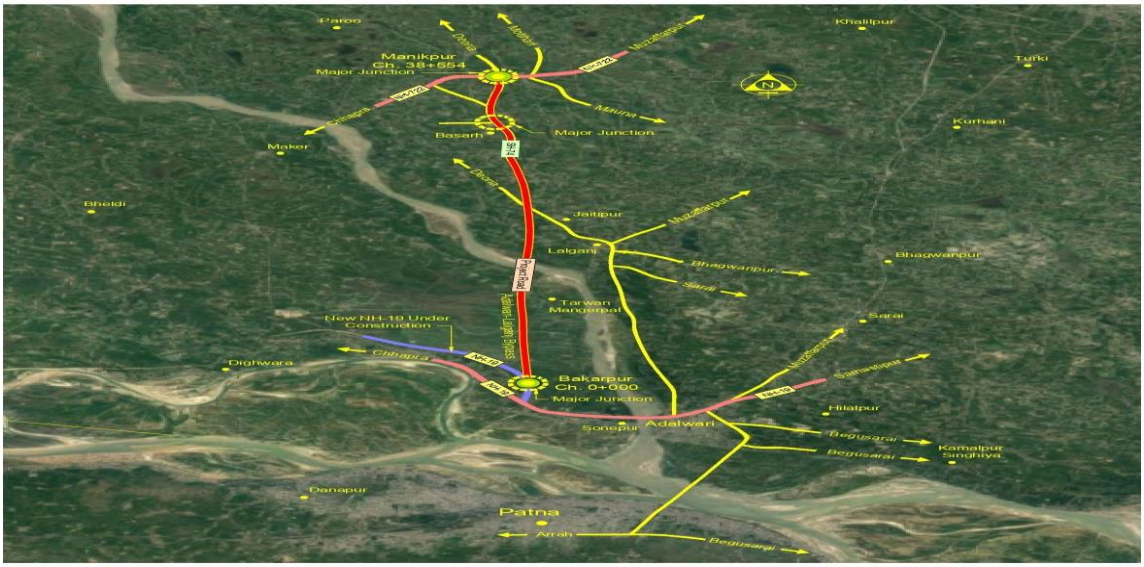
Tree Translocation scheme (Tree Protection Plan)

1. Brief Summary of Project (Bakarpur- Manikpur Section)

Project Detail:- Preparation of Detailed Project Report for Development of Economic Corridors, Inter-Corridors, Feeder Routes and Border Roads to improve the efficiency of freight movement in India under Bharatmala Pariyojana (Lot-7/BIHAR/Package-1).

Section– Bakarpur-Manikpur: The project road is part of SH74 connecting Bakarpur and Manikpur in the state of Bihar. The proposed project road starts from design chainage Km 0+000 at the junction of NH-19 (Sitalpur Bypass) near village Bakarpur where is follows the bypass section and crossed Gandhak River at design km 15.300 km travels with bypass section till design km 35.000 near village-Hapur Basant at SH-74 and terminated at SH-74 with design km 38+554 near Manikpur where it touches NH-722.



GPS Co-ordinates (in UTM) of Project Take-off & Terminal Point

Sl No	Project Roads	Length	Traverse Districts	Lat/Long (Starting)	Lat/Long (Ending)
1	Bakarpur to Manikpur Section	38+554 Km at SH-74	Saran, Vaishali and Muzaffarpur	45 N , 313181.458E, 2846326.086N	45 N, 313068.217E, 2880174.552N

The proposed project confluence with nearly 30 Villages (Table 1) directly or indirectly. The proposed road is passing through three districts Saran, Vaishali and Muzaffarpur out of which Sonpur and Dariapur tehsils under Saran district, Lalganj and Vaishali tehsils under Vaishali district and Saraiya tehsils comes under Muzaffarpur district. The proposed project starts from from design chainage Km 0+000 at the junction of NH-19 (Sitalpur Bypass) at village Bakarpur in Sonpur block of

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district- Saran and terminates at SH-74 with design km 38+554 near Manikpur where it touches NH-722 in Saraiya block in the district of Muzaffarpur of Bihar.

BYPASS/REALIGNMENT-

The summary of bypasses with design start and end chainage and length are tabulated in **Table.**

Bypass- 1:

Start Chainage(Km)	End Chainage (Km)	GPS Co-Ordinate (UTM)	
		Start Point	End Point
Design Ch 0+000 Start Point near NH-19	Design Ch15+000 near Gandhak River Bridge	45 N , 313181.458E, 2846326.086N	45N, 314523.123m E, 2859433.754m N

Bypass- 2:

Start Chainage(Km)	End Chainage (Km)	GPS Co-Ordinate (UTM)	
		Start Point	End Point
Design Ch15+600 after the Gandhak River Bridge	Design Ch35+000near HarpurBasant at SH-74	45N, 314771.867 m E, 2859979.763 m N	45N, 312625.644 m E, 2876740.795 m N

TRAFFIC CHARACTERISTICS

Traffic varies by the hour, by the day and by the month. Hence, it is essential to estimate a factor which provides a relationship between Annual Average Daily Traffic (AADT) and Average Daily Traffic (ADT) of the month corresponding to the traffic surveys.

