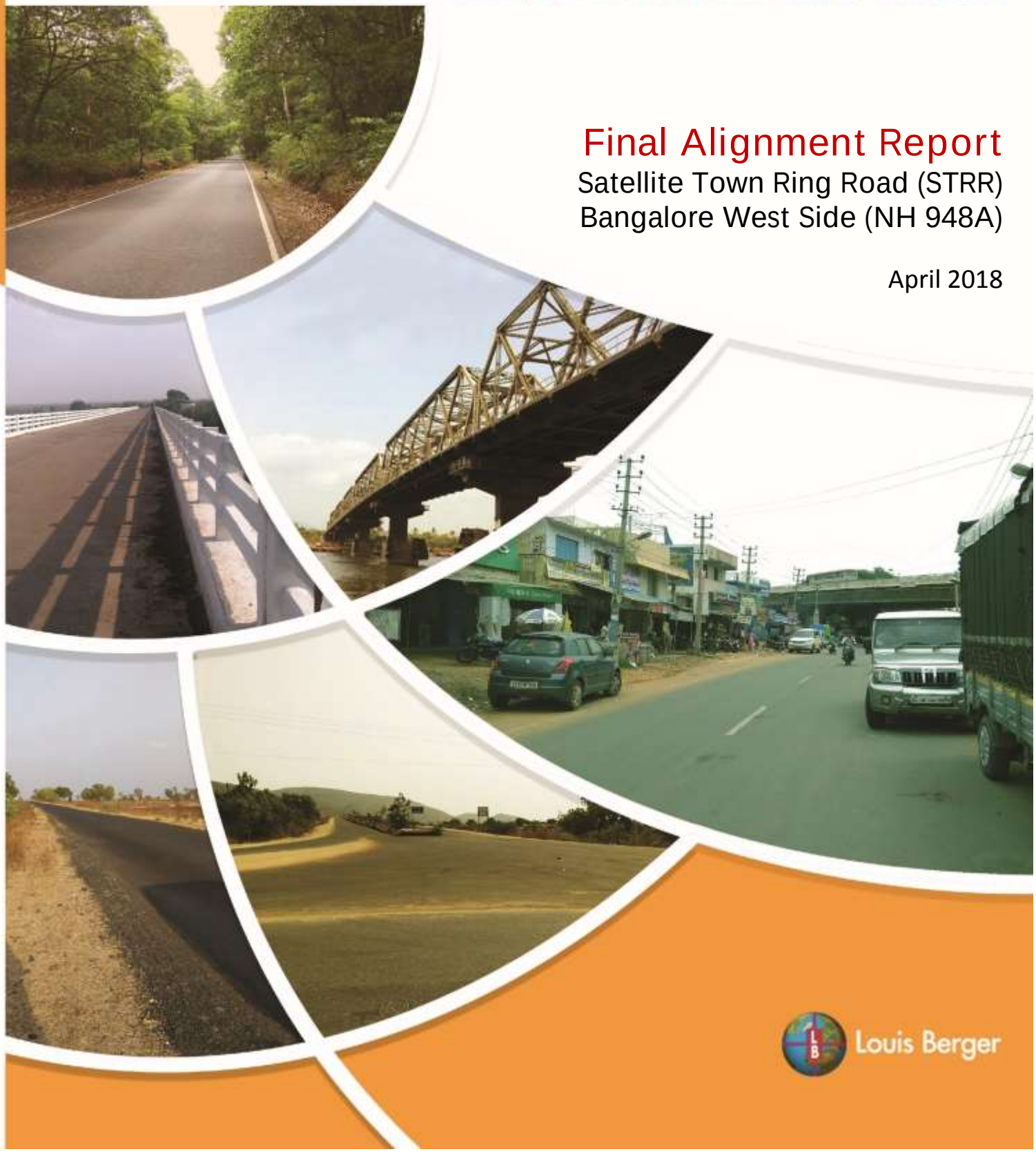
CONSULTANCY SERVICES FOR
PREPARATION OF DPR FOR DEVELOPMENT OF

ECONOMIC CORRIDORS, INTER CORRIDORS, FEEDER ROUTES TO IMPROVE THE EFFICIENCY OF FREIGHT MOVEMENT IN INDIA

UNDER BHARATMALA PARIYOJANA LOT 3
ANDHRA PRADESH, KARNATAKA, GOA & KERALA / PACKAGE 1



Final Alignment Report

Satellite Town Ring Road (STRR)
Bangalore West Side (NH 948A)

April 2018

Louis Berger

FINAL ALIGNMENT REPORT

Project Name	*Consultancy Services for preparation of DPR for Development of Economic Corridors, Inter Corridors, Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojana - Lot 3/ Andhra Pradesh, Karnataka, GOA & Kerala /Package 1*	
Document Name	**FINAL ALIGNMENT REPORT (STRR)**	
Document No.	**4800182- GGN-DE-003(B)**	Issue No. 03
Prepared by	Vivek/Swaraj	
Reviewed By	K Mohan Team leader/Senior Highway Engineer	

ISSUE LOG / SIGNATURE PAGE

Issue #	**Submission Date**	**Remark**	**Approved By**	
			Name/Position	**Signature**
01	10 Nov. 2017	Draft Alignment Report submitted	K Mohan Team Leader	
02	07/02/2018	Final Alignment Report is being Submitted	K Mohan Team Leader	
03	13/04/2018	Final Alignment Report is being Submitted	K Mohan Team Leader	

TABLE OF CONTENTS

List of Tables

List of Figures

List of Annexures

ALIGNMENT REPORT

1.0 GENERAL

The Ministry of Road Transport and Highways (MORTH), Government of India has proposed "Bharat Mala Pariyojana" an Umbrella scheme of road development project through National Highways Authority of India (NHAI), National Highway and Industrial Development Corporation (NHIDC) and state Public Works Departments (PWD) at an estimated cost of INR 5,35,000crores. This is the second largest highways construction project in the country after NHDP, in that almost 50,000 km of roads targeted across the country. This project aim to improve connectivity particularly on economic corridors, border areas and to remote areas with an aim of rapid and safe movement of cargo to boost exports. International trade considered as a key aspect in this scheme and northeastern states have given special focus. The project cleared by the Union Cabinet on October 25, 2017.

The ambitious project expected to create nearly 100million man days of jobs during the construction and subsequently to about 22million jobs of the increased economic activity across the country. The construction will carried out through many means including debt funds, budgetary allocation, private investment, toll operator transfer etc. The total length of around 34,800km considered in phase 1 including

- Economic corridors of around 9,000km,
- Inter-corridor and feeder routes of around 6,000km,
- National Corridors Efficiency Program of about 5,000 km roads
- Border and international connectivity roads of around 2,000 km,
- Coastal and port connectivity roads of around 2,000 km,
- Expressways of around 800 km
- NHDP roads of 10,000km

In pursuance of the above program, NHAI appointed M/s Louis Berger Consulting Private Limited, New Delhi as Consultants to carry out the Consultancy Services for preparation of DPR for development of Economic Corridors, Inner corridors, feeder Routes and Costal Roads to improve the efficiency of fright movement in India - Lot 3/Andhra Pradesh, Karnataka, Goa & Kerala, / Package 1. The project consists the following stretches of roads finalized as per final Inception Report.

1. Aurad – Bidar section - KA SH 15
2. Mydukur – Badvel section – NH 67
3. Puttur - Janappanchatram section - AP SH 4421 & TN SH 51
4. Belagavi (Belgaum) – Sanquelim with a proper Connectivity to NH4A and NH 17 through existing SH – KA SH 54, KA SH 31, GA SH 4
5. Balance Portion of Satellite Ring Road of Bangalore (West Side) including connection to Hosur town & Feasibility for widening the existing SH between Anekal to Sarjapur for Passenger traffic bound to Attibele/ Sarjapur to ensure ring road connectivity for Bangalore.

The Letter of Acceptance was communicated vide NHAI letter NHAI/Planning/ EC/2016/DPR/Lot 3/ Ap. Knt. Goa &KL/Package 1/98598 dated 21/04/2017. The contract agreement signed on 11/5/2017 vide letter NHAI/planning/EC/2016/DPR/Lot 3/AP, Karnataka, Goa &KL, / Package 1/99575 dated 11/05/2017 with immediate commencement date.

The draft alignment report submitted vie dated 10/11/2017. Based on joint site visit and further discussions held with RO/NHAI/Bangalore and PD/Bangalore some modifications made. The current submission is Final Alignment Report for STRR Bangalore, the alignment declared declared NH 948A.

1.1 Original STRR alignment

In order to ensure safe, smooth, efficient, and high speed transport corridor to Bangalore city, it is impetus that the infrastructure of city and adjoining towns anticipated the development. National Highways NH 648 (NH 207), NH 48 (NH 4), NH 275, NH 948, NH 209 & NH 75 (Hassan road), and majority of State Highways SH 3, SH 85, & SH 35 pass through Bangalore city comprising heavy commercial traffic movement. Most of these traffic are not intend to pass through the Bangalore city. These traffic further aggravate the scenario in the city roads and resulting huge traffic jams.

