



Confederation of Indian Industry

# Roads and highways sector-Current trends and future road map

September 2019

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# KPMG in India Foreword

I am happy to share with you KPMG in India's paper on 'Roads and highways sector – Current trends and future road map'.

The sector has been witnessing high construction rates over the last few years. A host of policy initiatives undertaken by the government in recent past covering aspects like expeditious land acquisition, solving operational issues, revival of languishing projects and time bound resolution of disputes in an affordable manner have gone a long way in ensuring an enabling environment. In addition, launching of the Bharatmala Pariyojana in 2017 and introducing new project implementation models like the hybrid annuity, operational asset monetisation models like Toll- Operate-Transfer (TOT) have also made a significant

impact. In the realm of road transport, the Motor Vehicles (Amendment) Act-2019, enhanced focus on road safety and adapting technology enabled solutions also played major roles.

The current focus on construction of roads and highways is expected to continue over the next five to six years. Post that the focus is expected to shift to efficient operations and maintenance of roads and enhanced service provisions to road users. In addition to this, multi-modal integration is expected to gain further significance, both in passenger and freight transport. Road safety and increasing use of technology are other areas of priority for the government. Better utilisation of existing sources of funding and searching for new avenues

is also a key requirement. New asset monetisation options like Infrastructure Investment Trusts (InvIT)s and securitisation of toll revenue are being considered. All above are expected to be taken forward in a sustainable manner, keeping in mind green initiatives and increasing focus on e-mobility.

CII INFRANET 2019: Building Roads and Highways: IMPERATIVE FOR NATION'S GROWTH is an important milestone in the journey to sustainable and focused development of the sector.

As the 'Knowledge Partner' to the conference, KPMG has prepared this elaborate paper covering various pertinent aspects of the roads and highways sector.

I am confident you will find the paper informative and thought provoking.



## Davinder Sandhu

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# CII Foreword

India is one of the fastest growing economies and is entering into an era where infrastructure will be at the core of country's economic development. In recent years, the government has embarked on series of measures to accelerate infrastructure development.

As a result of some of these initiatives, India's rank in terms of overall infrastructure development as per the Global Competitive Ranking of the World Economic Forum, has vastly improved from 87th position in 2015 to 63rd position in 2018.

The Roads and Highways Sector plays a critical role in the growth of Indian economy as around 64.5 per cent of goods are transported via road and nearly 90 per cent of passenger traffic is by road. The Government of India's efforts to fasten pace of construction in

the roads and highways sector is commendable. India has undoubtedly become the fastest highway developer in the world with 27 kms of highways built each day and the aim is to increase this target to 40 Kms a day. New bids have however slowed down considerably and many major Detailed Project Report (DPR)s have been cancelled, raising questions about the pipeline.

The sector is confronted by a number of challenges viz. competing demands leading to insufficient budgetary support, contracting companies in financial stress, lack of feedback mechanism, challenges in bidding process, shortcomings in DPR preparation amongst others. Pending payment against routine bills, against awards already

agreed by arbitration panels and against variations carried out after due approvals etc are causing too much of stress in the system. Similarly, methodology of TOT bidding, approvals for change of ownership of assets and modalities of payments for Engineering-Procurement-Construction (EPC) contracts need immediate attention. Government should consider addressing industry's apprehensions arising out of the recent news of NHAI's role as developer or only asset manager. Lenders' reluctance to provide credit or non-fund based support is also resulting in more challenges.

Therefore, there should be broad based consultations with active involvement of all the stakeholders to chalk out a long term strategy for roads and highways.



## Parvesh Minocha

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# 01. Executive Summary

India has the second largest road network in the world. Ministry of Road Transport and Highways (MoRTH) is planning to develop around 60,000 km of roads in the next five years at about 40km/day. Road construction and award trends in recent years also give optimism of achieving such high targets. Focus continues to be on Bharatmala Pariyojana, with added stress on multimodal integration, road safety, increasing use of Information Technology (IT) applications, augmentation of existing funding sources and emphasis on green initiatives. Also, enhanced passenger facilities and logistics efficiency are major considerations.

Public Private Partnership (PPP) is the need of the hour. With reference to PPPs, roads and highways has a long history. The journey started toward the beginning of the millennium with road asset development and operation models like Build Operate Transfer (BOT) (Toll) and BOT (Annuity) and attracted high participation. This gradually waned post 2012 due to various issues including aggressive bidding and over-leveraged balance sheet of developers, shortcomings in project preparation activities and land acquisition issues. The Hybrid Annuity Model (HAM) was introduced to reinvigorate PPP participation in the road sector after interest in BOT projects waned. It focused on proper allocation of risk among partners. Further, operational asset monetisation models have gained prominence recently with the advent of the Toll-Operate-Transfer (TOT). Other asset monetisation options like

Trusts (InvIT) and securitisation of toll revenue are also under consideration.

MoRTH is targeting completion of 60,000 km of NH in the next five years<sup>1</sup> at an average road construction rate of 40 km per day. Assuming average construction cost of approximately INR30 crore per km (including land acquisition cost), and factoring in inflation for road construction cost at a conservative 3 per cent, the total funding requirement over five years is estimated at approximately INR19 lakh crore which amounts to average annual fund requirement of approximately INR3.8 lakh crore. Additionally, many issues have been plaguing the roads and highways sector in India. Such issues include aspects like land acquisition, streamlined operations, financing, operation and maintenance (O&M) and revival of languishing projects.

The government has been taking a number of initiatives to solve the various issues. These are in the form of operational initiatives like process streamlining and various technological initiatives to increase operational efficiencies, measures to revive languishing projects like equity divestment, premium deferment and one time fund infusion, amicable dispute resolution by forming Society for Affordable Redressal of Disputes (SAROD) and other initiatives like continuous evolution of PPP mode, developer friendly reforms for HAM projects and safety related policies.

Road development costs are increasing and funding is getting even more constrained. Increasing costs, limited available funding and waning interest of private sector in PPPs are challenges. The

approach levers are to better costs across the various phases of road development, improving existing sources of funding and exploring new avenues and policy reforms including new PPP models.

Global trends in infrastructure indicate increased focus on innovations, use of technology tools based on data and analytics to unlock operational efficiencies, shift of focus to developing economies and mainstreaming of sustainability. Roads and highways sector is not an exception. The role of roads and highways sector in the overall transport sector continues to be globally recognised.

Focus has been on institutional integration of transport departments, increasing use of green principles in road development, adoption of e-mobility as a service, implementation of integrated payment mechanisms for multi-modal transport, increasing use of big data analytics, other technology initiatives and flexible road pricing initiatives. Enhanced road user facilities is a focus area globally.

Highways development in the country for bridging the required infrastructure gap is likely to be over in the next five to six years and development/construction activities could reduce progressively. A shift is expected from highway construction/ development to provision of quality service to highway users, enhanced use of technology applications, adoption of safety solutions, promoting sustainability and augmenting existing sources of finance.

1. BJP manifesto: 60,000 kilometres of highways to be built in 5 years, Business Today, April 2019



02

# Introduction to the roads and highways sector





## 2.1 Sector background

Creation and operation of quality road infrastructure continue to be major requirements for enabling overall growth and development of India in a sustained manner. Bridging of existing infrastructure gaps and creating additional facilities to cater to the increasing population are equally important. Apart from providing connectivity in terms of enabling movement of passengers and freight, roads act as force multipliers in the economy. Further, roads play a significant role in times of natural calamities, wars and other such events in terms of timely evacuation of the impacted population, carriage of relief material and other associated movements. Other innovative uses of highways include emergency landing and take off for fighter planes. Government takes cognisance of this requirement and road infrastructure remains to be a focus area.

The honourable Finance Minister in her Budget Speech for 2019-20 re-emphasised the importance of connectivity and transport infrastructure:

**“Connectivity is the lifeblood of an economy. The government has given a massive push to all forms of physical connectivity through Pradhan Mantri Gram Sadak Yojana, industrial corridors, dedicated freight corridors, Bharatmala and Sagarmala projects, Jal Marg Vikas and UDAN Schemes.”**<sup>1</sup>

India has the second largest road network in the world at 58.98 lakh km. Out of this around 1.14 lakh km are National Highways (NHs)<sup>2</sup>. Significantly, NHs constitute around 2 per cent of the total road network in the country but carry about 40 per cent of the road traffic<sup>3</sup>. The density of India’s highway network – at 0.66 km of roads per square kilometer of land – is similar to that of the United States (0.65) and much greater than China’s (0.16) or Brazil’s (0.20)<sup>4</sup>.

The National Highways Development Project (NHDP) in the context of NHs is nearing completion- in seven phases. Later, other highway development programmes like Special Accelerated Road Development Programme for Development of Road Network in the North Eastern States (SARDP-NE), and the National Highways Inter-connectivity Improvement Project (NHIP) were also taken up by the Ministry of Road Transport and Highways (MoRTH). Further, the Bharatmala Pariyojana is currently ongoing. For majority of the projects under NHDP and Bharatmala Pariyojana, National Highways Authority of India (NHAI) is the implementation agency. Other NH related programmes/ works are being implemented through agencies like National Highways Infrastructure Development Corporation Ltd (NHIDCL), State Public Works Department (PWD)s, State Road

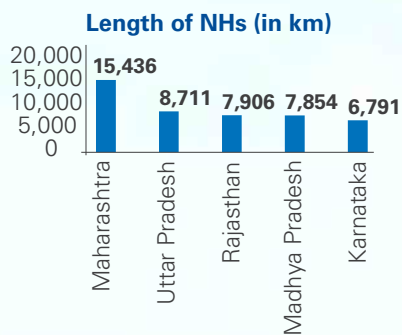
Development Corporations and the Border Roads Organisation (BRO)<sup>5</sup>.

Roads in the jurisdiction of state governments are under different categories like State Highways (SHs) and Major District Roads (MDRs). They are being developed/ upgraded through State PWDs and State Road Development Corporations. Pradhan Mantri Gram Sadak Yojana (PMGSY) is being implemented for rural roads through the Ministry of Rural Affairs with active participation by state governments. Further, roads within urban areas are mostly with Public Works Department (PWDs) and Urban Local Bodies (ULB)s.

1. Speech of Nirmala Sitharaman, Union Budget, July 2019
2. Industry and Infrastructure, Economic Survey 2018-19, Economic Survey, Accessed August 2019
3. Roadways, Business.gov.in, Accessed July 2019
4. Transportation in India, World Bank Group, Accessed July 2019
5. KPMG in India’s analysis, 2019 based on secondary research

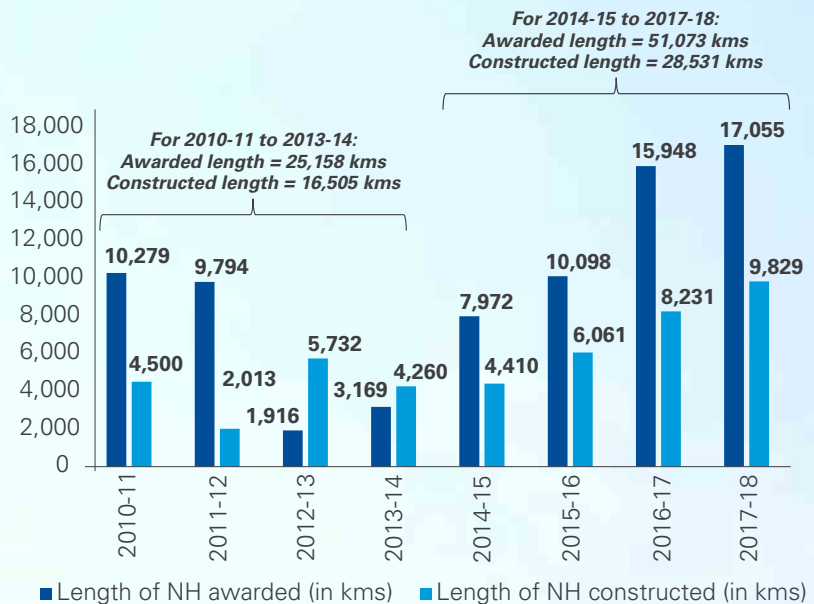
State Governments have a significant role to play in ensuring connectivity beyond NHs – development of Non NH roads like SH, MDR, Other District Roads (ODRs), ensuring last mile connectivity, providing strategic locations for logistic facilities and passenger transport amenities. States have varying levels of maturity in terms of road infrastructure development. Top 5 states as per length of NHs are shown below:

**Figure 1: Top 5 states by length of NHs in India (in km)<sup>6</sup>**



Issues plaguing state governments include adequate identification and prioritisation of projects, funding shortfall in project execution, limited institutional capacity to implement projects and absence of adequate tolling guidelines and policies. In addition to budgets, multilateral funding has been assisting the state governments to facilitate institutional capacity building, providing Project Management Consultancy (PMC) services, supervision support and public transport and logistics facilities enhancement measures over and above road project development.

**Figure 2: Length of NH awarded and constructed (in kms)<sup>9</sup>**



MoRTH is planning to construct around 60,000 km of National Highways in the next five years<sup>7</sup>. This underlines the importance of roads and highways development in India. A major reason is that in addition to being a major carrier for passenger traffic, roads and highways also play a key role in carrying freight across the country. The share of road in freight transport is approximately 60 per cent<sup>8</sup>.

