A SUMMARY OF THE THESIS

PRIVATE SECTOR PARTICIPATION IN ROADS DEVELOPMENT:

PLANNING AND MANAGEMENT ISSUES

A THESIS SUBMITTED TO
THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA
FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY
IN MANAGEMENT STUDIES

BY

SATISH PANDURANG KARVEKAR

GUIDE:

DR. AMITA S. KANTAWALA

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THE M.S. UNIVERSITY OF BARODA
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SUMMARY OF THESIS

i) INTRODUCTION AND RATIONALE:

Of late, Indian road sector has seen overt divergence from its traditional public sector produced delivery system to very new approach of Public Private Partnership conceding resource crunch to meet with the enormous need for the investment in the sector. Under Public Private Partnership (PPP), the private sector builds up the facility and retains assets with him for maintenance and collection of tolls for agreed period of time. The agreement is done for recovering of investments with returns as per type of regulation adopted in agreement. These agreements are called concession agreements which allow either agreed rate of return on investment or whatever return is attained by investor within agreed term subject to capping on toll levels. In such cases, the competition in the field is not practical since duplication of such facility on rivalry is ruinous and hence by virtue of concession agreement the investor's interests are secured. Installation and operations of public utilities by private investors have been practiced by European countries since early 1900s and the probable monopolistic exploitation of users was controlled by Governments using regulations. The economists like Chadwick and Demsetz advocated market exposure to this regulated concession awarding practices in the public interest observing sinister outcome of regulations *sans* open competition in those days. Hence, **competition for the field** was prescribed by the economists and this is the precursor of above said concession awarding for roads under PPP in India. Under this background, this study is framed to inquire in to the road sector in India; the main agencies of the delivery system; the policy shift from public provision to various levels of Private Sector Participation (PSP) including the financially dependent Public Private Partnership approach; international experience on various levels of PSP including PPP; case studies of selected toll projects in India for planning and management of such projects; the user's perspective in overall framework and interrogation of users for their preferences.

As far as Indian scenario is concerned, Government has recognized importance of National Highways (NH) and has focused policies and investments in this segment. Government recognizes that development of this segment of road can not wait for

adequacy of budgetary allocations. A mega investment plan amounting Rs. 2,20,000 crores is taken up by Indian Government under National Highway Development Project (NHDP) since last one decade supported with dedicated cess on petrol and diesel through specialized agency namely National Highway Authority of India (NHAI). Knowing the paucity of public funds, it is inevitably envisaged by Indian Government to attempt the route of PPP for development of National Highways on very large scale in the Eleventh Five Year Plan Period (2007-2012). A huge investment of Rs. 87,000 crores is anticipated from private sector through PPP route for development of NH segment under ambitious NHDP during Eleventh Five Year Plan. This is unprecedented and is almost three times of actual total expenditure on NHDP during Tenth Five Year Plan including all sources. The PPP route is also going to be major way of developing important State Highways. But roads being perceived as public goods, development and operations of road facility using private investments ripple many issues at planning (at project formulation level) and management (at project operation level) stages. These are issues mainly related to commercial viability of investment and public acceptance of such projects and are covered in this study.

ii) OBJECTIVES OF THE STUDY:

The overall objective of this study is to bring out planning and management issues to promote sustainable Private Sector Participation (PSP) in roads development and understand factors affecting willingness to pay (or not to pay) for using the roads.

Precisely the objectives are:

i) To inquire into the status of prevalent practices with reference to road facility creation and financing of the same through international experience.

ii) To inquire into the prevalent views with reference to control of road facility as a public good and methods of ownership, transfer of ownership, viability of projects with the help of literature review.

iii) To understand the status of road development in India , the urgent need for road development, the causes for private sector participation and regulatory development for the same.

iv) To identify present level of PSP (Private sector participation) and scope for the same in roads development.

v) To identify issues related to PSP at project formulation level and management level based upon case studies.

vi) To inquire into 'Willingness To Pay' for use of road facility.

vii) To find out measures to promote sustainable PSP in roads development and to understand factors affecting willingness to pay for using the roads.

iii) RESEARCH DESIGN, METHOD OF ANALYSIS AND SOURCES OF DATA:

Since a national level highway programme (NHDP) is already underway in India, the implementation of this programme, policy reforms and various agreements in vogue for PPP route of private sector participation are providing opportunity to study the PSP related issues for the road sector. The NH being commercially important for nation and being trend setter for development of road sector, study of this segment has been emphasized as compared to remaining categories. The research work is designed to cover the planning and implementation of NHDP at programme level keeping in view international experience in taking up such programmes. The library work and internet searches helped in gathering relevant information on this subject matter. However, no text books on comprehensive studies of Private Sector Participation in Roads are available for ready reference. The research work also encompasses project level study of selected case studies under PPP route in India. The user's preferences in terms of willingness to pay are inquired conducting preliminary surveys for Willingness To Pay.

