

STRUCTURAL FRAMEWORK OF NHAI-PPP MODEL

The National Highways Authority of India is an independent agency constituted by an Act of Parliament, the National Highways Authority of India Act, in 1988. It is accountable for managing the network of national highways in India and comes under the Ministry of Road Transport and Highways. NHAI Act ensures the development, maintenance, and management of National highways and has a three-tier structure such as the headquarters, the Regional Offices, and the Project Implementation Units. The Headquarters of NHAI is situated in New Delhi. The National highway authority of India role consists of a) Planning, development and maintenance of National Highways in the country b) widen technical and monetary assistance to State Governments for the growth of state roads and the roads of inter-state linkage and economic importance c) develop a standard pattern for roads and bridges in the nation, and d) act as a repository of technical knowledge on roads as well as bridges.



LEARNING OUTCOMES

After studying this lesson the learner:

- explains the current road projects by Governments;
- identifies design innovative models for highways;
- categorizes the Bharatmala Project;
- outlines the structure of NHDP;
- classifies various phases of ventures.



Notes

4.1 NHAI-PPP MODEL

According to the Public Private Partnership Appraisal Committee (PPPAC), as of December 2019, 824 projects have been recommended by the National Highways Authority of India (NHAI). Some PPP models generally which are being used are Built Operate Transfer (BOT) Toll, BOT Annuity, and Hybrid Annuity. Additionally NHAI executes road ventures NHAI finance the construction of road projects under the Engineering Procurement Construction (EPC) system. Several significant PPP road projects were implemented such as Delhi-Gurgaon (Gurugram), Ahmedabad-Vadodara, Chenani-Naseri tunnel projects etc. For the selection of implementation methods the waterfall mechanism is used. First the projects would be appraise under BOT toll and the equity return would remain at 15 per cent. If these ventures were not appropriate under BOT toll i.e. if the EIRR would be identified as less than 15 %, then the project would fall under BOT Annuity and only after failing in the attempt to take up under these two, it could be opted for EPC. However, in the wake of the 2008 recession, there was less appetite for BOT projects. The hybrid annuity mode or HAM, was introduced in December 2016 as a new format PPP. The first example of successful HAM is Delhi-Meerut Expressway Package I. This venture would commence from Sarai Kale Khan and end at the Delhi-UP boundary.

The highest ever award of 51,073 km of National Highway projects and highest ever construction of 28,531 km over a four year period from 2014-5 to 2017-18 was achieved by the Ministry of Road Transport and Highways. Construction of National Highways has more than doubled from 12 km/day in 2014-15 to 27 km/day in 2017-18 and the total investments in the sector has increased by 2.5 times when compared to 2014-15. Through the multiple strategy initiatives taken by the Ministry, this significant leap in highways award and construction was achieved. These growth efforts have been facilitate augmented threshold for project appraisal, delegation of power and approval and superior inter-ministerial coordination on procedure streamline been facilitate. The ventures of Languishing were revived – under which 73 projects of length approximately 8,310 kms were revived through this strategy interferences by permitting 100% equity for developers two years after the start of operations, premium deferment in stressed projects which would permit rescheduling of quality dedicated by concessionaires during the bid phase, streamlined reward to concessionaires for languishing NH projects in BOT form for delays will not be attributable to concessionaires and One-time fund infusion.



INTEXT QUESTIONS 4.1

1. PPPAC stands for _____.
2. BOT stands for _____.
3. NHAI is one of the leading players in the world in implementing the _____ model in the highway sector.
4. Through the _____ strategy initiatives taken by the Ministry, this significant leap in highways award and construction was achieved.



Notes

4.2 INNOVATIVE PROJECT IMPLEMENTATION MODELS

4.2.1 Hybrid Annuity Model (HAM)

In the model, 40% of project cost is provided by the Government as 'Construction Support' and the remaining 60% as annuity payments during operations period with interest (Bank Rate +3.00%). Separate stipulation for O&M compensations for the concessionaire. The private party does not have to abide by the traffic and risks involved due to inflation. The model has been widely accepted by the market.

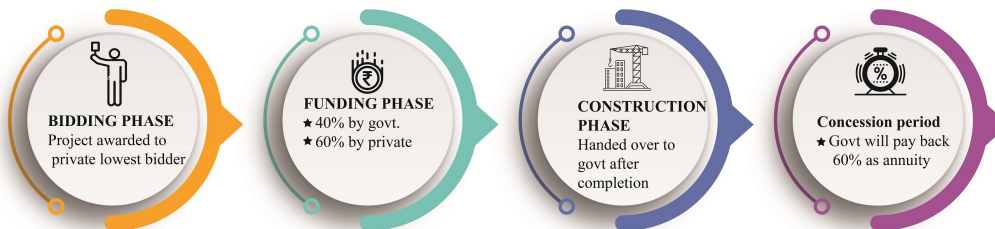


Fig. 4.1: Hybrid Annuity Model

A. The Hybrid Annuity Model (HAM)

- In our nation, the present day HAM is a mixture of BOT Annuity and EPC models.
- According to the design, the respective government will contribute towards 40% of the venture cost in the initial five years via annual payments (annuity).
- The balance payment will be made on the basis of the assets generated as well as on the performance of the developer.