Road award and construction trends have significantly increased in recent years, highlighting the outstanding work being done by the government in the sector recently. The length of National Highways awarded has almost doubled in the years FY15 to FY18 compared to FY11 to FY14. Length of NHs constructed has increased by

70 per cent during the same period, as highlighted in the table at Figure 2.

The above trend highlights the growth story in the road sector – where pace has picked up recently. This pace is expected to gain further ground in the future, with the ambitious targets set by the ministry and the implementation of the Bharatmala Pariyojana.

6. Total Length of National Highways in the Country, Press Information Bureau, July 2017

7. BJP manifesto: 60,000 kilometres of highways to be built in 5 years, Business Today, April 2019

8. Road Transport Scenario in India, Press Information Bureau, January 2013

9. Achievements of four years, Ministry of Road Transport and Highways, Accessed July 2019

## 2.2 Sector trends

Lately the focus of the sector is not only on efficient award and construction of roads, but also on smooth movement of passenger and freight through enhanced logistics efficiency. This has been the guiding principle behind Bharatmala Pariyojana.

### a. Bharatmala Pariyojana Programme

Approval of the major highway sector programme **Bharatmala Pariyojana Phase I** by the Cabinet in October 2017 reiterated the focus is on optimising efficiency of freight and passenger movement across the country.

Under Bharatmala Phase -I, development/upgradation of 34,800 km of NHs is envisaged over a five-year period (2017-18 to 2021-22) at an outlay of **INR5,35,000 crore**<sup>10</sup>. Summary of the approved components under the programme is as follows:

**Table 1: Salient features of the Bharatmala Pariyojana<sup>11</sup>**

Sr.No.	Components	Length -km	Outlay -Rs crore
a.	Economic corridors development	9,000	1,20,000
b.	Inter-corridor and feeder roads	6,000	80,000
c.	National corridors efficiency improvements:	5,000	100,000
d.	Border and international connectivity roads	2,000	25,000
e.	Coastal and port connectivity roads	2,000	20,000
f.	Expressways	800	40,000
	Total:	<b>24,800</b>	<b>385,000</b>
	Balance road works under NHDP	<b>10,000</b>	<b>1,50,000</b>
	<b>Total</b>		<b>5,35,000</b>

Upto October 2018, 6,407 km of roads had been awarded under the Bharatmala Pariyojana<sup>12</sup>.

### b. Implementation of important projects and expressways

A number of important projects have been taken up in recent years. Few of the important ones are:

- **Char Dham Mahamarg Vikas Pariyojana:** Project envisages development of easy access to the four dhams in India - Gangotri, Yamunotri, Kedarnath and Badrinath. Development of 889 km of roads is expected at

an estimated cost of INR12,000 crore<sup>13</sup>

- **Setu Bharatam:** This project aims to replace level crossings on NHs with ROBs/RUBs. This aims to construct 174 such structures<sup>14</sup>
- **Eastern peripheral and western peripheral expressway:** These two projects connect NH-1 and N-2 from western and eastern side of Delhi<sup>15</sup>.

Other such important expressways taken up for construction are Delhi-Meerut Expressway, Vadodara-Mumbai Expressway, Delhi – Mumbai

Expressway, Bangalore-Chennai Expressway, etc<sup>16</sup>.

### c. Road Transport - focus on smooth traffic movement and enhancement of logistics efficiency through multi-modal integration

Road transport is vital to India's economy. India's road network carries more than 60 per cent of its freight and about 85 per cent of passenger traffic<sup>17</sup>. Our growing economy has witnessed a rise in demand for transport infrastructure and services.

10. Shri Gadkari says highways works worth Rs 8 lakh crore will begin before the end of 2018 under Bharatmala Pariyojana, Press Information Bureau, October 2017

11. Shri Gadkari says highways works worth Rs 8 lakh crore will begin before the end of 2018 under Bharatmala Pariyojana, Press Information Bureau, October 2017

12. Year end Review: Ministry of Road Transport and Highways, Press Information Bureau, December 2018

13. Year end Review: Ministry of Road Transport and Highways, Press Information Bureau, December 2018

14. Year end Review: Ministry of Road Transport and Highways, Press Information Bureau, December 2018

15. Year end Review: Ministry of Road Transport and Highways, Press Information Bureau, December 2018

16. Year end Review: Ministry of Road Transport and Highways, Press Information Bureau, December 2018

17. Transportation in India, World Bank Group, Accessed July 2019

Passenger transport is gaining more of significance - increasing mobility needs of the Indian population due to enhanced urbanisation and need to move more for livelihood, education, healthcare, fulfilment of social needs etc. Requirements are improved public transport facilities through enhancement of physical infrastructure and rolling stock, operational efficiency and enhanced passenger facilities including safety and information availability.

In today's scenario of high road congestion, and increasing pollution, the focus is shifting towards increasing use of public transportation. Important considerations are seamless integration of multimodal options, first and last mile connectivity, integrated technology solutions enabled ticketing, enhanced passenger safety and information availability

Freight transportation in the country is predominantly road based— more than 60 per cent of total freight. Issues include high logistics cost— around 14 per cent of the nation's GDP as against 8-9 per cent for developed nations<sup>18</sup>, existing logistics inefficiencies - delays in inter- state border crossing, manual toll collection, non-availability of bypasses for busy urban stretches and integrated logistics facilities like Multi Modal Logistics Parks.

A number of measures have been undertaken to ensure easy and economic passenger and freight movement in recent years. Some of such measures are revision of axle weight to bring down logistics cost, launch of ranking systems for toll plazas, revision in maximum speed of vehicles, encouraging development of Multi Modal Logistic Parks (MMLPs) and Inter modal stations for passenger transport.

#### **d. Focus on Road Safety**

Road safety has been taken up as a priority. A number of initiatives have been taken regarding this, such as black spots rectification, setting up driver training institutes, SukhadYatra app and toll-free emergency number, capacity building of officers, etc. Trainings have been conducted for NHAI field officers, concessionaires, consultants, contractors, etc. Road safety audit is mandatory in all NHAI projects through independent safety consultants<sup>19</sup>.

#### **e. Increasing use of Information Technology (IT) applications**

IT applications are being progressively mainstreamed in all aspects of the road sector. A number of IT applications have been developed to aid on ground operations. Some major IT applications are; use of Electronic Toll Collection (ETC), development of Bidder Information Management System, Bhoomirashi, etc. MoRTH, NHAI and NHIDCL have also adopted an e-procuring and e-tendering system for procurement of goods

and services. A mobile application system has also been launched for tag purchases and top up of FASTags called MyFASTag.

#### **f. Initiatives related to augmentation of existing funding sources**

There is a gap between the actual funding required in the sector, and the funding which has been incoming in the sector. This funding gap needs to be reduced by exploring alternate sources of financing. A number of options have been taken in this direction such as raising capital from Life Insurance Corporation, Employee Provident Fund Association and issuing rupee-denominated masala bonds in London Stoke Exchange. Asset monetisation models like Toll-Operate-Transfer (TOT) have already been implemented and Infrastructure Investment Trusts (InvITs) and securitisation of toll revenue are also being explored by NHAI.

#### **g. Emphasis on green initiatives**

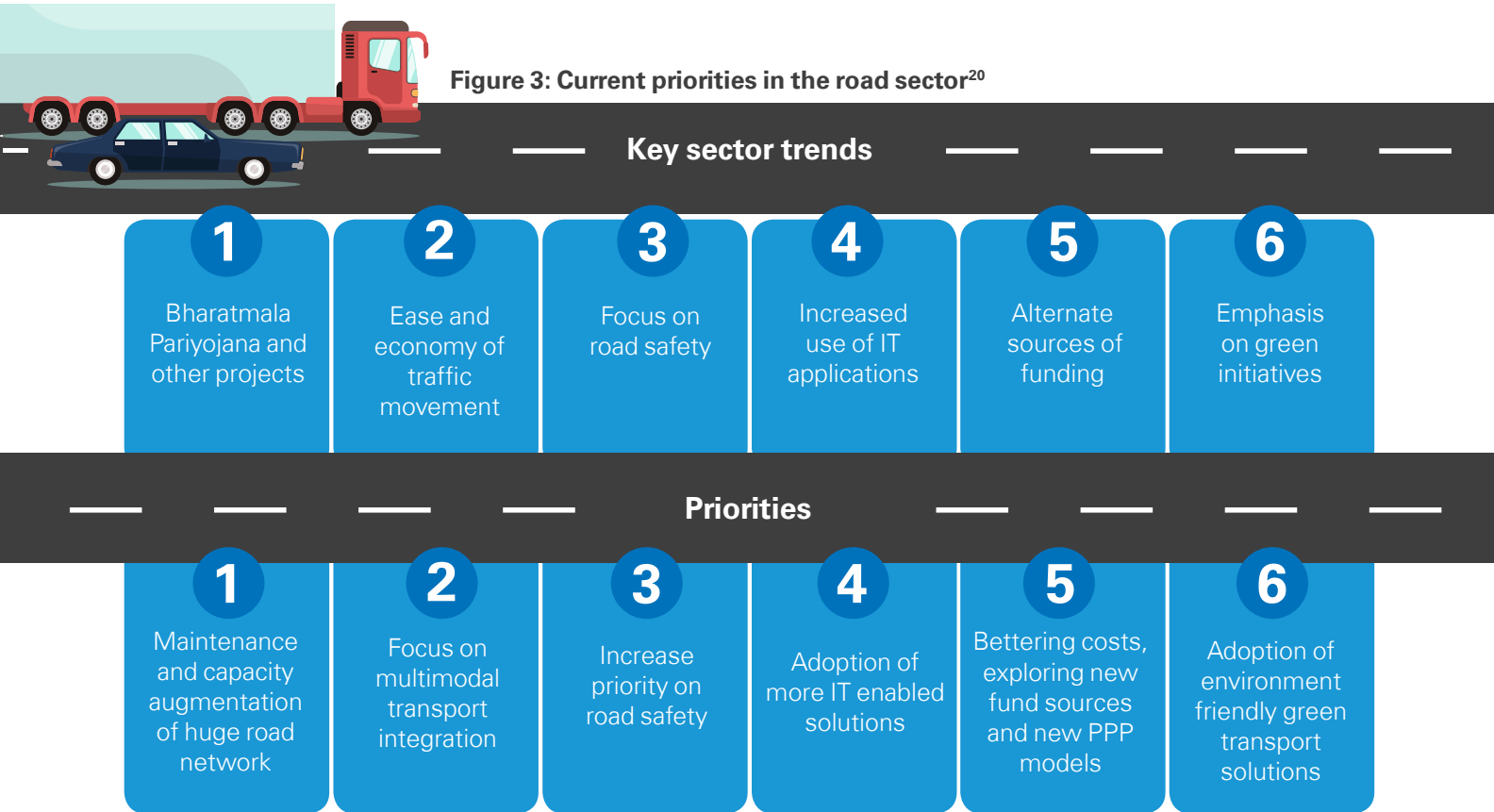
A number of green initiatives have also been taken up in the recent years to check the issue of environment pollution. Battery operated vehicles, and vehicles driven on methanol and ethanol have been exempted from permit. A Green Highway Division has been set up by NHAI to carry out plantation along highways and medians. A number of initiatives have been taken in Union Budget 2019-20 to encourage adoption of electric vehicles (EVs), such as reduction of GST on EVs and tax benefits for buying an EV.

18. Debunking India's logistics myths, Livemint, March 2018

19. Annual Report 2017-18, National Highways Authority of India, accessed August 2019

## 2.3 Current priorities for the sector

The current sector trends give an indication of the various priorities for the sector. This can be visualised as below:



Bharatmala Pariyojana Phase I is to continue until 2022. Post that, infrastructure creation is expected to continue at a reduced level and eventually a saturation is to be expected. Construction is progressively expected to decline post that phase.

During that phase, the focus may shift to efficient operation and maintenance of the existing road assets and sustained provision

of quality services to road users. This may result in reorientation of skills and sectoral requirements and the government needs to start planning now for the same. Private capabilities and efficiencies in operation and maintenance of road assets will be of importance.

In addition to this, the current focus on road safety and increased use of IT applications is only expected to increase in the coming years.

Both the factors are swiftly gaining significance and this is expected to continue in the future.

Other priority areas include focus on multimodal transport integration and bettering costs, exploring new funding sources and introducing new Public Private Partnership (PPP) modes. Sustainable green development is also gaining significance.