The Government of Karnataka took steps to improve and augment network within and neighboring area of the city to match with its phase of development. Bangalore Metropolitan Regional Development Authority (BMRDA) had planned the following network of roads consisting the length of 367km to match these requirements.

- Satellite Towns Ring Road (STRR) – 204km
- Individual Town ring Roads (ITRR) – 163km

The total length of STRR (204km) is exclude the stretch passing within the ITRR except for Neelmangala town. The STRR connects the important towns namely Dobbaspet, Doddaballapura, Devanahalli, Sulibele, Hoskote, Sarjapura, Attibele, Anekal, Tattekere, Kanakapura, Ramanagara and Magadi.

BMRDA assigned M/s SECON for the consultancy services to undertake the topographical & Cadastral surveys, finalize the proposed alignment and to prepare the land acquisition report in year 2006. Subsequently, the same agency was engaged to carry out the consultancy for Techno –Economic Feasibility Report in 2007.The notification for land acquisition for STRR & ITRR issued on 12/09/2007 and the project report approved by BMRDA on 10/06/2008. The proposed STRR alignment has declared as State Highway (special) -2 as per the provisions of Karnataka Highways Act 1964 and the SE, PWD, Bangalore circle nominated as 'The Highway Authority'. Land acquisition processes initiated vide notification NO4017-07-08 dated 19/10/2007.

The original corridor proposed with 90m right-of-way consists of divided 4lanes carriageways with depressed median of 20.50m, with service roads (7m) on both sides. Provision of high speed rail corridor of 15m on one side throughout also made. In addition to this utility corridor of 5m and bus lay-bye of 4m also considered on both sides. The corridor of 90m also frozen by the state government. Ring roads was also proposed to be developed individually for 8 major towns namely Anekal, Kanakapura, Ramanagara, Magadi, Neelmangala, Doddaballapura, Devanahalli & Hoskote to act as bypass for these towns. However, the project shelved due to paucity of funds with the State government.

The original alignment as think of by Karnataka State government and obtained from M/s SECON through NHAI enclosed in **Fig 1**.

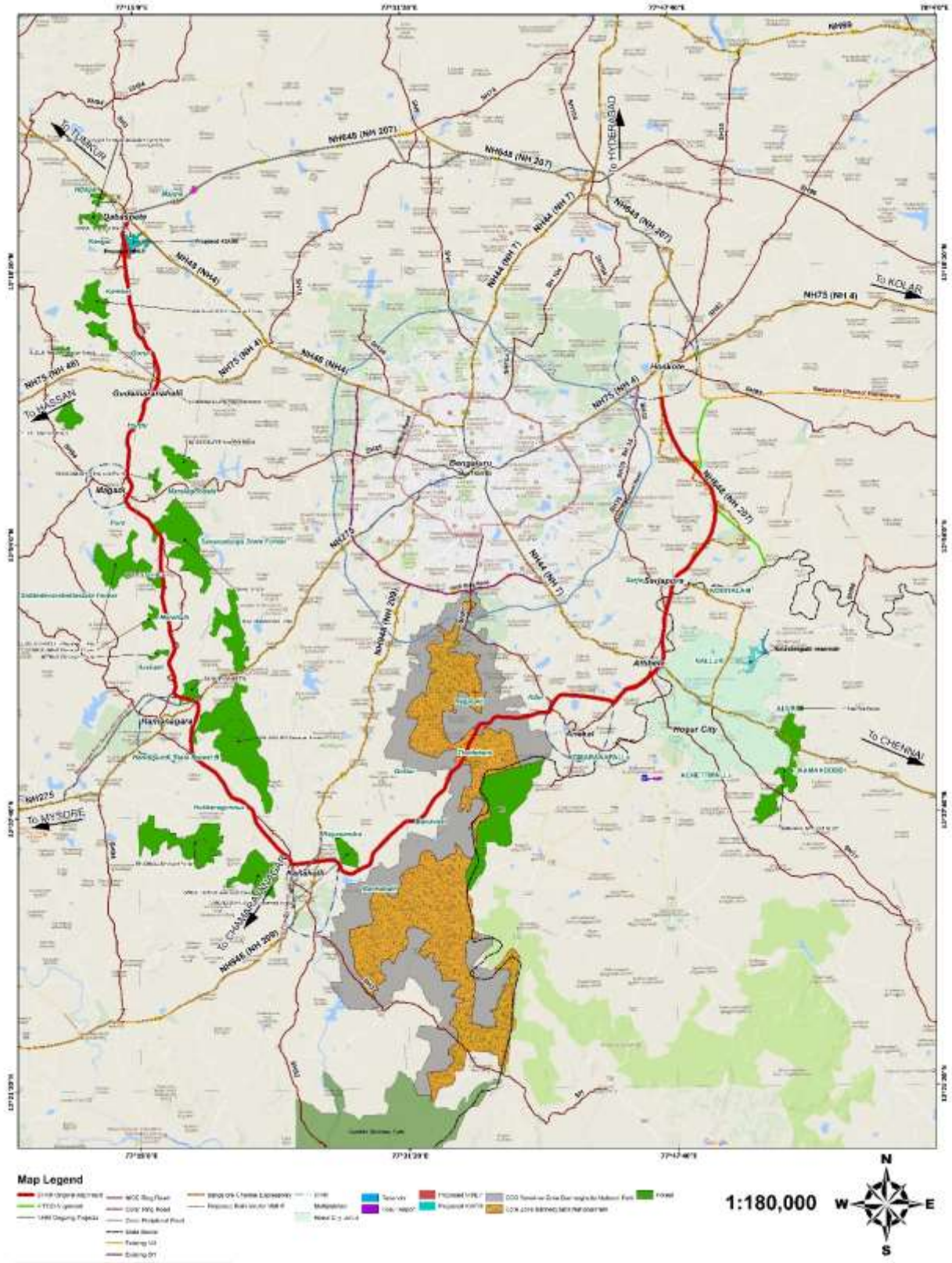


Fig. 1: Original STRR Alignment as think of by Karnataka State Government

However, the earlier proposed alignment by the Karnataka state government passes through some of built up stretches, tanks including religious structures, burial grounds etc. Also during the course of time, some new activities also come up. Therefore, it was indispensable to further study the alignment and update, considering the current scenario along the original proposed alignment. Accordingly, modifications are propose to ensure minimal social Impact and to serve the alignment to wider spectrum of inhabitants in that region. The details given below.

1.1.1 Modifications proposed

1. The original alignment passes through the Dobbaspet town connecting NH 4 on Bangalore side. This extended further on Doddaballapura side towards NH 207 to ensure avoidance of Dobbaspet town local traffic.
2. The original alignment (in the cross point of Hassan road) passes through thickly built up area in Gudermaranahalli from km 14.000 to km 22.000 This stretch consists of residential, school and religious structures.
3. The earlier alignment passes through thickly built up area from km 22.000 to km 25.600 in Harthi/Renganahalli.
4. The original alignment passes through Savanadurga Forest area from km 34.700 to km 41.700. This forest also has wildlife.
5. The original alignment pass through Siddadevarabetta Forest area from km 43.000 to km 46.700
6. The original alignment passes through Ramadevarabetta forest area from km 57.700 to km 58.300 near NH 275 crossing in Ramanagara.

1.1.2 Value addition proposed

Further the alignment made value additions by connecting some cross roads and considering the current and future proposals in that location as per below details.

1. The starting point of the STRR extended to connect NH 207 (near km 131.200) with a bypass provision in Dobbaspet town on Pune side to ensure uninterrupted traffic flow, contrary to the earlier proposed location pass through the mid of built up area in Dobbaspet. It is relevant to mention that the through traffic contribute from Pune direction, on NH 4 is significant.
2. There is Multi Model Logistic Park (MMLP) and proposed KIADB coming up near Dobbaspet on SH 3 spread at about 250acres of land. The Feasibility study also done for the proposed MMLP project. Therefore, connection to this park is eminent and provision made accordingly to these logistic park & KIADB with proposed STRR.
3. NHAI is currently developing bypasses to Kankapura and Ramanagara towns under different programs to ease traffic congestion on NH 209 and NH 275 respectively. Thus, in order to ensure seamless traffic flow through these proposed bypasses, it is necessary to integrate with proposed STRR at these locations.
4. Hosur is an automobile industry town located in the vicinity of about 7km away from Karnataka state border. This city generates huge amount of through traffic and currently experiencing massive traffic congestion. It observed that the proposed STRR would further deteriorate the Hosur traffic. Therefore, consideration of STRR taking along this town necessitated.

The modification proposed to original alignment of Karnataka state portion tabulated as below.

