

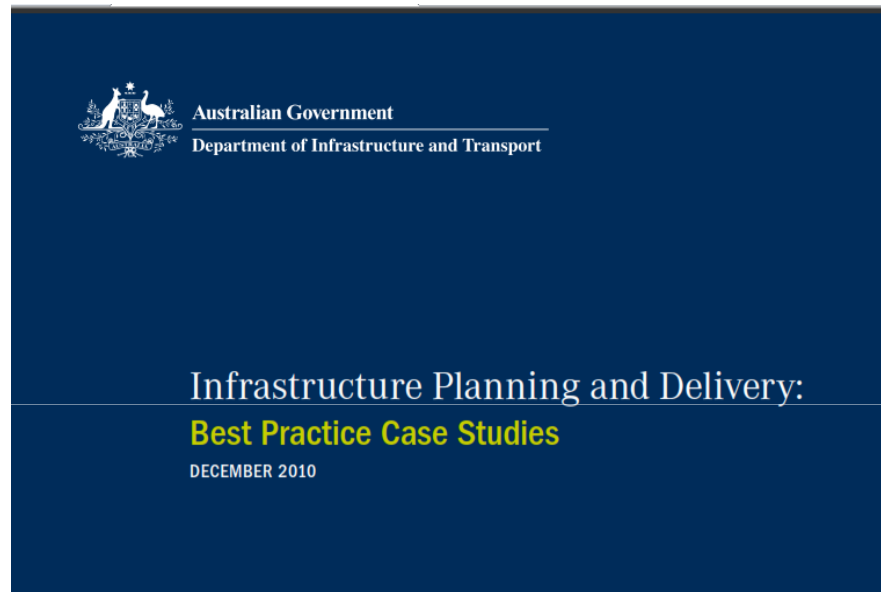
INFRASTRUCTURE CASE STUDY : ROAD SECTOR

Structure

- **National & International Case studies of Infrastructure PPP projects**
- **Case Study : Road Sector**
- **Case Study : Delhi Metro**

Compendium of Best Practices : Web

➤ Australian Govt : Infrastructure Planning & Delivery : Best Practice Case Studies, 2010



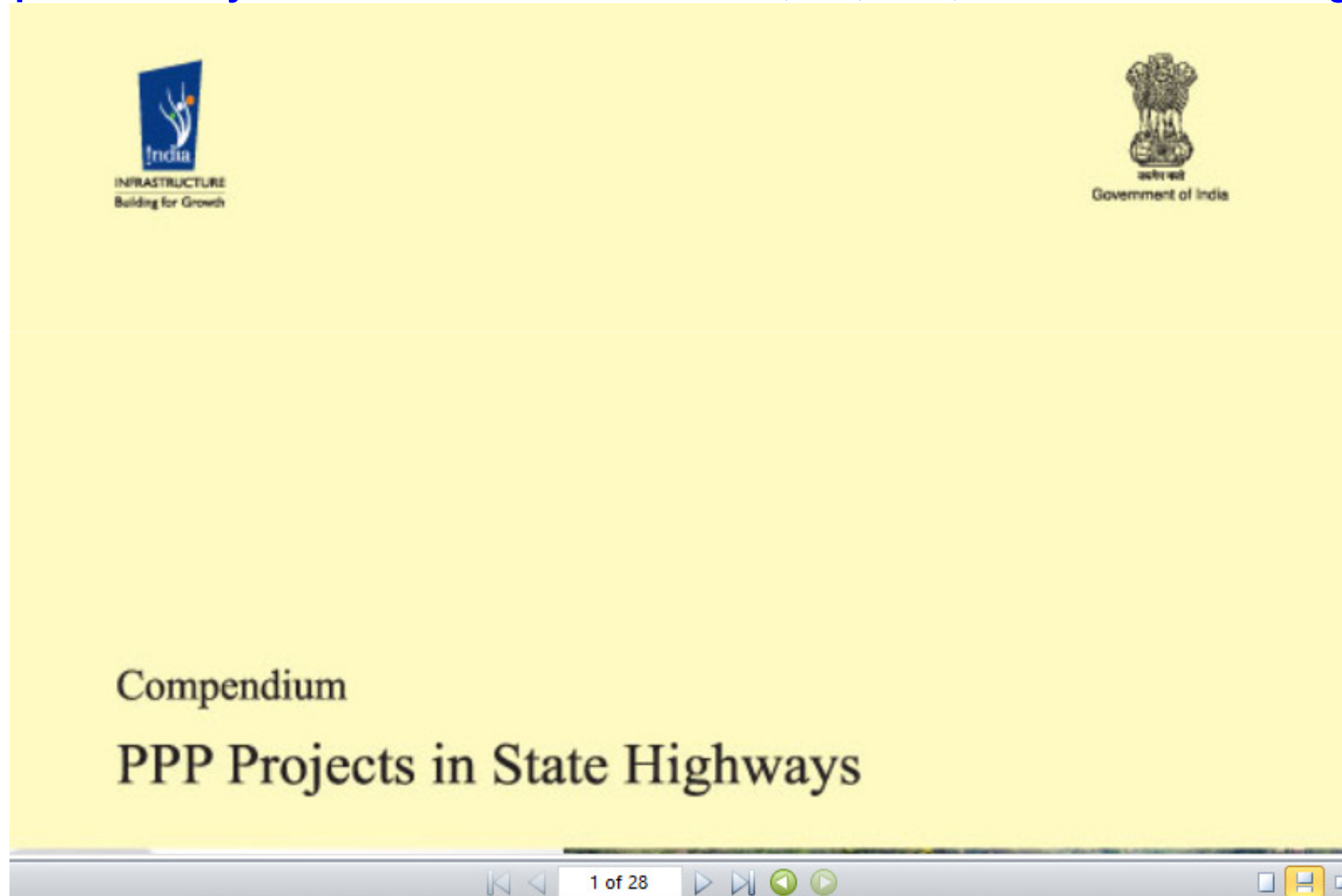
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Compendium of Best Practices : Web

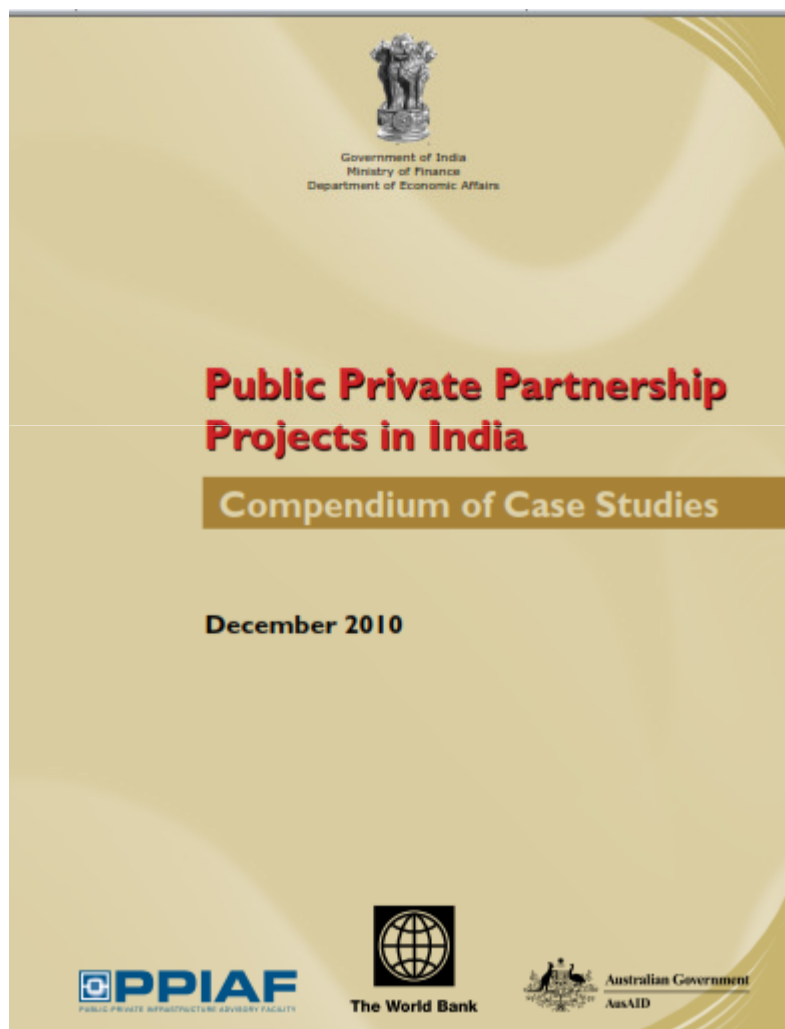
➤ Govt of India : PPP Projects in State Highways, June 2010

published by Secretariat for Infrastructure , PC, GoI , www.infrastructure.gov.in



