,027	6,054	3,756	590,850	133,510	1,574,040	1,652,640	1,442,129,600
2028	2029	110	160	310	530	6,762	1,058	6,235	3,869	743,820	169,280	1,932,850	2,050,570	1,787,229,800
2029	2030	110	160	310	530	6,965	1,089	6,423	3,985	766,150	174,240	1,991,130	2,112,050	1,840,903,050
2030	2031	110	160	310	530	7,174	1,122	6,615	4,105	789,140	179,520	2,050,650	2,175,650	1,896,160,400
2031	2032	130	190	360	630	7,389	1,156	6,814	4,228	960,570	219,640	2,453,040	2,663,640	2,298,364,850
2032	2033	130	190	360	630	7,611	1,190	7,018	4,355	989,430	226,100	2,526,480	2,743,650	2,367,265,900
2033	2034	130	190	360	630	7,839	1,226	7,229	4,485	1,019,070	232,940	2,602,440	2,825,550	2,438,200,000
2034	2035	160	230	430	750	8,074	1,263	7,445	4,620	1,291,840	290,490	3,201,350	3,465,000	3,010,768,200
2035	2036	160	230	430	750	8,317	1,301	7,669	4,758	1,330,720	299,230	3,297,670	3,568,500	3,101,083,800
2036	2037	160	230	430	750	8,566	1,340	7,899	4,901	1,370,560	308,200	3,396,570	3,675,750	3,194,144,200
2037	2038	190	270	520	890	8,823	1,380	8,136	5,048	1,676,370	372,600	4,230,720	4,492,720	3,931,929,650
2038	2039	190	270	520	890	9,088	1,421	8,380	5,200	1,726,720	383,670	4,357,600	4,628,000	4,050,036,350

Chandrapur TVC & Collection-2016-17 month wise
Nanduri & Visapur Toll Plaza

Month	(LCV) Total Number	(MCV) Total Number	(HCV) Total Number	Total INCOME/MONTH(in Rs.Lakh)
16-Apr	32,148	13,986	82,543	318.21
16-May	35,125	15,010	79,491	302.39
16-Jun	25,701	12,620	77,590	293.54
16-Jul	22,773	11,194	62,319	239.6
16-Aug	22,609	11,195	60,659	234.01
16-Sep	19,783	9,968	57,337	216.61
16-Oct	22,815	10,578	63,774	241.47
16-Nov	6,242	3,049	15,778	62.17
16-Dec	24,768	12,270	61,825	249.36
17-Jan	25,665	12,620	68,537	279.54
17-Feb	26,337	12,909	67,594	273.99
17-Mar	28,770	15,757	78,165	314.28

Buldhana Cash Flow Projection
Reference No. Form-4, Page No.-213

Year		Toll Rate in Rs. (Actual)				Traffic/day				Toll Income /day in Rs. (Actual)			
From	To	Car	LCV	Truck/Bus	Trallar	Car	LCV	Truck/Bus	Trallar	Car	LCV	Truck/Bus	Trallar
1st Apr 06	31st Mar 07	0.44	0.3	0.701	0.32	2,189	1,216	1,275	355	963.160	364.800	893.775	113.600
1st Apr 07	31st Mar 08	0.45	0.37	0.845	0.4	2,233	1,240	1,301	362	1,004.850	458.800	1,099.345	144.800
1st Apr 08	31st Mar 09	0.46	0.38	0.862	0.41	2,277	1,265	1,327	369	1,047.420	480.700	1,143.874	151.290
1st Apr 09	31st Mar 10	0.46	0.39	0.879	0.41	2,323	1,290	1,353	376	1,068.580	503.100	1,189.287	154.160
1st Apr 10	31st Mar 11	0.59	0.53	1.035	0.5	2,369	1,316	1,380	384	1,397.710	697.480	1,428.300	192.000
1st Apr 11	31st Mar 12	0.6	0.54	1.056	0.51	2,417	1,343	1,408	392	1,450.200	725.220	1,486.848	199.920
1st Apr 12	31st Mar 13	0.62	0.55	1.077	0.52	2,465	1,369	1,436	400	1,528.300	752.950	1,546.572	208.000
1st Apr 13	31st Mar 14	0.75	0.63	1.318	0.63	2,514	1,397	1,465	408	1,885.500	880.110	1,930.870	257.040
1st Apr 14	31st Mar 15	0.77	0.64	1.344	0.64	2,565	1,425	1,494	416	1,975.050	912.000	2,007.936	266.240
1st Apr 15	31st Mar 16	0.78	0.65	1.371	0.66	2,616	1,453	1,524	424	2,040.480	944.450	2,089.404	279.840
1st Apr 16	31st Mar 17	0.93	0.82	1.632	0.78	2,668	1,482	1,554	432	2,481.240	1,215.240	2,536.128	336.960

