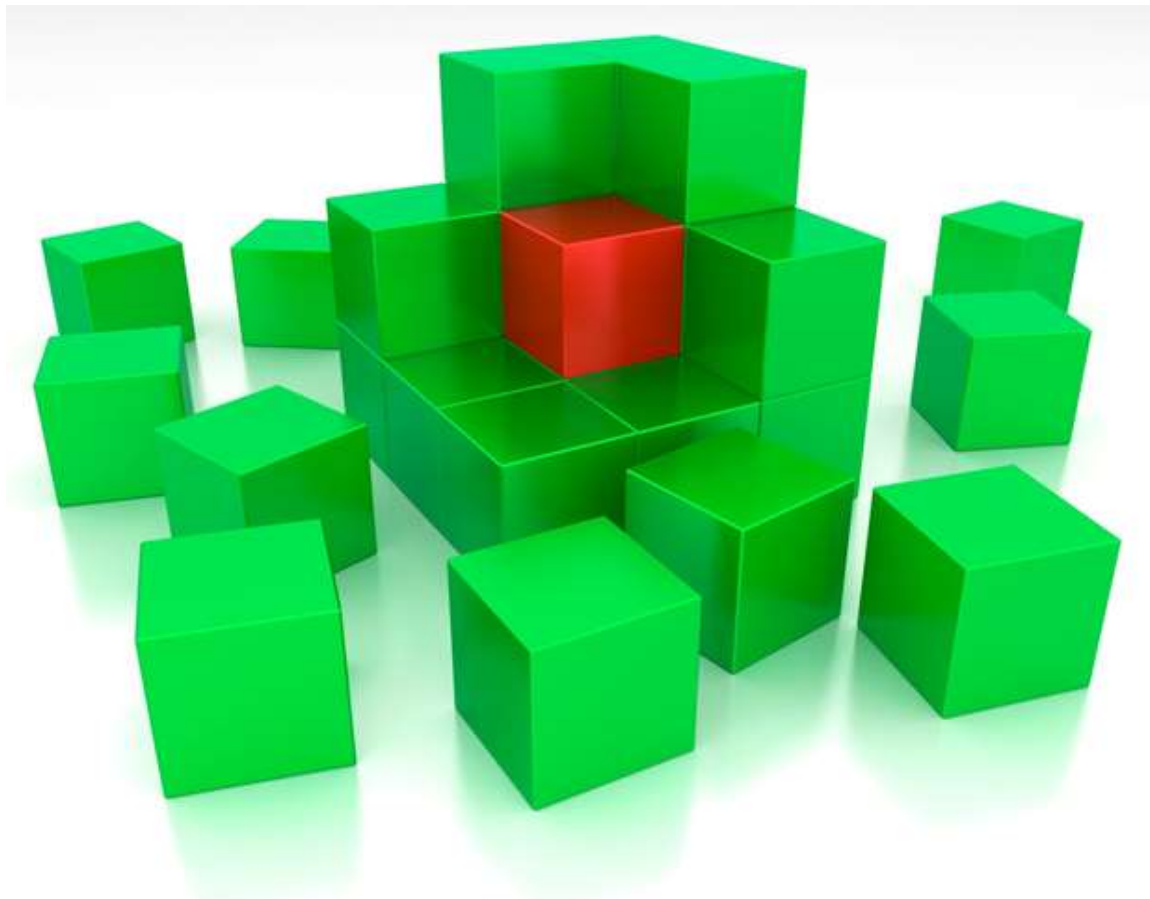




Sector Specific Inventory & Institutional Strengthening for PPP Mainstreaming

Karnataka Public Works Department

Pre-Feasibility Report on O&M of Roads on OMT Basis



Submitted By
Deloitte Touche Tohmatsu India Private Limited

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ACRONYMS

ADB	Asian Development Bank
BOT	Build Operate Transfer
CRN	Core Road Network
FY	Financial Year
Gol	Government of India
GoK	Government of Karnataka
IRR	Internal Rate of Return
KSHIP	Karnataka State Highways Implementation Project
MDR	Major District Roads
NH	National Highways
NPV	Net Present Value
PCU	Passenger Car Unit
PPP	Public Private Partnership
PWD	Public Works Department (Karnataka)
SH	State Highways
SRN	Strategic Road Network
TPC	Total Project Cost
VGf	Viability Gap Funding
WB	World Bank

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1 Executive Summary

Background

- 1.1.1 This report covers the financial feasibility analysis for undertaking Operation & Maintenance (O&M) of identified road corridors on PPP basis. The road corridors considered for the analysis have already been upgraded or which do not require up gradation. This study is expected to estimate pipeline projects, corresponding investment amounts and also the estimated revenues which can be generated by GoK from such projects.
- 1.1.2 Scott Wilson was appointed by KSHIP / GoK to prepare a Detailed Master Plan identifying the Core Road Network (CRN) for the State based on detailed technical analysis of road network in terms of weighted scoring against the parameters i.e. traffic, connectivity, other transport Infrastructure, Industrial Parks and Development Corridors, Mining, Tourism and Agricultural Centres. In its report submitted by Scott Wilson to KSHIP in February, 2012, it has identified 24,225.60 Km under CRN.

Projects Considered for Analysis

- 1.1.3 Scott Wilson in its final report on the Core Road Network has identified twelve (12) road projects covering the length of 1751 Km which has been already developed under KSHIP - I & KRDCCL programme and which do not require any up gradation. These projects have been developed by State Government using its own funds and loan/assistance from various funding agencies. For sustainability of O&M of all these developed projects, it is important to look at tolling options and O&M on PPP basis.

Traffic and Toll Plaza Locations

- 1.1.4 As per the general norms, toll plaza locations in any package are identified where the traffic is highest, subject to general principles relating to distance between any two toll plazas. In view of this fact, for the identified projects, the toll plaza locations have been identified based on following principles:
- *Toll plaza has been considered in each projects with a minimum distance of 50 km between two toll plazas, with few exceptions.*
 - *Toll plaza locations identified at the point of highest traffic subject to above principle.*
 - *As mentioned above, highest traffic on each Toll Plaza has been considered for the analysis.*
- 1.1.5 It is to be noted that such identification of Toll Plaza locations is indicative and is only for the purpose of analysis. Actual identification of locations of toll plazas shall be undertaken after detailed technical and traffic study.

Other inputs and assumptions

- 1.1.6 The analysis also uses various other inputs and assumptions relating to tollable traffic, toll rates per PCU, debt equity structure, cost of up-gradation per km etc. The same have been discussed and described in the report and summary is provided below:

Table: Basic Assumptions for Financial Analysis

Parameter	Value
Concession Period	10 Years
Up-Gradation Period	6 Months
Traffic	Highest traffic on each toll Plaza
Tollable Traffic	74% (average tollable traffic on all State Highways based on traffic data from PWD)
Traffic Leakage	10%
Traffic Growth Rate	5% per annum (CAGR)
Inflation	5% per year (change in WPI)
Toll Rate	Rs. 0.64 per PCU per KM (FY2013)
Initial Cost	Rs. 21 lakhs per km (two laning) (towards first periodic maintenance during the up gradation period)
Debt Equity ratio	70: 30 (Debt: Equity)
Cost of Debt & Debt Tenure	13% for 8 yrs
Routine Maintenance	Rs. 1 Lakh per km (FY13) for two lane
Periodic Maintenance	Rs. 21 Lakh per km (FY13) for two lane every 5 years i.e. twice during the Concession Period, including initial maintenance in first 6 months
TPC	110% of EPC Cost (10% additional cost is towards cost of funding, cost of Independent Engineer and other preliminary & pre-operative expenses)
Depreciation & Taxation	As per current set of rules & policies
Target Equity IRR	Around 15%
Premium	Fixed amount every year (for entire concession period)

Results and Inferences

- 1.1.7 Based on the above assumptions, it is estimated that out of the total 1751 km, 1264 km seems viable with positive premium and remaining 488 km would require financial support from GoK. However, this analysis is on normative basis and therefore after detailed technical and traffic study the results might change. Summary of the estimated revenue which can be generated by GoK is given in table below:

Table: Summary of Estimated Revenue

TYPE	No. of Projects	Length	Positive Premium (sum of premium across years)	NPV of Positive Premium (@12%)	O&M Support	NPV of O&M Support (@12%)	Net Premium	NPV of Net Premium
Earlier developed by KRDCCL	6	571	426.66	241.07	-77.21	-43.62	349.45	197.44
Earlier developed by KSHIP - I	6	1181	504.23	284.90	-23.91	-13.51	480.32	271.39
Total	12	1751	930.88	525.97	-101.12	-57.14	829.76	468.83

- 1.1.8 As evident from the summary provided above, the expected total revenue from the viable projects which can be generated by GoK would be around INR 931 cr over next 9 years i.e. about INR 526 cr in NPV terms (@12%). For Operation & Maintenance of those projects which do not seem viable, the expected total O&M support requirement is 101 cr over next 9 years i.e. about INR 57 cr in NPV terms (@12%). In result of the same the net expected revenue from all 12 projects which can be generated by GoK would be around INR 830 cr over next 9 years i.e. about INR 469 cr in NPV terms (@12%). Detailed summary of Financial Analysis is given in **Annexure A**

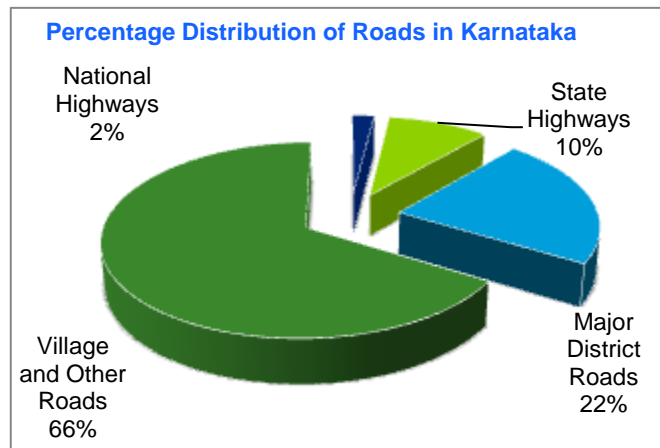
2.3 Sector Overview

2.3.1 Karnataka is well connected to its six neighbouring States and other parts of India through 14 National Highways; it accounts for about 6% of the total NH network in India. It's District Centres and other major towns are linked through 146 State Highways. The category wise summary of Karnataka Road Network is given in table and figure below:

Table: Karnataka Road Statistics

Category	Length (km)
National Highways	4,459
State Highways	20,819
Major District Roads	49,476
Village and Other Roads	147,212
Total	221,966

Source: Karnataka State PWD, February 2011



3 Approach & Methodology

- 3.1.1 To understand the existing projects as well as the proposed plans, Deloitte had meetings with Principal Secretary PWD, Additional Secretary PWD, MD – KRDCCL, Chief Engineer – South, Chief Engineer – North, Chief Engineer – KRDCCL, Project Director – KSHIP & other key department / agency representatives to understand existing projects and proposed plans.
- 3.1.2 Based on the discussions and the key information requirements identified, key data has been provided to us for the assessment carried out in this report. Deloitte perused the Scott Wilson report and based on the further discussion with stakeholders 12 projects were considered for prefeasibility study, which are part of CRN.
- 3.1.3 Based on assumptions detailed out in Inputs & Assumptions section of this report, the financial analysis has been carried out. The analysis results have been categorised in different categories based on Premium/Revenue Sharing with GoK and O&M support from the Government of Karnataka Based on such analysis the total revenue is estimated which can be generated by GoK from such projects.

