



75
Azadi Ka
Amrit Mahotsav

BUILDING A SUSTAINABLE ROAD INFRASTRUCTURE

SUSTAINABILITY REPORT FOR
FY 2021-2022

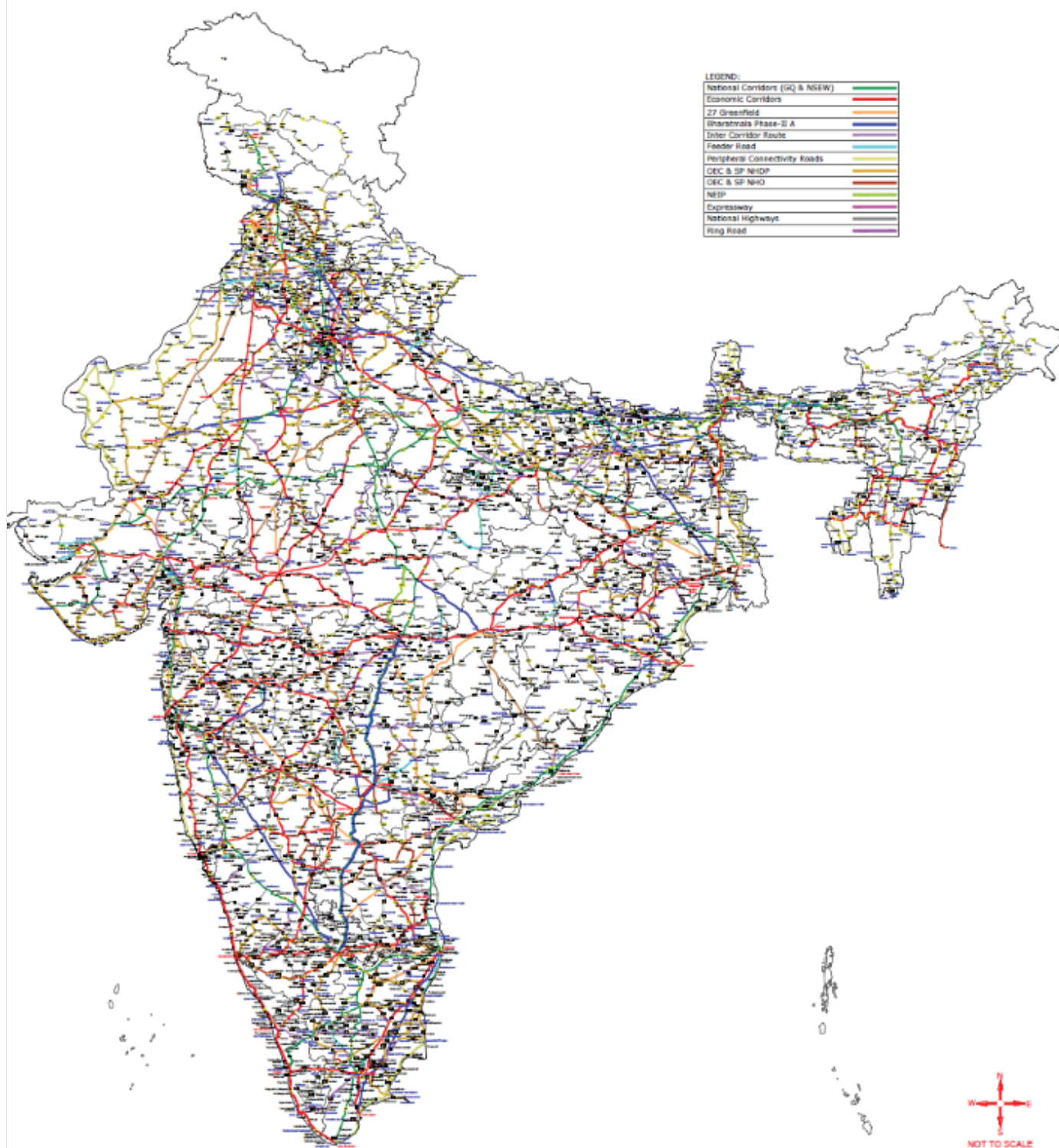


भारतीय राष्ट्रीय राजमार्ग प्राधिकरण

सड़क परिवहन एवं राजमार्ग मंत्रालय, भारत सरकार

National Highways Authority of India

Ministry of Road Transport and Highways, Government of India





A decorative graphic consisting of several overlapping, wavy, curved shapes in shades of blue and white, resembling a stylized road or a modern design element, positioned in the bottom left and center of the page.

ABOUT **THE REPORT**



ABOUT THE REPORT



At National Highways Authority of India (NHAI), we are focused on ***'building our nation, not just its roads'***. We are passionate about building sustainable roads, green highways, and an excellent and inclusive infrastructure. We are affiliate of the Ministry of Road Transport & Highways (MoRTH), tasked with conceptualizing, developing, maintaining and managing our nation's highways and associated infrastructure, and we are aligned with our nation's aim to conduct operations keeping long term sustainability as our focus.

All our projects are aligned with the national regulatory requirements and international best practices for connecting people and places with road infrastructure. We pride ourselves on our ability to connect the entire nation with uniform and high standards of work. We also aim to align our organization's practices with the United Nation's Sustainable Development Goals (UN SDGs) and aim to achieve excellence in the development and management of highways, while being responsive towards the environment, fostering inclusive growth, and committing to good governance.

As NHAI, we are publishing our ***first Sustainability Report for Financial Year 2021-22*** following the guidelines of the Global Reporting Initiative (GRI) reporting guidelines meant for a wider audience. Since this is the first of NHAI's sustainability reports, any significant changes

from previous reporting periods in the list of material topics and topic boundaries, shall be reported in subsequent reporting cycles. While we already share information about our sustainability initiatives through the Annual Reports of MoRTH and various compliance reports of our projects, this sustainability report is an exclusive consolidation of our year-long sustainability initiatives which are important to our business and stakeholders. All data points reported are for the period 1st April 2021 to 31st March 2022, unless stated otherwise. This report has been prepared in accordance with the GRI Standards 'In Accordance – Core' approach.

The report attempts to holistically present NHAI's governance structure, nature of its operations, its stakeholders, its environment and social responsibility initiatives. This report is externally assured by



Figure 1 Ahmedabad-Vadodara Section of NH-8

third party, M/s. Bureau Veritas (India) Pvt. Ltd., appointed through a standard e-tendering process governed by NHAI. The assurance is conducted adhering to International Standards on Assurance Engagements i.e., ISAE 3000 and AA1000, with scope as limited assurance.

The reporting boundary is limited to directly controlled procedures, processes and projects of NHAI through which we conduct our operations. **The information**

represented covers 20 Regional Offices (ROs) out of 25 functional ROs in current reporting cycle, whose names are mentioned in Annexure 2. Data from rest of the 5 ROs have been analyzed and understood in the similar manner, while it has been not included in current report due to absence of completeness as per GRI Standards. Processes and activities of concessionaires (engaged by NHAI for construction, operation and maintenance of

our projects) and their vendors, suppliers, contractors and sub-contractors, are not considered for this Sustainability Report. Any feedback or suggestions regarding the report can be sent to following address.

Shri Alok Kumar,
GM, Environment,
G 5&6, Sector 10, Dwarka,
Delhi, 110075
Email: alokkumar@nhai.org



MESSAGE FROM HON'BLE MINISTER, MINISTRY OF ROAD TRANSPORT AND HIGHWAYS

NITIN JAIRAM GADKARI

Minister of Road Transport and Highways of India



Dear Citizens,

Under the visionary and dynamic leadership of Hon'ble Prime Minister of India, Shri Narendra Modi Ji, I feel proud to present the first Sustainability Report of the National Highways Authority of India (NHAI). Sustainability, as we all know is a critical issue that affects every aspect of our lives, and it is, therefore, essential that we take onus of our present actions to ensure that we leave a better world for our future generations.

NHAI has made significant strides in promoting sustainable practices in our country's road infrastructure. NHAI's commitment to sustainability goes well beyond just meeting environmental conservation goals; it encompasses commitment towards social well-being and economic growth of our society. NHAI is taking concrete steps towards reducing carbon emissions and promoting the use of renewable energy in our road infrastructure ecosystem. We are emphasizing on improving the accessibility and sustainability of roads while ensuring resource optimization which will in-turn mitigate negative environmental footprints, whilst promoting equitable transportation for all.

Emerging as a leader in sustainability, NHAI has been institutionalizing eco-friendly construction practices in its infrastructure development projects, such as using recycled materials, using inert waste from landfills, using renewable solar energy, creating surface water bodies, rain water harvesting, undertaking large scale plantations, use of green technologies and implementing environmental management practices which address issues of biodiversity, wildlife, and local population. Further, 'Azadi Ka Amrit Mahotsav' which is an initiative of the Government of India to celebrate and commemorate 75 years of India's independence is being celebrated by the MoRTH and its affiliate NHAI by planting 75 lakh saplings. NHAI has taken the responsibility of creating 538 such 'Amrit Sarovars' and is implementing the same as envisioned by Hon'ble Prime Minister Shri Narendra Modi Ji.

I am happy to state that significant milestones have been achieved in the development of the country's road network. We are continuously striving to raise the benchmark in terms of length of highways constructed per day as against already achieved targets and creating new records in our developmental journey.

NHAI's first Sustainability Report is indeed a positive beginning in the right earnest which will help in achieving India's mission of creating a holistic road infrastructure which is Clean, Green, and Sustainable. I am sure that NHAI will continue to prioritize sustainability in all its policies, plans and practices, and I invite you to join us in this journey towards a more sustainable future. Finally, I assure you that NHAI is committed to create sustainable infrastructure that meets the needs of our citizens while protecting our planet's natural resources.

Jai Hind!

Nitin Jairam Gadkari





MESSAGE FROM HON'BLE MINISTER OF STATE, MINISTRY OF ROAD TRANSPORT AND HIGHWAYS

GENERAL (DR.) V. K. SINGH (RETD.)

State Minister, Ministry of Road Transport and Highways



Dear Readers,

I am delighted to witness the release of the first Sustainability Report of the National Highways Authority of India (NHAI), which is highlighting our achievements and demonstrating our commitment towards building a sustainable road infrastructure which is in sync with the vision of our Hon'ble Prime Minister of India in promoting and sustaining 'LiFE'- 'Lifestyle for Environment'.

I strongly believe that sustainable development is the key to create a better tomorrow for ourselves and for our future generations. Our commitment towards sustainability is reflected in our policies, strategies, projects and programmes, which are designed to achieve a balance between economic

growth, environmental protection and social progress.

It is my privilege to state that NHAI has expanded its vision to improve overall transportation ecosystem by establishing Greenfield corridors across our country. In addition, NHAI is also taking an initiative of developing eco-friendly highways, ropeways and multimodal logistic parks.

NHAI has been making significant efforts towards environmental sustainability in all its projects, and it is committed to reduce any adverse environmental impact of its road development endeavor. These measures not only help in reducing the carbon footprint of road construction but also contribute in conservation and protection of our pristine natural resources and biodiversity.

We must continue to collaborate with citizens, communities, and industries, to create a sustainable transportation eco-system that meets the needs of current and the future generations. I am confident that our commitment and efforts towards sustainability will benefit the environment, society, and economy, and will create a more resilient future for our nation.

Let us all take pledge to build sustainable and inclusive infrastructure in India.

Sincerely,

General (Dr.) V. K. Singh (Retd.)



MESSAGE FROM SECRETARY, MINISTRY OF ROAD TRANSPORT AND HIGHWAYS

ANURAG JAIN IAS

Secretary, Ministry of Road Transport & Highways



Dear Readers,

I am pleased to note the release of NHAI's first ever Sustainability Report. The Highway and Roads Sector has played a very crucial role in India's growth story. The importance of the sector stems from the fact that the highways constitute only about 2% road network but caters 40% road traffic. To start with, NHAI in the FY 2021-22 has consolidated gains that have accrued from major policy decisions taken in the previous years and is aspiring to maintain the momentum of the historically highest pace of road development.

We are so fortunate to be part of the lives of millions of Indians and proud to state that every one of our employees is committed to not only driving growth across our work, but also delivering a positive impact to our customers, communities, environment and shareholders. As part of this

commitment, we are on an ongoing journey to deliver meaningful impact across all facets of our sustainability efforts. Our first ever, Sustainability Report, FY 2021-22 showcases the measurable progress we have made towards strengthening our networks, closing the connectivity divide, investing in advanced technologies, being a good environmental stewardship while fostering best practices across our work domain. It is immensely gratifying to note that all our endeavors are in sync with our national and international commitments and vision of our Hon'ble Prime Minister.

We have accelerated towards growing our road networks and bridging the connectivity besides protecting the environment and embedding ESG across our work domain. Environmental stewardship is evident across all our operations and that will become even more deeply embedded as we become more energy, water, and resource efficient and reduce waste. A critical part of building a sustainable future for the next generation is protecting and conserving our environment. We are also focused on road safety, reducing greenhouse gas emissions, diverting inert waste from landfills for road construction, creating green corridors by involvement of SHGs, use of geo-synthetics including coir/jute and reducing our environmental footprints.

I am sure this report will open new vistas for harnessing 'green finance' in accordance with the vision of the Government of India.

Best Wishes for Sustainable Future

Anurag Jain IAS

Secretary, Ministry of Road Transport & Highways.



MESSAGE FROM CHAIRMAN, NATIONAL HIGHWAYS AUTHORITY OF INDIA

SANTOSH KUMAR YADAV, IAS

Chairman, NHAI



Dear Stakeholders,

It gives me immense pleasure to share with you the first Sustainability Report of National Highways Authority of India covering activities for the period 2021-2022. NHAI, being a leader in conceptualizing, implementing, operating and maintaining road infrastructure of India, is pleased to have begun its sustainability reporting journey. The intension herein is to demonstrate our sustainability endeavors and commitment to society, policy makers and the nation. I am proud to say that this report is in accordance with the Global Reporting Initiative (GRI) sustainability reporting standards, which have been followed and practiced worldwide, and presents a wide range of sustainability initiatives undertaken by the organization.

This report is very timely because of three reasons- firstly, NHAI has scaled new heights every year for road construction while increasingly adopting green highways concepts for environment conservation. Secondly, the NHAI has taken up determined targets of road connectivity, which encompasses a holistic approach of sustainable road network.

Lastly, NHAI has aligned itself with our Nationally Determined Contributions (NDCs) declared under the Paris Agreement and the vision of our Hon'ble Prime Minister, 'LiFE' - 'Lifestyle for Environment' as a key to combat the threat of climate change.

NHAI has achieved scaling heights by constructing a total 4,331 KM of roads in FY 2021-22. NHAI is thus consistently demonstrating higher and higher growth in comparison to previous years. Further, we strongly believe that our employees are the most important resource for us, and with the adoption of employee friendly policies and programmes, we have been able to harness talent and provide employees a congenial workplace to excel.

I would like to assure all our stakeholders that NHAI will continue to work towards building sustainable infrastructure and would improve its sustainability performance on a continuous basis. I also feel privileged to announce that the first Sustainability Report of NHAI has not only been successfully reported but also assured by a credible third party in terms of GRI protocols.

I would like to place on record, my highest appreciation to the team Environment Division for their dedicated and untiring efforts to bring out this report. I also duly acknowledge the efforts of all our field and head quarter functionaries in this endeavor. I hope that our maiden report offers an insight into NHAI's operations from a sustainability lens and acts as a yardstick for improving its performance in coming years. In this effort, I would like to invite your feedback on this first Sustainability Report and assure you that this journey of sustainability reporting shall continue in coming years as well.

Sincerely,

Santosh Kumar Yadav, IAS

Chairman, NHAI.



MESSAGE FROM FORMER CHAIRPERSON, NHAI AND SECRETARY, MORTH

ALKA UPADHYAYA IAS

Secretary, Ministry of Road Transport & Highways.



"I am happy that the endeavor started by me as the Chairperson, NHAI has fructified and has come out as the first Sustainability Report of NHAI. I am proud to say that the sustainability is at the core of NHAI's policies and practices, and NHAI is committed to building sustainable infrastructure for our country and its people. I would like to place on record my appreciation to the contribution of the World Bank, Delhi office in terms of guidance in the preparation of this Sustainability Report of NHAI."



Figure 2 The then Chairperson, NHAI Visit at Ambala Kotputli section

MESSAGE FROM THE BOARD MEMBERS



SHRI R K PANDEY - Member Projects

"**Achieving** sustainability of road projects is a continuous process, which entails concentrated efforts of sustainable sourcing, material stewardship and achieving an incremental operational efficiency. Reduction in Carbon, Energy, Waste and Water footprints has been NHAI's strategic focus, while developing sustainable road projects"



SHRI MANOJ KUMAR - Member Projects

"**Sustainability** is vital for long term road projects which caters to the needs of millions of citizens while ensuring smooth conduct of business. NHAI has been taking up projects with increased focus on reducing its ecological footprints and impacts while proactively taking steps for mitigation"



SHRI MAHABIR SINGH - Member Technical

"**NHAI** has reached scaling heights in construction and management of national highways over the last 5 years. Sustainable design with use of recyclables and innovative materials has provided a futuristic dimension to road engineering. Our journey to enriching future lies in holistic approach to sustainability"



SHRI NRVVMK RAJENDRA KUMAR - Member Finance

"**Achieving** financial prudence and financial efficiency are the core attributes for any organization to succeed in a long run. Our sustainability approach elaborated through this report, has given us actionable insights to build robust financial management system for future"



SHRI K VENKATA RAMANA - Member PPP and Admin

"**Our employees** have been our greatest strength. NHAI provides an excellent platform for personal growth with apt combination of challenging assignments and work life balance. We are also moving ahead with large number of PPPs, keeping in mind their long-term operational sustainability"

SALIENT FEATURES OF THE REPORT

- Decreasing trend from FY 2019-20 till 2021-22 by 18.44% and 9.49% in NHAI's Scope – I (direct) emissions. This gets further offset by NHAI's activities under Green Highways initiative.
- Coverage of FASTag for Toll collection is 97.5%, which contributes to reduction in carbon foot print.
- Gradual decrease in Green House Gas (GHG) Emissions Intensity of 9.7% in FY 2020-21 and 2% in FY 2021-22.
- Reduction in Energy Intensity in GJ/Km of 37% in FY 2020-21 and 27% in FY 2021-22 in its operations while the kilometres constructed through the reporting period has been rising steadily.
- Significant increase in number of saplings planted from 2016-17 onwards till 2021-22. Total 2.74 crore saplings were planted till 2021-22 since 2016-17 to mitigate Scope – I emissions (direct emissions).
- For the year 2022-23 the target is 75 lakhs which is in sync with 'Azadi ka Amrit Mahotsav' celebrating 75 years of our independence.
- Steady increase in female hiring by 7.4% YoY and total increase of 3% in overall work force in three financial years.
- NHAI has demonstrated increased usage of fly-ash and plastic waste in road construction in last three years.
- NHAI has continuously been using recycled materials for highways construction. The use of Recycled Asphalt (RAP) and Recycled Aggregates (RA).
- More than 100 Wildlife Crossings were created in 3 years across 20 States as a measure for wildlife protection and conservation and to reduce the man-animal conflict.
- NHAI could achieve about more than 100 hrs. of training per employee.
- NHAI has partnered with SHGs, State SRLMs and NGOs to collaboratively conduct plantation drives.
- About 1.10 Lakh plants were planted in collaboration with 4 corporates under CSR partnership.
- NHAI has stepped as a responsible and caring organization showing compassion during difficult situations of COVID pandemic by supplant necessary food items and sanitary supplies for migrants while also setting up number of oxygen plants in hospitals.
- The MoEF&CC Study on 'A Rapid Assessment of Avoided CO₂ Emissions during Construction, Maintenance and Operation of National Highways' got conducted through a technical consortium of CSIR-IIP, CSIR-CRI, TERI and IORA has demonstrated the sustainability credentials of NHAI. It has been reported in the study that a total of 77,265 KM of national highways have been constructed till date since 2014 which can potentially avoid 32.15 million tonnes of CO₂ annually and 642.95 million tonnes of CO₂ cumulatively over a period of 20 years. This is equivalent to CO₂ sequestration by 31,826 million trees.



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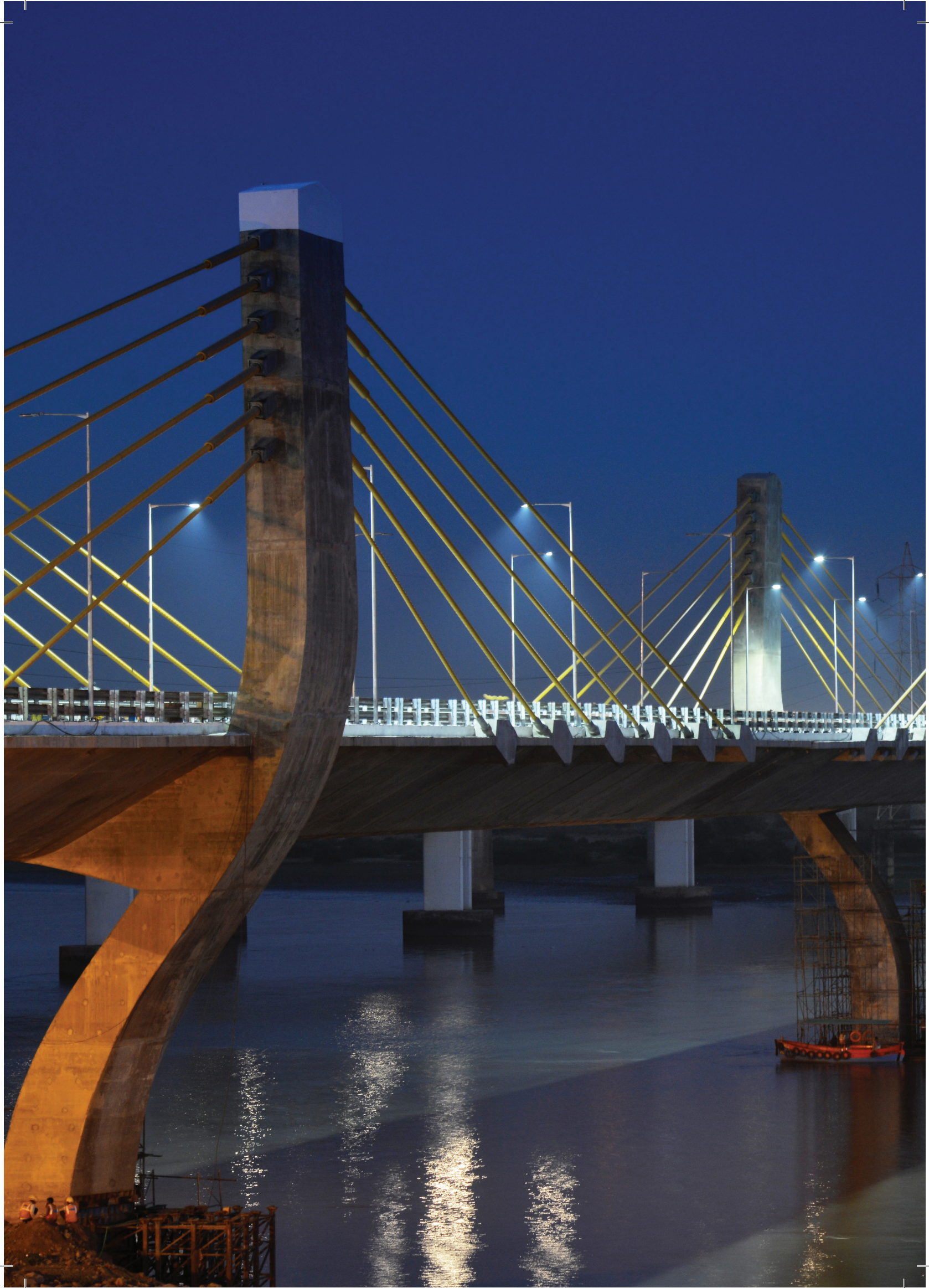
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The background of the entire page is a photograph of a large cable-stayed bridge at night. The bridge has multiple tall, white, A-frame pylons and numerous stay cables. It is illuminated with warm yellow lights, and its reflection is visible in the water below. In the foreground, there is a large, stylized blue graphic element that resembles a road or a wave, curving from the bottom left towards the center. It has a dashed white line running along its length. A small blue circle is positioned near the top right of this graphic.

ABOUT US

ABOUT US

National Highways Authority of India (NHAI) was set up through an Act of Parliament, namely the National Highways Authority of India Act of 1988. NHAI is responsible for development, maintenance, and management of National Highways (NHs) across India and for matters connected therewith or incidental thereto. We are a nodal agency of Ministry of Road Transport and Highways (MoRTH). It has Memorandum of Understanding (MoU) with the Indian Space Research Organization (ISRO) for satellite mapping of National Highways.

National Highways are the arterial roads of the country for inter-state movement of passengers and goods. They traverse the length and width of the country connecting the National and State capitals, major ports and rail junctions and link up with border roads and foreign highways. The total length of NH (including expressways) in the country as on 31.08.2021 is 1,40,152 kms. While Highways/Expressways constitute only about 1.7% of the length of all roads, they carry about 40% of the road traffic.

Our State/UT wise National Highway Length as on 31.08.2021 is provided in the table below with construction update for the reporting period.

Table 1 Highway lengths in India- State Wise

Sr. No.	State / UT	Highways Length (KM)	Construction for FY 21-22 (KM)
1	Andhra Pradesh	7,784	80
2	Arunachal Pradesh	2,537	0
3	Assam	4,006	29
4	Bihar	5,940	275
5	Chandigarh	15	0
6	Chhattisgarh	3,620	66
7	Delhi	157	5
8	Goa	299	0
9	Gujarat	7,885	202
10	Haryana	3,237	284
11	Himachal Pradesh	2,607	42
12	Jammu Kashmir	1,752	71
13	Jharkhand	3,430	55
14	Karnataka	7,656	213
15	Kerala	1,782	13
16	Ladakh	806	0
17	Madhya Pradesh	9,003	469
18	Maharashtra	18,317	584
19	Manipur	1,840	0
20	Meghalaya	1,156	0
21	Mizoram	1,423	0
22	Nagaland	1,670	0
23	Orissa	5,897	230
24	Puducherry	64	0
25	Punjab	4,105	33
26	Rajasthan	10,350	559
27	Sikkim	709	0
28	Tamil Nadu	6,858	285

Sr. No.	State / UT	Highways Length (KM)	Construction for FY 21-22 (KM)
29	Telangana	4,644	108
30	Tripura	854	0
31	Uttar Pradesh	12,245	626
32	Uttarakhand	3,449	44
33	West Bengal	3,665	61
34	A&N Islands	331	0
35	Dadar Nagar Haveli & Daman & Diu	59	0
TOTAL		1,40,152	4,334

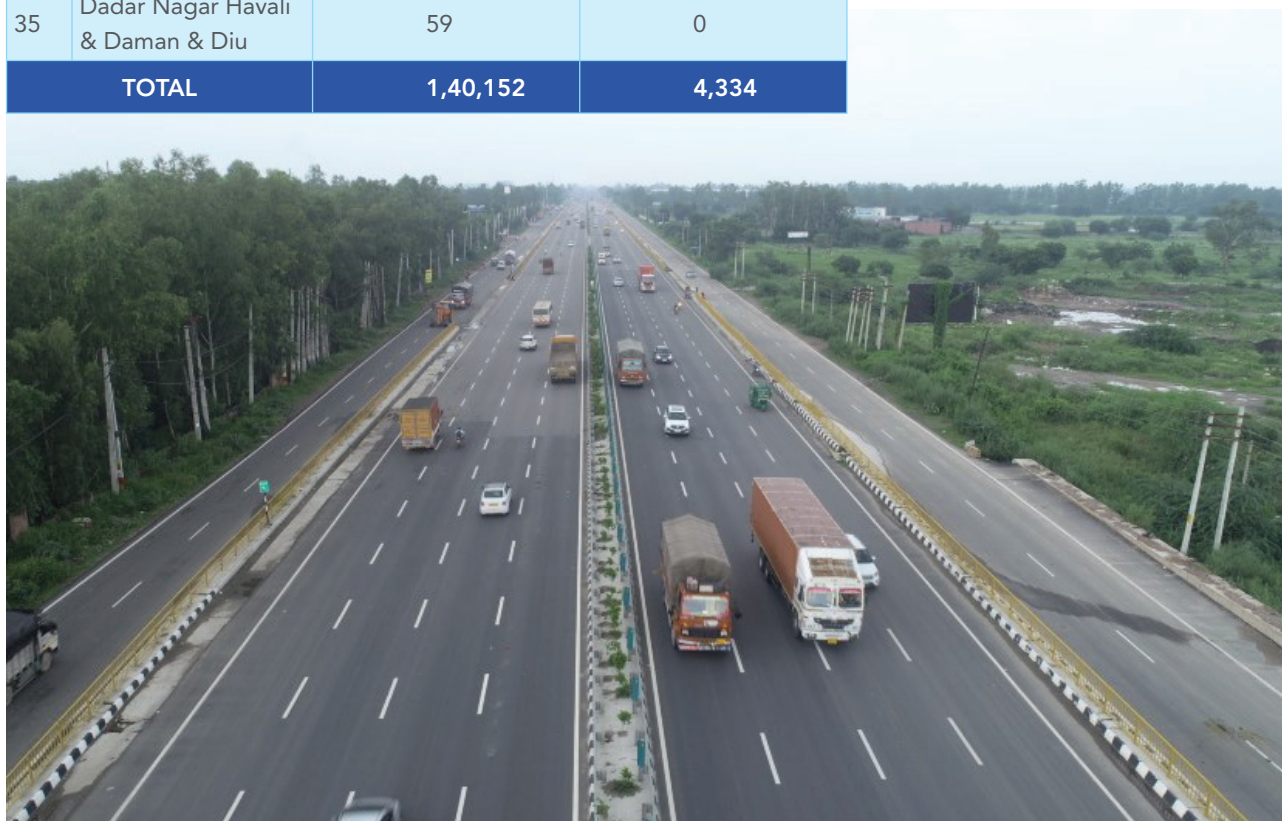


Figure 3 Green Highway Initiatives

NHAI became an autonomous body in February 1995, and we have been entrusted with the National Highways Development Project, which along with other minor projects, has vested in it 50,329 km of National Highways for development, maintenance and management. Our objective is to ensure that all contract awards and procurements conform to the best industry practices with regard to transparency of process, adoption of bid criteria to ensure healthy competition in award of contracts, implementation

of projects conform to best quality requirements and the highway system is maintained to ensure best user comfort and convenience.

MANDATE

NHAI is mandated to implement National Highways Development Project (NHDP) which is India's largest ever highways project in a phased manner. The National Highways have a total length of 1,40,152 (approx.) KM to serve as the arterial network of the country. Although National

Highways constitute only about 2 per cent of the road network, it carries 40 per cent of the total road traffic. Rapid expansion of passenger and freight traffic makes it imperative to improve the road network in the country. Accordingly, Government of India launched major initiatives to upgrade and strengthen National Highways through various phases of National Highways Development Project (NHDP).



ABOUT US

VISION AND MISSION

At NHAI, we have the Vision to meet the Nation's need for provision and maintenance of National Highways network to global standards and to meet the user's expectations in the most time-bound and cost-effective manner, within the strategic policy framework set by the Government of India and thus promote economic well-being and quality of life of the people.



To develop, maintain and manage National Highways vested in it by the Government



To regulate and control the plying of vehicles on National Highways for its proper Management



To develop and provide consultancy and construction services in India and abroad and carry on research activities in relation to the development, maintenance and management of highways or any other facilities there at



Provide such facilities and amenities for the users of the highways vested in, or entrusted to, it as are, in the opinion of the authority, necessary for the smooth traffic flow on such highways



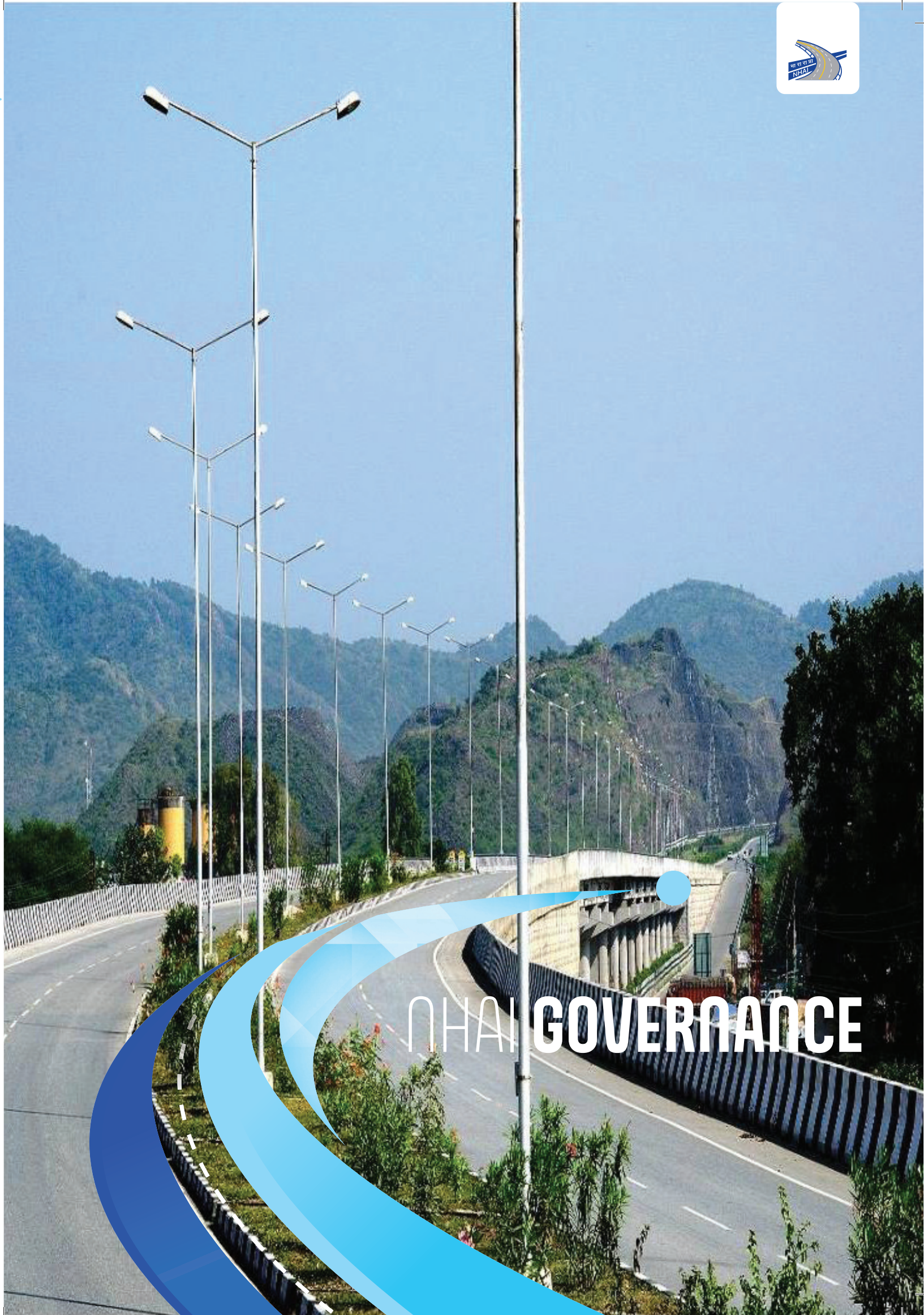
Construct offices or workshops and establish and maintain hotels, motels, restaurants, and rest rooms at or near the highways vested in or entrusted to



To advise the Central Government on matters relating to highways



To assist on such terms and conditions as may be mutually agreed upon, any State Government in the formulation and implementation of schemes for highway development



NHAI GOVERNANCE

NHAI GOVERNANCE



Figure 4 Hon'ble Minister (R,T&H) steering meeting at NHAI

NHAI benefits from the rich experience of the professionals from various departments. NHAI consists of permanent officers as well as officers on deputation. The officers on deputation are drawn from Ministry of Road Transport & Highways, Ministry of Defense, Public Works Department (PWDs) of various States, and other related organizations.

NHAI's Board comprises of the Chairperson, six (6) full time Members and four (4) part time Members, and two (2) non-Government part time Members. Chairman is the head of the organization and assisted by the Members who report to the

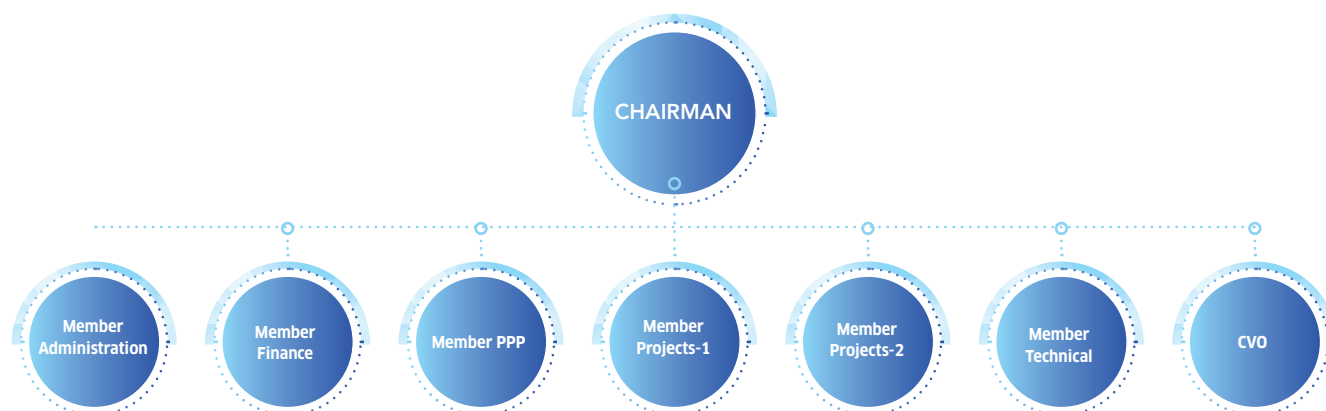
Chairperson, i.e., Administration, Finance, PPP, Projects, Technical and Chief Vigilance Officer (CVO). Our Board, being the highest governance body, is key for setting purpose, values and strategy that drives NHAI. The Board ensures all supervision and monitors progress of all projects and initiatives of NHAI.

Our erstwhile Chairperson and Secretary, MoRTH, Smt. Alka Upadhyaya, took charge in December, 2021. Prior to joining as Chairperson, NHAI, Smt. Upadhyaya served as the Additional Secretary, Ministry of Rural Development, Government of India. She has worked

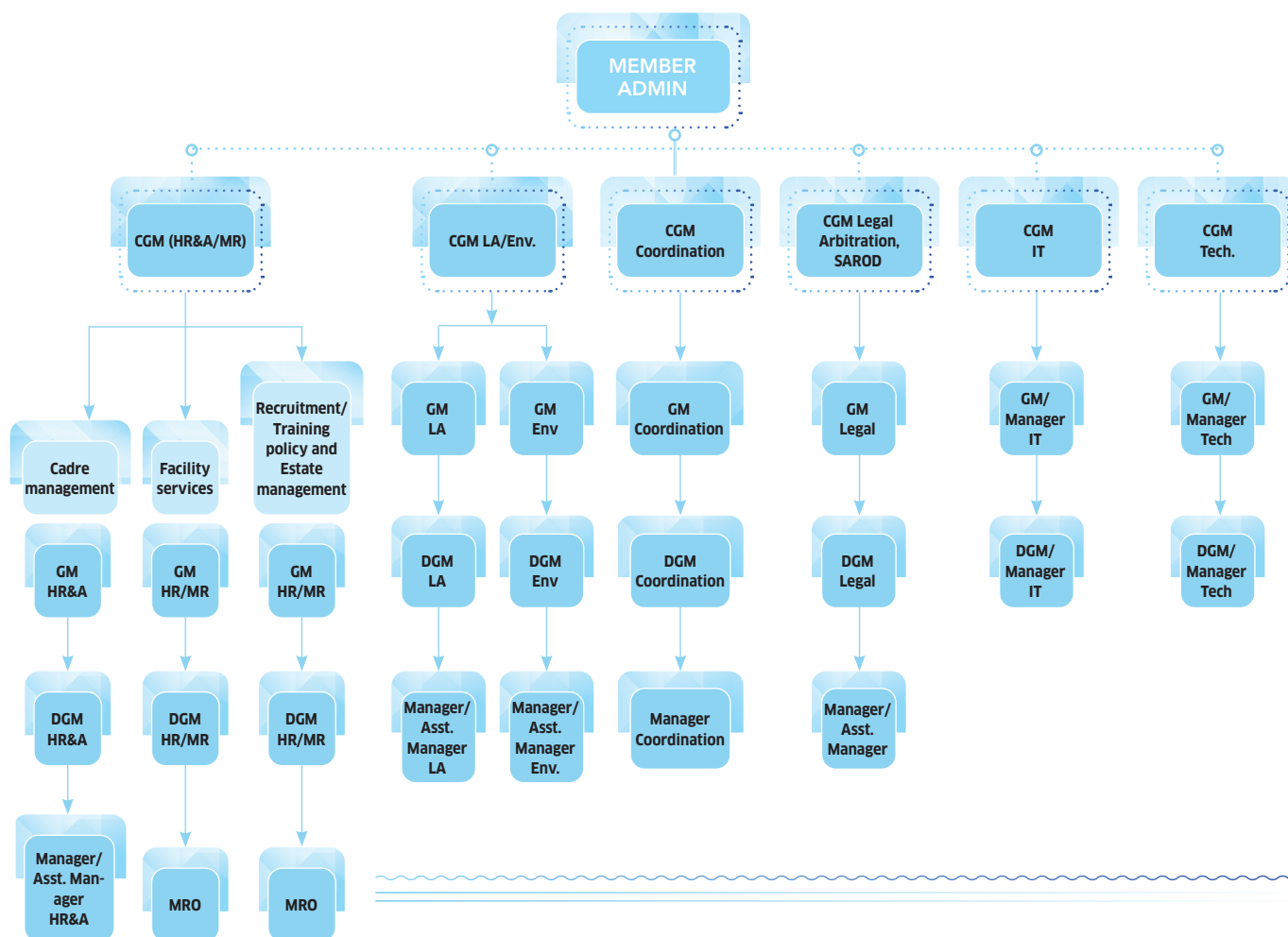
extensively on developing a Robust Asset Management System in the Country with Information Technology (IT) enabled systems. One of her flagship projects has been large scale use of plastic waste in construction of Rural Roads, along with promotion of other local materials for building ecologically sustainable roads. Each full-time Board Member heads their own department, with each department consisting of a Chief General Manager (CGM), who supervises the various General Managers (GMs), Deputy General Managers (DGMs), Managers and Deputy Managers (DMs) in their respective departments.