**Notes**

- Here, hybrid annuity means the first 40% payment is made as a fixed amount in five equal instalments. The remaining 60% is paid as variable annuity amount depending upon the value of assets which is created only after the completion of the project.
- During the construction stage, the government will only cover 40% of the cost, so the developer should find an alternative for the balance amount. At this stage, he has to raise the remaining 60% in the form of equity or loans.
- Over a period of 15 years, the private sector developers will recover their investment from the government by obtaining annuity payments.
- For developers who undertake these sorts of projects, the government will provide 80 per cent of prior land possession as well as forest clearance.
- For the project developers there is no toll right.
- The collection of revenue will be the responsibility of the National Highways Authority of India under the HAM.

B. Advantage of HAM

- It provides adequate liquidity to the project developers and the financial burden is shared by the respective governments.
- Whereas the private partnership prolongs to bear the construction and maintenance hazards as in the model of BOT. Further the developer is obligated to partially bear the finance risk.
- Where other models are not applicable the HAM will be used in stalled projects according to the Governments strategy.

4.2.2 Toll – Operate – Transfer (TOT) Model

As per this model the right to collect toll fees for public funds is allocated to concessionaire for a 30-year concession period against on upfront payment. During the concession period, the O&M obligations are with the concessionaire. For TOT projects, the initial round of bids were completed at NHAI with a bundle of 9 project stretches (length 680 km) bid out. The H1 bidder estimated a concession fee of Rs 9,681.5 crores (against NHAI estimated Rs 6,258 Cr). DPR groundwork is under development for TOT bundles 2,3 and 4 at NHAI.



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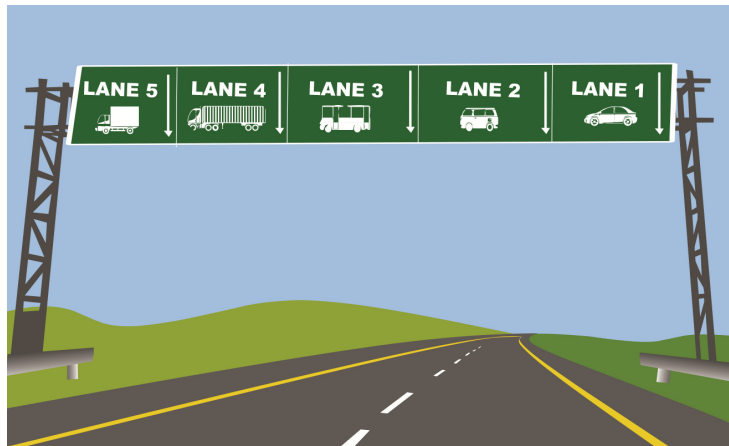


Fig. 4.2: Toll – Operate – Transfer (TOT) Model

A. Benefits

The TOT Model allows NHAI to:

- Ensure competent management of constructed and operational NH projects through appropriate Operation and Maintenance (O&M).
- Additional funds one necessary for the achievement of targets under the Bharatmala Programme and other such NH development projects.
- This model would aid in realisation of competent tolls through the private sector.

B. Highlights of TOT Model

- A concession period of around 30 years may be extended (e.g. increased or decreased) depending on certain circumstances that may arise when the project begins.
- Once the project concession is granted, the concessionaire is required to pay a lump sum upfront as the concession charge to the Authority. This is done prior to the date of appointment. Moreover, the escrow account is essential only if the concessionaire obtains loans or advances from the respective banks/ FIs.
- While the government anticipates any foreign players showing interest in TOT ventures, they must obtain approval from the relevant Authority both from a national security and public interest stand point. For all such acquisitions, ownership or control should not be less than 25% of the concessionaires; earnout, or any control aur the concessionaire board.