Compendium of Best Practices : Web

➤ DEA, GoI : PPP Projects in India : Compendium of Case Studies Dec. 2010



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Compendium of Best Practices : Web

➤ UN ESCAP (Economic & Social commission for Asia & Pacific):

Public-Private Partnerships Case Study #3



Mobilizing Private Funding: the Case of the National Highways of India

by Mathieu Verougstraete and Hyo Jin Kang (June 2014)

This case study reviews the development of highways in India and shows the possible shift in infrastructure financing from traditional public procurement to a Public-Private Partnership (PPP) model within a relatively short period, as well as the challenges encountered.

PRIVATE FINANCING

There is massive demand for infrastructure

Implementation Strategy

To implement the first two phases of

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➤ UN , UNDP Special Unit for South –South Cooperation:



EAST COAST ROAD, TAMIL NADU, INDIA

Case Study (Transportation)

Project Summary:

The southern India state of Tamil Nadu has been a leader in the area of urban sector reforms and has established an efficient framework to carry out this process. One of the tools it has used for a

Compendium of Best Practices : Web

➤ Global Infrastructure Hub : Pennsylvania Rapid Bridge Replacement Project , Aug 2017



The image is a screenshot of a video player. At the top left is the logo for the Global Infrastructure Hub, which consists of a stylized grid of horizontal lines in shades of blue and green, followed by the text "Global Infrastructure Hub". At the top right, it says "A G20 INITIATIVE" and "SHOWCASE PROJECTS". The main content is a photograph of a concrete bridge over a stream, surrounded by lush greenery. A small text overlay in the top right of the photo reads "Image courtesy of Plenary Group (https://plenarygroup.com)". At the bottom of the photo, the title "Pennsylvania Rapid Bridge Replacement Project" is written in large white letters. Below the photo, the date "August 2017" is displayed. At the very bottom, there is a video player control bar with navigation icons and a "1 of 5" indicator.

Global Infrastructure Hub

A G20 INITIATIVE
SHOWCASE PROJECTS

Image courtesy of Plenary Group
(<https://plenarygroup.com>)

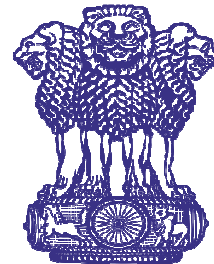
Pennsylvania Rapid Bridge Replacement Project

August 2017

1 of 5

INFRASTRUCTURE :

CS -ROAD SECTOR



सत्यमेव जयते

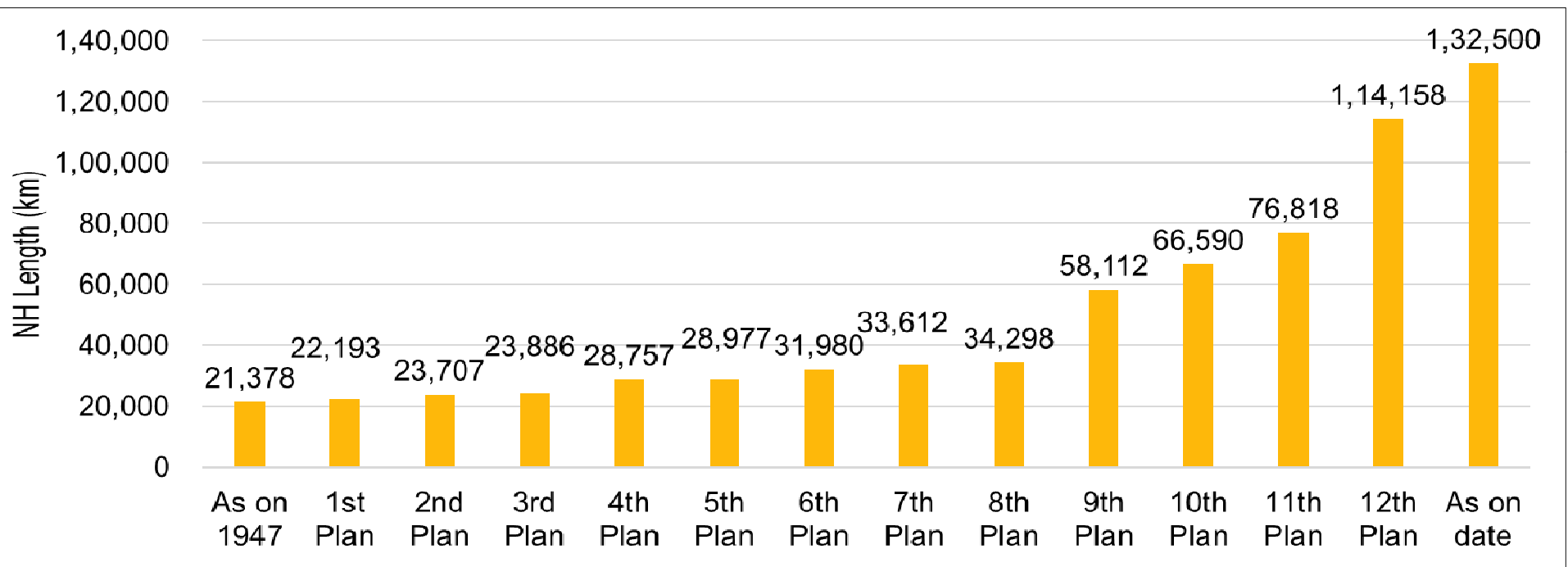
**Presentation of Shri Amit Kr. Gosh
JS(LA & Highways)**