Figure 5 Present Chairman along with Members, NHAI

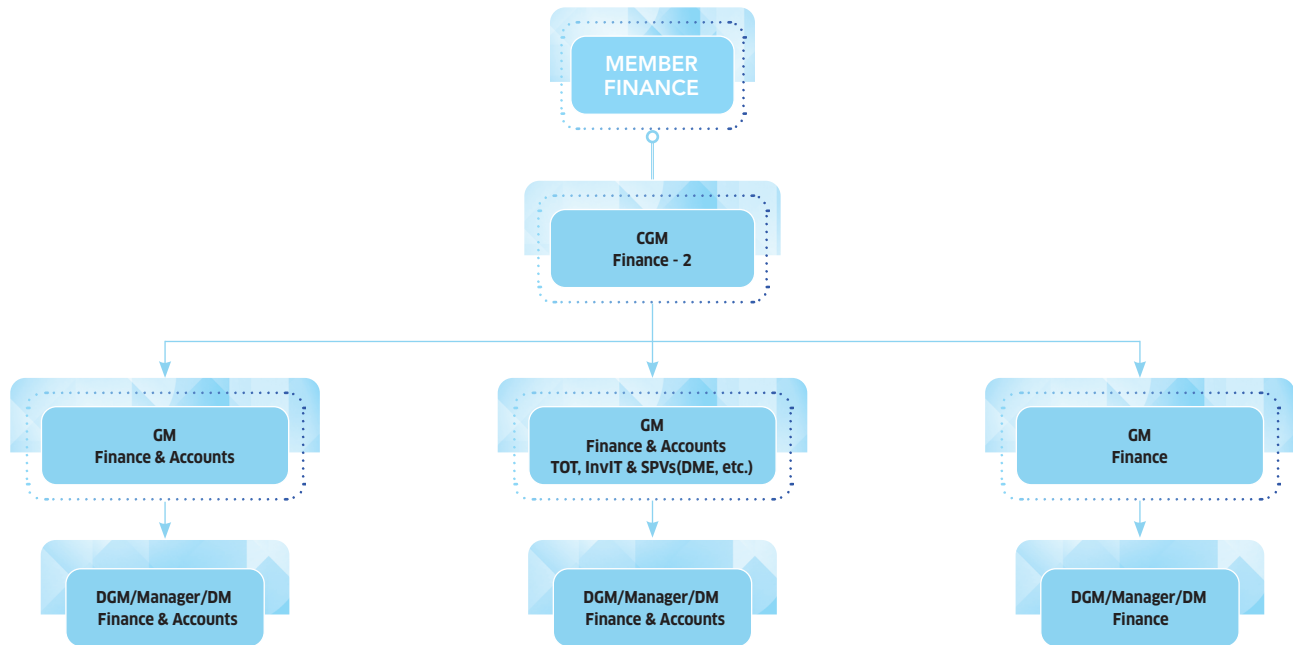


MEMBER- ADMIN

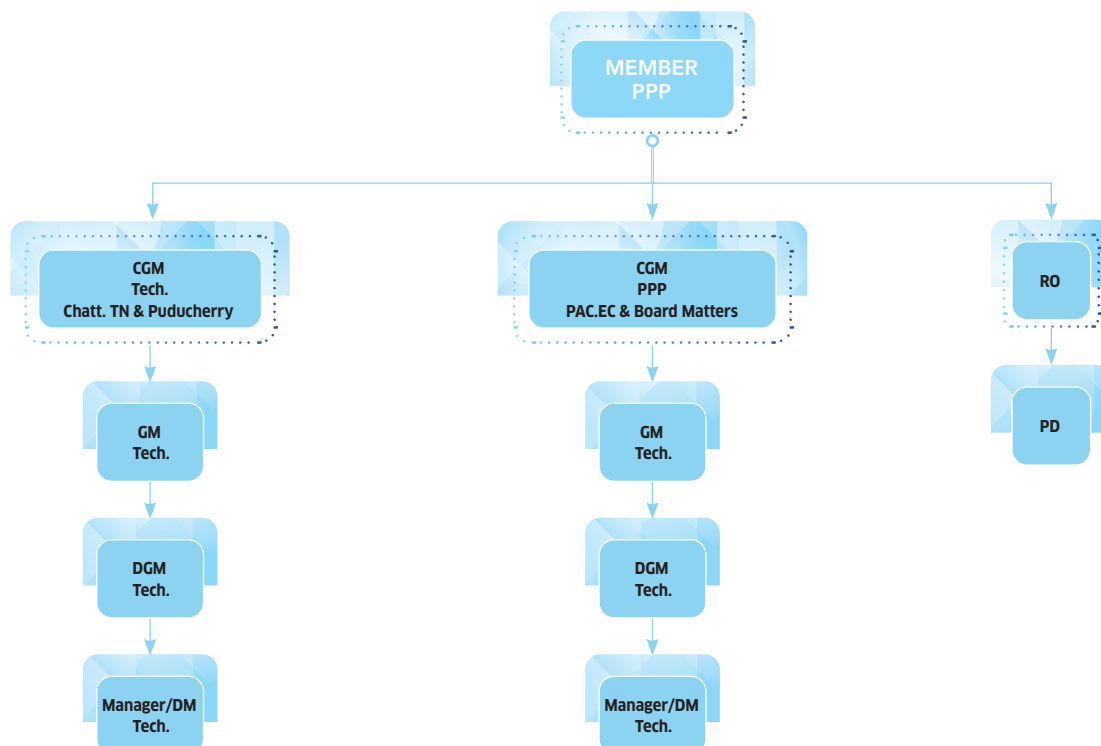


NHAI GOVERNANCE

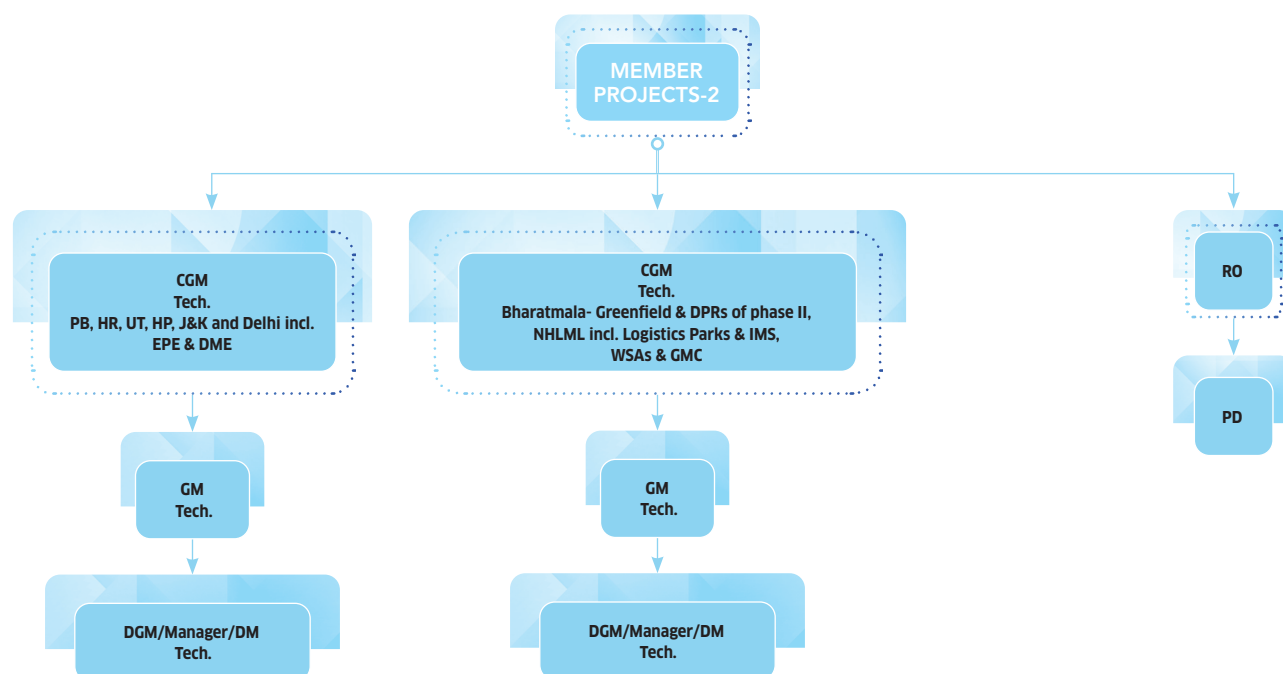
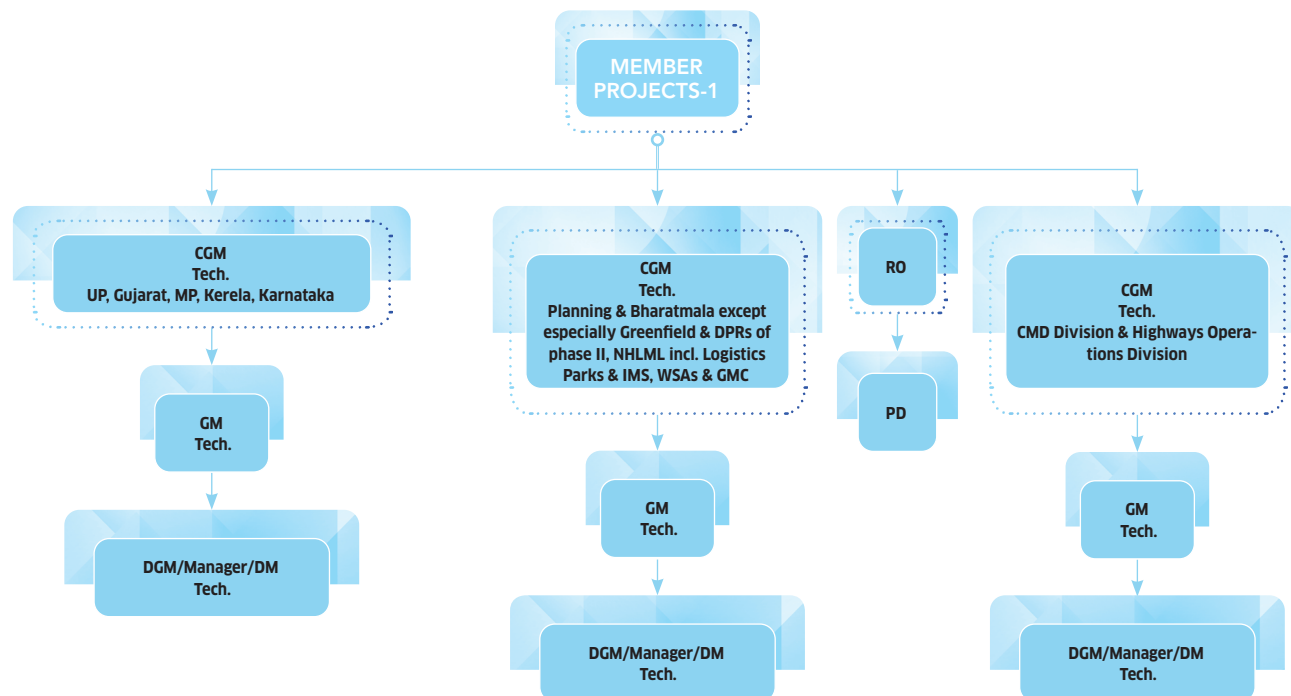
MEMBER - FINANCE



MEMBER - PPP

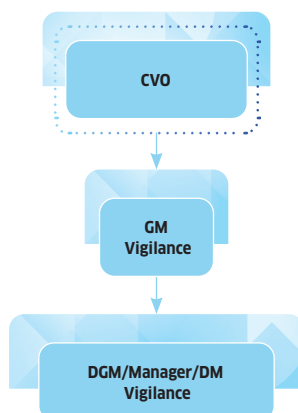


MEMBER- PROJECTS



NHAI GOVERNANCE

CHIEF VIGILANCE OFFICER (CVO)



Sh. Santosh Kumar Yadav, IAS
Chairman



Sh. R K Pandey
Member-Projects



Sh. Manoj Kumar
Member - Projects



Sh. Mahabir Singh
Member - Technical



Sh. NRVVMK Rajendra Kumar
Member - Finance



Sh. K. Venkata Ramana
Member - Administration
and PPP

NHAI is guided by four Part-time Members. The details are as under

Table 2 Part-time members of NHAI Governance board

PAR-TIME MEMBERS
CEO NITI Aayog
Secretary, Department of Expenditure, MoF
Secretary, MoRTH
Director General, RD and SS, MoRTH



NHAI GOVERNANCE

NHAI'S OPERATIONS ARE GOVERNED BY SIX (6) PRINCIPAL ACTS:

1. National Highways Authority of India Act, 1988 and rules framed thereunder govern the overall functioning of NHAI
2. National Highways Act, 1956 governs land acquisition and tolling
3. Control of National Highways (Land and Traffic) Act, 2002 governs matters related to encroachment and regulating the traffic on the highways and control of land within National Highways
4. The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 provides for payment of compensation, resettlement, and rehabilitation
5. Motor Vehicles Act, 1988
6. Road Transport Act, 1981

These Acts provide the governing framework for NHAI for the development, maintenance, and management of National Highways. In addition, policies, guidelines, and rules have been formulated to govern NHAI's day to day operations. Furthermore, the Green Highways (Plantation & Maintenance) Policy of 2015 has been

developed to promote the development of eco-friendly National Highways with the participation of the community, farmers, NGOs, private sectors, institutions, government agencies, and the Forest Department. These aforementioned aspects have been further explored in subsequent sections of this Report.





1.1 FUNCTIONS OF THE NHAI

NHAI is mandated to develop, maintain and manage the national highways and any other highways vested in, or entrusted to it by the Government.

NHAI may, for the discharge of its functions:

- Survey, develop, maintain and manage highways vested in , or entrusted to it;
- Construct offices, or workshops and establish and maintain hotels, motels, restaurants and rest rooms at or near the highways vested in , or entrusted to it;
- Construct residential buildings and townships for its employees;
- Regulate and control the plying of vehicles on the highways vested in, or entrusted to it for the proper management thereof;
- Develop and provide consultancy and construction services in India and abroad and carry on research activities in relation to the development, maintenance and management of highways or any facilities thereat;
- Provide such facilities and amenities for the users of the highways vested in, or entrusted to, it as are, in the opinion of the Authority, necessary for the smooth flow of traffic on such highways;
- Form one or more companies under the Companies Act, 1956 (1 of 1956) to further the efficient discharge of the functions imposed on it by this Act;
- Engage, or entrust any of its functions to, any person on such terms and conditions as may be prescribed;
- Advise the Central Government on matters relating to highways;
- Assist, on such terms and conditions as may be mutually agreed upon, any State Government in the formulation and implementation of schemes for highway development;
- Collect fees on behalf of the Central Government for services or benefits rendered under section 7 of the National Highways Act, 1956 (48 of 1956) , as amended from time to time, and such other fees on behalf of the State Governments on such terms and conditions as may be specified by such State Government; and
- Take all such steps as may be necessary or convenient for, or may be incidental to, the exercise of any power or the discharge of any function conferred or imposed on it by this Act.

NHAI GOVERNANCE

1.2 DECISION MAKING PROCESS AT NHAI

NHAI has been modeled as a lean organization. The officers and staff are appointed as per the provisions of National Highways Authority of India (Recruitment, Seniority and Promotion) Regulations, 1996. The recruitments are done by Administrative Division of the Authority headed by Member (Admin) supported by CGM (Admin.), General Manager (Admin.), Dy. General Manager (Admin.), Manager (Admin.) and Asstt. Manager (Admin.).

The Authority generally outsource its services for supervision and administration of the civil contracts in FIDIC format. The procurement of Supervision Consultant / Engineer is done through rigorous international competitive bidding. The civil work contracts also are procured through international competitive bidding following internationally accepted procedure. The NHAI functions as 'Employer' of the contract whereas the supervision consultant acts as the 'Engineer' for day to day contract management including quality assurance. The Project Director at field level acts as employer's representative for administration of the projects. The monitoring of the projects are done at Headquarters by Technical Divisions headed by a Member supported by CGM (Tech), GM (Tech), DGM (Tech), Manager (Tech) and Dy. Manager (Tech). The financial decisions generally taken with the consultation of Finance Division headed by Member (Finance) supported by CGM (F&A), GM (F&A), DGM (F&A), Manager (F&A) and Dy. Manager (F&A).

The Vigilance Division of the Authority headed

by a Chief Vigilance Officer appointed by the Central Government with the consultation of Central Vigilance Commission supported by GM (Vig.), DGM(Vig.), Manager (Vig.) and Dy. Manager (Vig.). The division receives and investigates complaints and submits periodic reports / returns to the Commission as per the Vigilance Manual.

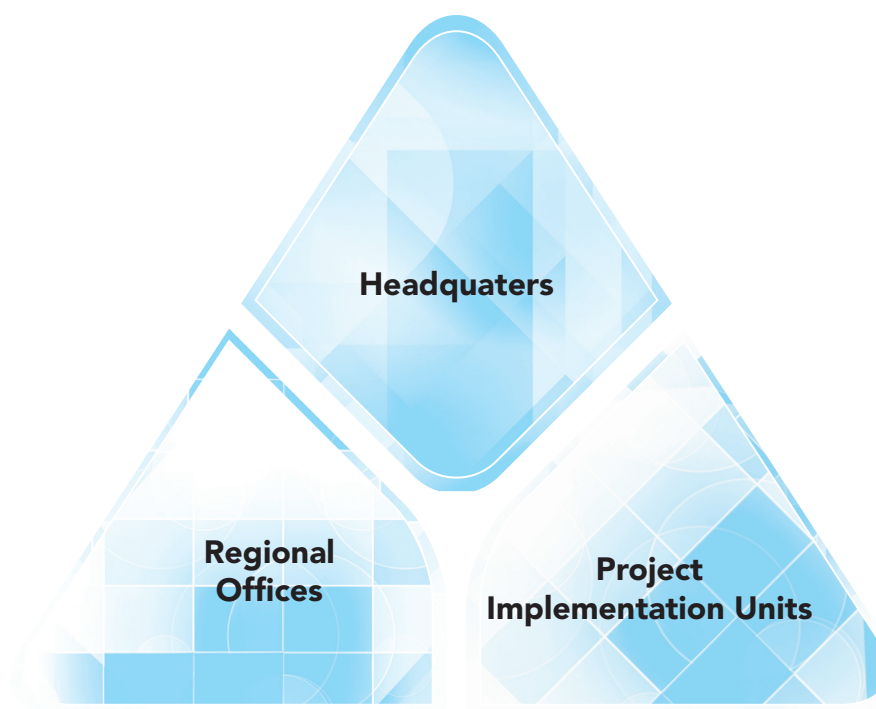
1.3 DECENTRALIZED GOVERNANCE

Governance at NHAI is a three-tier structure to manage our projects across India, i.e., Headquarters (HQ), Regional Offices (RO) and Project Implementation Units (PIU), wherein majority of our correspondence is through our Headquarters (HQ) in New Delhi. We have twenty-five (25) Regional Offices (RO) that supervise one hundred eighty-seven (187) Project Implementation Units (PIUs) across India. Each Project Implementation Unit manages projects within their jurisdiction, as well as the concessionaires of respective projects and their contractors / sub-contractors, suppliers, and vendors, with NHAI being the delegating authority. Regional offices through respective subject matter experts are responsible for executive-level decision making pertaining to economic, environmental, and social topics related to project under their respective jurisdiction.

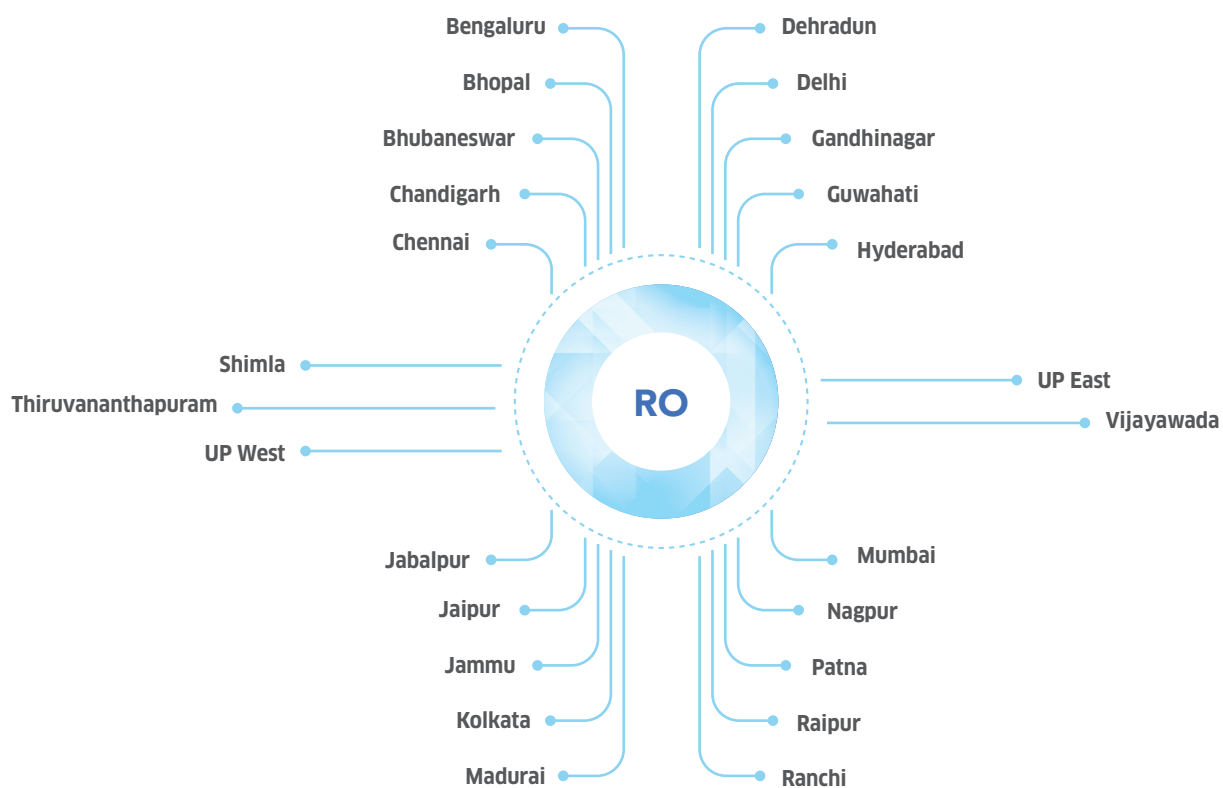
The PIUs, headed by Project Directors, are responsible for the implementation of projects assigned to them. ROs, headed by a CGM level officer, have been set-up in various parts of the country for decentralizing and strengthening the field level operations in NHAI. The HQ management is responsible for the overall supervision of the works assigned to NHAI.



Figure 6 Manthan Meeting at NHAI



The twenty-five (25) Regional Offices under NHAI are listed below:



NHAI GOVERNANCE

1.4 PROJECT DEVELOPMENT AND IMPLEMENTATION

NHAI follows a comprehensive strategy having consultative and holistic road conceptualization and development process. Prior to developing a green field project, NHAI is mandated as per the EIA Notification 2006 to carry out an Environment Impact Assessment (EIA), prepare Environmental Management Plan (EMP) and follow the requirement of Public Hearings. This is followed by implementation of an Environmental Management Plan (EMP) and land acquisition. These activities are further discussed under our Sustainability Strategy and Approach.

Once NHAI starts the process of acquiring land, a strategy is further developed to construct and operate the project throughout its life cycle. NHAI

publishes a tender for selection of a Concessionaire (Road Developer) for Engineering, Procurement, Construction (EPC) and Operations & Maintenance (O&M) of a project, with qualification criteria and requirements. Upon the final Concessionaire selection through a thorough qualification process, NHAI delivers the Letter of Award (LOA). The Concession Agreement for the contract defines scope of work, considerations, requirements and payment milestones against the percentage of project completed.

NHAI further engages an Independent Engineering (IE) Consultant to monitor and supervise the Project, and report to NHAI monthly and annually. Other Experts, Consultants and Advisors are engaged to help manage our projects as and when required.



THE CONCESSIONAIRE DEVELOPS THE PROJECTS AS PER THE FOLLOWING FOUR (4) MODES IMPLEMENTED BY NHAI:

1. Build, Operate, Transfer (BOT) Toll Mode
2. Build, Operate, Transfer (BOT) Annuity Mode
3. EPC Mode
4. Hybrid Annuity Mode

BOT (Toll) Model

- Under the BOT model, a private player (road developer) is granted a concession to finance, build and operate a project for a specified period of time (20 or 25 year concession period)
- The developer recoups their investments by way of user charges or tolls charged from customers using the facility

BOT (Annuity) Model

- In the BOT (Build, Operate, Transfer) model of infrastructure construction, the road developers are involved for an extended period
- They deal with constructing, operating, and maintaining the roads for a specific period, i.e., 15-25 years
 - The roads are then handed back to NHAI
 - The road developers are paid a pre-fixed amount as an annuity
 - The government bears the risk of toll revenue

EPC Model

- The EPC (Engineering, Procurement, and Construction) model denotes a process of infrastructure construction in which the government pays private parties to build roads
- The responsibility of the road developer ends after EPC
- They are not involved in road maintenance, toll collection, or road ownership. The government remains responsible for these things

Hybrid Annuity Model

- NHAI pays 40% of the total project expenditure
- This payment is released in ten equal instalments based on the completion of project milestones
 - The remaining 60% amount has to be arranged by the road developer through private financing
- The developer finances around 20 to 25% of the total project cost. The remaining amount of money is raised as debt

The Concessionaire develops the projects as per the following four (4) modes implemented by NHAI:

1. Build, Operate, Transfer (BOT) Toll Mode
2. Build, Operate, Transfer (BOT) Annuity Mode
3. EPC Mode
4. Hybrid Annuity Mode

NHAI GOVERNANCE

1.5 POLICIES

NHAI has formulated policies that further govern our operations and functions and said policies have been aligned with the applicable Government of India policies and procedures. Our policies cover wide range of aspects, such as admin, finance, public relations, vigilance, IT, construction, safety, quality and commercials. The active policies of NHAI are showcased below.

- Administration Policy
- Dispute Resolution and Legal Matters Policy
- Finance & Accounts Policy
- Advertisement / Media Relations / Inaugurations Policy
- Vigilance Policy
- Guidelines Related to IT Application
- Pre-construction Policy
- Public Private Partnership Policy
- Public Funded
- Consultancy Policy
- Standard Documents
- Road Safety
- Technology Induction Policy
- Access Permission Policy
- Quality Assurance Policy
- Criteria for Assessment of Concessionaire / Contractor / Consultant
- Commercial Operations Policy
- Miscellaneous Guidelines

Link to said policies is <https://library.nhai.org/>.

1.6 PROGRAMMES

NHAI has developed its own programs and also abides by various programs of the Government of India. These programmes are aimed at further developing the road / highway infrastructure of our Nation and helps connect the remotest of locations. Our flagship programmes are highlighted subsequently.



Figure 7 Eastern Peripheral Express way

Table 3: The expected coverage through Bharatmala Pariyojana

Sr. No	Scheme	Length (KM)
1	Economic Corridors	9,000
2	Inter-Corridors & feeder roads	6,000
3	National Corridor Efficiency improvement	5,000
4	Border & International connectivity roads	2,000
5	Coastal & Port connectivity roads	2,000
6	Expressways	800
Total		24,800



1.6.1. GOVERNANCE MECHANISMS

NHAI adheres to guidelines issued by Central government of India for assuring highest governance standards for systems and processes and conduct of activities. The governance body has been nominated and has been entrusted to keep highest ethics and governance standards. NHAI follows several guidelines which have been issued time to time, by the Central government and related agencies. A few ethics guidelines which NHAI follows are

1. Central Civil Services (Conduct) Rules, 1964: As and when updated by the Central government.
2. Central Vigilance Commission Guidelines: Issued from time to time.
3. Department of Personnel and Trainings Guidelines: DoPT issues guidelines for conduct and management of human resource during conducting duties for the entities.

To manage conflict of interest issues, the governance body ensure to follow:

- Defined and timely updated laid down processes for the highest governance body to ensure conflicts of interest are avoided and managed.
- Conflicts of interest are checked to ensure that they are disclosed to respective stakeholder with no material impact on institutions including,
 1. Cross-board membership.
 2. Cross-shareholding with suppliers and other stakeholder.

3. Existence of controlling shareholder.
4. Related party disclosures.

1.6.1.1. KNOWLEDGE INITIATIVES BY GOVERNANCE BODY

NHAI makes serious efforts to develop the interest of the highest governance body's collective knowledge of economic, environmental, and social topics. New initiatives are being developed under guidance of subject matter experts to enhance the scope existing work of environmental management, social inclusion during planning phase, implementation phase, and ensure its enhanced financial efficiency.

The governance body members leading respective subjects, thematic and new initiative committees, guide the management teams to prepare feasibility proposal for enhancing scope of work, include new environment and social inclusion activities and take initiatives to manage these initiatives through their life cycle.

A committee is constituted to take up these new initiatives which analyses the proposal and while checking the proposed impact and financial implications. Through due process of verification, analysis and feasibility assessment, the action plan is devised and further executed.

NHAI GOVERNANCE

Bharatmala Pariyojana	National Highways Development Project (NHDP)
<ul style="list-style-type: none"> Bharatmala Pariyojana, India's largest infrastructure program was envisioned in 2017 to develop 34,800 km of National Highway corridors, connecting 600+ districts in the Nation The program signalled a paradigm shift to corridor approach of infrastructure development Bharatmala Pariyojana focuses on development of 24,800 km of dedicated expressways, access-controlled economic corridors, and associated feeder routes, coastal and port connectivity, border and international connectivity corridors Another key component of the program is the development of 22 greenfield expressways and access-controlled corridors of over 7,900 km at INR 3.3 lakh crore 	<ul style="list-style-type: none"> NHAI is mandated to implement National Highways Development Project (NHDP) which is India's largest ever Highways Project in a phased manner Rapid expansion of passenger and freight traffic makes it imperative to improve the road network in the country NHDP has had various phases of implementation, which have been summarised below: <ul style="list-style-type: none"> CCEA* on 12th January, 2000 approved NHDP Phase-I - Four laning of 6,359 km. at a cost of Rs. 30,300.00 Cr CCEA on 18th December, 2003 approved NHDP Phase-II: Four laning of 6,702 km. at a cost of Rs. 34,339 Cr in December, 2003. These two phases comprise of Golden Quadrilateral North-South and East-West Corridors (NS-EW), Port Connectivity and other projects CCEA on 12th April, 2007 approved upgradation of 12,109 km under NHDP Phase III at an estimated cost of Rs. 80,626 Cr CCEA on 18th June, 2008 approved upgradation/strengthening of 20,000 kms of national highways to 2/4 lane with paved shoulders on EPC/ BOT (Toll/Annuity) basis under NHDP Phase-IV CCEA on 05th October, 2006 approved six laning of 6,500 km of national highways comprising 5,700 km of GQ and balance 800 km of other sections under NHDP Phase-V at a cost of Rs. 41,210 Cr In November, 2006 approved construction of 1000 km of expressways with full access control on new alignments at a cost of Rs. 16,680 Cr under NHDP-Phase-VI CCEA in December, 2007 approved construction of ring roads, bypasses, grade separators, flyovers, elevated roads and tunnels at a cost of Rs. 16,680 Cr under the NHDP Phase-VII

*CCEA - Cabinet Committee on Economic Affairs

1.7 MEMORANDUM OF UNDERSTANDING (MOU)

At NHAI, we believe in collaboration to get the right results. We have partnered with other Government-backed entities to deliver our services seamlessly and efficiently. Our current MoUs are with the following entities:

- Ministry of Railway and MoRTH: The MoU is for construction of Road Over/ Under Bridges on National Highways Corridors.
- National Remote Sensing Centre (NRSC / ISRO): The MoU is for Satellite Mapping of National Highways.
- Northeast Centre for Technology Application & Reach (NECTAR): The MoU is for application of appropriate technologies for development in areas of biodiversity concern, watershed management, telemedicine, horticulture, infrastructure planning, etc.

1.8 PM GATI SHAKTI

The PM Gati Shakti initiative is a strategic program launched by the Ministry of Road Transport and Highways in August 2021, aimed at developing a multi-modal logistics and transport infrastructure

that integrates road, rail, waterways, and air transport in a seamless and efficient manner. The initiative is expected to reduce logistics cost, enhance the ease of doing business, and promote sustainable and environmentally friendly transportation.



Figure 8 Deliverance of Eastern Peripheral Expressway by Hon'ble Prime Minister Shri Narendra Modi

OBJECTIVES OF PM GATI SHAKTI INITIATIVE:

The primary objectives of the PM Gati Shakti initiative are as follows:

- ✓ **Develop a national infrastructure grid:** The initiative seeks to develop a national infrastructure grid that connects various transportation modes and facilitates the movement of goods and people across the country. This will enable seamless movement of freight and reduce transit time, which will enhance efficiency and reduce logistics costs.
- ✓ **Improve last-mile connectivity:** The Gati Shakti initiative aims to improve last-mile connectivity, which is critical for the efficient movement of goods and people. This includes improving road and rail connectivity to ports, airports, and industrial clusters.
- ✓ **Modernize ports and airports:** The initiative seeks to modernize ports and airports to improve their capacity and efficiency. This includes developing new ports and airports, as well as upgrading existing ones.
- ✓ **Leverage technology:** The Gati Shakti initiative aims to leverage technology to improve the efficiency of logistics and supply chain management. This includes the use of digital platforms for tracking and monitoring the movement of goods, as well as the use of artificial intelligence and machine learning to optimize transportation routes and reduce costs.

NHAI GOVERNANCE



Figure 9 NH 24 Interchange at Akshardham Junction, DELHI-MEERUT Expressway, DELHI

KEY COMPONENTS OF PM GATI SHAKTI INITIATIVE:

The Gati Shakti initiative has the following key components:

- ❖ **National Infrastructure Grid:** The initiative seeks to develop a national infrastructure grid that connects various transportation modes, including roads, railways, waterways, and airways.
- ❖ **Industrial and logistics clusters:** The initiative aims to develop industrial and logistics clusters along the national infrastructure grid to promote the development of manufacturing and logistics industries.
- ❖ **Multi-modal logistics parks:** The initiative seeks to develop multi-modal logistics parks that integrate various transportation modes and provide storage and distribution facilities.

KEY COMPONENTS OF PM GATI SHAKTI INITIATIVE:

The PM Gati Shakti initiative is expected to have several benefits, including:

- ❖ **Reduced logistics cost:** The initiative will enable the efficient movement of goods and reduce transit time, which will lead to lower logistics costs.
- ❖ **Improved connectivity:** The initiative will improve connectivity between different transportation modes, which will enhance the efficiency of transportation.
- ❖ **Boost to manufacturing and logistics industries:** The development of industrial and logistics clusters along the national infrastructure grid is expected to provide a boost to the manufacturing and logistics industries.
- ❖ **Environmentally friendly transportation:** The initiative seeks to promote sustainable and environmentally friendly transportation by reducing the carbon footprint of transportation.



Figure 10 Gomti ka Chauraha-Udaipur, NH-8

NHAI GOVERNANCE



Figure 11 Ambala Kotputli Road

1.9 STAKEHOLDER MANAGEMENT

We work with various stakeholder as part of our day-to-day operations as well as during project development.



KEY STAKEHOLDERS OF NHAI

NHAI has been engaging the stakeholders throughout the year with purpose of improving the operational and financial efficiencies. NHAI also covers important sustainability topics through communications with both internal and external stakeholders, which encompass business sustainability and business as usual practices.

These are structured, periodic and effective interactions which enables NHAI to identify issues and communicate critical concerns associated with Environment, Social aspects and Governance of its operations. All the issues raised are addressed by relevant committees, authorities and key management personnel in time bound manner and communicated through appropriate channels.

IDENTIFIED STAKEHOLDERS

Table 4 Stakeholders of NHAI

Internal Stakeholders	External Stakeholders
Ministry of Road Transport and Highways, GoI	Concessionaires, Authority/ Independent Engineers, Suppliers and Contractors
Central Government & State Governments	Road Users
Forest, Environment, Revenue, Water resources departments	Industry and Trade organizations
Employees: Permanent and Contractual	Communities and NGOs
Subject Matter Experts	Regulators

NHAI regularly interacts with all the stakeholders to maintain enriching dialogue, which in turn helps NHAI to improve is operational and financial efficiencies. During these interactions, NHAI ensures that it

addresses key and context specific concerns of the stakeholders to make sure a holistic project development takes. Following table illustrates approach to address the stakeholder specific concerns.

NHAI GOVERNANCE

Table 5 Stakeholder management approach from NHAI

Stakeholders	Key topics of Concern	NHAI's response
Road Users	<ul style="list-style-type: none"> • Adequate connectivity through road • All weather roads • Safe travel • Accessible road 	Holistic long term planning of roads for greater connectivity. Road safety awareness campaigns. Improving ease of driving.
Communities and NGOs	<ul style="list-style-type: none"> • Benefits to all strata of society • Boost livelihoods through connectivity • Connect with underprivileged areas • Conservation of environment 	NHAI plans to reach every possible geographies to connect most underprivileged individuals to mainstream, creating people to market connect and boost rural businesses. NHAI also take proactive measure to minimize negative impacts on environment while using sustainable strategies during road construction and maintenance.
Concessionaires/contractors	<ul style="list-style-type: none"> • Timely allotment of project • Timely clearances from departments • Handholding and support 	NHAI maintains healthy relationship with concessionaires and had led down thorough procedures to obtain pre -project clearance. It also helps in coordinating with respective state and central government departments during project execution.
Independent Engineers/Authority Engineers	<ul style="list-style-type: none"> • Quality management standards and processes uniformity 	NHAI has thoroughly worked on details of roles and responsibility of consultant (as Engineer) who details quality management procedures, deliverables vis-à-vis project timelines.
Employees	<ul style="list-style-type: none"> • Appropriate employee welfare schemes and benefits • Learning and development 	NHAI follows all the statutory norms laid down by Government of India to ensure that employees can access all their entitlements and benefits. It has committed to provide skill up gradation trainings to enhance the operational efficiency.
Governments and Regulators	<ul style="list-style-type: none"> • Compliance with environmental and social laws • Sustainable design with least negative impact 	NHAI strictly adheres to all the compliance requirements which are mandated under regional and central laws. This has been monitored through robust data and document monitoring mechanisms.

ROLE OF AUTHORITY ENGINEERS/INDEPENDENT ENGINEERS IN QUALITY ASSURANCE

The Independent Engineers or Authority Engineers are entrusted with quality assurance and corresponding monitoring of progress during both construction and monitoring phase of the project. The Consultants are team of third party, Independent Engineers who are subject matter experts and add value to the quality management process by creating robust monitoring, assessment, recording and reporting mechanisms. A few of the responsibilities given to these Independent Consultants are:

i. During the Construction Period,

- The Independent Engineers reviews and approve the drawings furnished by the Contractor along with supporting data, including the geo-technical and hydrological investigations, characteristics of materials from borrow areas and quarry sites, topographical surveys, and the recommendations of the Safety Consultants
- The Independent Engineer reviews and approve the Quality Assurance Plan submitted by the Contractor
- The Independent Engineer reviews the monthly progress report furnished by the Contractor etc.

ii. Maintenance Period

- The Independent Engineer undertakes regular inspections, at least once every month, to evaluate compliance with the Maintenance Requirements and submit a Maintenance Inspection Report to the Authority and the Contractor.
- The Independent Engineer determines the costs, and/or their reasonableness, that are required to be determined by it under the Agreement. The Independent Engineer determines the period of Time Extension that is required to be determined by it under the Agreement.

NHAI functions on the lean management structure, which enhances the work efficiency and accountability. There are numerous such detailed instructions having clear roles and responsibilities assigned to these Independent Consultants who have been carrying out quality inspections throughout the life cycle of the project.

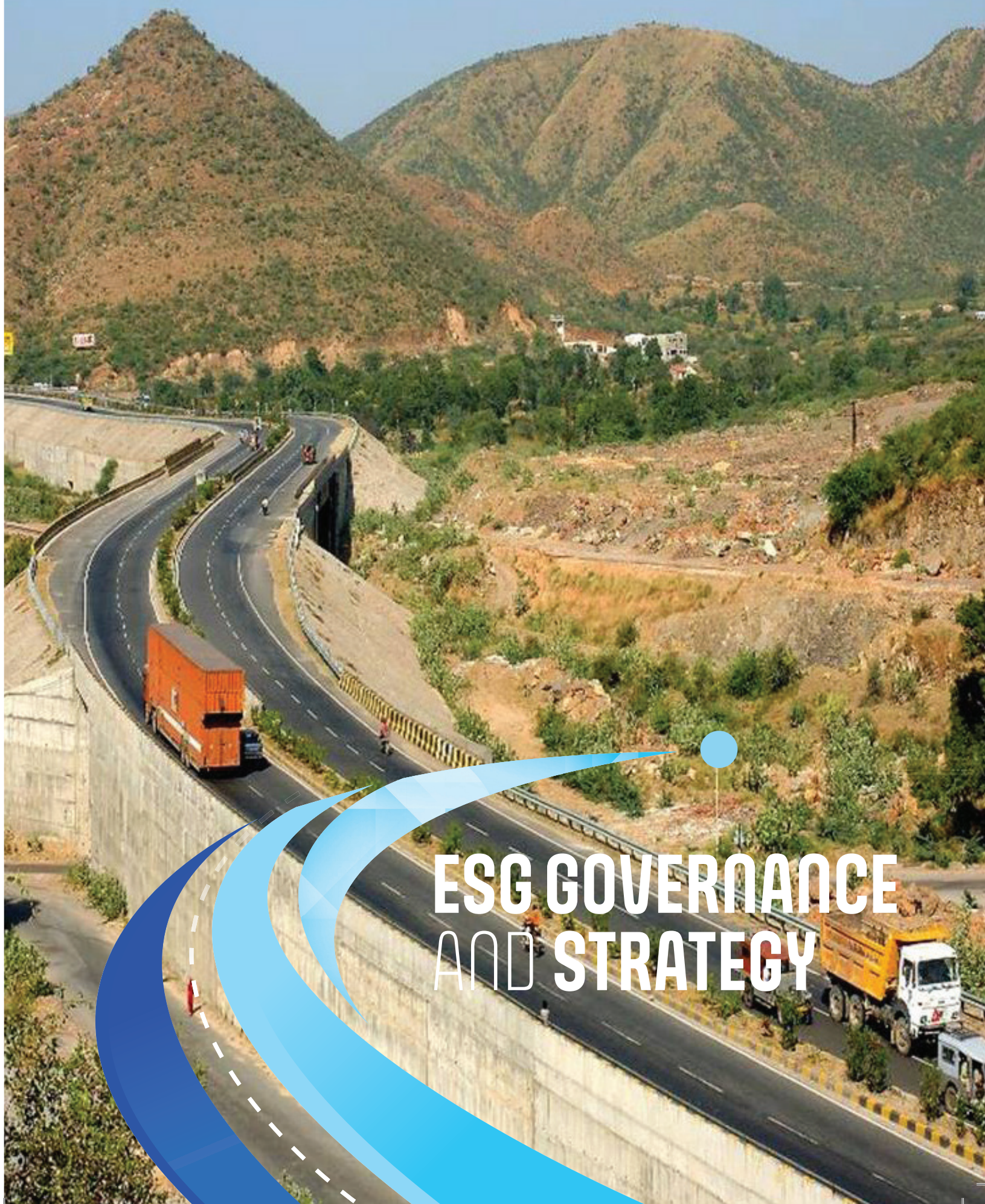
NHAI APPROACH TO STAKEHOLDER ENGAGEMENT

Stakeholders are individuals or group of individuals who are directly or indirectly affected by a program or project, as well as those who may have interests in a program or project and/or the ability to change its outcome, either positively or negatively. NHAI's approach is to identify the key stakeholders, who were further divided into internal and external stakeholder groups. Engagement with these stakeholders has been carried out through multiple channels and at regular intervals. Further details about the nature of interactions are mentioned in Table 6.

NHAI GOVERNANCE

Table 6 Stakeholder Interactions and Management Mechanisms of NHAI

Stakeholder	Frequency and Mode of Engagement		
	Annual	Periodic	Need based
Road Users	Road Safety Week	Feedback through online and offline platforms for road infrastructure plans, services and facilities	Need based interaction with communities as and when required basis at places. A designated schedule has been kept for such interaction.
Communities			<ul style="list-style-type: none"> • Community engagement programs • Grievance redressal camps
Employees	Annual Day Topical celebration days	Employee welfare meetings	Issue specific staff meetings
Concessionaires		Continuous connect with both qualitative and quantitative data capture mechanism, during all phases of road project life cycle.	
Independent Engineers / Consultant/ Authority Engineers		Monthly and Quarterly progress reports for monitoring of project progress.	Project specific requirement for clarification and reporting
Governments		Monthly and Quarterly meetings for project updates and other context specific issues on the table	Project plan documents i.e., DPRs having details of operational and financial details
Regulatory Bodies		Periodic regulatory filings and reporting to compliance bodies	
Industry and Trade Organizations			Project design and project management meetings for key high value projects assisting organization's growth.