**Notes**

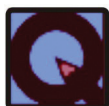
- In nations like India, competing road projects are a serious and recurring point of dispute. Therefore in such cases the Authority is restrained from constructing competing roads under the TOT model, subject to certain stipulations. Furthermore, this model also lays down penalties in case the Authority breaches its responsibility.
- The Concessionaires are allowed by the Authority to secure refinancing in full or in part of the Debt which is Due subject to the condition being such funds are utilised only for the project purpose.
- Under the TOT model, with the intent to motivate the concessionaire, the Authority will allow one-half of the payment, price and expenses of the Independent Engineer.
- This model also offers flexibility to concessionaires to promote an ‘intelligent tolling system’ or comparable mechanism, upon the similar being introduced in the future. This is coupled with the advantage of settlement of income collection with the Authority in case of substantial disparity.
- NHAI recommends implementing a tolling structure, which will work on a mixture of mobile telecommunications technology (GSM) as well as satellite-related GPS, and would be capable of deducting the funds from a vehicle account, crediting to concessionaire within one day and opening a toll gate. During a failed transaction it would be capable of alerting the toll operator to receive the payment manually and not release the gate.
- As a protection measures to the lenders, besides obtaining permission from the Authority, the concessionaire is also required to obtain permission from its lenders for alteration in order of payment mentioned under the TOT model.
- This TOT model intends to decrease the argument for expansion of the period of concession by offering expansion upon material default or breach dedicated by the Authority, directing to suspension of or decrease (*i.e. less than 90% of ‘Average Daily Fee’*) in collection of charge, as described in the TOT model.

It is also offered that:

- (i) Owing to default by concessionaire and upon the termination of such agreement, the Authority shall forfeit the performance protection, but have to pay 70% of unexpired cash flow to concessionaire and
- (ii) Owing to default by Authority and upon the termination, the concessionaire shall be paid an sum equal to 105% of the unexpired cash stream, subject to

lenders (*if any*) offering NOC, failing to such fee shall be done by Authority straightly to such lenders.

- The model of TOT offers flexibility to Parties to neutralise the consequence of any:
 - (i) Augmentation in costs or
 - (ii) A decrease in net after-tax return or
 - (iii) Other monetary burden suffered by each of the Parties owing to ‘Change of Law’.
- To decrease the allegation of biases in arrangement of disputes, which erupts among the Parties, the model of TOT offers for reference thereof to Society for Affordable Redressal of Disputes (SAROD) for mediation, which was integrated in 2013, by NHAI, and the National Highways Builders Federation (NHBF) which is an apex firm of all the contractors or builders of NHs, State highways as well as bridges in India.



INTEXT QUESTIONS 4.2

1. Advantages of HAM.
2. In the hybrid annuity the first 40% payment is made as a fixed amount in five equal instalments -True / False
3. TOT stands for Toll, Operate and _____.
4. The TOT model facilitates competent toll realisation through the _____ sector.

4.3 IT INITIATIVES

4.3.1 Project Monitoring and Information System (PMIS)

To ensure timely delivery of projects, a state-of-the-art Project Monitoring Information System (PMIS) has been developed in-house. A series of Executive Dashboards have been designed to provide updated progress on all these data fields, at various levels, such as national, Regional Office (RO) level, Project Implementation Unit (PIU) and venture level. Focused ventures with key pending issues can be indentified during these reviews by on in-built algorithm. Apart from the dashboard data views, the PMIS is also facilitated with the Geographical Information System (GIS), which offers a geographical visualisation of all NHAI projects on an India map.





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4.3.2 Integrated Technology Solution (ERP):

To digitally integrate all systems and processes across MoRTH, NHAI and NHIDCL (including all the regional offices) it has initiated an ERP solution. With the execution of ERP solution, MoRTH plans to combine more than 60 softwares and tools on a single platform along with digitization of over 30 lakh documents. Further, this project is expected to be completed within two years and will improve competence and transparency.



Fig. 4.3: Enterprises Resource Planning Model

4.3.3 Infracon:

“INFRACON” has been developed by NHIDCL as a comprehensive National Portal for infrastructure consultancy firms as key personnel, to make the assessment procedure during procurement of consultancy firms more objective, user friendly and transparent. Moreover this portal has the capability to host companies and personnel CVs as well as credentials online and has connections to Aadhaar and Digilocker for statistics validation and clarity.

4.3.4 Inam-pro:

INAM-Pro is a web based application which offers for Infrastructure and materials providers and would perform as a general platform for Infrastructure material provider’s viz. Cement Companies, Steel Companies Infrastructure providers, Ministry of Road Transport and Highways and other stakeholders.

4.3.5 Electronic Toll Collection:

MoRTH (Ministry of Road transport & Highways) has fast-tracked the execution of



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Electronic Toll Collection through Fastags in order to reduce the congestion at toll plazas. It has now been decided to equip all the Toll Plaza lanes with gantry mounted ETC Infrastructure and installation of Weigh-in-Motion (WIMs) systems in about 50% of the lanes. The NHAI has been energetically pursuing the stipulation of ETC infrastructure on all the lanes. Nearly, 25.99 lakhs fastags have been issued as on 26th July, 2018 and more than 20 percent of the collections are being received through the ETC.