20. KPMG in India's analysis, 2019 based on secondary research





03

# Evolution of PPP in roads and highways





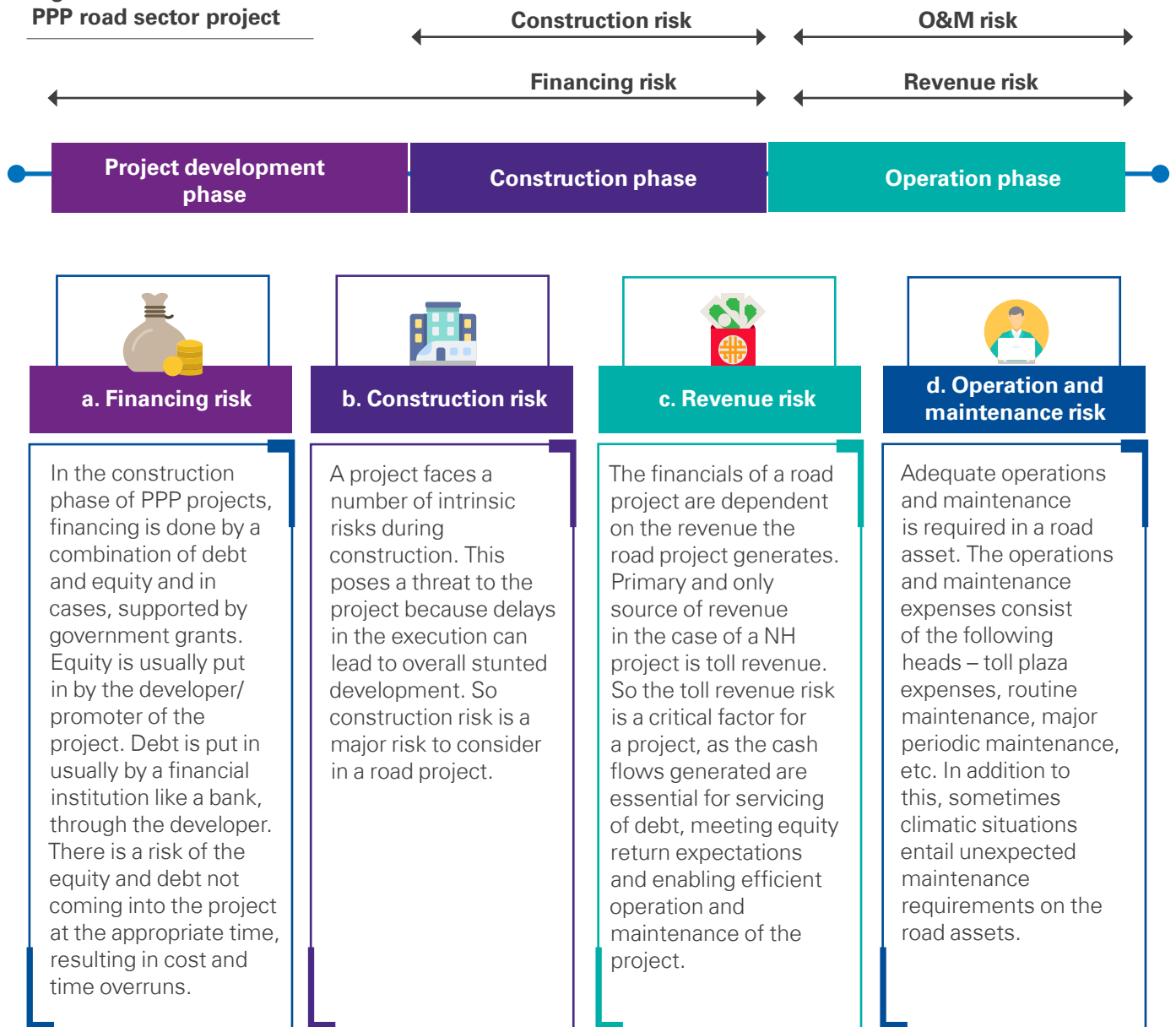
# 3.1 Risk Perception in highway projects

Public Private Partnerships (PPPs) have been a major contributor to the success story of the roads and highways sector in India. The effectiveness, efficiency and acceptance of a PPP model hinges on appropriate risk allocation between the government and private developers.

A brief understanding of various risks in a PPP road sector project is as follows:



**Figure 1: Various risks in a PPP road sector project**



**PPP modes have been used in India for both development and operation and maintenance of road assets. The major PPP modes prevalent in India are as follows:**

**a. PPP modes for road asset development** – BOT (Toll), BOT (Annuity) and Hybrid Annuity Mode (HAM)

**b. PPP modes for road asset operation and maintenance**– Operate- Maintain – Transfer (OMT), TOT

While the asset development based PPP model has been the more traditional PPP model, operation and maintenance based PPP models like TOTs are also gaining significance.

A brief description of the various road asset development PPP modes in existence in India is as follows:

**a. BOT (Toll)<sup>1</sup>**

In a BOT (Toll) project, the concessionaire is responsible for designing, building, financing, operating, maintaining, tolling and transferring the project to the authority at the end of the concession period. The concession period is around 30 years, but is project specific. Depending on the viability of the project, there is a provision

of up to 40 per cent of the project cost which is paid by the government in the form of a Viability Gap Funding (VGF). The concessionaire earns revenue primarily in the form of toll revenue, which depends on traffic that needs to pay toll on the road stretch. Toll rates are standardised and regulated by the government through rules.

**b. BOT (Annuity)<sup>2</sup>**

In a BOT (Annuity) project, the concessionaire is responsible for designing, building, financing, operating, maintaining and transferring the project to the authority at the end of the concession period. The responsibility for tolling on the road stretch is with the government. The concessionaire earns revenue primarily in the form of pre-determined semi-annual annuity payments which are made by the government to the concessionaire.

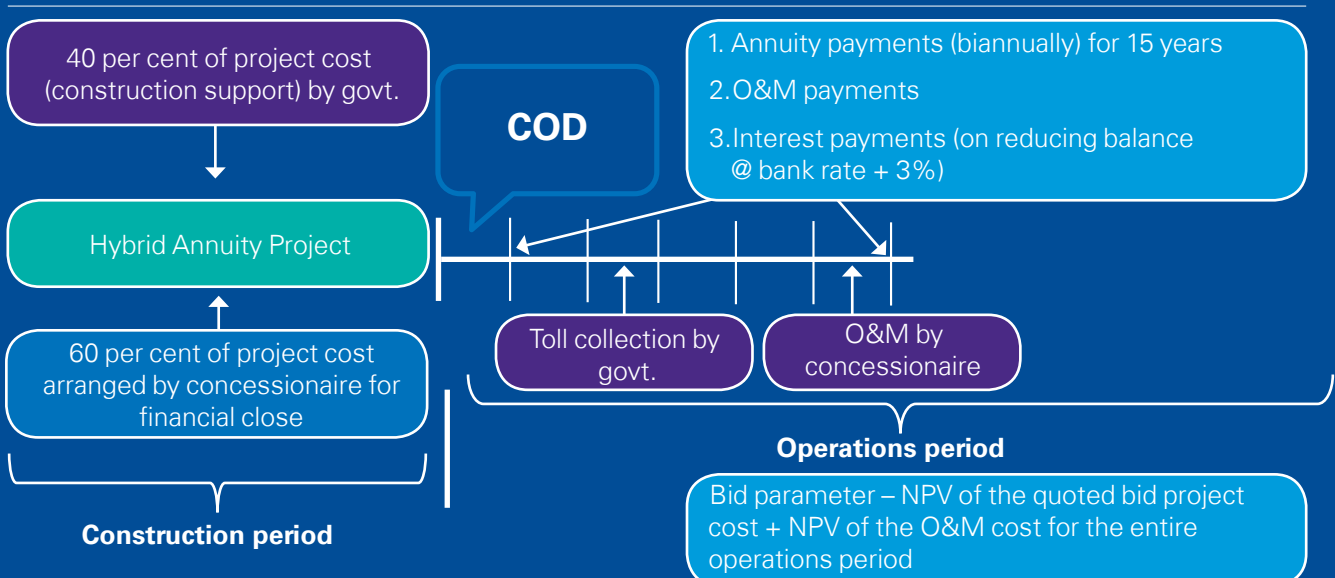
**c. Hybrid Annuity Mode (HAM)<sup>3</sup>**

In a HAM project, the concessionaire is responsible for

designing, building, financing, operating, maintaining and transferring the project to the authority at the end of the concession period. The responsibility for tolling on the road stretch is with the government. The concession period is project specific construction period and a fixed operation period of 15 years. An inflation adjusted construction support of 40 per cent of the bid project cost is provided by the government to the concessionaire during the construction period, in five equal installments of 8 per cent each of the bid project cost. Hence, only 60 per cent of the bid project cost is to be arranged by the concessionaire during the construction period. This is paid to the concessionaire by the government in the form of semi-annual payments. In addition to this, interest on reducing balance and operations and maintenance cost are also paid semi-annually by the government to the concessionaire.

HAM model is explained as below:

**Figure 2: HAM model – key features<sup>4</sup>**



1. KPMG in India's analysis, 2019 based on secondary research and industry discussions

2. KPMG in India's analysis, 2019 based on secondary research and industry discussions

3. KPMG in India's analysis, 2019 based on secondary research and industry discussions

4. KPMG in India's analysis, 2019 based on secondary research and industry discussions

A brief snapshot of risk sharing in the various PPP road development projects is mentioned below:

**Table 1: Risk parameters for road PPP models<sup>5</sup>**

Reducing risk for concessionaire	Mode	Financing risk	Construction risk	Traffic risk	O&M risk
	BOT (Toll)	Concessionaire	Concessionaire	Concessionaire	Concessionaire
	BOT (Annuity)	Concessionaire	Concessionaire	Authority	Concessionaire
	HAM	Concessionaire (partly)	Concessionaire	Authority	Concessionaire

In addition to the road development models, the maintenance of such a huge network of national highways will require efficient operation and maintenance of the road assets. In addition to this, there is an opportunity to monetise future toll earnings of completed highway assets.

A brief description of the various road asset operation and maintenance modes in existence in India is as follows:

**a. Toll-Operate-Transfer (TOT)**

This is an effective model that ensures efficient Operation and Maintenance (O&M) of highways on a long-term basis and generates resources upfront that can be invested in new highway projects. In this model, for operational public

funded highway projects, long-term O&M responsibilities and tolling rights are assigned to developers/investors after construction completion. This is done after a few years of successful operation of a project once the traffic on it stabilises. An upfront fee is paid by the concessionaire to the government in exchange of the right to toll, operate and maintain the road asset for the concession period. In the current scenario, the concession period is 30 years.

**b. Operate-maintain-transfer (OMT)**

Under the OMT mode, the concessionaire operates and maintains the completed road asset for a smaller duration - ranging from four to nine years. An operational

road asset is transferred to the concessionaire without any rights for capacity augmentation. Concessionaire is given the right to collect toll on the road asset. In return, the concessionaire pays an agreed premium to the government. The model brings in private sector efficiencies in operation and maintenance of road assets. Responsibilities of the concessionaire include routine maintenance, periodic maintenance, traffic incident management and traffic flow management.

An understanding of the various PPP modes is critical to understand the road sector scenario in India. The next section discusses the evolution of PPP in the road sector in India.

5. KPMG in India's analysis, 2019 based on secondary research and industry discussions



## 3.2 Evolution of PPP in road sector in India

PPP in the road sector in India has passed through a number of distinct phases:

- Build-Operate-Transfer (Toll and Annuity)
- Hybrid Annuity Mode
- Toll Operate Transfer

A brief description of the phases is provided below:

### a. Build-operate-transfer (Toll and Annuity)

An investor friendly climate in the first decade of the twenty-first century attracted private investment into the roads and highways sector.

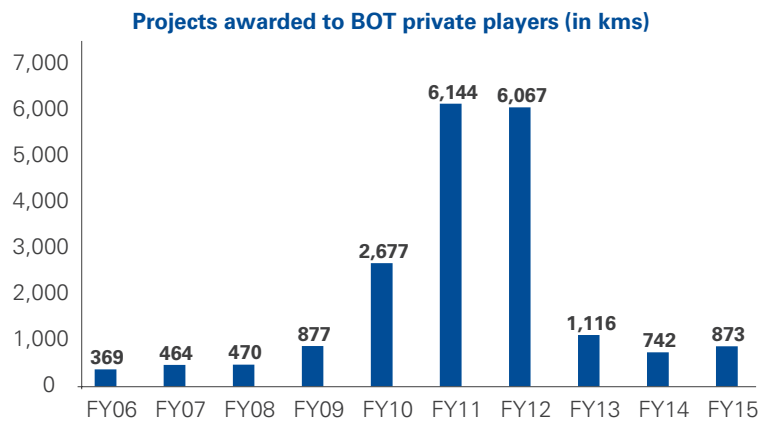
However, as an aftermath of the global economic meltdown in 2008-09, major issues cropped up for the sector. B.K. Chaturvedi Committee was formed in 2009 to work out suitable recommendations, which included the following:

- Suitable modifications in the template project documents
- Empowering MoRTH to make amendments in Request for Qualification (RFQ)/Request for Proposal (RFP) on basis of recommendation from NHAI
- Waterfall mechanism in mode of implementation of projects.

Significant improvements in private participation were observed. Private sector participation in BOT projects peaked till Financial Year (FY)12. But a steep decline in PPP participation was observed in FY13 and FY14 with many viable projects unable to attract even a single bid. This is evident from the **Figure1** which shows the projects awarded to BOT private players in km:

Reasons include over-leveraged financials for limited number of highway developers in the country, some banks reaching the ceiling as per sectoral exposure norms, aggressive bidding based on

**Figure1: Length of road projects awarded to BOT private players (in km)<sup>6</sup>**



unrealistic traffic projections and quite a few projects getting stalled in the construction. This resulted in decline of interest in BOT models post 2013, which paved the way for the emergence of HAM in 2016.