As per vide circular letter no. RW/NH-33044/37/2015/S&R (R) dated 26th 2016, the MoRT&H revised the up gradation to 4-lane in Plain Terrain with Traffic as 10,000 PCU/Day.

The annual average daily traffic (AADT) of the proposed Project is 16785 PCUs in year 2019 and the project PCUs will be more. Hence the Project stretch qualifies for 4-lane.

DETAILS OF AFFECTED TREES:

The entire linear stretch of road side plantations along the highways is declared as protected forests. About nearly 116 no. of trees are affected within the proposed ROW in Sonpur of district-Saran of the entire project section Bakarur-Manikpur. 71 no. of trees are proposed to be translocated and rest 45 trees need to be felled. **List of Plants which needs to be translocate are also attached.**

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2. Details of Identified Land For Translocation of Trees

Name of District of Identified Land :- Saran

Location of Identified land for Translocation of Trees= Sonpur Blocak, (last 3.5 meter in both side of Proposed Row of Bakarpur-Manikpur section)

Name of Forest Division :- Saran Forest Division

No. of Trees for Translocation :- 76 nos.

Calculation of Identified Land :-

Required area for translocation of 01 Tree = 3m*3m = 9 sq.Meter
Therefore Required Area for translocation of 76 Trees = 09*71= **639 Sq Meter (0.064 Hectare)**
= 0.064 Ha.

Therefore required length for linear translocation of trees within PROW
= 639/3= 213 meter

Required Length for Translocation of Trees with 3.o meter width	**71*3=213 meter=0.213 km**
Length would be available for Translocation of Trees:	From km 0.000 to km 15.000 =**15.000 km**

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Methodology of Trees Translocation

Translocation is the term used to describe the digging and replanting of trees from one location to a new location. Due to the wide extent and morphology of tree root system, translocation of trees usually involves substantial removal of roots.

Design and Documentation

It is ensured that the requirements such as timing of root pruning, size of root ball, translocate and lifting requirement, monitoring and post translocation maintenance, etc. shall be properly planned.

Safety precautions- Tree translocation, like other tree management works, would be conducted in a controlled and safe manner. Workers who shall involve in translocate trees will be given adequate instruction and supervision to ensure that tasks are completed in a safe manner.

Translocation operations

Tools and equipment -All tools and equipment shall be appropriate to the operations and prepared in advance. Digging and root pruning tools shall be sharp and clean in order to cut without breaking, crushing or tearing roots. Mechanical digging and root pruning equipment shall be operated according to manufacturers' recommendations to minimise root damage.

Lifting cables, chains, straps, and/or slings shall be inspected and used according to manufacturers' instructions and specifications.

Preparation of root ball- Root pruning is sometimes required before translocation a tree. Sufficient time shall be allowed between preparation and final lifting for development of new roots capable of sustaining and continuing the growth of the translocated tree.

The root system of a woodland or open-grown tree will normally be widespread. Lifting such trees without initial preparation of a root ball will result in much of the root system being left in the soil. After translocation, the tree crown may then die back, or the tree may not be able to recover and will die eventually.

The root ball size shall varies depending on species, habit, location and specific attributes which shall be as large as practicable to maximise the potential of survival during and after translocation while balancing other logistical and cost concerns.

The root ball sizes would be of a diameter and depth to encompass enough of the root system as necessary for establishment. Normally the diameter of a root ball is larger than its depth which seldom exceeds 1 metre.

Pre-lifting operations -Tree lifting operations shall be carefully timed so as to enable direct delivery to the receptor site. No translocation operations would commence until either the receptor site or the holding nursery is fully prepared. Tree uplifted must be translocated and watered the same day. Watering before lifting is recommended.

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Before uplifting, the outer edge of the previously dug trenches shall be loosened from the surrounding soil, and the root ball can be shaped with taper on the sides, slanting inward toward the base. The first cut around the perimeter of the root ball should be made with a sharp tool. Cuts should be clean to avoid tearing or breaking the roots. The shaping and final cuts should be done by hand.