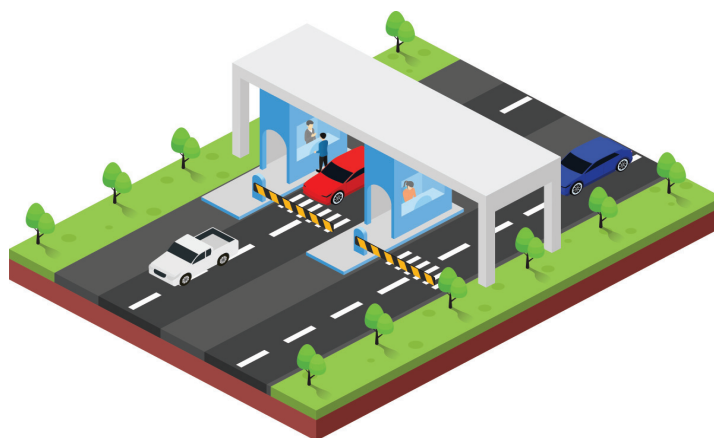


Fig. 4.4: Electronic Toll Collection

4.3.6 Sukhad Yatra:

It is an interactive mobile application designed to empower the National Highways user with pertinent information. Key modules include receiving real-time toll plaza waiting time, reporting any highway related incident or providing feedback on highway quality, exploring highway details and related amenities and purchasing FASTag.



Fig. 4.5: Sukhad Yatra

4.3.7 Bidder Information Management System (BIMS):

This system is developed by MoRTH to modernise the procedure of pre-qualification of bidders for EPC/HAM/BOT form of agreements for all National Highway and other similar works which is a centrally sponsored work with enhanced transparency and objectivity. For invitation of bids for civil works of EPC form and considerably lessen

**Notes**

time for appraisal of pre-qualification, the BIMS will be functioned in combination with the CPPP portal.

4.3.8 Bhoomi-Rashi:

Once the alignment and land acquisition plan is approved, the land acquisition is critical for the beginning and completion of construction. Bhoomi Rashi is presently being extensively implemented for issuing the notifications. By using the portal, so far, more than 900 notifications have been issued. Pertaining to land acquisition, the Bhoomi Rashi portal has been instrumental in reducing the time taken for approval and publication of notifications. Currently, the users of MoRTH have the substitute of making payments to the beneficiaries directly through the portal when Bhoomi Rashi and PFMS were integrated.

**INTEXT QUESTIONS 4.3**

1. “INFRACON” has been developed by NHIDCL - True / False.
2. Define - Sukhad Yatra.
3. _____ is a web based application which offers for Infrastructure and materials providers.
4. The PMIS is also facilitated with the _____ System, which offers a geographical visualisation of all NHAI projects on an India map.

4.4 OVERVIEW OF BHARATMALA PROJECT**4.4.1 Bharatmala Project:**

The Bharatmala Pariyojana/India Garland Project is a centrally-sponsored and funded Road and Highways project of the Government of India. The total venture of 83,677 km has committed towards the new highways which is estimated at Rs. 5.35 lakh crore, making it the single largest outlay for a government road construction scheme.

The progress of any country purely depends on the shipping systems and the paths on which they are being preserved. For the development of an enormous and populous country like India it reflects fact. For linking the segments and sustaining the smooth stream of passage, the construction of innovative and developed paths is a necessity. By implementing the Bharatmala project it can be achieved and under this format, a mass of new paths will be laid down in the country. For the highways division that targets on optimising competence of freight and passenger movement across the nation by connecting



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the significant infrastructure gaps through efficient interferences like enhancement of Economic Corridors, Inter Corridors and Feeder paths, National Corridor competence Improvement, Border and International connectivity roads, Coastal and Port connectivity roads and Green-field expressways are concerned of Bharatmala Pariyojanas new umbrella program. Under Bharatmala Pariyojana, a total of 65,000 kms of roads and highways are to be constructed.

The mammoth scheme announcement was done by Shri Nitin Gadkari, in the presence of Prime Minister Shri Narendra Modi and the idea behind the execution of a pan-nation proposal is to enhance the road network. The Road Transport and Highways Ministry of the nation will manage all key aspects of the plan.