iii).1 Selection of Case Studies:

The selection of case studies from projects implemented in India on PPP route is based on two basic criterions. Hence, cases from both of these categories are selected from growing population of PPP projects. Knowing the fact that these projects have come into operations from around year 1999-2000, the tenure of toll operations have been seven to eight years only. From the limited population of PPP projects, two projects on State Highways and two projects on National Highways are selected

which also represented Price Cap regulation and Rate of Return regulation. The selected case studies are:

1. Construction Of Four Lane Road Over Bridge In Lieu Of Level Crossing Near Village Chalthan On NH No.-8 in Gujarat State (Chalthan project)
2. Construction of Delhi –NOIDA Toll Bridge in NOIDA (UP State)- IL&FS project (NOIDA Project)
3. Construction Of Four Lane Vadodara – Halol Road SH No.-87 with access control divided carriage and Service roads km 8/300 to 40/00 in Gujarat State- IL&FS project (Vadodara- Halol project)
4. Construction Of Additional Two Lane Bridge Across River Narmada With Approaches on NH No.-8 km 192/0 to 198/0 in Gujarat State (NICE project)

Keeping the objectives of study in view, the scope of case studies include aspects of project formulation that encompasses - basis of project selection, actual site conditions, decision for fixing toll rates, derivation of toll period, types of concession regulation adopted in framing agreement, traffic characteristics for planning level issues. The study of actual operational part of concession agreement is relevant for understanding of management issues. The operational part is most important to know about the robustness of concession agreement in inviting and protecting private and public interests. The audited financial results of companies are found useful to describe commercial viability of project. The project details, concession agreements and operational details like toll revenues and expenses were gathered from offices of concessionaires and some details are availed from internet. Also, relevant details are traced from Government offices.

iii).2 Preliminary Survey for Willingness to Pay:

Regarding primary data, Willingness To Pay (WTP) surveys are conducted on users of one of the case studies. The samples are collected from population of Cars and Trucks only to represent passenger movement and goods movement respectively. Practically the surveys for cars are done on toll road itself. For trucks, looking to the limited decision making capacity of truck drivers in choosing toll roads versus free roads and communication problems with truck drivers, it was preferred to make personal dialogue in the offices of truck owners/operators (which are located near

Golden Chokdi near entrance point of Vadodara- Halol Toll Road) in presence of truck drivers. Looking to the sensitivity of issue, mailing or telephonic interviews were avoided for gathering primary data collection.

The primary data collected from field survey for Willingness To Pay is statistically analyzed using linear multiple regression model. The results are tested for goodness of fit (coefficient of determination, adjusted R^2) and significance of individual coefficients of regression. An analysis of variance (ANOVA) technique provides F-test which is used herewith to verify overall significance of the model.

iv) SCHEME OF CHAPTERS:

The course of intended work basically maneuvers around programme level private sector participation for NHDP and some PPP project specific details leading to answer important questions like – what is really changed delivery system for highways and how effective it is in enhancing private sector participation in development of roads, what are the basic issues of private interest and public interest to be equated in designing a monopolistic concession etc. The actual stream of chapters is arranged as below.

Chapter-I is encircling study back ground justifying rationale for taking up this study. The study framework is derived and objectives of study are narrated with methodology.

Chapter-II is encompassing relevant literature review for exploring the area of study.

Chapter-III is basically related to study of spectrum of Private Sector Participation and understanding of conceptual structure of concession for roads taking help of international experience.

Chapter-IV presents the development of National Highways in India through various agencies and the issues related to planning and management of National Highways Development Project (NHDP).

Chapter-V discusses PPP case studies of highway projects executed under private sector participation in India.

Chapter-VI discusses user's preference in tolling a highway after developing it for present and future needs. A field survey for cars and trucks is conducted to understand the issues related to willingness to pay (WTP) for passenger traffic and commercial goods traffic respectively.

Chapter-VII presents the conclusions derived based on the detailed study. The issues emerging out at planning and management stage are studied and listed for policy implications.

v) CONCLUSIONS AND SUGGESTIONS

The study is made to gather the planning and management issues in undertaking PSP in general and PPP in specific. The findings and suggestions based on conclusions are presented hereunder. It is required to mention that planning issues are reflected in managing the projects and management issues basically stem out of planning aspects or they have remedies in planning of new projects. Hence, delineation of planning and management issues in isolation is not preferred however, significant planning issues are specified as planning issues in the course of study. The conclusions and suggestions are summarized from study in Chapter-II to VI and are presented below.