Table 1: Modified proposed Original alignment of Karnataka

S. No	STRR Original alignment (km) as received			Modified STRR Alignment (km)			Re-Alignment Side w.r.t Original STRR Alignment	Reason for change
	From	To	Length (km)	From	To	Length (km)		
1	0.00	6.50	6.50	0.00	17.50	17.50	Right	To provide Bypass to Dobaspette town and to connect NH 207 and Proposed MMLP in Dobaspette
2	6.50	14.00	7.50	17.50	25.00	7.50		No change in original alignment
3	14.00	22.00	8.00	25.00	33.40	8.40	Left	To avoid Temple and Pond
4	22.00	25.60	3.60	33.40	37.00	3.60	Left	To avoid Builtup area
5	25.60	34.70	9.10	37.00	46.00	9.00		No change in original alignment
6	34.70	41.70	7.00	46.00	52.70	6.70	Right	To avoid Savandurga forest.
7	41.70	43.00	1.30	52.70	54.00	1.30		No change in original alignment
8	43.00	46.70	3.70	54.00	58.00	4.00	Left	To avoid Siddadevarabetta Reserve Forest.
9	46.70	51.00	4.30	58.00	62.20	4.20		No change in original alignment
10	51.00	68.00	17.00	62.20	80.80	18.60	Left	To avoid Siddadevarabetta Vulture Sanctuary (Ramanagara)
11	68.00	74.00	6.00	80.80	86.75	5.95		No change in original alignment
12	74.00	99.00	25.00	86.75	106.00	19.25	Left	To avoid Reserve forest and Hill cutting (Kanakpura)
13	99.00	115.00	16.00	106.00	121.85	15.85		No change in original alignment
14	115.00	End	-	121.85	179.63	57.78		Due to inclusion of Ring Road of Hosur town, Automobile Hub of Tamil Nadu and Connecting with proposed KITCO alignment

1.2 Connection to Hosur city

It was also envisage connecting the Hosur city with the proposed STRR alignment as per the meeting held with CGM/NHAI in Bangalore during the Inception study. The city is located in the proximity of only 7km from Karnataka state border. The Industrial town of Hosur is also an automobile hub of Tamil Nadu. Thus, this proposal will enable to disburse the traffic toward further south in a methodical manner. It also further enables a connectivity for Hosur to the proposed Bangalore - Chennai Expressway.

The proposed alignment also discussed with District Commissioner, Krishnagiri and with various stake holders, district level officers, and NHAI. Four options proposed and all options discussed with its merits and demerits. The details given in **Fig 2.**

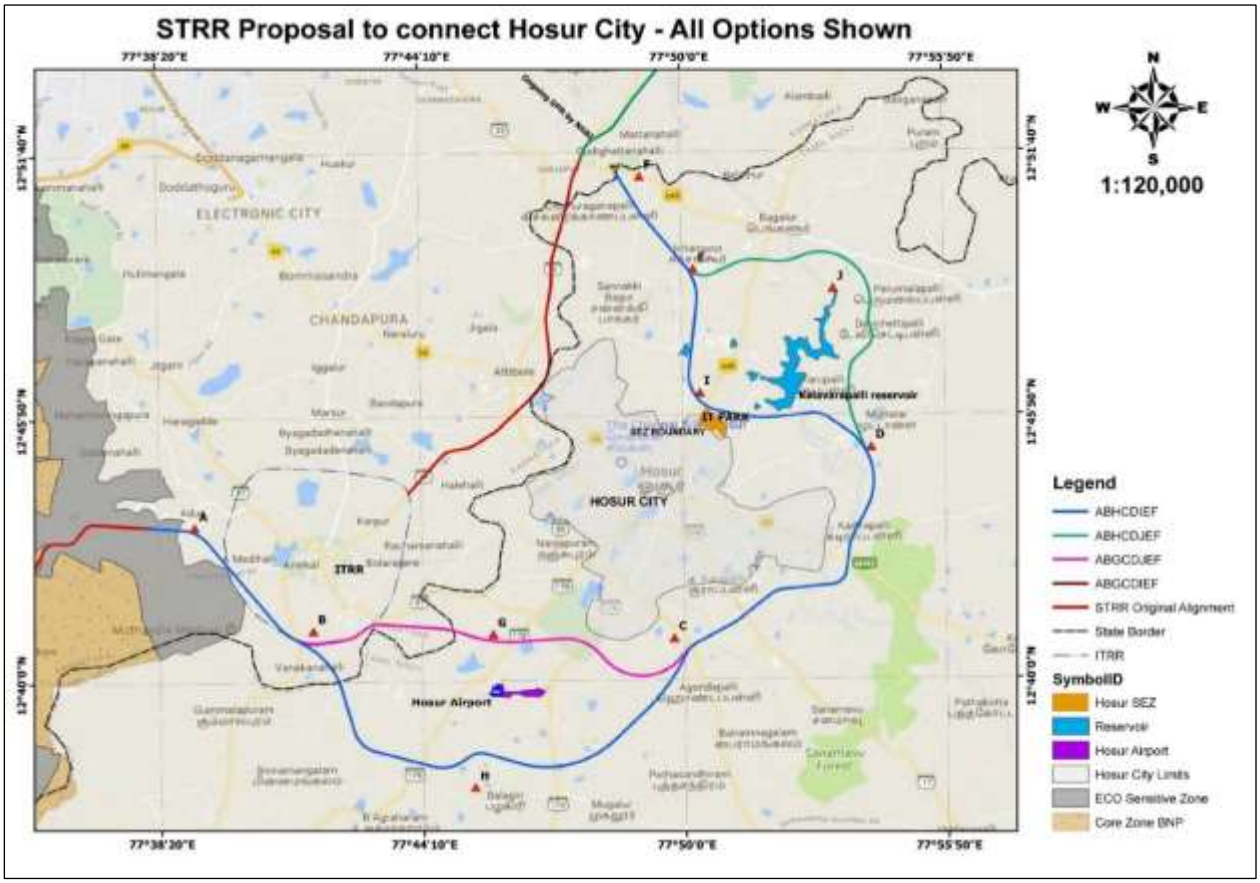


Fig 2: STRR proposal connect Hosur city with four options

The comparative statements of all options of proposed Hosur bypass alignment are as below

Table 2: Comparative Statement of Proposed Alignment

No	Description	Option - 1 (ABHCDIEF)	Option - 2 (ABGCDIEF)	Option - 3 (ABHCDJEF)	Option - 4 (ABGCDJEF)
1	Starting	139.000	139.000	139.000	139.000
2	Ending	190.000	190.000	190.000	190.000
3	Route Alignment side	After Hosur airport & away from Kelavarapalli reservoir area	Before Hosur airport & away from Kelavarapalli reservoir area	After Hosur airport & Close to Kelavarapalli reservoir area	Before Hosur airport & Close to Kelavarapalli reservoir area
4	Length of Bypass (km)	60	59	63	59
5	Length of existing alignment/ bypassed (km)	nil	nil	nil	nil
6	Built-up stretch (km)	nil	nil	nil	nil
7	Terrain	Plain	Plain	Plain	Plain
8	Speed	100 km/h	100 km/h	100 km/h	100 km/h
9	Geometries	Geometry is good, supports 100	Geometry is good, supports 100 km/h	Geometry is good, supports	Geometry is good, supports

No	Description	Option - 1 (ABHCDIEF)	Option - 2 (ABGCDIEF)	Option - 3 (ABHCDJEF)	Option - 4 (ABGCDJEF)
		km/h speed. Good sight distance with curves widely spaced.	speed. Good sight distance with curves widely spaced.	100 km/h speed. Good sight distance with curves widely spaced.	100 km/h speed. Good sight distance with curves widely spaced.
10	Intersection developments	7	7	7	7
11	Existing Land use pattern through proposed alignment	Agricultural Land and barren land	Agricultural Land and barren land	Agricultural Land and barren land	Agricultural Land and barren land
12	Major Bridge	2	2	2	2
13	Minor Bridge	3	3	2	2
14	Approximate Culverts (no)	120	120	130	120
15	ROB	1	1	1	1
16	Interchange	7	7	7	7
17	VUP	nil	nil	nil	nil
18	PUP	nil	nil	nil	nil
19	Proposed ROW	90	90	90	90
20	Existing ROW	0	0	0	0
21	No of affected Settlements	nil	nil	nil	nil
22	Alignment passes through villages	Agasa Timanahalli, Patnagere Gollahalli, Muttur, Mattakur, Agraharam, Achettipalli, Kothur, Peranadapalli, Attur, Pathamuthalli, Avalapalli, Eluvapalli, Nallur, Chikhanathpuram, Kothapalli, Sarjapur	Agasa Timanahalli, Singasandra, KomaranapalliPoonahalli, Achettipalli, Kothur, Peranadapalli, Attur, Pathamuthalli, Avalapalli, Eluvapalli, Nallur, Chikhanathpuram, Kothapalli, Sarjapur	Agasa Timanahalli, Patnagere Gollahalli, Muttur, Mattakur, Agraharam, Achettipalli, Kothur, Peranadapalli, Nandi maglam, Baglur, Kaganur Sarjapura.	Agasa Timanahalli, Singasandra, Komaranapalli, Poonahalli, Achettipalli, Kothur, Peranadapalli, Nandimaglam, Baglur, Kaganur Sarjapur.
23	Social Impact	Not significant	Not significant	Not significant	Not significant
24	Environmental Impact	Not significant	Not significant	Not significant	Not significant

The merits and demerits for the Hosur alignment inclusion in STRR are as follow.