1st Apr 17	31st Mar 18	0.95	0.83	1.665	0.79	2,722	1,512	1,585	441	2,585.900	1,254.960	2,639.025	348.390
1st Apr 18	31st Mar 19	0.97	0.85	1.698	0.81	2,776	1,542	1,617	450	2,692.720	1,310.700	2,745.666	364.500
1st Apr 19	31st Mar 20	1.27	1.02	2.062	0.99	2,832	1,573	1,649	459	3,596.640	1,604.460	3,400.238	454.410
1st Apr 20	31st Mar 21	1.3	1.04	2.103	1.01	2,888	1,604	1,682	468	3,754.400	1,668.160	3,537.246	472.680
1st Apr 21	31st Mar 22	1.33	1.06	2.145	1.03	2,946	1,637	1,716	477	3,918.180	1,735.220	3,680.820	491.310
1st Apr 22	31st Mar 23	1.5	1.25	2.625	1.27	3,005	1,669	1,750	487	4,507.500	2,086.250	4,593.750	618.490
1st Apr 23	31st Mar 24	1.53	1.28	2.678	1.29	3,065	1,703	1,785	497	4,689.450	2,179.840	4,780.230	641.130
1st Apr 24	31st Mar 25	1.66	1.3	2.732	1.32	3,126	1,737	1,821	507	5,189.160	2,258.100	4,974.972	669.240
1st Apr 25	31st Mar 26	1.91	1.59	3.343	1.6	3,189	1,771	1,857	517	6,090.990	2,815.890	6,207.951	827.200
1st Apr 26	31st Mar 27	1.95	1.63	3.41	1.63	3,253	1,807	1,895	527	6,343.350	2,945.410	6,461.950	859.010
1st Apr 27	31st Mar 28	1.99	1.66	3.478	1.67	3,318	1,843	1,932	538	6,602.820	3,059.380	6,719.496	898.460
1st Apr 28	31st Mar 29	2.37	2.07	4.139	2.03	3,384	1,880	1,971	549	8,020.080	3,891.600	8,157.969	1,114.470
1st Apr 29	31st Mar 30	2.42	2.11	4.222	2.07	3,452	1,918	2,011	560	8,353.840	4,046.980	8,490.442	1,159.200

Buldhana 7 days traffic

Buldana Urban Co-Operative Credit Society Ltd, Buldana & N.B.C.(J.V.) **(Amount units: Rs. Actual)**

Date	Car/Jeep		LCV		Bus		Heavy Vehicles & All axle		Total Count by whom toll collected	Total Amount
	Count	Amount	Count	Amount	Count	Amount	Count	Amount		
01.10.2017	2,696	Nil	350	24,584	510	Nil	253	38,971	603	63,555
02.10.2017	2,704	Nil	382	30,580	513	Nil	260	39,458	642	70,038
03.10.2017	2,696	Nil	455	31,955	506	Nil	249	40,358	704	72,313
04.10.2017	2,691	Nil	478	35,475	515	Nil	247	40,905	725	76,380
05.10.2017	2,700	Nil	516	35,998	507	Nil	255	41,617	771	77,615
06.10.2017	2,697	Nil	528	36,080	511	Nil	278	43,515	806	79,595
07.10.2017	2,700	Nil	457	37,098	510	Nil	305	46,920	762	84,018
Total	1,884		3166	231,770	3572	0	1847	291,744	5,013	523,514