### b. Hybrid Annuity Mode (HAM)

HAM was introduced to reinvigorate PPP participation in the road sector after interest in BOT projects waned. The main advantages to the developer include the following:

- To reduce the initial funding requirement in PPP projects:** As 60 per cent of the bid project cost is to be arranged by the concessionaire, assuming a 70:30 debt equity ratio, around 18 per cent of project cost to be put in as equity is required to be put in by the concessionaire during the construction period as opposed to 30 per cent in a BOT project. This reduces the initial equity requirement and encourages participation by mid-sized developers to invest in PPP projects. Further, debt requirements goes down from 70 per cent to around 42 per cent of project cost
- To eliminate traffic risk of the concessionaire:** Concessionaire is paid three pre-determined

semi-annual payment streams by the government as described earlier which cumulatively form the revenue earned by the concessionaire irrespective of toll revenue collection. Hence, no traffic related risk is borne by the concessionaire.

The introduction and strong implementation of HAM has seen HAM become the preferred PPP mode in India. Till March 2018, 112 road projects of 6,325 km in length had already been awarded under HAM. The estimated cost of these projects is approximately INR1,26,750 crore<sup>7</sup>.

In addition to introduction of HAM which resulted in reduced initial investment requirement from the government in highway projects, efficient O&M of completed highway assets and augmenting existing sources of funding for the sector was also thought to be important. A model was introduced by the government that takes care of O&M requirements of an increasing highway network and also facilitates monetisation of toll receivables for operational highways –this was the Toll Operate Transfer (TOT) model.

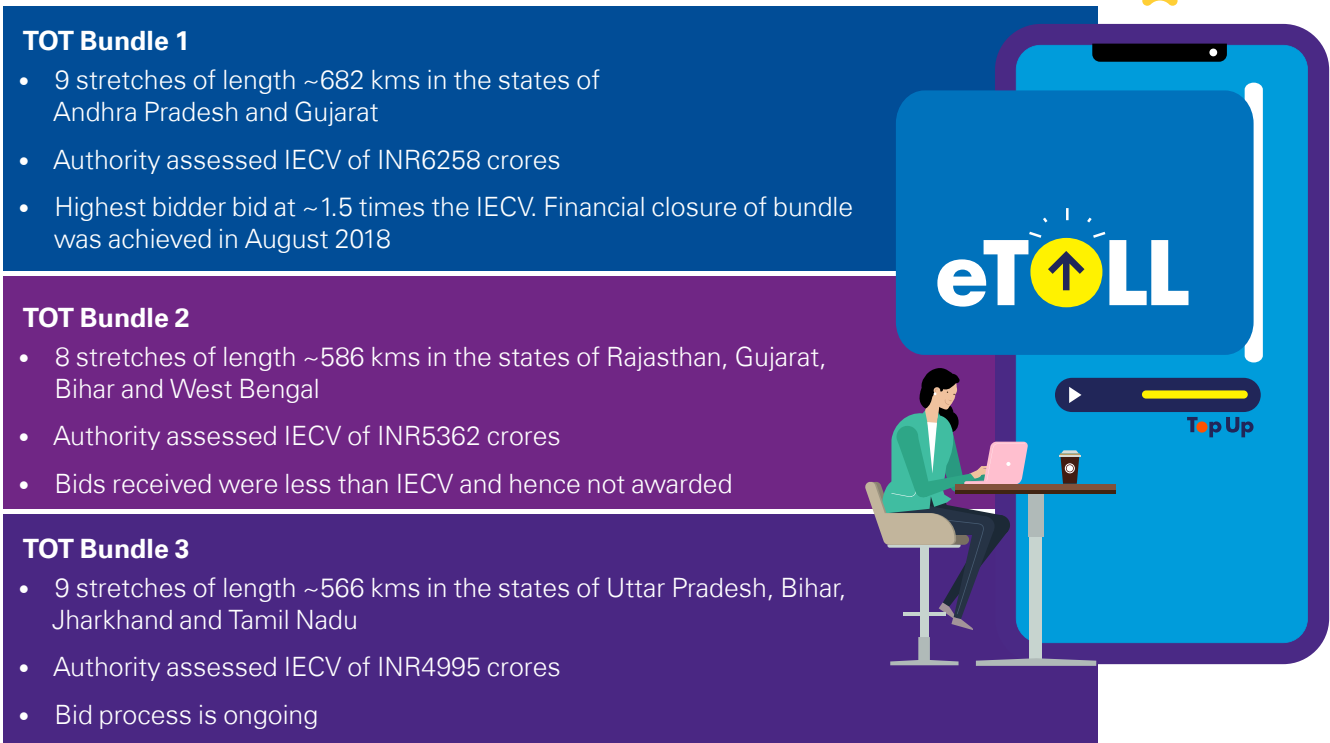
6. Transportation in India, World Bank Group, Accessed July 2019

7. Achievements of four years, Ministry of Road Transport and Highways, Accessed July 2019

### c. Toll-operate-transfer (TOT)

Three TOT bundles have been floated by NHAI so far. Details of these bundles are as follows:

Figure 2: Details of TOT bundles bid out<sup>8</sup>



## 3.3 Future of PPP in India

### a. HAM to continue as a major PPP road development mode

As evident, pure play PPP projects like BOT (Toll and Annuity) have dried up recently, paving the way for innovative modes like HAM. Reasons include

- Dearth of high traffic stretches which are being bid out by the authority
- Developers/investors being generally hesitant to participate in traditional PPP projects due to increased risk perception
- Legacy of projects languishing post award.

So HAM is expected to continue as the major mode of PPP for road development projects at least for the time being. Innovative implementation models with focus

on suitable risk allocation should also be tried.

### b. Asset monetisation modes to gain significance

Asset monetisation models like TOT have also gained prominence in recent years. This trend is expected to continue, with NHAI having identified approximately 6,400 km of roads to be bid out on TOT<sup>9</sup>. NHAI is also looking for mechanisms to fund TOT through Infrastructure Debt Funds. In addition, NHAI is also exploring other monetisation techniques like Infrastructure Investment Trust (InvIT) and securitisation of toll revenue.

NHAI is expecting to get cabinet approval and float its Infrastructure Investment Trust (InvIT) by the end of this year<sup>10</sup>. This is expected to be an important instrument for funding of Bharatmala Pariyojana.

NHAI is also exploring securitisation of toll revenue, which can be one of the most cost-effective ways to raise capital. NHAI is exploring a similar instrument with the State Bank of India, where it intends to monetise road projects with high traffic density. In this arrangement, SBI will be providing a loan to NHAI against toll receivables from a selected bouquet of projects<sup>11</sup>.

8. Request for Proposal for TOT Bundle 1, National Highways Authority of India, 2017, Request for Proposal for TOT Bundle 2, National Highways Authority of India, 2018, Request for Proposal for TOT Bundle 2, National Highways Authority of India, 2019, Road Projects under TOT Model, Press Information Bureau, July 2019

9. Road Projects under TOT Model, Press Information Bureau, July 2019

10. NHAI plans to raise 75,000 crore from market, says chairman, Livemint, July 2019

11. NHAI, SBI in talks to monetize highways, Economic Times, July 2019



04

# Roads and highways sector issues

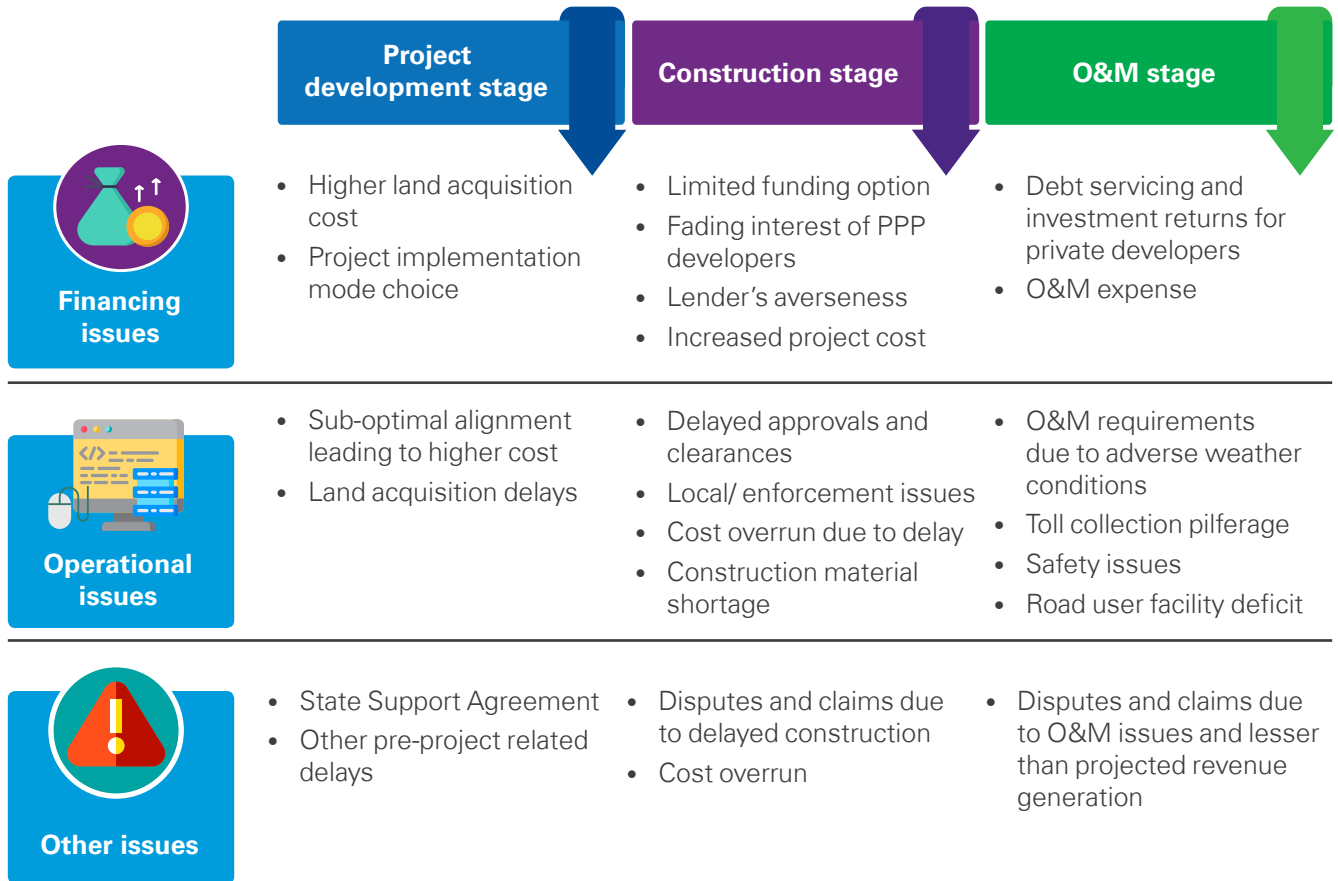




# 4.1 Overview of issues in the sector

The roads and highways sector has its own set of issues This can be classified as follows:

Figure 1: Overview of issues in roads and highways sector over project life cycle<sup>1</sup>



1. KPMG in India’s analysis, 2019 based on secondary research

These issues have been discussed in the following section:

## 4.2 Financing issues

Following is a brief description of various financing issues observed throughout the project development life-cycle:

a. Project-development stage	b. Construction stage	c. O&M stage
<p>Land acquisition cost has increased more than 30 per cent since 2017<sup>2</sup> primarily due to enhanced compensation payment requirements as per 'The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act'.</p> <p>In addition to this, current project implementation modes like EPC and HAM put high stress on government resources, thus limiting the number of projects that can be taken up at one go.</p>	<p>There is a lower appetite for private developers to absorb construction risk as well as traffic risk based on legacies – e.g. languishing projects and projects needing premium payment deferment.</p> <p>Road sector projects are increasingly facing financial closure issues. Reasons include wariness of banks to lend, high share of NPAs, asset liability mismatch and banks reaching infrastructure lending caps.</p>	<p>There is uncertainty on equity returns in existing operational PPP projects along with difficulties faced in servicing debt. This is due to uncertainty of toll revenue collection and variation of collected toll revenue compared to projected levels. This discourages private sector interest. The increase in O&amp;M costs are also affecting the project returns.</p>

## 4.3 Operational issues

Following is a brief description of various financing issues observed throughout the project development life cycle:

a. Project-development stage	b. Construction stage	c. O&M stage
<p>Delays in pre-construction activities (such as land acquisition, relocation) is affecting project timelines. These processes consume considerable time. Land acquisition for road projects involve various stages. Each stage involves a number of stakeholders and regulatory bodies. The completion depends on other factors like geographical location and hence, the process is challenging. Inadequate technical due diligence at the time of preparation of Detailed Project Report (DPR) can also lead to high project costs due to aspects like sub-optimal alignments leading to enhancement in construction cost.</p>	<p>Road development process requires a number of approvals such as environmental clearance, forest clearance, railways clearance, etc. Each of these activities take considerable time and non-adherence to timelines result in cost overruns due to delays. In addition, other factors like enforcement issues and lack of construction material also result in delays. Managing problems of sub-contractors and holding them accountable is also a major issue faced. Sub-contractors also face payment issues.</p>	<p>Often unforeseen weather conditions require unplanned O&amp;M, over and above the routine and periodic maintenance activities. This results in enhanced O&amp;M expenses. In addition to this, there is a general lack of road user facilities. Safety related issues are also observed on many road stretches such as high accident response times, etc.</p>

2. NHA1 ordering to slow down, land costs to remain stable till 2020, Financial Express, January 2019

## 4.4 Other issues

Following is a brief description of various project related issues observed in the roads and highways sector:

a. Project-development stage	b. Construction stage	c. O&M stage
<p>All state government authorised projects are not backed by a state support agreement, which results in low interest in such projects.</p>	<p>Claims arising out of disputes between the concessionaire/ contractor and the government authorities is also a significant cost which can lead to large liabilities.</p>	<p>The returns on projects is not upto expectations because of improper DPR and traffic reports in the feasibility stage. Actual traffic is much less than the anticipated traffic, and so the lower returns deeply affects the financials of the project. Arbitration issues also result in project delays, which cause cost and time overruns.</p>





05

Recent  
policy  
initiatives by  
the government



The government has introduced a number of policy initiatives to ensure an enabling environment for various stakeholders involved. The policy initiatives can broadly be categorised into the following:

Figure 1: Overview of policy initiatives in roads and highways sector<sup>1</sup>

Operational initiatives		Revival of languishing projects	
<b>Overview</b>	To enable process streamlining through policy interventions and enhanced automation.	<b>Overview</b>	To revive, complete and make operational languishing projects.
<b>Specific Policies</b>	Mode of delivery determination, increased appraisal and approval threshold, Bhoomirashi, Bidder Information Management System, platform interlinking etc.	<b>Specific Policies</b>	100 per cent equity divestment 2 years post COD, premium deferment, rationalised compensation, one time fund infusion.
Amicable dispute resolution		Other initiatives	
<b>Overview</b>	To enable time bound resolution of disputes in an affordable manner.	<b>Overview</b>	Augmenting funding sources, easing out operational issues, enhancing road safety and ETC.
<b>Specific Policies</b>	Dispute resolution through 3 tier stage, formation of SAROD.	<b>Specific Policies</b>	Continuous evolution of PPP modes, changes in HAM regarding mobilisation advance and construction grant, safety related policies etc.