4 OMT Project Structure of NHAI

4.1 Background

- 4.1.1 Under the PPP programme, the Government of India has decided to undertake Operation and Maintenance of select existing and near completion four lane highways through OMT (Operate, Maintain & Transfer) Concessions.
- 4.1.2 Earlier, the tasks of toll collection and maintenance on these highways were entrusted with tolling agents / operators and sub-contractors, respectively. These tasks have been integrated under the OMT concessions.
- 4.1.3 Under the concession, private operators are permitted to collect tolls on these projects for maintaining highway, constructing additional project facilities (such as toll plazas, bus shelters etc.) and providing essential services (such as emergency / safety services).

4.2 Key Features

- 4.2.1 The structure of an OMT Concession Agreement of NHAI is similar to BOT (Toll) Concession Agreement. The Primary purpose of the concession is to provide for PPP in O&M with an underlying condition that construction works have been completed and the highway is amenable to tolling. There might be some minor upgradation work required on such Highways, such task is generally included as part of the OMT concession on case to case basis.
- 4.2.2 In general it has been observed that for NHAI projects, the maximum Concession Period of about ten years is considered with a view to make the Project Highway available for capacity augmentation post the OMT Concession Period.
- 4.2.3 Comparison of some other important features of normal tolling contract and OMT contract (based on contracts awarded by NHAI and other agencies of India) is given in table below:

Table: Comparison of some important features normal tolling contracts & OMT contract

Type	Description	Traffic Risk	Toll Collections Appropriated By	O&M By	Govt. Revenue	Private Party Revenue	Requirement of Established Traffic profile (past data)	Term	Qualification Requirements	Award Criteria
Normal Tolling Contracts	Out-sourcing toll collection to a third party	Govt.	Govt.	Pvt Party	Toll	Fee	No	8 yrs or less	toll collection experience; toll collection design and implementation plan; and toll revenue-auditing procedures	lowest cost to install toll collection equipment (manual and/or electronic) and annual toll collection operating and maintenance fees
Operations, Maintenance and Transfer (OMT) Contracts	Private party collects toll revenue and undertakes O&M	Pvt Party	Pvt Party	Pvt Party (with SLAs)	Revenue Share / Premium	Toll	Yes	8 yrs or higher	As above + Experience of maintenance	Highest % of toll revenues or highest premium per year
Securitisation	Sale of the future flow of the toll revenues to a private party/investor	Pvt Party	Pvt Party	Pvt Party	Upfront Payment	Toll	Yes	Can be higher	As above + experience of managing toll collections / contracting	Highest Upfront payment amount
Other Features										
Requirement of Capacity Augmentation, ETC or Upfront Capital Expenditure	Can be part of project, in case toll collections meet the same. Otherwise either Govt. can do it itself or provide support to Private Party in form of extension in period or Grant									

4.3 Benefit of OMT projects for GoK

4.3.1 As mentioned above, OMT model is a successful model in NHAI and the projects being considered under the same are the ones which were developed under EPC mode. In same line Government of Karnataka can also Operate & Maintain select projects on OMT basis which are already developed or which do not require any up-gradation. Some key benefits of OMT model for GoK may be as under:

- *Revenue generation through revenue share/premium to GoK, which can be used for development of other road corridors.*
- *Leveraging private sector efficiency in toll collection and road maintenance.*
- *Reduction in leakages considering that the revenue accrues to the private concessionaire.*
- *Reduction of Administrative burden of KPWD and time saving as multiple maintenance contracts do not need to be awarded.*
- *Recurring non plan out lay on maintenance would not be required.*
- *Good road quality and adequate service levels for users.*

5 Toll Policy

5.1 Toll Policy of Karnataka

5.1.1 Government of Karnataka (GoK) notified the rate of Toll to be collected as Toll or User Fee for using a section of SH or MDR to be developed under PPP. Some key highlights of Toll Notification issued by GoK are as under:

- *This notification provides the definitions of key terms like “public funded projects” and “private funded projects” etc.*
- *The Base Year is defined from 1st April, 2008 to 31st March, 2009. The category wise Toll Rate is given in table below:*

Table: Base Toll Rates

Type of Vehicles	Basic Toll Rate (Rs. Per Km. and per trip) (4 Lanes & above)	Basic Toll Rate (Rs. Per Km. and per trip) (2 Lanes)
Car, Jeep, Van or Light Motor Vehicle	0.65	0.50
Light Commercial Vehicle, Light Goods Vehicles or Mini Bus	1.05	0.75
Bus or Truck	2.20	1.50
Heavy Construction Machinery (HCM) or Earth Moving Equipment (EME) or Multi Axle Vehicle (MAV) (three to six Axles)	3.45	2.25
Over-sized vehicles (seven or more Axle)	4.20	1.50

The notification also provides the provisions for yearly revision of Toll Rates which is dependent on the WPI.

The methodology for calculation of Revised Toll Rates is provided in table below.

Table: Revision of Toll Rate

Basic wholesale Price Index for the year ending 31st December, 2008 (WPI as on 27-12-2008 is 229.50)	WPI (A)
Wholesale Price Index for the year ended 31st December, 2009	WPI (B)
Formula for calculation New Toll Rate (w.e.f. 01-03-2010)	Basic Toll Rate X WPI (B) / WPI (A)

Illustration (for Cars):

Toll Rate for Year 2013 (1st April, 2012 to 31st March, 2013) for Car = 0.65 (basic toll rate) X (WPI of year ending on Dec 2012/229.50)

- *Daily Passes & Monthly Passes: the exempted Toll Rate is provided in table below for daily & monthly passes:*

Table: Discounts in Toll Rate

Amount Payable	Maximum no. of one way Journeys allowed	Period of validity
One and half times of the fee for one way journeys	Two	Twenty four hours from the time of payment.
Two-third of amount of the fee payable for fifty single journeys	Fifty	One month from date of payment.

- *Local Traffic: Local traffic exempted from paying tolls.*
- *The Toll Fee as well as passes notified under this notification shall be rounded off and levied in multiple of the nearest rupees five.*
- *Over-loading: Without prejudice to the liability of the driver, owner or a person in charge of a mechanical vehicle, which is loaded in excess of the permissible load specified category under this notification, shall be liable to pay fee at such rate which is applicable for the next higher category of mechanical vehicles.*
- *The notification also lists down the vehicles that are exempted from paying the Tolls.*

5.2 Comparison with other Toll Policies

5.2.1 Karnataka Toll Notification is slightly different than other states and National Highways Toll Notification. We have compared the key aspects of the Karnataka toll policy with the National Highways toll policy as well as the toll policy for Andhra Pradesh, Orissa and Rajasthan. The summary of comparison of key provisions is provided in table below:

Table: Comparison of Karnataka Toll Notification

SI	Aspect	Toll Notification as published by Karnataka Public Works, Ports & Inland Water Transport Secretariat	New Toll Policy as applicable for National Highways	Toll Policy as approved by Government of Andhra Pradesh for SH	Toll Policy as approved by Government of Orissa for SH	Toll Policy as approved by Government of Rajasthan for SH
1	Different Base Rate of Fee depending on lanes.	Different rates are specified for 4-lane and above and 2-lane roads.	Different rates are specified for 4-lane and above and 2-lane roads.	Rates are only mentioned for 4-lane roads.	Different rates are specified for Single lane, Intermediate lane, 2-lane and 4-lane roads.	For two lanes or more lanes the toll rates will be same.
2	Different treatments for structures e.g. bridge, Tunnel etc.	No such different treatments is prescribed for structures e.g. bridges, tunnel etc.	The toll rates for structures (only if the cost is more than INR 50 crores) are different from rest of the project highway, but will be levied together with the rest of the project highway at the same toll plaza.	No such different treatments is prescribed for structures e.g. bridges, tunnel and etc.	The toll rates for structures (only if the cost is more than INR 10 crores) are different from rest of the project highway, but will be levied together with the rest of the project highway at the same toll plaza.	The toll rates for structures including bypass (only if the cost is more than INR 5 crores) are different from rest of the project highway, but will be levied together with the rest of the project highway at the same toll plaza.
3	Different treatments for bypasses.	No such different treatment is prescribed for bypass.	The toll rates for bypasses (only if the cost is more than INR 10 crores) are different from rest of the project highway, but will be	No such different treatment is prescribed for bypass.	The toll rates for bypasses are different from rest of the project highway, but will be levied together with the	Same as structure toll rate