ESG GOVERNANCE AND STRATEGY

ESG GOVERNANCE AND STRATEGY

At NHAI, we believe in Governance with a purpose. We focus on sustainable, safe and green development of road projects in the country. Even with the growing pressure of construction of road infrastructure with speed, NHAI aims to develop safe, sustainable, accessible, clean and green mobility. NHAI is strongly committed to goal of green and clean India and is aligned with our Country's goals pertaining to clean energy and reduction in emissions.



Figure 11 Inauguration of Delhi Meerut Expressway

2.1 OUR SUSTAINABILITY JOURNEY

2.1.1 GREEN HIGHWAYS – SINCE 2015

Our sustainability journey in true sense began in 2015, with MoRTH's Green Highways (Plantations, Transplantations, Beautification and Maintenance) Policy. Clearance of forest and tree felling activities are at times inevitable consequences of highways development and has the potential of environmental degradation in the form of biodiversity loss and release of carbon stocked in trees. The situation gets aggravated with incessant movement of vehicles contributing further to release of greenhouse gases and other suspended particulate matter.

Consequent to Green Highways Policy 2015, an institutional framework has emerged which has acted as a convergence point to the earlier arrangements which had in past resulted in unscientific management of plantations. With this policy in place, the plantation works along the National Highways in the last decade has shown marked improvements. This policy besides others, inter alia prescribes green corridors along the highways for carbon sequestration, abatement of

air and noise pollution and envisages to provide shelter for nesting of birds. It also seeks to enhance the groundwater regime and helps in guiding the traffic, thereby reducing risks and travelling hazards. The policy objectives envisage much needed shade on glaring hot roads during summer caused due to increase in number of vehicles, making provisions to arrest soil erosion at the embankments slopes, preventing glare from the headlight of incoming radiation and to create employment opportunity for local people.

Considering the importance of road network in our lives and at the same time damage caused to the environment and nearby surroundings due to overuse of the road network, it becomes responsibility of the Government, corporates, and people to join hands to keep the highways green and beautiful negating the ill effects of vehicular pollution and felling of trees to build new highways. National Highways Authority of India (NHAI) created the Green Highways Division (GHD) and entrusted the task of planning, implementation and monitoring roadside plantations along the National Highways. GHD also plans to use/adopt innovative and best green highways technology practices.

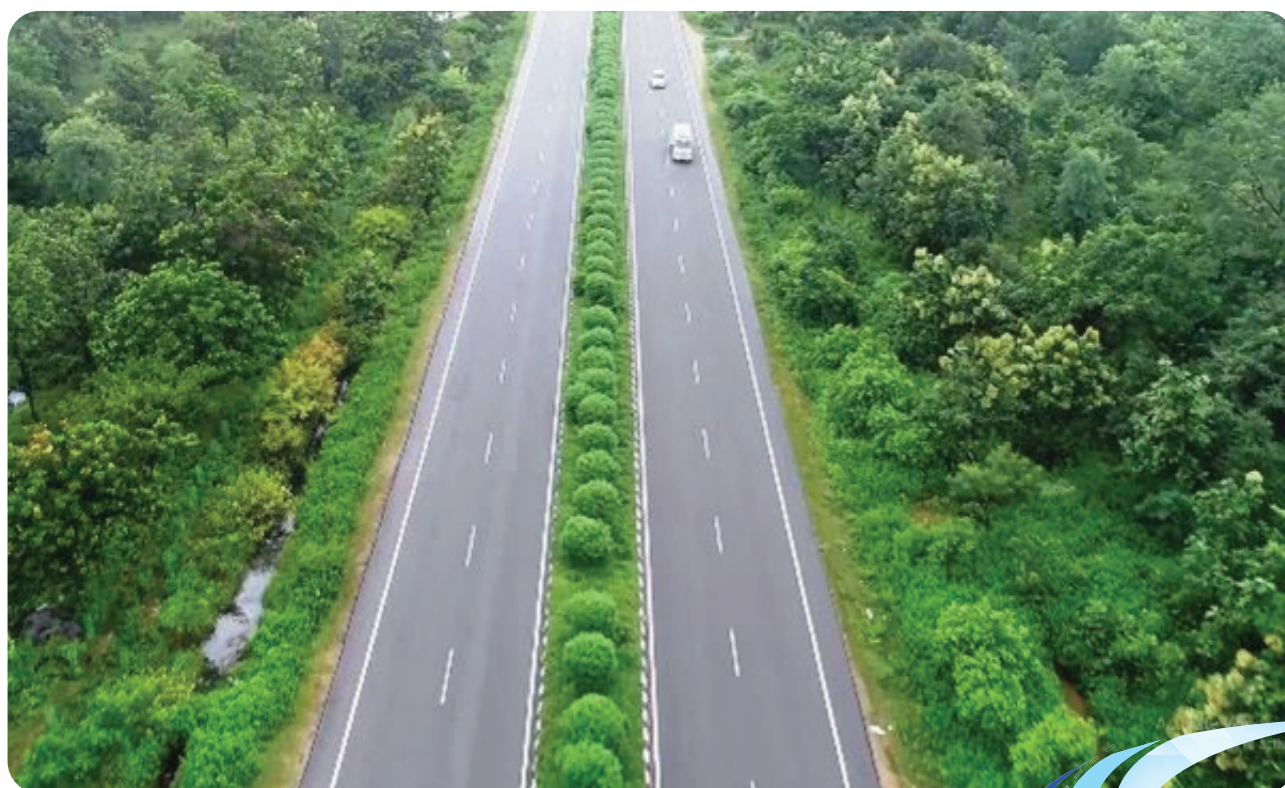


Figure 12 Plantations along NH-44 Hyderabad

ESG GOVERNANCE AND STRATEGY

The NHAI also has a mechanism for undertaking compliance reviews through its *Environment Division* with respect to the conditions of all statutory clearances such as Environment Clearance, Forest Clearance, local approvals etc. and is regularly undertaking intensive monitoring. The effort is to strictly adhere to the statutory regulations. NHAI is determined to proactively traverse the path of inclusive growth and sustainable development.

For effective monitoring and evaluation of plantation activities by different agencies, a mobile app "*Harit Path*" has been developed and made operational in August 2020 through which 184.93 Lakh plants were geo-tagged till March, 2022 and the process is continuing. This initiative has been implemented through the central & state agencies such as SRLM and with the involvement of Self Help Groups (SHG), Local SHG and rural masses according to IRC:SP:21:2009 Guidelines, National Green Highways Policy 2015 and applicable rules of the States. Further, the MoUs have been signed between NHAI and the SRLM of Vijayawada, Bhopal, Lucknow, Jaipur and Guwahati for plantation along length of National Highways through SHGs.

NHAI since focused on developing eco-friendly National Highways with participation of the community, farmers, NGOs, private sector, institutions, government agencies and the Forest Department for economic growth and development in a sustainable manner.

NHAI has planted more than 274 lakh plants on national highways in post adoption of Green Highway Policy from years of 2016-17. These plantations are executed under the annual plantation action plans made by NHAI. As per Annual Plantation Action Plan of 2021-22, 72.05 Lakh plants have been planted till March 2022. A progression of plantation is given in the below mentioned table.

Table 7 Details of Plantation activities

Year or Plantation	No. of Saplings Planted in Lakh
2016-17	38.00
2017-18	38.26
2018-19	31.36
2019-20	36.20
2020-21	58.87
2021-22	72.05
TOTAL	274.74

OBJECTIVES OF THE GREEN HIGHWAYS POLICY:

- To evolve a policy framework for plantation along National Highways
- To reduce the impact of air pollution and dust as trees and shrubs are known to be natural sink for air pollutants
- To provide much needed shade on glaring hot roads during summer
- To reduce the impact of increasing noise pollution caused due to increase in number of vehicles
- To arrest soil erosion at the embankment slopes
- To prevent glare from the headlight of incoming vehicles
- To moderate the effect of wind and incoming radiation
- To create employment opportunities for local people



Figure 13 Tuni-Ankapalli Section of NH-5

2.1.2 MATERIAL STEWARDSHIP AND INNOVATIONS

NHAI has always developed innovative strategies to drive material stewardship approach in its construction activities. The strategies focus on use of alternate materials, diversion of waste materials and reduction of use of natural resources, which in turn prevents environmental pollution at source, have emerged as core tenets for all the projects of NHAI.

In addition to the traditional road construction activities, installation of drip irrigation, creation of recharge pits and other surface water bodies have significantly

contributed to water conservation and incrementing groundwater levels of the area. Additionally, solar lighting for operation of tolls, rescue vans in the case of emergency scenarios, awareness of adjoining population along the National Highway network for environment and safety issues have been taken up as part of product stewardship initiatives of NHAI.

NHAI also provides sound barriers for the stretches which pass through sensitive areas and also covering the areas of high biodiversity, wildlife and protected areas. Further, rehabilitation of borrow areas to control the erosion and slope protection have been part of road development strategies. Use of adequate control devices for all construction machineries and their regular maintenance for reduction in pollution levels have been actively undertaken under material stewardship approach of NHAI.



ESG GOVERNANCE AND STRATEGY

During last decade, NHAI has developed an array of interventions which are environmentally and socially sustainable. Some of them are listed below

Eastern Peripheral Expressway: Decongestion of Delhi NCR with the following environmental and social economic benefits:

- To evolve a policy framework for plantation along National Highways
- To reduce the impact of air pollution and dust as trees and shrubs are known to be natural sink for air pollutants
- To provide much needed shade on glaring hot roads during summer
- To reduce the impact of increasing noise pollution caused due to increase in number of vehicles
- To arrest soil erosion at the embankment slopes
- To prevent glare from the headlight of incoming vehicles
- To moderate the effect of wind and incoming radiation
- To create employment opportunities for local people

- Reduction in vehicular pollution in NCR saving fuel and time;
- 8 solar power plants of capacity 4,000 kilowatt to provide solar power in 135 kilometres
- Plantation of 2,60,296 plants with drip irrigation facilities for plants all along the Expressway;
- Rainwater harvesting every 500 metres of intervals;
- Utilization of 1.2 crore cubic metres of fly ash.

Delhi-Vadodara-Mumbai Expressway: It is an example of environmentally sound engineering excellence viz. an elevated corridor of about 1.7 km length near Chakan dam to attenuate noise and glaring effects of traffic, as per Wildlife Institute of India (WII) and IRC guidelines, pre-cast underground box structures by "Cut & Cover Technique" for length about 3.940 km to maintain the natural

ecosystem of the area along with suitable ventilation and safety requirements in the underground boxes, hanging bridge at National Chambal WL Sanctuary to avoid erection of piers in the mid-course of the flowing stream, tunnel for about 3.5 km of length in Mukundra Hills Tiger Reserve (MHTR) to obviate the needless bisection and to avoid disturbance in the vicinity of the tiger reserve.

Delhi Katra Expressway: It is an example of principle of avoidance which conveys that no natural forest or wildlife sanctuary or National Park in almost 392 kilometres, has been affected by the road construction activities. A single span cable stayed bridge was constructed on Beas River to avoid any disturbances to dolphin movements and their breeding grounds. NHAI has also constructed 8 via duct in Bahu Conservation Reserve.

MoRTH issued notification dated 27th August, 2018 and 23rd October, 2020 referring the notification by MoEF&CC dated 25th January, 2016, regarding the use of fly ash in construction of roads, flyovers and embankments in all stretches of National Highway. It has been now made mandatory to use the fly ash for development of roads and highways by NHAI.

With the rapid urbanization, a large quantum of plastic waste is being generated and its safe disposal is a serious environmental problem. Studies have revealed that use of waste plastic improves the desirable

properties of bituminous mixes leading to improved longevity and pavement performance. NHAI is also using plastic waste for construction of service roads, following the guidelines issued by MoRTH circular dated 27th August 2020 for reuse of plastic waste. Efforts are being made that all plastic wastes collected from tolls and areas around national highways is used for road construction. Total 547.6 kilometres of service roads have been successfully completed through this innovative intervention. These innovative use of materials under NHAI's material stewardship program contributes towards the vision circular economy envisaged by Hon'ble Minister Shri Nitin Gadkari ji.

NHAI also prepares site specific resource conservation plans for civil works which have high

environmental and social impact values. The site-specific implementation plans have mitigation measures planned during the construction and operation phase of the road. These measures become an integral part of scope of contractor. These plans are being monitored by Independent Consultants and engineers for compliance at site, at regular intervals of time. NHAI has applied extensive innovation, out of the box thinking and uniqueness to develop these site-specific plans. This has resulted in breaking strategic shift with respect to high value construction projects. These plans have been made and executed keeping in mind eco fragile ecosystems (both terrestrial and aquatic) water bodies, socioeconomic imperatives, topography changes etc., for enhancing in sustainable development of geographies.



Figure 14 Usage of Plastic waste for road construction

ESG GOVERNANCE AND STRATEGY

2.1.3 AMRIT SAROVAR – A PILOT

With a long term vision of environmental sustainability, Hon'ble Prime Minister Shri Narendra Modi ji has envisaged a program of life cycle sustainability of roads, for NHAI. The water sustainability initiative of "Amrit Sarovar" aims to create 75 water storage structures which are surface water bodies to be made in each district. This has been a revolutionary approach to make road construction more and more sustainable, while addressing the issues of ground water augmentation.

This initiative while creating more than 50,000 water structures will also augment water availability especially in the water stressed areas of the country, which in turn will provide water resources for livelihoods and productivity. Various Central and State agencies are part of this noble endeavour. NHAI has a vision of creating 538 such water bodies and is implementing the same via a thorough stakeholder consultation and following the able guidance of Hon'ble Minister MoRTH, Shri Nitin Gadkari ji. The water body is made by deepening of existing ponds and increasing the capacity of these ponds. This environment friendly and people centric intervention has proven to augment the water regime of the locality, besides this will also ensure flow of ecosystem services for the society in the course of development.

In line with the requirements of the Union Government, NHAI uses the soil/silt excavated from

ponds/tanks in all districts across the country under the Amrit Sarovar mission for development of our roads / highways. We have mapped our projects with the Amrit Sarovar sites in all States and Union Territories and have used the soil and silt excavated from the sites for the construction of ongoing projects. A pilot of these Sarovar or water bodies has been ongoing under multiple Regional Offices.



Figure 15 Amrit Sarovar along Madurai to Chettikulam Section of NH-785 in TN



Figure 16 Amrit sarover along Bareilly - Sitapur highway

2.1.4 CREATING STANDARDS ON ROAD SUSTAINABILITY

Ministry of Road Transport and Highways has prepared and notified operational documents such as IRC Guidelines, Standard Operating Procedures, Expression of Interest, Request for Proposals and Letter of Intent to involve multiple external agencies such as Self Help Groups (SHGs), Non-Governmental Organizations (NGOs) and private agencies, for creating a strategy for sustainable road network.

Memorandum of Understanding (MoU) have been undertaken to involve State Government agencies such as State Forest Department, State Forest Development Corporations, State Sericulture and Horticulture Departments and local research agencies for creating strategies for sustainability. Further lately at NHAI, it is being contemplated to involve industrial and corporate houses of repute, which have a strong Corporate Social Responsibility (CSR) track record for CSR activities, to be part of creating holistic program targeting sustainability of road infrastructure.

The technical specification guidelines in the Indian Road Congress, issued from time to time with regard to 2-laning, 4-laning, 6-laning and express highways contain different provisions for raising and maintaining roadside plantations, medians and landscaping. IRC:SP:73 which deals with 2 lane highways whose revision was conducted in the year 2015 and 2018. IRC:SP:84 which deals with 4 lane highways whose revisions were undertaken in the year 2014 and 2019. IRC:SP:87 which deals with 6 lane highways whose revisions have been affected in the year 2013 and 2019 and lastly IRC:SP:99, which specifically deals with the expressways, has been revised and affected in 2013,2014 and 2019.

Further, It is mandatory to ensure compliance to the stipulations of the IRC: SP: 108-2015, Guidelines on Preparation and Implementation of Environment Management Plan (EMP) for all national highways, expressway projects etc. These guidelines laid down comprehensive framework in conformity with the extant policies of Ministry of Environment Forests and Climate Change (MoEF&CC). This is applicable for any project being implemented by MoRTH through its various implementation agencies. The provision



contained clause for mitigation of environmental damages and are strictly applicable to all stages of the road project. To keep pace with emerging international challenges and to meet India's commitment to international conventions, IRC SP-122 Guidelines on Reduction on Carbon Footprint in Road Construction Projects were issued in 2019 for attending climate change aspects in road constructions.

ESG GOVERNANCE AND STRATEGY

2.1.5 DATA LAKE

NHAI has developed a Data Lake tool to manage the huge amount of data generated by the highways and roads under its supervision. This tool has large significance and features as it manages complete workflow of the projects. Some of the notable advantages being

- **Centralized Data Storage:** The Data Lake tool is a centralized data storage platform that allows NHAI to store all types of structured and unstructured data, including data from sensors, cameras, and toll booths, in a single repository.
- **Scalability:** The tool is designed to handle large volumes of data, which is essential for managing data generated by the vast highway network in India.
- **Analytics Capabilities:** The Data Lake tool provides analytics capabilities that allow NHAI to extract insights from the data, enabling them to make informed decisions and improve the overall performance of the highway network.
- **Real-time Monitoring:** The tool allows NHAI to monitor the highways and roads in real-time, enabling them to identify issues and take corrective actions promptly.
- **Predictive Maintenance:** By analysing the data, the tool can predict maintenance requirements, allowing NHAI to schedule maintenance activities in advance and reduce downtime.
- **Improved Safety:** The tool enables NHAI to monitor the highways and roads for any safety issues, such as accidents, and take appropriate actions to prevent them.
- **Cost-effective:** The Data Lake tool is a cost-effective solution for managing the vast amount of data generated by NHAI, as it eliminates the need for multiple data storage solutions.
- **Collaboration:** The tool enables collaboration among different departments within NHAI, allowing them to share data and insights, leading to better decision-making and improved performance.

The Data Lake tool developed by NHAI is a significant step towards digitizing the highway network in India, enabling NHAI to manage the vast amount of data generated by its infrastructure effectively. The tool's features, such as real-time monitoring, predictive maintenance, and analytics capabilities, have enabled NHAI to improve the safety and performance of the highways and roads under its supervision.

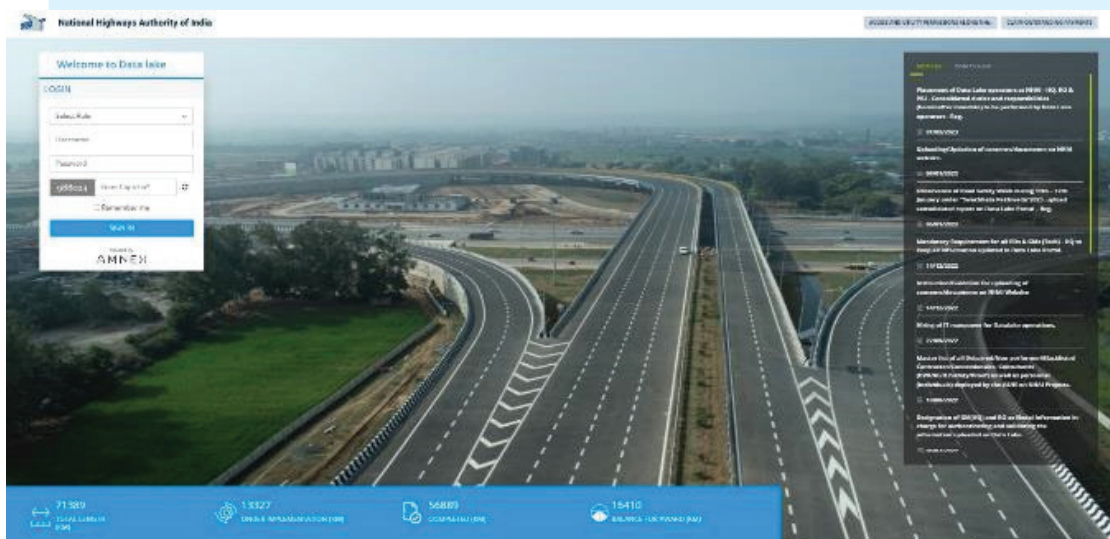


Figure 17 The data aggregation interface "Data Lake" by NHAI



2.1.6 ON-GOING ENVIRONMENTAL CONSERVATION AND ROAD SAFETY INITIATIVES

We have implemented various programs and initiatives through our years of operations that helped in environmental conservation and road safety.

2.1.6.1 ADOPTING LIFESTYLE FOR ENVIRONMENT (LIFE) FRAMEWORK

"Today, there is a need for all of us to come together and take Lifestyle for Environment (LIFE) forward as a campaign. This can become a mass movement of Environmental Conscious Lifestyle." - Hon'ble Prime Minister Shri Narendra Modi Ji.

Hon'ble Prime Minister Shri Narendra Modi ji has given the world a message of sustainable

living through which sustainable development can be achieved. The framework focuses on elements which are being followed by NHAI during the conceptualization of projects and during their implementation. The components being

1. Creating mass movement to trigger simple actions that everyone across the world can take to protect the environment. NHAI follows similar approach for behavior change campaigns on road safety,
2. Nudges to "Responsible Production and Consumption" (SDG 12) which is also one of the vital pillar of NHAI activities of road construction

These initiatives are expected to positively affect the environment and people through water savings, ensuring food security, ensuring basic living facilities and service, and improving quality of life.

ESG GOVERNANCE AND STRATEGY

ENVIRONMENTAL CLEARANCE

As per the amendments to EIA Notification made in 2013, new national highways and expansion of highways greater than 100km, involving additional right of way greater than 40m on existing alignments and 60m on realignments or by passes involving land acquisition and passing through more than one state, require a prior environmental clearance

NHAI ensures that all its projects are aligned to the requirements of the EIA Notification, and we conduct detailed Environment Impact Assessment studies and prepare project specific Environmental Management Plans

PLANTATION

Our projects are characterised by the presence of plantations at the median and shoulders of the road

We engage Plantation Experts to advise us on plantation needs in each State, and we have also engaged Young Professionals and Horticulture expert to ensure our activities make a marked difference

In July 2022, we celebrated Azadi Ka Amrit Mohatsav through tree plantation - 3,95,000 plants were planted at each of the selected locations in one day along the highways

ROAD SAFETY

NHAI has developed and implemented various road safety systems to help the users drive with a sense of safety

Through our Independent Engineers and Road Safety Consultants, we carry our regular road safety audits and identify accident prone areas and black spots

Based on our findings, we implement safety systems, such as rumble strips, traffic lights and traffic crossings, to ensure further enhancement of safety systems

NHAI has also institutionalized a fully functional Road Safety Cell

Road Safety Vision: "To make the transport on roads efficient, safe and sustainable. To reduce the fatalities on roads by half compared to 2010 reported deaths."

Road Safety Policy: Road Safety is governed by "National Road Safety Policy"

NHAI Policy Matter for Road Safety: Implementation of Road Safety Action Plan for NHAI

2.2. SUSTAINABILITY STRATEGY

Our sustainability strategy covers entire life cycle of road construction and management. It focuses on reducing the resource foot prints while sourcing of natural materials, their processing and further usage, in environmentally friendly way.

2.2.1 COVERAGE UNDER CONCESSIONAIRE AGREEMENT

We have in place a Model Concession Agreement (MCA) Template that addresses the issues which are typically important for investors as well as for limited recourse financing of highway projects, such as:

- Mitigation and unbundling of risks
- Allocation of risks and rewards
- Symmetry of obligations between the principal parties
- Precision and predictability of costs and obligations
- Reduction of transaction costs
- Force majeure
- Termination

It also addresses other important concerns such as user protection, independent monitoring, dispute resolution and financial support from the Government.

The MCA also elaborates on the basis for commercializing highways in a planned and phased manner through optimal utilization of resources on the one hand and adoption of international best practices on the other hand. The objective is to secure value for public money and provide efficient and cost-effective services to the users.

We ensure safety and quality service, along with ensuring that all relevant requirements are in place before engaging the concessionaire. Handing over possession of at least 80 per cent of the required land and obtaining of environmental clearances are among the conditions precedent to be satisfied by the Government before financial closure.

We rely on cost-effective designs and to combine them with a phased investment programme to enable a more efficient and sustainable programme of highway development. As a general principle, capacity augmentation of highways is based on the standards recommended by the Indian Roads

Congress for different bands of traffic volume. The emphasis is on phased development rather than on providing high-cost roads for catering to the projected growth in the long term.

In addition to the above, risks are allocated to parties that are best suited to manage them. Project risks are, therefore, assigned to the private sector to the extent it is capable of managing them. The transfer of such risks and responsibilities to the private sector increases the scope of innovation leading to efficiencies in costs and services.

2.2.2 ENVIRONMENT MANAGEMENT

NHAI ensures its alignment with the guidance and framework formulated by Ministry of Road Transport and Highways (MoRTH). We have adopted MoRTH's Environmental Management Framework, which is a guidance document to deal with environmental issues during planning, design, and construction of roads under the Green National Highways Corridor Project.

Good environmental management practices are essential and integral elements of sound project preparation and implementation. From this perspective, more specifically, the Environment Management Framework (EMF) seeks to:

- Establish clear procedures and methodologies for environmental planning, review, approval and implementation of sub-projects to be financed under the project
- To provide practical guidance for planning, designing and implementing the environmental management measures
- Specify appropriate roles and responsibilities, and outline the necessary reporting procedures, for managing and monitoring environmental and related social concerns
- Determine the institutional arrangements, including those related to training and capacity building needed to successfully implement the provisions of the EMF.

ESG GOVERNANCE AND STRATEGY

The key contents of the Environmental Management Framework are as follows:



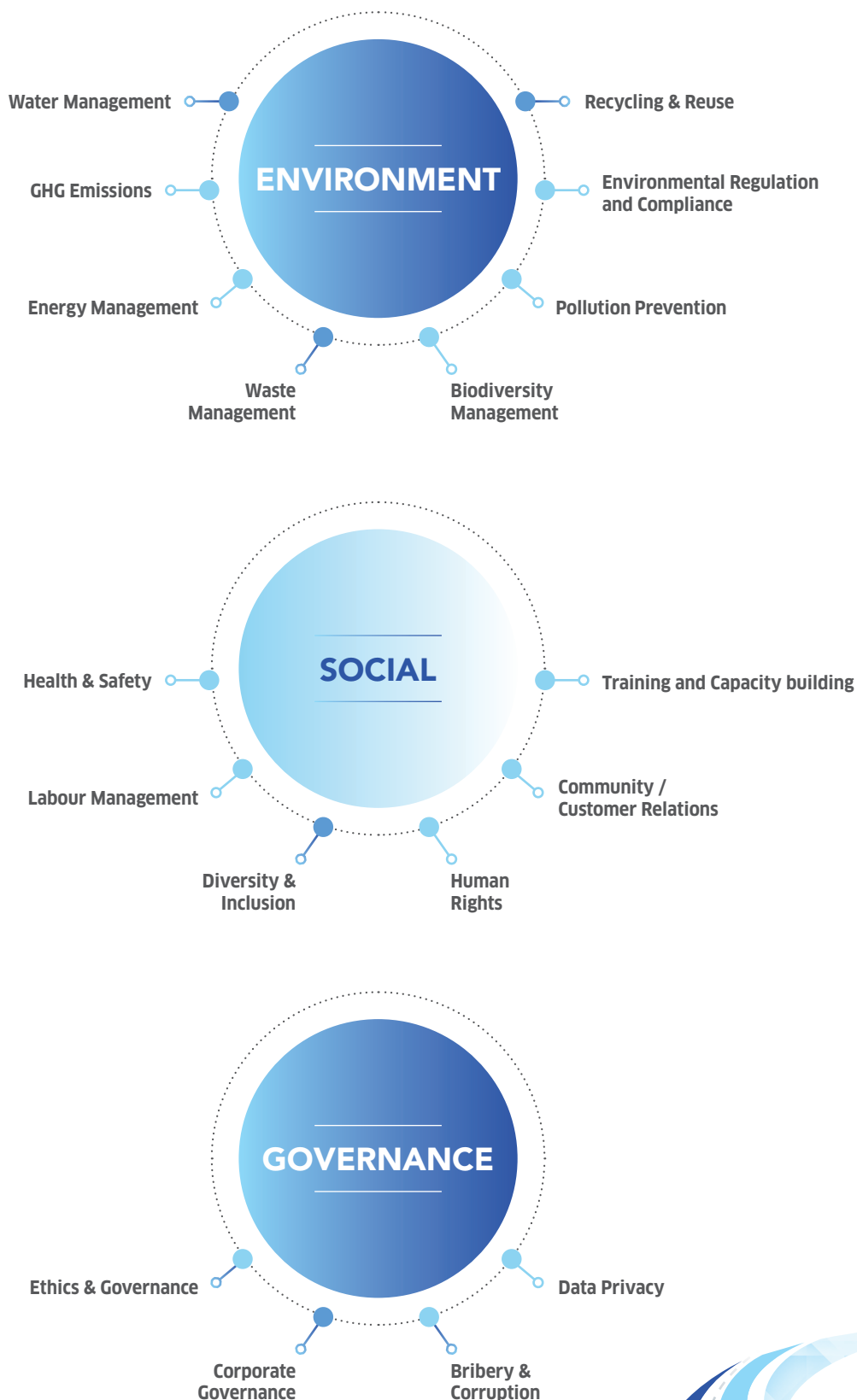
2.3. MATERIALITY ASSESSMENT

We at NHAI, identify material ESG/sustainability topics as those topics that are likely to have a potential impact on our operations and business or are important to our external stakeholders in the short, medium or long-term.

The process of identifying the material topic follows below mentioned process

1. **Determining Assessment Parameters:** For selecting any material issues for NHAI, three parameters are considered: implication, outcome, and relevance. The topics are analyzed rigorously on these criteria to eliminate non-relevant topics from the lists.
2. **Issue Selection:** Through stakeholder engagement and previous experiences the issues have been selected for assessments.
3. **Prioritization:** Through internal and external consultation with stakeholders, a prioritization matrix is produced for the issues. This gives NHAI a comprehensive listing of material issues.
4. **Impact Assessment:** Post prioritization, the impact of such topics is assessed to come up listing of topics and corresponding impacts perceived by the stakeholder, in priority order.
5. **Analysis and Validation:** Qualitative analysis is conducted to validate these material topics for final representation in the report.

The following material topics have been identified basis a structured materiality assessment conducted through a combination of industry analysis, review of global risks and mega trends, topics identified by rating frameworks and internal review, in keeping with the GRI standards.



ESG GOVERNANCE AND STRATEGY

MANAGEMENT APPROACH

The matrix mentioned subsequently, represents the outcomes of our materiality assessment with further explanation of how management of NHAI approaches such topics of interest. Management approach considers response to all the parameters as critical inputs, while the action on ground depends upon the prioritisation of activities perceived throughout the year.

Table 8 Management Approach for Material topics

GRI Category	Material Topic	GRI Topic	Management Approach
Economic	Economic Performance	GRI 201: Economic Performance	NHAI aims to improve the financial stability of organisation by improving operational efficiency while maintaining higher sustainability performance.
	Economic Compliance	GRI 419: Socio-Economic Compliance	NHAI has comprehensive policies, guidelines and adequate monitoring mechanisms to adhere to local and central laws which ensures effective compliance.
Environment	Energy	GRI 302: Energy	In accordance with national goals of energy efficiency and energy management, NHAI encourages its concessionaires to adopt energy efficient practices to reduce their energy footprint. NHAI itself promotes usage of renewable energy in all its operations, wherever applicable.
	Efficient Water Management	GRI 303: Water	NHAI understands effects of its operations on water as a natural resource. It has proactively taken initiatives to conserve rain water and recharge it throughout its operational period. It has also advised concessionaires to adopt water recycling practices.
	Minimising environmental impact	GRI 301: Material GRI 305: Emissions GRI 306: Waste GRI 304: Biodiversity	NHAI believes that its operations through the concessionaires do affect natural resources. NHAI has created guidelines to manage these ill effects to make the impact less severe, through robust mitigation plans. NHAI also guides its concessionaires to maintain highest standards of occupational health and safety of the labourers and employees.
	Environmental Compliance	GRI 307: Environmental Compliance	NHAI directs its contractors and it self adheres to all laws and regulations where it operates. It has put in place various monitoring mechanisms to reduce non compliant instances.
Social	Inclusive Development	GRI 413: Local Communities	NHAI always considers the empowerment and capacity building of local communities are its utmost priority for sustainable usage of infrastructure.
	Training and Development of Employees	GRI 401: Employment GRI 404: Training and Education	NHAI upholds high working standards and considered its employees as most valuable resource to actualise the projects on ground. NHAI has various policies which ensure well being of its employees.
	Health and Safety	GRI 403: Occupational Health and Safety GRI 408: Child Labour GRI 402: Labour Management	NHAI mandates its concessionaires to maintain healthy and safe working standards with adequate adoption and mitigation measures during the operations. It has multiple mechanisms to check these conditions throughout the project cycle.



OPPORTUNITIES, RISKS AND IMPACTS:

The expansion of roads and associated improvement works is likely to create adverse environmental impacts in general, particularly in case of road corridors that will involve realignments and bypasses, requiring land beyond the existing Right of Way (RoW). The project activities, if not properly managed and mitigated, could have following impacts:

ENVIRONMENTAL IMPACTS

- Felling of roadside trees;
- Adverse impacts on water resources (water bodies/ public water supply sources);
- Impairment to or worsening of the local/ regional drainage;
- Issues related to cutting of slopes and management of debris (for hill or mountainous area);
- Uptake of fertile agricultural land;
- Increased traffic leading to safety concerns for road users and road side residents;
- Diversion of forest land.

SOCIAL IMPACTS

- Potential impacts on material sources and common property resources along the road;
- Impact on environmentally sensitive receptors (such as school and health facilities) located along the road corridors from increased noise and air pollution during construction and the operation phase;
- Changes in land use pattern;
- Changes in occupational patterns.

ESG GOVERNANCE AND STRATEGY

At NHAI, we are committed to identify the potential adverse and positive impacts of the project through the screening exercises, Environment Impact Assessment and Environment Management Plan. With the help of mitigation plans designed for a project, we are continuously engaging ourselves in reducing the adverse impacts of the projects to the extent possible. We have identified some of the potential risks associated with our project activities.



RISKS ASSOCIATED WITH DIVERSION OF FOREST LANDS

Some of the projects require forest land diversion to construct the road to standard configuration. However, in such scenario we ensure that the project does not significantly impact the health and quality of the natural forest as well as to not impact the right and welfare of the people and their level of dependence upon the forest. For stretches that are in close proximity (within 10km) of wildlife sanctuaries or passing through pristine forest areas, biodiversity assessment is carried out in addition to the results from the environmental screening to ascertain potential direct and indirect impact on wildlife particularly where charismatic fauna and endangered species are involved.

RISKS ASSOCIATED WITH THE UPTAKE OF AGRICULTURAL LANDS

In addition to diversion of forest lands for road construction, fertile agricultural lands could also be acquired in the process. This may put pressure on less arable lands and could lead to environmental degradation of the area.

RISKS ASSOCIATED WITH THE WILDLIFE

When project roads traverse close to natural forest reserves and wildlife sanctuaries (the road itself would be outside designated protected areas), construction process could increase noise levels, cause affect migration paths, impact availability and access to food especially for obligate herbivores and carnivorous faunal species. The corridors where surface water bodies are usually sources of water for wildlife get affected due to construction activities, there is likelihood of dependent wildlife will also get affected.

Transportation and hauling of material and increased vehicular activity within the road corridor may introduce invasive species, increase noise and air pollution associated, destroy plants with conservation value. Extraction of raw material for construction such as gravel, sand, etc outside designated locations could create further disturbance to the ecosystem by degrading habitat conditions. Also, one of the risks would be the possibility of increased wildlife poaching during construction.

RISKS ASSOCIATED WITH THE MANAGEMENT OF CONSTRUCTION MATERIALS

Road construction will involve use of construction materials such as aggregates, sand, earth and water and other chemical inputs including bitumen, grease, oil, petrol, kerosene and other substance considered hazardous to human health or the environment according to the Management Storage and Import of Hazardous Chemicals (MSIHC) Rules of India. Uncontrolled extraction practices such as river sand quarrying, water extraction from both underground and ground sources, earth excavation could result in irreversible effects including depressions that may demand huge restorative actions. Improper disposal of construction material waste could affect local water sources and agricultural lands with related health issues.

RISKS ASSOCIATED WITH ROAD TOPOGRAPHY

Topography of most of the road corridors are flat plains, undulating with mild slopes and to a small degree, rolling terrains and mountainous with steep slopes. The flat terrains affect drainage conditions with increased potential for flooding, overtopping and soil erosion. Road works may thus involve raising the road to offset frequent overtopping. For road works that will involve slope cutting, concerns will

evolve around increased potential for soil erosion, landslides especially during monsoonal seasons, debris storage, management and disposal.

OTHER RISKS

Increased traffic from upgraded roads may cause safety concerns for both road-users and road-side residents, occupational health related risks faced by construction workers and construction stage nuisances such as dust and noise. In towns with touristic sites and potential medium to large scale industrial plants/hubs, new commercial and public activities may lead to an increase in pressure on local and regional natural resources. Potential long-term impacts could include changes in land use patterns (from agriculture, natural habitats to real estate, or other non-farming purposes) and changes in occupational patterns.

Keeping all the identified potential risks in mind, we aim to provide an overall positive impact from all of the projects in terms of providing better connectivity and improved access to population in less developed or remote areas to more advanced socio-economic centers. Other expected positive outcomes from most of our projects include improved access to a larger number of economic opportunities, better health services, facilities and higher levels of education, and improved road safety.



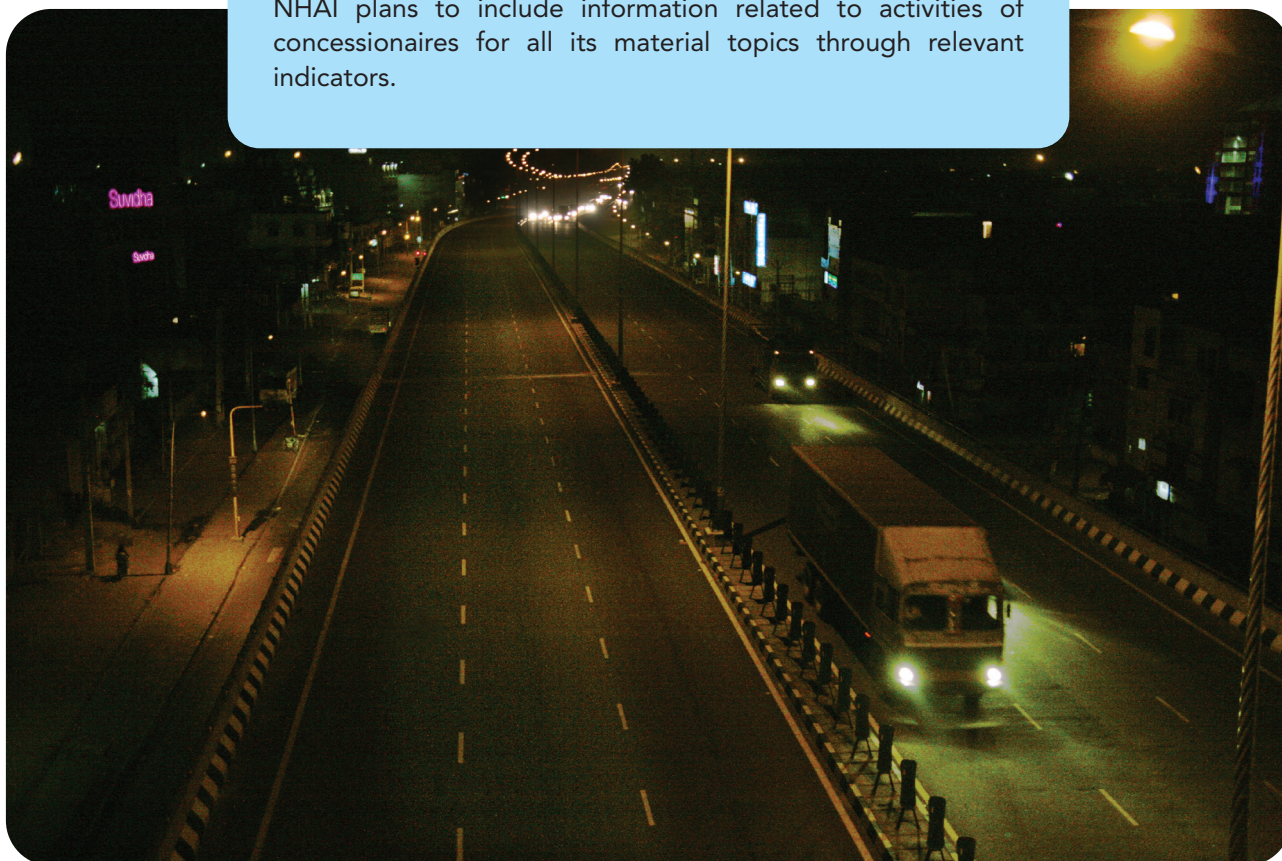


ESG GOVERNANCE AND STRATEGY

Being the first Sustainability Report, NHAI has tried to establish processes and scope for data collection and management with its appropriate representation for all our material topics. It can be noted that

- For the GRI Indicators pertaining to Energy, Emissions, Economic Performance, Anti-Corruption, Employment, Training & Education and Diversity & Inclusion, the data is represented for only NHAI owned assets, its employed personnel, NHAI owned establishments along with its operations and excludes the concessionaires and their operations.
- NHAI being the ultimate responsible body for roads, the indicators pertaining to Water and Effluents, Waste Management, Materials, Biodiversity, Environmental Compliance, Labour Management, Occupational Health and Safety and Socio-Economic Compliance, have represented with inclusion operations by concessionaires appointed by NHAI, who have constructed, operated, and have maintained the roads.

In the upcoming reporting cycles of sustainability reporting, NHAI plans to include information related to activities of concessionaires for all its material topics through relevant indicators.



An aerial photograph of a long, winding highway bridge with multiple concrete pillars, curving through a hilly, forested landscape. A river is visible in the bottom left corner. The bridge has several vehicles, including trucks and cars, traveling on it. The surrounding area is a mix of green trees and brownish, cleared land.

CONSERVING NATURAL ENVIRONMENT

CONSERVING NATURAL ENVIRONMENT



NHAI has been increasingly cognizant about the environmental impact of its core activities which is planning, constructing and maintaining our national highways, through Concessionaires. These activities have a potential of wider impact on earth's natural resources in terms of materials, soil, water, air and biodiversity.



We have in place a detailed mechanism with particular significance on assessing our environmental data such as energy usage, carbon emissions, water consumption, waste production and materials usage. Adherence to environmental

regulations, compliance and management is an integral part of our operating procedures with their specific mention in the agreements and monitoring mechanisms. These procedures have been updated regularly as per new regulations and context

specific requirements. Being a leader in road connectivity projects, we are increasingly concentrating on the principles of sustainable construction and have established a new record in executing green highways projects.

NHAI HAS BUILT ITS ENVIRONMENT MANAGEMENT FRAMEWORK ON 3 CORE VALUES.

1. Environmental Management Plan compliance
2. Environmental Impact Mitigation
3. Environmental Awareness

ENVIRONMENTAL MANAGEMENT PLAN

NHAI, while getting into contract with Concessionaires have strict requirement of conceptualization and ratification of Environmental Impact Management Plans during various phases of the project. This is done under the Environmental Management Plans prepared as a sequel to Environmental Impact Assessment studies conducted for our projects, which provides an effectiveness of risk management processes.

The contract sets out specific guidelines and procedures for all the environmental aspects encountered during the project execution. Large number of our partner Concessionaires have been certified with ISO 14001: 2015 certifications and align with the requirements of Indian laws and regulations and guidelines issued by regulatory bodies.