Temporary support of trees before lifting- A tree after root pruning shall not be having extensive root support during the interim of the translocate process. It may be vulnerable to inclement weather, such as typhoon or heavy rainfall.
Removal of the root system may sometimes aggravate the natural form and balance of a tree and is prone to tree failure. When the stability of a tree is likely to be jeopardized, a temporary support, such as guying or simple prop is essential.

Lifting and handling of root-balled trees - The root ball would be properly wrapped before lifting. Lifting shall be done by direct lift, with padded protection for the tree, using a machine of appropriate capacity connected to the support around the root ball, not to any other part of the trees. Trees shall not be lifted by the trunk as this can cause serious trunk injury but by its root ball which shall be properly prepared and wrapped. Root balls that are not properly protected would easily collapse during transplanting due to its own weight.

Post-planting Care- In case of translocation of trees within the project site amidst the construction activities, they will be well protected with robust fencing.
All newly translocated trees shall receive proper maintenance care in order to facilitate recovery of tree from the translocation shock. It would be ensure the tree shall be stable before its root system is fully recovered to give support.
The stress of a tree shall be observed immediately after translocation or gradually after a period of time. Proper care after transplanting will help to assure survival and minimise stress and ensure a higher successful rate. Maintenance of translocate trees will be in continuation till one year.

Annexure:- **1.** Summary of Plants which needs to be Translocate
2. Undertaking to bear the amount of translocation and translocation shall be done by User Agency
3. Linear Plan of Identified Land to translocate the Plants (**71 Nos**.)

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Project Title- Diversion of 1.471 ha. (District-Saran) for four lanes with paved shoulder of of Bakarur to Manikppur design chainage km 0.000 to km 38.554 under Bharatmala Pariyojna (Lot-7/Bihar/Package-1) in the district of Saran in the state of Bihar.

UNDERTAKING TO TRANSLOCATE OF AFFECTED PLANTS

I, Project director undersigned that on behalf of National Highway of Authority, PIU-Motihari, Bihar, ensuring to affect plants- 71 nos. under Sonpur block, in district of Saran (Which are decided by concerned Forest Department) shall be translocated in last 4 meter both side of PROW after stage-1 clearance with all safety measures. The affected plants shall be translocate according to a detailed scheme for suitable plants prepared in consultation with the state Forest Department and the cost for the same shall be borne by User Agency.

User Agency also undertakes to continue to maintain such trees for a period of one year from transplantation.

You're sincerely

Amresh Kumar Sharma
Project Director
NHAI, PIU-Motihari

Detailed Summary of Trees/Plants for widening of Strengthing of Bakarpur-Manikpur section (From km 0.000 to km 38.554)

Section- Km 0.000 to km 15.300

District – Saran

(A) *Detailed Summary of Affected Plants (Both Side)*

for Translocation

(District-Saran) ***(Km 0.000 to km 15.300)***

Counted Plants	***Left Side***	***Right Side***	***Total (Both Side)***	***Remarks***
Affected Plants (Girth more than 60 cm)	44	27	71	Needs to be Translocate
Total	44	27	71	

(B) *Detailed Summary of Affected Trees*

For Felling

(District-Saran) (From km 0.000 to km 15.300)

Counted Plants	***Left Side***	***Right Side***	***Total (Both Side)***	***Remarks***
Affected Trees (less than 60cm)	25	20	45	Needs to be Felling
Total	25	20	45	

Total Abstract (Both Side)

From (Km 0.000 to km 15.300)

Affected Trees/Plants	**Left Side**	**Right Side**	**Total Trees/Plants (Both Side)**
A (Translocation Plants)	44	27	71
B (Felling Trees)	25	20	45
Total Trees/Plants	**69**	**47**	**116**

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Range Officer of Forests
Dighwara

STRIP CHART/LINEAR PLAN FOR TRANSLOCATION OF TREES in District-Saran in the last strip of the Proposed ROW of Bakarpur-Manikpur (FROM KM 0+000 to 15+000)

Left Side	Rest Land for Translocation of Trees (44 Plants) (> 60cm Girth Size)	4+000 meter
	Drain	1+500 meter
	Protection Land	1+000 meter
	Embankment Slop (1:2 Ratio)	3+000 meter
	Earthen Shoulder	2+000 Meter
	Paved Shoulder	01.500 meter
	Proposed Carriage way	07.000 meter
	Median	05+000 meter (4+0.5+0.5)
Right Side	Proposed Carriage way	07.000 meter
	Shoulder/Emb.	01.500 meter
	Earthan Shoulder	02.000 meter
	Embankment Slop (1:2 Ratio)	03.000 meter
	Protection Land	01.000 meter
	Drain	01.500 meter
	Rest Land for Translocation of Trees (27 Plants) > 60cm Girth Size)	04.000 meter
	Design Chainage	0+000 → 15+000

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