SI	Aspect	Toll Notification as published by Karnataka Public Works, Ports & Inland Water Transport Secretariat	New Toll Policy as applicable for National Highways	Toll Policy as approved by Government of Andhra Pradesh for SH	Toll Policy as approved by Government of Orissa for SH	Toll Policy as approved by Government of Rajasthan for SH
			levied together with the rest of the project highway at the same toll plaza.		rest of the project highway at the same toll plaza.	
4	Annual Revision Date	Annual revision of rate of fee under this rule shall be effective from 1st April every year.	Annual revision of rate of fee under this rule shall be effective from 1st April every year.	Base rate is fixed as on the date of start of tolling. The revision of toll rates shall be done on the very same date every 2 year INR	Annual revision of rate of fee under this rule shall be effective from 1st April every year.	Annual revision of rate of fee under this rule shall be effective from 1st April every year.
5	Methodology for annual revision of Toll Rates	<p>The calculation of Revised Toll Rates is provided below.</p> <p>Toll Rate for year B = $\text{[Basic Toll Rate} \times \frac{\text{WPI-B}}{\text{WPI-A}}]$ WPI-A = WPI of the year ending on 31st Dec, 08 i.e. on 27th Dec, 08 and equal to 229.50 WPI-B = WPI of the year ending on 31st Dec of the preceding year. Basic Toll Rates are as mentioned in the</p>	<p>The calculation of Revised Toll Rates is provided below.</p> <p>Toll Rate for year B = $\text{base rate} + \text{base rate} \times \left\{ \frac{\text{WPI B}-\text{WPI A}}{\text{WPI A}} \right\} \times 0.4$ The rates specified for Base Year shall be increased without compounding, by three per cent. each year with effect from the 1st day of April, 2008 and such increased rate shall be deemed to be the base rate for the subsequent years.</p>	<p>The calculation of Revised Toll Rates is provided below.</p> <p>Toll Rate for year B = $\text{[Basic Toll Rate} \times \frac{\text{WPI-B}}{\text{WPI-A}}]$ WPI-A = WPI at the time of fixing the base toll rate. WPI-B = WPI at the time of revision. Basic Toll Rates are fixed at the time of start of tolling.</p>	<p>The calculation of Revised Toll Rates is provided below.</p> <p>Toll Rate for year B = $\text{base rate} + \text{base rate} \times \left\{ \frac{\text{WPI B}-\text{WPI A}}{\text{WPI A}} \right\} \times 0.4$ The rates specified for Base Year shall be increased without compounding, by three per cent. each year with effect from the 1st day of April, 2011 and such increased rate shall be deemed to be the base rate for the subsequent</p>	<p>The calculation of Revised Toll Rates is provided below.</p> <p>Toll Rate for year B = $\text{base rate} + \text{base rate} \times \left\{ \frac{\text{WPI B}-\text{WPI A}}{\text{WPI A}} \right\} \times 0.4$ The rates specified for Base Year shall be increased without compounding, by three per cent. each year with effect from the 1st day of April, 2011 and such increased rate shall be deemed to be the base rate for the</p>

SI	Aspect	Toll Notification as published by Karnataka Public Works, Ports & Inland Water Transport Secretariat	New Toll Policy as applicable for National Highways	Toll Policy as approved by Government of Andhra Pradesh for SH	Toll Policy as approved by Government of Orissa for SH	Toll Policy as approved by Government of Rajasthan for SH
		notification.	<p>WPI-A = WPI of the week ending on 1st week of Jan 2007 i.e. on 7th Jan, 07 and equal to 208.70</p> <p>WPI-B = WPI of the week ending on 1st week of that year i.e. on 1st week of Jan.</p>		<p>years.</p> <p>WPI-A = WPI of the week ending on 1st week of Jan 2010</p> <p>WPI-B = WPI of the week ending on 1st week of that year.</p>	<p>subsequent years.</p> <p>WPI-A = WPI of the week ending on 1st week of Jan 2010</p> <p>WPI-B = WPI of the week ending on 1st week of that year.</p>
6	Rounding-off of the Toll Rates	The fee as well as passes notified by this notification shall be rounded off and levied in multiple of the nearest rupees five.	The fee as well as passes notified by this notification shall be rounded off and levied in multiple of the nearest rupees five.	<p>The fee notified by this notification shall be rounded off and levied in multiple of the nearest rupees one.</p> <p>The fee for passes will be rounded off to the nearest rupees five.</p>	The fee notified by this notification shall be rounded off and levied in multiple of the nearest rupees one.	The fee as well as passes notified by this notification shall be rounded off and levied in multiple of the nearest rupees five.
7	Levying fees for Local Users	Local non-commercial users are exempted.	A monthly pass of INR. 150/- for the Base Year will be levied to the local non-commercial users as defined in the RFP. This fee will be revised annually and rounded off to the nearest 5 rupees as per the provision provided in the fee	<p>Car/Jeep/Van (non-commercial) are exempted.</p> <p>Car/Jeep/Van (commercial): INR150/- per month for 0 to 20 Km from fee collection booth.</p>	A monthly pass will be levied to local users.	Local non-commercial users are allowed to use monthly passes.

SI	Aspect	Toll Notification as published by Karnataka Public Works, Ports & Inland Water Transport Secretariat	New Toll Policy as applicable for National Highways	Toll Policy as approved by Government of Andhra Pradesh for SH	Toll Policy as approved by Government of Orissa for SH	Toll Policy as approved by Government of Rajasthan for SH
			notification.	Trucks: INR 25/- per crossing for 0 to 20 Km from fee collection booth.		
8	Exempted vehicles	Tractor trailers carrying agricultural produce are exempted from the toll payment. School buses are not exempted from paying toll.	Tractor trailers carrying agricultural produce are exempted from the toll payment. School buses are not exempted from paying toll.	Tractor trailers carrying agricultural produce are exempted from the toll payment. However a vehicle for agricultural produce being used by a trader will be levied toll. School buses are exempted from paying toll.	Two wheelers, Three Wheelers, Bus and Mini Bus are exempted.	Two wheelers, Tractor without trailers and tractor with trolley carrying agricultural produce are exempted from the toll payment.
9	Rate of fee for overloading	Without prejudice to the liability of the driver, owner or a person in charge of a mechanical vehicle, which is loaded in excess of the permissible load specified category under this notification, shall be liable to pay fee at such rate which is applicable for the	Without prejudice to the liability of the driver, owner or a person in charge of a mechanical vehicle, which is loaded in excess of the permissible load specified category under this notification, shall be liable to pay fee at such rate which is applicable for the next higher category of mechanical vehicles.	Without prejudice to the liability incurred under the Applicable Laws by any person driving a vehicle that is loaded in excess of the permissible limit set forth in such laws, the Concessionaire may, in its discretion, recover an additional fee. The Additional Fee shall not	Without prejudice to the liability of the driver, owner or a person in charge of a mechanical vehicle, which is loaded in excess of the permissible load specified category under this notification, shall be liable to pay fee at such rate which is applicable for the next higher category of	Without prejudice to the liability of the driver, owner or a person in charge of a mechanical vehicle, which is loaded in excess of the permissible load specified category under this notification, shall be liable to pay fee at such rate which is applicable for the

SI	Aspect	Toll Notification as published by Karnataka Public Works, Ports & Inland Water Transport Secretariat	New Toll Policy as applicable for National Highways	Toll Policy as approved by Government of Andhra Pradesh for SH	Toll Policy as approved by Government of Orissa for SH	Toll Policy as approved by Government of Rajasthan for SH
		next higher category of mechanical vehicles.		exceed: (a) 50% (fifty per cent) of the Fee if the overloading of such vehicle exceeds 10% (ten per cent) of the permissible load but is not greater than 20% (twenty per cent) thereof; and (b) 100% (one hundred per cent) of the Fee if such overloading exceeds 20% (twenty per cent) of the permissible load: The above penalties would be in addition to the penal action under the applicable laws.	mechanical vehicles.	next higher category of mechanical vehicles.

5.3 Key Observations on Comparison of Toll Policies

5.3.1 As mentioned in the above table, we have undertaken a comparison of five different Toll Policies of Road & Highways sector including the Toll Policy of Karnataka and NHAI. After the comparison, we have some observation related to Karnataka Toll Policy and some of important observations are as under:

- **Fee revision:** As per the notification, the user fee is revised on 1st April of every year. The fee revision is dependent on WPI of the last week of the preceding year. This provision makes the toll revision totally dependent on the movements of WPI which means the revenue realized by the Concessionaire is completely exposed to the WPI risk and hence increases the total risk perception of the project to the Concessionaire. The Toll Notification for National Highways in India includes a fixed component 3% annual revision and 40% of change in WPI.
- **Defining Local Traffic:** The Notification does not provide the definition of Local Traffic and it refers to the Concession Agreement for the same. GoK may decide to include the definition of the same to make the clauses more clear.
- **Toll Fee for Local Traffic:** The Notification exempts Local Traffic from using Toll Fee. However; GoK may decide to include provisions for Local Passenger Traffic to pay tolls and the rates for the same.
- **Location of Toll Plaza:** The notification does not provide any restrictions or any provisions on location of Toll Plaza (it refers to the MCA on the same). However; GoK may restrict locating the Toll Plaza within 10 kilometers of urban limits on similar lines to the Toll Notification used for Tolling on National Highways.
- **Structures:** The Toll Notification published by Gol for tolling on NHs has the provisions of differential toll rates for structures with costs more than a threshold amount compared to roads. The provisions also define the structures to avoid any doubts. This differential toll rates makes the project more viable as it boosts the revenue realized by the Concessionaire. However, while making provisions for the same, willingness of the users to pay the higher charges has to be taken into consideration.
- **Bypasses:** The Toll Notification published by Gol for tolling on NHs has the provisions of differential (i.e. 1.5 times of normal Highways) toll rates for bypasses with cost more than Rs. 10 Cr. This differential toll rates makes the project more viable as it boosts the revenue realized by the Concessionaire. However, while making provisions for the same, willingness of the users to pay the higher charges has to be taken into consideration.

6 Identified Projects on OMT basis

- 6.1.1 As a part of the strategy formulated in the year 1999-2000, KPWD, undertook the World Bank-financed road project, the Karnataka State Highways Improvement Project (KSHIP- I; Loan: US\$360 million) through which about 2,413 Km of SHs were improved. With the intention of developing further lengths of the SHs, the State Government initiated a Second Karnataka State Highway Improvement Project (KSHIP-II) to cover 3,411 Km of SHs at an estimated cost of Rs. 6,246 Crore (US\$ 1.6 billion, approx.). In 2009, PWC was appointed under a World Bank funded study for identifying Strategic Road Network (SRN). Further, towards the end of 2009, Scott Wilson with ADB-TA was appointed to prepare a Detailed Master Plan identifying the Core Road Network (CRN) for the State based on detailed technical analysis of road network in terms of weighted scoring against the parameters i.e. traffic, connectivity, other transport Infrastructure, Industrial Parks and Development Corridors, Mining, Tourism and Agricultural Centres.
- 6.1.2 Scott Wilson in its final report on the Core Road Network has identified various road projects which have been developed under KSHIP & KRDCCL programme. These projects have been developed by State Government using its own funds and loan assistance from various funding agencies. For sustainability of Operation & Maintenance of all these developed corridors, it is important to look at tolling options and O&M on PPP basis.
- 6.1.3 As per the copy of Scott Wilson report provided to us by PWD / KSHIP, we understand that the report has identified 13 road projects which have been already upgraded or which do not require further up-gradation. Out of such 13 road projects, 12 projects / packages are part of CRN and the same have been considered for this analysis. These 12 projects cover a length of 1751 km. Summary of such 12 projects is given in table below and list of all 12 projects is given in **Annexure – B**.