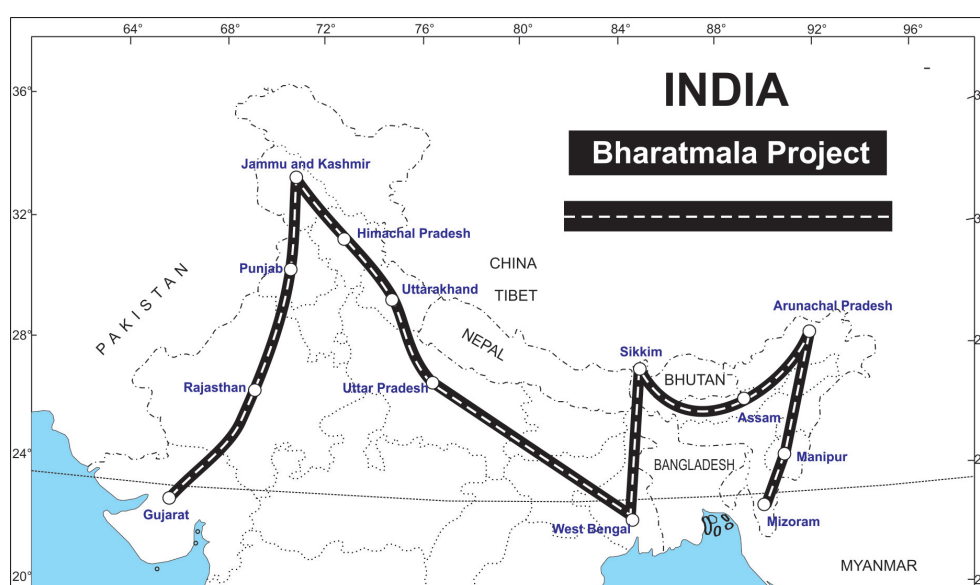


Fig. 4.6: Bharatmala Project

1. Scheme Highlights

- Through the development of Multimodal Logistics Parks and the abolition of choke points, has developed the competence of existing corridors.
- To leverage synergies with Inland Waterways as well as enhance by focusing on improving the North East.
- For project preparation and asset monitoring, emphasis on use of sophisticated technology & scientific planning.
- To assign of supremacy in order to expedite venture delivery - Phase I which to be completed by 2022
- To improve connectivity in the North East region.



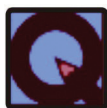
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2. Budget Allocation

According to Phase I of Bharatmala project, a total of around 24,800 kms are being considered and in addition to phase -I under NHDP, it also includes 10,000 kms of balance roadworks rising the total to 34,800 kms at an approximate price of Rs.5, 35,000 crores. Moreover, over a five year tenure i.e. 2017-18 to 2021-22 the Bharatmala Phase I - is to be implemented.

3. Key Characteristics of the Scheme

- **Improving the roads quality** - Under this venture, the construction of roads, in all segments of the country will be undertaken. The main purpose of this scheme is to bring a new wave of development in the country in the structure of well-maintained and developed roads.
- **Entire road construction** - According to the draft of the method, the government and the ministry will attempt to finish new roads, which will include to a whopping 34, 800 kms.
- **Integrated scheme** - The name which denotes as “Bharatmala” is given to the road development and it will comprise of many other associated proposals as well. With the achievement of all the methods, the overall triumph of the design will be guaranteed.
- **Tenure of the program** - The central government has planned to complete the proposal within a span of five years and it is suggested that the first phase to be completed before the end of 2022.
- **Division in phases** - It is alienated into seven distinct phases due to the sheer magnitude and spread of the scheme. At present, the first phase is under construction.
- **Daily basis construction**- To complete the first phase on time, the respective section has taken efforts to construct at least 18 km of path on a daily basis. Further, to beat the clock, continuous attempts are being made to elevate it to 30 km/day.
- **Road construction categories** - In the official draft of the scheme, it has been clearly highlighted to offer enhanced the connectivity. In order to construct the road various categories of measures will be undertaken.
- **Finding Multi-source** - For funding a mammoth project, one source will not be sufficient. Therefore, the government has to depend on other sources for generating sufficient funds to meet the required expenses.



INTEXT QUESTIONS 4.4

1. The name which denotes “ Bharatmala” is given to the _____.
2. Under Phase I of Bharatmala project, a total of around 54,800 kms are being considered -True / False.
3. The _____ scheme announcement was made by Shri Nitin Gadkari, in the presence of Prime Minister Shri Narendra Modi .
4. Under Bharatmala Pariyojana, a total of _____ kms of roads and highways are to be constructed.



Notes

4.5 CATEGORY OF BHARATMALA PROJECT

4.5.1 Economic Corridor :

The corridors of economic are incorporated networks of infrastructure surrounded by a geographical location which is designed to motivate economic development. They link diverse economic agents in exacting geographical locations. These corridors could be created inside a nation or flanked by countries and prevail in continents of Asia, Africa, and other areas. The corridors of economic are an incorporated system of roads, rails as well as ports that link GMS with nations. They connect mainly with centres of production, manufacturing hubs, industrial clusters, special economic zones, and centres of demand which are the capitals and metropolitan cities. They act as gateways to the sub region for regional and international trade. The construction of 9000 kms of Economic Corridors will be undertaken by the central government as per the guidelines of the road construction project.