1. KPMG in India's analysis, 2019 based on secondary research



## 5.1 Operational initiatives

Process streamlining is being increasingly taken up by the ministry to ensure smooth appraisal and approval of road sector projects. Some of the major steps for process streamlining are:

- a. Mode of delivery** – MoRTH is empowered by a Cabinet Committee on Economic Affairs (CCEA) decision to decide on mode of delivery of projects
- b. Increased threshold for project appraisal and approval** – MoRTH was authorised through a CCEA decision to appraise and approve projects up to INR1000 crore<sup>2</sup>

In addition to this, many technological initiatives have been adopted by the ministry to aid the execution and operation of a road project. Some major technological initiatives are:

- a. Use of Bhoomirashi** – The ministry has corroborated with the National Informatics

Centre, to create Bhoomirashi, a web portal which digitises the cumbersome land acquisition process, and also helps in processing notifications relating to land acquisition online. Processing time, which was earlier two to three months has come down to one to two weeks now<sup>3</sup>

- b. E-procurement system:** NHAI is using the e-procurement portal for tendering of all kinds of goods and services. This has led to greater transparency. The system currently in use by NHAI is the Central Public Procurement Portal by National Informatics Centre (NIC)
- c. FASTag:** A mobile application has been launched for purchase of tag and top up of FASTags. FASTag has penetrated very rapidly. In one year, it has breached 1.5 million new users<sup>4</sup>
- d. Bidder Information Management System (BIMS)**–

This system aims to simplify the qualification process of bidders for road construction contracts. This helps in faster evaluation of technical information provided by the bidders

- e. Interlinking between various platforms** - The two IT initiatives Bhoomirashi and BIMS, have now been integrated with the Public Financial Management System (PFMS). PFMS allows for the compensation amount to be paid to the concerned person directly, rather than being deposited with the CALA (Competent Authority for Land Acquisition).

Introduction of Goods and Services Tax (GST) created some initial issues such as change in material cost and addition of new tax. But in long term it will lead to decongestion, accelerated demand for logistics services and interstate flow of goods<sup>5</sup>.

## 5.2 Revival of languishing projects

Projects which were languishing for a number of years have been attempted to be revived, with the help of a number of policy measures taken by the government. Some of the policy measures have been discussed below:

- a. 100 per cent equity divestment two years post COD** – The policy enables private developers to take out their entire equity and exit all operational BOT projects two years from commercial operation date (COD)

- b. Premium deferment in stressed projects** – The policy permits rescheduling of premium committed by concessionaires during bid stage for awarded projects.
- c. Rationalised compensation to concessionaires for languishing NH projects in BOT mode for delays not attributable to concessionaires** -The policy enables extension of concession period for languishing BOT (Toll) projects to

the extent of delay provided. The original operation period remains unchanged.

- d. One time fund infusion** – The policy enables revival and physical completion of languishing BOT projects that have achieved at least 50 per cent physical progress, through one time fund infusion by NHAI, subject to adequate due diligence on a case to case basis.

2. Policy Initiatives by Ministry of Road Transport & Highways, Press Information Bureau, July 2018

3. Bhoomi Rashi Portal, Press Information Bureau, January 2019

4. Annual Report 2017-18, National Highways Authority of India, accessed August 2019

5. GST is good and simple tax, Ministry of Road Transport and Highways, accessed August 2019

## 5.3 Amicable dispute resolution

Efforts have been made by NHAI for dispute resolution through the established mechanism of Alternate Dispute Resolution through the three tier stage of:

- a. 3-CGMs committee
- b. Independent Settlement Advisory Committee (ISAC) and
- c. Executive Committee/Board of NHAI for settlement of disputes

This entailed a settlement of claims amounting to INR381 crore for an amount of approximately INR30 crore in FY18. In 2017, NHAI has also established Conciliation through Committee of Independent Experts (CCIE)<sup>6</sup>.

Society for Affordable Redressal of Disputes (SAROD) was formed in 2013 by NHAI to reduce cost and time overruns due to the arbitration

process, and for fast dispute redressal<sup>7</sup>. The main objectives of SAROD were to reduce cost due to the arbitration process and pendency of disputes, efficient disposal of disputes and to develop experts for the arbitration process. 347 arbitrators have already been empanelled<sup>8</sup>.

## 5.4 Other initiatives

**A number of other initiatives have been taken by the government to bring in efficiencies and safety into the road sector. Some of such initiatives have been described below:**

### a. Continuous evolution of PPP modes

– After BOT (Toll) and BOT (Annuity) models failed to pique the interest of private investors post FY12, MoRTH came up with the HAM model in 2016. HAM tried to reduce the risks borne by private players, by reducing the financing risk of private investors (40 per cent of bid project cost paid by the Government during construction phase) and also eliminating revenue risk. The HAM mode was very successful and resulted in many new developers also participating in the mode. MoRTH also introduced the TOT mode in the roads and highways sector to attract institutional investors into the road sector.

**b. Developer friendly reforms for HAM mode** – HAM mode has been constantly updated over the years to bring in developer friendly policies. Some of such reforms are early release of mobilisation advance and construction grant

### c. Safety related policies

– Ministry has also introduced a number of safety related measures in recent years. Some of the important measures are as follows:

- Ministry has proactively identified black spots and is working on its rectification. As of 31 December 2018, 789 road accident black spots have been identified in various states of which 651 are on National Highways and 138 are on state roads<sup>9</sup>
- Ministry has been trying to strengthen the various institutes for driving, in association with various stakeholders like corresponding states, manufacturers, etc. Government is also implementing a scheme for developing Institute of Drivers Training and Research (IDTR). 16 such institutes were functioning as on 31 December 2018<sup>10</sup>

- Through various applications, users have been entitled to report road quality data, accidents, potholes, etc. It also provides users with real time data like waiting time, and other key places of interest near toll plazas
- An institution, Asian Institute of Transport Development, has been announced as an apex body for capacity building in the area of road safety. Till October 2018, over 1,400 professionals have been trained in road safety and road safety audit<sup>11</sup>.

Policy initiatives by the government have created a sustainable environment for the road sector development in India. But another major factor – road sector financing, also has a huge impact on the road sector development. This is discussed in the subsequent section.

6. Annual Report 2017-18, National Highways Authority of India, accessed August 2019

7. Annual Report 2017-18, National Highways Authority of India, accessed August 2019

8. Annual Report 2017-18, National Highways Authority of India, accessed August 2019

9. Year end Review: Ministry of Road Transport and Highways, Press Information Bureau, December 2018

10. Year end Review: Ministry of Road Transport and Highways, Press Information Bureau, December 2018

11. Year end Review: Ministry of Road Transport and Highways, Press Information Bureau, December 2018



06

# Road sector financing in India





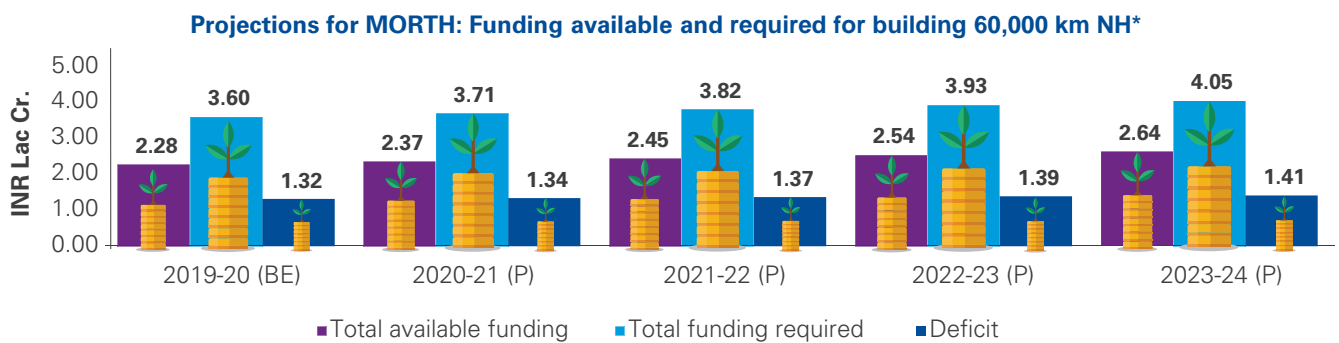
## 6.1 Fund requirement

MoRTH is targeting completion of 60,000 km of NH in the next five years<sup>1</sup> at an average road construction rate of 40 km per day. Assuming average construction cost of approximately INR30 crore per km (including land acquisition cost), and factoring in inflation for road construction cost at a conservative 3 per cent, the total

funding requirement over five years is estimated at approximately INR19 lakh crore which amounts to average annual fund requirement of approximately INR3.8 lakh crore. This analysis only considers fund requirements due to development of 60,000 km of NHs irrespective of mode of delivery.

However, current sources of funds are projected to meet only approximately INR2.46 lakh crore of the average annual fund requirement with an average deficit of approximately INR1.36 lakh crore per annum only for road development part at the rate of 12,000 km per annum. This is depicted in the following graph:

**Figure 1: Projections for MoRTH – Funding available and required (INR lakh crore)<sup>2</sup>**



While it is imperative for MoRTH to explore new avenues and opportunities to bridge the

funding gap in order to realise its infrastructure targets, it is also important to explore and address

key reasons for increasing gaps between available sources of funding and actual funding required.

## 6.2 Sources of fund

While the costs are rising, the funding is getting ever more constrained leaving the government

and MoRTH with very limited options to explore in order to bridge the funding gap. The

assessment of the various financing heads to address the future fund requirement is as follows:

**Table 1: Assessment of sources of fund for MoRTH<sup>3</sup>**

	Financing head	Assessment
1	GBS: Gross Budgetary Support	Competing demand from other ministries - limited allocation to MoRTH
2	CRIF: Central Road and Infrastructure Fund	Limited increment as fund usage broad based to include other sectors
3	PBFF: Permanent Bridge Fee Fund	Limited quantum available on annual basis
4	Proceeds from TOT projects	Set to increase with extensive use in coming years.
5	IEBR: Internal and Extra Budgetary Resources	Can be increased with caution considering MoRTH's future liability
6	Others: National Highway Fund (NHF), National Investment Fund (NIF), Nibhaya Fund	Overall contribution to funding is low (5-10 per cent)

1. BJP manifesto: 60,000 kilometres of highways to be built in 5 years, Business Today, April 2019

2. Achievements of four years, Ministry of Road Transport and Highways, Accessed July 2019, KPMG in India's analysis, 2019 based on secondary research

3. Achievements of four years, Ministry of Road Transport and Highways, Accessed July 2019, KPMG in India's analysis, 2019 based on secondary research

As evident IEBR is the current funding route which can be explored further, but with caution keeping in mind future liabilities. Apart from aforementioned sources, private investments in the form of PPPs is another source of funding for road infrastructure projects. TOT is expected to be

used extensively in the coming years.