Table: Road Developed by different Agencies

Road Developed by	Length (Km)
KRDCL	570.76
KSHIP – I	1180.50
Total	1751.26

7 Inputs & Assumptions

7.1 Traffic & Toll Plaza Locations

- 7.1.1 As per the general norms, toll plaza locations in any project are identified where the traffic is highest, subject to general principles relating to distance between any two toll plazas. In view of this fact, for the identified project, the toll plaza locations have been identified based on following principles:
- Toll plaza has been considered in each projects with a minimum distance of 50 km between two toll plazas, with few exceptions.
 - Toll plaza locations identified at the point of highest traffic subject to above principle.
 - As mentioned above, highest traffic on each Toll Plaza has been considered for the analysis.
- 7.1.2 It is to be noted that such identification of Toll Plaza locations is indicative and is only for the purpose of this analysis. Actual identification of locations of toll plazas shall be undertaken after detailed technical and traffic study.

7.2 Methodology for calculation of Tollable Traffic

- 7.2.1 The base traffic for this analysis has been taken from Scott Wilson report. The State Highways wise traffic detail is provided for year 2010 in Scott Wilson report. However, as per the Toll Policy of Karnataka, certain categories of vehicles are not required to pay toll and thus they do not form part of the tollable traffic. The Scott Wilson report provides traffic details for each link id in PCUs and separate counts for each vehicle category are not provided. In view of this, using the PWD traffic data for 2010 for all State Highways, we have calculated average tollable traffic as percentage of total traffic. Such average percentage has been used for financial analysis of O&M projects. It may be noted that for each package the traffic profile would be different, which can be ascertained only after a detailed traffic study.
- 7.2.2 The table below provides the calculation used for estimation of tollable traffic in total traffic. Based on the data provided by KPWD, 153 State Highways traffic has been considered for the purpose of per PCU toll rate calculation which is covering the length of almost 21650 km.

Table: Average Tollable Traffic Calculation

Category	Tollable Traffic on all State Highways in Karnataka									Non Tollable Traffic on all State Highways in Karnataka							Total	
	Car & Jeeps	Vans & Tempos	Mini Buses	Buses	LCV	2 Axle Rigid	3 Axle Rigid	Multi Axle	Tractors with Trailors	Two Wheelers	Auto Rikshaw	Pedal Cycle	Cycle Rickshaw	Horse Drawn	wooden wheel	Rubber Tyre	Total Tollable Traffic	Total Traffic
PCU Factor	1	1	1.5	3	1.5	3	3	4.5	4.5	0.5	1	0.5	2	4	8	6		
Traffic (No.)	751105	274994	106566	231938	236888	498077	264269	100711	276339	1473977	479803	399012	10596	4779	47702	49541	2740887	5206297
Traffic (PCU)	751105	274994	159849	695814	355332	1494231	792807	453200	1243526	736989	479803	199506	21192	19116	381616	297246	6220857 (A)	8356325 (B)
Average % of Tollable Traffic																A/B = 74%		

Source of Traffic: PWD

7.3 Methodology for Calculation of Per PCU Toll Rate

- 7.3.1 The Toll Policy of Karnataka provides per km toll rates for each category of vehicle. However, since we are using traffic in PCU terms, an equivalent per PCU per km toll rate has been calculated for financial analysis. Such per PCU per km toll rate would vary based on composition of traffic on a particular project and such composition can be ascertained only after a detailed traffic study. In view of this, the per PCU per km toll rate is calculated based on the category wise break up of traffic data for year 2010 of all State Highways in the State of Karnataka. Based on the data provided by PWD, 153 State Highways traffic has been considered for the purpose of per PCU toll rate calculation which is covering the length of almost 21650 km.
- 7.3.2 As mentioned above, for the purpose of per PCU toll rate calculation, traffic figures for all the State Highways in Karnataka, as provided by PWD, have been considered. Out of this total traffic the categories of vehicles which can be tolled as per the Karnataka toll act have been identified and based on the toll rate provided in Karnataka Toll Policy for 1st April 2008 to 31st March, 2009, the total toll revenue has been calculated and per PCU toll rate has been worked out.

Table: Per PCU Toll Rate Calculation

Category	Car & Jeeps	Vans & Tempos	Mini Buses	Buses	LCV	2 Axle Rigid	3 Axle Rigid	Multi Axle	Tractors with Trailers	Total
Traffic	751105	274994	106566	231938	236888	498077	264269	100711	276339	2740887
PCU Factor	1	1	1.5	3	1.5	3	3	4.5	4.5	-
Toll Rate	0.5	0.5	0.75	1.5	0.75	1.5	2.25	3	2.25	-
Total PCU	751105	274994	159849	695814	355332	1494231	792807	453199.5	1243526	6220857 (A)
Total Revenue	375553	137497	79924.5	347907	177666	747116	594605.3	302133	621762.8	3384163.5 (B)
Per PCU Toll Rate (B / A)						INR 0.544 (1st April 2008 to 31 st March 2009)				

Source of Traffic: PWD

7.4 General Assumptions for Financial Model

Table: Basic Assumptions for Financial Analysis

Parameter	Value
Concession Period	10 Years
Up-gradation period	6 Months
Traffic	Highest traffic on each toll Plaza
Tollable Traffic	74% (average tollable traffic on all State Highways based on traffic data from PWD)
Traffic Leakage	10%
Traffic Growth Rate	5% per annum (CAGR)
Inflation	5% per year (change in WPI)
Toll Rate	Rs. 0.64 per PCU per KM (FY2013)
Initial Cost	Rs. 21 lakhs per km (two laning) (towards first periodic maintenance during Up-gradation period)
Debt Equity ratio	70: 30 (Debt: Equity)
Cost of Debt & Debt Tenure	13% for 8 yrs
Routine Maintenance	Rs. 1 Lakh per km (FY13) for two lane
Periodic Maintenance	Rs. 21 Lakh per km (FY13) for two lane every 5 years i.e. twice during the Concession Period, including initial maintenance in first 6 months
TPC	110% of EPC Cost (10% additional cost is towards cost of funding, cost of Independent Engineer and other preliminary & pre-operative expenses)
Depreciation & Taxation	As per current set of rules & policies
Target Equity IRR	Around 15%
Premium	Fixed amount every year (for entire concession period)

8 Financial Feasibility Analysis on OMT Basis

8.1 Results of the Analysis

8.1.1 Based on the approach and assumption mentioned in this report and information provided in Scott Wilson report, financial analysis of all 12 projects has been undertaken. Each project wise result is given in table below the summary of the analysis is provided in **Annexure A**.

Table: Results of Financial Analysis of projects

Projects developed by KRDCL

Sl. No.	SH Reference	Total CRN Length	Premium (Rs. Cr)
1	SH-08	48.6	-0.64
2	SH-16	91.1	-5.55
3	SH-17	108	36.76
4	SH-51	86.4	-1.27
5	SH-57	154	-0.27
6	SH-88	88	5.90

Projects developed under KSHIP - I

Sl. No.	SH Reference	Total CRN Length	Premium (Rs. Cr)
1	SH-12	46	2.64
2	SH-19	478	25.42
3	SH-20	351.5	8.84
4	SH-23	150	13.42
5	SH-34	113	-2.39
6	SH-45	42	0.11

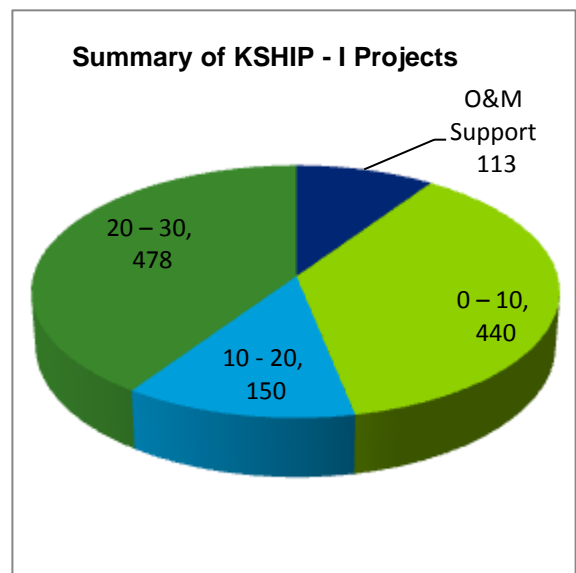
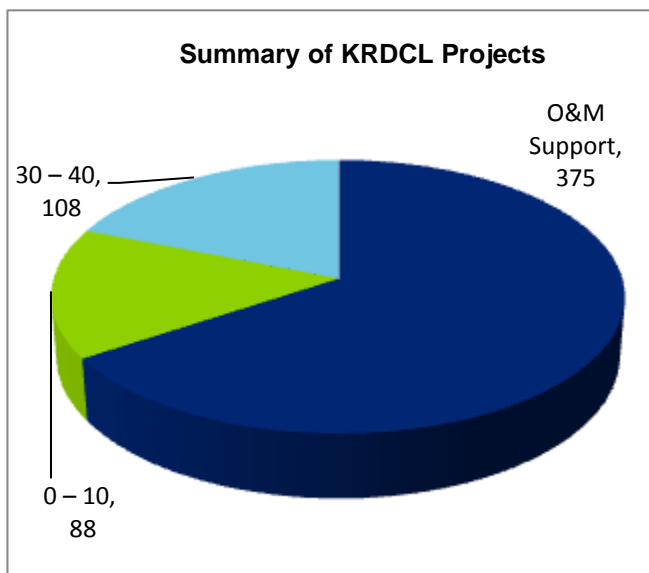
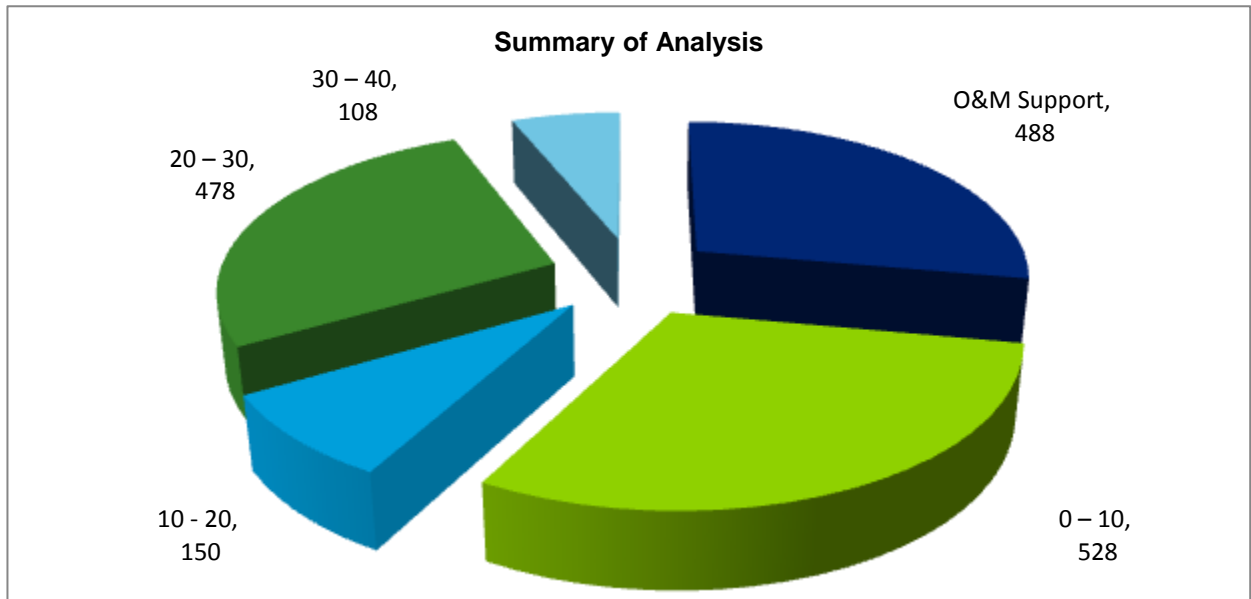
Note: Negative Premium denotes O&M support requirement for the project. The results for each of the packages might change after detailed traffic study and technical study.