1. The review of international literature brings in light that PSP or its financially depending format of PPP is not a new paradigm for supply of roads. The private sector had been developer and provider of this utility on its own initiative which saw demise on the eve of nationalization of roads.
2. The bitterest fact to be concluded from review of UK and US experience of private initiative for roads development is that any state administration can be safely assumed to be **strongest competitor with coercive power** and if not satisfied, can cause demise of PSP. The present red carpet welcome from Government needs careful interaction while dealing on public utilities like roads.
3. The unprecedented level of private investment envisaged by Government of India seems to be most difficult task as the international experience of such

nation wide programme is discouraging and suggests limited scope (about 10 % of total investment in important network) for privately financed toll roads.

4. The Europe has remained pioneer in awarding concession to develop and operate public utilities and it has imparted many innovations other than PPP for better private sector participation. The theme of these innovations is more trust on contractors (Outsourcing); allowing contractors to participate in development process before award of work (Early Contractor Involvement); emphasize on value based evaluation of bids instead of awarding works based on offer for lowest bid (Best Value Procurement); instead of prescribing for predetermined civil work, focusing on performance standards; the long term planning perspective; prequalifying contractors for specific need of a job etc. However, the outsourcing of all activities including core engineering functions in India is suggested to be taken up with due care. In a wide country like India, any loss in engineering capability among Government engineers due to continued outsourcing clubbed with thinning of strength of public bodies can mean future generations of Government engineers not even capable of evaluating outsourcing proposals. Hence, it is strongly suggested that outsourcing of core engineering functions shall not lead to loss of engineering capabilities in Government engineers over a period of time. Hence, outsourcing and Government way of execution shall co-exist side by side which may be competitive.

5. Regarding European approach to concessions for new construction and maintenance, the small size of the nation is allowing them to take ample time in preparing the project case and reaching to award stage. However, by any standards, the inordinate time taken for awarding the concessions in Portugal and Spain is avoidable.

6. The pendulum of nationalization and then private participation is noticed in case of countries like Portugal, France, and Spain which raises concern over sustainability of private operations over long period of time. The changing priorities for the sector seems responsible for such treatment to this public utility. This is note worthy for Indian perspective where private sector is being invited on all fronts assuring long standing partnerships.

7. The Public-Private Comparator (PPC) is most attractive feature practiced by UK for efficient screening of private investment vis-à-vis public investment.

The working of PPC requires good hold over cost implications of various options and it is well managed by UK.

8. The Latin America & Caribbean countries have seen alarming rate of renegotiation and some cancellation of concessions awarded for public utilities. The concern for price and quality standards as mentioned by Alfred Marshall is found not addressed while negotiating for award of concession and while taking up renegotiation.

9. The experience of toll road programme in Mexico is most eye-catching for Indian perspective. The present Mexican programme is very much similar to PPP format being used by NHAI. The apathy for reliable traffic count and improper preparation and evaluation of financial case of project are the aspects of earlier Mexican programme quite relevant for present Indian practice. The features like Administration Trust for proper accounting of construction process, formation of corruption proof technical committee for supervision and setting up of Issuance Trust for proper accounting of operations (tolling and maintenance) are the strongholds of new approach to toll roads in Mexico and are worth admitting in Indian NHDP.

10. The Chinese mega project for expressways is good case for securitization of tolling operations. The major aspect is, instead of BOT type of PPP project, State supports major initial investment that is subsequently recovered through proceeds of initial public offer or securitization. The public support to investment through stock market is good concept to secure public acceptance of toll operations.

11. The Indian roads are quantitatively leading the world chart but it has no place in international comparative for superior roads. The National Highways are superior category of roads in India and carry 40% of road traffic though they are only 2% of total road network. The NH segment has however seen resource crunch since atleast last two (Ninth and Tenth) Five Year Plans wherein NH stock has doubled but central funding has not kept pace with even routine maintenance requirements. Hence, almost one third of NH stock is found of village road standards.