Ministry of Road Transport & Highways, Dec2019

Road Network in India

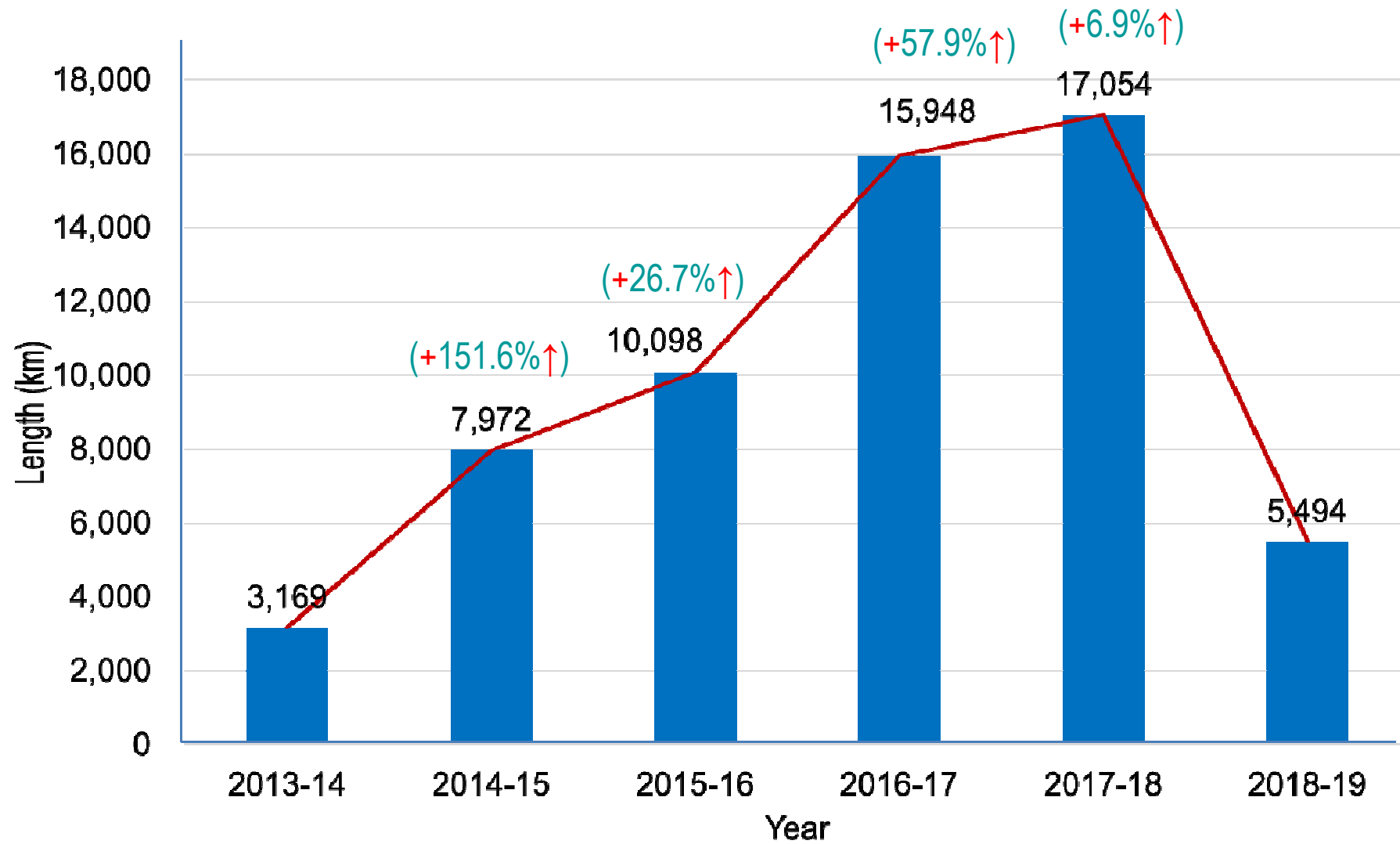
- Total length of road network - 58.98 lakh km
 - National Highways - 1,32,500 km (2.3%)

NHs carry more than 40 % traffic
 - State Highways - 1,56,694 km
 - Other Roads - 56,08,477 km

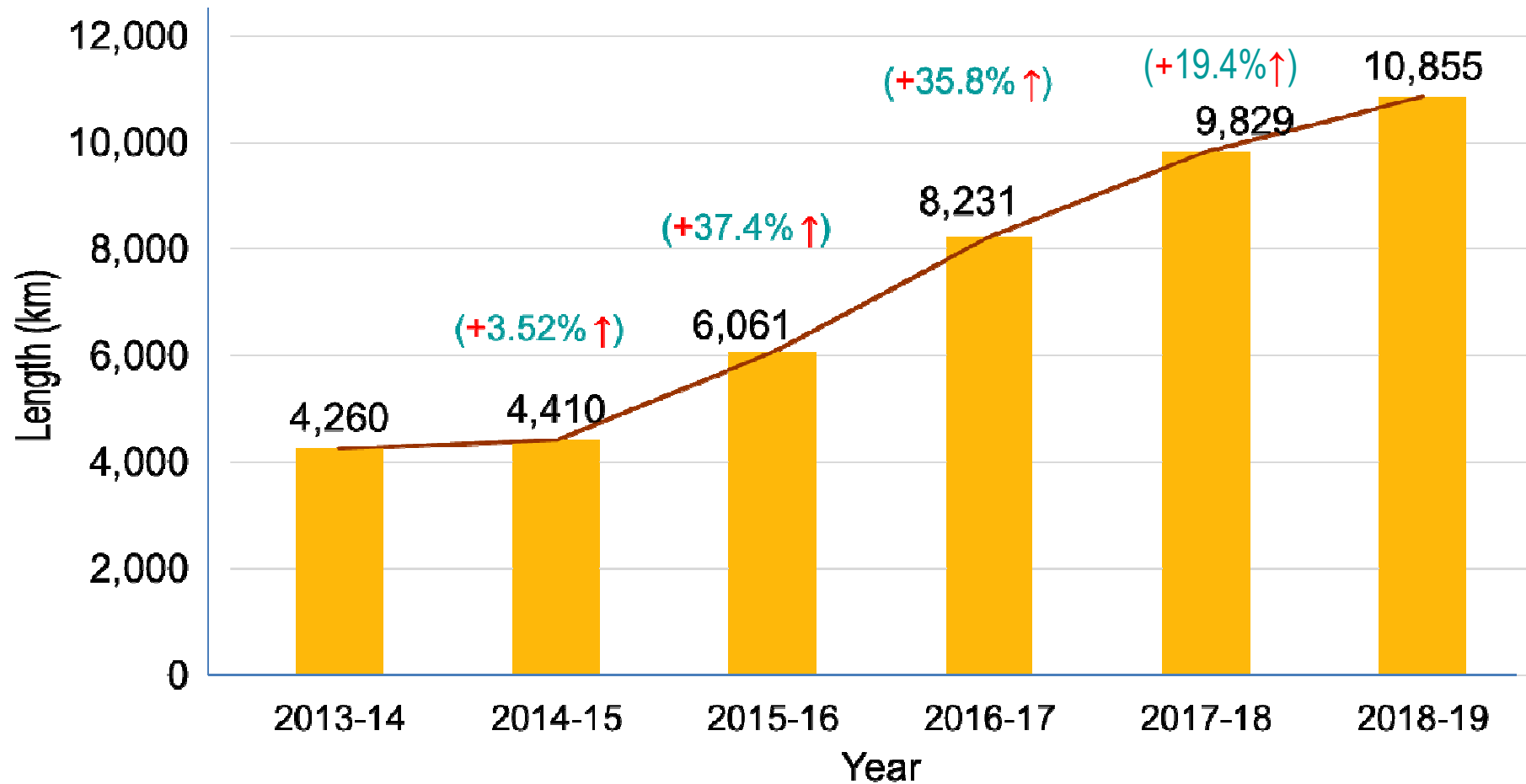


- NH length enhanced from 91,287 km (April, 2014) to 1,32,500 km
- Major challenges – Development of balance 35,000 km NHs

Performance – Award (km)



Performance – Construction (km)



Central Road Sector Schemes

➤ Development of NHs

- **Bharatmala Pariyojana – Phase-I started in July 2015 [which has fully subsumed National Highways Development Project (NHDP - 1998)]**
- **Special Accelerated Development Program for North Eastern States [SARDP-NE] (2005) including Ar.P. Package of Roads**
- **Externally Aided Projects funded by (i) World Bank (1,120 km), (ii) JICA (645 km), (iii) ADB (128 km)**
- **Development of 5,453km of NH & SH in Left Wing Extremism affected areas, Mar2019, including 592 km of Vijayawada Ranchi Corridor**
- **Chardham (889 km) connecting BGKY (Badrinath, Gangotri, Kedarnath, & Yamunotri) in Uttarakhand; Foundation stone laid in Dec 2016**
- **PM Package - J&K (1,619 km) & Bihar (2,645 km)**
- **Development of balance NHs under National Highways (Original) [NH(O)]**

Central Road Sector Schemes

➤ Implementing Agencies.