8.1.2 Based the on the results given in above tables, all 12 packages are categorised in five different categories on the basis of Premium and VGF requirement. The summary of all results are given in table and figure below:

Table: Summary of Results of Financial Analysis

Premium (Rs. Cr.)	KRDCL		KSHIP - I		Total	
	No of Packages	Length (km)	No of Packages	Length (km)	No of Packages	Length (km)
O&M support	4	375	1	113	5	488
0 – 10	1	88	3	440	4	528
10 – 20	-	-	1	150	1	150
20 – 30	-	-	1	478	1	478
30 – 40	1	108	-	-	1	108
Total	6	571	6	1181	12	1752

Figure: Summary of Results of Financial Analysis



8.1.3 Further, KRDC has also identified eleven (11) packages covering the length of 1191 km on OMT basis. These 11 packages form part of CRN and also the 12 packages identified in Scott Wilson report. KRDC had undertaken feasibility analysis of these 11 packages on the basis of certain traffic data and other assumptions. The results of such analysis along with the traffic considered by KRDC were made available to us. Using such traffic data from KRDC and other assumption provided in previous chapters, we have also undertaken financial analysis for those 11 packages. The summary of such analysis results is given in **Annexure – C**.

8.1.4 Based on the traffic projection for the projects which have been considered for OMT we found that for one of the project the traffic exceed the traffic design volumes for two lanes (i.e. 25,000 PCUs) within the OMT Concession Period. Project wise summary with the year in which the traffic exceeded the road capacity is provided in **Annexure B**.

- 8.1.5 In the project awarded by NHAI on OMT there is no provision for capacity augmentation similarly it can be argued that such provision may be considered for OMT concessions by KRDCL.
- 8.1.6 In the mentioned case the traffic is expected to exceed the road capacity in year 2016-17 which would be the fifth year of concession. In such case either the project can be awarded on OMT for the concession period of 5 years or can be awarded on BOT basis for improvement /upgradation.

8.2 Summary of Results

Table: Summary of Financial Analysis on OMT basis

Coverage of Analysis for Viability on OMT Basis			Viability with O&M Support				Viability with Premium of 0-10 cr to GoK				Viability with Premium of 10-20 cr to GoK				Viability with Premium of 20-30 cr to GoK				Viability with Premium of 30-40 cr to GoK			
Type	No. of packages identified	Length covered by the Identified Packages (km)	No. of Packages	Length under Packages (Km)	Premium first year (Rs Cr)	Total Premium during CP (Rs Cr) (Not NPV)	No. of Packages	Length under Packages (Km)	Premium first year (Rs Cr)	Total Premium during CP (Rs Cr) (Not NPV)	No. of Packages	Length under Packages (Km)	Premium first year (Rs Cr)	Total Premium during CP (Rs Cr) (Not NPV)	No. of Packages	Length under Packages (Km)	Premium first year (Rs Cr)	Total Premium during CP (Rs Cr) (Not NPV)	No. of Packages	Length under Packages (Km)	Premium first year (Rs Cr)	Total Premium during CP (Rs Cr) (Not NPV)
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
KRDCL	6	571	4	375	(7.72)	(77.23)	1	88	5.9	59.04	-	-	-	-	-	-	-	-	1	108	36.77	367.71
KSHIP – I	6	1181	1	113	(2.39)	(23.92)	3	440	12	116	1	150	13	116	1	478	25	254	-	-	-	116.00
Total of	12	1752	5	488	(10.12)	(101.16)	4	527.5	17.47	174.75	1	150	13.4	115.7	1	478	25.43	254.25	1	108	36.77	483.412

8.3 Marginal Tolling

8.3.1 The above mentioned analysis has been undertaken considering the 100% user fee as per Karnataka Toll Policy. However, in other Fee Notifications like that of NHAI, it is mentioned that after the recovery of capital cost through user fee realised, in respect of a public funded project, the fee leviable would be reduced to 40% of the of the user fee for such section.

8.3.2 In view of the same we have undertaken a sensitivity analysis considering various levels of user fee. In case of marginal tolling in the range of 40% - 60% of the normal toll rates, most of the packages require Government support to Operate & Maintain the road. For example in case of application of 60% of normal toll rates, only three projects would fetch a premium/revenue share for the Government while both in case of 40% & 50% of normal toll rates, only one project would fetch a premium/revenue share for the Government. The summary of results is given in table below:

Table: Summary of Results on Marginal Tolling Option:

Premium (Rs. Cr.)	100% Tolling		60% Tolling		50% Tolling		40% Tolling	
	No of Packages	Length (km)	No of Packages	Length (km)	No of Packages	Length (km)	No of Packages	Length (km)
O&M Support	5	488	9	1405	11	1643	11	1643
0 – 10	4	528	2	238	-	-	1	108
10 – 20	1	150	1	108	1	108	-	-
20 – 30	1	478	-	-	-	-	-	-
30 – 40	1	108	-	-	-	-	-	-
Total	12	1752	12	1751	12	1751	12	1751

8.4 Sensitivity Analysis

8.4.1 Traffic growth rate is a key factor in the viability of a highway project. In the above analysis the traffic growth rates have been considered as 5% per annum. However, based on traffic studies to be conducted the same can be adjusted and can be expected to be higher. In view of the same, we have undertaken the sensitivity analysis at different level of traffic growth rates. The summary of the analysis is given in table below:

Table: Analysis Summary with 6% Traffic Growth Rate

Coverage of Analysis for Viability on OMT Basis			Viability with O&M Support				Viability with Premium of 0-10 cr to GoK				Viability with Premium of 10-20 cr to GoK				Viability with Premium of 20-30 cr to GoK				Viability with Premium of 30-40 cr to GoK			
Type	No. of packages identified	Length covered by the Identified Packages (km)	No. of Packages	Length under Packages (Km)	Premium first year (Rs Cr)	Total Premium during CP (Rs Cr) (Not NPV)	No. of Packages	Length under Packages (Km)	Premium first year (Rs Cr)	Total Premium during CP (Rs Cr) (Not NPV)	No. of Packages	Length under Packages (Km)	Premium first year (Rs Cr)	Total Premium during CP (Rs Cr) (Not NPV)	No. of Packages	Length under Packages (Km)	Premium first year (Rs Cr)	Total Premium during CP (Rs Cr) (Not NPV)	No. of Packages	Length under Packages (Km)	Premium first year (Rs Cr)	Total Premium during CP (Rs Cr) (Not NPV)
	D	E	F	G	H	I	J	K	L	M	J	K	L	M	N	O	P	Q	R	S		
KRDCL	6	571	3	221	(7.21)	(72.07)	2	242	6.19	61.91	-	-	-	-	-	-	-	-	1	108	37.65	376.51
KSHIP - I	6	1181	1	113	(2.22)	(22.24)	3	440	13	126	1	150	14	126	1	478	27	267	-	-	-	126
Total of	12	1752	4	333.76	(9.43)	(94.31)	5	681.5	18.77	187.65	1	150	13.9	125.74	1	478	26.708	267.081	1	108	37.65	502.25

Table: Analysis Summary with 7% Traffic Growth Rate

Coverage of Analysis for Viability on OMT Basis			Viability with O&M Support				Viability with Premium of 0-10 cr to GoK				Viability with Premium of 10-20 cr to GoK				Viability with Premium of 20-30 cr to GoK				Viability with Premium of 30-40 cr to GoK			
Type	No. of packages identified	Length covered by the Identified Packages (km)	No. of Packages	Length under Packages (Km)	Premium first year (Rs Cr)	Total Premium during CP (Rs Cr) (Not NPV)	No. of Packages	Length under Packages (Km)	Premium first year (Rs Cr)	Total Premium during CP (Rs Cr) (Not NPV)	No. of Packages	Length under Packages (Km)	Premium first year (Rs Cr)	Total Premium during CP (Rs Cr) (Not NPV)	No. of Packages	Length under Packages (Km)	Premium first year (Rs Cr)	Total Premium during CP (Rs Cr) (Not NPV)	No. of Packages	Length under Packages (Km)	Premium first year (Rs Cr)	Total Premium during CP (Rs Cr) (Not NPV)
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
KRDCL	6	571	3	221	(6.96)	(69.60)	2	242	6.76	67.60	-	-	-	-	-	-	-	-	1	108	38.55	385.52
KSHIP - I	6	1181	1	113	(2.05)	(20.49)	2	88	3	32	2	502	25	32	1	478	28	280	-	-	-	32
Total of	12	1752	4	333.76	(9.01)	(90.09)	4	330	9.96	99.57	2	501.5	24.8	31.971	1	478	28.031	280.313	1	108	38.55	417.486

8.4.2 The above mentioned analysis has been undertaken considering the fixed premium amount per annum for entire concession period. However, other agencies like NHAI consider the premium amount with escalation of 10% every year. In view of the same we have undertaken the sensitivity analysis with every year 10% escalation in premium amount (CAGR) for entire concession period. Summary of results from this analysis is given in table below and project wise comparison is provided in **Annexure D**:

Table: Analysis Summary with 10% Escalation in Premium (every year)