1. **Inter Corridor** - Approximately, the overall length of the roads which fall under the Feeder Route is 6000kms.
2. **National Corridor** - In the category of National Corridor for the better connection between roads around 5000kms was constructed under the scheme.
3. **International Connectivity** - For integrating the cities and rural sector, which are located in the border areas, the venture has kept stipulation for constructing around 2000kms roads which fall in the border road which connects the International.
4. **Port and Coastal Connectivity** - The central government has ordered the construction of 2000km of roads to connect the areas that are dotted along the coastlines and significant ports.



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5. **Green Field Expressway:** For better administration of traffic and freight, the foremost priority will be given to the construction and development of Green Field Expressway.

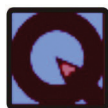


Fig. 4.7: Green Field Expressway

6. **Balance Works of NHDP -** These ventures, under the final segment will outlook the construction and maintenance of around 10,000kms of new roads.

A. VENTURES WHICH ARE NOT A PART OF BHARATMALA

If any of the projects which is proposed by the concerned State or otherwise measured as essential and expedient to build including the Ring Road or Bypass which is not considered as a Bharatmala shelf of ventures, such new ventures will be taken into account by the MoRTH with a stipulation, if the respective State or Agency is equipped to agree to at least 50% value of land acquisition. Further MoRTH will also conduct a due discussion with the Ministry of Finance and other respective Departments/Ministries. For similar offers from more than one state /Agency the Grand Challenge mechanism would still apply.



INTEXT QUESTIONS 4.5

1. Define the Economic Corridor.
2. The construction of 9000kms of Economic Corridors will be undertaken by the central government -True / False.
3. The overall length of inter corridor roads which fall under the _____ route is 6000kms.
4. The construction of 9000kms of Economic Corridors will be undertaken by the _____ government as per the guidelines of the road construction project.



Notes

4.6 OVERVIEW OF NATIONAL HIGHWAYS DEVELOPMENT PROJECT (NHDP)

The **National Highways Development Project (NHDP)** is a venture to promote, regenerate and extend the chief highways in India to a elevated standard. The venture was commenced in 1998 under the guidance of Prime Minister Atal Bihari Vajpayee. National Highways which account for only about 2% of the total length of paths, but move about 40% of the total traffic across the length and breadth of the nation. This venture is administered by the National Highways Authority of India (NHAI) below the Ministry of Road Transport and Highways. The NHDP symbolises 49,260 kms of roads and highways work and structure in order to enhance the economic development of the nation. The government has sketched to end the NHDP program in early 2018 and consume the ongoing ventures under a well-built Bharatmala project.

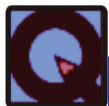
1. NHDP Functions

The National Highways Development Project (NHDP) is a project to upgrade, rehabilitate and widen major highways in India to a higher standard.

2. Features of NHDP

The stages I & II of the NHDP were visualised towards a laning of 4/6 for about 14,330 kilometres of the national highways, at a complete estimated price worth of Rs. 65,000 crores (at 2004 prices). The stages of these two comprise of

1. The Golden Quadrilateral (GQ), the North-South & East-West corridors, Port Connectivity and
2. Other projects.



INTEXT QUESTIONS 4.6

1. NHDP stands for _____.
2. NHDP was started in the year _____.
3. NHDP is a project to upgrade _____ and widen major highways in India.
4. The NHDP symbolises 49,260 kms of roads and highways work and structure in order to enhance _____ development of the nation.



4.7 PHASES OF VENTURES

4.7.1 The venture is comprises of the subsequent phases:

- a) Phase I
- b) Phase II
- c) Phase III
- d) Phase IV
- e) Phase V
- f) Phase VI
- g) Phase VII

1. **Phase I:** It is referred as The Golden Quadrilateral with 5,846 kms, links the four major cities such as Delhi, Mumbai, Chennai and Kolkata. The total price of the venture is Rs.300 billion (US\$6.8 billion) which is funded mainly by the government's special petroleum product tax revenues and government borrowing.



Fig 4.8: Golden Quadrilateral



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2. Phase II: It connects four tremendous points of the nation such as the North-South and East-West corridors comprising the national highways. The North-South and East-West corridor (NS-EW; 7,142 km) links Srinagar in the north to Kanyakumari in the south, by including a spur from Salem to Kanyakumari (through Coimbatore and Kochi) and Silchar in the east to Porbandar in the west. Total length of the network is 7,142 km (4,438 mi). It also includes Port connectivity and other ventures with 435 km (270 mi).