ENVIRONMENTAL IMPACT MITIGATION:

Preliminary impact studies are conducted before starting of any project by NHAI and respective clearances were obtained from Regional and Central authorities such as Forest department, Central Ground Water Board, Revenue department etc. As a result, all the recommended preventive measures are implemented beforehand to

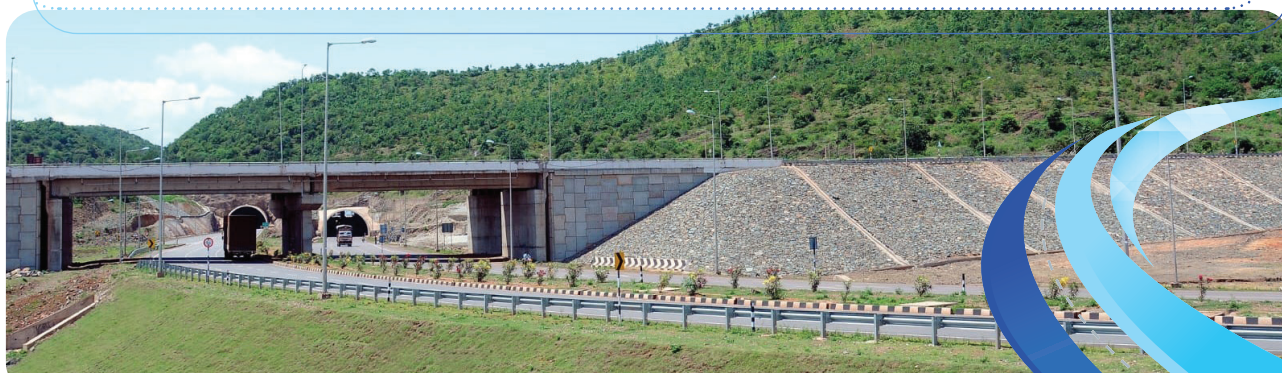
limit the pollution, contamination and risks, throughout the project life. Comprehensive procedures have been established to be followed by the Concessionaires to address

- Land degradation mitigation
- Water pollution prevention, abatement and control
- Water conservation and control
- Waste management

ENVIRONMENTAL AWARENESS

NHAI believes that Environmental Awareness constitutes a major part of achieving compliance for environmental protection. Therefore, an environmental awareness orientation is given to all new inductees while awareness campaigns are expected from the Concessionaires for the employees and non-employees during the course of project implementation.

At NHAI, we recognize the need for resource conservation, energy efficiency and enhancement of biodiversity. Through our Green Highways Programme plantation drive, we plan to transition towards clean and green energy and waste management practices, we are enabling ourselves to become more sustainable and environment conscious organization.



CONSERVING NATURAL ENVIRONMENT

WORKING TOWARDS NET ZERO IN ROAD CONSTRUCTION AND MANAGEMENT.

In growing context of India's infrastructure facilities, the road construction and management sector contribute noticeable amount of Greenhouse Gas Emissions (GHG), however, it faces many opportunities for increasing its efficiencies while reducing its carbon, water and waste footprints. NHAI, is leading by example to set standards of a "Sustainable Construction and Management" approach through detailed guidelines, data driven processes and enhanced management of materials and waste.

This is the summary of key initiatives to reduce the greenhouse gas emissions and our work towards sustainable construction and its management.

1. Recycled asphalt
2. Solar blinkers and solar energy panels
3. Low emissions concrete
4. Usage of plastic and fly ash
5. Water conservation – Amrit Sarovar
6. Efficient toll management for fuel savings
7. Roadside plantations



Figure 18 Usage of Fly Ash



Figure 19 Solar Panel Delhi Meerut Expressway



Figure 20Way Side Amenities

3.1 EMISSIONS REDUCTION: TOWARDS CLIMATE POSITIVE FUTURE

NHAI, leading by example has envisaged a holistic approach to address the climate change effects through a thorough road life cycle-based Climate Adaptation Plan. The methods used by Concessionaires of NHAI help reduce carbon emissions, which are guided and supervised through thorough guidelines. All the stakeholders involved in road construction and maintenance operations, have been guided to reduce carbon emissions, through:

1. Limiting energy consumption by improving operational efficiency;
2. Utilizing renewable energy, wherever applicable and plausible;
3. Having continuous dialogues with concessionaire for reducing their carbon footprint.

We ask Concessionaires, to periodically record their energy consumption data of fuels, electricity and renewable energies. The data is gathered project wise, which in turn get compiled at Regional Office level to give NHAI officials a regional picture of operations and corresponding emissions with energy consumption.

To combat the air pollution caused mainly by ongoing construction work, National Highways Authority of India (NHAI) recommends use of sprinklers which mitigates smog at the under-construction and major maintenance sections of our National Highways. Smog is formed by the accumulation of particulate matter present in the atmosphere and fine particles emitted through industrial units, vehicles, and other similar sources. An anti-smog gun is deployed in such conditions, which sprays water mist to settle dust and particles. In addition, tankers are always kept moving as they sprinkle water on dusty patches and areas where earth work is on.

CONSERVING NATURAL ENVIRONMENT

3.1.1 EMISSIONS

NHAI gathered data to calculate and report all Scope 1 and Scope 2 Emissions of GHG protocol since 2019. In this reporting cycle, we have also tried to gather insights for indirect emissions by Concessionaires, which is being planned to be included in subsequent reporting cycles.

We have mapped our Scope 1 and Scope 2 Emissions for the last three (3) financial years. Scope 1 emissions sources within our operations are Vehicles, including

construction vehicles & route patrolling vehicles, diesel generator sets etc.

As for Scope 2 Emission, the same is through electricity sourced from State and National Grids. The electricity is sourced from the National and State Grids for our toll plazas, toll plaza offices, Regional Offices (RO), Project Implementation Units (PIUs) and our Headquarters (HQ).

Our Scope emissions data is provided in the table below.

Table 9 Scope 1 and Scope 2 Emissions from NHAI's assets and establishments

Type	Source of Emissions	Numbers are in MT of CO2 eq.		
		FY 2019-20	FY 2020-21	FY 2021-22
Scope 1 Emissions	Fuel Consumption	30425.28	24811.69	22695.03
Scope 2 Emissions	Grid Electricity Consumption	1477.6	2139.8	3632.17

EMISSIONS SCOPE

The GHG protocols guides the organisations to capture two scopes of greenhouse gas emissions for accounting and reporting purpose

1. Scope 1 Emissions: These emissions have originated from direct fuel consumption made throughout the life cycle of the road, by the assets fully owned by NHAI. The consumption of fuel is considered for petrol, diesel, and hybrid vehicles owned by NHAI, consumption of diesel in generator sets and usage of fuel for any other direct operations by NHAI.
2. Scope 2 Emissions: These are the indirect emissions which are originated from the purchased electricity from the grid for the establishments of NHAI at various project and regional offices.

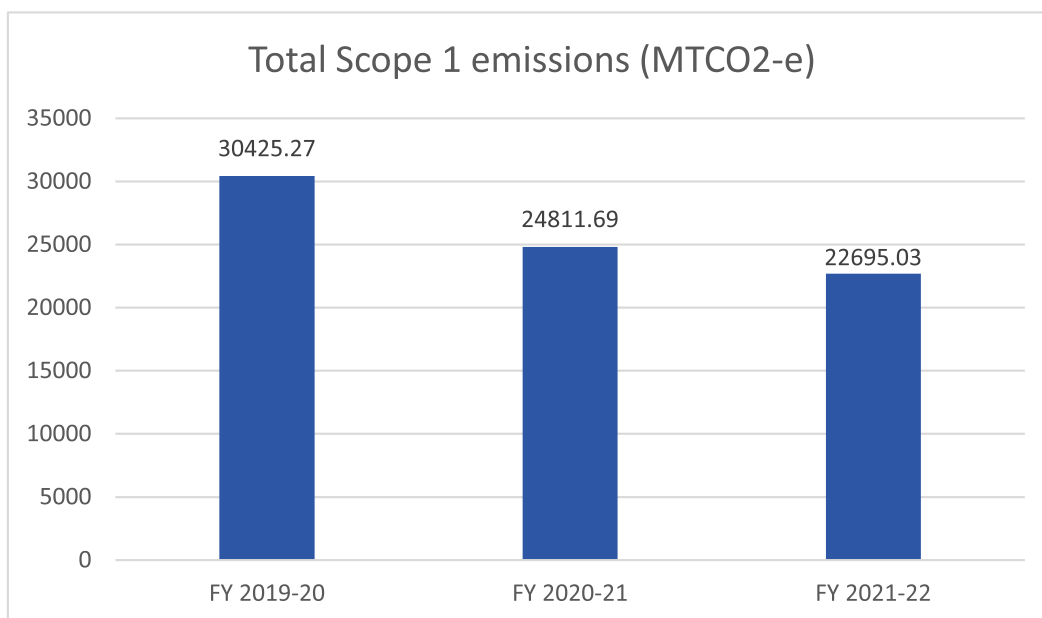


Figure 21 Total Scope 1 Emissions trend over last 3 FYs

As can be observed from the above table and figure for FY 2021-22, there has been a decreasing trend in 3 FY from FY 2019-20 due to less petrol and electricity consumption in our Scope 1 Emissions. Our carbon offsetting activities have potential for offsetting carbon emissions under our Green Highways initiative. NHAI has been undertaking plantation drives from time to time to develop eco-friendly National Highways and has constantly addressed ecological concerns by adopting environmental-friendly methods. In post policy years from 2016-17 to 2020-21, more than 2 crore

plants have been planted.

In the year 2021-22, NHAI carried out a sustained plantation drive. The aim was to saturate all National Highway stretches with plantations, collectively by Concessionaire, State Government Departments and Private Plantation Agencies.

We have also built upon our solar power usage capacity and have ensured that our ROs and PIUs are working together with our Concessionaires to further reduce and/or offset emissions.



Figure 22 Solar blinkers

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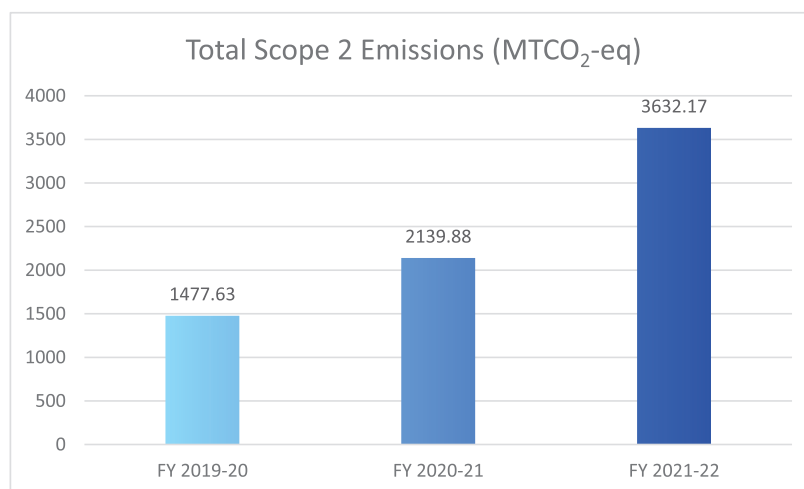


Figure 23 Total Scope 2 Emissions over last 3 FYs

As can be observed from the figure above, our Scope 2 Emissions have gone up. This is due to our increased dependence on National and State Grids for electricity sourcing and consumption. We are striving to decrease our dependence on fuels, such as diesel in diesel generator sets. As highlighted in said section, we will continue to decrease our dependence on fuel and will work towards decreasing our Scope 2 Emissions as well by transition towards clean and green energy sources.

3.1.2 GHG EMISSIONS INTENSITY

NHAI's emission intensity varies according to its project portfolio. Construction of roads has seen substantial rise since last decade, while NHAI leading the sustainable practices all through these expansions. Years 2019-22 demonstrated substantial

progress in road connectivity through NHAI, while the emissions have seen gradual decline achieved through concentrated efforts by NHAI.

NHAI measures the carbon equivalent GHG Intensity in tonnes of CO₂ equivalent per km of road constructed.

As for our GHG emissions intensity, i.e., emissions from energy consumption, operations, transport and company travel, the same has decreased since FY 2019-20 to FY 2021-22.

We will further work towards decreasing our GHG Emissions Intensity by cost-effective ways to decrease the same, i.e., through improved energy efficiency, conservation and the use of lower-carbon energy sources.

GHG EMISSIONS INTENSITY

Table 10 GHG Emissions Intensity trends at NHAI

Total GHG Emission Intensity (MTCO ₂ eq/KM constructed)	FY 2019-20	FY 2020-21	FY 2021-22
GHG Emission Intensity (including Scope 1 and 2 Emissions)	22.23	12.47	10.50

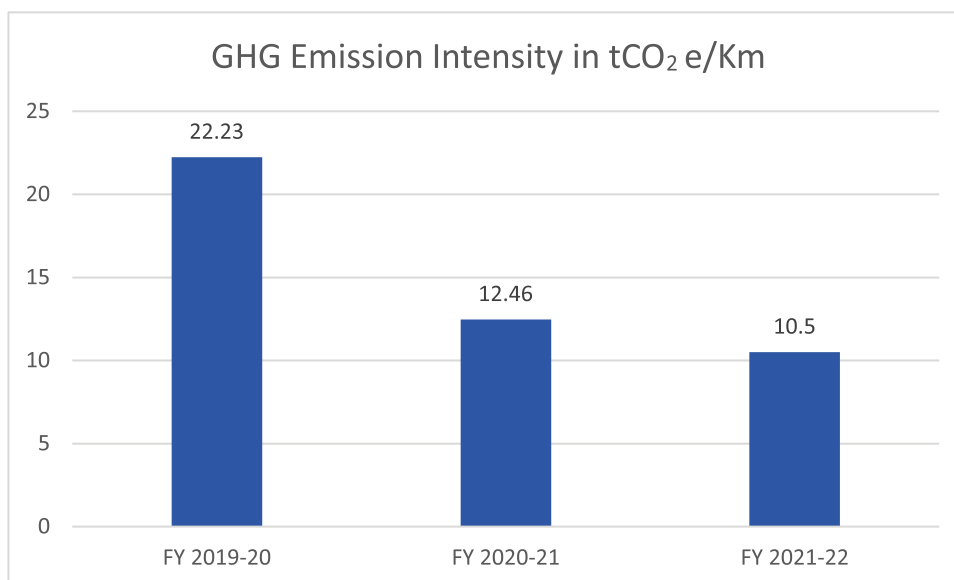


Figure 24 GHG Emissions Intensity trends at NHAI

3.2 RAPID ASSESSMENT OF AVOIDED EMISSIONS- A BRIEF STUDY

NHAI has supported a Rapid Assessment Study to understand the quantum amount of carbon emissions, extent of carbon sequestration possible and avoidance of potentially possible carbon emissions due to operations of National Highways construction projects. This study is 'An assessment of avoided CO₂ emissions during Construction, Maintenance and Operation of National Highways'. This study has been conducted by MoEF&CC from a technical consortium of CSIR-IIP, CSIR-CRI, TERI and IORA ecological solutions for assessing net GHG emissions from National Highways construction and its related operations.

This report presents a methodology for assessing the extent of CO₂ that can be avoided per km of operational highways. Data from 20 National Highways together extending to a length of 2191.5 km and located in India's diverse climate zones and topography have been applied to estimate that potential CO₂ that can be avoided by the National Highways. Of the 20 National Highways stretches considered, 5 are Greenfield and 15 are brownfield. The result of this assessment indicate that:

1. Construction of these stretches together have led to an emission of 5,717 thousand tonnes of CO₂ and maintenance of the roads led to an

emission of 1,165 thousand tonnes of CO₂.

2. Felling of trees outside forests and removal of forests done to pave the way for construction of the highways has led to the emission of 653 thousand tonnes of CO₂.
3. Fuel consumption by vehicles would have been 51 billion litres in a 20-year period if BAU conditions of highways persisted. In the BAU case, the share of petrol in the total fuel consumption would have been 17-19% and diesel share would have been 81-83%.
4. In the improvement cases, when the new highways are operational, it is estimated that the total fuel consumption would be about 41.2 billion liters in a 20- year period. This amount of consumption is less by 19% or 9.8 billion liters of fuel is saved in the improvement case as compared to the BAU case.
5. In the total fuel savings, share of petrol will be about 7% and rest will be share of diesel. The major savings will be 53% and 23% by MCVs and HCVs, respectively.
6. For the 20 NH stretches, the savings in petrol range from 2% to 21% and diesel saving ranges from 1% to 42%. This variation is mainly due to variable conditions of the highways, vis-à-vis their road characteristics (width, roughness, etc.) and wide-ranging traffic volumes and share of different vehicle types.

CONSERVING NATURAL ENVIRONMENT

7. Therefore, due to vehicles plying on the newly constructed and improved highways, it is estimated that in a 20 - year period about 25.19 million tonnes of CO₂, will be avoided along the entire 2,191.5 km of NH stretches, which is equivalent to an avoidance of 11,493 tonnes CO₂, per km in 20-years.
 - a. In case of Greenfield highways improvements, the CO₂, avoidance in 20 years can be of the order of 10,167 tonnes per km whereas
 - b. Improvement of Brownfield highways can result in about 11,936 tonnes per km of CO₂ avoidance.
8. It is estimated that the avenue plantations and compensatory afforestation done post construction of the highways together potentially can sequester 584.27 thousand tonnes of CO₂ over a 20-year period.
9. Adding up the CO₂ emissions and sequestrations streams across all the stretches considered that together extend to a total of 2191.5 km, it is estimated that potentially 18,237 thousand tonnes of CO₂ over a 20-year period can be avoided. This is equivalent to a potential avoidance of 8,321 tonnes CO₂ per km.
10. Based on standard assumptions, it is estimated that a total of 18,237 thousand tonnes of CO₂ emissions avoided across 2191.5 km of NH in a 20- year period is equivalent to CO₂ sequestered by 45 million trees.
11. A total of 77,265 km of national highway has been constructed till date since 2014 which can together potentially avoid 32.15 million tonnes of CO₂ annually and 642.95 million tonnes of CO₂ cumulatively over a period of 20 years. This is equivalent to CO₂ sequestration by 31,826 million trees.

3.3 ENERGY MANAGEMENT

As a road planning, constructing and road management organization via directing the

concessionaires, energy is the core component of our day to day operations. Over last decade, NHAI has taken numerous initiatives to enhance the energy efficiency and conserve energy throughout its operations, spread across varied geographies. This has resulted in emissions reductions from both direct and indirect energy sources.

We are strongly focused on advising concessionaires to enhance the energy efficiency and incremental adoption of renewable energy sources. Regular monitoring and updates have been taken up from the stakeholders to further enhance and strategize the sustainable energy usage and thereby reducing NHAI's energy footprint.

We believe in managing energy through the use of new technologies, lower costs and practicing energy efficiency. In 2021, we signed a Memorandum of Understanding (MoU) with Energy Efficiency Services Limited (EESL) to establish various clean and energy efficiency interventions at NHAI structures. EESL and NHAI agreed to implement energy efficient, renewable energy projects and e-mobility services to reduce dependence on fossil fuel and achieve sustainable development across toll plazas and other NHAI establishments. The establishment of energy efficiency measures at the NHAI buildings and toll plazas are helping to meet the targets of increasing environment friendly clean initiatives. In addition, in December 2021 there were steps taken by the Ministry of Road Transport & Highways for the adoption of electric vehicles and the use of alternative fuels. Electric vehicle Charging Stations are to be provided by the developer as part of the Wayside Amenities (WSAs) being awarded by the National Highways Authority of India. NHAI has already awarded 39 such facilities and the proposals for 103 such sites are at bidding stage. Further, additional WSA sites, as and when identified by the Authority, would also be put up for bidding. The works which have been already awarded are expected to be completed by the end of FY 2022-23.



ENERGY SAVINGS AND MANAGEMENT – CASE STUDY

NHAI is very conscious about the environment and most importantly energy conservation at the projects sites. We take active efforts in implementing a green and renewable source of energy into operations to reduce its impact on the environment. Under RO-Bengaluru following energy conservation activities were carried out:

1) Solar panels installed in toll Plazas for energy needs

i). **Project name:** Four Lanning from Km.253.600 to KM.308.550 of Bellary to Byrapura Section of NH-150(A) on Hybrid Annuity Mode under Bharatmala Pariyojana in the State of Karnataka. Energy conservation initiatives i.e. use of solar panels for generation of electricity which has been provided in Toll Plazas (Jajarikallu) in NH-150A

ii). **Project name:** Four/Six Laning of Hungund-Hospet Section of NH-13 (New NH-50) from Km 202+000 to Km 299+000 in the state of Karnataka under NHDP Phase – III on Design, Build, Finance, Operate and Transfer (DBFOT) basis under NHDP III (Package No: KAR/Phase-III/IE-2/2010)

2) Street lighting has been changed from Sodium Vapour lamps to LED Bulbs

Advantages of LED lights

1. LED lifespan can be greater than 1,00,000 hours more than four times that of sodium lamps.
2. Sodium lamps are Omni directional in that they emit light at 360 degrees, while LED lamps light



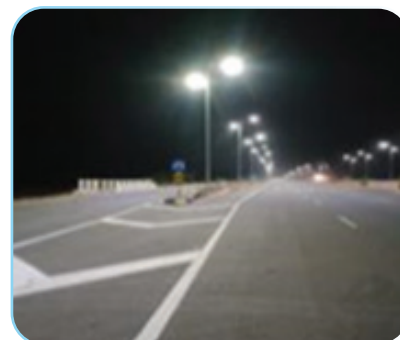
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Solar panels installed on roof of the toll plaza canopy



Solar panels installed on roof of the toll plaza canopy



Led lights installed in NH-Project stretch

3.4 THE GREEN NATIONAL HIGHWAYS CORRIDOR

The Green National Highways Corridor (GNHC) is an initiative by the Ministry of Road Transport and Highways (MoRTH) in India to develop a sustainable and environmentally friendly transportation network in the country. The primary objective of the initiative is to create a green corridor along the national highways by planting trees, installing solar panels, and developing wayside amenities that promote the use of renewable energy and promote sustainable practices.

The GNHC initiative aims to develop a network of highways that are not only safe and efficient but also sustainable and eco-friendly. Some of the key features of the initiative include:

- **Plantation of Trees:** Under the GNHC initiative, NHAI aims to plant trees on both sides of the national highways to improve the air quality, reduce carbon emissions, and provide shade to the travelers.
- **Use of Renewable Energy:** The GNHC initiative promotes the use of renewable energy by installing solar panels at various points along the

highways to power the street lights, toll booths, and other facilities.

- **Development of Wayside Amenities:** The initiative aims to develop wayside amenities that promote sustainable practices, such as rainwater harvesting, waste management, and recycling.
- **Eco-friendly Construction Practices:** The GNHC initiative promotes the use of eco-friendly construction practices, such as the use of recycled materials, to reduce the carbon footprint of the construction process.
- **Public Awareness:** The initiative aims to raise public awareness about the importance of sustainability and environmental conservation by conducting various campaigns and programs.

The GNHC initiative is a significant step towards developing a sustainable transportation network in India. It promotes the use of renewable energy, reduces the carbon footprint of transportation, and promotes sustainable practices. The initiative is also expected to improve the quality of life of people living along the national highways by improving the air quality, reducing noise pollution, and promoting eco-tourism.

Table 11 Energy Consumption from NHAI's Assets and Establishments

Source	Measure	FY 19-20	FY 20-21	FY 21-22
Energy through Petrol Consumption	GJ	1105.4	876.3	2894.4
Energy through Diesel Consumption	GJ	256571.3	241602.6	193677.9
Energy through Grid Electricity	GJ	6733.5	9751.4	16551.7
Energy through LPG	GJ	98.9	59.8	70.2
Total	GJ	264509.1	252290.1	213194.2

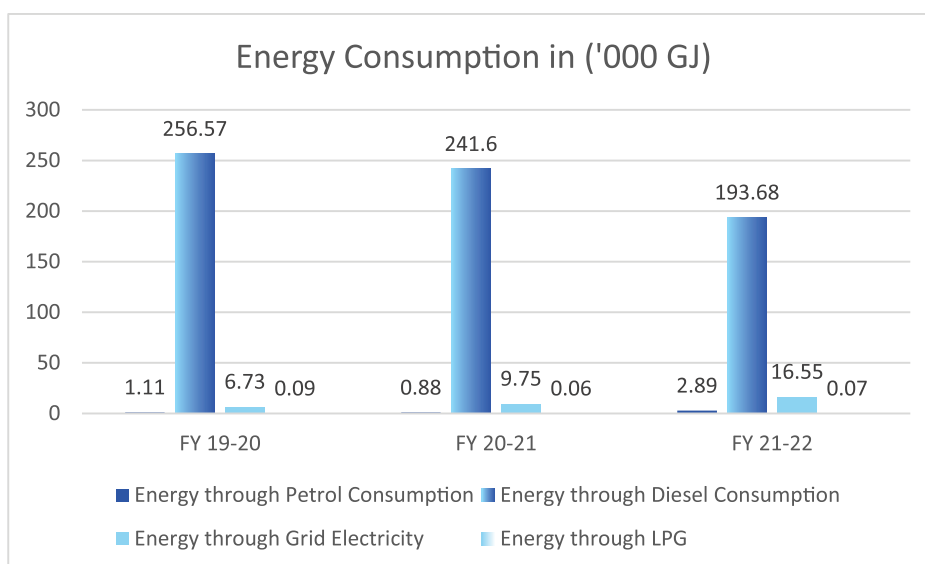


Figure 25 Energy Consumption from NHAI's assets and establishments

It can be observed from the above table and figure, our energy consumption was primarily through fuels (696956.82 GJ) over the past three financial years, followed by energy consumed through electric units (33036.6 GJ).

We are making efforts towards transitioning towards clean and green energy, and over the last two (2) financial years, we have installed rooftop solar panels at select offices and toll plazas locations. We aim to keep expanding upon energy consumed through green and clean resources, and will explore further scope of integration of renewable technology in our business in the near future.

3.5 ENERGY CONSUMPTION

At NHAI, we make sure that we track our energy consumption across all our assets and facilities. Across our operations, energy is consumed through the following: Fuel Electric Units, through the state grid supply

Power generators For the last three financial years, we have tracked data pertaining to our energy consumption across our offices, assets and facilities. The same is presented in the table below.

3.5.1 ENERGY INTENSITY

We have steadily worked towards decreasing our dependence on fuel for energy consumption and have expanded towards state grid supply and solar energy supply to meet our energy requirements. Although there is still a long way to go for us to transition towards renewable sources, we believe that we are on track to ensure our operations are greener and more sustainable in the near future.

Figure below gives an interpretation that the energy intensity has been reducing in our operations while the KM constructed through the reporting period have been rising steadily. This depicts the efforts of energy conservation has been fruitful.

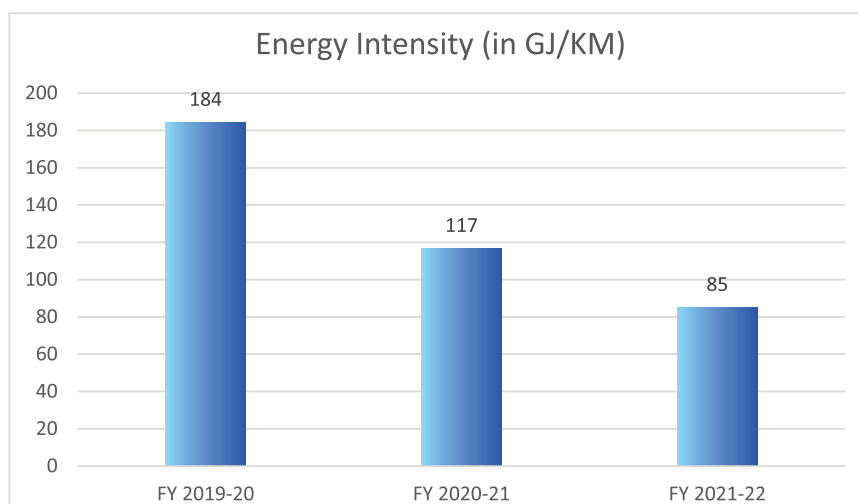


Figure 26 Energy Intensity for NHAI energy consumption



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3.6 WATER MANAGEMENT

Here at NHAI, we understand the value of water as a resource and is thus committed to responsible management and conservation of water resources. We understand that water is a resource that is critical for the advancement of the economy, communities and even biodiversity. Significant area of India is water stressed and the position has worsened in recent decades due to changes in rainfall pattern and local weather conditions, consequence of climate change.

In our endeavor to address water conservation we adopted best measures and practices to save water and manage water efficiently. The Concessionaires have been advised to use surface water resources and also to avoid extraction of ground water for construction purposes. The projects in NHAI have utilized both man made or natural surface reservoirs and grey water for fulfilling the demand for water, both during construction and during maintenance operations of road. However, in the areas where sufficient surface water is not available, ground water is sustainably extracted by creating a recharge plan of equivalent or more than the amount of water which is being extracted.

3.6.1 SURFACE WATER MANAGEMENT

Constructing highways requires soil, which can be obtained in a manner that new water bodies can be formed. This will not only fulfill the road construction requirements but also provide new surface water bodies in rural areas.

Under the aegis of 'Azadi ka Amrit Mahotsav', which began on 12th March, 2021 celebrating 75 years of India's Independence, later in the year, on 11th June, 2022, NHAI held a two-day conference of Regional Officers in Srinagar. Inaugurated by NHAI Chairperson Smt. Alka Upadhyaya, this unique initiative is one of the four regional conferences which brought together NHAI officials and regional stakeholders from J&K, Himachal Pradesh, Punjab, Haryana, and Delhi onto a common platform to share knowledge, achievements, and challenges pertaining to water management.

In 2022, the government asked the Ministry of Railways and the National Highways Authority of India (NHAI) to use the soil/silt excavated from

ponds/tanks in all districts across the country. The water conservation mission launched by Hon'ble Prime Minister Narendra Modi in 2022, aims at developing and rejuvenating 75 water bodies in each district in all States as part of the celebrations of 'Azadi ka Amrit Mahotsav'. At least 50,000 water bodies are expected to be rejuvenated across the country during the nationwide programme that would culminate on August 15, 2023.

Laying emphasis on use of innovative ways to build ecologically sustainable National Highway framework, NHAI plans to construct 538 'Amrit Sarovar' or Ponds near National Highways across the country, that will help to rejuvenate surface water bodies and ground water.

3.6.2 GROUNDWATER MANAGEMENT

In 2022, National Highways Authority of India (NHAI) carried out a first-of-its-kind experiment in Himachal Pradesh using a unique technology of water harvesting in highway tunnels. As part of this project, NHAI successfully managed to harvest seepage water in the Nela tunnel (a 1245-metres long tunnel in Nela village, Mandi) that lies between Pandoh and Nerchowk on the Kirathpur- Manali Highway.

Besides tackling the water damage to the tunnels, NHAI's new initiative will also help to tackle the increasing water crisis. Since 50% of the drinking water comes from groundwater, it's an innovative idea to utilize natural resources to fulfil the water needs of everyone.

Road infrastructure projects do have in-built ground water recharge provision which regulate natural water flows and simultaneously recharges the ground water. The DPR for the Concessionaires has provisions for

1. Identification of locations of rainwater harvesting and artificial recharge structures.
2. The DPR includes design of such structures based on rainfall intensity and geo technical strata.
3. Way side amenities and other costumer centric services need to have rain water harvesting structures.

These provisions are governed under MoRTH Circular dated 3rd September, 2019 on Rain Water

Harvesting and Artificial Recharge along National Highways- Standard Operating Procedure.

3.6.3 WATER CONSUMPTION

To the extent possible, we ensure that no groundwater is utilized during construction and operations of our assets. Water stress is a major issue in some states in India and we make sure that we

are informed and sensitized to the water availability scenario of the regions / states. This is done through Environmental Impact Assessment (EIA) studies, as well as through reports and studies published by Central Groundwater Authority (CGWA) in India.

Our water consumption parameters and sources are highlighted in the table below.

Table 11 Energy Consumption through NHA's Assets and Establishments

Water Consumption Parameters	FY 21-22
Total water consumption from all areas KL	7,37,10,943
Total water consumption from all areas with water stress in KL	1,96,000





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Primarily, the preference for water being utilized for our operations is to be sourced from State authorized tanker water suppliers. In FY 22, we consumed more than 70 million cubic meters of water across all our operations and assets in India, out of which only 196000 cubic meters of water was sourced from water stressed areas in India. This accounts for less than 10% of our total water sourced. We also started with the practice of storing water, which allowed us to recycle and reuse water to the extent possible, thus decreasing stress on our various sources of water.

In addition, our initiative supporting the Amrit Sarovar Programme was successfully implemented and we were able to harvest significant amount of rainwater from the various ponds developed by NHAI. The ponds created are also aimed to provide number of ecological services for the area. This success story will be further enhanced as NHAI will keep working towards developing more surface bodies that will help with water conservation, rainwater harvesting, meeting community needs and helping us in our goal of efficient use of water resources.

3.7 MATERIALS AND WASTE MANAGEMENT

NHAI is committed to reducing and recycling its waste in line with objectives of our environmental management system and resource optimization strategy. We ensure that best waste and effluent practices are in place for

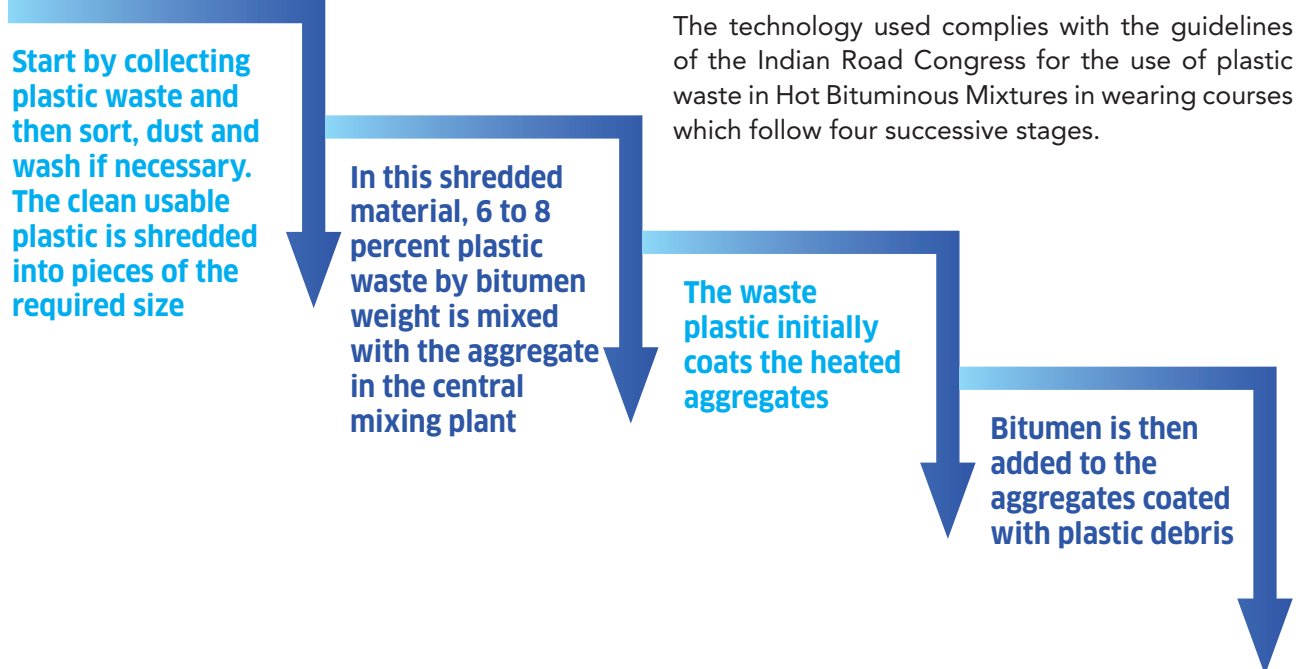
the waste generated. We are striving to reduce waste not just due to regulatory obligations, but to act as a responsible corporate so that the waste generated has minimal impact on the environment.

The Ministry of Road Transport and Highways encourages the use of plastic waste in the construction of National Highways, especially in those areas located within 50 km of urban areas having a population of 5 lakhs or more. Highly populated urban areas are likely to generate the most plastic waste.

NHAI has already used plastic waste in the surface courses of the construction of National Highways on a pilot basis in the states of Tamil Nadu and Kerala. We are now expanding the use of plastic waste by mapping ongoing projects in the vicinity of populated urban areas. NHAI has recently built a stretch of road with plastic waste on NH-48 near Dhaula Kuan in the national capital.

A portion of the Delhi-Meerut Expressway and the Gurugram-Sohna Highway have also been planned to be built using plastic waste. In addition, all NHAI Offices had been asked to collect plastic waste from the beginning of September, 2021. The plastic waste collected in this way is used for the construction of roads. Regional Officers have also been directed to coordinate with State/Union Territories to receive plastic waste collected from various centers for use in road construction.

The technology used complies with the guidelines of the Indian Road Congress for the use of plastic waste in Hot Bituminous Mixtures in wearing courses which follow four successive stages.



Start by collecting plastic waste and then sort, dust and wash if necessary. The clean usable plastic is shredded into pieces of the required size

In this shredded material, 6 to 8 percent plastic waste by bitumen weight is mixed with the aggregate in the central mixing plant

The waste plastic initially coats the heated aggregates

Bitumen is then added to the aggregates coated with plastic debris

The construction of 1 kilometer of four-lane highway would help eliminate approximately seven tons of plastic waste.

Field performance studies carried out in India have identified many advantages of using plastic waste in bituminous mixtures for road construction such as:

- Greater resistance to deformation,
- Greater durability and improved useful life and greater stability and resistance,
- Increase in Marshal Stability Value which defines the maximum load carried by a specimen at standard 60 degree Celsius,
- Increase strength and durability of the road,
- Better resistance to uncontrolled rainwater and water stagnation,
- Augmented binding capacities of the mixture,
- Lesser possibilities of generation of potholes, and
- Reduction of pore formation in aggregates.

The consumption of bitumen in the mixes is also reduced. In addition, this process opens a path for the environmentally friendly disposal of plastic waste. NHA monitors the long-term performance of national highways using plastic waste with bituminous mixtures to assess pavement performance.



USE OF PLASTIC IN ROAD CONSTRUCTION – CASE STUDY

In December 2021, NHA signed a memorandum of understanding with the National Cadet Corps (NCC) to reuse plastic waste, collected by the cadets during its latest campaign, for construction of roads across the country. According to the ministry, 3.4 lakh cadets from 127 coastal area NCC units have so far collected approximately six tons of plastic waste.

The aim of the campaign was to propagate the message of 'importance of clean seashores/beaches' amongst the local population and future generations.

Figure 27 Usage of Plastic for roads



CONSERVING NATURAL ENVIRONMENT

3.7.1 MATERIALS MANAGEMENT BY NHAI

Over the last three (3) financial year, we have used various types of material to meet the needs of highway construction and maintenance. NHAI tasks Concessionaire(s) with sourcing the required

materials from local and reputed sources, to ensure that the project needs are met and the local community is provided with a source of employment. The materials used in our projects over the last three financial years are listed in the table below.

Table 13 : Materials

ITEM	Unit of Measure (UoM)	FY 19-20	FY 20-21	FY 21-22
Non-renewable materials used				
Cement	Metric tonne (MT)	21,72,990	44,76,042	64,72,189
Steel	Metric tonne (MT)	5,99,249	5,99,601	5,98,827
Aggregates	Metric tonne (MT)	4,10,30,165	5,06,81,269	5,18,20,562
Sand	Cubic metre (Cum)	1630600	1626765	16,26,629
Stone dust	Cubic metre (Cum)	50,211	21,163	61,781
Soil	Metric tonne (MT)	23,08,612	42,81,859	54,70,945
Bitumen	Metric tonne (MT)	11,26,309	13,69,133	15,22,000
Emulsion	Metric tonne (MT)	1,34,654	1,66,726	8,44,978
Borrow Earth/Earth	Cubic metre (Cum)	2,76,60,593	3,20,51,844	4,10,09,970
GSB	Cubic metre (Cum)	2,49,960	6,57,574	6,18,628
Dowel Bars	Metric tonne (MT)	116	340	673
GGBS (Ground Granulated Blast Furnace Slag)	Metric tonne (MT)	2,816	5,169	9,446
Gravel	Metric tonne (MT)	13,68,097	20,81,913	18,87,583
Admixture	Metric tonne (MT)	275	179	610
WMM (Wet Mix Macadam)	Metric tonne (MT)	1,64,441	3,00,254	2,67,625
Morrum	Metric tonne (MT)	1,36,565	1,82,088	1,36,566

Apart from above mentioned materials, NHAI sources regionally available resources which can be reused during future course of actions of construction as a practice of recyclability. The materials such as shuttering, sheets, fibres etc. have been used in multiple ways during the construction.

All of the above listed materials are essential to highway construction and maintenance. However, we do recognize that said material may not be renewable and alternatives are essential in ensuring that our projects do not get disrupted. Therefore, NHAI has identified various sources of recyclable materials that are used in highway construction and maintenance. They are listed in the table below.

Table 14: Recycled Materials

ITEM	Unit of Measure (UoM)	FY 19-20	FY 20-21	FY 21-22
Recycled materials used				
Reclaimed Asphalt Pavement (RAP)	MT	320	14,020	NA
Recycled Aggregates (RA)	MT	21,426	20,818	3,271

As can be observed in the table above, NHAI has continuously been using recyclable materials for highways construction. Reclaimed Asphalt Pavement (RAP) and Recycled Aggregates (RA) have been the primary sources, due to their easy access and efficient use in our industry. Use of RAP and RA is something we encourage all our concessionaires to do, and the response has been positive. With this we aim to further enhance our capabilities towards efficient use of materials. We have also commenced the use of plastic in road construction, which has not only helped our materials management but has also kept

us aligned with the goal of plastic management and reduction.

3.7.2 WASTE MANAGEMENT BY NHAI

This section highlights how NHAI has managed and diverted its waste.

The waste generated in NHAI's operations over the last three (3) financial years is provided in the table below. Herein in this report, Non-Hazardous waste materials consists of construction and demolition waste, and waste generated during periodic maintenance of National Highways.

Table 15: Non-Hazardous Waste

Composition of Waste	Unit	FY 19-20	FY 20-21	FY 21-22
Non-Hazardous Waste				
Demolition waste	MT	33,28,761	34,42,919	31,13,673
Organic Waste	MT	4,31,136	7,33,658	7,64,666
Dismantling of existing road	MT	3,00,581	14,33,935	3,36,669
RAP & Aggregate	MT	1,20,858	3,53,732	8,19,278
Electrical Street Light poles	MT	1,312	1,213	941
Metal Waste	MT	15	13	25
Plastic	MT	4	4	3
Concrete	MT	Not Available	Not Available	15,000
DBM BC scrap	MT	Not Available	Not Available	35,000
Steel scrap	MT	Not Available	Not Available	100
Scarified Bituminous	MT	3,694	2,873	1,642
Crusher Wastage	MT	2,02,175	1,57,247	89,856
Used Tyres as Rubber	MT	1	1	0
Admixture	MT	275	179	610
WMM (Wet Mix Macadam)	MT	1,64,441	3,00,254	2,67,625
Morrum	MT	1,36,565	1,82,088	1,36,566

The data mentioned as not available was not measured at project site in respective FY.

CONSERVING NATURAL ENVIRONMENT

As can be observed in the above table, our operations primarily generate construction and demolition waste, which is managed as per the Construction & Demolition Waste Management Rules of 2016. In 2021-22, we observed a decrease in C&D waste and similar trend was observed in waste generated from dismantling of roads and crusher waste.

We have identified paper waste as a concern within our offices and we aim to digitize our paper records to decrease our dependence on paper, thus decreasing paper

waste generated in our offices. This exercise is proposed for all our Regional Offices and at our Project Implementation Units including Head Quarters.

Furthermore, we have extensively worked towards diversion of waste from landfill. Our recycling and reuse practices ensure that we reuse the waste generated by us to the extent possible and we have also tied up with various industries to utilize their waste in our operations. Data for waste diverted by NHAI is presented in the table 16.

Table 16: Waste diverted from Landfill or Disposal Sites

Parameters in MT	FY 19-20	FY 20-21	FY 21-22
Fly ash	95,22,040	94,57,208	1,27,82,460
Plastic	365	263	431
Debris	14,000	9,002	Not Available
Steel Slag	61,706	72,413	42,429
Pond Ash	Not Available	Not Available	10,75,966

The data mentioned as not available was not measured at project site in respective FY.