Merits

- Enabling new spatial distribution of business/ housing in Hosur city
- Improved road geometry will ensure enhanced traffic safety and reduction in road accident rate.
- Major cross roads intersections will provisioned with free flow interchanges and will catalyzed development of Industrial sited located near to this places
- Will remove through truck traffic from city's main artery
- More local traffic may get encouraged to use a route previously avoided due to heavy truck traffic
- Proactive planning by local authorities will further catalyze industrial development
- Will benefits the town in revenues, real estate, and job opportunities

Demerit

- The overall alignment length will increase and result higher land acquisition and construction costs.

Based on facts presented, the district administration recommended and approved Option 4 (ABGCDJEF) for consideration.

1.3 Submission & Approvals from Government of Karnataka & Tamil Nadu

Karnataka

The original alignment validated with current developments in that region and the updated alignment discussed with NHAI. Accordingly, this updated STRR alignment submitted to NHAI vide our reference 4800182-GGN-OC-019 dated 05/10/2017 for Concurrences from Government of Karnataka. NHAI submitted to Government of Karnataka to seek consent to the modifications proposed in STRR vide letter NHAI/12012/Lot 3/Package 1/I/2017/PIU-BNG (EXP)/530 dated 09/10/2017.

The government of Karnataka vide its letter PWD/518/CNH2017 dated 27/10/2017 conveyed the concurrences. NHAI vide letter NHAI/Planning/EC/2016/DPR/Lot 3/AP-KT-Goa & Kerala/Pkg 1/1087-28 dated 17/11/2017 agreed to the further modification proposed.

The approval letters obtained from the government of Karnataka and the approved alignment are given in **Fig 3 & Fig 4.**

Tamil Nadu

The concurrences for Hosur portion of Tamil Nadu obtained vide letter 14787/HV1/2017-2 dated 24/01/2018. The approval letters obtained from government of Tamil Nadu with approved alignments given in **Fig 5 & Fig 6.**

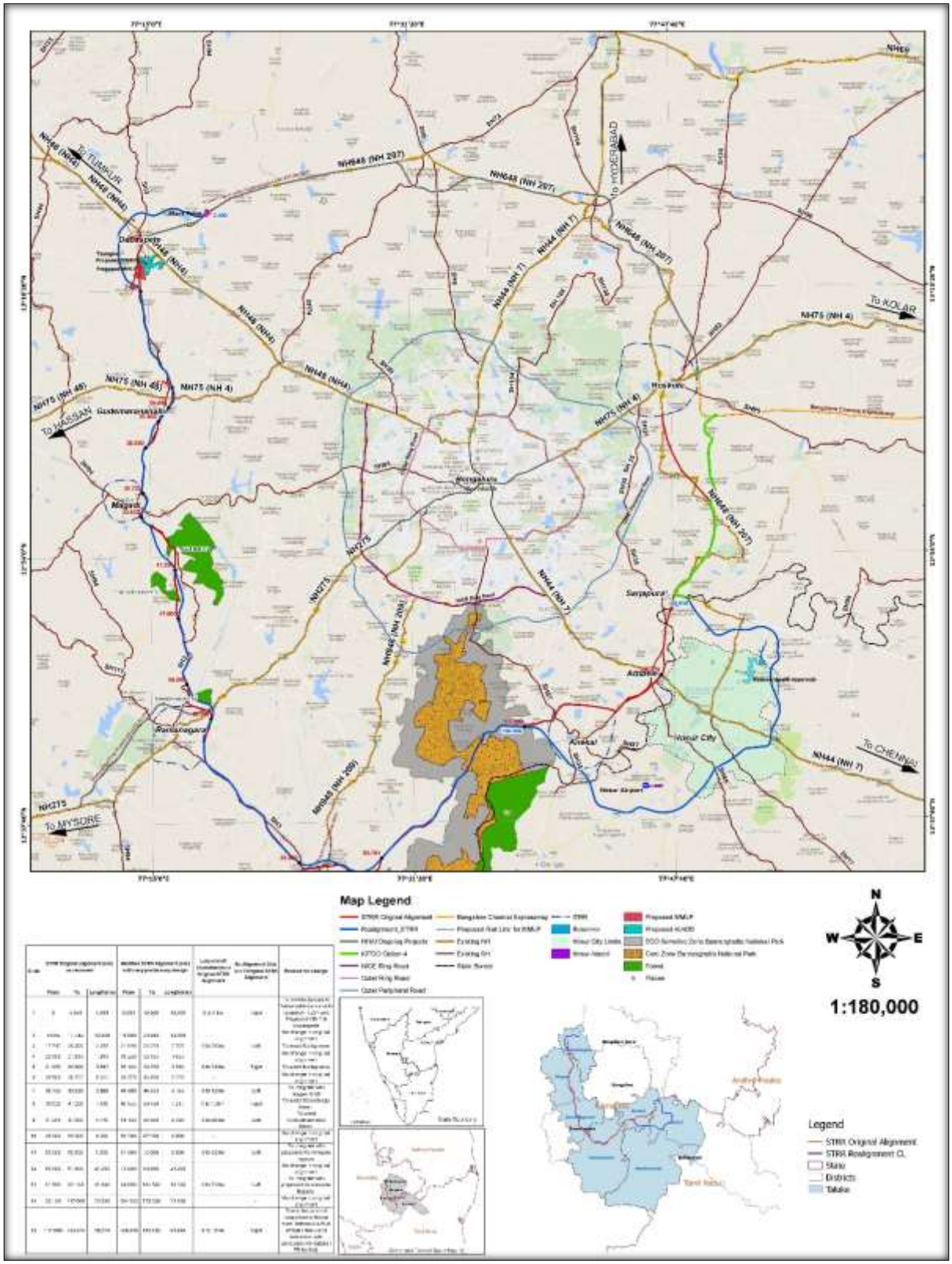


Fig 3: Concurrence obtained for alignment from Karnataka state

GOVERNMENT OF KARNATAKA

No. PWD 518 CNH 2017.

Karnataka Government Secretariat
Vikasa Soudha,
Bengaluru, dated 27.10.2017.

From:

The Additional Chief Secretary to Government,
Public Works, Ports & Inland Water
Transport Department, Bangalore.

To:

The Deputy General Manager(Tech),
& Project Director,
PIU-Bangalore (Expressway)
National Highways Authority of India,
(Ministry of Road Transport & Highways)
Nagasandra, Near Deepak Bus Stand,
Bangalore-Tumkur Road, NH-4,
M.S.Ramaiah Enclave,
Bangalore-560 073.

Sir,

Sub: NHAI, PIU-Bangalore (Expressway)-Preparation of DPR for Development of Economic Corridors, Inner Corridors, Feeder Routes and Coastal roads to improve the Efficiency of Fright Movement in India –Lot 3/Andhra Pradesh, Karnataka, Goa & Kerala/Package –I Consent of Government of Karnataka for taking up STRR (west side) along with the concurrence for the modifications-requested- reg.

Ref: Your letter No.NHAI/12012/Lot3/Package-I/1/2017/PIU-BNG (EXP)/ 1530 dated 19.10.2017.

*****

With reference to the above subject, the Government of Karnataka examined the above referred your proposal for the modifications to the STRR [west side] alignment and agrees for the same. Further I am directed to convey the concurrence for taking up further studies and for initiation of preconstruction activities such as Land acquisition, MOEF and wildlife clearance etc., for the development of STRR around Bangalore.

Yours faithfully,

(M. LAKSHMINARAYANA)
Additional Chief Secretary to Government,
Public Works, Ports & Inland Water
Transport Department.