12. Despite rhetoric support to PPP route, NHAI has not really realized more than 10% of private sector investment in recently completed Golden Quadrilateral (GQ) under Phase-I. The GQ is the only portion completed by NHAI under

NHDP so far in last eight years. This private investment has been found on piecemeal basis (like Spain and Mexico) where commercial viability was evident and hence, there is faster development on busy corridor like National Highway No.-8 (Delhi- Mumbai corridor). But on such busy corridor also, development has been on piecemeal basis. The most striking fact is famous Golden Quadrilateral network under the Phase-I took more than double time for completion with substantial cost overrun. The GQ was to be implemented under established and favourable conditions whereas now Phase-II is to be implemented under greenfield conditions. Despite slow progress in Phase-I and II, the original scope of 14234 km under Phase-I and II is expanded to 51834 km that is almost four times expansion of NHDP. The expansion of NHDP is not to cost Government much as all these added works are declared to be taken up on BOT basis. The new targeted year of NHDP is 2015 which is found unrealistic as analyzed based on progress so far. Also, the chances of realizing so many works on BOT basis are dim in want of existence of financial framework and Working Group of Eleventh Plan itself suggest scope for cash contract type of execution that was employed by NHAI in last eight years.

13. The Task Force on infrastructure (1998) had anticipated financing of NHDP based on access to long term institutional finance like commercial banks, insurance and provident funds which were supposed to have matching terms of repayment with road project and were in need of stable source of returns for long time. The repayment to such institution was estimated to come from cess and other user charges (including tolls) and in this concept the private sector equity was estimated only around 10%. In reality, no such leverage is enabled either by NHAI or using PPP route through private investors. So far the users charges collected on current receipt basis are directly employed to pay the capital expenditure of contractors under cash contracts. This mechanism has not produced sufficient output where deficient executive capacity of NHAI has also played major role. Since the production of tollable four lane got slow, it directly affected the inflow of toll income and hence the current receipt under cess got under severe pressure to see the cess reaching level of Rs. 2.0 per liter of petrol and diesel from Re. 1.0 within first eight years of NHDP.

14. If the concept of Task Force(1998) is extended, a supportive financial market for financing and refinancing of such investment leveraged on current receipts of project is required (like primary and secondary mortgage markets in housing loans) irrespective of type of player involved i.e. public player like NHAI or private player like individual BOT concessionaire. The international experience suggests that NHAI should create many public concession companies to tap long term resources (e.g. Insurance and Provident Funds) with the help of GOI based on leverage on project revenues (and cess support). For example France has done this and divested public investment at proper stage from such toll companies. The pooling of NHDP inflow at national or such large scale can help in ascertaining financial viability of long term finance gathered from financial institutions. Otherwise scattered type of present PPP will be limited to attractive stretches and are susceptible to viability concern (as found in case of Mexico and Spain). Alternatively, large private consortium if handles many stretches bundled from viability perspective, the overall spread of PPP may get penetration into greenfield conditions. This level of private financing of highways may require foreign investment which was arranged by China by linking the PPP projects to capital market. All these mean, basically creation of proper financial market which was contemplated by Task Force (1998) in the terms of operation of IDFC is yet unattended by Government and it needs priority. Otherwise, the present scenario is limited to awarding concession for attractive stretches on Build-Operate -Transfer basis and NHAI awarding cash contracts to the maximum extent possible under given public resources.

15. NHAI is drawing satisfaction by executing cash contracts using outsourcing type of consultancy services at the cost of removal of State PWD from execution of such projects. But the outcome is not encouraging for continuation of this approach. For speedier implementation of NHDP either on PPP route or by cash contracts, State PWD is felt proper partner in development of NH. It is felt that NHAI should concentrate on PPP route using public concession companies like France and shall invite private sector competition **for the field** of NH segment. The cash contracts shall be left to traditional players like State PWDs. If the supervision is to be outsourced then

State PWDs shall be inspired to compete with private consultants for supervisory job so that this valuable public agency is put to task.

16. In fact whole approach to NHDP tends not to expose the field to the market at larger scale. The PPP route envisaged through MCA (Model Concession Agreement) is an attempt to regulate the natural monopoly conferred upon to BOT concessionaire to control superfluous profits but it has no jurisdiction to foster PPP by linking the project with market. The MCA provides grant support in BOT projects and calls it leveraging over public funds (in terms of grant support) to attract private investments on project basis. But even at project level, leveraging on private equity funds or toll revenue to facilitate cheaper debt resources is not attended in this MCA. Hence, the approach for PPP is a piecemeal approach that can not meet expected investments under NHDP. If the NHDP is going to depend upon budgetary allocations like public financing, the sustainability of NHDP and NHAI is vulnerable. The tenure of NHDP so far is envisaged to be only fifteen years which is very short as compared to US and China who required two decades or more to construct the system of superior roads. Hence, NHDP can be taken up cautiously applying corridor approach or package of many routes so that field on wider scale is exposed to market forces and competition for field is materialized in case of natural monopoly conditions.