Coverage of Analysis for Viability on OMT Basis			Viability with O&M Support				Viability with Premium of 0-10 cr to GoK				Viability with Premium of 10-20 cr to GoK				Viability with Premium of 20-30 cr to GoK				Viability with Premium of 30-40 cr to GoK			
Type	No. of packages identified	Length covered by the Identified Packages (km)	No. of Packages	Length under Packages (Km)	Premium first year (Rs Cr)	Total Premium during CP (Rs Cr) (Not NPV)	No. of Packages	Length under Packages (Km)	Premium first year (Rs Cr)	Total Premium during CP (Rs Cr) (Not NPV)	No. of Packages	Length under Packages (Km)	Premium first year (Rs Cr)	Total Premium during CP (Rs Cr) (Not NPV)	No. of Packages	Length under Packages (Km)	Premium first year (Rs Cr)	Total Premium during CP (Rs Cr) (Not NPV)	No. of Packages	Length under Packages (Km)	Premium first year (Rs Cr)	Total Premium during CP (Rs Cr) (Not NPV)
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
KRDCL	6	571	4	375	(5.37)	(85.57)	1	88	4.19	66.83	-	-	-	-	1.00	108.00	26.40	420.79	0	0	0.00	0.00
KSHIP - I	6	1181	1	113	(1.66)	(26.50)	4	590	18	283	1	478	18	283	-	-	-	-	-	-	-	283
Total of	12	1752	5	487.76	(7.03)	(112.07)	5	677.5	21.97	350.17	1	478	18.1	283.34	1	108	26.403	420.789	0	0	0	283.344

9 Conclusion

- 9.1.1 This analysis is based on the CRN identified in Scott Wilson Report which is covering a length of 24,225 Km. In the CRN, Scott Wilson has identified 1751 Km (12 packages) on OMT basis. These projects have been developed by State Govt. using its own funds and loan/assistance from various funding agencies. For sustainability of operation & maintenance of all these developed corridors, it is important to look at tolling options and O&M on PPP basis.
- 9.1.2 In this analysis, the estimated revenues which can be generated by GoK from such projects have been calculated. Out of the 1751 km total 1264 km seems viable with positive premium and remaining 488 km requires support from Govt. However, this analysis is on normative basis and after detailed technical and traffic study the situation might change. Summary of the estimated revenue which can be generated by GoK is given in table below:

Table: Summary of Estimated Revenue

TYPE	No. of Projects	Length covered	Positive Premium (sum of premium across years)	NPV of Positive Premium (@12%)	O&M Support	NPV of O&M support (@12%)	Net Revenue	NPV of Net Revenue
Earlier developed by KRDCCL	6	571	426.66	241.07	-77.21	-43.62	349.45	197.44
Earlier developed by KSHIP - I	6	1181	504.23	284.90	-23.91	-13.51	480.32	271.39
Total	12	1751	930.88	525.97	-101.12	-57.14	829.76	468.83

- 9.1.3 As evident from the summary provided above, the expected total revenue from the viable projects which can be generated by GoK would be around INR 931 cr over next 9 years i.e. about INR 526 cr in NPV terms (@12%). For Operation & Maintenance of those projects which do not seem viable, the expected total O&M support requirement is 101 cr over next 9 years i.e. about INR 57 cr in NPV terms (@12%). In result of the same the net expected revenue from all 12 projects which can be generated by GoK would be around INR 830 cr over next 9 years i.e. about INR 469 cr in NPV terms (@12%).

Annexure A: Summary of Financial Analysis

Details Summary of Financial Analysis

Sl. No.	SH No.	Name of the Project	Length of the Project	Initial Maintenance Cost (Rs Crore)	Total Project Cost (Rs Crore)	Premium	Equity IRR	Total Premium	NPV of Premium (@ 12%)
1	SH - 08	Highway connecting Hirisave with Chattalli via Sravanabelagula, Chennarayapatna, Holenarasipura, Arakalagudu, Sanivarasanthe, Chengadahalli	48.06	10.09	11.10	-0.64	15.06%	(6.39)	(3.61)
2	SH - 16	Highway connecting Sindagi with Kodangal via Sahapur, Kanapur, Yadagiri and Gurmitkal.	91.10	19.13	21.04	-5.55	15.00%	(55.53)	(31.38)
3	SH - 17	Highway connecting Bangalore with Mysore via Ramnagara, Chennapatna, Maddur, Mandya and Srirangapatna.	108.00	22.68	24.95	36.76	15.02%	367.63	207.72
4	SH - 51	Highway connecting Basavakalyan with Raichur via Gulbarga, Shahabad, Ravur and Yadhgiri.	81.60	17.14	18.85	-1.26	15.00%	(12.60)	(7.12)
5	SH - 57	Highway connecting Bagalakote with Beligeriranganabetta via Badami, Ron, Huyatgola, Gadag, Sirahatti, Guttal, Ranibennur, Masur,	154.00	32.34	35.57	-0.27	15.00%	(2.69)	(1.52)
6	SH - 88	Highway connecting Mysore with Bhanthwal via Hunsur, Periyapatna, Kushalanagar, Madikeri, Sulya and Puttur	88.00	18.48	20.33	5.90	15.02%	59.02	33.35
7	SH - 12	Highway connecting Bijapur with Sankeshwar via Athani and Chikkodi	46.00	9.66	10.63	2.64	15.00%	26.45	14.94

Sl. No.	SH No.	Name of the Project	Length of the Project	Initial Maintenance Cost (Rs Crore)	Total Project Cost (Rs Crore)	Premium	Equity IRR	Total Premium	NPV of Premium (@ 12%)
8	SH - 19	Highway connecting Srirangapatna with Jeevargi via Nagamangala, Hiriyur, Chellakere, Bellary, Straguppa, Sindhanur, Lingasugur, Surpur and Sahapur (including	478.00	100.38	110.42	25.42	15.01%	254.20	143.63
9	SH - 20	Highway connecting Raichur with Bachi via Lingasugur, Hungund, Bagalkote, Lokapur, Yeraghatti and Belgaum.	351.50	73.82	81.20	8.84	15.00%	88.36	49.92
10	SH - 23	Highway .connecting Kalmal with Shiggaon via Manvi, Sindhanur, Gangavathi, Ginigera, Koppal, Mundaragi, Laxmeshwar and Gudigere.	150.00	31.50	34.65	13.42	15.00%	134.18	75.81
11	SH - 34	Highway connecting Aurad with Sadashlvagacl via Balk!, Basavakalyana, Alandh, Afzalpur, Indt, Bijapur, Jamakhandi, Mudhol, Lokapur, Ramdurg, Saundatti,	113.00	23.73	26.10	-2.39	14.99%	(23.91)	(13.51)
12	SH - 45	Highway connecting Arabhavi with Challakere via Gokak, Naragund, Shalavadi, Sirahatti, Mandaragi, Hadagali, Itagi, Ujjani and Jagalur.	42.00	8.82	9.70	0.11	15.00%	1.05	0.59

Toll Revenue

S.NO	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
1	1.74	3.66	4.48	4.71	5.65	5.93	6.23	7.35	7.72	9.01
2	1.49	3.13	3.56	4.02	4.22	4.75	5.32	5.93	6.23	6.93
3	20.12	45.26	47.52	53.23	59.38	66.02	73.17	80.87	89.16	98.08
4	2.99	6.27	7.19	7.55	8.58	9.01	10.19	11.47	12.84	13.48
5	6.13	13.53	14.88	16.33	17.89	19.57	22.19	24.17	26.28	29.50
6	5.95	13.63	14.31	16.28	18.40	19.32	21.74	24.35	27.16	30.20
7	3.12	6.56	8.03	8.44	8.86	10.63	11.16	11.72	13.84	14.54
8	29.12	64.12	70.43	77.22	85.65	94.73	104.50	115.01	126.31	139.92
9	17.21	38.54	42.15	46.03	51.12	56.61	62.51	68.87	75.70	83.04
10	11.44	25.29	27.89	30.67	33.67	38.43	41.97	45.76	51.60	56.05
11	3.73	7.84	8.78	9.79	10.89	12.07	13.34	14.00	16.17	17.75
12	1.74	4.39	4.61	4.84	5.93	6.23	6.54	7.85	8.24	8.65

EBITDA

S.NO	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
1	1.46	2.47	3.14	3.26	-1.52	-1.62	4.38	5.31	5.54	6.60
2	5.92	6.01	6.29	6.59	-3.87	-4.06	7.36	7.77	7.89	8.35
3	-19.72	1.02	2.91	7.89	0.80	5.99	25.35	32.10	39.37	47.19
4	3.03	4.66	5.37	5.58	-3.03	-3.24	7.59	8.59	9.69	10.11
5	4.49	8.57	9.60	10.71	-5.87	-5.46	15.34	16.88	18.53	21.17
6	-1.50	4.04	4.55	6.20	-2.17	-1.98	10.73	12.93	15.32	17.89
7	-0.57	1.81	3.07	3.36	-1.65	-0.40	5.57	5.98	7.80	8.33
8	-2.18	22.39	27.60	33.21	-14.92	-10.05	56.12	64.98	74.52	86.09
9	4.33	18.16	21.05	24.15	-12.26	-9.78	37.70	42.95	48.61	54.70
10	-4.40	5.94	8.11	10.45	-4.36	-1.13	20.04	23.25	28.29	32.06
11	4.67	6.44	7.14	7.90	-4.32	-4.08	10.59	11.00	12.76	13.98
12	0.75	2.45	2.58	2.71	-1.23	-1.28	4.01	5.10	5.36	5.63

Profit Before Tax (PBT)

S.NO	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
1	0.37	0.36	1.17	1.45	(3.19)	(3.15)	3.00	4.07	4.38	5.43
2	3.86	2.02	2.57	3.14	(7.05)	(6.96)	4.74	5.42	5.67	6.14
3	(22.17)	(3.72)	(1.50)	3.81	(2.96)	2.55	22.23	29.31	36.74	44.56
4	1.18	1.08	2.04	2.50	(5.87)	(5.83)	5.23	6.49	7.70	8.13
5	1.00	1.82	3.31	4.89	(11.23)	(10.36)	10.91	12.90	14.79	17.42
6	(3.50)	0.19	0.95	2.87	(5.23)	(4.78)	8.19	10.66	13.18	15.75
7	(1.61)	(0.20)	1.20	1.62	(3.25)	(1.86)	4.25	4.80	6.68	7.21
8	(13.02)	1.43	8.08	15.13	(31.57)	(25.27)	42.35	52.64	62.89	74.47
9	(3.64)	2.75	6.69	10.86	(24.50)	(20.97)	27.57	33.88	40.06	46.15
10	(7.80)	(0.64)	1.98	4.77	(9.58)	(5.90)	15.72	19.37	24.64	28.41
11	2.10	1.48	2.52	3.63	(8.26)	(7.68)	7.33	8.08	10.01	11.23
12	(0.21)	0.61	0.86	1.13	(2.69)	(2.62)	2.80	4.01	4.34	4.61

Profit After Tax (PAT)