As evident, major funding and project related concerns can be summarised as under:

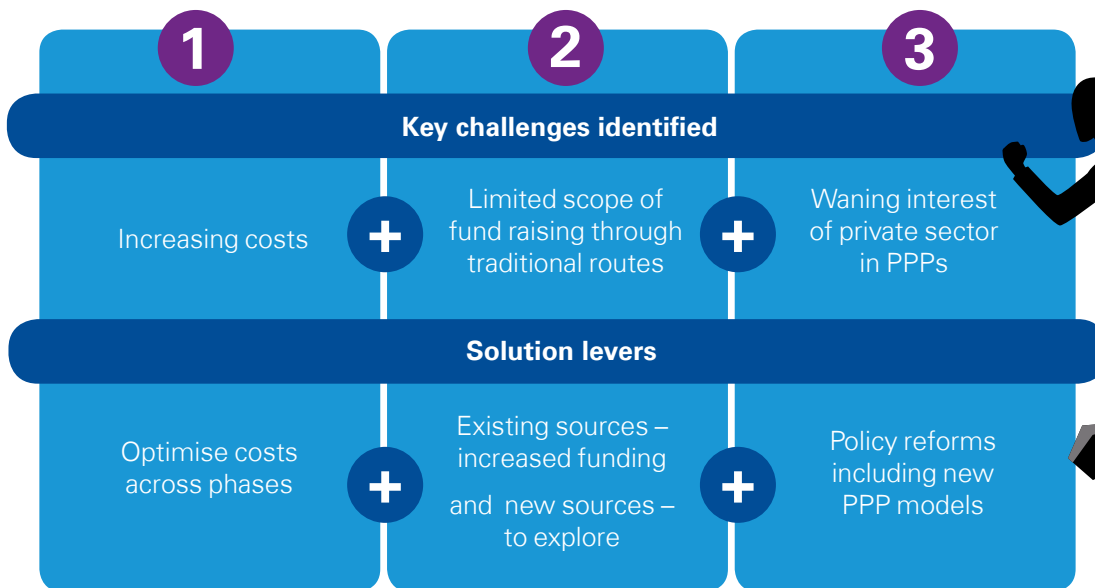
a. Increasing cost of highway sector projects leading to higher fund requirement

b. Limited options within the current prevailing ecosystem to enhance funding

c. Fading interest of highway sector developers in PPPs.

A broad framework to address key concerns are as follows:

**Figure 2: Framework for current funding challenges and related approaches<sup>4</sup>**



The approaches presented above form the basis for bridging the funding requirement for the sector in the coming years to maintain the pace of road development that was observed in the past few years.

Augmentation of current funding sources and conceptualisation of innovative ones is the current need of the hour. Three possible ways to achieve this is by encouraging monetisation of road assets, looking for new implementation models and augmenting IEBR with appropriate instruments.

Monetisation of road assets has been picking up in recent years. Some of the particular approaches in asset monetisation are TOT, InvITs and securitisation of toll revenue. TOT has been explored recently by NHAI. TOT is expected to be used aggressively in the coming years to unlock more value. NHAI is also expected to come up with its own InvIT by the end of this year<sup>5</sup>. Securitisation of toll revenue is also being explored by NHAI. A similar instrument is already being explored with the State Bank of India, where it intends to

monetise road projects with high traffic density<sup>6</sup>.

New implementation modes like least present value of revenue which explores the concept of variable concession period can also be looked into. Introducing such new implementation modes can help reignite private sector interest. IEBR can be beefed up with increasing use of tools like value capture financing to enable recovery of a portion of the appreciation in value of land/property by the government.

4. KPMG in India's analysis, 2019 based on secondary research

5. NHAI plans to raise 75,000 crore from market, says chairman, Livemint, July 2019

6. NHAI, SBI in talks to monetise highways, Economic Times, July 2019



07

# Global perspective in highways sector





Global trends in infrastructure indicate increased focus on innovations, use of technology tools based on data and analytics to unlock operational efficiencies, shift of focus to developing economies and mainstreaming of sustainability. Roads and highways sector is not an exception. The role of roads and highways sector in the overall transport sector continues to be globally recognised.

In some countries like Canada, Singapore etc., focus is on creating multimodal integration of the various modes of transport to ensure integrated development. While in other countries where road infrastructure development is still impending, issues like financing of road assets are major areas of consideration.

Focus has also been observed on institutional integration

of transport departments, increasing use of green principles in road development, adoption of e-mobility as a service, implementation of integrated payment mechanisms for multimodal transport, increasing use of big data analytics, other technology initiatives and flexible road pricing initiatives. Enhanced road user facilities is a focus area globally.

## 7.1 Information, Communication and Technology (ICT) in roads

Technology is already beginning to play a pivotal role in easing the problems prevailing in various transportation sectors. For the

road transport sector, some of the solutions lie in encouraging online processes for transactions, real time monitoring for safety and

security, passenger information system, digitisation of records etc.

### ICT Solutions in Australia<sup>1</sup>

The Australian Government is encouraging the development and deployment of new technologies and is working with states and territories towards a nationally consistent policy and regulatory environment.

#### Major focus areas are:

- **Automation:** Most major vehicle manufacturers, as well as several large technology companies, are developing vehicles with higher levels of automation, including vehicles

that are designed to require no human control

- **Connectivity:** Next generation of connected vehicles, which involve Cooperative Intelligent Transport Systems (C-ITS), will be able to communicate with other vehicles (V2V), road-side infrastructure (V2I) and other devices, such as mobile phones (V2P) for a wide range of safety and efficiency applications
- **Sharing economy:** Innovative car-sharing and ride-sharing

services are providing a viable alternative to car ownership for some consumers. This could accelerate long-term trends away from car ownership, and impact on travel patterns and infrastructure use

- **Zero emission vehicles:** Falling costs and new storage options are likely to make electric-powered vehicles and other alternative fuel technologies (such as hydrogen fuel cells) more popular in the future.



1. KPMG in India's analysis, 2019 based on secondary research

## 7.2 Funding from multilaterals

Multilateral funding institutions provide funding and/or guarantees in countries like Brazil, Nepal etc. to encourage private sector investment, mitigate government

related risks and improve the financing health of projects. They offer a host of benefit to private investors such as access to use of AAA rated instrument which

improves the investment credit quality, reduce risks and ensure project bankability.

### Sao Paulo State Sustainable Transport Project<sup>2</sup>

**Problem:** Project was for rehabilitation of 650 kms of roads and reconstruction of 2 bridges. Total cost was estimated at \$729 million. A loan of \$300 million was approved by World Bank. But additional debt funding could not be procured, although assistance was provided by the state of Sao Paulo

**Solution:** Broadly the following solutions were proposed:

- Partnership with the World Bank's agency to provide guarantees
- Projects were bid out to commercial banks
- Guarantees were issued to a bank on a \$300 million loan.

**Benefits:** The benefits envisaged are as follows:

- Insured against political risk
- Better freight and passenger transport leading to logistical efficiency
- Long term increase in quality of life.



2. Brazil bridges infrastructure gap with innovative funding solution, The World Bank, November 2014

08

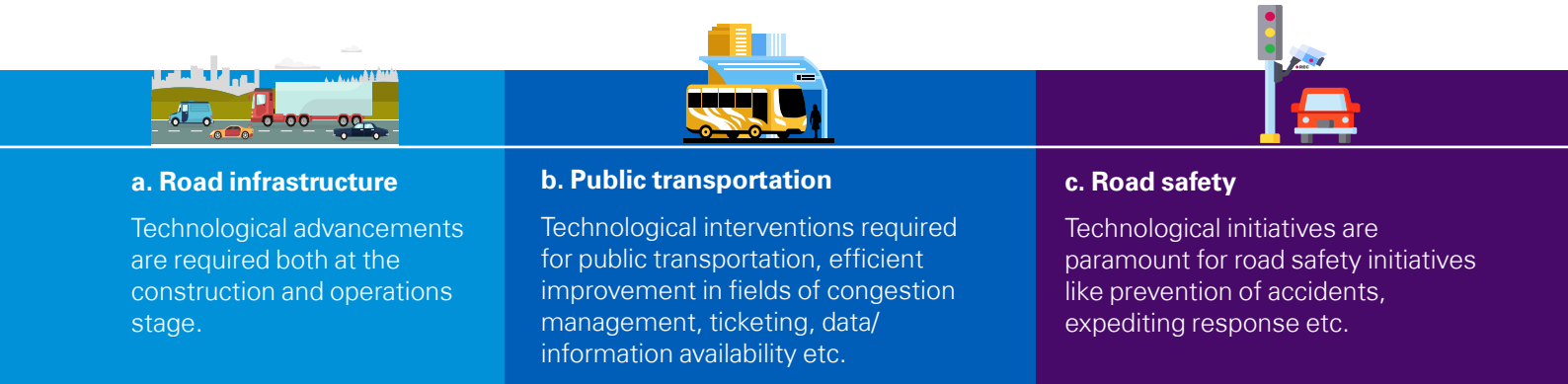
# Recent technological advancements in the sector





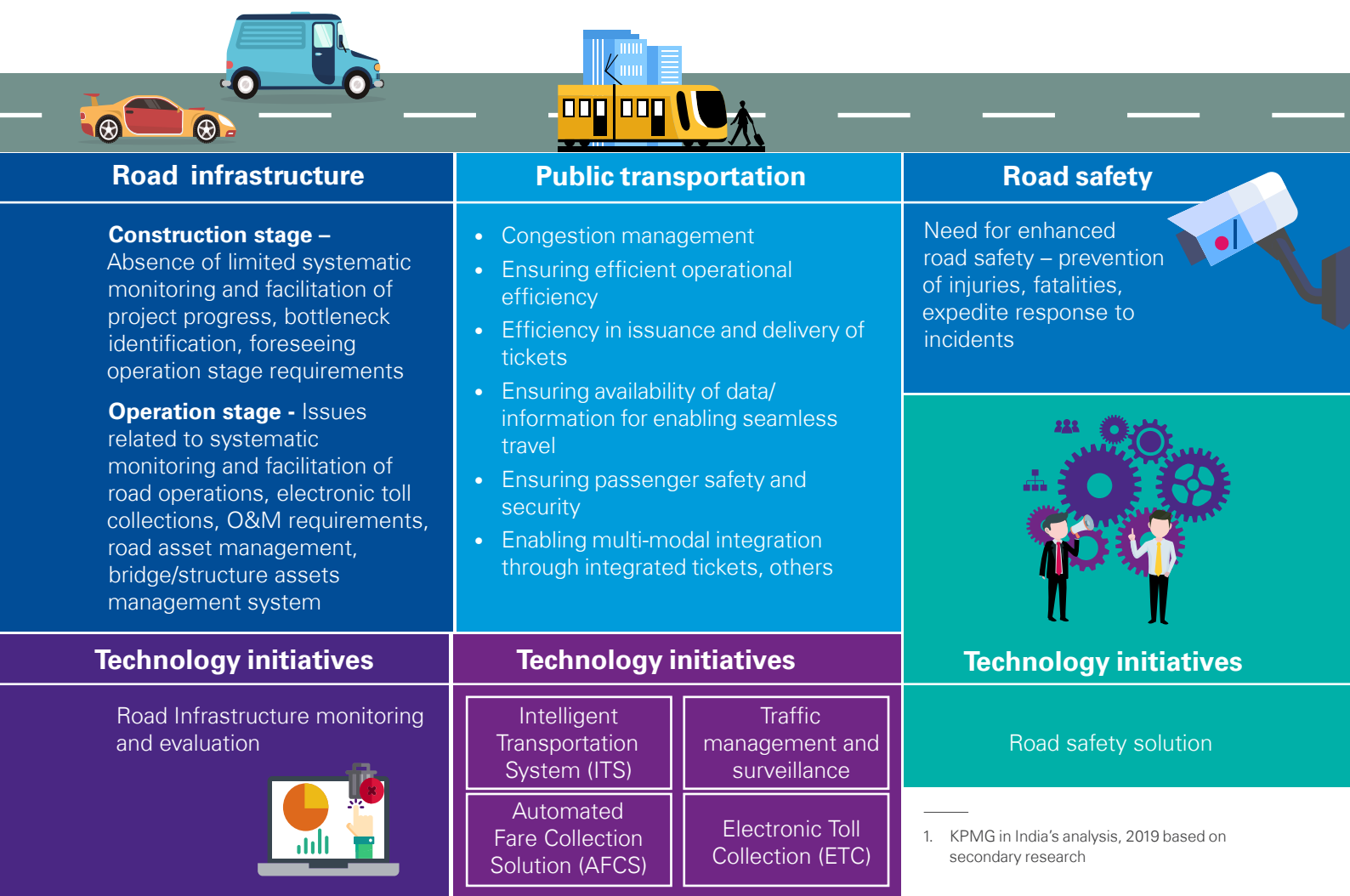
# 8.1 Types of technological advancements in the sector

A number of technological advancements have been observed in the roads and highways sector in various modes of transport. Technological advancements can be bifurcated into the following modes:



A brief description of some of the issues posed and approaches are as follows:

Figure 1: Framework for technological approaches in the road sector<sup>1</sup>



1. KPMG in India's analysis, 2019 based on secondary research

## 8.2 Technological initiatives in road infrastructure

Technology based initiatives in the road sector are increasingly being adopted – right from the initial stage of project preparation to construction and O&M phases and in enhancing service levels for