Corridor - North-South and East-West

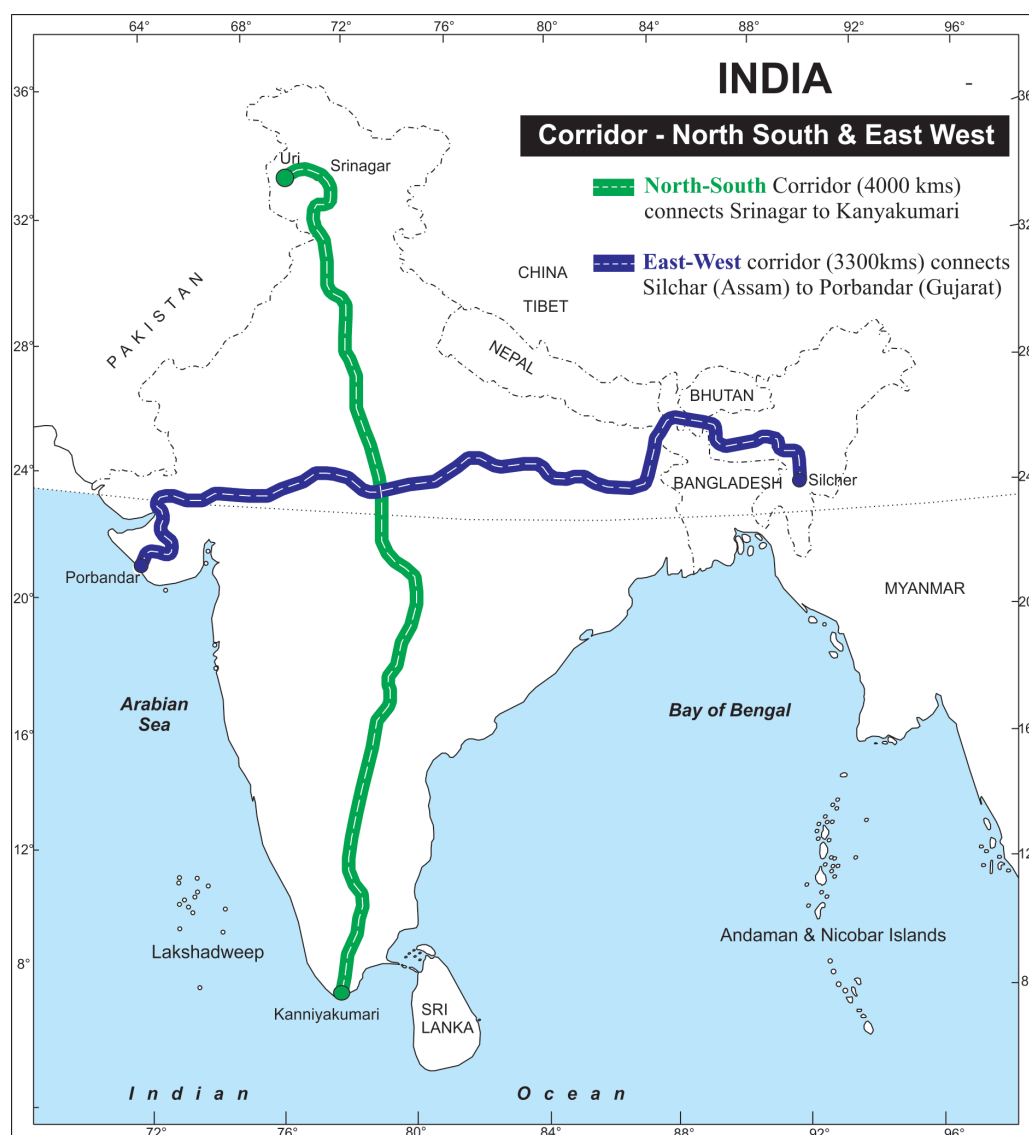


Fig. 4.9: Corridor - North South & East West

3. Phase III: The government on 12 April 2007 approved NHDP-III to upgrade



Notes

12,109 km (7,524 mi) of national highways on a Build, Operate and Transfer (BOT) basis, which takes into account the high-density traffic, which connects the state capitals via NHDP Phase I and II, and links to the centres of economic significance.