S.NO	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
1	0.24	0.21	0.72	0.88	(3.19)	(3.15)	1.86	2.56	2.75	3.45
2	2.59	1.30	1.61	1.94	(7.05)	(6.96)	2.88	3.30	3.44	3.72
3	(22.17)	(3.72)	(1.50)	2.35	(2.96)	1.38	14.67	19.42	24.41	29.67
4	0.78	0.67	1.26	1.52	(5.87)	(5.83)	3.25	4.06	4.85	5.11
5	0.65	1.11	2.02	2.99	(11.23)	(10.36)	6.82	8.11	9.33	11.06
6	(3.50)	0.06	0.52	1.76	(5.23)	(4.78)	5.23	6.87	8.54	10.25
7	(1.61)	(0.20)	0.74	1.00	(3.25)	(1.86)	2.71	3.06	4.32	4.66
8	(13.02)	0.61	4.77	9.24	(31.57)	(25.27)	26.94	33.71	40.48	48.16
9	(3.64)	1.60	4.02	6.61	(24.50)	(20.97)	17.39	21.52	25.57	29.58
10	(7.80)	(0.64)	1.12	2.92	(9.58)	(5.90)	10.10	12.51	16.03	18.53
11	1.40	0.92	1.54	2.22	(8.26)	(7.68)	4.55	5.01	6.28	7.07
12	(0.21)	0.38	0.52	0.67	(2.69)	(2.62)	1.74	2.55	2.75	2.92

Free Cash Flow to Equity

S.NO	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
1	(2.51)	0.27	0.78	0.94	(3.13)	(3.09)	1.91	2.62	3.92	4.62
2	(2.61)	1.41	1.72	2.05	(6.94)	(6.85)	2.99	3.41	5.65	5.94
3	(28.34)	(3.59)	(1.37)	2.48	(2.82)	1.52	14.80	19.55	27.04	32.30
4	(3.88)	0.77	1.36	1.62	(5.77)	(5.73)	3.35	4.16	6.84	7.10
5	(8.15)	1.30	2.21	3.18	(11.04)	(10.18)	7.01	8.30	13.08	14.81
6	(8.53)	0.17	0.63	1.87	(5.12)	(4.67)	5.34	6.97	10.68	12.39
7	(4.24)	(0.14)	0.80	1.06	(3.19)	(1.81)	2.76	3.12	5.44	5.78
8	(40.33)	1.19	5.35	9.82	(30.98)	(24.68)	27.52	34.29	52.10	59.78
9	(23.72)	2.02	4.45	7.04	(24.07)	(20.54)	17.82	21.95	34.12	38.13
10	(16.37)	(0.45)	1.31	3.10	(9.40)	(5.72)	10.28	12.70	19.67	22.18
11	(5.05)	1.06	1.68	2.36	(8.12)	(7.54)	4.69	5.15	9.03	9.81
12	(2.61)	0.43	0.57	0.73	(2.64)	(2.57)	1.79	2.60	3.77	3.94

Free Cash Flow to Project

S. No	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
1	(9.77)	2.31	2.69	2.70	(1.52)	(1.62)	3.24	3.80	3.92	4.62
2	(16.38)	5.29	5.33	5.38	(3.87)	(4.06)	5.50	5.65	5.65	5.94
3	(44.66)	1.02	2.91	6.44	0.80	4.82	17.78	22.20	27.04	32.30
4	(16.21)	4.25	4.59	4.60	(3.03)	(3.24)	5.60	6.17	6.84	7.10
5	(31.43)	7.86	8.31	8.81	(5.87)	(5.46)	11.26	12.09	13.08	14.81
6	(21.82)	3.92	4.11	5.09	(2.17)	(1.98)	7.76	9.14	10.68	12.39
7	(11.19)	1.81	2.62	2.74	(1.65)	(0.40)	4.03	4.25	5.44	5.78
8	(112.60)	21.56	24.29	27.32	(14.92)	(10.05)	40.71	46.05	52.10	59.78
9	(76.86)	17.00	18.37	19.91	(12.26)	(9.78)	27.52	30.59	34.12	38.13
10	(39.04)	5.94	7.25	8.59	(4.36)	(1.13)	14.42	16.39	19.67	22.18
11	(22.14)	5.87	6.16	6.49	(4.32)	(4.08)	7.81	7.93	9.03	9.81
12	(8.95)	2.22	2.24	2.26	(1.23)	(1.28)	2.95	3.63	3.77	3.94

Annexure B: List of Identified Projects with Details

List of Identified Project on OMT Basis

Road No	Name of the Project	Length (In Km)	Total PCU (2012-13)	Tollable PCU (2012-13)	Breaching Road Capacity
SH - 08	Highway connecting Hirisave with Chattalli via Sraavanabelagula, Chennarayapatna, Arakalagudu, Holenarasipura, Sanivarasanthe,	48.06	4300	3182	After 2022
SH - 16	Highway connecting Sindagi with Kodangal via Sahapur, Kanapur, Yadagiri and Gurmitkal.	91.10	1837	1359	After 2022
SH - 17	Highway connecting Bangalore with Mysore via Ramnagara, Chennapatna, Maddur, Mandya and Srirangapatna.	108.00	21278	15746	2016-17
SH - 51	Highway connecting Basavakalyan with Raichur via Gulbarga, Shahabad, Ravur and Yadhgiri.	81.60	4023	2977	After 2022
SH - 57	Highway connecting Bagalakote with Beligeriranganabetta via Badami, Ron, Huyatgola, Gadag, Sirahatti, Guttal, Ranibennur, Masur,	154.00	4542	3361	After 2022
SH - 88	Highway connecting Mysore with Bhanthwal via Hunsur, Periyapatna, Kushalanagar, Madikeri, Sulya and Puttur	88.00	8008	5926	After 2022
SH - 12	Highway connecting Bijapur with Sankeshwar via Athani and Chikkodi	46.00	7709	5704	After 2022
SH - 19	Highway connecting Srirangapatna with Jeevargi via Nagamangala, Hiriyyur, Chellakere, Bellary, Straguppa, Sindhanur, Lingasugur, Surpur and Sahapur (including	478.00	6957	5148	After 2022
SH - 20	Highway connecting Raichur with Bachi via Lingasugur, Hungund, Bagalkote, Lokapur, Yeraghatti and Belgaum.	351.50	5662	4190	After 2022
SH - 23	Highway .connecting Kalmal with Shiggaon via Manvi, Sindhanur, Gangavathi, Ginigera, Koppal, Mundaragi, Laxmeshwar and Gudigere.	150.00	8918	6600	After 2022
SH - 34	Highway connecting Aurad with Sadashlvagacl via Balk!, Basavakalyana, Alandh, Afzalpur, Indt, Bijapur, Jamakhandi, Mudhol, Lokapur, Ramdurg, Saundatti.	113.00	3685	2727	After 2022
SH - 45	Highway connecting Arabhavi with Challakere via Gokak, Naragund, Shalavadi, Sirahatti, Mandaragi, Hadagali, Itagi, Ujjani and Jagalur.	42.00	5163	3821	After 2022

Source: Scott Wilson Report

Link IDs and their respective Length & Traffic Details

RoadNo.	Link ID	District Name	Length, Km	Toll Plaza Location	PCU (2010-11)	PCU (2012-13)
SH008	SH008SL2	Hassan	48.06	SH08-TP1	3,900	4300
SH016	SH016NL1	Bijapur	25	SH16-TP1	1,666	1837
SH016	SH016NL1A	Yadgir	48	-	1,666	1837
SH016	SH016NL2	Yadgir	18.1	-	1,655	1825
SH017	SH017SL1	Ramanagara	25.2	-	21,262	23441
SH017	SH017SL2	Ramanagara	21.2	SH17-TP1	24,750	27287
SH017	SH017SL3	Mandya	42	-	13,794	15208
SH017	SH017SL4	Mandya	7.9	SH17-TP2	15,195	16752
SH017	SH017SL4A	Mysore	11.7	-	15,195	16752
SH051	SH051NL5	Gulbarga	25.1	SH51-TP1	4628	5102
SH051	SH051NL5A	Yadgir	18.1	-	4628	5102
SH051	SH051NL6	Yadgir	38.4	SH51-TP2	2808	3096
SH057	SH057SL6	Chickmagalur	13.5	-	4,841	5337
SH057	SH057SL6A	Hassan	12.5	-	4,841	5337
SH057	SH057SL7	Hassan	36	SH57-TP1	5,130	5656
SH057	SH057SL8	Hassan	24	SH57-TP2	3,348	3691
SH057	SH057SL9	Hassan	25.3	-	3,332	3674
SH057	SH057SL9A	Mysore	6.7	-	2,917	3216
SH057	SH057SL10	Mysore	36	SH57-TP3	3,544	3907
SH088	SH088SL1	Mysore	24	SH88-TP1	9,777	10779
SH088	SH088SL2	Mysore	24	-	4,858	5356
SH088	SH088SL3	Mysore	40	SH88-TP2	4,248	4683
SH012	SH012NL4	Belgaum	46	SH12-TP1	6,992	7709
SH019	SH019NL1	Bellary	12	SH19-TP1	9,008	9931
SH019	SH019NL2	Bellary	52	-	7,918	8730
SH019	SH019NL3	Bellary	6	-	5,311	5855
SH019	SH019NL3A	Raichur	20	-	5,311	5855
SH019	SH019NL4	Raichur	45	SH19-TP2	7,760	8555

RoadNo.	Link ID	District Name	Length, Km	Toll Plaza Location	PCU (2010-11)	PCU (2012-13)
SH019	SH019NL5	Raichur	28	-	1,032	1138
SH019	SH019SL1	Mandya	27	SH19-TP3	3,746	4130
SH019	SH019SL2	Mandya	21	SH19-TP4	3,746	4130
SH019	SH019SL3	Mandya	15	-	1,844	2033
SH019	SH019SL4	Mandya	11.3	-	2,790	3076
SH019	SH019SL4A	Tumkur	36.7	SH19-TP5	3,768	4154
SH019	SH019SL5	Tumkur	38	SH19-TP6	7,681	8468
SH019	SH019SL6	Tumkur	9.4	-	2,291	2526
SH019	SH019SL6A	Chitradurga	34.6	SH19-TP7	2,356	2597
SH019	SH019SL7	Chitradurga	45	-	7,305	8054
SH019	SH019SL8	Chitradurga	31	SH19-TP8	7,453	8217
SH019	SH019SL9	Chitradurga	17	-	7,453	8217
SH019	SH019SL10	Chitradurga	29	SH19-TP9	8,808	9711
SH020	SH020NL1	Raichur	36	-	7,973	8790
SH020	SH020NL10	Belgaum	13.5	SH20-TP1	10,649	11741
SH020	SH020NL2	Raichur	57	SH20-TP2	6,221	6859
SH020	SH020NL3	Raichur	19	-	1,703	1878
SH020	SH020NL4	Raichur	15	SH20-TP3	4,077	4495
SH020	SH020NL4A	Bagalkot	26	-	4,077	4495
SH020	SH020NL5	Bagalkot	24	SH20-TP4	1,779	1961
SH020	SH020NL6	Bagalkot	30	-	538	593
SH020	SH020NL7	Bagalkot	28	SH20-TP5	7,297	8045
SH020	SH020NL8	Bagalkot	12.1	-	4,585	5055
SH020	SH020NL8A	Belgaum	34.9	SH20-TP6	4,585	5055
SH020	SH020NL9	Belgaum	56	SH20-TP7	2,326	2564
SH023	SH023NL1	Raichur	35	SH23-TP1	7,690	8478
SH023	SH023NL2	Raichur	42	SH23-TP2	8,901	9813
SH023	SH023NL3	Raichur	9.8	-	5104	5627
SH023	SH023NL3	Raichur	8.3	-	4,966	5475