◦ National Highways Authority of India (NHAI)	–	49,300 km
◦ State Public Works Departments	-	57,950 km
◦ National Highways & Infra.Deve.Corp(NHIDCL)	-	3,760 km
◦ Border Roads Organisation (BRO)	-	1,510 km
◦ Directly being executed by MoRTH	-	810 km
◦ Length yet to be entrusted	-	19,170 km

➤ Lane –wise NH Length

◦ Single/Intermediate Lane	–	36,310 km
◦ 2 lane	-	65,123 km
◦ 4 Lane	-	28,412 km
◦ 6/8 Lane	-	2,655 km

➤ Development of State Roads under Central Road & Infrastructure Fund (CRIF) (formerly CRF) scheme as per CRF Act, 2000, amended by the Finance Act, 2018 – The Act is being administered by the D/o Economic Affairs

NH Network

1	Length of notified NH in April, 2014	91,287 km
2	Length of Notified NH –February 2019	1,32,500 km
3	Re-aligned length of additional NH length	41,213 km
4	Addition during 5 yrs (April-2014 to March-2019)	40,650 km
(i)	Out of 'In-principle' NH	19,170 km
(ii)	Under District/ Religious/ Tourist Connectivity	11,719 km
(iii)	Under Bharatmala	9,761 km
5	Total "In-principle NH" approved – subject to outcome of DPRs	71,898 km
6	Balance "In-principle" NH	52,728 km

NH -Status of Development

1	Total Length of Notified National Highways	1,32,500 km
2	Length developed so far	62,206 km
3	Under Implementation (Balance Liability: Rs. 4,80,200 cr.)	35,244 km
4	Balance length to be taken up out of Notified NHs	35,050 km
(i)	NH notified before April, 2014	6,344 km
(ii)	Other NH notified after April, 2014	20,360 km
(iii)	Notified under Bharatmala	8,346 km
5	Yet to be Notified under Bharatmala	10,000 km

BHARATMALA PARIYOJANA

Length in km, amount in Rs. crore

Sl. No.	Scheme	Total Length	Phase-I Length	Phase-I Cost
1	Economic Corridors	26,200	9,000	120,000
2	Inter-Corridors & feeder roads	15,500	6,000	80,000
3	National Corridor Efficiency improvement	13,100 #	5,000	100,000
4	Border & International connectivity roads	5,300	2,000	25,000
5	Coastal & port connectivity roads	4,100	2,000	20,000
6	Expressways	1,900	800	40,000
	Sub Total	66,100	24,800	385,000
7	Ongoing Projects, including NHDP		10,000	150,000
	Total		34,800	535,000
	Other ongoing projects			1,57,324
	Grand Total			6,92,324

- 28 ring roads, 125 choke point, 66 congestion points, 35 nos. logistics parks

➤ **265 nos. projects with aggregate length 10,985 km and total capital cost as Rs. 2,76,427.55 crores have been approved under Bharatmala Pariyojana Phase-I till now.**

SARDP-NE including Ar.P. Package

➤ The programme

- Upgrade National Highways connecting State Capitals to 2/ 4 lane
- Provide connectivity of all 88 District HQs of NER by at least 2-lane road;
- Improve roads of strategic importance in border area.
- Improve connectivity to neighbouring countries
- Phase 'A' -4,099 km length of roads (3,014 km of NH and 1,085 km of State roads)
 - Cabinet Approval for Rs. 14,743 crore on 22.09.2005
 - Target for completion – March, 2009 (Initial); 2023-24 (Revised)
 - Progress – 2,101 km completed upto 31.03.2019
- Ar.P. Package - 2,319 km length of road (2,205 km of NHs & 114 km of State / General Staff / Strategic Roads)
 - Cabinet Approval for Rs. 15,643 crore on 09.01.2009
 - Target for completion – March, 2014 (Initial); 2023-24 (Revised)
 - Progress – 928 km completed upto 31.03.2019
- Total estimated Revised Cost-Rs. 79,862 crore (52,541–Phase A; 27,321–Ar. Pkg.)
- Phase 'B' -3,723 km length of roads (2,210 km of NH and 1,513 km of State roads) – approved for DPR preparation on 18.05.2006
- Status of works:
 - Projects sanctioned – Rs. 57,047 crore (5,273 km)
 - 3,029 km length completed
 - Cumulative expenditure – Rs. 30,315 crore

SARDP-NE including Ar.P. Package

➤ Major Issues

- Difficulty in acquisition of additional land, diversion of forest land compensation for Afforestation, compensation to tribal land
- Lesser working period in NER States (November to March)
- Non-availability of major contractors in NER region

➤ Actions taken

- Making Small size project for attacking local agency
- Projects are being sanctioned/awarded only after acquisition of at least 90 % land & after completion Forest clearance & other preconstruction activities
- Close monitoring of progress

Externally Aided Projects – World Bank Funded

NH Interconnectivity Improvement Project (NHIP) - 1,120 km

➤ Sanction details

➤ Original

- Cost – Rs. 5,193 crore sanctioned on 18.04.2013
- Target for completion – June, 2019

➤ Revised

- Cost – Rs. 6,461 crore sanctioned on 24.08.2016
- Target for completion – June, 2020

➤ In Rajasthan, West Bengal, Odisha, Karnataka, Bihar

➤ Total 11 nos. of works of aggregate length 1,087 km costing Rs. 6,461 cr

➤ Total 857 km completed with total expenditure of Rs.. 4,190 crore

➤ Issues

➤ Land Acquisition

➤ Delay in disbursement of R&R compensation

➤ Financial constraints of the Contractor

Externally Aided Projects – JICA Funded

- **4-Lanning of NH-82 (Gaya-Hisua-Rajgir-Nalanda-Biharsharif Section) - 92.9 km**
 - **Original Sanction**
 - Cost – Rs.1,409 crore sanctioned on 21.01.2014
 - Target for completion – 24.10.2019
 - **Revised Sanction**
 - Cost – Rs.2,138 crore sanctioned on 02.08.2018
 - Target for completion – June, 2020
- **4-Lanning of NH-83 (Patna – Gaya – Dobhi) – 127 km**
 - **Original Sanction**
 - Cost – Rs.2,265 crore sanctioned on 07.10.2014
 - Target for completion – 09.04.2018
 - Contract foreclosed
- **Total 53 km completed out of 220 km**
- **"North-East Road Network Connectivity Project Phase I with total length 403 km costing Rs. 6,721 crore**

Externally Aided Projects – ADB Funded

➤ 2 Asian Highways Projects in West Bengal with total length 127.84 km

➤ Original Sanction

- Cost – Rs.1,572.27 crore sanctioned in August, 2014
- Target for completion – November, 2017

➤ Revised Sanction

- Cost – Rs.1,658.73 crore sanctioned on December, 2017
- Target for completion – August, 2018
- Likely date of completion – June, 2019

➤ 125.60 km completed at an expenditure of Rs. 1,301.48 crore

(as on April, 2019)

Development of Roads in LWE affected areas

- **Road Requirement Plan (RRP) for improvement of road connectivity in Left Wing Extremism (LWE) affected areas of 34 Districts in 9 States**
- **LWE -5,422 km length (1,177 km NHs & 4,245 km State Roads)**
 - **Cabinet Approval on 26.02.2009**
 - **Original Cost – Rs. 7,300 crore**
 - **Target for completion – March 2012(Initial); March 2022(Revised)**
 - **Estimates sanctioned – 5,422 km (Rs. 8,593 crore)**
 - **Works awarded – 5,419 km (Rs. 8,654 crore)**
 - **Progress – 4,792 km completed upto 31.03.2019**
 - **Expenditure upto 31.03.2019 (Cumulative) – Rs. 7,309 crore**