17. The NHDP is in fact good ground for inducing private sector participation in various categories of roads. The local bodies and State PWDs shall be made partner in this process who can carry lessons to their jurisdiction of remaining categories of roads. Considering importance of State PWD in fostering PPP at State level (for State roads), NHAI shall atleast involve State PWDs in their set up (may be on loan service basis) so the PPP at NH level gets sound local support and State PWDs get valuable exposure to NH PPP which in turn can help PWDs to develop State roads in convergence with NH.

18. Present delivery system under non PPP route is also not efficient and need project level careful estimation and design of projects through responsible consultants if outsourcing is opted for. The modus operandi of NHAI under outsourcing based approach has worse problems as compared to State PWDs since the present consultancy firms are not really found working satisfactorily. The duress component is still maintained in non PPP mode of execution as

evident from analysis of delivery system. It is hereby suggested that the consultants shall be made responsible in their performance for effective outcome in non PPP route which is necessitated from evaluation of their performance by CAG auditors. A system of retention money for atleast five years or lien on remunerations of consultants from other projects shall be embedded in contracts with consultants so that financial penalties can be imposed and realized even after completion of project.

19. At project level, an attempt is made by Government to make PPP more viable based on provisions of MCA e.g. staggering the investment for six lanning with a gap of around ten years, State support agreements for not creating competing routes, acceptance of subsistence level of revenue and availability of shortfall loans, traffic guarantee for traffic volume on a decided point of time in the concession period, availability of capital grant up to 40%of project cost to meet construction and O &M cost etc. but user's recourse is missed as was asserted by Alfred Marshall. More over, the partial traffic guarantee embedded in MCA is risky to rely upon by lenders since it is merely assuring traffic as per predecided growth rate on specified point of time and compensation is not in cash but converted in to further extension of liability by extending the concession period. The Mexican experience of first wave of toll roads alarms lenders for not to overlook own assessment of traffic worthiness of individual projects and suggests adequate evaluation of financial case prepared by concessionaire instead of relying upon Government support.

20. As per MCA, bidding is based on least cost to Government, under given fixed concession period and fixed toll rates. Hence the concessionaire now faces not only price capping but also faces to some extent revenue capping which are regulations embedded to control superfluous profit from BOT operations. But in case of lower traffic conditions, the MCA only offers shortfall loans under unattractive stipulations. The stipulated traffic guarantee is not really compensation as it is converted in to extension of concession period which could ultimately mean winner's curse. Hence, in absence of any guarantee on returns, the risky and complicated nature of BOT format embedded in MCA is not going to lure the private investors despite cost sharing provisions.

21. The BOT projects are only a decade old concept in India which covers many aspects beyond traditional cash contract projects. However, planning and

designing of concession agreements have been on line of construction agreements only. Except recent provision for partial traffic guarantee in MCA, the very important aspect of traffic is most neglected by planners so far. Hence, neither reliable past records are committed by Government or future traffic is forecasted by Government as a commitment. All the four case studies suggest that traffic after the starting of toll operations hold the key for success of BOT projects.

22. The case study of Chalthan ROB is significant to explain perils of tolling local traffic. Though the local traffic is now regarded as toll free under recent MCA, the issue of estimating tollable traffic is yet unresolved. In absence of reliable traffic database, the tollable traffic is need of guarantee atleast during Ramp Up period. Otherwise, BOT project is turning up into a speculation business where concessionaire has no capacity to influence the demand. In fact good database for tollable traffic can be helpful in negotiating BOT projects at award stage.

23. The Chalthan project also suggests confirming toll booth locations aprior with necessary understanding of intermix of local traffic with tollable traffic. The planners shall have full understanding of alternative location of toll plaza so that issues arising from location of toll plaza can be sorted out smoothly.

24. The claims arisen due to issue of local traffic in Chalthan ROB emphasized requirement of accounting and monitoring of actual project cost and actual toll revenues though it was a price capped BOT project. Even recent MCA has not given importance to these issues with an understanding that it is all related to profitability of concessionaire and hence is not of public concern. These aspects are most vital in Rate of Return regulation based PPP projects but has relevance for Price Cap regulation also when issues of refinancing, re-auctioning and claims are to be resolved. Also, hold over such details can help Government in renegotiating events.

25. The BOOT projects jointly sponsored by IL&FS and Government for NOIDA toll bridge and Vadodara- Halol road are excellent cases of minute detailing of viability concern under Rate of Return regulation. The most striking planning issue in formulating these two projects is, avoidance of open **competition for the field**. Since competition in the field in road sector is not advisable, efficient concession can be awarded only through competition for the field. In

both cases, it is unsolicited proposals being awarded the field and two diverging representatives of public (i.e. Government) and private concern (i.e. IL&FS) are made partner of commercial interest in project. This is most debatable partnership where private concern is most likely to overshadow the public concern in terms of increasing toll rates beyond inflationary limits and no user's recourse in case of reduced service standards. On the other hand, IL&FS played multiple roles of- Sponsor, Concessionaire, and to certain extent lenders. The worries of Demsetz in regulating public utilities are relevant in these cases where Alfred Marshall's proposal to focus prices and service standards is ignored for avoiding public investment.