Fig 4: Concurrence obtained for alignment from Karnataka state

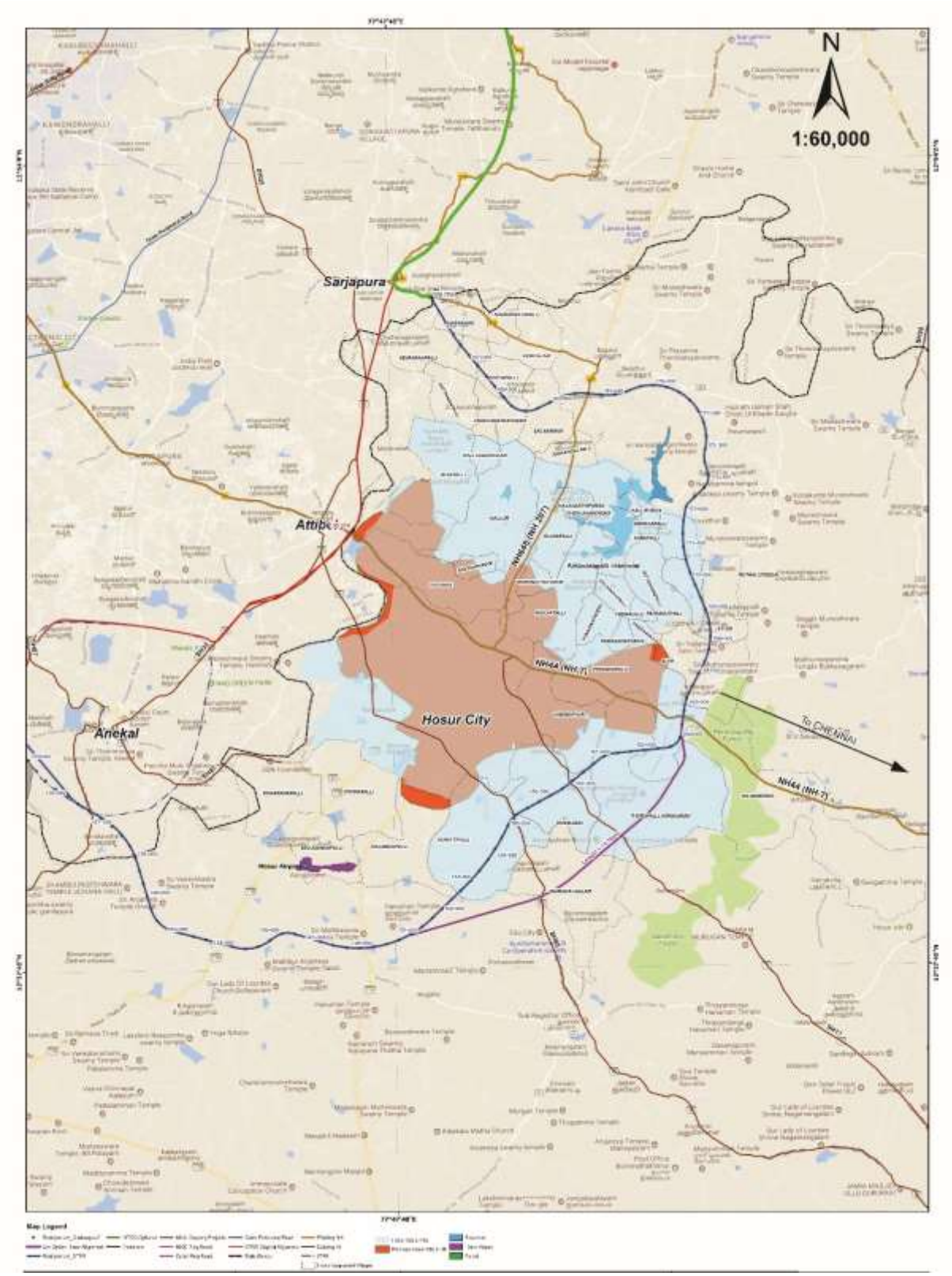
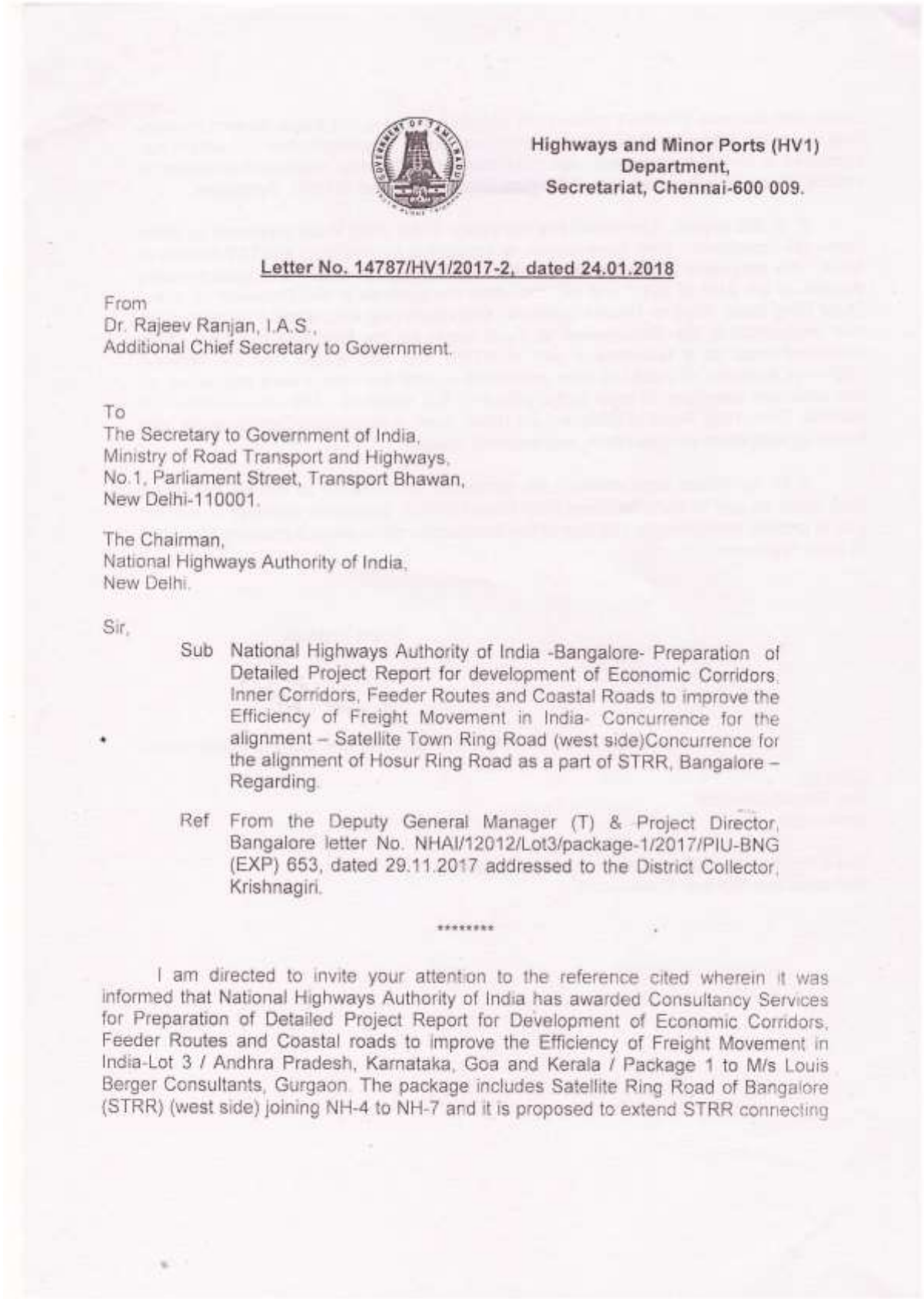


Fig 5: Concurrence obtained for alignment of Hosur portion of Tamil Nadu



Highways and Minor Ports (HV1)
Department,
Secretariat, Chennai-600 009.

Letter No. 14787/HV1/2017-2, dated 24.01.2018

From
Dr. Rajeev Ranjan, I.A.S.,
Additional Chief Secretary to Government.

To
The Secretary to Government of India,
Ministry of Road Transport and Highways,
No.1, Parliament Street, Transport Bhawan,
New Delhi-110001.

The Chairman,
National Highways Authority of India,
New Delhi.

Sir,

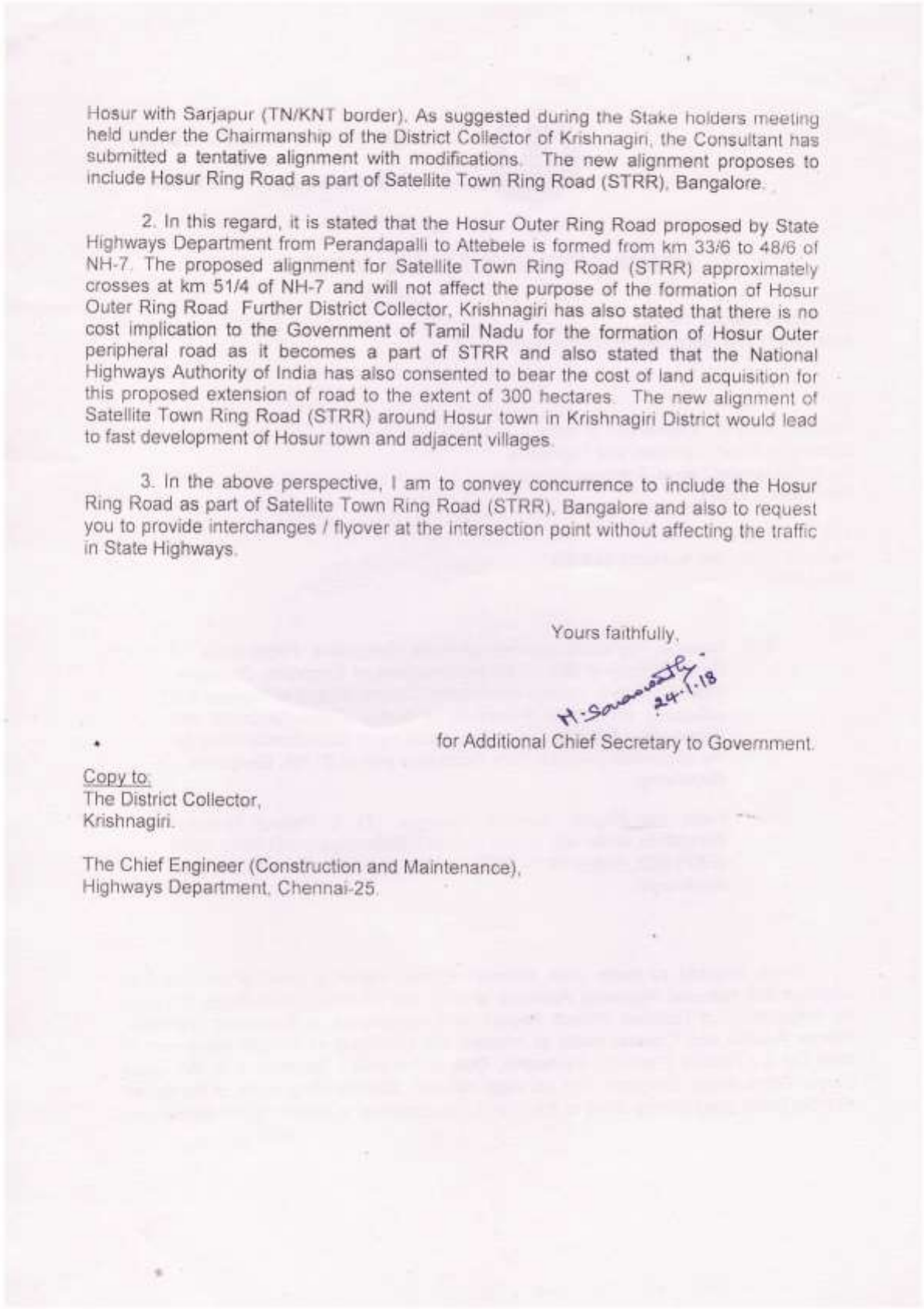
Sub National Highways Authority of India -Bangalore- Preparation of Detailed Project Report for development of Economic Corridors, Inner Corridors, Feeder Routes and Coastal Roads to improve the Efficiency of Freight Movement in India- Concurrence for the alignment – Satellite Town Ring Road (west side)Concurrence for the alignment of Hosur Ring Road as a part of STRR, Bangalore – Regarding.