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 - **Expenditure upto 31.03.2019 (Cumulative) – Rs. 7,309 crore**
- **Issues**
 - **Major security concerns ; Delay in land acquisition ; Delay in forest clearance ;**
 - **Slow progress of works by agency ; Inadequate deployment of security forces**
- **Action taken for resolving the Issues**
 - **Acceptance of bids:-** State Governments have been authorized to accept bids up to 10% excess over the cost of work based on current SOR.
 - **Schedule of Rates (SOR):-** If required, separate SOR for LWE areas may be adopted while preparing estimates of works under LWE scheme.
 - **Clubbing and splitting of works horizontally and vertically have been permitted, Ministry had permitted splitting of works into small packages of 2 to 3 km**

Development of Roads in LWE affected areas

➤ Actions taken for resolving outstanding issues

- Secretary (RT&H) requested Chief Secretaries of concerned States vide letter dated 01.03.2013 to constitute District level Coordination Committee headed by DM and comprising of SP, Central Armed Forces, State PWD and Contractor to plan and proceed with Area Domination by Armed Forces for execution of works.**
- Secretary (RT&H) requested the Union Home Secretary vide DO letter dated 23.06.2016 to provide 81 additional security camps.**
- Subsequently a meeting was taken by Principal Secretary (Home), Chhattisgarh with CE(LWE) and State PWD on 24.01.2017.**
 - Contractors given programmes in a prioritized manner to complete sections in a project stretch by stretch in a progressive manner depending upon availability of security personnel.**

Chardham Mahamarg Pariyojana

- NHs damaged severely at many places due to heavy rainfall/ cloud burst in June,2013.
- Action taken up for rehabilitation, reconstruction, Improvement & Strengthening of such NHs.
- Project to provide all weather road connectivity to Chardham (Kedarnath, Badrinath, Gangotri, Yamunotri)
Original Cost – Rs. 11,700 crore
Target for completion – March 2020 (Initial) ; December 2021 (Revised)
Physical progress - 35%
Expenditure - Rs. 2,083 crore

Total length	889 km
Total project cost	Rs. 11,700 crore
Sanctioned	Rs. 9,030 crore (635 km)- 37 projects
Status of award	Rs. 8,085 crore (612 km)- 36 projects
Works in progress	Rs. 6,440 crore (508 km)- 28 projects

Chardham Mahamarg Pariyojana

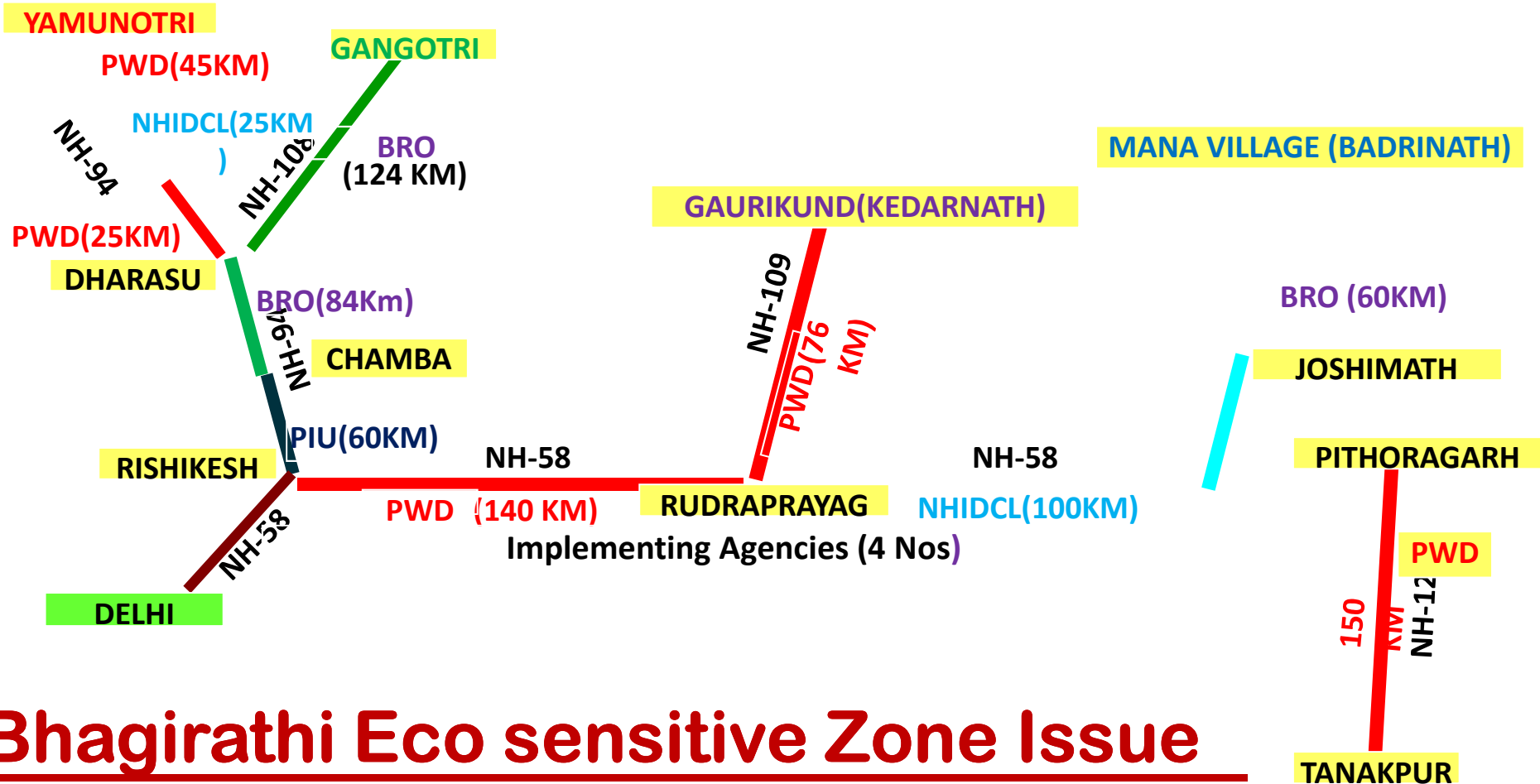
➤ Issues

- LA and utility shifting issues
- Forest clearance issues due to ongoing litigation in Hon'ble Supreme Court & NGT
- Hindrances in May and June (working season) due to Chardham Yatra
- Muck dumping issues
- Bhagirathi Eco sensitive Zone issue

➤ Action Taken to resolve the issues

- Contesting the case in Hon'ble Supreme Court and NGT Forest clearance issues due to ongoing litigation in Hon'ble Supreme Court and NGT
- Regular interactions with State Govt. officials
- Raising the matters in review meetings chaired by Chief Secretary of Uttarakhand
- A petition was filed by Citizens for Green Doon, Uttarakhand (an NGO) in Hon'ble NGT in Feb.2018 alleging that projects under Chardham program require Environmental Clearance (as per EIA Notification 2006 & its amendments) has not been obtained. The matter was disposed off vide order dated 26.09.2018 which has now been challenged by the applicants in Hon'ble Supreme Court, date of hearing was 17.07.2019.

Scope of Chardham



Bhagirathi Eco sensitive Zone Issue

- Uttarkashi-Gangotri section of NH-108 lies on Bhagirath Eco Sensitive Zone (BESZ) on which no project is to be taken up pending finalization of Master Plan of the Zone.
- State Govt. submitted the Zonal Master Plan to MoEF&CC vide their letter dated 27.09.2018.
- In the 34th ESZ Expert Committee meeting held on 06.03.2019, consideration of proposal of ZMP was deferred pending approval of MoWR, RD & GR

Char Dham- Alignment Issue

- **Dharasu bend - Uttarkashi-Gangotri section of NH-108** : In order to minimize felling of trees in this zone, it was suggested in meeting of CoS held on 26.12.2018 to explore an alternative alignment.
 - However, alternative alignment on right bank is not feasible due to landslide prone area in between Km 13 to Km 29.50.
 - Subsequently, it has been decided that the stretch be developed to intermediate lane specifications as this will meet the width requirement for movement of military Guns/vehicles as well as minimize felling of trees.
- **Joshimath (Helong-Marwari) Bypass on NH-58**: The locals & traders Association of Joshimath have not agreed for construction of this bye-pass due to apprehension of losing their livelihood.
 - As such, it was decided that while other options may be explored by the BRO & State Government (as alternative suggested by villagers will not remove traffic bottleneck of Joshimath Town) and a final decision on the issue be deferred till the conclusion of the Parliament election.