Sion Panvel Cash Flow Projection
Reference -Form-4

Year		Toll Rate in Rs. (Actual)				Traffic/day				Toll Income /day in Rs. (Actual)				Total Toll Income/Year (Rs. Actual)
From	To	Car	LCV	Truck/Bus	Trallar	Car	LCV	Truck/Bus	Trallar	Car	LCV	Truck/Bus	Trallar	
2008 – 09	April	March	25	45	90	150	200	39,780	4,785	11,544	4,433	3,036	994,500	215,325
2009 – 10	April	March	25	45	90	150	200	41,769	5,024	12,121	4,655	3,188	1,044,225	226,091
2010 – 11	April	March	25	45	90	150	200	43,857	5,275	12,727	4,887	3,347	1,096,436	237,396
2011 – 12	April	March	25	45	90	150	200	46,050	5,539	13,364	5,132	3,515	1,151,258	249,266
2012 – 13	April	March	25	45	90	150	200	48,353	5,816	14,032	5,388	3,690	1,208,821	261,729
2013 – 14	April	March	30	55	110	180	240	50,770	6,107	14,733	5,658	3,875	1,523,114	335,885
2014 - 15	April	March	30	55	110	180	240	53,309	6,412	15,470	6,941	4,069	1,599,270	352,680
2015 – 16	April	March	30	55	110	180	240	55,974	6,733	16,244	6,238	4,272	1,679,234	370,314
2016 - 17	April	March	35	65	130	210	280	58,773	7,070	17,056	6,550	4,486	2,057,061	459,526
2017 - 18	April	March	35	65	130	210	280	61,712	7,423	17,909	6,877	4,710	2,159,914	482,502
2018 - 19	April	March	35	65	130	210	280	64,797	7,784	18,804	7,221	4,945	2,267,910	506,627
2019 - 20	April	March	45	75	160	250	340	88,037	8,184	19,744	7,582	5,193	3,061,678	613,788
2020 - 21	April	March	45	75	160	250	340	71,439	8,593	20,731	7,961	5,452	3,214,762	644,488
2021 - 22	April	March	45	75	160	250	340	75,011	9,023	21,768	8,359	5,725	3,375,501	676,712
2022 - 23	April	March	50	90	190	300	400	78,762	9,474	22,856	8,777	6,011	3,938,084	852,658
2023 - 24	April	March	50	90	190	300	400	81,912	9,853	23,771	9,128	6,252	4,095,607	886,764
2024 - 25	April	March	50	90	190	300	400	85,189	10,247	24,721	9,493	6,502	4,259,432	922,234
2025 - 26	April	March	60	110	200	350	500	88,596	10,657	25,710	9,873	6,762	5,315,771	1,172,262
2026 - 27	April	March	60	110	200	350	500	92,140	11,083	26,739	10,268	7,032	5,528,401	1,219,153
2027 - 28	April	March	60	110	200	350	500	95,826	11,527	27,828	10,679	7,313	5,749,538	1,287,919
2028 - 29	April	March	70	130	250	450	550	99,659	11,988	28,921	11,106	7,606	6,976,106	1,558,388

Sion Panvel 7 days traffic
Reference from Toll Plaza **(Collection units: Rs. Actual)**

Traffic Volume								
Date	**LMV**	**LCV**	**Truck**	**Bus**	**3 Axle**	**Multi Axle**	**Total Traffic**	**Collection**
11.09.17	0	11,426	2,789	5,053	1,434	2,219	22,921	2,273,686
12.09.17	0	12,079	2,846	4,824	1,379	2,590	23,718	2,021,339
13.09.17	0	12,447	2,847	4,590	1,342	2,821	24,049	2,079,683
14.09.17	0	12,373	3,061	4,528	1,345	2,690	23,997	2,130,788
15.09.17	0	12,072	2,876	4,774	1,343	2,647	23,712	2,154,230
16.09.17	0	12,999	3,067	4,726	1,468	2,957	25,217	2,235,188
17.09.17	0	8,475	2,085	4,605	975	2,153	18,293	1,624,403
Total	**0**	**81,871**	**19,573**	**33,100**	**9,286**	**18,077**	**161,907**	**14,519,257**