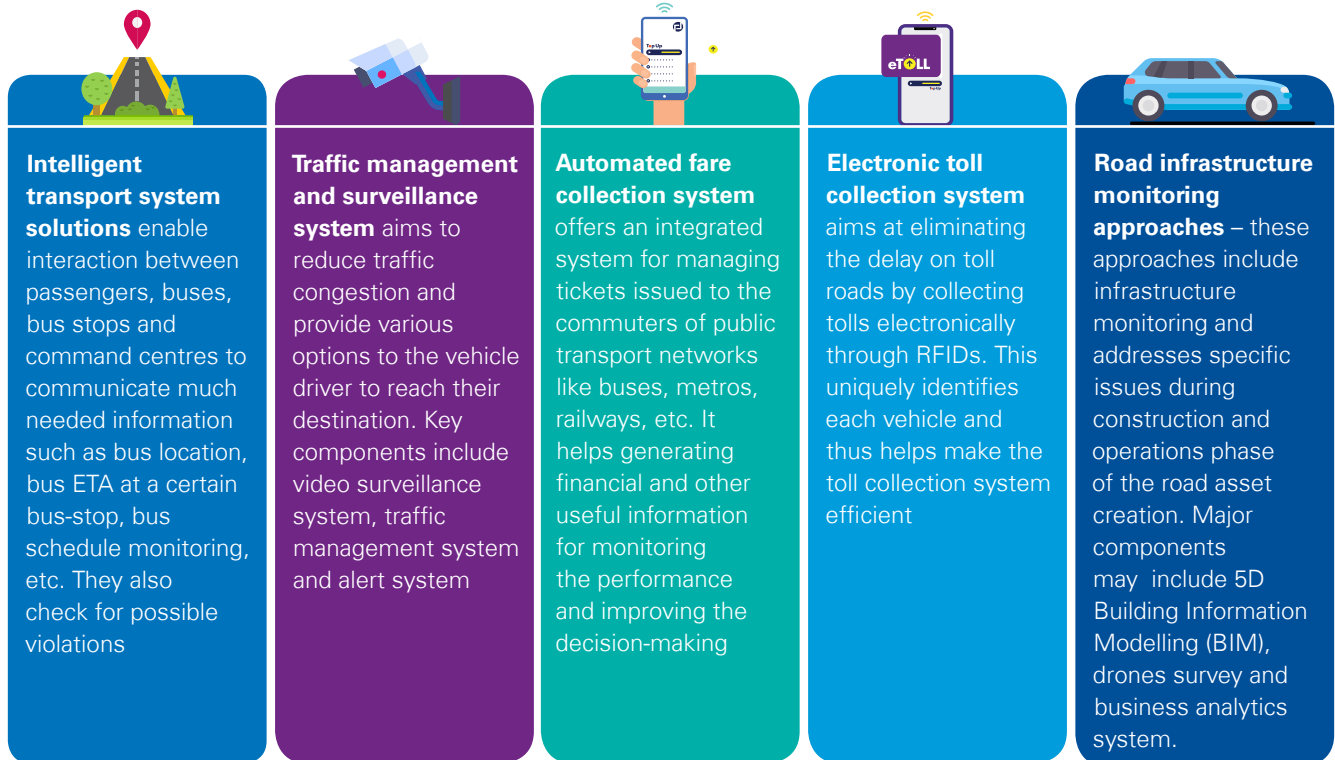
passenger and freight transport. Road safety is another important area of application.

Many such technologies have been adopted, such as the Project

Management Information System which has been developed by NHAI and is currently used to monitor more than 3,000 projects<sup>2</sup>.

## 8.3 Technological initiatives in public transportation

Significant technology interventions that are being adopted for the road transport sector are as follows:



Electronic Toll Collection (ETC) has already been implemented throughout India. NHAI is also working to convert all lanes into ETC enabled lanes.

## 8.4 Technological initiatives in road safety

Road safety approaches are citizen centric and aim to provide road quality-related information or to report any accident or pothole on the roads. They provide information on diversion in traffic, bottlenecks and safety through command

control centre, provide real time information about accidents and routes to avoid and minimise accident response times.

NHAI has already launched the SukhadYatra app, which helps in reporting of accidents, as well as

road quality details and real time information on waiting time.

2. Annual Report 2017-18, National Highways Authority of India, accessed August 2019

09

# Investment/ business possibilities

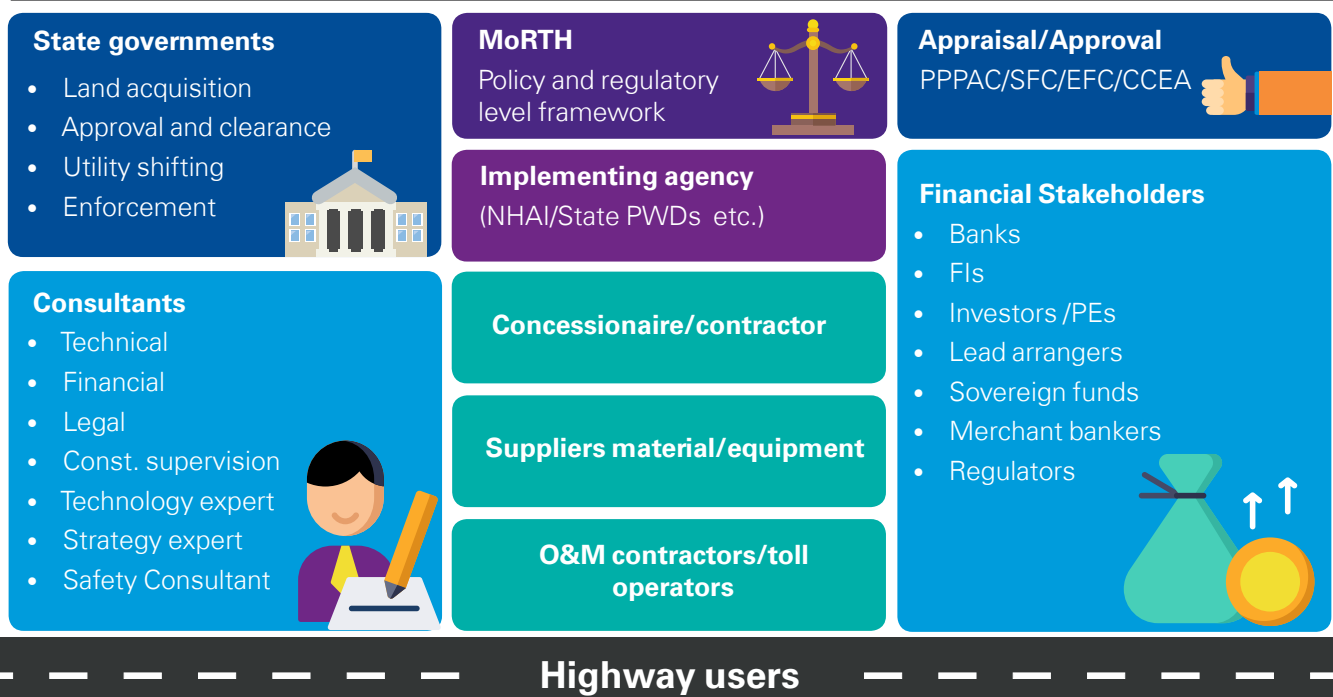




## 9.1 Stakeholders involved in roads and highways sector

A number of stakeholders are involved in the road development and operation life cycle. Brief is as below:

Figure 1: Brief of stakeholders involved in the roads and highways sector<sup>1</sup>



## 9.2 Opportunities for contractors, developers, and operators

The various opportunities for contractors, developers and operators in the present environment are as follows:

- The opportunities for developers are in the form of PPP projects, i.e. predominantly HAM projects coming up in recent years. With 60 per cent of the projects being floated on HAM mode, a number of mid-range developers have also joined the PPP bandwagon. BOT (Toll) projects are also expected to come up with the government keen on offering 10-20 per cent of NH projects in FY20 on BOT basis<sup>2</sup>
- The opportunities for contractors are in the form of constructing the project via EPC mode or rehabilitation of roads. EPC projects have a number of developers, throughout high, medium and low turnover categories
- The opportunities for operators are in the form of short-term OMT contracts floated by the government. These contracts are typically for a duration of four to nine years. Additionally, generally TOT projects are bid by investors. These investors typically hire OMT contractors for operations of the road assets. This is expected to pick up significantly in the coming years.

1. KPMG in India's analysis, 2019 based on secondary research

2. Govt to offer 10-20% of national highway projects on BOT basis for bidding, Business Standard, July 2019

## 9.3 Opportunities for investors/ lenders

**Banks have been the traditional debt providers for road projects. But a new kind of investors have come up. These are the institutional investors who invest in long-term operation assets. They invest in two kinds of assets:**



- **TOT bundles being floated by the government** which gives them the right to collect toll on road assets for a long-term concession period, while operating and managing the project. This is in return for an upfront fee paid to the government. Additional investment opportunity in the future can be in the form of monetisation of high traffic SHs and MDRs authorised by state governments

- **Buying of portfolio of operational road assets** from Indian developers. This is in the form of road assets which have already been developed and are operational.



In addition to this, various upcoming opportunities are expected to come up in the near future. These may be in the form of InvITs and securitisation of toll revenues. Private placed InvITs

have already come up in the roads and highways sector. NHAI's InvIT is also expected to come up by the end of the year, to fund the Bharatmala Pariyojana. Such kind of acceptance by a central authority

can spur the future InvIT market in India. Securitisation of toll revenue may also attract investment once it starts gaining popularity.

## 9.4 Opportunities for consultants

**There are a number of opportunities for consultants in the current scenario. This has been highlighted below:**

- Project related opportunities are in the form of feasibility study and project management unit (PMU) for roads
- Advisory in policy matters including regulatory, financial and legal aspects
- Advisory and implementation support in technology including technology solution ideation, development, deployment and operation
- Advisory in road safety including road safety approach design and implementation, technical studies, road safety audit including identification and addressal of blackspots and organising workshops
- Passenger transport like transport planning, business strategy formulation and operation improvement
- Freight transport like demand estimation, strategy formulation and operational improvement
- Advisory to state governments for projects funded by multilaterals in areas of Project Management Consultancy (PMC), capacity building, feasibility of specific projects like expressways, road safety and IT application development and implementation.

10

Road map  
for the roads  
and highways  
sector



## 10.1 Way forward

Highways development in the country for bridging the required infrastructure gap is likely to be over in the next five to six years and development/construction activities could reduce progressively. A paradigm shift is expected from highway construction/ development to provision of quality service to highway users, both for freight and passenger transport. Enhanced

use of technology applications will be a key requirement here. Promoting sustainability will be another significant focus area with increased reliance on e-mobility, use of bio fuels and eco-friendly development/construction. Further, augmenting existing sources of finance in order to complete the required highway construction in

the next five to six years shall also be an important consideration.

The above road development cycle is likely to be broadly observed across different states in terms of SHs and other roads also, though in a staggered manner.

Based on the current sector trends, following are the priorities of the sector which are likely to be addressed in the immediate future:

### a. Shift from construction to O&M and capacity augmentation work

As mentioned above, a shift can be observed from construction to O&M and capacity augmentation work. The monetisation of existing roads offer the following benefits:

- Efficient O&M of the roads
- Augmentation of existing fund for the authority.

State governments also need to embrace the TOT mode to monetise operational high traffic state highways and major district roads, to create an additional funding source which can be used in development of new roads.

In addition to this, capacity augmentation work may also be observed in the upcoming years due to many high traffic road stretches breaching capacity. This is expected to be an additional source of business for contractors in coming years.

### b. Focus on efficiency of freight and passenger transport

Bharatmala Pariyojana was planned for efficiency of freight and passenger transport, and this focus is expected to continue.

MMLPs have been at the heart of this development. Multimodal Logistics Parks are aggregation and disaggregation centres for freight. Their primary objective is to ensure smooth migration to faster transport modes such as rail, coastal shipping, etc. This helps in decongestion of roads.

35 MMLP locations have been identified under Bharatmala Pariyojana. Availability of land has been confirmed for seven locations<sup>1</sup>. Development of such MMLPs is expected to pick up in the coming years as ease and efficiency of travel gathers more significance.

Intermodal stations for passenger transport are being considered at select urban locations in order to facilitate enhanced services to passenger transport.

In addition to this, a number of IT enabled solutions are also being used to ensure ease and efficiency of freight and passenger transport. These are in the form of e-ticketing, discovery of flexi-routes by e-tracking, multimodal online smart tickets, use of security devices, etc.

Convergence with other transport ministries is also essential to ensure an integrated and holistic approach leading to multi-modal integration.

1. Annual Report 2017-18, National Highways Authority of India, accessed August 2019



### c. Increased priority on road safety

Road safety is expected to garner more focus in the future. Some of the priority areas include:

- **Addressing of black spots:** The government is taking many active steps in this direction. This is expected to continue going forward
- **Reduced response time to accidents:** Response time to accidents is a factor leading to fatalities. This is likely to

continue garnering significant attention

- **System of IT based alerts:** IT based alerts about accidents, bad quality of roads and potholes is expected to gain further acceptance
- **Driver and staff training:** Driver and staff training institutes are expected to come up throughout the

country, and witness more enrollments

- **Safety features in vehicles:** More safety features in vehicles are likely to be adopted, such as adaptive cruise control, automatic emergency braking, blind spot detection and safety exit assist.

### d. Adoption of more IT enabled solutions



A number of IT applications have been adopted in recent years, and this trend is expected to continue.