Development of balance NHs [under National Highways (Original)]

- **Covers NHs which has not been included in any of the Ministry's Road Development schemes**
- **Works are sanctioned as per Annual Plan forwarded by State Govt.**
- **Works mainly gets executed through State PWDs & NHIDCL**
- **Status of Works**
 - **904 nos. of works costing- Rs. 1,37,600 crore**
 - **Total sanctioned length – 20,540 km**
 - **Total liability as on date - + Rs. 1,20,000 crore**
 - **Annual allocation**
 - **Rs. 22,850 crore – NH(O)**
 - **Rs. 1,900 crore – NH(O) – TSP**
 - **Rs. 700 crore – NH(O) – NER**
 - **Estimated shortfall in availability of fund during 2018-19 – Rs. 15,000 crore**
- **ISSUES**
 - **Finalization of Annual Plan of works for 2019-20**

Total Budget Allocation & Expenditure of MORTH

Amount in Rs. Crore

Financial Year	Allocation			Expenditure		
	GBS	IEBR	Total	GBS	IEBR	Total
2012-13	21,818	13,000	34,818	21,586	2,902	24,488
2013-14	26,090	8,000	34,090	25,803	7,942	33,745
2014-15	30,398	7,611	38,009	29,338	3,343	32,682
2015-16	47,137	42,695	89,831	45,967	23,281	69,248
2016-17	52,503	59,279	1,11,782	49,201	33,118	82,319
2017-18	61,000	59,279	1,20,279	59,619	50,533	1,10,152
2018-19	78,625	62,000	1,40,625	76,016	61,217	1,37,233

Total Expenditure including Private Sector Investments

Amount in Rs. Crore

Financial Year	Dev. of NHs	M&R of NHs	Sub Total	State Roads	Road Transport	Sectt. Expd.	Total (Budgetary)	IEBR	Grand Total (Budget)	Pvt. Sect. Invest.
2012-13	17,314	1,478	18,792	2,594	136	64	21,586	2,902	24,488	20,305
2013-14	20,641	1,803	22,444	3,160	133	66	25,803	7,942	33,745	22,515
2014-15	24,418	2,534	26,952	2,188	123	75	29,338	3,343	32,682	19,232
2015-16	40,560	2,528	43,088	2,665	133	81	45,967	23,281	69,248	29,770
2016-17	40,654	2,503	43,157	5,816	127	100	49,201	33,118	82,319	16,029
2017-18	49,665	2,655	52,319	7,045	144	111	59,619	50,533	1,10,152	16,501
2018-19	66,804	1,680	68,485	7,259	155	117	76,016	61,217	1,37,233	21,605
2019-20 (Estt. BE)	71,642	3,100	74,742	7,839	280	155	83,016	62,000	1,45,016	25,000

Year wise expenditure for NH Development

Amount in Rs. Crore

Financial Year	Development of NHs	IEBR (actual raised)	Grand Total (Budget)	Pvt. Sect. Investment
2012-13	17,314	2,902	20,216	20,305
2013-14	20,641	7,942	28,583	22,515
2014-15	24,418	3,343	27,761	19,232
2015-16	40,650	23,281	63,931	29,770
2016-17	40,654	33,118	73,772	16,029
2017-18	49,665	50,533	1,00,198	16,501
2018-19	66,804	61,217	1,28,021	21,605
2019-20 (Estt. BE)	71,642	62,000	1,33,642	25,000

Actual Expd. vis-à-vis Allocation of NHA

Amount in Rs. Crore

Financial Year	Budgetary Allocation	IEBR Raised	Total Budgetary Allocation	Actual Expenditure
2015-16	22,390	23,281	45,671	42,689
2016-17	15,705	33,118	48,823	48,858
2017-18	25,672	50,533	76,205	83,231
2018-19	31,222	61,217	92,439	1,16,811

NH Projects – Committed Liabilities & Ongoing Works

- **Projects in Progress at present**
 - 1,446 nos. in 52,103 km length costing Rs. 6,13,539 crore
- **Implementation period of NH/road projects vary between 2 to 4 yrs.**
- **The Bank of Sanction of projects are accordingly built up year-by-year considering estimated fund availability, committed liabilities, scope of particular sanctioned scheme.**
- **Projects under NH(O) are accordingly taken up as per inter-se priority & availability of funds after giving priority for other major schemes.**
- **Assured funding required as per approved Financing Plan for Bharatmala Pariyojana Phase-I for**
 - **Timely completion of all ongoing schemes including Bharatmala Pariyojana Phase-I;**
 - **Attending balance NHs under NH(O) scheme;**
 - **Avoid contractual claims, litigations, etc., besides delay in project implementation**

CRIF Act, 2000 - Developments

- **The CRIF Act, 2000 amended through the Finance Act, 2018 as “The Central Road and Infrastructure (CRIF) Act, 2000**
- **DEA, M/o Finance is responsible for administering the CRIF Act, 2000, since 26.07.2018**
- **No assurance of fixed apportionment of share of cess for infrastructure sectors including NHs now**
- **More sectors included now, viz. Ports, Shipyards, Inland Waterways, Airports in Transport Sector besides other Sectors such as Energy, Water & Sanitation, Communication, Social & Commercial Infrastructure**
- **Share of fund to be apportioned to each Infrastructure Projects to be finalized by Committee headed by Hon’ble Finance Minister**

CRIF Act, 2000 - Developments

- Comparison of Cess distribution before 01.06.2016, after 01.06.2016 and before 31.03.2018 and as per CRF Act, 2000 amended to CRIF Act, 2000 by the Finance Act, 2018

Ministry / Organization	Tentative distribution before 01.06.2016	Distributions after 01.06.2016 and before 31.03.2018	Distributions as per CRIF amended by the Finance Act, 2018 w.e.f. 01.04.2018
(1)	(2)	(3)	(4)
Rural Roads (PMGSY)	34.6 %	33.50 %	To be decided by Committee headed by Hon'ble Finance Minister as per Section 7A of the CRIF Act, 2000 (erstwhile CRF Act, 2000)
National Highways	41.1 %	41.50 %	
Railways	7.2 %	14.00 %	
State Roads under CRF and EI&ISC	17.1 %	10.00 %	
Border Area Roads (MoD)	0 %	1.00 %	
Other Infrastructure Sectors	0%	0%	

- Committee headed by Hon'ble Finance Minister constituted vide S.O. 3226 (E), dated 02.07.2018 to approve recommendations of the Sub-Committee headed by Secretary (DEA) having TOR to
 - Examine and evaluate proposals to be financed from CRIF
 - Prioritize list of projects each year
 - Give recommendations to Committee for approval of projects

CRIF Act, 2000 - Developments

- **Draft CRIF (State Roads) Rules, 2018 forwarded to the DEA in May, 2018 requesting for necessary action for notifying the said Rules.**
- **Outstanding committed liabilities for State Road Schemes as on 01.04.2019 –**
 - **CRF Scheme – Rs. 53,400 crore**
 - **Economic Importance & Inter State Connectivity (EI & ISC) Scheme – Rs. 2,620 crore**
 - **Additionally projects approved “In-Principle” under EI & ISC Schemes – Rs. 933 crore**
- **Committed and assured funding required annually for ensuring timely completion of projects and obviate State/ Peoples Representatives’ resentments**