Thane Cash Flow Projection

Year		Toll Rate in Rs. (Actual)				Traffic/day				Toll Income /day in Rs. (Actual)				Total Toll Income/Year (Rs. Actual)
From	To	Car	LCV	Truck/Bus	Trallar	Car	LCV	Truck/Bus	Trallar	Car	LCV	Truck/Bus	Trallar	
01.04.07	31.03.08	20	30	65	110	1,279	2,195	1,929	832	25,530	65,850	125,385	91,520	112,542,275
01.04.08	31.03.09	20	30	65	110	1,343	2,305	2,025	874	26,859	69,143	131,654	96,096	118,169,389
01.04.09	31.03.10	20	30	65	110	1,410	2,420	2,127	917	28,202	72,600	138,237	100,901	124,077,858
01.04.10	31.03.11	25	40	75	130	1,481	2,541	2,233	963	37,015	101,639	167,479	125,209	157,440,068
01.04.11	31.03.12	25	40	75	130	1,555	2,668	2,345	1,011	38,866	106,721	175,853	131,469	165,312,071
01.04.12	31.03.13	25	40	75	130	1,632	2,801	2,462	1,062	40,809	112,058	184,648	138,043	173,577,675
01.04.13	31.03.14	30	45	90	155	1,698	2,913	2,560	1,104	50,930	131,107	230,438	171,173	213,031,576
01.04.14	31.03.15	30	45	90	155	1,766	3,030	2,663	1,149	52,967	136,352	239,656	178,020	221,552,639
01.04.15	31.03.16	30	45	90	155	1,836	3,151	2,769	1,194	55,086	141,806	249,242	185,141	230,414,952
01.04.16	31.03.17	35	55	105	180	1,910	3,277	2,880	1,242	66,837	180,251	302,414	223,602	282,182,520
01.04.17	31.03.18	35	55	105	180	1,986	3,408	2,995	1,292	69,511	187,461	314,510	232,546	293,470,133
01.04.18	31.03.19	35	55	105	180	2,046	3,511	3,085	1,331	71,596	193,085	323,945	239,522	302,274,237
01.04.19	31.03.20	45	65	125	215	2,107	3,616	3,178	1,371	94,814	235,037	397,219	294,679	372,938,119
01.04.20	31.03.21	45	65	125	215	2,170	3,724	3,273	1,412	97,658	242,088	409,135	303,520	384,126,262
01.04.21	31.03.22	45	65	125	215	2,235	3,836	3,371	1,454	100,588	249,350	421,410	312,625	395,650,050
01.04.22	31.03.23	50	75	130	260	2,302	3,951	3,472	1,498	115,117	296,343	520,862	389,400	482,428,746
01.04.23	31.03.24	50	75	150	260	2,371	4,070	3,577	1,543	118,571	305,234	536,488	401,082	496,901,508
01.04.24	31.03.25	50	75	150	260	2,443	4,192	3,684	1,589	122,128	314,391	552,583	413,115	511,808,556
01.04.25	31.03.26	60	90	180	310	2,516	4,318	3,794	1,637	150,950	386,587	682,932	507,336	631,400,804
01.04.26	31.03.27	60	90	180	310	2,591	4,447	3,908	1,686	155,478	400,244	703,482	522,556	650,342,828
01.04.27	31.03.28	60	90	180	310	2,669	4,581	4,025	1,736	160,143	412,252	724,586	538,233	669,853,113
01.04.28	31.03.29	70	110	210	370	2,749	4,718	4,146	1,788	192,438	518,979	870,711	661,380	818,989,975
01.04.29	31.03.30	70	110	210	370	2,832	4,860	4,271	1,842	158,211	534,548	896,833	681,530	343,559,675
01.04.30	31.03.31	70	110	210	370	2,917	5,005	4,399	1,897	204,158	550,585	923,738	701,976	868,866,465
01.04.31	31.03.32	90	130	250	440	3,004	5,155	4,531	1,954	270,363	670,212	1,132,678	859,826	1,070,573,309
01.04.32	31.03.33	90	130	250	440	3,094	5,310	4,667	2,013	278,474	690,318	1,166,659	885,620	1,102,691,024
01.04.33	31.03.34	90	130	250	440	3,987	5,469	4,807	2,073	286,828	711,028	1,201,658	912,189	1,135,771,754

Thane TVC & Collection-16-17 month wise

Name of the Project: Four Laning of Chinchoti Kaman Anjuphata to Mankoli Road Km.0./000 to 26/425

(Collection units: Rs.Actual)

Name of Project: Supreme Vasai Bhiwandi toll-way Pvt. Ltd.				Toll Booth(Malodi Chinchoti Kaman)	
Month & Year	**Car/Jeep**	**LCV**	**Truck/Bus**	**Multiexcle**	**Monthly Toll Collection**
13-Oct	620,992	960,300	3,449,610	5,216,775	10,247,677
13-Nov	547,245	763,875	2,989,035	4,684,255	8,984,410
13-Dec	603,960	1,001,835	3,386,475	5,960,215	10,952,485
14-Jan	736,860	1,179,428	3,936,105	6,408,708	12,261,100
14-Feb	852,630	1,184,063	4,209,075	7,388,928	13,634,695
14-Mar	1,068,855	1,145,295	4,630,860	8,773,233	15,618,243
14-Apr	974,190	1,062,968	4,372,650	8,550,963	14,960,770
14-May	1,034,550	1,044,045	3,890,160	8,053,335	14,022,090
14-Jun	837,210	950,490	4,229,750	7,567,488	13,384,938
14-Jul	1,190,400	926,078	3,253,590	6,787,064	12,157,131
14-Aug	1,292,063	1,196,258	3,541,140	7,977,850	14,007,310
14-Sep	631,545	1,238,490	4,885,335	8,751,998	15,507,368
14-Oct	389,940	2,013,075	5,573,520	10,530,855	18,507,390
14-Nov	437,205	2,083,005	6,170,310	10,971,210	19,661,730
14-Dec	535,065	2,182,300	6,806,520	11,975,920	21,501,805
15-Jan	498,420	2,134,960	6,748,425	11,278,420	20,660,225
15-Feb	393,060	1,879,538	6,247,530	10,942,845	19,462,973
15-Mar	411,465	1,752,120	6,427,665	12,435,418	21,026,668
15-Apr	365,580	1,967,693	6,751,935	11,780,698	20,865,905