Ref From the Deputy General Manager (T) & Project Director, Bangalore letter No. NHAI/12012/Lot3/package-1/2017/PIU-BNG (EXP) 653, dated 29.11.2017 addressed to the District Collector, Krishnagiri.

****

I am directed to invite your attention to the reference cited wherein it was informed that National Highways Authority of India has awarded Consultancy Services for Preparation of Detailed Project Report for Development of Economic Corridors, Feeder Routes and Coastal roads to improve the Efficiency of Freight Movement in India-Lot 3 / Andhra Pradesh, Karnataka, Goa and Kerala / Package 1 to M/s Louis Berger Consultants, Gurgaon. The package includes Satellite Ring Road of Bangalore (STRR) (west side) joining NH-4 to NH-7 and it is proposed to extend STRR connecting

Fig 6a: Concurrence obtained for alignment of Hosur portion of Tamil Nadu



Hosur with Sarjapur (TN/KNT border). As suggested during the Stake holders meeting held under the Chairmanship of the District Collector of Krishnagiri, the Consultant has submitted a tentative alignment with modifications. The new alignment proposes to include Hosur Ring Road as part of Satellite Town Ring Road (STRR), Bangalore.

2. In this regard, it is stated that the Hosur Outer Ring Road proposed by State Highways Department from Perandapalli to Attebele is formed from km 33/6 to 48/6 of NH-7. The proposed alignment for Satellite Town Ring Road (STRR) approximately crosses at km 51/4 of NH-7 and will not affect the purpose of the formation of Hosur Outer Ring Road. Further District Collector, Krishnagiri has also stated that there is no cost implication to the Government of Tamil Nadu for the formation of Hosur Outer peripheral road as it becomes a part of STRR and also stated that the National Highways Authority of India has also consented to bear the cost of land acquisition for this proposed extension of road to the extent of 300 hectares. The new alignment of Satellite Town Ring Road (STRR) around Hosur town in Krishnagiri District would lead to fast development of Hosur town and adjacent villages.

3. In the above perspective, I am to convey concurrence to include the Hosur Ring Road as part of Satellite Town Ring Road (STRR), Bangalore and also to request you to provide interchanges / flyover at the intersection point without affecting the traffic in State Highways.

Yours faithfully,

H. Sarangath 24.1.18

for Additional Chief Secretary to Government.

Copy to:
The District Collector,
Krishnagiri.

The Chief Engineer (Construction and Maintenance),
Highways Department, Chennai-25.

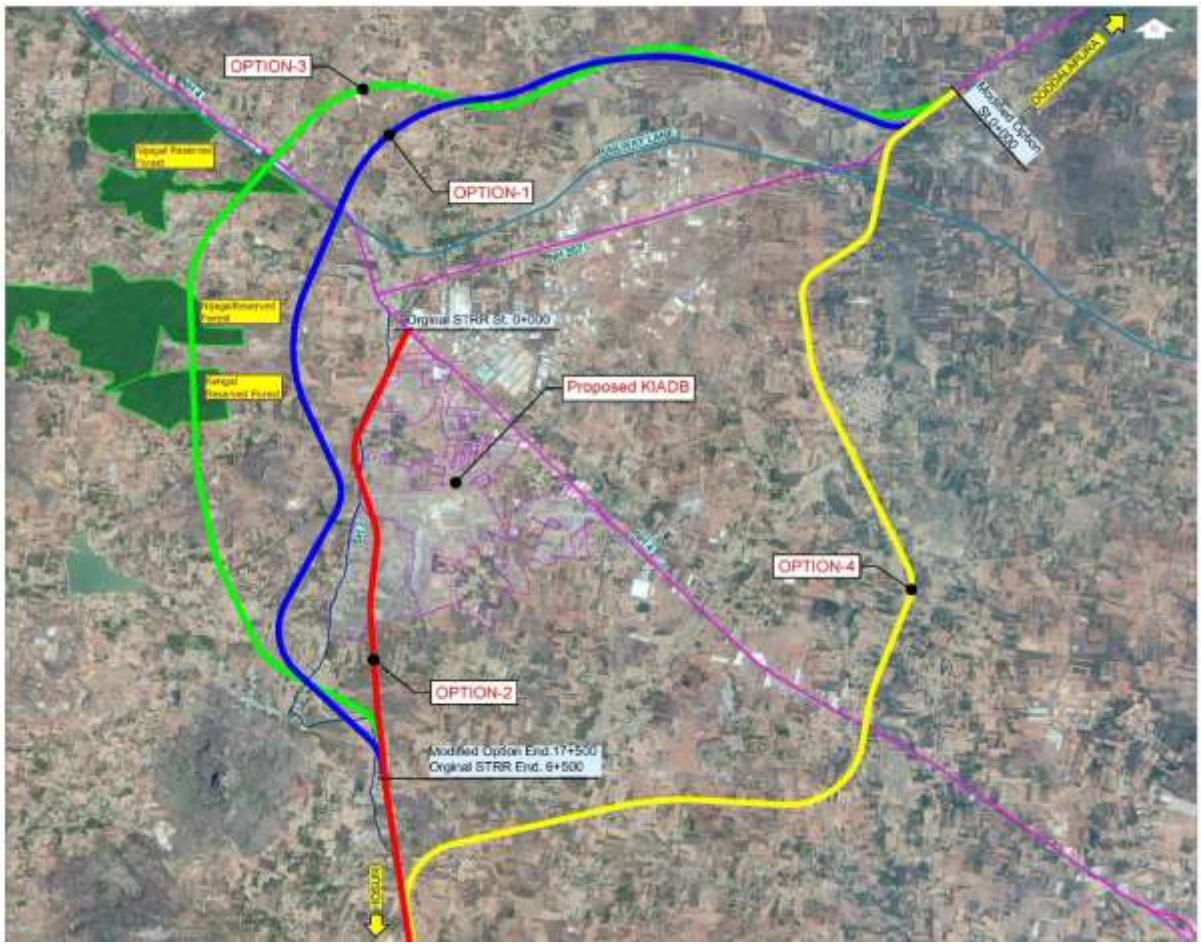
Fig 6b: Concurrence obtained for alignment of Hosur portion of Tamil Nadu

1.4 Modifications in Original STRR

The approved alignment also gone through some further slight modifications so to amalgamate the proposal with adjoining alignments and the details are as below.