26. Both of these projects have met with drastically poor traffic as compared to own assessment and the cost of overinvestment is passed on to the ultimate users. The uncapped definition of project cost was infact loose corner unregulated under partnership of Government.

27. Both cases underwent massive restructuring to bail out respective companies from doldrums conditions. However, Government could not extract any benefit in this process for public concern owing to its partnership in commercial operations.

28. In both cases, users are charged excessive tolls by annual increments (beyond inflation based formulae provided in agreement) just to reduce the deficit in return. The benefits to users are however never compared with tolls being levied during operation period.

29. Due to assured returns, Government carries most of the risk in both the cases. Both the cases in fact carry explicit Government guarantee for debts raised and hence basically all funds are attracted on Sovereign eligibility. Thus essence of PPP is not served. Though both cases started with modest 30% of equity, the operating losses forced the owners to infuse more equity within operation of around five years to the tune of 50% or more and thus it was failure of financial plan to model a replicable PPP project on pioneer basis.

30. As far as planning of Vadodara- Halol project is concerned, the agreement has provided only four lane facility whereas the stretch is functioning as a interstate highway between Vadodara- Delhi, Vadodara- Indore and Vadodara- Banswada. Hence, the future problem with this limited capacity of project road is going to hamper project economics.

31. As an academic suggestion, it is felt that Rate of Return regulation with assured returns at 20% associated with wholesome Sovereign guarantee is not in public interest and hence both the agreements should be terminated immediately. The concession agreement requires paying back concessionaire's outstanding project cost at the time of termination. In fact Government missed the chance of re-awarding the concession for both the cases when these projects underwent financial restructuring. Academic exercise of estimating NPV of future cash flow suggests that it is possible to terminate both the project agreements and pay back concessionaire from proceeds of awarding concession to other concessionaire through open market competition. Further it is also found possible to demand rebate on toll rate at the time of auctioning as a precondition of new agreement which shall not be on Rate of Return regulation.

32. The case study of Narmada bridge is NH project with Price Cap regulation. Due to overestimation of traffic and huge debt servicing cost as compared to toll income, occurrence of Ramp Up period seems generic for toll projects. However, this aspect is consistently neglected in all four cases by Government that could affect maintenance capability of concessionaire. Hence either reserve for maintenance shall be ensured or appropriate designing of project specific financial base case is suggested to mitigate the viability problem. The preparation and acceptance of appropriate financial base case will enable planners to stipulate financial covenants (e.g. Debt/ Equity ratio during construction and operation period) and will facilitate loading and unloading of equity funds as the cash flow prospers. This suggestion of emphasizing financial covenants is aimed at reducing financial cost of project and to mitigate problems of Ramp Up period.

33. The salient feature of Narmada bridge case study is planning issue of tolling the existing bridge under the concession awarded for construction of adjoining new bridge. The users are found aware of tolling purpose and any illogical tolling is resisted by mostly local users. The problem of tolling existing bridge is acute here because the existing bridge is having structural defect leading to often closure for traffic which renders four lane facility into two lane. In absence of user's recourse, users pay tolls for four lanning capacity though they have to undergo long queue to cross the Narmada river. This is the fact

leading to conclusion that the concession agreement shall be flexible to accommodate issue of closure of old bridge either by reduction in toll or by re-auctioning the concession for accommodating the repairs to old bridge or construction of new bridge.

34. Another planning issue of Narmada case study which is in need of renegotiation or re-awarding is non availability of category of Multi-axle vehicles and tolling of them at the rate of six wheel trucks. NICE has claimed that introduction of ten wheel trucks and multi-axle vehicles have reduced the total population of vehicles under the category of trucks. The issue is pending with Steering Group but such issues are most relevant when technology changes fast and nomenclature used in agreement affects the viability of project. The problem with Price Cap based concession agreement used for NICE or even MCA is ignorance of financial aspects of project. It affects the viability of project when renegotiation becomes impossible in want of agreeable past financial data that is never monitored by Government. All such operational and management problems surfacing due to flaws in planning or changing perspective hints at constitution of flexible agreement that is only possible if returns demanded in the bid at award stage are evaluated at bidding stage and are monitored during operations which are missing for Price Cap regulation cases.