RoadNo.	Link ID	District Name	Length, Km	Toll Plaza Location	PCU (2010-11)	PCU (2012-13)
SH023	SH023NL3A	Koppal	27.9	-	4966	5475
SH023	SH023NL4	Koppal	27	SH23-TP3	7455	8219
SH034	SH034NL1	Bidar	31	-	169	186
SH034	SH034NL2	Bidar	57	SH34-TP1	3,342	3685
SH034	SH034NL3	Bidar	25	-	1,173	1293
SH045	SH045NL3	Belgaum	42	SH45-TP1	4,683	5163

Source: Scott Wilson Report

Annexure C: Summary of Financial Analysis – Packages Identified by KRDCCL

Summary of Details provided by KRDCCL

Sl.No.	SH-No.	Package No.	Package Name	Tollable PCU	length in Kms	Estimated Premium (Annual) Rs. Crore
KSHIP Roads						
1	SH -19	Package 2	Hiriyur to Bellary	6475	144	4.80
2	SH-20	Package 7	Hungund-Belgaum via Baglakot-Lokapur (To MH Border)	10684	170	19.20
3	SH-34	Package 8	Bijapur-Lokapur via Krishna Bridge, Mudhol-Jamakhandi	10025	104	10.60
4	SH-44 & 45	Package 11	Sankeshwar-Yeragatti via Gokak	5351	73	2.00
5	SH- 19	Package 4	Hattigudur to Bidar	10645	105	11.50
6	SH- 23	Package 5	Kalmala-Budh gumpa via Sindhnur	17711	77	13.70
KRDCL Roads						
7	SH- 57	Package 16	Road from Bilikere to Belur via Hassan	4366	119	0.04
8	SH -17	Package 17	Road from Bangalore to Mysore	32298	111	66.00
9	SH- 88	Package 18	Road from Mysore to Madikeri	9452	119	16.50
10	SH- 16	Package 20	Road from AP Border (Medak) to Shahapur Via Yadgir	3688	81	0.10
11	SH- 51	Package 22	Road from Wadi to Raichur	8959	88	15.40
Total					1191	159.84

Source: KRDCCL

Analysis summary of the Project Identified by KRDC on OMT Basis

Sl. No.	SH No.	Name of the Project	Length of the Highways	Tollable PCU	Estimated Construction Cost (Rs Crore)	Total Project Cost (Rs Crore)	Premium	Equity IRR	Total Premium
1	SH -19	Hiriyur to Bellary	144.00	6,475	30.24	33.26	10.99	15.05%	109.93
2	SH-20	Hungund-Belgaum via Baglakot-Lokapur (To MH Border)	170.00	10,684	35.70	39.27	32.68	15.02%	326.81
3	SH-34	Bijapur-Lokapur via Krishna Bridge, Mudhol-Jamakhandi	104.00	10,025	21.84	24.02	17.36	15.02%	173.56
4	SH-44 & 45	Sankeshwar-Yeragatti via Gokak	73.00	5,351	15.33	16.86	2.48	15.02%	24.79
5	SH- 19	Hattigudur to Bidar	105.00	10,645	22.05	24.26	19.22	15.02%	192.23
6	SH- 23	Kalmala-Budh gumpa via Sindhnur	77.00	17,711	16.17	17.79	28.60	15.01%	286.05
7	SH- 57	Road from Bilikere to Belur via Hassan	119.00	4,366	24.99	27.49	1.82	15.03%	18.24
8	SH -17	Road from Bangalore to Mysore	111.00	32,298	23.31	25.64	85.12	15.02%	851.18
9	SH- 88	Road from Mysore to Madikeri	119.00	9,452	24.99	27.49	18.45	15.01%	184.51
10	SH- 16	Road from AP Border (Medak) to Shahapur Via Yadgir	81.00	3,688	17.01	18.71	-0.71	15.10%	(7.10)
11	SH- 51	Road from Wadi to Raichur	88.00	8,959	18.48	20.33	12.15	15.01%	121.53
Total			1191		250	275	228		2282

Annexure D: Summary of Financial Analysis Results in Comparison of Fixed Premium and Escalated Premium

Summary of Comparison of Results with Fixed Premium and Escalated Premium

SH No.	Length of the Highways	With Fixed Premium (in Rs. Cr)			With every year 10% Escalation in Premium (in Rs. Cr)		
		Premium (1st yr)	Premium (Total)	NPV of Premium (@12%)	Premium (1st yr)	Premium (Total)	NPV of Premium (@12%)
SH - 08	48.06	(0.64)	(6.37)	(3.60)	(0.44)	(7.05)	(3.65)
SH - 16	91.10	(5.55)	(55.53)	(31.38)	(3.86)	(61.53)	(31.83)
SH - 17	108.00	36.77	367.71	207.76	26.40	420.79	217.67
SH - 51	81.60	(1.26)	(12.61)	(7.12)	(0.88)	(13.97)	(7.23)
SH - 57	154.00	(0.27)	(2.71)	(1.53)	(0.19)	(2.98)	(1.54)
SH - 88	88.00	5.90	58.99	33.33	4.20	66.86	34.59
SH - 12	46.00	2.64	26.45	14.94	1.89	30.06	15.55
SH - 19	478.00	25.42	254.17	143.61	18.07	287.95	148.95
SH - 20	351.50	8.82	88.16	49.81	6.29	100.18	51.82
SH - 23	150.00	13.42	134.18	75.81	9.55	152.13	78.70
SH - 34	113.00	(2.39)	(23.92)	(13.52)	(1.67)	(26.55)	(13.73)
SH - 45	42.00	0.10	1.05	0.59	0.07	1.19	0.61

Annexure E: Snapshot of the road network in Karnataka

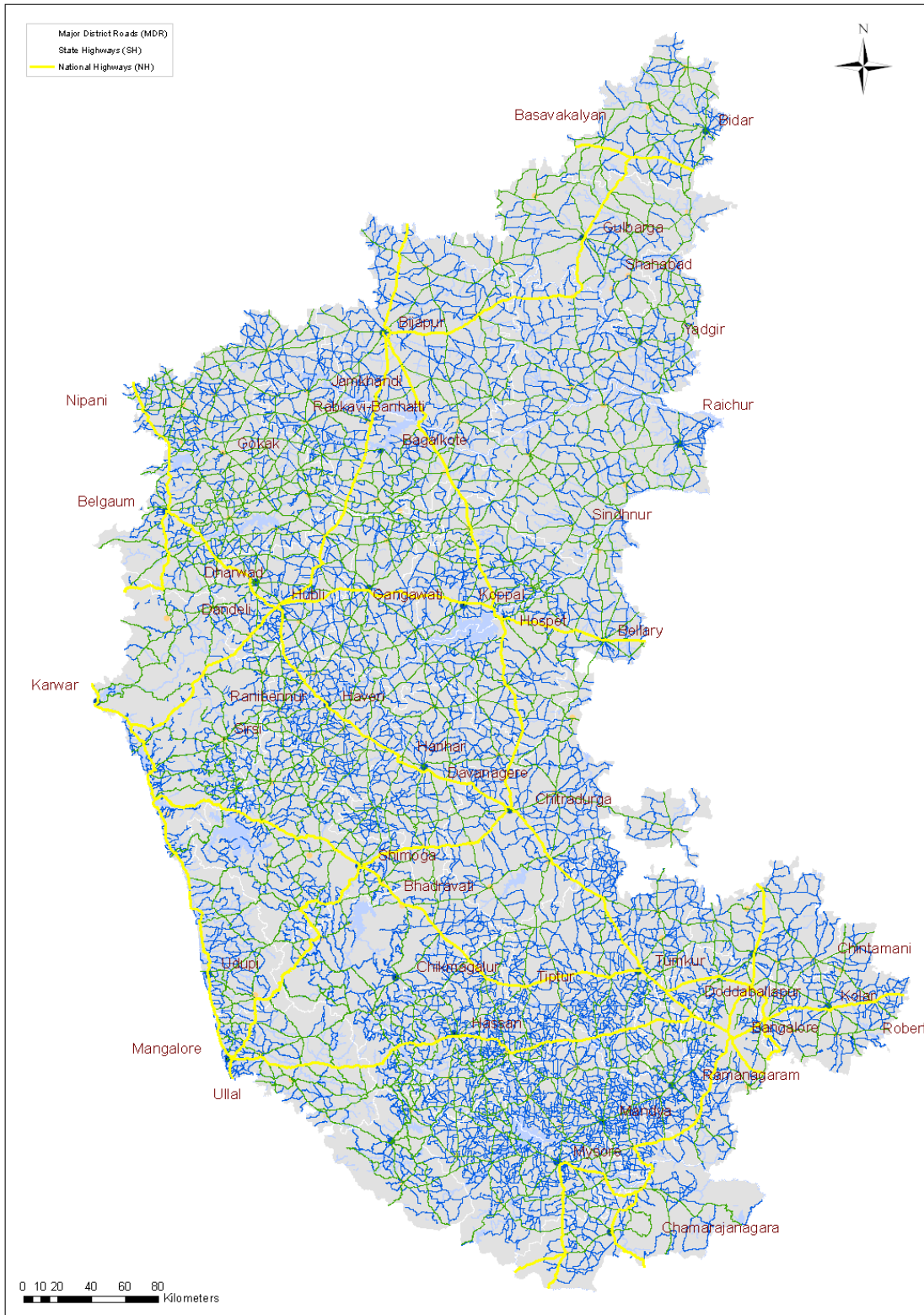


Figure: Karnataka Road Network (NH, SH, MDR)

Village Roads are not shown on the above map for purposes of clarity. Source: Scott Wilson Report



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