1. Inclusion of Multi Model Logistic Park (MMLP) & proposed KIADB in Dobbaspet: change km 0.000 to km 17.500 (original km 0.000 to km 6.500)

Alignment options



Comparative statement

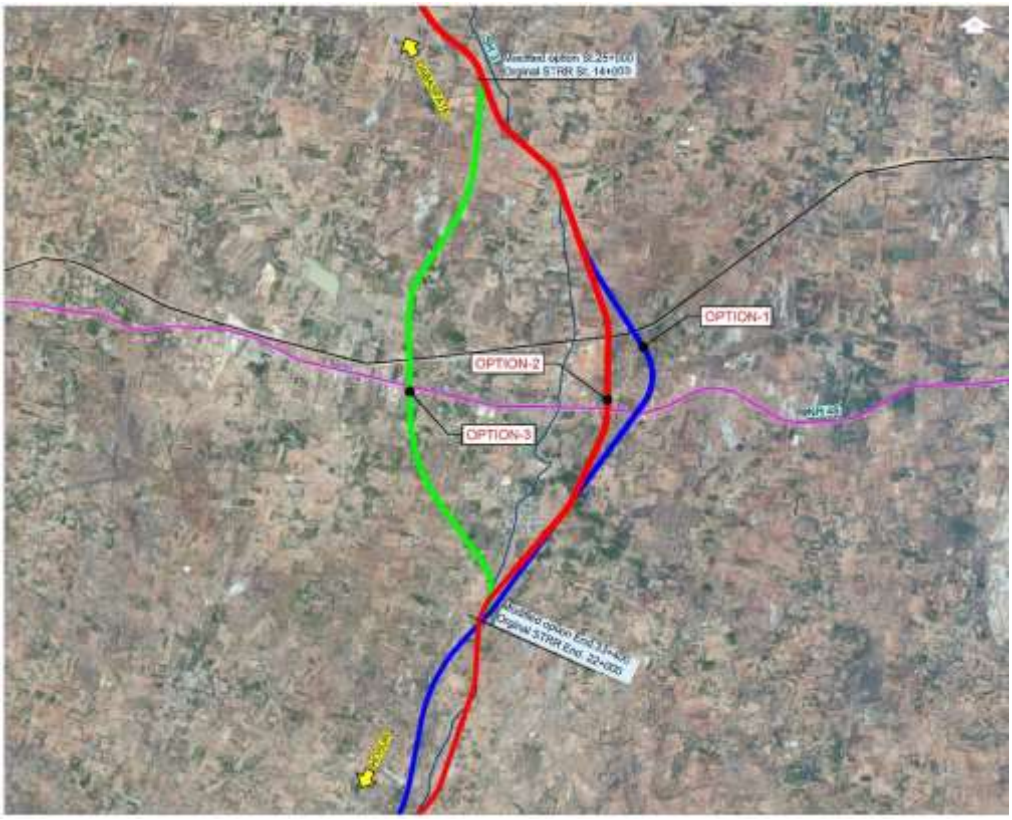
The comparative statements of all four options of proposed modifications in Dobbaspet are given below.

S. No.	Description	Option-1	Option 2 (Original STRR)	Option-3	Option-4
1	Length of Alignment (km)	17.5	6.5	19.6	17.54
2	Built-up stretch	Nil	Nil	Nil	Nil
3	Terrain	Plain	Plain	Plain	Plain
4	Speed	100 kmph	100 kmph	100 kmph	100 kmph
5	Geometries	Geometry is good, supports 100	Geometry is good, supports	Geometry is good, supports	Geometry is good, supports

S. No.	Description	Option-1	Option 2 (Original STRR)	Option-3	Option-4
		kmph speed. Good sight distance with curves widely spaced.	100 kmph speed. Good sight distance with curves widely spaced.	100 kmph speed. Good sight distance with curves widely spaced.	100 kmph speed. Good sight distance with curves widely spaced.
6	Existing Land use pattern through proposed alignment	Agricultural Land/Barren Land	Industrial Land / Agricultural Land	Agricultural Land / Forest Land	Agricultural Land / Residential
7	Proposed ROW (m)	75	75	75	75
8	Total Additional land required in Hec.	131.25	48.75	147	131.55
9	No of affected Structures (tentative)	0	20	5	20
10	ROB	1	0	1	1
11	Bridge	0	0	0	0
12	Interchange	1	0	0	0
13	Environmental Impact	No significant environmental impact is envisaged	No significant environmental impact is envisaged	The proposed alignment will passes through Nijagal and Kengal Reserve Forest	No significant environmental impact is envisaged
15	Tentative cost (INR in crores)	941.05	320.89	994.576	1029.5624
16	Merits	1. No structure/establishment is affected 2. Connectivity given to proposed MMLP in Dabaspete 3. Comparatively shorter alignment		Better road geometry could be achieved	
17	Demerits		1. Alignment passes through built-up location at Dabaspete 2. Passes through the proposed MMLP Industrial location in Dabaspete 3.Not connecting Dabaspete as a whole	1. Larger alignment length 2. Passes through Forest land & thus forest clearence need to be obtained before implimentation of project 3. Passes through the aggregate quarry area 4. Passes through abutting CISF land	1.Poor alignment Geometry 2.Passing through Built-up stretch 3.Land cost will be more as the alignement passing through buit-up region
18	Recommendation	Recommended	Not Recommended	Not Recommended	Not Recommended

2. Design chainage km 25.000 to km 33.400 (Original km 14.000 to km 22.000)

Alignment options



Comparative statement

The comparative statements of all four options of proposed modifications in Dobbaspet are given below

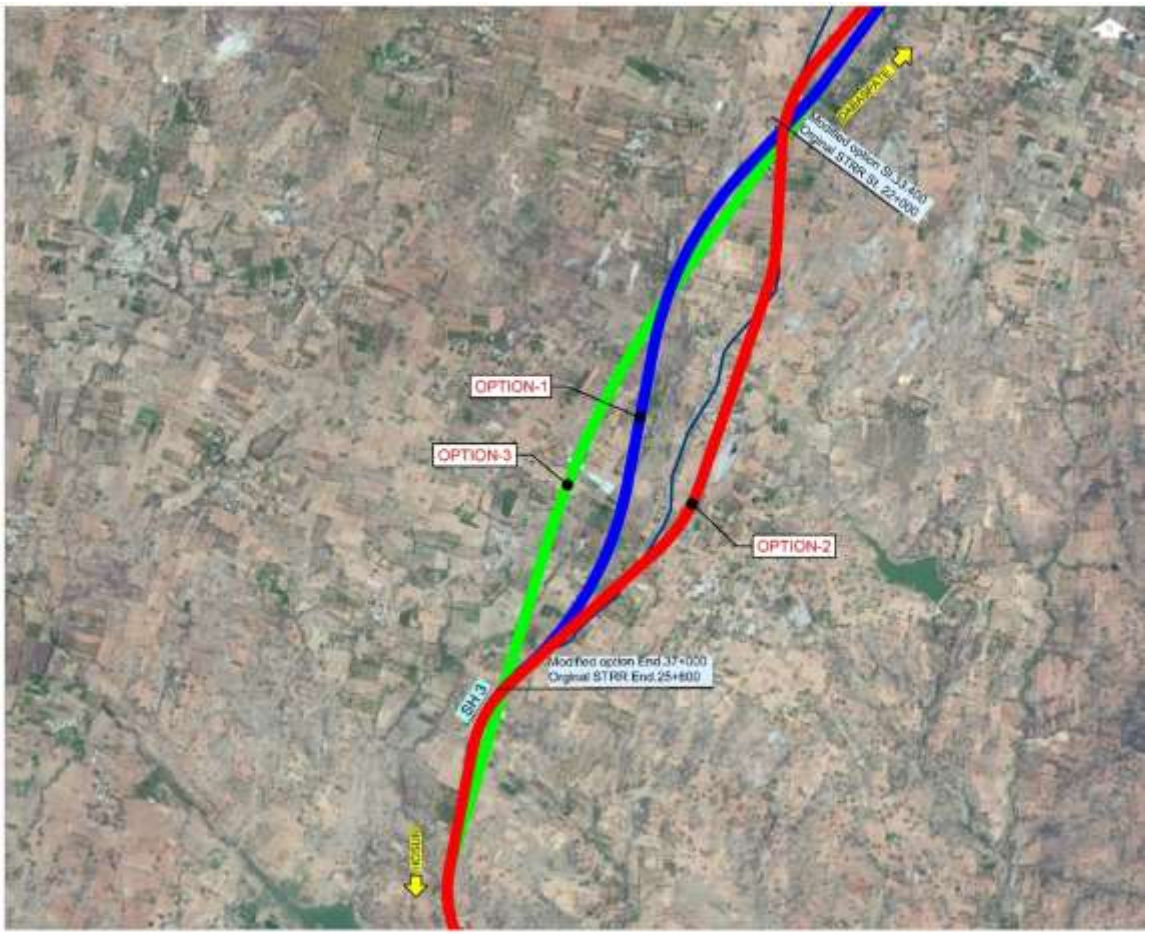
S. No.	Description	Option-1	Option-2 (original STRR)	Option-3
1	Length of Alignment (km)	8.4	8	7.6
2	Built-up stretch	Nil	Nil	Nil
3	Terrain	Plain	Plain	Plain
4	Speed	100 kmph	100 kmph	100 kmph
5	Geometries	Geometry is good, supports 100 kmph speed. Good sight distance with curves widely spaced.	Geometry is good, supports 100 kmph speed. Good sight distance with curves widely spaced.	Geometry is good, supports 100 kmph speed. Good sight distance with curves widely spaced.
6	Existing Land use pattern through proposed alignment	Agricultural Land	Agricultural Land	Agricultural Land
7	Proposed ROW (m)	75	75	75