CRIF Act, 2000 - Developments

- While forwarding proposal for consideration of the Sub-Committee headed by Secretary (DEA) for finalizing project financing from CRIF in December, 2018 DEA was also requested to: -
 - **Authorize the Ministry to finalize list/ details of projects to be taken up under NHs share of CRIF cess at its level**
 - **Authorize the Ministry to finalize the list of projects to be taken up for development of State roads under CRF and EI&ISC Schemes annually at its level, continue identifying and approving individual State road projects under these Schemes as per previous policy following the principles laid down vide the CRF (State Roads) Rules, 2014 with its amendments made from time to time till the draft CRIF (State Roads) Rules, 2018 are notified**
 - **Authorize the Ministry to earmark State/ UT-wise allocation of funds, make release of funds, subject to ensuring compliance with the provisions as per extant Rules**

Monetization of Assets through TOT Model

- Policy for Toll-Operate-Transfer having concession period of 30 years approved by Cabinet on 03.08.2016
- Targeted to raise funds to the tune of about Rs. 34,000 crore under TOT concessions upto 2021-22 as per approved Financing Plan
- First bundle (9 project stretches, 680 km) already awarded and Concession started w.e.f. 29.08.2018 & Rs. 9,681.50 crore has been received & deposited in CFI; Ring-fenced in budget in 2018-19.
- Bids for second Bundle of TOT was invited on 06.08.2018. H-1 bid received 14% below IECV of Rs. 5,362 crore. NHAI Board asked to re-invite the bids by restructuring the Bundle.
- TOT bundle 3 H-1 bid for an amount of Rs. 5011 crores finalised.
- Target of Rs. 10,000 crore has been set for realization of funds under TOT during 2019-20

Financing of State Road Projects

- The funds for State Roads under EI&ISC Schemes (Economic Importance & Inter State Connectivity) are allocated keeping in view the committed liabilities, progress of works, inter-se priority, etc.
- For these works, direct payment procedure as applicable for NH works is followed; the funds are released directly to the contractors by MoRT&H's Regional Offices (ROs) through Regional Pay & Accounts Offices (RPAOs) based on the bills received/ processed.

Amount in Rs. Crore						
Budget Year	Demands for States' share of CRF / CRIF		Total	Allocations/ Indicative allocations		Total
	CRF/ CRIF Scheme	EI&ISC Scheme		CRF/ CRIF Scheme	EI&ISC Scheme	
2018-19 (BE)	7,994.42	897.24	8,891.66	8,007.42	898.70	8,906.12
2018-19 (RE)	8,007.42	898.70	8,906.12	6,998.92	500.00	7,498.92
2019-20 (BE)	8,807.51	988.50	9,796.01	7,421.58	500.00	7,921.58

MODES OF PROJECT IMPLEMENTATION & ASSET MONETIZATION

Key Implementation Modes

BOT – Toll (PPP)	<ul style="list-style-type: none">• Concessionaire responsible for designing, building, financing, operating & transferring the project at end of concession period.• Provisions of VGF of up to 40% of total project cost by Govt.• Commercial returns to concessionaire through collection of toll revenue at Government regulated rates.• Commercial risk taken by the concessionaire.
BOT - Annuity (PPP)	<ul style="list-style-type: none">• Concessionaire responsible for designing, building, financing, operating & transferring the project at end of concession period.• Financial returns to concessionaire through pre-determined semi-annual annuity payments made by the Government.• Government responsible for collecting toll revenue.• Commercial risk not transferred to the concessionaire.

Key Implementation Modes

EPC	<ul style="list-style-type: none">• Concessionaire responsible for designing, building & transferring the project at end of construction period.• Financial returns to the concessionaire through payments made by the Govt.• Govt responsible for collecting toll revenue & maintaining road.• Government handling financing risk, O&M risk and revenue risk .• Considerable strain on Government finances until toll stabilizes.
HAM	<ul style="list-style-type: none">• Concessionaire responsible for designing, building, operating and transferring the project at end of concession period.• Authority as well as the concessionaire responsible for financing the project.• 40% of Project Cost (Construction Support) by Govt. & 60% of Project Cost arranged by Concessionaire for Financial Close.• Financial returns to concessionaire through pre-determined semi-annual annuity payments made by the Government.• Government responsible for collecting toll revenue.• Commercial risk not transferred to the concessionaire.

Modes of Implementation - Risk & Responsibility

<div style="text-align: center;">Mode</div> <div style="text-align: left;">Parameters</div>	<div style="text-align: center;">EPC (Public funded)</div>	<div style="text-align: center;">BOT (Annuity) (PPP mode)</div>	<div style="text-align: center;">BOT (Toll) (PPP mode)</div>	<div style="text-align: center;">HAM (PPP mode)</div>
<div style="text-align: center;">Construction</div>	<div style="text-align: center;">Authority/ Contractor</div>	<div style="text-align: center;">Private Investor</div>	<div style="text-align: center;">Private Investor</div>	<div style="text-align: center;">Authority/ Private Investor</div>
<div style="text-align: center;">Operation & Maintenance</div>	<div style="text-align: center;">Authority</div>	<div style="text-align: center;">Private Investor</div>	<div style="text-align: center;">Private Investor</div>	<div style="text-align: center;">Private Investor</div>
<div style="text-align: center;">Traffic & Toll</div>	<div style="text-align: center;">Authority</div>	<div style="text-align: center;">Authority</div>	<div style="text-align: center;">Private Investor</div>	<div style="text-align: center;">Authority</div>

Modes of Implementation - Risk & Responsibility

Particulars Mode	Strengths	Constraints
BOT (Toll)	The major responsibility of Construction, operation & maintenance and Traffic/Toll risk with the concessionaire/ private developer.	Lack of availability of debt products aligned with revenue stream profile of highway projects. Lenders apprehensive about making investments.
BOT (Annuity)	The major responsibility of Construction and operation & maintenance with the concessionaire/ private developer. Traffic/Toll risk with the Government.	Lack of availability of debt products aligned with revenue stream profile of highway projects. Lenders apprehensive about making investments.
EPC	The major responsibility of Construction, operation & maintenance and Traffic/ Toll risk with the Government.	Shift to public funded EPC mode for highway projects not possible due to constraints because of existing financial resources of Government.
HAM	Private developer takes responsibility with reduced risk perception vis-a-vis BOT model. Innovative concession provision such as termination payment for Concessionaire event of default during construction.	Higher financial commitment for the Authority.

Implementation of PPP & EPC : Challenges

- **Steep decline in PPP participation observed - 2012-13 & 2013-14 with many viable projects unable to attract even a single bid due to :**
 - **Over-leveraged financials for developers due to excessive exposure to infrastructure projects,**
 - **Lack of availability of debt products aligned with revenue stream profile of highway projects,**
 - **Banks reaching the ceiling as per sectoral exposure norms,**
 - **Aggressive bidding based on unrealistic traffic projections,**
 - **Inadequate project preparatory activities,**
 - **Projects getting stalled during construction due to LA and clearance related issues.**
- **Complete shift to public funded EPC mode for highway projects not possible due to constraints because of existing financial resources of Govt.**
- **Requirement for an innovative implementation model to revive interest of Private Investors. Therefore, Hybrid Annuity Model was considered for implementation of the projects.**