As can be observed in the above table, we have seen an increase in the utilization of plastic in road. At NHAI, we also started using pond ash for highway construction in FY 21-22, with the aim to find more sources of recyclable waste.



USE OF FLY ASH IN ROAD CONSTRUCTION

Fly-ash has caused environmental pollution, creating health hazards and requires large areas of precious land for disposal. Due to increasing concern for environmental protection and growing awareness of the ill effects of pollution, disposal of ash generated at thermal power plants has become an urgent and challenging task.

Ministry of Environment, Forests and Climate Change (MoEF&CC) has issued various notifications for fly-ash utilization. As per the latest notification of MoEF&CC, it is mandatory to use fly-ash in construction of roads or flyover embankments within a radius of 300 km of thermal power plants.

In October 2020, MoRTH published guidelines for 'Specifications for Road and Bridge Works' and IRC 'Manual of Specifications and Standards' (two, four and six laning of Highways etc.), use of fly-ash shall conform to the MoEF&CC guidelines.

Bulk utilization of fly ash in construction has a lot of potential. National Highways Authority of India (NHAI) is currently using more than 100 lakh Tonne fly ash in construction in different NH projects in India and proposed to increase it two folds in the future. The scope of utilization of fly ash in road construction are - Embankments and backfills, Reinforced or unreinforced, Stabilization of subgrade, sub-base and base course, and for replacing a part of OPC in concrete pavements, paving blocks, kerb stones, etc.

3.8 BIODIVERSITY MANAGEMENT

Biodiversity conservation is an ongoing process occurrence, and we, as a conscious authority, realize the relevance of conserving biodiversity in terms of sustainability. All our projects go through the Environmental Impact Assessment (EIA) to identify risks, identify measures to minimize or avoid risks and define forms of mitigation against potentially adverse impacts and risks. We also develop site-specific management plans to avoid net loss of biodiversity.

All our projects aim to prevent human wildlife conflict. We are also aware of the fact that any violation of the laws may result in fines and/or sanctions to the organization.

At times, the untimely felling of trees can take place in anticipation of approval besides financial non-compliance. Corresponding regulatory action has been undertaken as per the prevailing rules.

3.8.1 PLANTATIONS AND GREEN HIGHWAYS

NHAI has a mandate to fulfil the objectives of Green Highways Policy-2015 by way of Plantation, Transplantation, Beautification and Maintenance activities so as to develop green aesthetic corridor along the National Highways by planting ornamental and flowering trees and shrubs on median and roadside available land in RoW. The plantation and landscape development activities are being implemented through Annual Plantation Action Plans as per IRC: SP: 21-2009 (Guidelines on Landscaping and Tree Plantation). NHAI is also taking up the transplantation of trees wherever it is feasible based on the technical parameters. Bamboo plantations in the extreme row of avenue plantations are also being taken up. Various plantation models like Miyawaki Plantations are being implemented on land parcels of NHAI with suitable local plant species which have maximum intake of Carbon dioxide and release of Oxygen. The monitoring and evaluation of plantation works is carried out with the help of IT

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based applications such as data analytics platform-Data Lake and Drone videography along with inspections by field functionaries. Mobile app 'Harit Path' has been developed and made operational in August, 2020 through which 184.93 lakhs plants were geo-tagged till March, 2022.

In addition, NHAI has notified IRC guidelines for all types of plantation landscaping activities on the highways. Standard Operating Procedure (SOPs) for Plantation and Transplantation, Expression of

Interest (EOI) and Request for Proposal (RFP) for empanelment of qualified agencies and project implementation process have been designed to involve plantation agencies, NGOs and Self Help Groups (SHGs). Majority of the plantations (approx. 80%) were carried out by the road concessionaires. The balance plantations were entrusted to private plantation agencies, NGOs, Self-Help Groups (SHGs) and State Government Agencies. The table below gives details of RO wise plantation initiatives of NHAI.

Table 17 Plantations in FY 21-22

Sr. No.	Regional Office	Fresh Plantations as on March, 2022 (No. of plants in Lakh)		
		Avenue	Median	Total
1	RO-Bengaluru	1.47	2.26	3.73
2	RO-Bhopal	2.25	3.52	5.77
3	RO-Bhubaneswar	2.43	1.35	3.78
4	RO-Chandigarh (HR)	1.00	0.59	1.59
5	RO-Chandigarh (PB)	2.15	0.81	2.96
6	RO-Chennai	0.33	0.32	0.65
7	RO-Dehradun	1.40	0.73	2.12
8	RO-Delhi	2.80	6.71	9.50
9	RO-Gandhinagar	0.58	1.80	2.38
10	RO-Guwahati	1.01	0.72	1.73
11	RO-Hyderabad	0.64	1.54	2.18
12	RO-Jaipur	4.17	5.28	9.45
13	RO-Jammu	0.11	0.31	0.42
14	RO-Kolkata	1.64	0.74	2.38
15	RO-Madurai	0.61	1.21	1.82
16	RO-Mumbai	1.03	2.47	3.50
17	RO-Nagpur	2.20	2.26	4.46
18	RO-Patna	1.07	0.96	2.03
19	RO-Raipur	0.70	0.31	1.02
20	RO-Ranchi	1.32	1.21	2.53
21	RO-Shimla	0.47	0.25	0.71
22	RO-Kerala	0.04	0.20	0.24
23	RO-UP East	1.13	2.12	3.24
24	RO-UP West	0.54	1.63	2.17
25	RO-Vijayawada	0.50	1.17	1.67
TOTAL		31.58	40.47	72.05

National Highways Authority of India (NHA) has created Environment Division and Green Highways Division (GHD) with a team of environment and forestry experts for planning, implementation and monitoring plantation programmes and other mitigation efforts with the involvement of all stakeholders - concessionaires, private plantation agencies, NGOs and State Government agencies. In this regard, project based collaboration is also envisioned with Corporates, PSUs and other plantation agencies willing to adopt/fund roadside plantations under their Corporate Social Responsibility Program. NHA has also collaborated with PSUs and banks in their CSR activities.

NHA has been undertaking

plantation drives from time to time to develop eco-friendly National Highways and has constantly addressed ecological concerns by adopting environmental-friendly methods. In the year 2021-22, NHA planned to undertake a sustained plantation drive. The aim was to saturate all National Highway stretches with plantations, collectively by Concessionaire, State Government Departments and Private Plantation Agencies. Apart from plantation, NHA is also emphasizing on transplantation of trees which are required to be felled for development of highways projects. NHA has engaged experts from the environment, plantation, forestry, agriculture, horticulture field with vast experience for guiding and overseeing these activities.



Figure 28 Chairman Sh. Santosh Kumar Yadav steering plantation drive



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A 40-km stretch along the Mumbai-Nashik national highway was turned into a carbon sink. It now serves as a natural reservoir that stores carbon-containing chemical compounds accumulated over an indefinite period of time.

The carbon sink is a Corporate Social Responsibility initiative of Yes Bank, which is working closely with the National Highways Authority of India (NHAI) to undertake plantation works. The project, which is a part of the NHAI's Adopt a Green Highway drive, was implemented along the stretch from Gonde to Pimpalgaon. As of now, 20, 000 saplings have been planted.



01

Addresses all the three pillars of sustainability: Environment, Economy and Society

02

Build resilient ecosystem in the form of “Green Corridors” along NHs which helps in absorption of GHG gases and collection of dust particles

03

Improvement in micro-climatic conditions along National Highways: such as air quality, soil quality, temperature, biodiversity richness etc

04

Contribute to general health, and well-being of citizens living along the highways by arresting pollution, purifying the air and reducing dust and noise pollution

05

Contribute in creating an additional Carbon Sink through roadside plantations for fulfilling the commitment under Nationally Determined Contributions (NDCs) at CoP 21



Plantation by NHA- Collaboration with SHGs



Assessment of plantation by NHA



Plantations Maintenance



Employee Volunteering for Plantations



Preparation for Plantations



Large Plantations Drives



Plantation protection and Management



Mass Plantation Drive



Worker engaged for plantation maintenance

3.8.1.1 CARBON SEQUESTRATION

Through our plantation drive and Green Highways mission, we are working towards Carbon Sequestration. As per the MoEF&CC study, it is estimated that the avenue plantations and compensatory afforestation done post construction of the highways together potentially can sequester 584.27 thousand tonnes of CO₂ over a 20-year period.

3.8.1.2 MONITORING OF PLANTATIONS

To monitor the plantations across our highways, we have implemented the following programmes to ensure our Green Highways mission is going ahead as planned.

- **Drone Videography** - NHA has adopted the latest technology of Drone Videography for regular monitoring of National Highways along with plantation stretches. It will bring transparency



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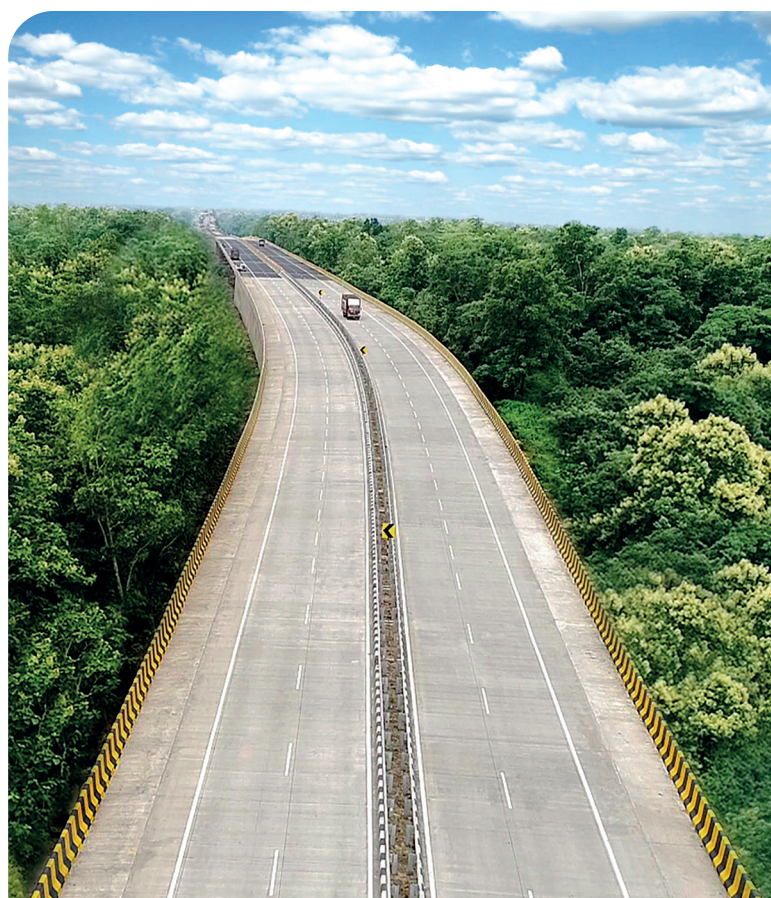
and uniformity while covering the entire National Highway stretches of Avenue and Median Plantations with minimal human intervention. Moreover, the Contractors/ Concessionaires are bound to carry out mandatory monthly drone video recording and upload the same in the Data Lake for capturing various project development phases.

- **Data Lake** - Data Lake is a Big Data Analytics platform of NHAI wherein the plantation data is also being uploaded every month for analysis and monitoring of all the projects. The data is carefully entered at each Program Implementation Unit (PIU) every month which is then verified at Regional Office level in order to ensure correctness and reliability of the data uploaded. It provides all the relevant information about the project e.g., chainage wise plantation details, species planted, IRC target, plantation done etc. This data is further utilized by Joint Advisors (Plantation) and Young Professionals to bring out necessary analytics for improving the overall plantation works along the National Highways.
- **Geo-tagging** - NHAI has launched 'Harit-Path' mobile app which provides digital address to every plant planted along the National Highways. The GPS based app was developed by NHAI to monitor location, growth, species details, targets and achievements etc. under all plantation projects. In order to track the growth and health of the plants, data of the plants captured using Harit-path is uploaded on NHAI's Big Data Analytics Platform- Data Lake. Till March, 2022 approx. 1.85 Cr plants have been geo-tagged within the Right of Way (RoW) of National Highways.
- **Field Inspections by Joint Advisors (Plantation) and Young Professionals** - NHAI has engaged Joint Advisors (Plantation) and Young Professionals (Plantation Manager) in all the Regional Offices whose primary task is to regularly monitor the plantation and other NRM activities under their jurisdiction. They visit the plantations on the National Highways regularly and provide necessary guidance to the frontliners. Due to the regular inspections, the actual condition of the plantations in the field done

by the Concessionaires/ Plantation Agencies is checked and necessary corrections are made to improve them.

3.8.2 WILDLIFE MANAGEMENT

The need to promote practices that integrate conservation concerns in infrastructure development are being universally acknowledged by planners, transportation agencies and ecologist in most countries. The need is even more emergent in India where the challenge to maintain healthy, living landscapes with the benefits they deliver invariably comes in conflict with the expanding infrastructure development. Wildlife conservation is not just a strategy aimed at protection of rare, threatened and endemic biodiversity but is a well-recognized means of achieving ecological security, human wellbeing and sustainable development of any country. The concept of Protected Area (PA) management has gradually expanded over the period of time as the areas adjoining as well as outside the Protected Areas have a significant role to play in protection and conservation of wildlife. The development of highways in wildlife rich areas at times can result in fragmentation of wildlife habitat and reduce carrying capacity of the area to sustain wildlife. Hence, proper designing of NH structures is very crucial for conservation and protection of wildlife.



SUCCESS STORY OF NH-44

In the case of NH-44 (Old NH- 7) a long stretch was passing Pench Tiger Reserve in Maharashtra. Hence, to mitigate the impact of highway construction, various structures were designed with the help of Wildlife Institute of India and constructed under the supervision of Hon'ble High Court, Nagpur. The total length of the project is 117.078 km out of that 37.450 km is passing through Pench Tiger Reserve.

Contract Amount (Rs. In crores)	1170.52
Cost of Mitigation Structure	260 Cr.
Length of Mitigation Structures	09 Mitigation measure structures viaduct length of 2, 255 m. The effective length of 6, 605 m in Forest stretch.
Date of Completion of Project (including Forest Reach)	19.03.2019 (for 78.628 km+ 37.450 km Forest Reach)
Completion Period	36 Months

EFFECTIVENESS OF MITIGATION STRUCTURE ON NH-44

- This is the first of its own type of project in India for the protection of Wildlife and the 750 m structure is the longest completed mitigation structure in India as on date.
- NHAI has shown their contribution towards diversified activities other than construction.
- The completed structure photographs and photographs of wildlife crossing through the mitigation structures caught by CCTV camera are given in figure below.
- The NH-44 (Old NH-7) has been developed into 4 lane configurations under NHDP Phase-II North South Corridor under BOT (Toll) from Km. 652.00 (New Km. 653/225) to Km. 729.00 including Construction of Kamptee-Kanhan and Nagpur Bypass and maintenance of already 4-Laned Section from Km. 14/585 to Km. 36/600 NH-7 (Nagpur-Hyderabad Section) in the State of Maharashtra.

PHOTOGRAPHS OF WILDLIFE MITIGATION STRUCTURES IN PENCH TIGER RESERVE



Figure 29 Wildlife Mitigation Structures in Pench Tiger Reserve

CONSERVING NATURAL ENVIRONMENT

PHOTOGRAPHS OF WILDLIFE CROSSINGS THROUGH THE MITIGATION STRUCTURES

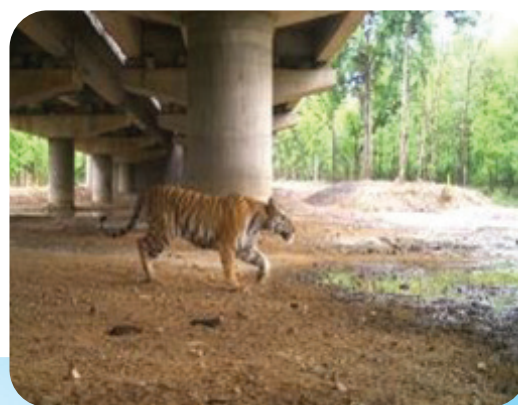


Figure 30 Wildlife crossing through Mitigation Structures

127% increase in use of NH-7 underpasses by tigers

Even as wildlife lovers raised reservations due to curtailed wildlife mitigation structures after a tiger got injured in a road hit on NH-44 (NH-7) on April 17, the latest report by the Wildlife Institute of India (WII), which suggested these mitigation steps, reveal that there is a 127% increase in the use of these underpasses by tigers as compared to 2019.

Dehradun-based WII Scientist said in 2019, 5,675 crossings by wild animals were recorded. However, in 2020, the crossings have increased to 16,608, a 193% increase. Besides, there is an increase in 127% use by tigers compared to 2019.

It has been stated that, "There is a 127% increase in the use of underpasses by tigers. Most species were found using these structures 50% more than the previous year. Hare, cheetals, and wild dogs were the most frequent users of these structures like last year."

The NH-7 is the longest highway in India and is part of the north-south corridor

connecting Srinagar and Kanyakumari. Along its course, it connects several important urban and rural centers of economic importance. It also cuts across important animal corridors along its route. Tigers have been regularly using six of the nine underpasses constructed by the NHAI that range from 80 meters to 750 meters in width.

The survey revealed 352 crossings by tigers in 2020, as compared to 155 in 2019. Similarly, 167 crossings of leopards were recorded as compared to 37 in 2019. Besides, 10,170 crossings of cheetals were recorded, which is nearly three times (3,450) more than in 2019. "At least 24 wild animal species are using these underpasses and there is an increase in movement of all the species," as per the WII scientist.

It has been further stated that, "Natural revegetation under the structures has prompted many wild species like the wild dog and cheetals to 'use' these spaces, in addition to merely crossing. On a few occasions, a pack of wild dogs was seen driving out a stag below the wildlife structures to open space."

PHOTOGRAPHS OF WILDLIFE CROSSING STRUCTURE FOR MITIGATION – GUWAHATI



Figure 31 Wildlife crossing structures 1



Figure 32 Wildlife crossing structures 2

CONSERVING NATURAL ENVIRONMENT



Figure 33 Natural habitat management initiatives 1

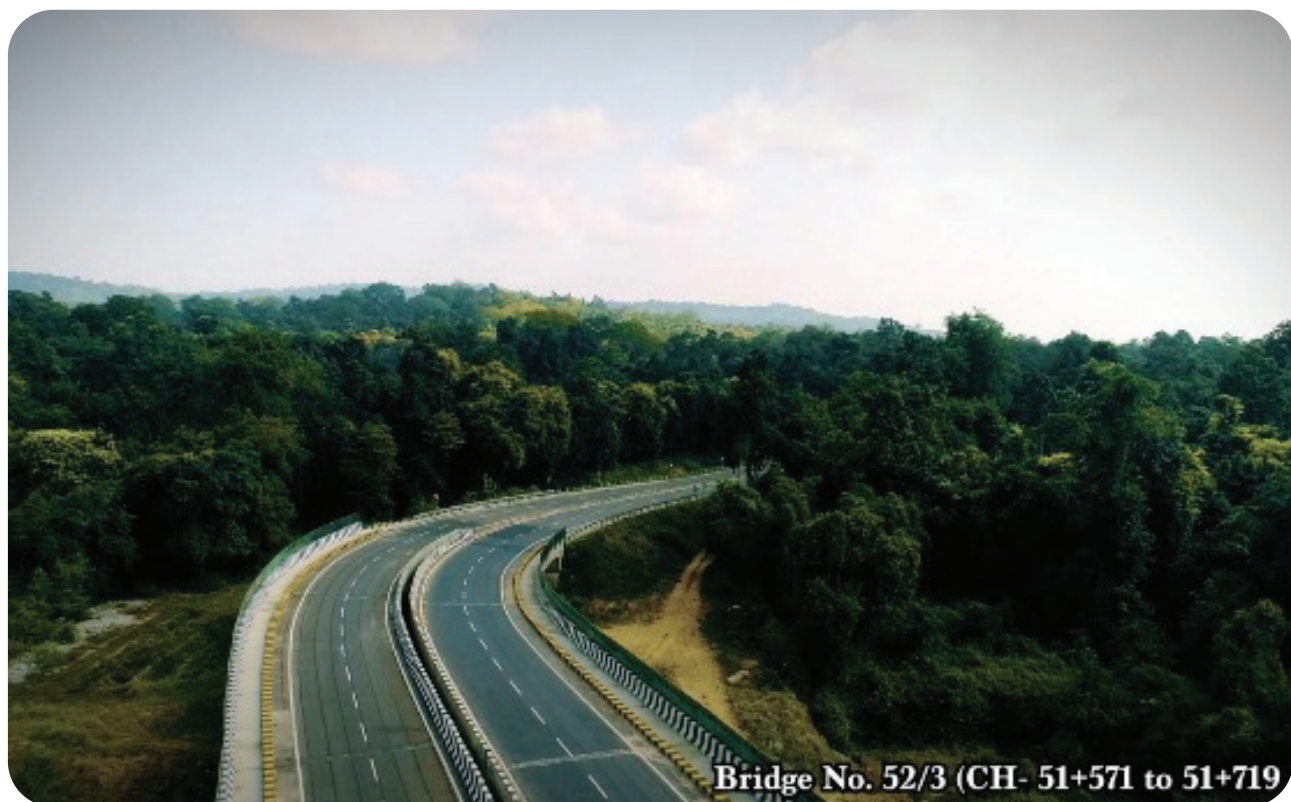
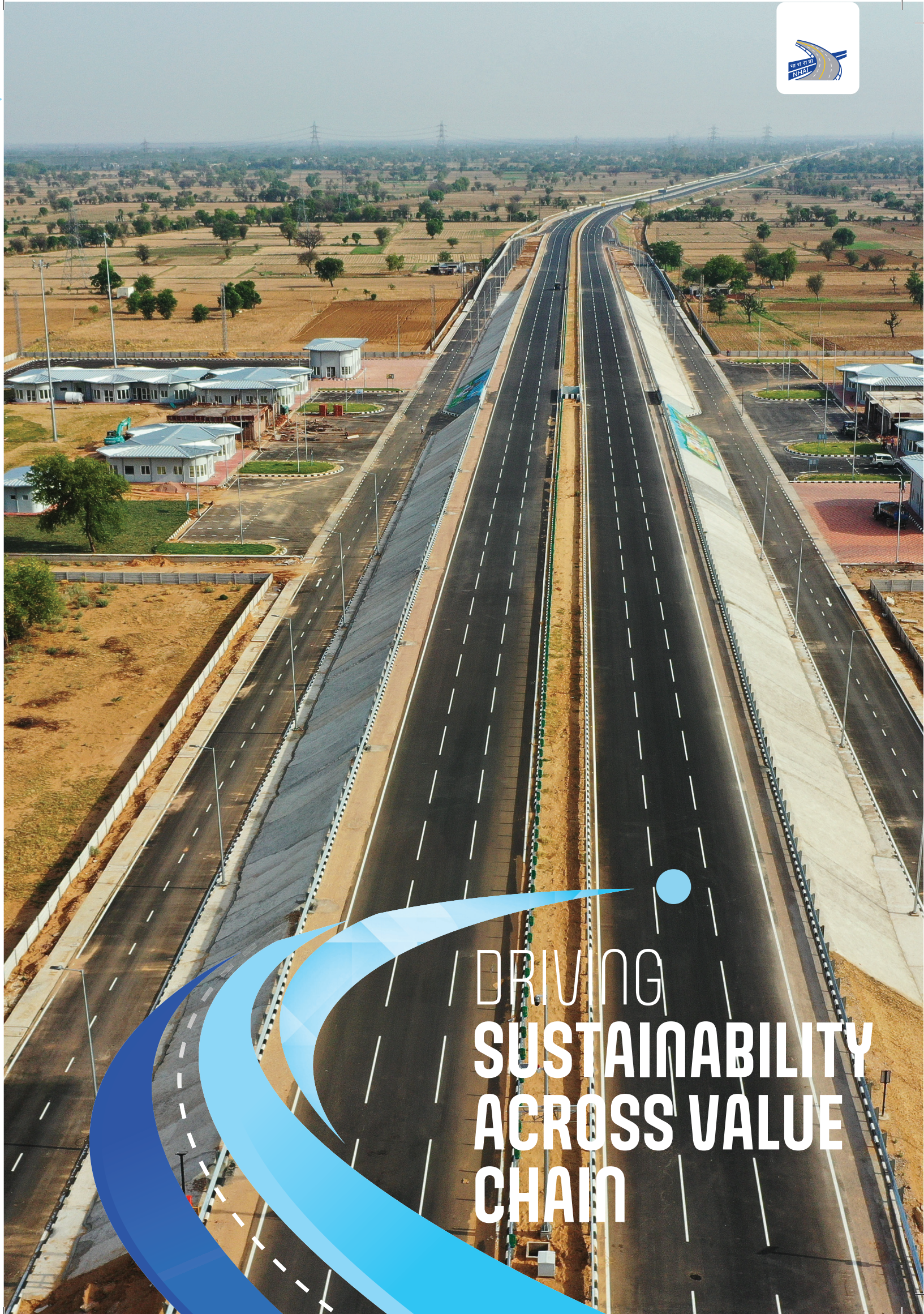


Figure 34 Natural habitat management initiatives 2



DRIVING
**SUSTAINABILITY
ACROSS VALUE
CHAIN**

DRIVING SUSTAINABILITY ACROSS VALUE CHAIN

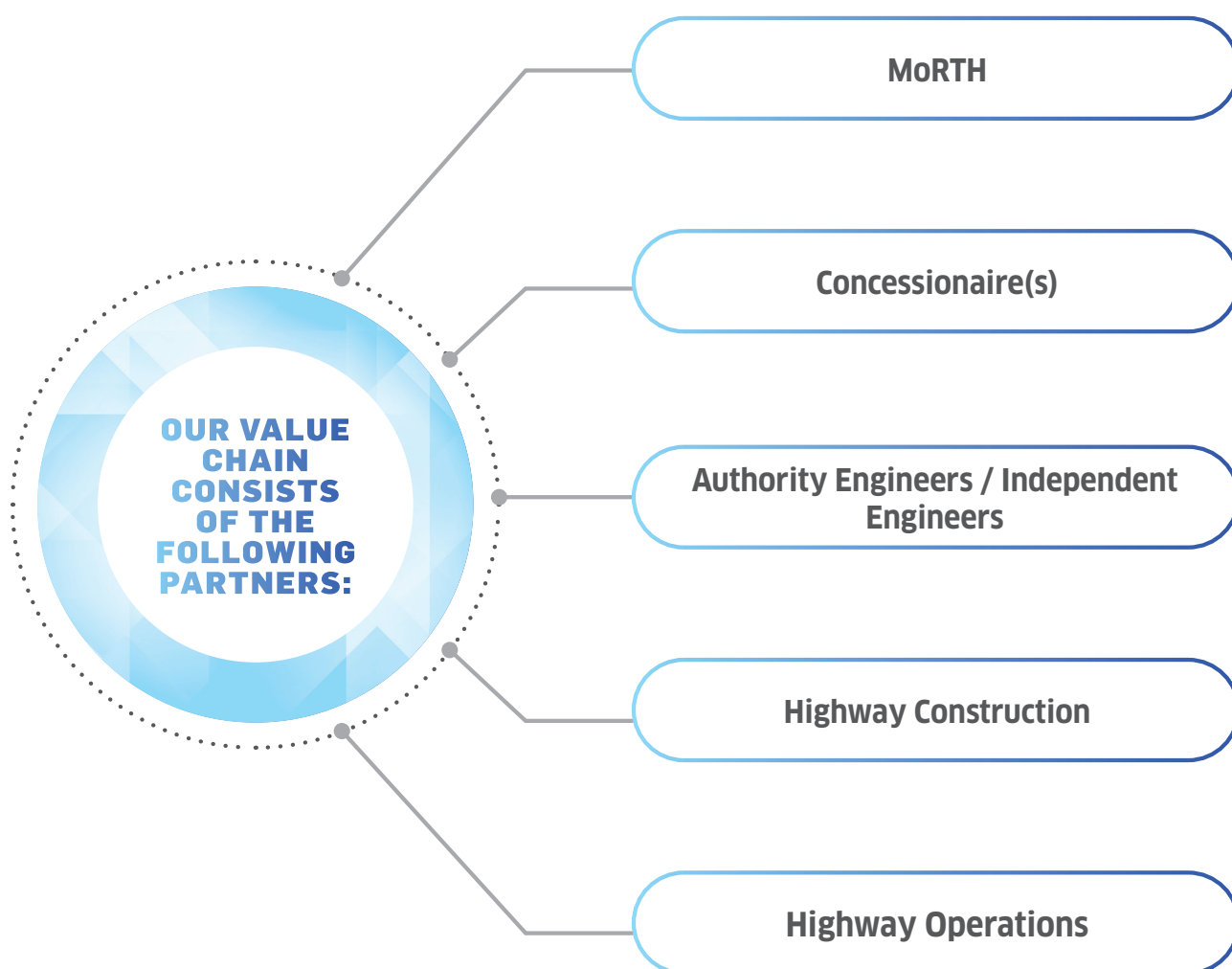
Responsible sourcing, introduction of circularity in waste management, sourcing of recyclable materials and reduction in use of single use materials are a few initiatives and approaches taken up by NHAI to enhance its value chain.

Principle of resource optimization along with financial efficiency guides our procurement and sustainable material practices. We lay emphasis on stringent anti-corruption practices and only engage with entities and individuals who ensure strict statutory and regulatory compliances.



Figure 35 MoU Signing with EESL

4.1 NHAI'S VALUE CHAIN AND ITS APPROACH OUR VALUE CHAIN CONSISTS OF THE FOLLOWING PARTNERS:



Our supply requirements are primarily the items listed in the figure below. For all construction and maintenance related materials, we task our Concessionaire(s) with sourcing the required materials from local and reputed sources, to ensure that the project needs are met and the local community is provided with a source of employment.

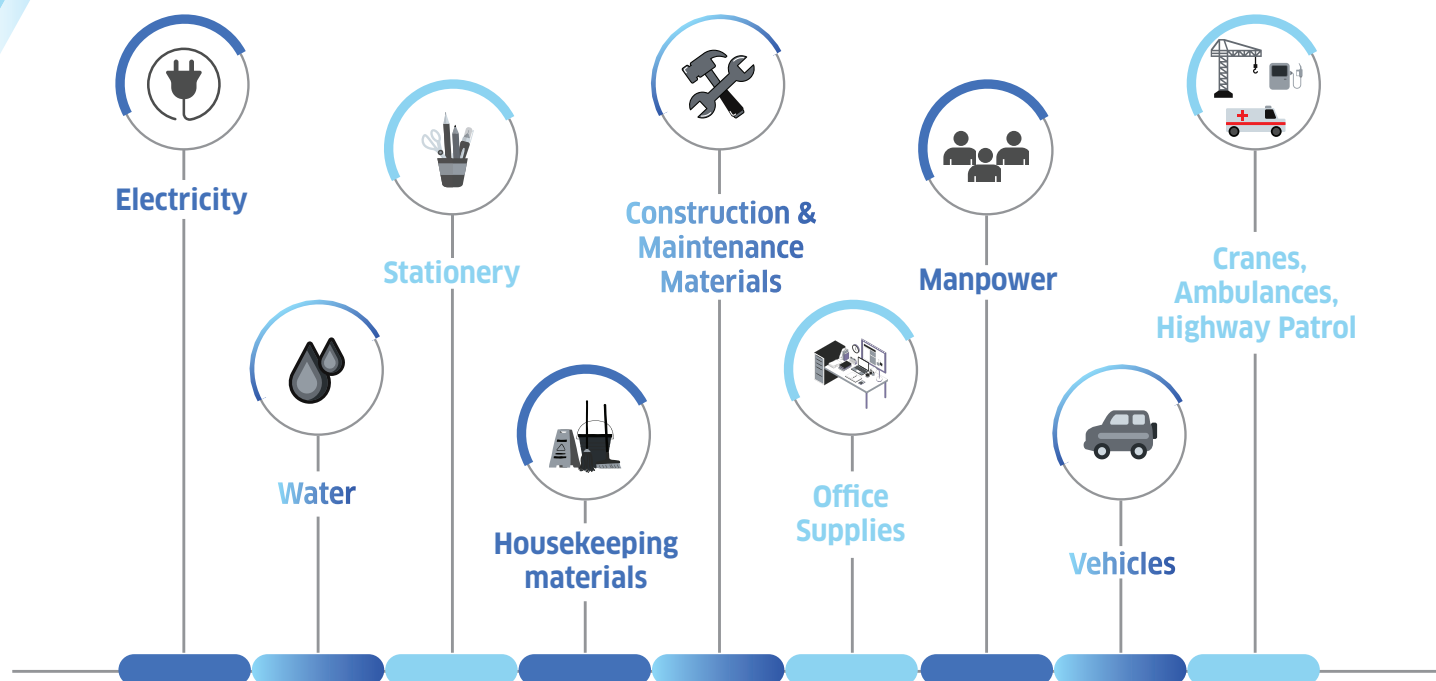
Our partners are mandated to adhere to applicable laws pertaining to worker wages, health and safety, and other workplace laws pertaining to human rights.

Proactive engagement with them aids us in imparting industry best practices and aligning with our ESG targets for achieving sustainable development.

At our HQ, Regional Offices and Project Implementation Units, we prepare and assign expenditure for the purpose of security and housekeeping including stores required for repairs/ sanitary fittings/ water supply/ electricity installations etc., in line with NHAI Policy Circulars issued time to time.

DRIVING SUSTAINABILITY ACROSS VALUE CHAIN

MATERIALS/ ITEMS REQUIRED BY NHAI



4.2 SUPPLY OF MANPOWER AND CONTRACTOR RESPONSIBILITIES

We ensure the compliance by contractors regarding Employee Pension Fund & Miscellaneous Provisions Act, 1952 along with other labour laws. Names of the Contractors covered under the EPF, and MP Act can be searched and downloaded from website – epfindia.gov.in

The provisions of EPF & MP Act, 1952 is applicable to the following:

- To every establishment which is a factory engaged in any industry specified in Schedule I and in which 20 (twenty) or more persons are employed, and
- To any other establishment employing 20 (twenty) or more persons or class of such establishments which the Central Government may, by notification in the Official Gazette, specify in this behalf.

The Contractor / Concessionaire is responsible for all pay and allowances of persons deployed and is required to be compliant to local laws including minimum wages etc. The Contractor is required to supply manpower for "Staff- Deployment" as well,

based on the demand given by NHAI from time to time, within 02 weeks of the Written Notice. In case of failure against any category, the NHAI can get the staff from other agency by nomination, at the risk and cost of the Bidder- Contractor/ Concessionaire.

The Contractor/ Concessionaire is also required to inspect the work site where the work under their contract is to be carried out and carefully note the area restrictions and obtain for themselves at their own responsibility all the information which may be necessary for the purpose of the successful execution of the contracted work.

Contractors/ Concessionaire must also make themselves conversant with all the local conditions, means of access to the site of work, transport facilities and character of the work, the supply of materials, conditions affecting labour and other matter that may affect their tender. All equipment required to be maintained are to be kept free from damages due to operation connection with the work. Site organization within the site boundary is the responsibility of the Contractors.



Figure 36 Workers at Site

4.3 RESPONSIBLE PROCUREMENT AND SUSTAINABLE MATERIAL SOURCING

We are committed to ensuring that materials sourced for highways construction are sustainable. We have seen an increase in the utilization of fly ash in road construction, along with plastic and steel slag.

NHAI has encouraged the use of plastic waste and abides by the following MoRTH requirements:

- Bituminous mix with waste plastic shall be the default mode for periodic renewal with hot mixes within 50 km periphery of urban area having population more than 5 lakhs. Any relaxation on ground of non-availability of waste plastic, cost etc. shall involve re-approval of the Ministry
- All the agencies responsible for preparation of project reports / estimates for the National Highways and Centrally sponsored works are expected to analyze and clearly bring out reasons of inclusion or otherwise of provision of use of waste plastic in wearing coats in the proposal.

We have also used inert materials for construction of our highways, especially in the Delhi/NCR region. The inert materials are residues that are neither chemically nor biologically reactive and that do not decompose, are provided by the bio-mining project in various landfills across India. Bio-mining separates various components from legacy waste, such as plastic, paper, cloth, sand, and bricks, by passing them through a trommel net screening machine.



DRIVING SUSTAINABILITY ACROSS VALUE CHAIN

New Delhi's three landfills (Okhla, Bhalswa and Ghazipur) contain more than 2,80,00,000 tonnes of legacy waste and it has been estimated that 60-70% of the material recovered after the bio-mining process consists of soil, stones and inert material.

UER2 is an upcoming 75.7 km long six-lane expressway in the capital, which will start at National Highway-44 in Alipur, pass through Rohini, Mundka, Najafgarh, Dwarka and end at Delhi-Gurugram Expressway in NH- 48 near Mahipalpur. The project forms a semicircle on the western side of the Capital.

National Highways Authority of India (NHAI) asked the Municipal Corporation of Delhi (MCD) to provide it 3,64,000 tonnes of inert material for the UER2 project, which will be developed in two phases called package 3 and package 4.

As much as 3,00,000 tonnes of inert material is sought for package 3 while 64,000 tonnes of inert will be used for package 4 of the project.

As mentioned in earlier sections of this report, over the last three (3) financial year, we have used various types of materials to meet the needs of highway construction and maintenance. NHAI tasks our Concessionaire/ Contractor (s) with sourcing the required materials from local and reputed sources, to ensure that the project needs are met and the local community is provided with a source of employment.

4.4 PROCESS AND PRODUCT STEWARDSHIP

At NHAI, we ensure that all our products are of the highest standards. Various levels of testing are carried out, at the supplier's level as well as NHAI's and Contractor's levels to ensure that the products being sourced are meeting the required criteria.

We follow the mandate provided by the Indian Road Congress (IRC) on materials, technologies and products to be used in highways construction. IRC has accredited materials, techniques, equipment and products that are required to be used in line with IRC Codes, Guidelines and Circulars. The details of accredited material/technology are available on IRC website.

4.4.1 PROCESS OF PRODUCT SOURCING, TESTING AND MANAGEMENT

On receipt of request from Manufacturers/Suppliers of accredited material and after evaluation in NHAI, trial of their products at ongoing construction projects are permitted in consultation with the supervision consultant and the contractor.

The Manufacturers/Suppliers are required to bear cost of trial and all extra cost of performance evaluation through reputed research institutes either engaged by NHAI or the manufacturer / supplier. Half yearly feedback on performance of sections is required to be intimated to NHAI.

NHAI has the overriding authority to take its own decisions at any stage of the field trials, if in

its opinion such field trials in any project reach are likely to adversely affect the progress, completion, commercial operations date, operation toll collection, and/or adversely impact the concession / contract agreement of the project in any way.

We engage Independent Consultants to ensure that all key activities for the field/ off-site testing of materials/ products such as samplings methods, marking, packing, sealing and transport of collected samples for testing by standard calibrated testing equipment, presentation and analysis of test results in standards formats, acceptance criteria, special tests, procedure

for handling non-conforming materials/ products, calibration of plants and testing equipment etc. are covered as per the Laboratory Testing Procedure Manual.

For wastes associated with the product and its end of lifecycle, NHAI ensures that the same is managed in accordance with the law of the land as well as in an environment friendly manner. We promote diversion of waste from landfills and reuse of the same in our operations. In case the waste is required to be diverted to a landfill site, we always identify said sites within the vicinity of our projects and ensure that the waste is transported and disposed in the appropriate manner.



Figure 37 Bridge at Chambal River at Kota, Rajasthan

DRIVING SUSTAINABILITY ACROSS VALUE CHAIN

Product Identification

01

Product Sourcing

02

Trail of the product by supplier on site

03

Trail of the product by NHAI

04

Use of the Product

05

Half-yearly performance feedback

06

Management and disposal of product, as required

07



Figure 38 Bridge over river Narmada on NH-8 at Bharuch (Gujarat)

4.5 CUSTOMER CENTRICITY

We ensure that we are accessible to our customers, including the highway users and roadside residents. We ensure that their concerns are addressed, and they are provided with best-in-class services. The following facilities are provided for our customers along our National Highways:

- Medical aid centers
- Washroom / toilet facilities
- Emergency phone booths- SoS "Save Our Soul"
- Road-side assistance
- Wayside amenities
- Customer complaint offices (at the toll plaza)

We ensure that all complaints are recorded, and all are brought to an accepted conclusion. We have also set up customer care numbers to ensure all our customers are able to provide their feedback and concerns in a timely manner.



Figure 39 Ambulance facilities at Toll plaza

Toll Plazas are being constructed at designated points of National Highways for collection of fees from the road users.

At NHAI, we have a compensation scheme including insurance cover for third party for workers, road users and road-side residents in case of death/injury/damage to the vehicle/property/resulting from accidents on the project highway, irrespective of the person at fault should be proposed by the Concessionaire. We have set up emergency helpline numbers and contacts details across all our projects, on each highway at regular intervals.

4.6 ROAD SAFETY EFFORTS BY NHAI

NHAI understands that road safety is most important of its material issues as the concerns with well-being for end user i.e. Citizens of India, while using the road which have been built. The principle focus of road safety campaigns lies in developing holistic strategies which remove lacunas of infrastructure, policy and knowledge during project implementation and makes utmost efforts to protect human lives.

NHAI, strongly adheres to National Road Safety policy which was formed through a Committee under the Chairmanship of Shri S. Sundar, Former Secretary (MoST) in the year 2010. The National Road Safety Policy outlines the policy initiatives to be framed / taken by the Government at all levels to improve the road safety activities in the country.



DRIVING SUSTAINABILITY ACROSS VALUE CHAIN

NHAI, in order to achieve a significant improvement in road safety, is committed to:

RAISE AWARENESS ABOUT ROAD SAFETY ISSUES:

NHAI, has been enhancing its efforts to promote awareness about the various aspects of road safety, the social and economic implications of road accidents and what needs to be done to curb the rising menace of road accidents. This has enabled and empowered the different stakeholders to play a meaningful role in promoting road safety.

NHAI's road safety campaign focuses on 4Es of road safety and subsequently develops strategies to ensure safer roads. The 4Es being

- 1. Engineering:** Road Safety is an integral part of engineering design at the Project Planning stage. Indian Roads Congress (IRC) formulates, updates and disseminates various codes on road construction and maintenance including those pertaining to road safety. Road safety specifications / designs are incorporated in the planning and execution of NHAI. Design of highways is done by the consultants meeting all relevant geometric and safety standards which include provisions for flyovers, grade separators, by passes, railway over/under bridges, bus/truck lay byes, service roads, junction improvements, overhead signs, cautionary / regulatory / informative retro reflective sign boards, crash barriers, medians, thermoplastic road markings, traffic lights and delineators, etc. NHAI ensures that these engineering measures are adequate and appropriate to minimize accidents and further fatalities.
- 2. Education:** Citizens using the National Highways are made aware of road safety practices and services to make sure the travel is safe with least records of accidents. NHAI has undertaken multiple initiatives which target the root cause of accidents and educated the end users about the issues which cause them. Education programs targeting heavy vehicle drivers have been key focus area, as about 80% accidents are caused by drivers' fault and 60% of them happen on highways. NHAI has been undertaking programs on Road Safety Education (RSE) through NGOs and local authorities, schools and community institutions.
- 3. Emergency:** NHAI operates an Incident Management System on the National Highways which entails a set of coordinated activities initiated when an accident occurs. The aim of this system is to minimize the effects of the incidents and restore normal capacity and safety levels to all affected road facilities as efficiently as possible. The operator has to identify relevant agencies viz., rescue, fire, hazardous materials, traffic, police, ambulance, hospitals, alternative routes, cleanups, etc. and to liaise with them. The operator also runs 24x7 Route Patrols, Cranes and Ambulances on the said stretches.
- 4. Enforcement:** Enforcement of existing safety laws and parameters is most important aspect for actualisation of road safety initiatives. NHAI has observed multiple impediments to this task such as overloading of commercial vehicles, limited usage of safety devices like seat belts, drunken driving, overcrowded passenger vehicles, limitation in road engineering and animal disturbances during the travel. NHAI has come with robust strategies to tackle these issues with strict monitoring of safety standards in engineering for roads, while helping local road traffic authorities to tackle traffic violation issues.