- **Road infrastructure monitoring and evaluation** is expected to be aided by technology solutions, and use of such solutions is expected to be more widespread. Such solutions can be in the form

of improving performance during construction, project management and use of unmanned aerial vehicles

- **New technological initiatives in public transport** are also expected to be observed. Some of such initiatives can be in the form of a logistics marketplace or an automated

and integrated border management system

- **Technology initiatives in road safety** are also expected to be adopted in a big way. Some of the likely solutions include intersection collision avoidance systems, dynamic curve warning systems and automatic crash detection.

### e. Exploring innovative financing mechanisms



To address the funding gap which is being observed in the sector, the approach levers that have been identified earlier need to be built upon.

**These approach levers are:**

- **Bettering funding from existing sources and leveraging other mechanisms:** As discussed, funding sources are limited. Ministry has to tap into internal extra budgetary resources as much as possible, subject to keeping tab on the extent

of future liabilities. The likely options to raise capital are bonds, masala bonds and debts from Multilateral Funding Institutions (MFI)s. Other funding mechanisms like Value Capture Financing (VCF) can also be explored. In addition to this, monetisation techniques like InvITs and securitisation of toll revenues can also be explored. Funding from TOT needs to be tapped into with aggressive bidding out of project bundles in the future

- **Policy reforms including new PPP modes:** A number of policy decisions have been taken by the ministry lately. This needs to continue into the future. Other measures that can be explored are reduction of tax on infrastructure bonds and extension of tax holiday to infrastructure developers. Some innovative PPP modes similar to Least Present Value of Revenue can also be explored.



## f. Adoption of sustainable transport approaches

Adoption of sustainable transport approaches can also be adopted in a widespread manner in the future. This is because environmental issues are fast gaining significance. Some of the ways to help ensure sustainable development are:

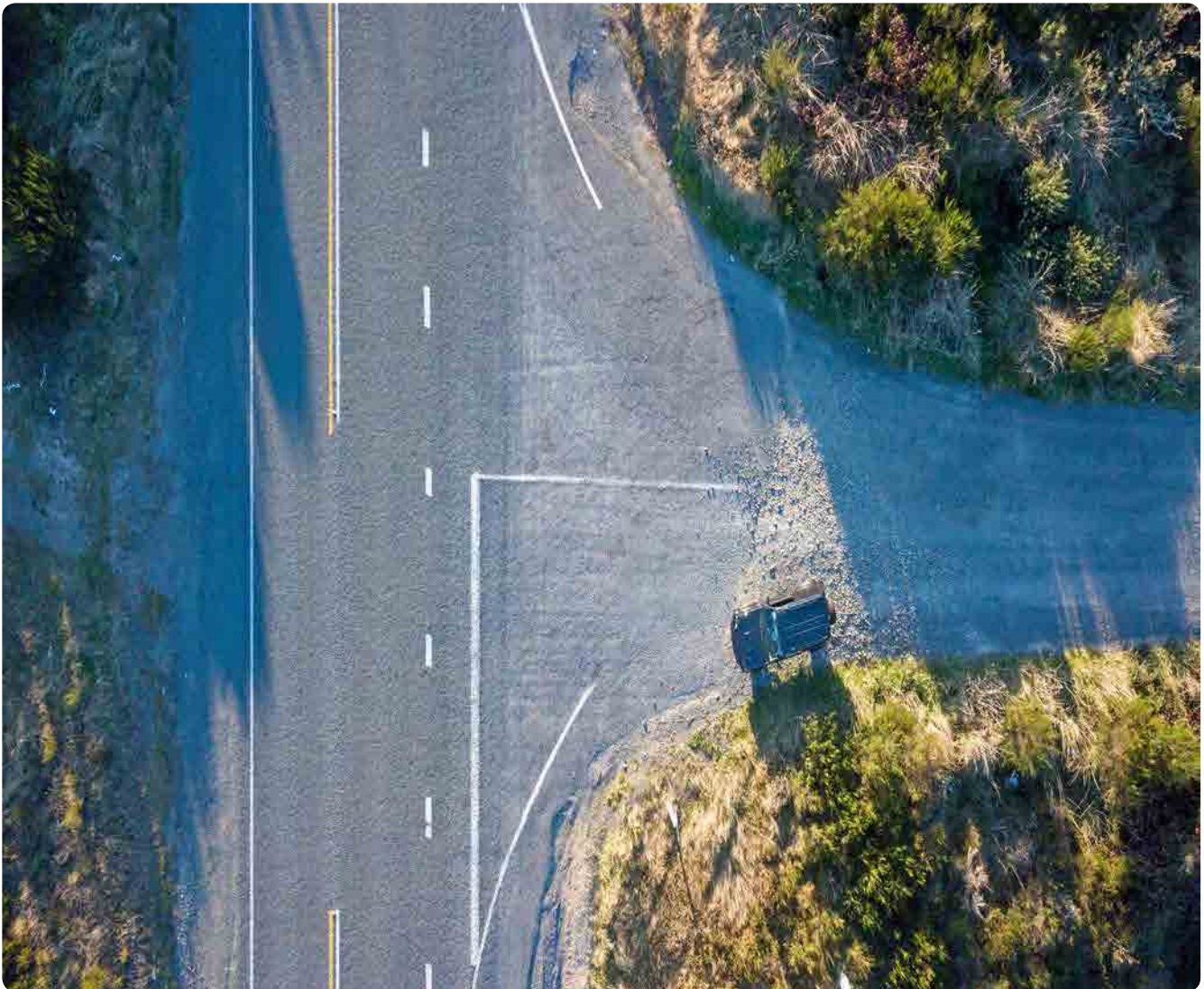
- **Adoption of EV** has been encouraged in the latest budget. While these policies promote investment in battery charging infrastructure, energy

storage solutions, smart grids, etc. they also promote the adoption of electric vehicles by the people through incentives proposed therein like subsidy on purchase of an electric vehicle, purchase and installation of charging station, etc. Such incentives are expected to be continued in the future

A number of states like Karnataka, Gujarat, Andhra

Pradesh, Maharashtra, etc. have come out with EV policies. This is expected to be adopted by more states

- **Use of biofuels has been encouraged**, with the ministry issuing a notification regarding the blending of gasoline with methanol in order to reduce vehicle exhaust emissions. Such measures are expected to continue in the future.



1. Annual Report 2017-18, National Highways Authority of India, accessed August 2019



# About KPMG in India

KPMG in India, a professional services firm, is the Indian member firm affiliated with KPMG International and was established in September 1993. Our professionals leverage the global network of firms, providing detailed knowledge of local laws, regulations, markets and competition. KPMG has

offices across India in Ahmedabad, Bengaluru, Chandigarh, Chennai, Gurugram, Hyderabad, Jaipur, Kochi, Kolkata, Mumbai, Noida, Pune, Vadodara and Vijayawada.

KPMG in India offers services to national and international clients in India across sectors. We strive to

provide rapid, performance-based, industry-focussed and technology-enabled services, which reflect a shared knowledge of global and local industries and our experience of the Indian business environment.

# About CII

The Confederation of Indian Industry (CII) works to create and sustain an environment conducive to the development of India, partnering industry, Government, and civil society, through advisory and consultative processes.

CII is a non-government, not-for-profit, industry-led and industry-managed organisation, playing a proactive role in India's development process. Founded in 1895, India's premier business association has around 9000 members, from the private as well as public sectors, including SMEs and MNCs, and an indirect membership of over 300,000 enterprises from around 276 national and regional sectoral industry bodies.

CII charts change by working closely with Government on policy issues, interfacing with thought leaders, and enhancing efficiency,

competitiveness and business opportunities for industry through a range of specialised services and strategic global linkages. It also provides a platform for consensus-building and networking on key issues.

Extending its agenda beyond business, CII assists industry to identify and execute corporate citizenship programmes. Partnerships with civil society organisations carry forward corporate initiatives for integrated and inclusive development across diverse domains including affirmative action, healthcare, education, livelihood, diversity management, skill development, empowerment of women, and water, to name a few.

India is now set to become a US\$ 5 trillion economy in the next five years and Indian industry will remain the principal growth

engine for achieving this target. With the theme for 2019-20 as 'Competitiveness of India Inc - India@75: Forging Ahead', CII will focus on five priority areas which would enable the country to stay on a solid growth track. These are - employment generation, rural-urban connect, energy security, environmental sustainability and governance.

With 66 offices, including 9 Centres of Excellence, in India, and 10 overseas offices in Australia, China, Egypt, France, Germany, Singapore, South Africa, UAE, UK, and USA, as well as institutional partnerships with 355 counterpart organisations in 126 countries, CII serves as a reference point for Indian industry and the international business community.



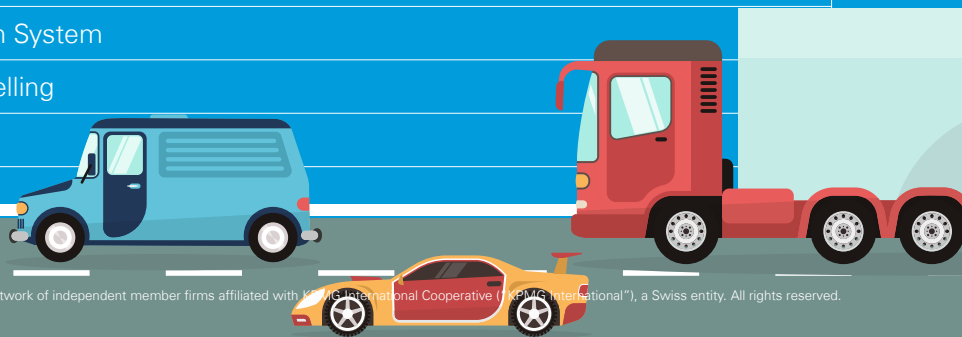


## List of Abbreviations

<b>NH:</b>	National Highway
<b>NHDP:</b>	National Highways Development Project
<b>SARDP-NE:</b>	Special Accelerated Road Development Programme for Development of Road Network in the North Eastern States
<b>MoRTH:</b>	Ministry of Road Transport and Highways
<b>NHAI:</b>	National Highways Authority of India
<b>NHIDCL:</b>	National Highways Infrastructure Development Corporation Ltd
<b>PWD:</b>	Public Works Department
<b>BRO:</b>	Border Roads Organisation
<b>SH:</b>	State Highway
<b>MDR:</b>	Major District Road
<b>PMGSY:</b>	Pradhan Mantri Gram Sadak Yojana
<b>ULB:</b>	Urban Local Body
<b>EPC:</b>	Engineering-Procurement-Construction
<b>MMLP:</b>	Multi Modal Logistics Park
<b>IT:</b>	Information Technology
<b>TOT:</b>	Toll-Operate-Transfer
<b>InVIT:</b>	Infrastructure Investment Trust
<b>EV:</b>	Electric Vehicle
<b>PPP:</b>	Public Private Partnership
<b>BOT:</b>	Build-Operate-Transfer
<b>HAM:</b>	Hybrid Annuity Mode
<b>OMT:</b>	Operate Maintain Transfer
<b>VGf:</b>	Viability Gap Funding
<b>O&amp;M:</b>	Operation and Maintenance
<b>MCA:</b>	Model Concession Agreement
<b>BKC:</b>	B K Chaturvedi
<b>RFQ:</b>	Request for Qualification
<b>ODR:</b>	Other District Road
<b>PMC:</b>	Project Management Consultancy
<b>ROB:</b>	Road Over Bridge
<b>RUB:</b>	Road Under Bridge
<b>GDP:</b>	Gross Domestic Product
<b>BIMS:</b>	Bidder Information Management System

## List of Abbreviations

<b>RFP:</b>	Request for Proposal
<b>FY:</b>	Financial Year
<b>HNI:</b>	High Net Worth Individuals
<b>PE:</b>	Private Equity
<b>IDF:</b>	Infrastructure Debt Fund
<b>DPR:</b>	Detailed Project Report
<b>CCEA:</b>	Cabinet Committee on Economic Affairs
<b>TPC:</b>	Total Project Cost
<b>COD:</b>	Commercial Operation Date
<b>NIC:</b>	National Informatics Centre
<b>BIMS:</b>	Bidder Information Management System
<b>PFMS:</b>	Public Financial Management System
<b>ISAC:</b>	Independent Settlement Advisory Committee
<b>CCIE:</b>	Conciliation through Committee of Independent Experts
<b>SAROD:</b>	Society for Affordable Redressal of Disputes
<b>IDTR:</b>	Institute of Drivers Training and Research
<b>GBS:</b>	Gross Budgetary Support
<b>CRIF:</b>	Central Road and Infrastructure Fund
<b>PBFF:</b>	Permanent Bridge Fee Fund
<b>IEBR:</b>	Internal and Extra Budgetary Resources
<b>NHF:</b>	National Highway Fund
<b>NIF:</b>	National Investment Fund
<b>PMU:</b>	Project Management Unit
<b>AI:</b>	Artificial Intelligence
<b>ISA:</b>	Intelligent Speed Adaptation
<b>MFI:</b>	Multilateral Funding Institutions
<b>VCF:</b>	Value Capture Financing
<b>GST:</b>	Goods and Services Tax
<b>ICT:</b>	Information, Communication and Technology
<b>ITS:</b>	Intelligent Transport System
<b>AFCS:</b>	Automated Fare Collection System
<b>BIM:</b>	Building Information Modelling
<b>ETC:</b>	Electronic Toll Collection



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