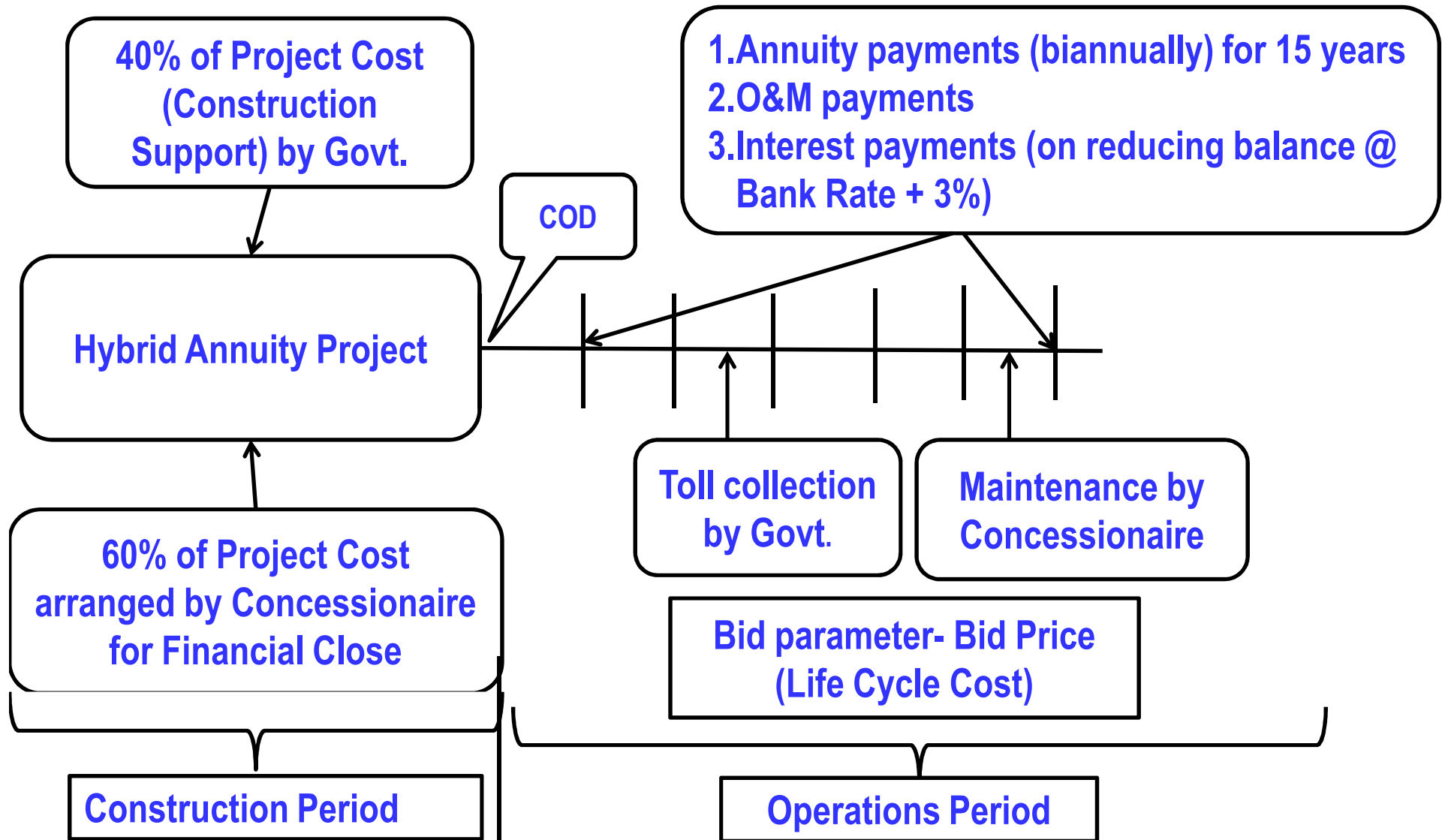
Hybrid Annuity Model – Risk Allocation

Risk shared in EPC Mode	
Type of Risk	Risk bearer
Financing Risk	Government
O & M Risk	Government
Revenue Risk	Government

Risk shared in BOT (Toll) Mode	
Type of Risk	Risk bearer
Financing Risk	Private
O & M Risk	Private
Revenue Risk	Private

Risk shared in Hybrid Annuity Model	
Type of Risk	Risk bearer
Financing Risk	Shared between Govt and Private
O & M Risk	Private
Revenue Risk	Government

Hybrid Annuity Model – Overview



COD – Commercial Operations Date

Asset Monetization

	NHAI Toll Collection	Securitization	TOT	InvIT
Payment	Monthly	Upfront	Upfront	Upfront
Toll Collection	NHAI	NHAI	Concessionaire	InvIT
O&M	NHAI	NHAI	Concessionaire	InvIT
Capacity augmentation	NHAI	NHAI	NHAI	InvIT
Type of Investor	-	Financial Institutions/ Banks	Institutional Investors/ Pension Funds	Retail/ Pension Funds/ Institutional Investors

Asset Monetization

Mode of Asset Monetization	Strengths	Constraints
NHAI Toll Collection	<ol style="list-style-type: none">1. Immediate Toll Collection2. Small Packages3. Availability of local investors	<ol style="list-style-type: none">1. Money goes to Consolidated Fund of India - not immediately available2. Regular leakage at Toll Plazas3. Short-term monetization4. Repeated tendering5. Requirement of oversight by NHAI

Asset Monetization

Mode of Asset Monetization	Strengths	Constraints
TOT	<ol style="list-style-type: none"><li data-bbox="577 443 1469 596">1. Upfront monetization of asset on long-term basis<li data-bbox="577 635 1469 692">2. Capital gained can be reinvested<li data-bbox="577 730 1469 884">3. Price discovery mechanism of asset is more robust<li data-bbox="577 922 1469 1075">4. Construction risk is removed from the entire process<li data-bbox="577 1114 1469 1362">5. Bundle variability and time-span variability will allow different class of investors	<ol style="list-style-type: none"><li data-bbox="1518 443 2018 788">1. Traffic projection uncertainty cannot be eliminated

Asset Monetization

Mode of Asset Monetization	Strengths	Constraints
Securitization	<ol style="list-style-type: none"><li data-bbox="577 438 1482 845">1. Allows NHAI to raise funds upfront from Banks & other institutional investors against security of toll user receipts for selected projects at a better rate<li data-bbox="577 877 1482 1021">2. Capacity augmentation remains with NHAI<li data-bbox="577 1053 1482 1292">3. Comfort to Banks and institutional investors as their loans are securitized<li data-bbox="577 1324 1482 1468">4. Attract investors, who do not want to take O&M work	<ol style="list-style-type: none"><li data-bbox="1518 438 2024 670">1. Toll collection and O&M risk retained by NHAI<li data-bbox="1518 702 2024 845">2. Commercial risk retained by NHAI<li data-bbox="1518 877 2024 1197">3. Out-crowding Banks towards private concessionaire

Asset Monetization

Mode of Asset Monetization	Strengths	Constraints
InvIT	<ol style="list-style-type: none"><li data-bbox="573 438 1267 671">1. Pools investments from retail and qualified institutional buyers<li data-bbox="573 703 1267 850">2. Attracts international long-term investors<li data-bbox="573 882 1193 935">3. Offers flexible structure<li data-bbox="573 967 1267 1118">4. O&M obligation with qualified project manager	<ol style="list-style-type: none"><li data-bbox="1294 438 1928 671">1. NHAI will have to retain minimum 15% for first 3 years<li data-bbox="1294 703 1995 935">2. NHAI will be engaged indirectly through the Trust in the operation of InvIT<li data-bbox="1294 967 1957 1374">3. Mandatory filing of regulatory requirement of SEBI as sponsor of InvIT challenge as it is the first Public Sector InvIT

INFRASTRUCTURE :

CS – DELHI METRO

DELHI METRO



H A R V A R D | B U S I N E S S | S C H O O L

N9-112-013

DECEMBER 18, 2011

V.G. NARAYANAN

SALONI CHATURVEDI

Delhi Metro Rail Corporation

I have not been to any management school. This is all simple common sense, down to earth tactics, nothing else.

– E. Sreedharan, Managing Director, Delhi Metro Rail Corporation

Professor V.G. Narayana and Research Associate Saloni Chaturvedi prepared this case. HBS cases are developed solely as the basis for class discussion. Cases are not intended to serve as endorsements, sources of primary data, or illustrations of effective or ineffective management.

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