35. NICE has faced operational problems like regular delay in revising toll rates each year, shortage of coins for collecting odd figure fees, toll evasion due to formation of alternative route circumventing the toll booths. All these management issues are minimum contribution expected to be sorted out by Public partner during design stage or atleast during operations instead of expecting it from private partner for his own viability concern.

36. Looking to the problems with rigid agreement, feasibility of re-auctioning is verified in case of NICE like exercised for IL&FS cases. But here the aim is to incorporate cost of new bridge and termination amount payable to NICE in bidding and then accommodating toll rebates. The projected cash flow suggest feasibility of such option and hence it is academically suggested to re-auction concession for this facility with provision for construction of new bridge that will give opportunity to NICE for relieving if desired or may continue by

agreeing new terms arrived at from open competition for re-award of concession.

The findings from response to WTP survey for **car** users are summarized as below.

37. The car users were found not ready with perception of savings in VOC or in time. The car users agree with benefits of toll road like time saving, lower maintenance higher speed, access control and safety, comfortable journey and road side amenities. But they have no tangible response that required gathering response for WTP in three levels (i.e. Highly Acceptable, Acceptable and OK). This is reflected in mean values for WTP observed. The mean value of maximum (OK) level of WTP is found Rs. 22.0 to Rs. 24 (std. error =6.8 to 10.6) that is near to actual toll level of Rs. 30 despite myriad arguments for tolling of road. The same respondents have stated most acceptable toll level of about Rs. 17.0 to Rs. 19.0 (std. error = 6.3 to 7.6) that is only 60% of prevailing toll rate. But assured the service standards, scope for good WTP was evident. Most stunning finding was none has expressed zero tolling for Vadodara-Halol stretch. The zero tolling was meant to be understood as road is maintained as per availability of State funds and no early improvements/widening. On this ground, zero tolling was not favoured even for existing toll free Halol- Godhra road. The car users were mostly found coming from Vadodara or Panchmahal district and were thus local people. For them, the total length of journey has improved and that was reflected in above response. The car users also discussed issue of existing taxation on possessing and using a car. Need to provide a free road for already prevailing taxes was discussed and present toll level on Vadodara –Halol road was stated proportionately higher than Vadodara- Ahmedabad Expressway.

38. As per regression analysis for cars, looking to the reasonable value of adjusted R^2 and extremely good overall significance of regression model, the linear relationship assumption is found tenable. Thus, the WTP has very simple relationship with independent variables.

39. Statistical analysis proved existence of positive and remarkable intercept of about Rs. 24 to Rs. 30 considering all level of WTP. This is most encouraging

outcome of this analysis. It simply means, Vadodara- Halol Toll road is worth paying tolls that too very near to prevailing toll level of Rs. 30.

40. The gap between mean WTP stated by respondents and intercept of regression model is mainly explained by the toll resistance arising from impact of other taxes on road sector. This is statistically observed from significance of that variable in all three levels of WTP.

41. The WTP is found depending on service standards in full length of journey. The toll free good riding quality of Halol-Godhra road is found helpful in explaining WTP for Vadodara- Halol Toll road. Another way, the analysis suggests that any downfall on service standards on remaining leg of journey hampers the WTP on existing toll road adversely. Practically it can be stated that a pothole on Halol - Godhra stretch can influence WTP on Vadodara-Halol Toll road. Hence it is suggested that knowledge of origin-destination of toll road users shall be given importance and the service standards of remaining leg (may be tolled or untolled) shall be ensured to the acceptable level for helping tolling on selected toll road.

The findings from response to WTP survey for **truckers** are summarized as below.

42. The truckers are found too annoyed with tolling practices on highways. They have very clear understanding of savings in VOC due to improved roads. The stated mean value of perceived savings on Vadodara –Halol road for three axle trucks is only Rs. 2.17 per km (Rs. 69.44 per one side journey) as compared to prevailing toll level at Rs. 4.4 per km (Rs. 140.0 per one side journey). Similar to car users, tolling seems to be accepted by transporters as indispensable charge on use of facility. But the mean WTP for Vadodara- Halol Toll road is very low i.e. Rs. 1.93 per km (i.e. Rs. 61.76 per one side journey of project road). Thus truckers perceive benefits of half of toll being paid on project road and they have expressed WTP for selected toll road even less than half of prevailing toll rate. The trucks travel far beyond Vadodara- Halol and hence any positive or negative experience on this 32 km of small stretch has limited relevance for them. But any positive or negative experience on remaining huge length has definite impact on WTP for this project. Since road between Vadodara- Shamlaji borders has only this alone tolled section, the mean WTP on toll road is infact covering benefits of remaining contiguous untolled length also. This is evident from the fact that truckers state per km WTP for full