15-May	366,495	1,795,658	6,668,865	11,777,288	20,608,305
15-Jun	0	1,726,695	6,264,585	11,182,010	19,173,290
15-Jul	0	1,982,452	6,349,050	10,672,990	19,004,492
15-Aug	0	1,632,555	6,135,210	11,159,845	18,927,610
15-Sep	0	1,581,705	6,003,450	9,835,680	17,420,835
15-Oct	0	1,782,000	6,468,660	11,132,410	19,383,070
15-Nov	0	1,505,745	4,206,195	13,081,225	18,793,165
15-Dec	0	1,697,355	3,663,135	15,769,700	21,130,190
16-Jan	0	1,532,183	3,627,675	16,674,358	21,834,215
16-Feb	0	1,510,605	3,578,805	16,346,765	21,436,175
16-Mar	0	1,539,405	3,687,795	16,911,430	22,138,630
16-Apr	0	1,580,540	4,080,874	17,762,230	23,423,644
16-May	0	1,802,695	4,654,468	20,258,832	26,715,995
16-Jun	0	1,694,860	4,376,043	19,046,971	25,117,874
16-Jul	0	1,195,685	3,605,265	16,353,270	21,154,220
16-Aug	0	1,220,926	3,628,140	15,073,470	19,922,536
16-Sep	0	1,124,077	3,772,940	25,047,990	29,945,007
16-Oct	0	1,021,728	3,629,107	29,064,870	33,715,705
16-Nov	0	212,222	771,600	5,881,140	6,864,962
16-Dec	0	1,044,993	3,584,743	18,413,850	23,049,586
17-Jan	0	905,754	3,552,570	18,644,536	23,102,860
17-Feb	0	825,916	3,262,935	19,148,334	23,237,185
17-Mar	0	1,127,982	3,817,545	19,497,330	24,442,857

Annexure 2

Guideline of Kalyan Keti regarding maintenance and operation of roads

Nature of defects/ deficiency	**Time limit for repair / rectification**
ROAD	
a. Carriageway and Pave Shoulders	
Breach and Blockade	Temporary restoration of traffic within 24 hours, permanent restoration within 15 days
Roughness value exceeding 2750 mm in a stretch of one km (as measured by a standardized roughometer / bump integrator	180 days
Pot holes	48 hours
Cracking in more than 5% of road surface in a stretch of 1 km	30 days
Rutting exceeding 10 in more than 2% of road surface in a stretch of 1 km (measured with 3 straight edge)	30 days
Bleeding and skidding	7 days
Ravelling / Sripping of bitumen surface exceeding 10 sq meter	15 days
Damage to pavement edges exceeding 10 cm	15 days
Removal of debris	6 hours
b. Hard earth shoulders, side slopes, drains and culvert	
Variation by more than 2% in the prescribed slope of camber / cross fall	30 days
Edge drop at shoulders exceeding 40 mm	7 days
Variation by more than 15% in the prescribed side (embankment) slopes	30 days
Rain cuts / gullies in slopes	7 days
Damage to or silting of culverts and side drains during and immediately proceeding the rainy season	7 days
Desiliting of drains in urban / semi urban areas	48 hours
c. Road side furniture including road signs and pavement marking	
Damage to shape or position, poor visibility or loss of retro reflectibility	48 hours
d. Street lighting and telecom (ATMS)	

Any major failure of the system	24 hours
Faults and minor failures	8 hours
e. Trees and plantation	
Obstruction in a minimum head-room of 5 in above barrage way or obstruction in visibility of road signs	24 hours
Deterioration in health of trees and bushes	Timely watering and treatment
Replacement of trees and bushes	90 days
Removal of vegetation effecting sight line and road structures	15 days
f. Rest areas	
Cleaning of toilets	Every 4 hours
Defects in electrical, water and sanitary installations	24 hours
g. Toll plazas	
Failure of toll collection equipment or lighting	8 hours
Damage to toll plazas	7 days
h. other project facilities and approach roads	
Damage or Deterioration in approach roads [pedestrians facilities truck lay – bays, bus bays, bus shelter, cattle crossings, traffic aid posts, medical aid posts and other works]	15 days
BRIDGES	
a. superstructure of bridges	
Cracks – temporary measures, permanent measures	Within 48 hours to 45 days
Spalling / scaling	15 days
b. Foundations of bridges	
Scouring and cavitations	15 days
c. piers abutments, return walls and wing walls of bridges	
Cracks and damages including settlement and tilting	30 days
d. Bearings (metallic) of bridges	
Deformation	15 days
e. Joints in bridges	