To propagate the cause of safer roads for all, 'Road Safety Week' was observed from 11th to 17th January, 2022. During the Week, various activities were organised throughout the Country by NHAI, to create awareness among general public and to give an opportunity to all stakeholders to contribute to the cause of road safety. This includes various awareness campaigns related to causes of road accidents and measures to prevent them.

Following these 4Es NHAI has been taking concrete steps towards improving road safety. In FY 21-2022, noticeable initiatives of NHAI were

1. Installation of road safety features: NHAI has been installing road safety features such as crash barriers, signage, and traffic signals on national highways to reduce accidents. Ministry has identified about 4,002 blackspots on NHs entrusted to NHAI based on accident data of 2015-18. Up to March 2022, 2548 blackspots have been rectified with remedial measures, such as sign boards, junction development, improving road geometry/widening, construction of under passes/flyovers, etc. Furthermore, short-term measures like warning sign boards, rumble strips, road markings and so on have been completed at all blackspots. In addition, out of 789 blackspots identified by Ministry on NHs based on accident data of 2011-14, 503 blackspots are under jurisdiction of NHAI. By March 2022, 372 blackspots were rectified. Lighting/illumination provisions have been made at vulnerable locations/intersections of NH with SH/MDR/ODR/Village roads for improving road safety and avoiding accidents during night in addition to locations mentioned in 4/6 laning IRC Manual.

2. Road safety audit: NHAI has been conducting road safety audits to identify the potential hazards on highways and to take corrective measures to prevent accidents. Road Safety Audit (RSA) is conducted at all projects of NHAI at all stages (development, construction and operation) through Safety Consultants appointed for the projects. During 2021-22, independent safety consultants carried road safety audit of 16,508 km of NHs. NHAI has empanelled a total of 53 teams of Road Safety Consultants, each consisting of one Road Safety Auditor-cum-Team Leader and one Traffic Planner. NHAI also conducted Road Assessment Programme (iRAP) safety ratings of 1,288 km of NHs in the state of Uttar Pradesh, Maharashtra and Tamil Nadu. The study assess safety features of road based on different road users such as vehicle occupants, motorcyclists, bicyclist, and pedestrians. The action plan for implementation of their recommendations are under progress with respective Regional Offices.



DRIVING SUSTAINABILITY ACROSS VALUE CHAIN

3. Awareness campaigns: NHAI has been conducting awareness campaigns to educate drivers and pedestrians about road safety measures. NHAI signed a Memorandum of Understanding (MoU) with the Institute for Road Traffic Education (IRTE) and Institute for Development and Communication, Chandigarh (IDC) to promote road safety and collaborate in the areas of traffic management through a programme titled "Capacity building of Road Safety Management through the Safe Systems Approach Programme". The study is being implemented, examined and monitored under Regional Office-Chandigarh.

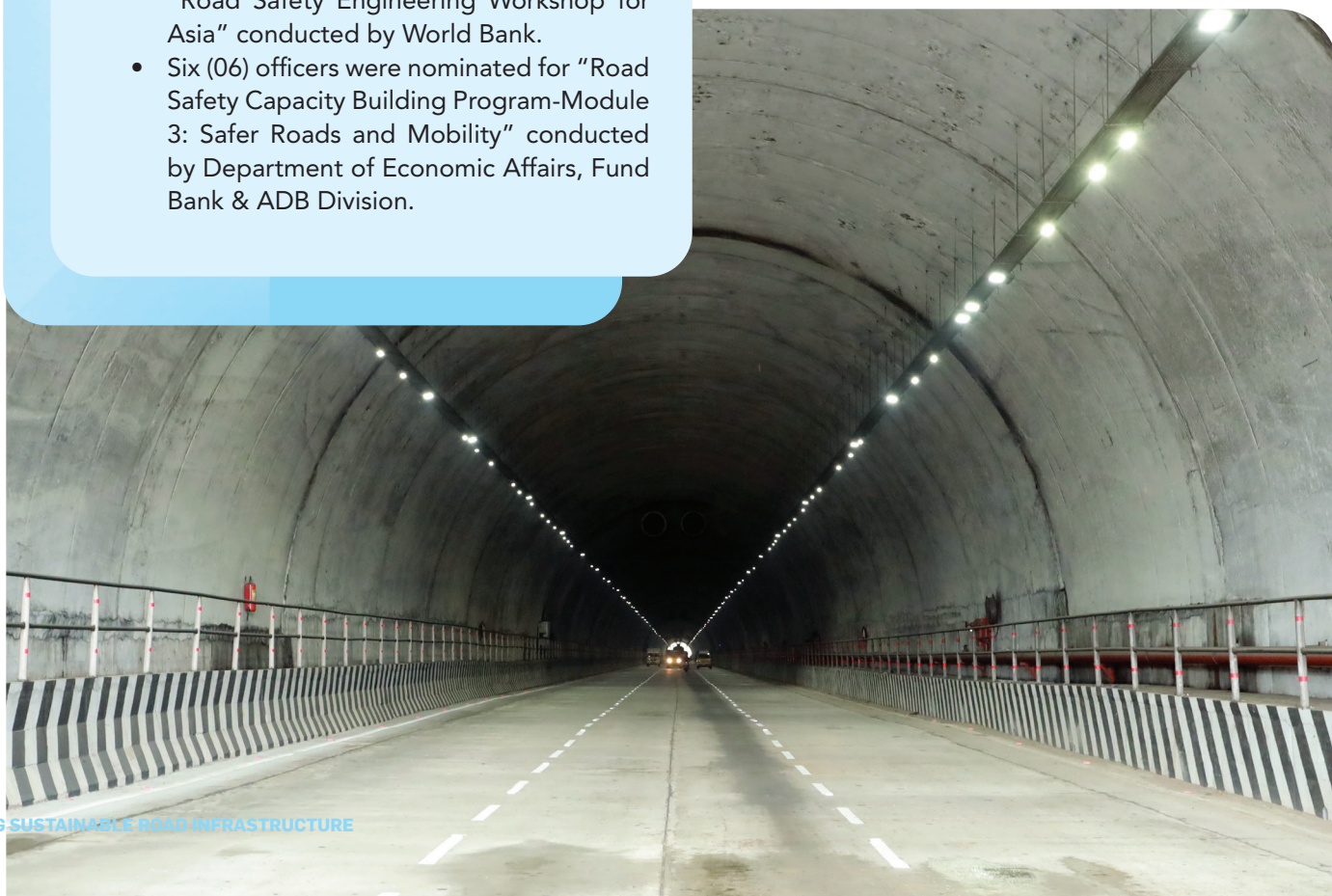
4. Training programs: NHAI has been conducting training programs for its staff, contractors, and stakeholders to improve their understanding of road safety. During the year, NHAI officers were nominated for various training programs in India.

- Twenty nine (29) officers were nominated for "Road Safety Engineering and Auditing" conducted by IAHE.
- Sixty three (63) officers were nominated for "Road Safety: Challengers & Emerging Paradigms in Loss prevention" conducted by IISSM.
- Ten (10) officers were nominated for "15 Days Certification Course on Road Safety Auditors" conducted by IAHE & IIT Guwahati.
- Five (05) officers were nominated for "Road Safety Engineering Workshop for Asia" conducted by World Bank.
- Six (06) officers were nominated for "Road Safety Capacity Building Program-Module 3: Safer Roads and Mobility" conducted by Department of Economic Affairs, Fund Bank & ADB Division.

5. Incident Management System:

NHAI has been setting up an incident management system to provide immediate assistance to accident victims and to clear the road quickly.

These initiatives have helped to reduce the number of accidents on national highways in India. NHAI is likely to continue with these initiatives and introduce new ones in the future to improve road safety further.





4.7 SUVIDHA APPLICATION

The Suvidha application is a mobile application launched by the National Highways Authority of India (NHAI) to provide a range of services and information related to the Indian highways network. The application is available for free download on both Android and iOS platforms.

The Suvidha application provides a variety of services and features to the users, including real-time traffic updates, toll plaza locations, and payment options, emergency services, highway-related notifications, and project-related information. The application also provides users with the facility to lodge complaints and grievances related to the national highways

network. One of the key features of the Suvidha application is the provision of Electronic Toll Collection (ETC) services, which enables users to make cashless toll payments through the application. The application is integrated with the National Electronic Toll Collection (NETC) program, which enables users to pay toll charges at any toll plaza on the national highways network using a single FASTag account.

The Suvidha application also provides information about the nearest petrol pumps, restaurants, and accommodation facilities on the highways. Users can also access information related to road safety, emergency services, and route planning through the application.

DRIVING SUSTAINABILITY ACROSS VALUE CHAIN

4.8 FASTag

FASTag is an electronic toll collection system implemented by the National Highways Authority of India (NHAI) in collaboration with the National Payments Corporation of India (NPCI). FASTag uses Radio Frequency Identification (RFID) technology to enable cashless and contactless toll payments at toll plazas across the country.

NHAI has been successful to be part of a growing digital India campaign by ensuring willful adoption of FASTag services by citizen i.e. road users on India. A few notable points which can highlight the significance and achievements of FASTag are:

- **Reduced Travel Time:** With FASTag, users do not need to wait in long queues at toll plazas, thus reducing travel time significantly. This has resulted in ease of connectivity and reduced waiting time ensuring seamless travel.
- **Cashless Transactions:** FASTag enables cashless transactions, reducing the need for cash and promoting digital payments. Being a significant step in Digital India with lesser and lesser scope for human interference, the FASTag has set example for completely transparent and digital transactions.
- **Increased Efficiency:** The use of FASTag has improved the overall efficiency of toll collection, as the need for manual toll collection has reduced significantly.
- **Environmental Benefits:** FASTag has contributed to reducing the carbon footprint by reducing idling time and congestion at toll plazas. A study has been ongoing to understand the impact of time savings which have averted carbon emissions, which could have been emitted in business as usual scenario.
- **Reduced Revenue Leakages:** FASTag has enabled the government to reduce revenue leakages, as the electronic toll collection system ensures that toll payments are made in a transparent and efficient manner.
- **Increased Compliance:** FASTag has encouraged greater compliance with toll payments, as users are required to maintain sufficient balance in their FASTag accounts to pass through toll plazas. This has also improved the transparency and profitability of project which helps for road sustainability in terms of operation and maintenance.



Figure 40 Kaashi Toll Plaza

A large, stylized blue swoosh graphic that curves from the bottom left towards the center of the page, partially framing the title text. It has a dashed white line running along its inner curve.

BUILDING CAPABILITIES FOR TOMORROW

BUILDING CAPABILITIES FOR TOMORROW



At NHAI, we seek, acquire and develop the skills and abilities to consistently perform at a higher level in pursuit of our innate potential. It is an incremental process of intentional improvement to push past limits and achieve what's most important to us and our stakeholders.

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We have holistic capacity building

capabilities, wherein we provide all applicable benefits to our employees and workers, and train them in such a way that they carry out their tasks to the best of their abilities and develop a potential to learn more. We continuously improve our internal ability to think, learn, plan and execute with discipline, as well as improve employees' health, wellbeing and physical performance.



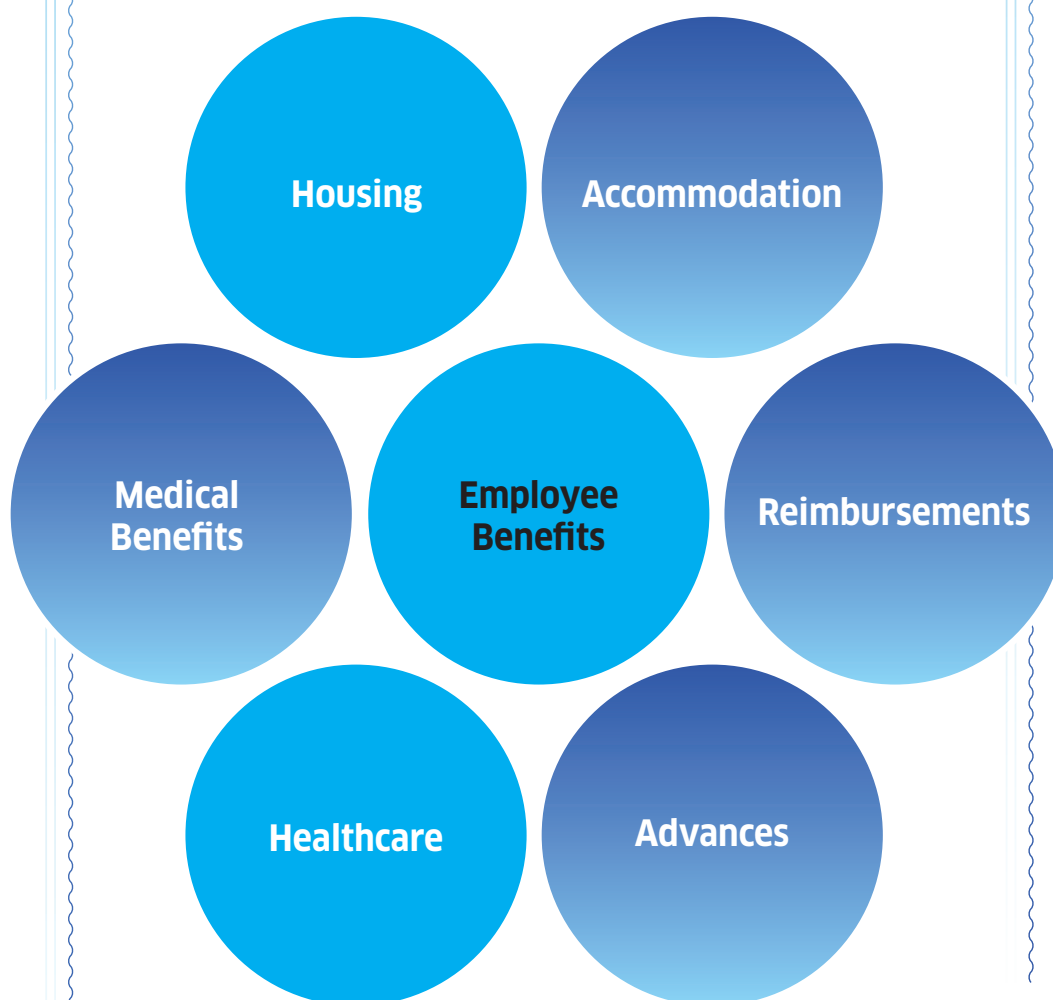
Figure 41 Employee engagement at Azadi ka Amrit Mahotsav

5.1 EMPLOYEE ENGAGEMENT

At NHAI, we define employees that work in all our offices and are under administrative control for project related work within each area of jurisdiction. Our employees are essential for our operations and functioning and we ensure that all basic needs of our employees are met. We provide the benefit of Employee Provident Fund (EPF) as well as Employee Insurance as per applicable Statutory Provisions on the subject. In addition, the Authority is liable to comply with

the provisions of all applicable Acts/Rules like the Employees Provident Funds Act, 1952, Maternity Benefit Act, 1961, Income Tax Act etc. as amended from time to time.

Offering work-from-home opportunities, flexible scheduling, promoting a work-life balance and reducing employee burnout are all important strategies we have used to hire and retain employees. Upon hiring, we provide our employees with the following:



BUILDING CAPABILITIES FOR TOMORROW

MEDICAL CHECK-UP

Our employees are provided with medical health check-ups, in line with schemes applicable only to the regular employees of NHAI and to those who are on deputation to NHAI. We have a tie-up with the following hospitals to ensure all our employees are provided regular and need-basis access, a few of them are listed below.

1. Fortis Hospital (Okhla & Noida Branch).
2. Indraprastha Apollo Hospital, Sarita Vihar, Delhi-Matura Road, New Delhi.
3. Max Hospital (Panchsheel Park, Vaishali and Saket (West Block).
4. HCMCT Manipal Hospital, Dwarka.
5. Primus Hospital, Chanakyapuri, New Delhi.
6. Venkateshwara Hospital, (NABH/NABL Accredited Lab).
7. Dr. Lal Path Labs.

POST-RETIREMENT BENEFITS

We provide such benefits to retired NHAI Officers/Employees. Said benefits are highlighted in the table below. A lump sum amount is indicated below is required to be paid as ten years contribution as payable by an employee:

Table 18 Post retirement benefits at NHAI

Level of pay drawn by the officer	CONTRIBUTION (RS.)
Level : 1 to 5	30,000/-
Level : 6	54,000/-
Level : 7 to 11	78,000/-
Level : 12 and above	1,20,000/-

FACILITIES PROVIDED TO EMPLOYEES:

We also provide our employees with reimbursement of amenities that are essential to them, on the basis of the designation and the pay scale attached to the designation. Some of the facilities are:

- Lease accommodation facility
- Reimbursement of cost of mobile instrument
- Reimbursement of cost of mobile/telephone charges
- Reimbursement of cost of laptop/Notebook
- Reimbursement for purchase of newspapers and magazines
- Reimbursement of the amount for purchase of briefcase/ladies bags etc.

GROUP LIFE INSURANCE

Consequent upon decision taken in the 97th Meeting of the Authority held on 22nd October 2013, the Group Insurance Scheme (GIS) for NHAI's Employees is funded through Annual Budget of NHAI w.e.f. January 2014.

All regular officers/employees of NHAI, officers on deputation to the Authority and all long-term contract employees, who are in active service of the Authority, are covered under the scheme. Uniform Insurance coverage of Rs. 20.00 Lakhs is provided. For personnel on deputation, the insurance cover is by the sum for which they are already insured in their parent organization.

Officers/employees on deputation to other organizations, short term contract employees appointed through the placement agencies or directly by the Project Directors and those on leave on medical grounds for 180 days or more are not covered by the Group Life Insurance Policy. For keeping the membership intact, officers/employees on medical leave are required to join duty for a day before expiry of the ceiling of 180 days.

New employees joining the Authority are enrolled as a member from the date of their joining. Similarly, those returning from leave exceeding 180 days are enrolled as a member of the Policy subject to the employee furnishing a certificate of good health and his/ her being found fit by the Doctor of the Insurance Company.

Risks covered under the scheme are death arising due to illness, accident and natural causes except suicide in the first year of the policy.

REMUNERATION

Our remuneration is in line with the latest requirements of the Central Pay Commission, and we ensure that our employees are adequately compensated. Our employees include the following personnel:

- Management
- Advisors
- Joint-advisors
- Young professionals
- Senior Staff

We provide fixed remunerations to our long-term employees in line with the mandate of the Central Pay Commission. For short-term employees, the consolidated emoluments payable to the short-term employees for the above posts engaged through the Outsourcing/ Placement Agencies, payment of EPF, ESI, Bonus etc. to these short-term employees, are in accordance with the policy guidelines issued by NHAI, HQ from time to time.

EPF and ESI at the prescribed rates are deducted by the Outsourcing/ Placement Agencies from the consolidated emoluments and the equal amount

towards contribution of EPF will be contributed by NHAI, which is deposited by the Outsourcing/ Placement Agencies with the concerned authorities. The consolidated emoluments are paid as per the amount agreed with the Outsourcing/ Placement Agencies, subject to the condition that they are not below the minimum wages prescribed by the Central Government/respective State Governments and a condition to this effect should be stipulated while inviting bids/quotations from the Outsourcing/ Placement Agencies by the field offices.

EMPLOYEE TRAINING AND WELFARE

We train our employees on the benefits we provide them and ensure that they are aware of engagement and welfare activities organized by NHAI. These trainings also include capacity building aspects that enable our employees to be more productive, grow and progress within the Authority. This enables us to reduce our employee turnover rate and also enhance our employee engagement activities.

The total number of Trainings/Workshops and No. of nominated officers during the last 03 years ending March 2022 is tabulated as below:

Table 20 Details of trainings and training nominations at NHAI

S. No.	Number of Training Programmes	No. of Nominations	F.Y.
1.	25	174	2019-20
2.	16	366	2020-21
3.	79	891	2021-22



BUILDING CAPABILITIES FOR TOMORROW

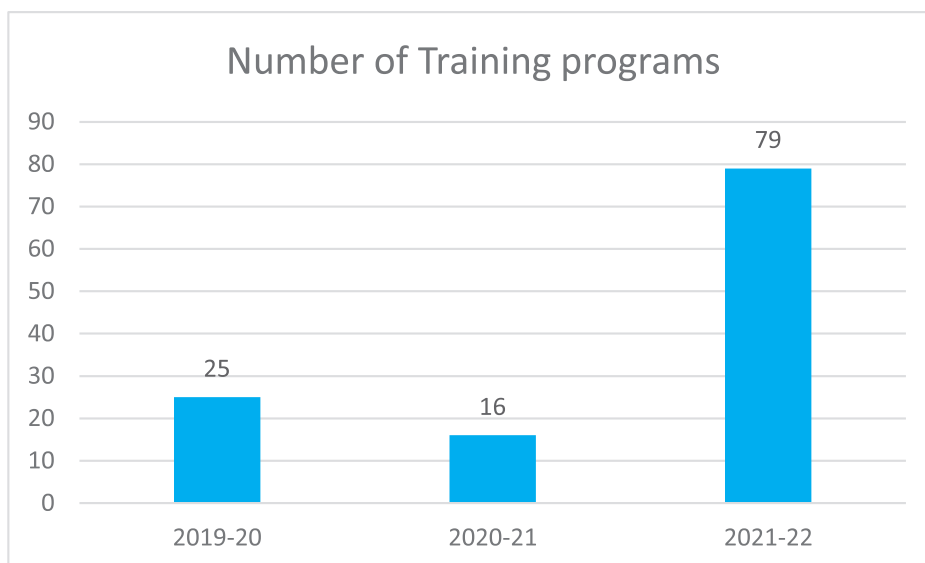


Figure 42 Number of training programs at NHA

As can be observed from the above representation, the number of employee training and welfare programmes increased significantly during FY 22. In addition to this, the number of nominees for said training and welfare programmes have seen increment over the years. This showcases our commitment towards engaging with and enhancing our employees.

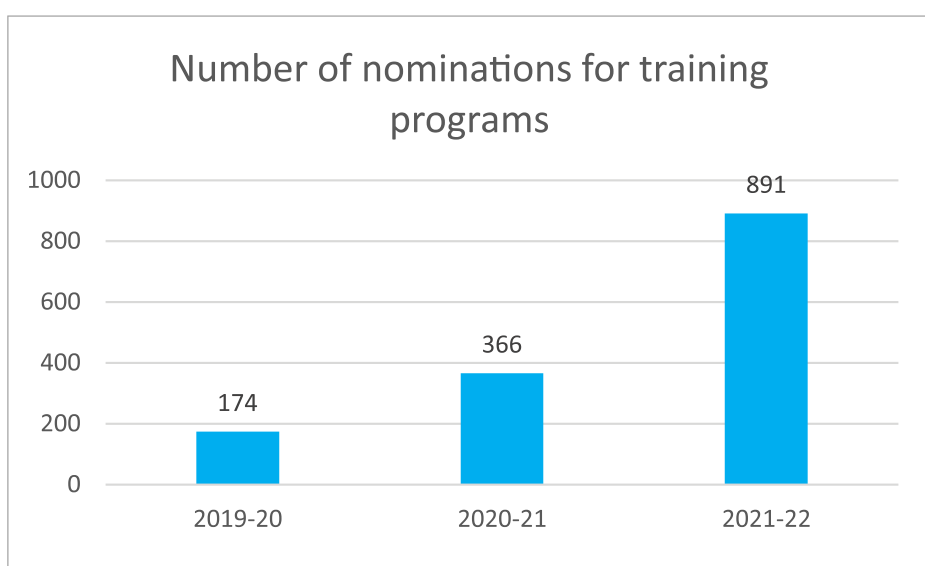


Figure 43 Number of Nominations for trainings

EMPLOYEE ENGAGEMENT

At NHAI, we celebrated “Hindi Diwas” from 1st September to 14th September with our employees to increase interest and awareness about Hindi. During the occasion, a total of 9 competitions including various programs and commenting, typing, translation quiz was organized for the employees. The employees participated in the event with great enthusiasm and displayed their proficiency in the official language Hindi. At the end of the fortnight, the winners were awarded with the prizes.

Besides the Employees in NHAI proactively participate in NHAI Day, International Yoga Day, Health Camps, Group picnics, Celebration of major festivals, Sports events, Women’s Day, Consultative Workshops, Employee Superannuation functions etc. to name a few.



Figure 44 International Yoga Day

VIGILANCE AT NHAI

NHAI observed a Vigilance Awareness Week from 26th October to 1st November 2021 as per the guidelines of Central Vigilance Commission. The week was aimed at affirming the commitment of promoting transparency and probity. In keeping with the celebrations of 75 years of India’s Independence, the theme of this year was “Independent India@75: Self Reliance with Integrity”.

The week started with an integrity pledge taken by all the officers and staff members of NHAI. A workshop on “Public Procurement – A Vigilance Perspective” was held at NHAI headquarters on 29th October 2021, where Shri Shailendra Singh, Chief Technical Examiner, Central Vigilance Commission shared his valuable thoughts on “Vigilance Perspective in Public Procurement” and Smt. Garima Lohani, Commissioner Income Tax, Ex-CVO, ESIC talked about “Stage Wise Assessment of Integrity Risk in Procurement Process”. In addition to that, Shri Giridhar Aramane, the then Secretary RTH & Chairman NHAI, released Vigilance E-Bulletin SACHETAN.



Figure 45 Vigilance Awareness Week at NHAI

Similarly, a Vigilance Awareness Program was organized on 29th October, 2021 at RO Hyderabad including a program at toll plaza with school children and other stake holders. A workshop on vigilance awareness was also organized in Bhopal on 1st November, 2021. All Project Directors under RO Bhopal participated in the workshop. Chief Vigilance Officer NHAI and Regional Officer, Ministry of Road Transport and Highways (Bhopal) addressed the gathering.

BUILDING CAPABILITIES FOR TOMORROW

5.2 TRAINING AND DEVELOPMENT

Regional Offices of NHAI enhance skills of highway workman by providing training to labourers through training providers enlisted by MoRTH under Recognition of Prior Learning (RPL) Scheme. The programme is monitored at the level of Ministry and executed through the Regional Offices and the PIUs of NHAI.

We provide all necessary trainings and development programmes for our employees to ensure they are aligned with our internal safety and HR requirements. We provide trainings on:

- Employee functions
- Benefits
- Internal requirements and procedures
- Reporting structure
- Grievance redressal
- Vigilance
- Health and safety, etc.

As part of the trainings and development programmes, we track all employees trainings and their compliance status. Data on employee participation and trainings is provided below.

Table 21 Average training hours for employees at NHAI

Gender	Measure	FY 19-20	FY 20-21	FY 21-22
Male	Avg. Hours	94	96	216
Female	Avg. Hours	23	28	39
Employee category		FY 19-20	FY 20-21	FY 21-22
Junior (Below Dy. Manager)	Avg. Hours	8	11	42
Middle (Dy. Manager and Manager)	Avg. Hours	86	96	215
Senior (DGM and Above)	Avg. Hours	23	54	54

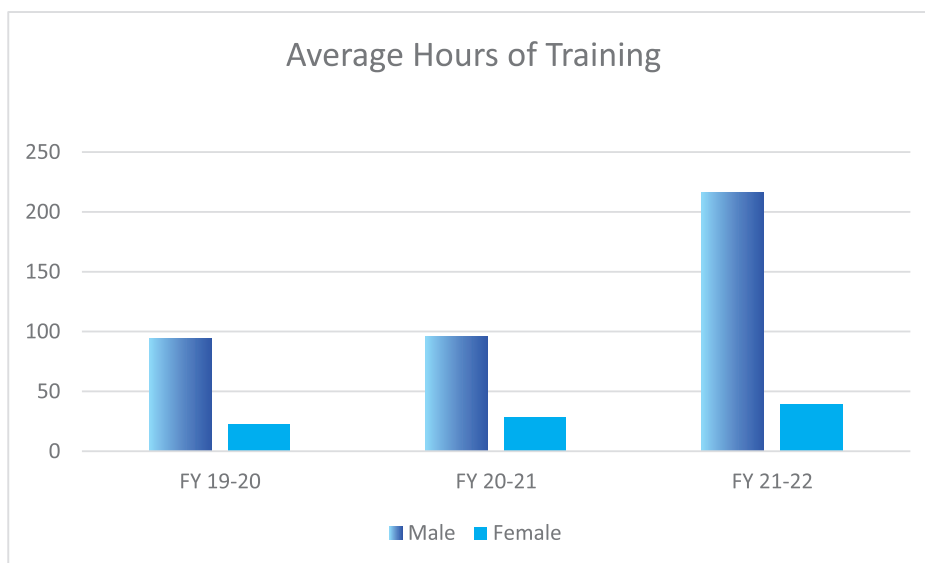


Figure 46 Average Training Hours at NHAI

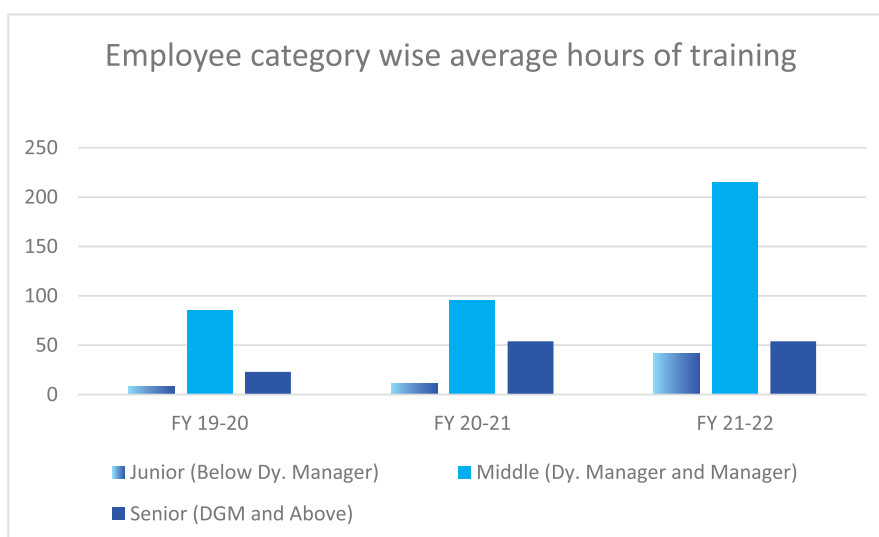


Figure 47 Employee category wise average training hours at NHAI

BUILDING CAPABILITIES FOR TOMORROW

As can be seen from the above data representation, training hours of our male and female employees have seen an increasing trend over the last three (3) years. Our junior and mid management staff are provided with all necessary trainings on an annual basis to ensure they are carrying out the works at the best of their abilities.

We also carry out Annual Performance and Career Development Reviews to ensure that our employees are able to grasp their functional requirements and are able to review their performance over the past year. This is an important exercise in career

development that we prioritize to ensure our employees are valued.

From FY 2019-20 to end of current reporting period, 100 % male and female employees including the contractual employees have undergone a review of their performance at least once a year. This in turn includes all employee categories i.e. Junior (below Deputy Manager), Middle level management (Deputy Managers and Managers) and senior management level (DGMs and above) which includes Technical and Non-Technical functionaries at NHAI.

5.3 EMPLOYEE AND WORKER COMPOSITION

At NHAI, we promote women empowerment and have ensured hiring of women at all levels within the authority. We also promote hiring of minorities for both temporary and permanent workers. Relevant data showcasing our Diversity & Inclusion performance over the last three years, is provided below.

Table 22 Employee and worker composition

Governance Body Composition	FY 19-20	FY 20-21	FY 21-22
No of males in Governance body	206	202	223
No of females in Governance body	10	10	8
No of SC/ST members in Governance body	17	17	11
Employee Composition			
No of males in employment	1736	1901	2169
No of females in employment	256	276	285
No of SC/ST members in employment	149	149	215
Permanent Workers- Male			
Males in management work	291	294	375
Males in non- management work	53	66	80
Permanent Workers- Females			
Females in management work	19	21	54
Females in non- management work	21	16	64
Temporary Workers- Male			
Males in management work	384	384	445
Males in non- management work	982	1007	1189
Temporary Workers- Females			
Females in management work	52	51	50
Females in non- management work	164	179	203

As discussed earlier, every Regional Office has been given authority to plan, conduct, and execute the plans made by them and subsequently approved by the Central Administration, Finance and Technical functionaries. The governance at Regional Office has control over ongoing projects and has control over day to day functions of the Regional Office.

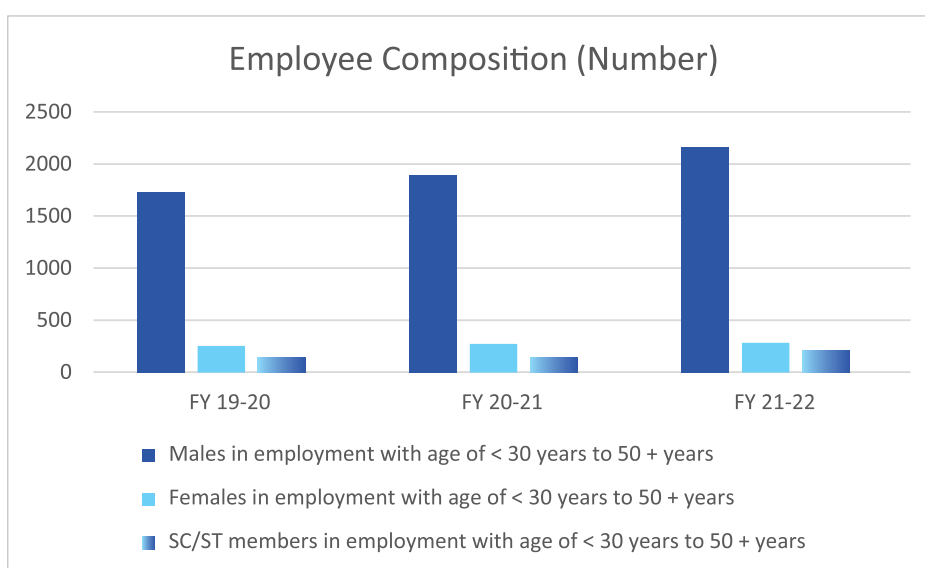


Figure 48 Employee composition at NHAI

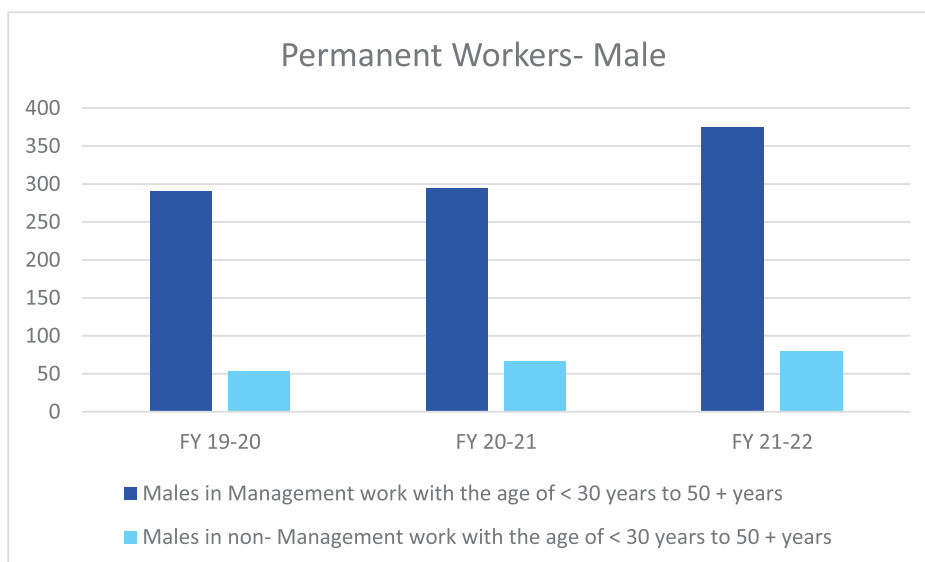


Figure 49 Employee composition at NHAI - Males

BUILDING CAPABILITIES FOR TOMORROW

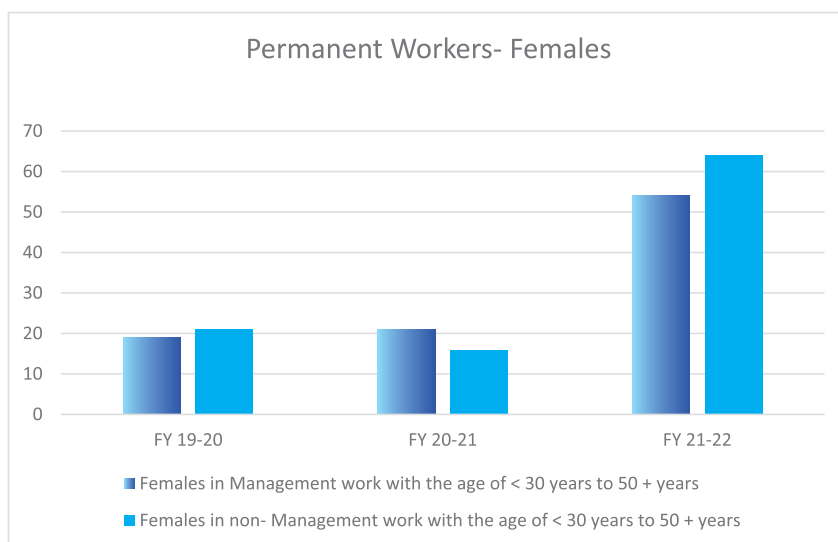


Figure 50 Female Employee Categorization

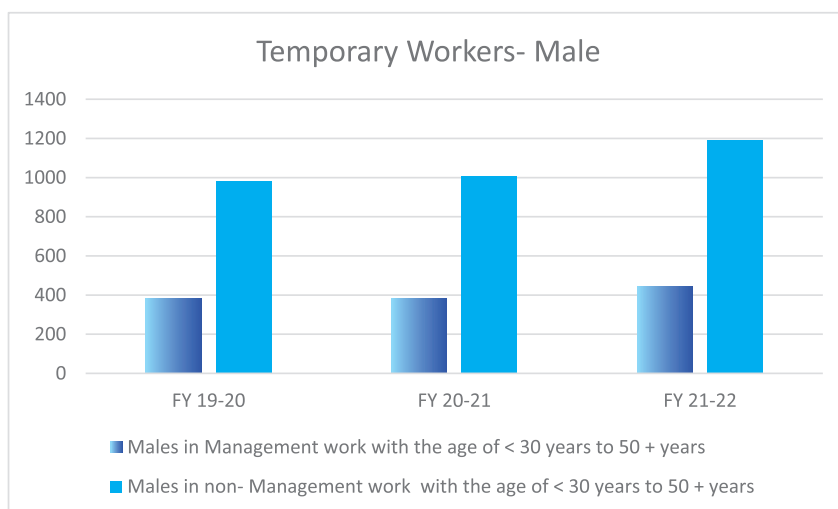


Figure 51 Male temporary workers classification at NHAI

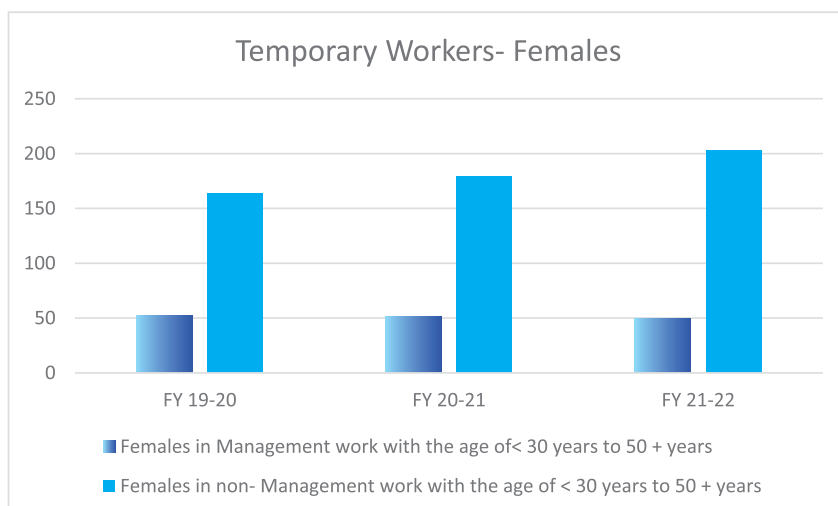


Figure 52 Female temporary workers classification

As can be seen from the above table, the number of female and minority employees has steadily increased over the past three years. We observed a huge rise in number of permanent female employees in FY 22, rising to a total of 118 comprising of management and non-management functionaries. As for temporary workers, we again saw a rise in the female workforce.

This showcases our commitment towards engaging more women and minority personnel within our operations. At Contractor level, we ensure that if female labor is

engaged, then the Contractor makes necessary provision for safeguarding small children and keeping them clear of the site operations.

As for male workers are considered, we have observed a steady increase in the number of workers and employees, ensuring that we hire the talented and best in class workforce to deliver quality and sustainable projects. Our aim is to keep growing and ensuring that NHAI's values are reflected through its employees and workers.

5.4 EMPLOYEE HIRING AND TURNOVER

We ensure that we hire employees regularly that refreshes our perspective on projects and ensure that best in quality services are provided by us. Our data for employee hiring and turnover is provided in the subsequent table.