4. **Phase IV:** On 18th June 2008, the government has approved to widen nearly 20,000 kms (12,000 mi) of highways, which is not a part of Phase I, II, or III. Phase IV will further renovate the existing single-lane highways into two lanes with paved shoulders.
5. **Phase V:** A number of four-lane highways are in need to be upgraded/expanded to six lanes because of road traffic congestion over time. So on 5th October 2006 in order to upgrade of about 5,000 kms (3,100 mi) of four-lane roads the government has given approval for the same.
6. **Phase VI:** The Indian government is working towards constructing 1,000 kms (620 mi) expressways which would link major commercial and industrial townships. It has also recognized 400 kms (250 mi) of Vadodara -Mumbai division that would join the existing Vadodara (earlier Baroda)-Ahmedabad division. This venture was under the observation of the World Bank and this project will be funded on Build Operate and Transfer basis. The 334 km (208 mi) Expressway which lies between Chennai -Bangalore and 277 km (172 mi) Expressway which lies between Kolkata -Dhanbad has already been acknowledged and practicability study and DPR agreement has also been honoured by NHAI.
7. **Phase VII:** In order to facilitate easier connectivity with national highways to significant cities, this phase calls for the enhancements to city road networks by adding ring roads. Moreover, in addition to it, the improvements will also be done to widen national highways that need additional flyovers and bypasses which has given population and housing growth along with the highways and increasing the traffic. So, the government has intended to invest Rs. 16,680 Cr for this phase. The Chennai port - Maduravoyal Elevated Expressway which is 19 kms (12 mi) long is executed under this phase.



INTEXT QUESTIONS 4.7

1. _____ major cities are connected by the first phase after Golden Quadrilateral.
2. The Chennai Port - Maduravoyal Elevated Expressway is executed under _____ phase.

3. Phase I, II, or III. Phase IV will further renovate the existing single-lane highways into _____ lanes with paved shoulders.
4. Phase II connects four tremendous points of the nation such as the _____ and _____ corridors.

**WHAT YOU HAVE LEARNT**

- The National Highways Authority of India (NHAI) is one of the leading players in the world in implementing PPP model in the highway sector. For the development by the Public Private Partnership Appraisal Committee (PPPAC), as on December 2019, 824 projects were recommended. Some PPP models generally which are being used are Built Operate Transfer (BOT) Toll, BOT Annuity, and Hybrid Annuity.
- The innovative project implementation models are the Hybrid Annuity Model (HAM) and toll operating and transfer models.
- The Bharatmala Pariyojana / India Garland Project is a centrally-sponsored and funded Road and Highways project of the Government of India. The total venture of 83,677 km has committed towards the new highways which is estimated at Rs. 5.35 lakh crore, making it the single largest outlay for a government road construction scheme.
- The corridors of economic are incorporated networks of infrastructure surrounded by a geographical location which is designed to motivate economic development. They link diverse economic agents in exacting geographical locations. These corridors could be created inside a nation or flanked by countries and prevail on the continents of Asia, Africa, and other areas.
- The National Highways Development Project (NHDP) is a venture to promote, regenerate and extend chief highways in India to an elevated standard. The venture was commenced in 1998 under the guidance of Prime Minister Atal Bihari Vajpayee. National Highways which account for only about 2% of the total length of paths, but move about 40% of the total traffic across the length and breadth of the nation.
- The venture comprises the subsequent phases such as a) Phase I, b) Phase II, c) Phase III, d) Phase IV, e) Phase V, f) Phase VI and g) Phase VII.





Notes



KEY TERMS

Bharatmala	PPP	Highways
Model	Project	Phase
Corridor	Transport	Road
Government	NHDP	Lane



TERMINAL EXERCISE

1. What are PPP models?
2. Define the benefits of the TOT Model.
3. Explain the infracon.
4. Explain the Bharatmala project in your own words.
5. What do you mean by Phase III?
6. Write a note on the TOT Model
7. What do you understand about Electronic Toll Collection?
8. Bring out the scheme for Bharatmala project
9. Sketch the guidelines of the road construction project
10. Point out the features of NHDP
11. Explain the **Hybrid Annuity Model**
12. List out any three important IT Initiatives.
13. Bring out the category of Bharatmala project.
14. Outline the overview of NHDP
15. Explain the five phases of ventures.



ANSWER TO INTEXT QUESTIONS



Notes

4.1

1. Public Private Partnership Appraisal Committee.
2. Build Operate Transfer.
3. PPP
4. Multiple

4.2

1. It provides adequate liquidity to the project developers and the financial burden is shared by the respective government.
2. True
3. Transfer
4. Private

4.3

1. True
2. It is an interactive mobile application designed to empower the National Highways user with pertinent information.
3. INAM-Pro
4. Geographical Information

4.4

1. Road development.
2. False
3. Mammoth
4. 65,000



Notes

4.5

1. The corridors of Economic are **incorporated** networks of infrastructure surrounded by a geographical location which is designed to motivate economic development.
2. True
3. Feeder
4. Central

4.6

1. National Highways Authority of India.
2. 1998
3. Rehabilitate
4. Economic

4.7

1. Four
2. VII
3. Two
4. North-South and East-West



DO AND LEARN

Learners can undertake their activity work in the areas of NHAI / NHDP and other Road infrastructure highway development organisations