Loosening and malfunctioning of joints	15 days
f. Other items relating to bridges	
Deforming of pads in elastomeric bearings	7 days
Gathering of dirt in bearings and joints, clogging of spouts, weep holes and vent holes	3 days
Damage or Deterioration in parapets and handrails	3 days
Rain cuts or erosion of banks of the side slopes of approaches	15 days
Damage to wearing coats	15 days
Damage or Deterioration in approach slabs, pitching, apron, toes, floor or guide bunds	30 days
Growth of vegetation effecting the structure or obstructing the water way	15 days

Annexure 3

Sampling Methodology Table

Project Name	Region	Circle	Division	Length of Road(Km)	Date of commencement of toll tax	Tax closure date as per tender
Construction of bridge at South and North Kalshi on Thane-Bhiwandi-Vadpe road, km 0/000 to 8/090 under privatization	Mumbai	Thane	Thane	8.09	17/11/11	27/11/32
Reconstruction to 4 lane road between Chichoti kaman anjura fata and maankoli, km 0/000 to 26/425under privatization	Mumbai	Thane	Thane	26.425	20/01/12	27/11/33
Reconstruction to 4 lane and Development of road between Manor to Wada and Wada to Bhiwandi to km 89/070 (total length 64.320 km) under privatization	Mumbai	Thane	Thane	72.22	2/3/2013	10/4/1939
Reconstruction of road between Ahmadnagar and Aurangabad, km 120/200 to 155/600 to 4 lane and km 155/600 to 162/000 to 3 lane under privatization	Nashik	Ahmadnagar	Ahmadnagar	41.8	4/5/2018	18/12/2018

Reconstruction to 4 lane road between Ahmadnagar and Aurangabad, km 162/000 to 224/600 (Aurangabad to Wadala circle) under privatization	Nashik	Ahmadnagar	Ahmadnagar	62.6	2/3/209	12/12/2031
Reconstruction to 4 lane road between Kopargoan and Ahmadnagar, km 120/000 to 175/530 under privatization	Nashik	Ahmadnagar	Ahmadnagar	55.53	23/09/11	28/06/19
Reconstruction to 4 lane and strengthening of road between Pune and Ahmadnagar (Shirur to Ahmadnagar), km 64/000 to 120/400 under privatization	Nashik	Ahmadnagar	Ahmadnagar	58.6	16/01/10	19/04/26
Improvement of road between Malegoan-Manmad-Kopargoan, km 95/00 to 170/600 under privatization	Nashik	Nashik	Nashik	75.6	12/7/2007	11/10/2025
Reconstruction to 4 lane road between Aurangabad Jalna road (km 10/400) and Zalta Walan road (km 00/000 to 1/850) and Beed	Aurangabad	Aurangabad	Aurangabad	65.8	28/07/09	31/07/30

Walan road (km 292/500 to 305/650)						
Reconstruction of road between Nanded and Narsee, km 264/000 to 307/000 to 4 lane and Narsee-Deglur to state border, km 307/000 to 341/700 to 2 lane under privatization	Aurangabad	Nanded	Nanded	77.7	4/6/2013	2/1/11/36
Reconstruction of road between Shirur Tajbandh-Narsee to 2 lane and Narsee-Biloli to state border, km 0/00 to 105/200 to 2 lane with paved shoulder under privatization	Aurangabad	Nanded	Nanded	105.2	18/01/14	17/11/36
Reconstruction to 4 lane of road Jalna Watur, km 69/000 to 114/300 under privatization	Aurangabad	Gabad	Jalna	45.3	11/1/2011	19/11/39
Reconstruction to 2 lane of road Malkapur-Buldhana-	Amravati	Kola	Buldhana	70.67	25/07/08	28/05/26