Table 23 Hiring trends at NHAI

New Employee Hiring And Employee Turnover	FY 19-20	FY 20-21	FY 21-22
Males been hired from 1ST April to 31ST March	407	442	565
Females been hired from 1ST April to 31ST March	115	112	119
Male Hiring Between 1st April To 31st March	FY 19-20	FY 20-21	FY 21-22
Age group while joining is 18-30 years	153	211	291
Age group while joining is 30-50 years	196	169	212
Age group while joining is above 50 years	62	62	62
Female Hiring Between 1st April To 31st March	FY 19-20	FY 20-21	FY 21-22
Age group while joining is 18-30 years	49	54	64
Age group while joining is 30-50 years	59	46	46
Age group while joining is above 50 years	7	12	9
Employees Left The Organization In Single Year	FY 19-20	FY 20-21	FY 21-22
Males left the organization from 1st April to 31st March	185	113	115
Females left the organization from 1st April to 31st March	35	30	22
Males Which Have Left Between 1st April To 31st March	FY 19-20	FY 20-21	FY 21-22
Age group while leaving is 18-30 years	38	49	57
Age group while leaving is 30-50 years	131	47	51
Age group while leaving is above 50 years	16	18	9
Female Leaving Between 1st April To 31st March	FY 19-20	FY 20-21	FY 21-22
Age group while leaving is 18-30 years	12	14	9
Age group while leaving is 30-50 years	21	17	10
Age group while leaving is above 50 years	2	0	2
TOTAL WORKFORCE	FY 19-20	FY 20-21	FY 21-22
MALES	1624	1986	2231
FEMALES	273	263	284

BUILDING CAPABILITIES FOR TOMORROW

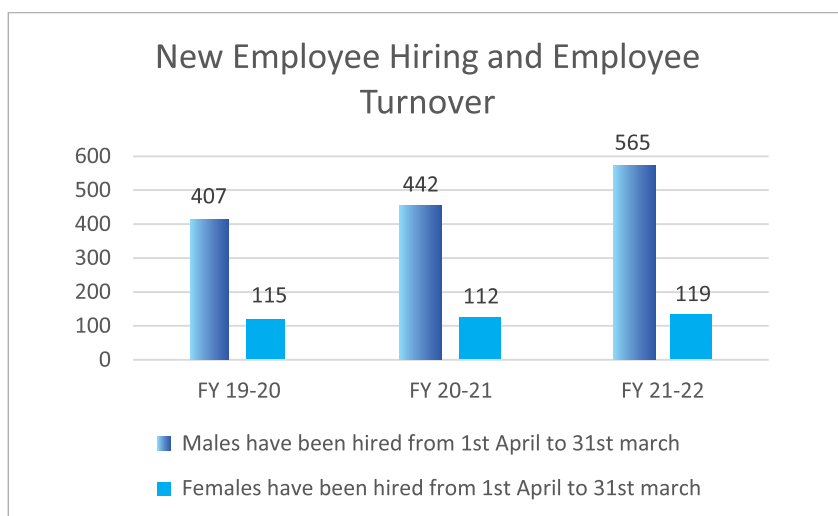


Figure 53 Employee hiring trends at NHAI

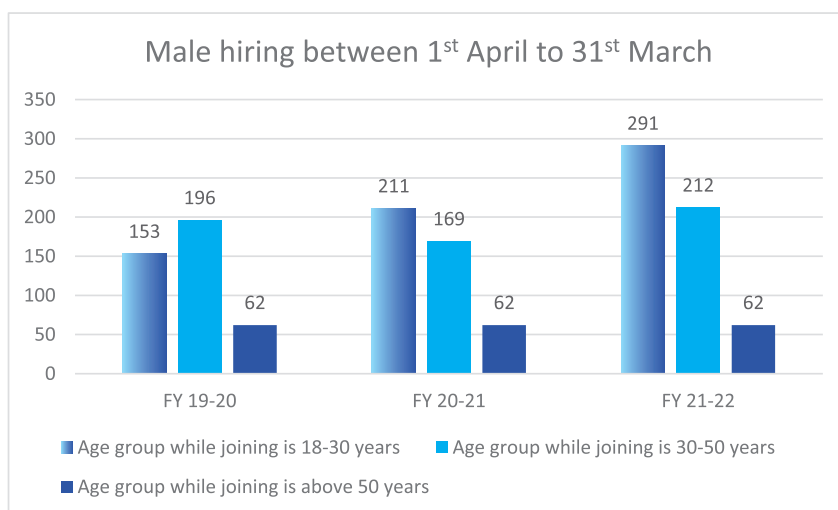


Figure 54 Male hiring trends at NHAI

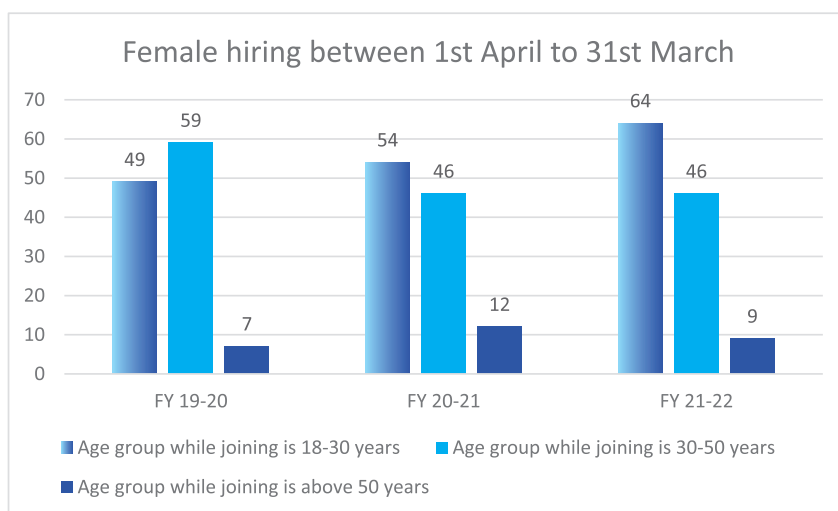


Figure 55 Female hiring trends at NHAI

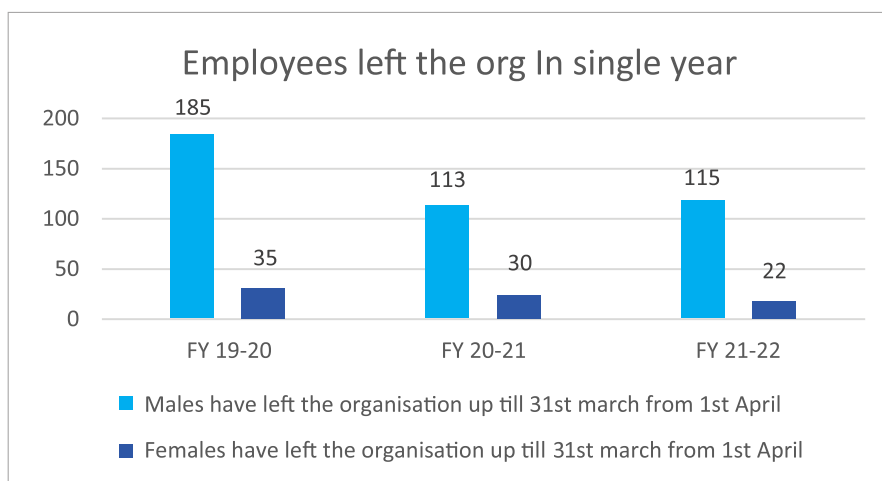


Figure 56 Employee leaving the organization

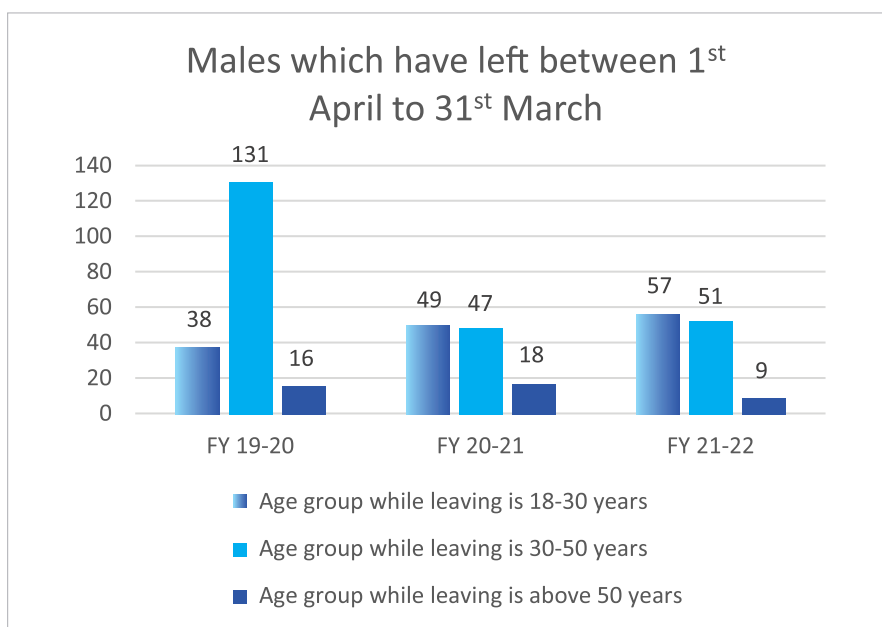


Figure 57 Male attrition trends

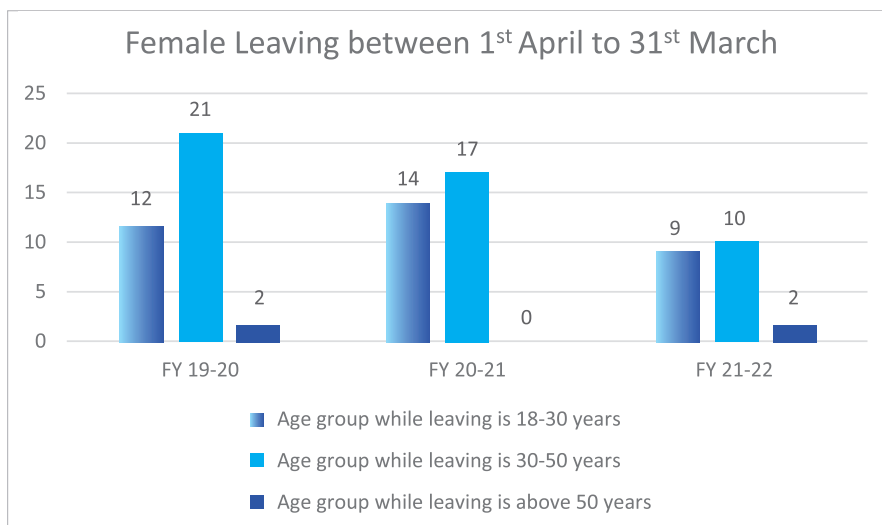


Figure 58 Female attrition trends

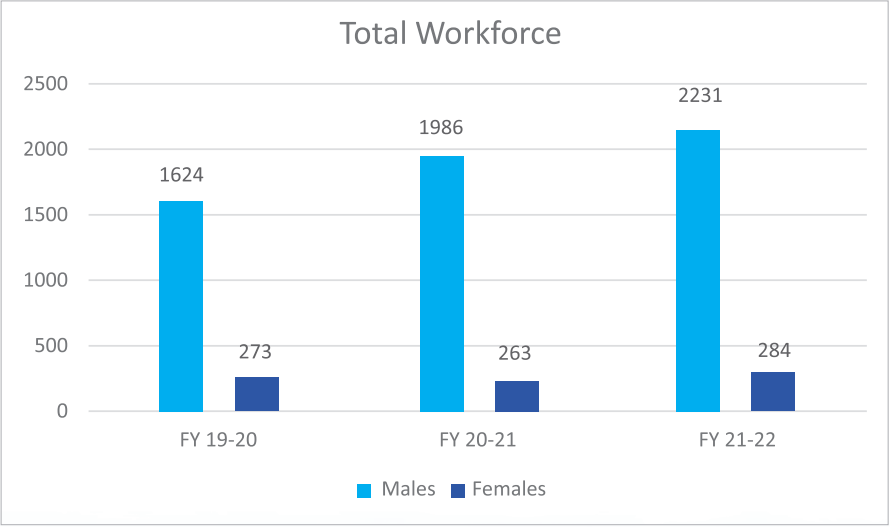


Figure 59 Total workforce at NHAI over the years



As can be observed from the above graphs and table, we have steadily increased our hiring over the last three years. We have seen an increasing trend in our total workforce and hiring, whereas FY 22 saw a decrease in employees leaving the organization. Our hiring numbers are higher than the attrition numbers, which says that NHAI is one of the most sought-after places to work.

Our workforce primarily consists of male workers / employees, but we are working extensively to engage more female and minority employees to showcase our dedication towards diversity and inclusion.

Our workforce has a great mix of various age groups, with youth adding the necessary drive for

us to enhance our organization, whereas the middle and senior management personnel providing the necessary experience to guide our organization and the youth of NHAI.

There have been no major and/or substantial organizational changes that have occurred in the last three years, except for setting up of a few new Regional Offices.

5.5 PARENTAL LEAVE

We provide parental leaves in the form of maternity leaves to our employees. The maternity leaves are provided in line with the Maternity Benefit Act of 1961. Our data for parental leaves over the last three financial years is provided in the table below.

Table 24 Entitlement provisions for Parental leave at NHAI

Reporting Requirements	FY 19-20	FY 20-21	FY 21-22
Number of employees entitled for parental leave (both permanent and contractual)	1897	2249	2515
Number of employees that took parental leave (both permanent and contractual)	10	12	16
Number of employees that returned to work in the reporting period after parental leave ended (both permanent and contractual)	11	12	13
Number of employees that returned to work after parental leave ended that were still employed 12 months after their return to work (both permanent and contractual)	11	11	10



Figure 60 Inauguration of Crèche at NHAI



BUILDING CAPABILITIES FOR TOMORROW

5.6 UPHOLD HUMAN RIGHTS

We at NHAI abide by the Central Civil Services (Conduct) Rules of 1964. As per said rules, a government servant whose services are placed at the disposal of a company, corporation, organization or a local authority by the Government shall, for the purpose of these rules, be deemed to be a Government servant serving under the Government, notwithstanding that his salary is drawn from sources other than the Consolidated Fund of India. The ethics and standards required to be maintained by such servants are as follows:

01

Maintain absolute integrity

02

Maintain devotion to duty

03

Do nothing which is unbecoming of a Government servant

04

Commit himself to and uphold the supremacy of the Constitution and democratic values

05

Defend and uphold the sovereignty and integrity of India, the security of the State, public order, decency and morality

06

Maintain high ethical standards and honesty

07

Maintain political neutrality

08

Promote the principles of merit, fairness and impartiality in the discharge of duties

09

Maintain accountability and transparency

10

Maintain responsiveness to the public, particularly to the weaker section

11

Maintain courtesy and good behaviour with the public

12

Take decisions solely in public interest and use or cause to use public resources efficiently, effectively and economically

13

Declare any private interests relating to his public duties and take steps to resolve any conflicts in a way that protects the public interest

14

Not place himself under any financial or other obligations to any individual or organisation which may influence him in the performance of his official duties

15

Not misuse his position as civil servant and not take decisions in order to derive financial or material benefits for himself, his family or his friends

16

Make choices, take decisions and make recommendations on merit alone

17

Act with fairness and impartiality and not discriminate against anyone, particularly the poor and the under-privileged sections of society

18

Refrain from doing anything which is or may be contrary to any law, rules, regulations and established practices

19

Maintain discipline in the discharge of his duties and be liable to implement the lawful orders duly communicated to him

20

Maintain confidentiality in the performance of his official duties as required by any laws for the time being in force, particularly with regard to information, disclosure

21

Perform and discharge his duties with the highest degree of professionalism and dedication to the best of his abilities

THE CENTRAL CIVIL SERVICES (CONDUCT) RULES OF 1964, AS ABIDED BY NHAI THAT THE EMPLOYEES / SERVANTS OF THE AUTHORITY WILL

The Central Civil Services (Conduct) Rules of 1964, as abided by NHAI that the employees / servants of the authority will:

- Prohibit sexual harassment of working women.
- Not take part in politics and elections.
- No Government servant employs to work any child below the age of 14 years.



BUILDING CAPABILITIES FOR TOMORROW

5.6.1 EMPLOYEE GRIEVANCE REDRESSAL

An internal Grievance Redressal Committee (GRC) has been formed by HR Division at NHAI to address the grievance of NHAI employees pertaining to their service matters. This is in line with GRC Office Memorandum dated 16th July, 2021. The memorandum states that the GRC constitutes of six (6) members, with inclusion of a Presiding Officer, a Member Secretary, and four (4) members. The employees are required to first report any grievance directly to the GRC, with relevant records on the same being maintained by concerned cadre controlling division.

In the reporting period, 95% of such grievances have been addressed/disposed-off in several GRC Meetings.

Furthermore, NHAI has constituted a Complaints Committee to look into the complaints of sexual harassment at workplace. The Committee is reconstituted from time to time as per the posting/availability of the incumbents.

As for employee, contractor and consultant complaints, we have a Compliant Policy that enables the aggrieved personnel to voice their concern in the following manner:

1. By written communication/ letter addressed directly to the Chief Vigilance Officer (CVO) for corruption related complaints and to General Manager (HR/Admin) for other than corruption matters.
2. Electronically through filling the details on the Portal "Complaints" on the website <https://nhai.gov.in>, and also through email . Complaint portal has two categories, which are to be selected by the complainant: (i) Corruption related and (ii) Others. Corruption related complaints will be dealt by CVO and Others by Admin.

Central Vigilance Commission (CVC) and CVO of Ministry of Road Transport & Highways (MoRTH) are the designated Authority to receive complaint under PIDPI (Public Interest Disclosure and Protection of Informers Resolution) wherein Complainant's identity will be kept secret.

5.6.2 PUBLIC GRIEVANCE REDRESSAL MECHANISM

NHAI has a well-defined public grievance redressal mechanism in place to address grievances and complaints from the public regarding NHAI's services or projects. The NHAI has set up a dedicated Grievance Redressal Cell (GRC) at its headquarters in New Delhi, which acts as the nodal agency for receiving and processing complaints from the public. The GRC is responsible for coordinating with the concerned authorities and ensuring that the grievances are resolved in a timely manner. The system has been improved by direct, digital and virtual feedbacks from road user, concessionaires, communities and other important stakeholders.

NHAI'S PUBLIC GRIEVANCE REDRESSAL MECHANISM WORKS THROUGH

1. **Grievance Redressal Portal:** NHAI has a dedicated online Grievance Redressal Portal (<https://pgportal.gov.in/>) where the public can register their grievances related to NHAI's services or projects. The portal allows citizens to track the status of their complaints and provides a platform for communication between the complainant and the concerned NHAI official.
2. **Toll-free helpline:** NHAI has set up a toll-free helpline number (1033) to address the grievances of road users, including complaints related to NHAI's services or projects. The helpline is available 24x7 and is accessible from anywhere in India.
3. **Grievance redressal officers:** NHAI has appointed grievance redressal officers at its Regional Offices and Project Implementation Units to handle complaints and grievances related to NHAI's services or projects. The contact details of these officers are available on NHAI's website.
4. **Public meetings:** NHAI conducts public meetings to get feedback from the public and address their grievances related to NHAI's services or projects. These meetings provide a platform for citizens to interact with NHAI officials and raise their concerns.
5. **Mobile Application:** General road users and citizens can use a mobile app titled "MyGrievance" available on both Android and iOS platforms to record, track and resolve their grievance while using the highways and related services.
6. **Social media:** NHAI is active on social media platforms such as Twitter and Facebook, where citizens can post their grievances related to NHAI's services or projects. NHAI officials regularly monitor these platforms and respond to complaints and grievances.

To file a complaint, the public can either write to the Grievance Redressal Cell at the NHAI headquarters or fill up an online form available on the NHAI website. The online form requires the complainant to provide details such as name, address, contact number, email address, and a brief description of the grievance. Once the complaint

is received, the GRC initiates an investigation and communicates with the concerned authority to resolve the issue. The complainant is also kept informed about the status of the complaint through regular updates and feedback.



BUILDING CAPABILITIES FOR TOMORROW

THE PUBLIC REPRESENTATIVE OR VIP GRIEVANCE REDRESSAL SYSTEM

The VIP reference system of grievance redressal of the NHAI is a mechanism designed to ensure that grievances and complaints from important or high-profile individuals are addressed promptly and efficiently.

Under this system, complaints received from VIPs such as Members of Parliament, Members of Legislative Assemblies, and other high-ranking officials are given priority and are immediately forwarded to the concerned officials for resolution.

The complaints received from VIPs

are first acknowledged by the NHAI Grievance Redressal Cell (GRC) and are then forwarded to the respective Project Director or Regional Officer for further action. The concerned officer is required to take prompt action on the complaint and provide a resolution within the shortest possible time frame. The progress of the complaint is closely monitored by the GRC, and regular feedback is provided to the VIP concerned. The NHAI also maintains a dedicated VIP grievance redressal cell to ensure that all complaints are handled with utmost priority and sensitivity.

5.7 EQUAL OPPORTUNITY

We at NHAI pride ourselves in providing equal opportunity to people belonging to the Scheduled Caste (SC), Scheduled Tribe (ST), and Other Backward Classes (OBC) categories.

We have set up a Reservation Cell to handle grievances of our SC, ST, and OBC category employees. The Cell was re-constituted in June 2022, having originally been constituted in November 2020 as per the direction of National Commissions for Scheduled Caste.

We submit quarterly reports on all grievances received to the Commission through MoRTH, with information provided on the following:

- Number of cases,
- Number of cases closed successfully,
- Number of unresolved cases,
- Action taken against willful defaulting officers.

5.8 HEALTH AND SAFETY

Health and safety are the main priority at NHAI, as we ensure that all our projects are aligned with Indian regulatory requirements as well as Good International Industry Practices. Our Model Concession Agreement cites all health and

safety requirements for concessionaire and their contractors to abide by, as we ensure that all staff and workforce are adequately trained to carry out works. Our appointed Authority Engineers/Independent Engineers ensure that all safety protocols are being implemented on site, and report back to us on a monthly basis.

All necessary precautions are required to be taken by the concessionaire to ensure the health and safety of staff and labour engaged for the NHAI's projects. The concessionaire, collaboration with and to the requirements of the local health authorities, ensure that para-medical staff, first aid facilities, ambulance service are available on the project site at all times, and that suitable arrangements are made for all necessary welfare and hygiene requirements and for the prevention of epidemics. NHAI as well as the concessionaire are required to appoint a safety officer to be responsible for the safety of personnel on the project site. These Safety Officers are qualified for their work and have the authority to issue instructions concerning safety and take protective measures to prevent accidents. The concessionaire maintains records and make reports concerning health, safety and welfare of personnel, and damage to property, in such manner as the Authority may reasonably require.

5.9 MANAGEMENT SYSTEM

Over the last three (3) years we have ensured that all our employees and workforce are fully covered under Contractors Occupational Health and Safety (OHS) Management Systems pertaining to the

Environment, Health and Safety. Total 1,50,953 number of all employees and workers who are not employees but whose work and/or workplace is controlled by contractors of NHAI were covered by OHS management system cumulatively in 3 FY's.

Table 25 Coverage of OHS Systems at worksites

Parameters	Measure	FY 19-20	FY 20-21	FY 21-22
Number of all employees and workers who are not employees but whose work and/or workplace is controlled by the organization, who are covered by such a system	Total No	34,218	60,542	56,193

5.10 HAZARD IDENTIFICATION AND RISK ASSESSMENT

Hazard Identification and Risk Assessment (HIRA) study offers a systematic approach to assess hazards and their associated risks. HIRA Safety helps to determine the objective of an identified hazard and provide the technique to manage the risk. NHAI has obtained robust measures of identifying hazards and assessing risks.

Health and Safety is important to NHAI for their construction activities and further maintenance. The impact felt in our communities from the COVID Pandemic underlines the importance of safety and wellbeing in NHAI. We acknowledge the duty by protecting our workers, employees, contractors, and other stakeholders from the risk of harm arising from the day-to-day activities in our business.

NHAI is committed to:

- Operate a structured health and safety management framework, which defines the Health and Safety Policies, and Standards needed to support the safe delivery of services,
- Comply with all relevant legislative requirements and where practical, to seek opportunities to promote higher standards of health and safety,
- Identify, and eliminate, hazards; or where we cannot eliminate hazards, minimize the risks as far as is reasonably practicable,
- Provide colleagues with appropriate safety and wellbeing information, instruction, training, and supervision relevant to their role and responsibilities, and
- Demonstrate personal leadership in safety and wellbeing matters and ensure that colleagues at all levels take personal responsibility for safety and wellbeing as part of their role.

BUILDING CAPABILITIES FOR TOMORROW

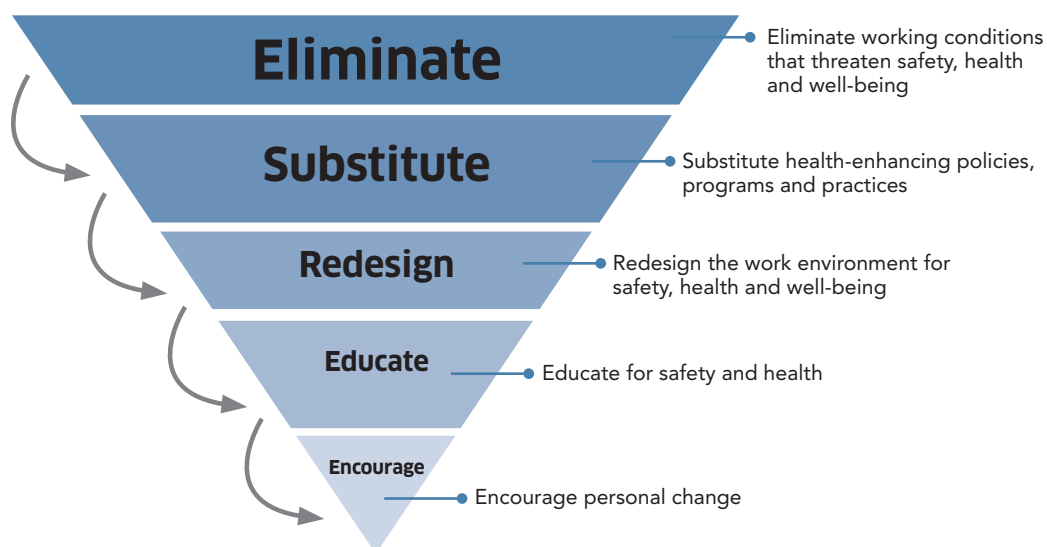


Figure 61: Hazard Identification and Risk Assessment Process

ROAD SAFETY MEASURES



Road Safety plays a very crucial role in assessing risks. NHAI has conducted Road Safety Audit for mitigating risks.

NHAI follows some strict process for performing audits which includes five stages:

- Stage 1: Feasibility Stage/ Preliminary Design Stage
- Stage 2: Detailed design Stage (Detailed Project Report Stage)
- Stage 3: Development Stage
- Stage 4: Construction Stage
- Stage 5: Safety Audit of Existing Roads

5.11 OCCUPATIONAL HEALTH SERVICES

NHAI conducted Industrial Health and Hygiene audit services across the regions respectively. The methodology of the audit covers the following points:

- Review of policies related to Health and Safety
- Assessment of SOP's related to industrial hygiene
- Review of HIRA and Material Safety and Data safety
- Review of exposure assessment
- Assessment of roles and responsibilities on OHS
- Review of overall PPE management plan
- Review of Industrial hygiene related accidents/incidents/first aid cases reported at the site (if, any)
- Inspection of Food safety/canteen safety assessment records.
- Review of Training and medical records
- Review of Incident and training register
- Review of vehicular movement
- Conducting Project Site walkthrough
- Examining site specific working conditions
- Interview with internal and external stakeholders
- Review onsite usage of PPE by employees and workers
- Visual observation of existing exposure and ergonomics assessment
- Review of handling and storage of waste materials
- On-site observation of working condition like high temperature, noise, illumination, vibration etc.



Figure 62: Occupational Health Services

BUILDING CAPABILITIES FOR TOMORROW

5.12 WORKER PARTICIPATION, CONSULTATION, AND COMMUNICATION ON OHS

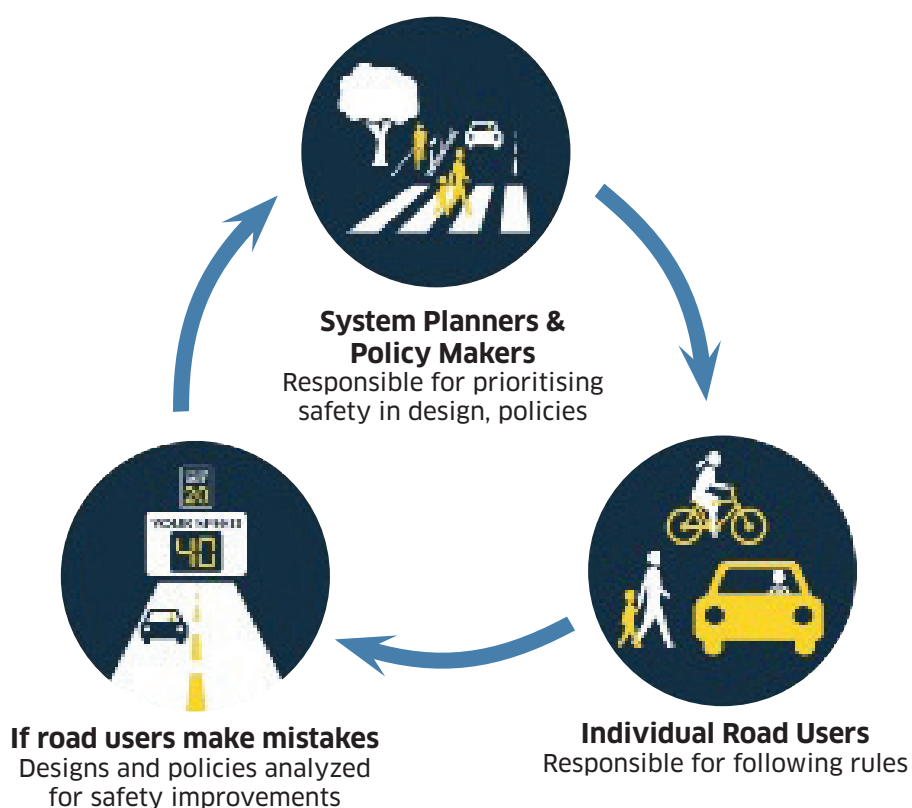
Worker participation in NHAI means that workers are involved in establishing, operating, evaluating, and improving the safety and health program. It includes participation of all workers at NHAI regional sites and Head Office in addition to those employed by contractors, subcontractors, and temporary staffing agencies.

NHAI is an Integrated Management Systems Certified organization based on the following standard certification disclosures:

- 9001: 2015 (Quality Management System)
- 14001-2015 (Environment Management System)
- 45001-2018 (Occupational Health & Safety Management System)

NHAI ensures that when new workers come to worksite, they are screened inducted and make them acquainted to the safety measure to be taken at site during work, as per OH&S Management System. Before starting any activities, necessary risk assessment and safety measures are taken to execute the job with zero harm. Besides these, thorough inspection of the workplaces is done to provide safe and risk-free environment to the workforce.

ENSURING SAFE SYSTEMS COMES SAFE MOBILITY



NHAI has introduced robust practices to encourage worker participation and communication which helps worker to build positive Safety and Health culture across the organization.

- Maintaining an open door policy that invites workers to talk to managers about safety and health and to make suggestions.
- Empower all workers to initiate or request a temporary suspension or shut down of any work activity or operation they believe to be unsafe.
- Involving workers in finding solutions to reported issues.
- Identifying the presence and causes of workplace hazards, which creates a sense of program ownership among workers, enhances their understanding of how the program works, and helps to sustain the program over time.
- To create employment opportunities for local people



Figure 63 Covid Safety Precautions





COMMUNITY DEVELOPMENT

COMMUNITY DEVELOPMENT

At NHAI, we believe that community development is important as it creates strong, diverse communities that are able to attract and keep talent, start and grow businesses, and overcome issues that arise.

We aim to empower community members and creates stronger and more connected communities, with the objective to improve the standard of living of the people and provide them with various employment facilities and opportunities to set up industries and the training to improve their livelihood.



Figure 64 Road Safety Awareness

6.1 COMMUNITY ENGAGEMENT AND SERVICES

As part of our community engagement, we ensure implementation of various programs that are of importance to our customers as well as the community as a whole. Some of the initiatives that NHAI has in place are listed below:

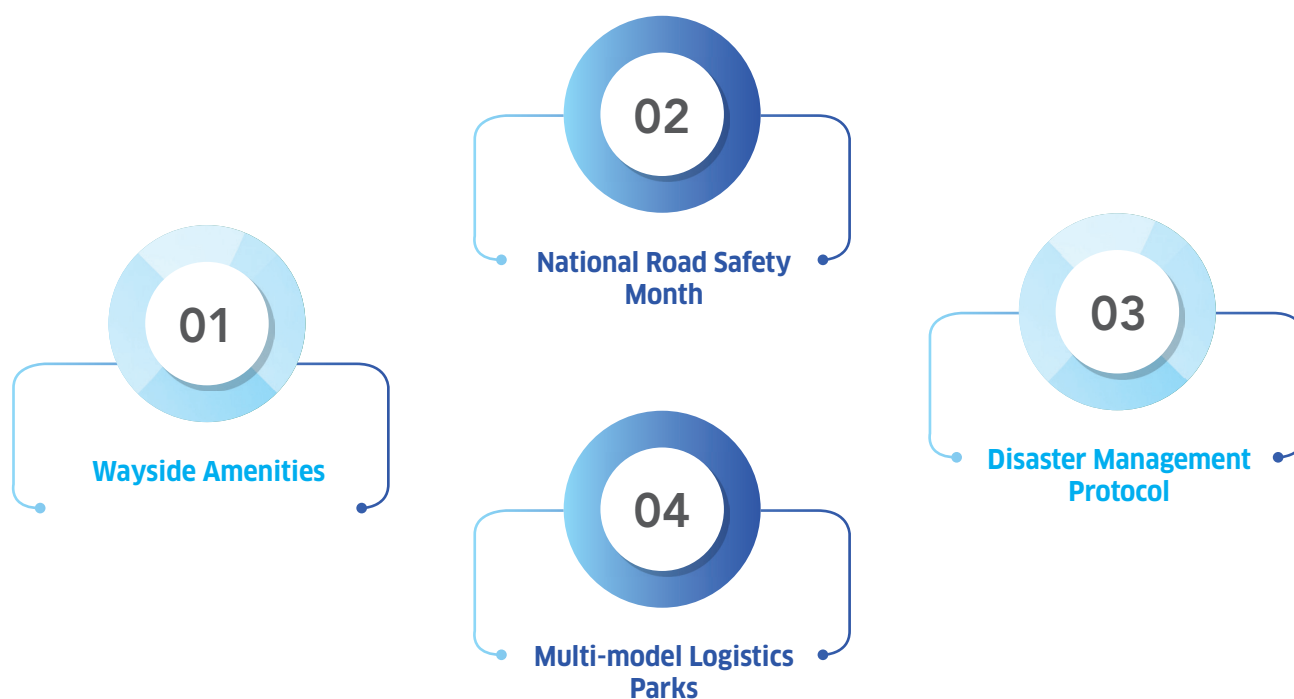


Figure 65 Road Safety Awareness Campaign



COMMUNITY DEVELOPMENT

WAYSIDE AMENITIES

In the FY 2021-22, NHAI came up with an initiative to develop more than 600 wayside amenities for commuters across 22 states in the upcoming five years. These wayside amenities will be developed every 30-50 KM on current and upcoming highways and expressways, with a combined area of over 3,000 hectares. The amenities will include numerous facilities for passengers such as fuel stations, electric charging facilities, food courts, retail shops, bank ATMs, toilets with shower facility, children play areas, clinics, village haat for local handicrafts, among others. Keeping in view the specific requirements of the truckers, separate 'Truckers Blocks' are being developed at large amenities that will include Truck and Trailer Parking, Auto Workshop, Truckers Dormitory, Cooking and Washing area, Toilets with shower, Medical Clinic, Dhaba, Retail shops etc., These amenities will generate employment opportunities for the local people to market their unique products at the village haats. In addition to that, the facilities like Electric Vehicle Charging Stations will promote the use of electric vehicles and therefore lead to reduction in the air pollution.

NATIONAL ROAD SAFETY MONTH

To strengthen road safety awareness, NHAI organized workshops and seminars, Bike Rallies, Walkathons and health-cum eye check-up camps across the country during the National Road Safety Month (January 11th to January 17th, 2022). During the event, we also reiterated our commitment to take various measures like road safety audits, identifying accident prone stretches and undertaking other remedial measures to reduce accidents.

NHAI'S DISASTER MANAGEMENT

NHAI displayed its expertise in disaster response and crisis management when India was hit by two successive severe cyclonic storms- Tauktae and Yaas during the month of May, 2021. Our prompt response ensured timely resumption of traffic on National Highways across the states where the two cyclones caused massive disruption and damage.

MULTI-MODAL LOGISTICS PARKS

An efficient transportation and logistics sector is critical for the overall growth of the economy. But inadequate modal & terminal transport infrastructure, modal mix, storage facilities, poor operational and maintenance protocols have led to a higher cost of freight transportation and low logistics performance. Through multiple touch points under MMLPs, greater competitiveness will be fostered in the primary and secondary sectors of the economy creating greater demands.

We, through our Special Purpose Vehicle- the National Highways Logistics Management Limited (NHLML), will develop MMLPs to enable efficient intermodal freight movement and formalize interface between logistics service providers, service users and regulators. MMLPs are being developed across the country in 35 strategic locations and NHLML has signed MoUs for setting up MMLPs at strategic locations in Maharashtra: Mumbai Metropolitan Region, Pune, Aurangabad, Nashik and Dighi Port Industrial Estate. MoUs have also been signed for setting up MMLPs in Chennai, Bengaluru, Hyderabad and Indore.

6.2 CORPORATE SOCIAL RESPONSIBILITY (CSR)

Under the Corporate Responsibility, which talks about the impact of an organization on society, environment and the ecology, the NHAI is directly or indirectly contributing positively so as to pursue the agenda of sustainable development. The NHAI is proactively handling the following 5 facets of corporate responsibility vis., Good Governance, Economic, Social, Labour and Environmental.

During Covid in 2021-22, NHAI constructed large number of Oxygen Plants for Hospitals/ Health care center to cater the society even in remote and far flung areas.



Figure 66 Medical Oxygen Plant

The NHAI is quite proactive towards its Corporate Environmental Responsibility (CER) and making noticeable effects to reduce any damaging effects on the environment from its activities in terms of water, energy, and carbon sequestration etc. Besides meeting its statutory obligations which have been indicated and budgeted under the Environmental Management Plan (EMP) in terms of contribution to/schools, hospitals, dispensaries or public facilities in green field projects, the NHAI is directly or indirectly meeting its societal and humanitarian commitments either directly or through its Concessionaires.

NHAI, mandates its concessionaires to create, a holistic Environmental Management Plan (EMP) which is part of the overall road approval procedure. Under the EIA notification of 2006 and its further amendments, the environment clearance given by MoEF&CC has component of environment management plan wherein there is a specific provision with regard to different components including cost of Corporate Environmental Responsibility (CER) aligning project roads. NHAI undertakes the compliance to the said activities and timely uploading on the MoEF&CC portal.

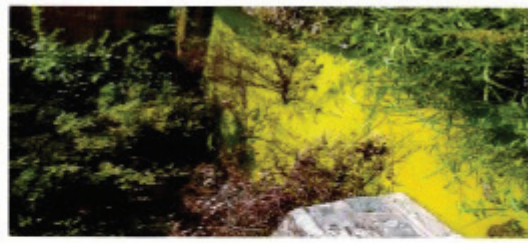
COMMUNITY DEVELOPMENT

As a part of CER, Hon'ble Prime Minister launched Amrit Sarovar initiative in Jammu and Kashmir as part of Azadi Ka Amrit Mahotsav in 2022 and it was directed by MoRTH to adopt water bodies for its development and rejuvenation. In this regard, Deputy Commissioner/ District Development Commissioner, Srinagar passed an Order to adopt below mentioned 3 water bodies:

- Dev Mohalla Shalimar (Spring)
- Karalpokhar Hawal (Spring)
- Botanical Garden (Spring)

Spring Location : Karalpokhar Hawal

Before Restoration

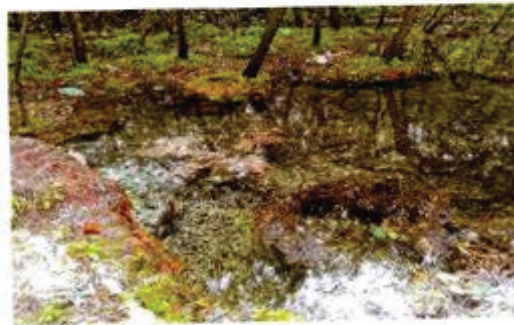


After Restoration



Spring Location : Dev.Mohalla Shalimar

Before Restoration



After Restoration



Spring Location : Botanical Garden

Before Restoration



After Restoration



Under PIU Ramban, NHAI has been working on natural resource management initiatives along with social development initiatives. Details being

⇒ Construction of Balance work of Four Lining from Ramban to Banihal excluding realignment portion of NH-1A (Now NH-44) with value addition at critical location on Engineering Procurement and construction mode (EPC mode) in the union Territory of Jammu & Kashmir under NHDP Phase-II.

The details of CSR expenditure spent by RO Bengaluru as follows:

NHAI is providing facilities to the villagers on various locations like Marog village, Chamalwas, wagan village. NHAI had provided water source in Sherbibi village. NHAI is in process to provide access via culvert in Chamalwas village both for villagers and animals.

The details of steps taken for keeping Environment clean for workers and locals:

- Personnel protective equipment provided like Helmets, Nose mask etc.
- Transport facilities provided to the workers at site.
- Inside tunnels, ambient quality air provided via ventilation fan to make the tunnel environment workable.
- Drinking water quality are being monitored on regular basis.
- Rest room provided to the workers.
- Plantation drive are being done in the project stretch to make the environment in good quality.
- Sprinkling of water via water tankers are being done to control the dust.

COMMUNITY DEVELOPMENT

Construction of tunnels/viaducts in slip/slip areas identified in Udhampur-Ramban section of NH-44 in J&K UT under residual NHDP on Engineering, Procurement and Construction (EPC) mode. The details of CSR activities are

- Covering the aspect to nutrition and Health: NHAI have made provision at site for clean drinking water and healthy food at site.
- For health concern, proper sanitation and medical facilities are provided at site. NHAI has been working with people for a focus on skill development for employability of localized youth based on individualized experience to help youth access the right information at right time for starting their careers and career progression.
- NHAI has provided required personal protective equipment to workers with hutment that has supply of electricity and toilets.
- In order to keep environment clean for workers and locals, we ensure to undertake all the work activities at site in compliance with safety measures as per MoRTH specifications.

With reference to the captioned subject and with regard to the information required for compliance of RTI-Reg under NHAI, We, Bharat Constructions (India) Private Limited, CIN: U45201UR2020PTC010677 (the 'Company') hereby submit the expenditure/contribution details towards Corporate Social Responsibility (CSR) as mentioned below:

S. No.	Particulars	Details of the Organization/Trust/NGO	Name of the Project	Scope of the Project	Contributed Amount (in Rs.)
1.	CSR Expenditure for the FY 2020-21	Socio Legal Research and Education Foundation (SLREF), 62, Masjid Moth, New Delhi- 110049	'Adopt a Village' situated at Village Narainkoti, Distt: Rudraprayag, Uttarakhand (Near Kedarnath Dham)	Protection of National Heritage, Promotion of Education and working for providing employment enhancing vocational skills.	34,22,962

Further, pursuant to applicable provisions of the Companies Act, 2013 and the Companies (Corporate Social Responsibility Policy) Rules, 2014, the CSR obligation for the FY 2021-22, shall be contributed by March 31, 2023.

Figure 67 Reply to RTI request on CSR activities

6.3 PUBLIC AND PRIVATE PARTNERSHIPS FOR CSR

NHAI has been partnering with multiple, well known CSR organizations, to undertake plantation activities alongside highways. This is a win-win situation of both the organizations, wherein the obligation of environmental stewardship for the CSR organization has been fulfilled by technical support made available by NHAI. Saplings and other related material costs are supported through CSR organization while the locals are involved as community participation. A few notable partnerships are mentioned herewith in the table

Table 26 Details of CSR partnerships for Plantation initiatives

S. No	Regional Office	Project Details	Length awarded (km)	Project Cost (in crore)	No of Plants planted	Funded BY
1	Guwahati	Avenue and median plantation along NH - 31 from Gauripur to Amingaon	6	0.83	5,500	Indian Oil Corporation Limited
2	Nagpur	Avenue Plantation and Maintenance Works along Nagpur - Hyderabad Section of NH-7 from km 83.000 to km 85.000	2	0.42	3,078	Power Finance Corporation
3	Nagpur	Avenue Plantation and Maintenance Works along Nagpur - Hyderabad Section of NH-7 from km 38.000 to 62.600, and from km 123.000 to 153.000	54.4	6.40	38,614	Power Finance Corporation
4	Nagpur	Avenue Plantation and Maintenance Works along Nagpur - Hyderabad Section of NH-7 from km 81.000 to km 83.000	2	0.43	5,843	Power Finance Corporation
5	Nagpur	Avenue Plantation and Maintenance works along Nagpur - Hyderabad section of NH - 7 from 85.00 km to 87.00	2	0.38	2,800	Power Finance Corporation
6	Nagpur	Avenue Plantation and Maintenance Works along Nagpur - Hyderabad Section of NH-7 from km 87.000 to km 93.750	6.795	1.30	8,009	Power Finance Corporation
7	Mumbai	Avenue & Median Plantation along NH-3 (Pimpalgaon - Nashik - Gonde) Km. 380.000 to Km. 440.000	40	3.94	20,000	Yes Bank
8	UP East	Varanasi Bypass Avenue & Median Plantation (NH - 56 & NH - 29)	16.55	5.00	26,000	Airport Authority of India



COMMUNITY DEVELOPMENT

6.4 PUBLIC DISCLOSURES

Over the last three (3) years, we have conducted Environmental Impact Assessment and Social Impact Assessment studies that provide necessary information to the project as well as the public on the issues identified, and mitigation measures taken to address the same. As part of these assessments, we conduct local community awareness programmes and stakeholder engagement sessions to ensure all of communities' concerns and grievances are answered.