length journey with four lane facility at only Rs.1.14 that is lower than per km WTP of Rs.1.93 on Vadodara- Halol road. The some of the reasons are common with car users. All of the respondents blamed other taxes affecting WTP. The heavy fixed and variable cost of owning and driving truck on national or three state permits, tyre renewals, servicing, body work and very competitive fares on other hand are stated as major hitch to pay this extra charge. One more intrinsic problem with truckers is stated as, diesel saving is generally cornered by drivers and maintenance savings is felt reaching to owners. The overloading and sundries collected for enroute short distance consignments were told helping many of times. Regarding time saving, there was no waiting business opportunity at any end stated as a major factor in underquoting WTP for selected toll road and for full length improvement. When business opportunity exists, trucks can not run at speed of 100-120 kilometer per hour and can not travel for more than six hours at a stretch to take benefits of toll roads. The absorption of tolls in overall business operations of transporters is not a planning issue here and statistically it has emerged insignificant too. Overall, the truckers view tolls as an additional tax imposed in-proportionately to savings. Hence, they are eager to know when the investments will be recovered resulting into cessation of tolls on all tolled sections. They are skeptical of tolling policy and demand transparency of tolling operations. These are all problems related with pricing the facility without precise estimates of users' benefits. If the users are the only payers of PPP project, the WTP can not be expected to match with prevailing toll levels. Important for planners is, user's recourse. The transporters have common experience of inferior treatment at toll plaza and lack of basic amenities on toll roads after paying heaviest tolls.

43. As per regression analysis, looking to the reasonably good value of adjusted R^2 and extremely good overall significance of regression model, the linear relationship assumption is found tenable. Thus, the WTP has very simple relationship with independent variables.

44. Here the intercept of regression model is positive, statistically significant but not remarkable (Rs.42) as compared to prevailing toll level of Rs.140 for selected category of three axle truck. This is only Rs.1.31 per km as compared to mean of Rs. 1.93 per km. Overall, statistically significant model for WTP

implies more to reduce effect of overall taxation than any enhancement measures. The variable of perceived savings on selected toll road is not having strong coefficient that could lead to increase WTP by increasing saving on selected toll road. Due to survey limitations, many variables are rendered statistically insignificant or many are yet to be explored which opens scope for further research. However it emerges from discussions during surveys, corridor type of hasslefree point to point superior roads for known origin-destination is one of the solutions to this. At broad policy level, rationalization of taxes on road sector and tapping externalities for project revenues are also worth applying measures to address to this issue of lower WTP for trucks.

45. The WTP estimates thus need to take into account many factors beyond project benefits. It requires time to time review of actual benefits from the project and from remaining leg of journey to sort out problems with users' recourse. Alternatively for a given WTP or for given estimate of quantum of benefits accruing to users due to improvement, the size of project and stages of investment shall be checked back since the project cost along with traffic volume are directly deciding the toll levels at present and viability gap shall be adjusted from other sources (externalities).

vi) SUGGESTION FOR MORE ACCOUNTABLE AND FLEXIBLE CONCESSION AGREEMENT.

The Chapterwise conclusions and suggestions could be effectively extracted to suggest that the regulating of public utility like roads is in need of a flexible concession agreement that can rectify flaws observed in ongoing agreement and accommodate development of changing perspective. The NH segment and hence remaining segments of road sector are practicing Price Cap regulation in award of concession. But these concession agreements are overlooking the financial aspect of project as the Price Cap regulation is not concerned with viability of project once the concession is awarded. The Rate of Return type of regulation is rare in road sector but they impart good lessons for accountability of agreement for viability of commercial agreements. The lumpy investment in road project can only be made attractive ***if periodic re-auctioning is embedded in concession agreement.*** Of course, it shall satisfy Demsetz auctioning by exposing to market forces through open competition

and it shall accommodate user's recourse by securing toll rebates in new agreement. This will be in line with Alfred Marshall's suggestion for focusing the bids on prices or service standards rather than on least investment liability to Government. If the exercise fails to evoke response then ongoing concessionaire shall continue to operate for remaining term of agreed concession period. More over, in case of successful bidding, the ongoing concessionaire shall have preemption right to continue under now improved agreement as derived from best offer. This type of agreement can be re-awarded during full economic life of original investment and hence transferring facility to Government at end of concession is avoided for efficient use of asset. Once the asset is created, such operations will be beyond traditional engineering practices. Hence it will require good financial market for such firms to operate and finance the project. Moreover, a regulatory framework will be needed to see that ***rebidding occurs at precise point of time*** under larger perspective of public interest. This is a major policy recommendation felt noteworthy in the design of concession agreement.