Chikli in Buldhana district under privatization						
Reconstruction to 4 lane of road Jaam-Warora-Chandrapur-Ranjura, km 0/000 to 40/000 under privatization	Nagpur	Chandrapur	Chandrapur	40	26/07/12	4/4/1941
Reconstruction to 4 lane of road Warora Chandrapur Vamni, Warora to Chandrapur km 40/000 to 83/400, Chandrapur to Vamni km 94/000 to 107/800, Chandrapur Walan road km 0/000 to 5/200 and state road under privatization	Nagpur	Chandrapur	Chandrapur	64	26/12/14	2/1/1941
Strengthening and improvement of road Sion Panvel, km 140/690 to 115/800 under privatization	Mumbai	Chembur	Kurla	23.09	6/1/2015	30/10/28
Improvement of road Prakasha-Chadvel-Samoda-Vinchur (Dahiwel to Chandwad km 80/000 to	Nashik	Nashik	Malegoan	86.9	22/05/05	18/12/21

139/700 and 154/200 to 174/400 and Bhabadbari to Saogras fata km 00/000 to 7/000) and Satana Dahiwel side road construction under privatization						
Reconstruction of road Nashik-Nifad-Yewla-Waijapur-Aurangabad to 4 lane (km 155/300 to 179/000) and km 235/00 to 251/300 to 2 lane with paved shoulder and additional railway bridge construction at Shilapur under privatization	Nashik	Nashik	Nashik	40	21/01/10 (Shilapur) 23/04/12 (Andarsul)	16/12/37

Annexure 4

EVALUATION OF GOVERNMENT SUPPORT FOR PRIVATIZATION SCHEME UNDER THE PUBLIC WORKS DEPARTMENT, GOVERNMENT OF MAHARASHTRA

Respondent: PRIVATE PLAYER
SURVEY CONDUCTED BY THE INDIAN INSTITUTE OF MANAGEMENT CALCUTTA

INTRODUCTION: The Directorate of Economics & Statistics, Mumbai, Government of Maharashtra awarded the Indian Institute of Management Calcutta the study report on Evaluation of Government support scheme under PWD. For this purpose, we have selected some BOT project roads in Maharashtra to understand the participation of Private and Public sectors in different aspects of partnership. In this regard, we have prepared a questionnaire for Private Players to understand the different issues related to existing projects. Your thoughtful participation would be very useful to strengthen the Report.

1	Name of Company	
2	Address of Corporate Office	
3	Address of Project Office	
4	Name of Respondent	
5	Designation	
6	Contact Number	
7	Work experience in this Trade	
8	Apart from this road, how many roads under your company operate in Maharashtra?	

9	Which are these Roads?	
10	Do you have a presence in other states? (Name of States)	
11	From when has your company taken authority in operation of this road?	
12	Responsibility as per contract	Only Operation & Maintenance………1 Only Construction & Development…..2 Both……………………………………..3
13	Before you, was there any other company engaged in this BOT project?	Yes……………….1 No………………..2
14	If yes, who are they?	
15	What was the early feature of the road before you took over? (multiple response)	It was two lanes at certain stretch…………..1 It was two lanes for entire stretch……………..2 There is no drainage system along the road sides……………………………………………..3 The Road was broken at different pockets……..4 The pavement condition was very bad………..5 Solder condition was very bad…………………6 Other facilities of road sides were unavailable…..7 Other(specify)______________________________8
16	Staffing Pattern at your project Office	At Toll Plaza________________ At Project Site_______________ At Operational office_________
17	How many are villages located along your road side?	
18	Arethere any Industrial locations near to your project road?	Yes………..1 No…………2
19	If yes, which locations and industry/warehouses are there? (Name of Industrial belt along with number of units)	

20	Existence of facilities along road side (multiple responses)	Ambulance……………..1 Pulling Car………………2 Medical shops……………3 First aid treatment………..4 Street light……………….5 Road Divider……………..6 Lane-Mark……………….7 Public Toilet ………………8 Drinking water…………….9 Others…………………….10
21	What kind of problems do you face regularly in operation?	
22.	Have you intimated the PWD officials about the problems?	Yes, many times…………..1 Yes, but not officially………2 Never……………………..3
23	In last one year, did you meet with	Police personnel……………..1 Local people………………..2 Transport Association………..3 MLA/MP/Councilor etc……….4 Other(specify)___________________________5
24	Number of accidents that occurred along the stretch in last 3 years.	
25	Please specify the accident prone locations.	
26	Have you taken any measures for those areas?	Yes…….1 No………2 Type of measures_____________________________ ____
27	What kind of support do you expect from PWD for smooth operation?	