ENVIRONMENTAL CLEARANCE FOR GREEN FIELD PROJECTS

When it comes to green field projects, which involve the construction of new highways or major modifications to existing highways, NHAI requires developers to obtain environmental clearance from the Ministry of Environment, Forest, and Climate Change. The conditions for obtaining environmental clearance may vary depending on the specific project and its impact on the environment. However, some of the common conditions that developers may need to comply with are:

- Conducting an Environmental Impact Assessment (EIA) study to identify potential environmental impacts of the project;
- Developing a detailed Environmental Management Plan (EMP) to mitigate adverse impacts on the environment;
- Obtaining all necessary permits and clearances from relevant authorities;
- Implementing measures to prevent pollution, such as wastewater treatment and waste management;
- Compensating for any loss of biodiversity or ecological services resulting from the project;
- Undertaking measures to conserve and enhance the environment, such as afforestation and soil conservation;
- Monitoring the environmental impacts of the project during construction and operation phases;
- Undertaking a social impact assessment to identify potential social impacts of the project and developing a plan to address them;
- Establishing a grievance redressal mechanism to address complaints from affected communities.

These conditions are designed to ensure that green field projects are developed in a sustainable manner, with minimum adverse impact on the environment and the local community. NHAI/Developers complies with these conditions and obtain clearance from the Ministry of Environment, Forest, and Climate Change before proceeding with the project.

THE FOLLOWING STEPS ARE INVOLVED IN OBTAINING ENVIRONMENT CLEARANCE FOR HIGHWAY PROJECTS.

1. Grant of Terms of Reference (ToR) by EAC, MoEF&CC for preparation of EIA/EMP
2. Public Hearing by State Pollution Control Board / UTPCC
3. Environment Clearance - Presentation before Expert Appraisal Committee (EAC), MoEF&CC for grant of EC.

Stage 1 Grant of Terms of Reference (ToR)

- Registration on PARIVESH Portal, MoEF&CC
- 3 Alternative Options Analysis and finalization of the proposed alignment
- Uploading the Form 1, PFR, Standard TOR
- Scoping by EAC
- ToR presentation to UA

EIA Report

- Baseline environment monitoring at Site
- Submission of Draft EIA
- District Wise public Hearing
- Proceedings to PH to EAC, MoEF&CC
- Finalisation of EIA report
- Uploading Form 2
- EC presentation to UA



COMMUNITY DEVELOPMENT

ENVIRONMENT MANAGEMENT PLAN

At NHAI, we have the Vision to meet the Nation's need for provision and maintenance of National Highways network to global standards and to meet the user's expectations in the most time-bound and cost-effective manner, within the strategic policy framework set by the Government of India and thus promote economic well-being and quality of life of the people.

When developing a green field project, concessionaires of the National Highways Authority of India (NHAI) are required to develop an Environmental Management Plan (EMP) to mitigate the potential adverse impacts of the project on the environment. The EMP is developed in accordance with the guidelines provided by the Ministry of Environment, Forest, and Climate Change, and should include the following components:

- **Environmental Impact Assessment (EIA):** The EIA is a detailed study of the potential environmental impacts of the project. It should identify potential impacts on air, water, soil, flora and fauna, and human health, and recommend measures to mitigate them.
- **Mitigation Measures:** Based on the findings of the EIA, the EMP should identify specific mitigation measures to minimize the environmental impacts of the project. These measures may include the use of advanced technologies to reduce emissions, waste management practices, and pollution prevention measures.
- **Monitoring and Reporting:** The EMP should include a plan for monitoring the environmental impacts of the project during construction and operation phases. The plan should identify parameters to be monitored, frequency of monitoring, and methods of reporting. The EMP should also include a mechanism for reporting any environmental incidents or violations.
- **Capacity Building:** The EMP should include a plan for capacity building to ensure that all employees and contractors are aware of the environmental policies and procedures

to be followed during the project. This may include training programs, awareness campaigns, and workshops.

- **Stakeholder Engagement:** The EMP should include a plan for stakeholder engagement to ensure that local communities are aware of the potential environmental impacts of the project, and are consulted on measures to mitigate these impacts. This includes public hearings, community meetings, and consultations with local NGOs.

The EMP is submitted to NHAI for approval before the start of the project and will be updated periodically by Concessionaire based on the monitoring results. Compliance with the EMP has been monitored and enforced by NHAI to ensure that the project is developed in a sustainable manner, with minimum adverse impact on the environment and the local community.

As per the mandates issued by Ministry, any road length greater than 100km in length needs to conduct certain set of mandatory pre implementation activities, to ensure their environmental and social sustainability. These activities are part of the Detailed Project Report (DPR) and also form part of concessionaire agreements. NHAI has been advising the concessionaires to follow these norms strictly, through a robust and timely reporting mechanisms. **The mandatory activities for stretches more than 100 km. are**

- Social impact assessments, including gender impact assessments, based on participatory processes.
- Environmental impact assessments and ongoing monitoring.
- Public disclosure of results of environmental and social impact assessments.
- Local community development programs based on local communities' needs.
- Stakeholder engagement plans based on stakeholder mapping.
- Formal local community grievance processes.

All the Regional Offices which had working projects or who had completed the projects in reporting period, have concluded above activities for stretches of 100 km. and above in road length.

NHAI has also followed similar approach to conduct this assessment even for the stretches lesser than 100 km., depending on specific conditions. This was conducted to ensure the uniformity across implementation and to retain sustainability standards. These activities have been done on a Regional Office level, with the results shared with NHAI HQ in a periodic manner. Basis the requirement of the project ROs have taken the decision to conduct this assignment. Following table describes voluntary efforts of compliance taken for road stretches less than 100 km.

Table 27 Social and Environmental compliance initiatives

Description	Count of ROs following these practices
Social impact assessments, including gender impact assessments, based on participatory processes	Total 11 ROs have taken this initiative as their practice to adhere to project compliance
Environmental impact assessments and ongoing monitoring	Total 13 ROs have taken this initiative to add compliance requirement
Public disclosure of results of environmental and social impact assessments	Total 11 ROs have publicly disclosed the results
Local community development programs based on local communities' needs	Total 6 ROs have undertaken dedicated programs for local community needs
Stakeholder engagement plans based on stakeholder mapping	Total 11 ROs have dedicated stakeholder engagement plans
Formal local community grievance processes.	Total 15 ROs have followed local community grievance management processes.

With thorough and robust monitoring mechanism and thorough well set up systems and processes, NHAI has put in place continuous data updating system for all compliance related filings. The progress and compliance on Environment Management Plan (EMP) needs to be uploaded to the portal of MoEF&CC, every 6 months wherein, progress has been validated by field teams as per the agreed interventions.

NHAI also has a mechanism for undertaking compliance review through its Environment Division w.r.t the conditions of all statutory clearances such as environmental clearance, forest clearance, CRZ clearance etc. NHAI is regularly undertaking intensive monitoring of

these initiatives. The effort is to strictly adhere and comply with the statutory regulation by NHAI, which shows the determination of NHAI to proactively traverse the path of inclusive growth and sustainable development.

6.5 COVID 19 PREVENTION INITIATIVES

Covid 19 was an existential risk to humanity that led to decimated jobs and placed millions of livelihoods at risk. We at NHAI prepared ourselves to tackle any and all issues that affected our business and employee interests. In line with numerous NHAI Circulars we provided Covid related coverage and reimbursements for our employees and workers.



COMMUNITY DEVELOPMENT

REIMBURSEMENT OF COST OF COVID-19 TEST CHARGES

Covid-19 test charges done as per advice by concerned medical authorities, as a special case, even of the same is done on OPD basis, the re-imbursement is allowed for the Officers/Staff (Regular/Deputation/Contract) and their dependent family members but restricted to the actual amount paid or the limit prescribed by the Central Govt. (ICMR) or the limited prescribed by the respective State Govt., whichever is less. The re-imbursement claims are submitted along-with following documents which will be processed by medical cell on monthly basis for payment similar to the procedure laid down in respect of Re-imbursement of Annual Health check-up claims:

- Original Payment receipt of Covid-19 Test.
- Copy of Test report.

REIMBURSEMENT OF COST OF 'PULSE OXIMETER' FOR THE FAMILY OF COVID POSITIVE

We provided our employees with reimbursement the charges of Pulse Oximeter to a maximum limit of Rs. 1200/- for the Officers/Staff (Regular/Deputation/Contract) subject to the following conditions:-

- NHAI employees who have been tested positive for COVID-19 infection are permitted to purchase one pulse Oximeter per family. In other words, in case there are more than one COVID positive cases in a family of CS (MA) beneficiary, they can claim reimbursement only for one pulse Oximeter.
- The reimbursement shall be claimed as per actual cost of pulse Oximeter, subject to a ceiling of Rs. 1200/-
- The claim for reimbursement of cost of such pulse Oximeter are required to be submitted as per prescribed norms enclosing therewith a copy of the COVID- 19 test report, to the Medical Cell, NHAI.
- The outsourced employees were required to submit the bills towards purchase of Oximeter and charges towards Covid-19 test (RTPCR/Rapid) to their respective outsourced agencies for reimbursement. The outsourced agencies were required to include the details of all such reimbursements (made to their respective outsourced staff) in their monthly bills for reimbursement by the NHAI.

REIMBURSEMENT OF PURCHASE/PROCURE OF ELECTRIC KETTLE

Officers / officials of the level of Assistant Manager and above are permitted to purchase/procure electric kettle, which will be reimbursed up to a maximum ceiling of Rs.1200/- or actual cost of the electric kettle, whichever is less.

REIMBURSEMENT OF VACCINATION CHARGES AND TESTS TOWARDS CONTAINMENT OF SPREAD OF COVID-19

Reimburse of the COVID-19 vaccination charges (2 doses) @ Rs.1200/- per vaccine or actual, whichever is less, in respect of all employees of NHAI and their dependent family members is allowed on submission of bills / invoices to this effect.

The cost of tests like Di Dimer, CRP, Ferritin, CT Scan, Antibodies Count etc. required/conducted in connection with covid-19, shall also be reimbursed on submission of bills / invoices to this effect. The reimbursements of these tests, which are related to COVID-19 only, shall be as per CGHS rates.

The contractual / outsourced staff are require submitting the bills to this effect (relating to them and their dependent family members) to their respective agencies for reimbursement, which in turn shall claim the same through their monthly bills.

OTHER CONSIDERATIONS

All Covid 19 related considerations are summarized subsequently:

- In order to contain spread of COVID-19, all employees were exempted to mark their attendance in Aadhar Based Biometric Attendance System and to mark attendance, attendance register were maintained in the office of concerned CGMs HQ/PD/RO (as the case may be)
- The employees of the level of Dy. Manager and below were allowed to attend office at 50% of the strength as per roaster issued by respective Division. The limit 50% of strength was also extended in respect of staff deployed through outsourcing agencies
- To contain spread of COVID-19, 05 bedded Primary Healthcare Unit was setup at Residential Complex of NHAI, Dwarka with facility of Doctor, Nurse and Oxygen
- Covid vaccinations were allowed to all employees of NHAI and their dependent family members. Further, the cost of tests like Di Dimer, CRP, Ferritin, CT Scan, Antibodies Count etc. were also allowed as per CGHS rates.

SUMMARY

BUSINESS RESPONSE

NHAI advised all its officials, contractors, consultants to take proper preparatory measures to restrict Covid impact on highway construction projects.

COMMUNITY ASSISTANCE INITIATIVES

During the year 2021, we organized a vaccination drive and built an isolation facility at our residential complex in Delhi. We have also set up 760 isolation wards, 2,700 beds and provided adequate health facilities at project sites across the country



Figure 68 Covid Vaccination Drive



A decorative graphic consisting of several overlapping, curved, blue and light blue shapes that resemble waves or a stylized road, positioned in the bottom left and center of the image.

ECONOMIC PERFORMANCE

ECONOMIC PERFORMANCE

National Highways Authority of India (NHAI) was set up by an Act of Parliament called National Highways Authority of India (NHAI) Act, 1988. NHAI has been entrusted with development, maintenance and management of National Highways entrusted to it. NHAI, in addition to the budgetary support from the Government of India, funds its highway development program through multiple funding sources including toll accruals from completed National Highway stretches, monetization of future toll revenues, borrowing from financial institutions and capital markets.

During the last three years highway construction under NHAI has seen an unprecedented growth. During FY 2021-22 Authority has constructed a total length of 4334 Km as against 4218 Km in 2020-21 and 3979 Km in 2019-20.

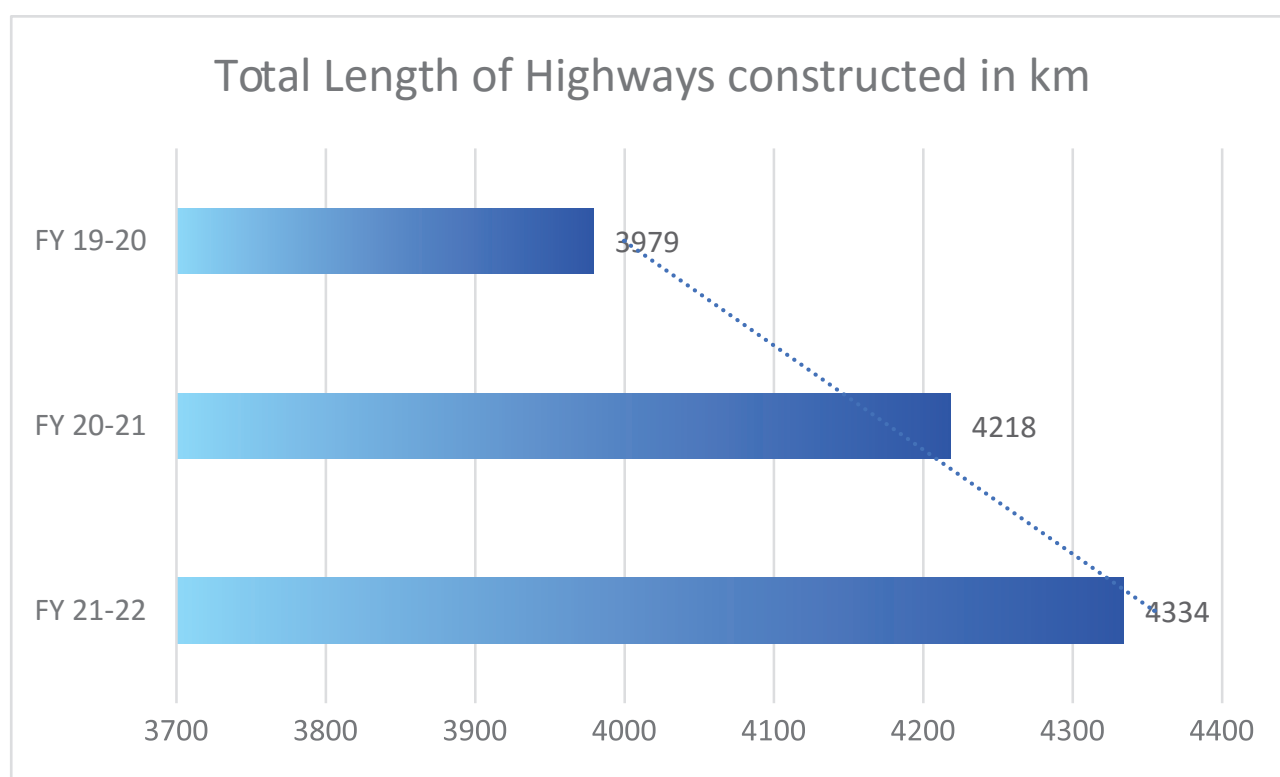


Figure 69 Total length of highways constructed by NHAI in km

The fast pace of highway development has been funded partly by Government Budgetary Support (GBS) and partly by Internal Extra Budgetary Recourses (IEBR) as depicted below (in Cr)

Table 28 Funding Sources for NHAI

Item	2020	2021	2022
Opening Balance	6,557	6,345	5,235
Cess	11,091	23,883	36,210
Toll Plough Back	10,600	11,500	12,670
InVIT	-	-	7,350
Borrowings (IEBR)	74,987	65,080	65,149
DME	-	9,731	14,006
NH (o) and Others	2,175	7,419	30,653
TOTAL	1,10,410	1,31,220	1,76,273

Sources and application of funds as per the Audited Financial Statements of the Authority for last three years are as under-

1. Source of Funds (in Cr)

Table 29 Source of funds for NHAI

Item	2020	2021	2022
Shareholders Capital	2,19,026.69	2,61,113.53	3,36,595.87
Capital from Grant	13,982.10	14,082.10	15,082.10
Total borrowings	2,48,831.66	3,07,162.61	3,48,907.23
Total Sources	4,81,840.45	5,82,358.25	7,00,585.20

2. Application of Funds (in Cr)

Table 30 Application of Funds by NHAI

Item	2020	2021	2022
Assets on behalf of Gol	4,62,896.54	5,70,709.30	6,95,287.71
Other fixed Assets	107.19	111.75	255.69
Investments	951.77	2,045.97	5,098.12
Net Current Assets	17,884.95	9491.21	-56.32
Total Assets	4,81,840.45	5,82,358.23	7,00,585.20

ECONOMIC PERFORMANCE

The Annual Economic performance and other highlights for FY 2021-22 are as under-

3. Annual Economic Performance (FY 21-22)

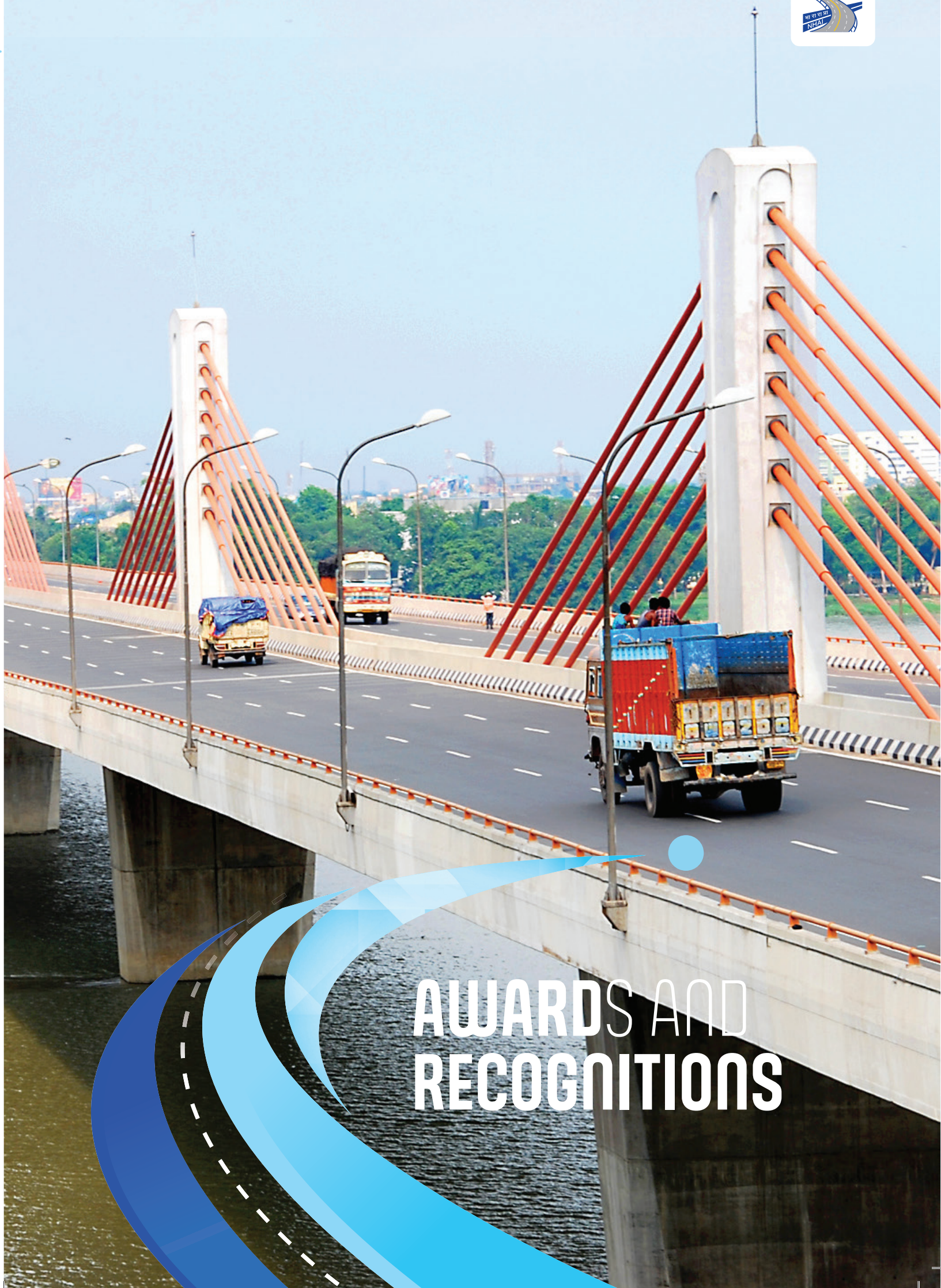
Table 31 Annual Economic performance for FY 21-22

Parameter	Performance in FY 2022
Annual Economic Performance	
User fee deposited to CFI during the year	INR 13,962.83 Crore
Capital Expenditure during the year	INR 1,72,301.70 Crore
Assets and Liabilities Status	
Capital (Provided by GoI)	INR 3,36,595.87 Crore
Total Assets	INR 7,52,776.36 Crore
Total Borrowings	INR 3,48,907.23 Crore
Net Worth	INR 336595.87 Crore
Ratios	
Debt Equity Ratio	1.04
Total Debt to Total Asset Ratio	0.46
Current Assets and Liabilities Ratio	1.00
Total amount pledged for secured NCDs / Outstanding balance of secured NCDs	3.64

(Note: above figures have been taken from Audited financial Statement 2021-22 of the Authority)

OTHER HIGHLIGHTS

- Capital Expenditure on highway infrastructure development reached an all-time high to INR 1,72,301.70 crores during FY 21-22. Furthermore, NHAI achieved the highest length of projects constructed during a given year. During the period NHAI collected and deposited toll revenue of INR 13,962.83 crore into Consolidated Fund of India (CFI).
- During FY 2021-22 NHAI settled 60 cases for INR 4,076 crores against the claimed amount of Rs. 14,590 crores through Dispute Resolution Mechanism, which is about 28 per cent of the total claimed amount.
- As of 31st March 2022, no investor complaint was pending for redressal. Further, the credit rating has also remain unchanged. NHAI did not commit any default in payment of interest for non-convertible debt securities and loans, etc.



AWARDS AND RECOGNITIONS

AWARDS AND RECOGNITION

Uptilting advancement of technology through effective planning and incorporating global best and cutting edge practices in highway construction, NHAI has achieved numerous construction records. It's well known and noteworthy achievement is a new Guinness World Record for laying of bituminous concrete on a 75 km single lane in just 105 hours and 33 minutes. The record-making accomplishment was made on the Amravati – Akola section of National Highway 53 in Maharashtra. This is an important East-West corridor which connects major cities like Kolkata, Raipur, Nagpur and Surat. This stretch is expected to play a significant role in easing the movement of traffic and freight on this route.



Figure 70 Guinness World Record by NHAI

LAYING OF PAVEMENT QUALITY CONCRETE WORLD RECORD

NHAI created a World Record for the laying of Pavement Quality Concrete (PQC) for a four-lane highway of 2,580 meters length within 24 hours.


The record is part of the green field Delhi-Vadodara-Mumbai 8-lane Expressway project and was carried out by the world's largest fully automatic ultra-modern concrete paver machine. With a width of 18.75 meters, as much an area as 48,711 square meters of concrete was laid for the expressway in 24 hours. The highest quantity of concrete laid in 24 hours – 14,613 Cubic Meter was also achieved. The feat has been recognised by both the India Book of Records and the Golden Book of World Records.

THE RECORD INCLUDES:

- Highest Quantity of Pavement Quality Concrete Laid In 24 Hours – 14613.30 Cubic Meters
- Largest Quantum of Pavement Quality Concrete Produced In 24 Hours. – 14370.00 Cubic Meters
- Laying of Pavement Quality Concrete In 18.75 Meters Width Continuously In 24 Hours – 1280.00 Meters
- Largest Area of Rigid Pavement Quality Concrete Laid for an Expressway In 24 Hours – 48711.00 SQM



Figure 71 Award winning construction patches for NHAI



The first Sustainability Report of the National Highway Authority of India highlights the organization's commitment to sustainable development, inclusive growth and responsible practices. The report demonstrates the efforts made by NHAI towards reducing its environmental impact, improving social welfare, and promoting economic growth. The NHAI has taken significant steps towards adopting sustainable and eco-friendly practices, including the use of renewable energy sources, promoting green highways, and adopting waste management practices. Going forward, the NHAI plans to continue its efforts towards sustainability, taking into account the changing social, economic, and environmental conditions. The organization remains committed to ensuring that its projects are not only economically viable but also socially responsible and environmentally sustainable.



A large, stylized blue wave graphic with a dashed white line runs diagonally across the bottom left of the page, partially overlapping the road image.

ANNEXURE 1: GRI INDEX MAPPING

ANNEXURE 1: GRI INDEX MAPPING

Table 32: GRI Index

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ANNEXURE 1: GRI INDEX MAPPING

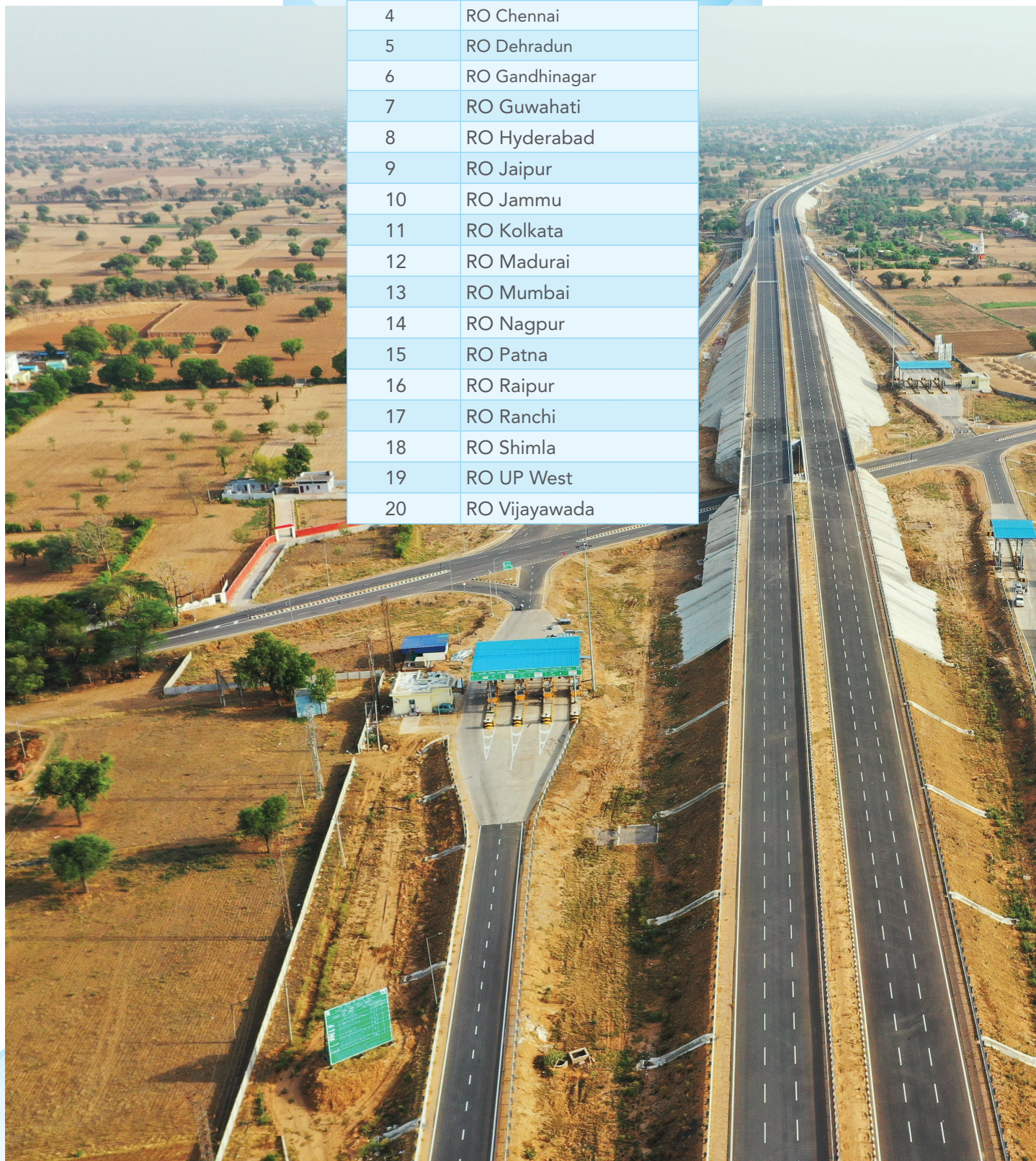
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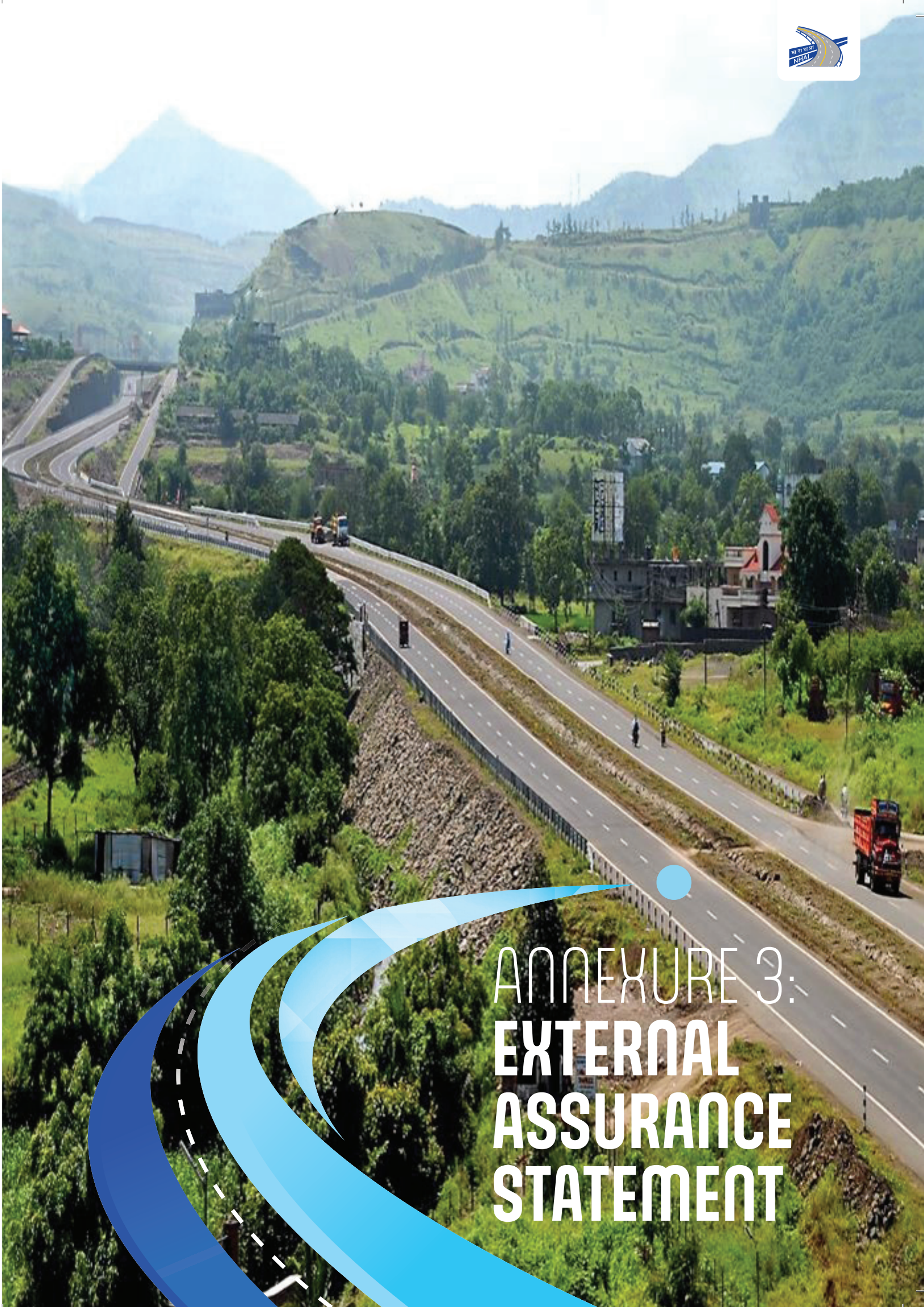


ANNEXURE 2

ANNEXURE 2

w	Regional Office
1	RO Bengaluru
2	RO Bhubaneswar
3	RO Chandigarh
4	RO Chennai
5	RO Dehradun
6	RO Gandhinagar
7	RO Guwahati
8	RO Hyderabad
9	RO Jaipur
10	RO Jammu
11	RO Kolkata
12	RO Madurai
13	RO Mumbai
14	RO Nagpur
15	RO Patna
16	RO Raipur
17	RO Ranchi
18	RO Shimla
19	RO UP West
20	RO Vijayawada





ANNEXURE 3: **EXTERNAL ASSURANCE STATEMENT**



ANNEXURE 3:



ASSURANCE STATEMENT ON SUSTAINABILITY REPORTING FOR NATIONAL HIGHWAY AUTHORITY OF INDIA

for
Reporting Period:

April 2021 - March 2022

24-03-2023



Bureau Veritas (India) Private Limited

72 Business Park, 9th Floor, MIDC Cross Road 'C', Opp.
SEEPZ Gate #2, Andheri (East) Mumbai-400 093 India.





INDEPENDENT SUSTAINABILITY ASSURANCE STATEMENT

INTRODUCTION AND OBJECTIVE OF WORK

BUREAU VERITAS has been engaged by National Highway Authority of India (hereinafter referred as "NHA") to provide an independent and limited assurance of its Sustainability Report (hereinafter abbreviated as "Report") for the reporting period from 01.04.2021 to 31.03.2022 based on Global Reporting Initiative (GRI) Standards for Sustainability Reporting.

The onsite verification of the Sustainability practices adopted by NHA Project Implementation Units under respective Regional Offices and review of documents and disclosures were conducted in March 2023 as a part of the sustainability assurance. The current reporting cycle covers 20 Regional Offices out of total 25 functional Regional Offices (RO). Further, the assurance and verification is limited to NHA 6 regional offices only. The selection of reporting criteria, reporting period, reporting boundary, monitoring and measurement of data, preparation, and presentation of information for the report are the sole responsibility of the management of "NHA". Bureau Veritas (BV) was not involved in the drafting or preparation of the back-up data of the said sustainability report. The responsibility of BV was to provide independent assurance as described in the scope of assurance.

INTENDED USER

The assurance statement is made solely for "National Highway Authority of India (NHA)" as per the governing contractual terms and conditions of the assurance engagement contract between "NHA" and "Bureau Veritas". To the extent that the law permits, we owe no responsibility and do not accept any liability to any other party other than "NHA" for the work we have performed for this assurance report or for the conclusions stated in the paragraph below.

ASSURANCE TYPE AND SCOPE

Bureau Veritas conducted sustainability assurance in accordance with the requirements of International Federation of Accountants (IFAC), International Standard on Assurance Engagement (ISAE) 3000 (Revised) (Limited Assurance), Assurance Engagements Other than Audits or Reviews of Historical Financial Information. In addition, Sustainability Assurance has been conducted in accordance with Account Ability's Assurance Standard (AA1000 AS v3 (Type I, Moderate Assurance). Under this standard, Bureau Veritas has reviewed the information presented in the report against the characteristics of relevance, completeness, materiality, reliability, neutrality, and understandability.

The scope of the assurance engagement, as agreed with NHA, included the review and verification of sustainability policies, practices, initiatives and performance presented in the Report, an assessment of underlying management and reporting processes in accordance with the GRI Standards and an evaluation of the Report's adherence to the "in accordance" criteria of the GRI Standards and verification of standard disclosures indicated in the GRI Content Index in the Report.





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SCOPE, BOUNDARY AND LIMITATIONS OF ASSURANCE

Assurance has been provided for selected sustainability performance disclosures as presented in the Sustainability Report. The reporting boundary included data and information for the period 01 April 2021 to 31 March 2022 for NHAI 20 regional offices, based on Global Reporting Initiative's (GRI) Standards.

The assurance included verification of the sample data and information on selected material topics reported at NHAI 6 regional offices, which includes RO Dehradun, RO Hyderabad, RO Nagpur, RO Madurai, RO Ranchi and RO Guwahati.

THE SCOPE OF SUSTAINABILITY ASSURANCE INCLUDES:

- An assessment of the methods used for data collection and reporting for the selected sustainability performance indicators.
- Testing of such systems, including related internal controls.
- Testing, on a sample basis, of evidence supporting the data.
- Verification of the sample data and information on selected material topics reported at Regional Offices of NHAI for the defined reporting period.
- Assessment of the consistency between the data for the selected sustainability performance indicators and the related written comments in the narrative of the Report
- The Company's compliance to legal obligations/disclosures
- The General and topic specific disclosures subject to assurance
- Completion of assurance statement for inclusion in the report, which will reflect the verification findings and conclusion. Gap assessment as per GRI standards, highlights of findings during verification process of data and information, draft assurance statement, signed assurance statement as per GRI standards compliance

BUREAU VERITAS SCOPE HAS NOT CONSIDERED THE BELOW DATA AS A PART OF SUSTAINABILITY ASSURANCE:

- Information apart from the defined reporting period and boundary
- Compliance to any legal issue related to the authority except environmental and social aspects.
- Any of the statement related to company aspect or reputation.

The Universal and Topic Specific Standard Disclosures subject to assurance were as follows:

GENERAL DISCLOSURES

- Organizational Profile (102-1 to 102-13)
- Strategy (102-14, 102-15)
- Ethics and Integrity (102-16)
- Governance (102-18, 102-22 to 102-25, 102-27, 102-35, 102-36)
- Stakeholder Engagement (102-40 to 102-44)
- Reporting Practice (102-45 to 102-56)





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TOPIC SPECIFIC STANDARD DISCLOSURES

Economic Performance

- Economic (201-3, 201-4)
- Anti-Corruption (205-1, 205-2)

Environment

- Materials (301-1, 301-2)
- Energy (302-1, 302-3)
- Water and Effluent (303-1, 303-5)
- Biodiversity (304-1, 304-2)
- Emissions (305-1, 305-2, 305-4)
- Waste (306-3, 306-4)
- Environmental Compliance (307-1)

Social

- Employment (401-1, 401-2, 401-3)
- Labour/Management Relation (402-1)
- Occupational Health and Safety (403-1 to 403-5, 403-7, 403-8)
- Training and Education (404-1, 404-3)
- Diversity and Equal Opportunity (405-1)
- Child Labour (408-1)
- Local Communities (413-1)
- Socio-economic Compliance (419-1)

METHODOLOGY ADOPTED FOR ASSURANCE

Bureau Veritas sustainability assurance process involve specified procedures to obtain evidence about the reliability of the data provided from the identity. The nature, timing and extent of procedures selected depend on the data and evidence provided, including the verification of the associated risks with the material topics of the selected sustainability disclosures and their relevance. While assessing the associated risks, internal strategy is being considered during preparation of the report to design the assurance procedure and validating their appropriateness to the possible extent.

As per the scope of the assurance, sample evidence, information and explanations that were considered necessary in relation to the assurance scope were considered and accordingly conclusions have been made as mentioned below:

- Assessing that the report is prepared in accordance with the Sustainability Reporting Standards based on Global Reporting Initiative (GRI Standards) applicable on operation of NHAI 6 regional offices.
- Understanding the appropriateness of various assumptions used for estimation of data by NHAI regional offices.
- Reviewing the Report to ensure that there is no misrepresentation of disclosures as per scope of assurance and findings.
- Reviewing the materiality matrix and stakeholder engagement framework deployed at National Highway Authority of India
- Assessing the systems used for data compilation and reporting on the basis of Universal Disclosures and Topic Specific Disclosures of material topics as listed in the assurance scope above.





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- Verifying systems and procedures used for quantification, collation and analysis of sustainability performance disclosures included in the Report.
- Assessing the month wise data considering the similarity, reliability and accuracy
- Verifying select key performance data through the data provided from the selected 6 regional offices:
 - Testing reliability and accuracy of data on a sample basis
 - Assessing stakeholder engagement process and approach to stakeholder engagement regarding the key topics and concerns raised as defined in the report.
 - Limited review of the materiality assessment process based on the information provided for respective ROs.
 - Reviewing the processes deployed for collection, compilation and reporting of sustainability performance disclosures.
 - Gap assessment of the present Sustainability Report w.r.t. GRI Standard framework
 - Classifying observations and findings and issuance of Assurance Statement

Sample data were collected in order to support Bureau Veritas conclusions on the verified information and data. However, limited available information and details is reviewed during the assurance of six regional offices.

CONCLUSIONS

Sustainability report of National Highway Authority of India (NHAI) is reviewed based on the scope of the assurance as per the GRI Standard framework. It is concluded that information presented in NHAI Sustainability Report in accordance with Global Reporting Initiative (GRI Standard) is proper, adequate and maintained in line with the material topics considered for the reporting.

RESPONSIBILITIES

NHAI is completely responsible for the Report contents, identification of material topics, and data reporting structure. The Assurance statement is provided within the scope of assurance. Apart from this, this assurance is limited to NHAI 6 regional offices considered for sample data and no other regional office/project implementation unit to National Highway Authority of India is being considered in this statement.

The said assessment is properly based on the assumption that the data and information provided in respect of NHAI 6 regional offices and sustainability report is proper and without any discrepancy. Bureau Veritas shall not be held liable or responsible for any type of decision a person or entity would make based on this assurance statement. While reading the assurance statement, stakeholders shall recognize and accept the limitation and scope as mentioned above.

LIMITATIONS AND EXCLUSIONS

Excluded from the scope of work is any assurance of information relating to:

- Activities outside the defined assurance period stated hereinabove.
- Positional statements, expressions of opinion, belief, aim or future intention by "NHAI" and statements of future commitment;





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- The assurance does not extend to the activities and operations of "NHAI" outside of the scope and geographical boundaries mentioned in the sustainability report as well as the operations undertaken by any other entity that may be associated with or have a business relationship with "NHAI".

UNCERTAINTY

The reliability of assurance is subject to uncertainty(ies) that are inherent in the assurance process. Uncertainties stem from limitations in quantification models used, assumptions or data conversion factors used or may be present in the estimation of data used to arrive at results. The conclusions in respect of this assurance are naturally subject to any inherent uncertainty(ies) involved in the assurance process.

STATEMENT OF INDEPENDENCE, IMPARTIALITY, AND COMPETENCE

Bureau Veritas is an independent professional services company that specialises in Quality, Health, Safety, Social and Environmental management with almost 190 years history in providing independent assurance services.

Bureau Veritas has implemented a Code of Ethics across the business to maintain high ethical standards among staff in their day-to-day business activities. We are particularly vigilant in the prevention of conflicts of interest.

No member of the assurance team has a business relationship with "NHAI", its Directors, Managers or officials beyond that required of this assignment. We have conducted this verification independently and there has been no conflict of interest.

The assurance team has extensive experience in conducting assurance over environmental, social, ethical and health & safety information, systems and processes an excellent understanding of Bureau Veritas standard methodology for the assurance of Sustainability Report as per Global Reporting Initiative (GRI) Standards.





**BUREAU
VERITAS**

INDEPENDENT SUSTAINABILITY ASSURANCE STATEMENT

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(Scanned signature of the Lead Assurer on white background)

Bholenath Vishwakarma
Lead Assurer

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Nishtha Gupta
Technical Reviewer

Date: 24/03/2023
Place: Mumbai, India



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**BUREAU
VERITAS**







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सड़क परिवहन एवं राजमार्ग मंत्रालय, भारत सरकार
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