28	Do you think, this BOT project is making profit ?	Yes……….1 No…………2
29	Whether other alternative roads are connected in parallel	Yes………1 No……….2
30	If yes, distance from your 0 point and end point	From 0 point(distance)___________ From end point(distance)_________
31	Other Remarks	
Please provide us some important data		a. Last 5 years income expenditure statement b. Toll collection in last 5 years c. Month wise break up of toll collection in last year d. Present vehicular traffic volume in last 7 days(day wise break up) e. Projected toll charges f. Copy of agreement paper

Annexure 5

EVALUATION OF GOVERNMENT SUPPORT FOR PRIVATIZATION SCHEME UNDER THE PUBLIC WORKS DEPARTMENT, GOVERNMENT OF MAHARASHTRA

VEHICULAR TRAFFIC SURVEY

CONDUCTED BY INDIAN INSTITUTE OF MANAGEMENT CALCUTTA

INTRODUCTION:I am shri__________________ representative of Indian Institute of Management, Calcutta conducting a study of Evaluation of Government support scheme under PWD, Government of Maharashtra. For the purpose, we have decided to interact a certain number of vehicles those are enjoying this road. Therefore we would like to ask some questions regarding on the scope. Please cooperate with me and spent 5 munities of your valuable time.

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1. Name of Road :____
2. Survey Location:
   Taluka:
   District:
   Chainage of Survey Location:
3. Day : Date:Time:
4. Vehicles type : Car /2-Wheeler /Auto-Rickshaw /Bus /
5. Vehicle Number
6. Contact No.
7. Origin :
8. Destination:
9. Road uses during Journey(mention all roads)_____________________________
   ____
10. Time Taken for using this stretch :
11. Frequency of Visit the sample Road:

12. Time taken to cross toll Plaza?
13. Have you enjoy ever any facilities along road side? Toilet / Drinking Water / Parking
14. Have you enjoy any alternative road instead of this road to reach your present destination? Yes……..1 No……..2
15. Time taken if you enjoy alternative Road:
16. How long have you been using this stretch?
17. Did you face any kind of accident along the stretch? Yes /No
18. If Yes, reason for accident ____

Annexure 6

EVALUATION OF GOVERNMENT SUPPORT FOR PRIVATIZATION SCHEME UNDER THE PUBLIC WORKS DEPARTMENT, GOVERNMENT OF MAHARASHTRA

FOR JUNIOR / DEPUTY / EXECUTIVE ENGINEER
CONDUCTED BY INDIAN INSTITUTE OF MANAGEMENT CALCUTTA

INTRODUCTIONDirectorate of Economics & Statistics, Mumbai, Government of Maharashtra awarded the Indian Institute of Management Calcutta the study report on Evaluation of Government support scheme under PWD. For the purpose, we have selected some BOT project roads in Maharashtra to understand the participation of Private and Public sectors in different aspects. In this regards, we have prepared a format for public officials. Your spontaneous participation would be very useful to strengthen Report. So, your responses are seriously required in such manner.

1	Name of Officer	
2	Gender & Age	
3	Service period in this designated Post	
4	Circle	
5	Division	
6	Staffing Pattern	Technical Non-Technical
7	Shortage of Staff	Technical Non-Technical
8	Number of completed Projects presently supervised	BOT Non-BOT
9	Number of On-going projects presently supervised	BOT Non-BOT
10	Number of projects in propose stage	BOT Non-BOT
11	Number of Vehicles	
12	Frequency of visit at road site	BOT Non-BOT

13	For Sample road, whether Private Player provided road side facilities according to agreement?	Yes fully……….1 Yes partly………2 Nothing………..3
14	What facilities is Private player not providing at site?	Explain
15	If provided partly/nothing, what actions have you taken against him	Explain
16	Normal time taken from Planning to Execution	
17	Did you received any major/minor complaint from anywhere about condition of sample road	Yes, Frequently…………….1 Yes, Occasionally…………..2 Never ……………………….3
18	How many complain have you got in last 3 years	Number
19	What kind of actions have you taken against complain(explain 3 cases)	
20	Is Private Player tried to solve the problems after your actions	Yes…………..1 No…………..2
21	If No, Reason	
22	How many days in last year did have a meeting with your officials?	

23	Whether any discussion regarding present status of BOT projects raised into the meetings?	Yes……………………………………….1 No………………………………………….2 For other agenda in meetings………….3
24	Major 5 constrains for execution of BOT Projects	Point.1 Point.2 Point 3 Point 4 Point 5
25	Major 3 constrains in Policy level of BOT Projects	Point.1 Point.2 Point 3
26	Key positive points for PPP model (explain)	

27	Key negative points of PPP model (explain)	
28	Please share your suggestion for further developments in Policy level, execution level and Operation level	