S. No.	Description	Option-1	Option-2 (original STRR)	Option-3
8	Total Additional land required in Hec.	63	60	57
9	No of affected Structures (tentative)	0	20	20
10	ROB	1	1	1
11	Bridge	0	0	0
12	Interchange	1	1	1
13	Environmental Impact	No significant environmental impact is envisaged	No significant environmental impact is envisaged	No significant environmental impact is envisaged
15	Tentative civil cost (INR in crores)	478.854	506.98	485.856
16	Merits	1. No structure/establishment is affected 2.Less construction cost 3.Better alignment geometry		
17	Demerits		1. Passes through large number of structures including religious structure, resulting higher land & social cost 2. Passes through the mid of a pond	1. Alignment passes through many existing roads, resulting provision grade separators 2. Combined interchange of ROB and NH crossing is required, for that under construction ROB to be demolished
18	Recommendation	Recommended	Not Recommended	Not Recommended

3 Avoiding thick built up area in Rangenahalli

Chainage km 33.400 to km 37.000 (original km 22.000 to km 25.600)

Alignment options



Comparative statement

The comparative statements of all four options of proposed modifications are given below

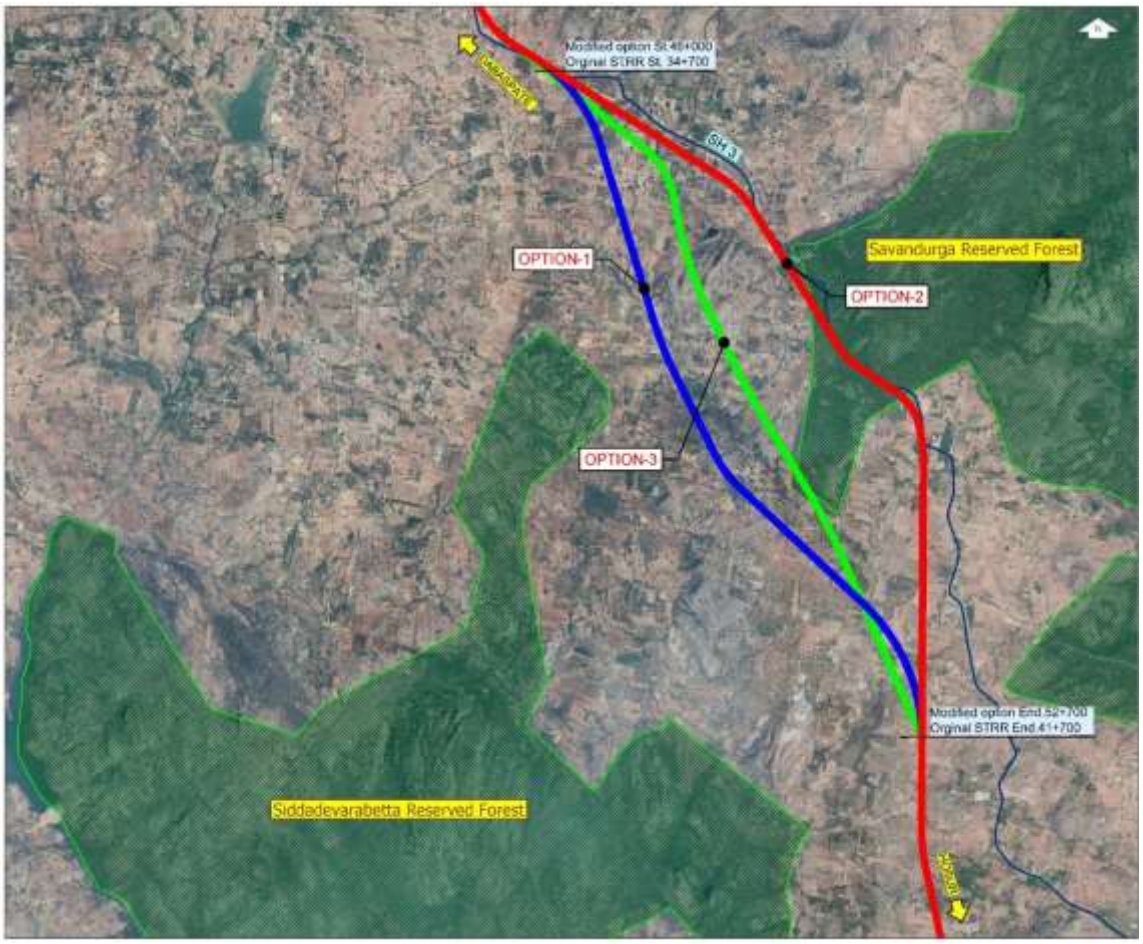
S. No.	Description	Option-1	Option-2 (original STRR)	Option-3
1	Length of Alignment (km)	3.6	3.6	5.7
2	Built-up stretch	Nil	Nil	Nil
3	Terrain	Plain	Plain	Plain
4	Speed	100 kmph	100 kmph	100 kmph
5	Geometries	Geometry is good, supports 100 kmph speed. Good sight distance with curves widely spaced.	Geometry is good, supports 100 kmph speed. Good sight distance with curves widely spaced.	Geometry is good, supports 100 kmph speed. Good sight distance with curves widely spaced.
6	Existing Land use pattern through proposed alignment	Agricultural Land	Agricultural Land	Agricultural Land / Forest Land

S. No.	Description	Option-1	Option-2 (original STRR)	Option-3
7	Proposed ROW (m)	75	75	75
8	Total Additional land required in Hec.	27	27	42.75
9	No of affected Structures (tentative)	0	30	5
10	ROB	0	0	0
11	Bridge	0	0	0
12	Interchange	0	0	0
13	Environmental Impact	No significant environmental impact is envisaged	No significant environmental impact is envisaged	No significant environmental impact is envisaged
15	Tentative civil cost (INR in crores)	169.866	172.866	269.4545
16	Merits	1. Shorter alignment length 2. No built-up land is involved		
17	Demerits		1. More than 30 establishments would get affected 2.Comparatively poor alignment geometry	1. Passes through pond 2.Higher construction cost
18	Recommendation	Recommended	Not Recommended	Not Recommended

4 Avoiding Savanadurga forest Area

Chainage km 46.000 to km 52.700 (Original km 34.700 to km 41.700)

Alignment options



Comparative statement

The comparative statements of all four options of proposed modifications are given below

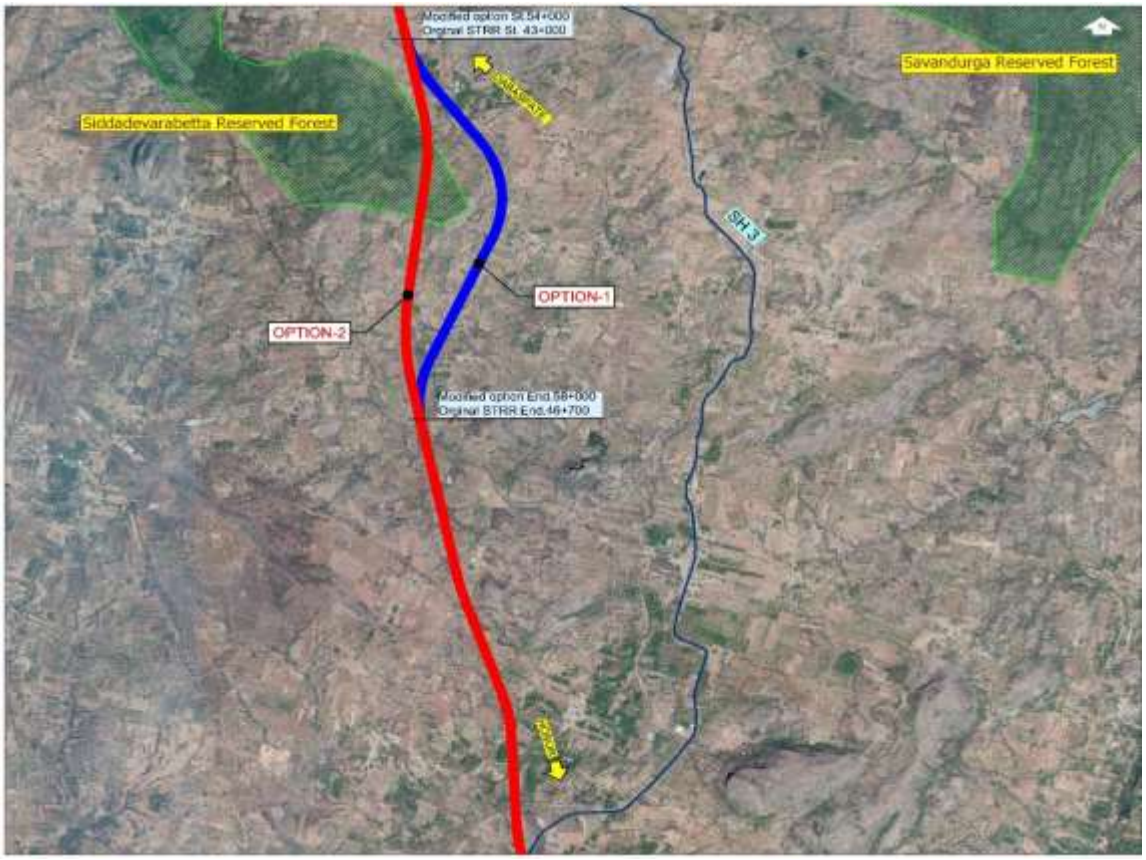
S. No.	Description	Option-1	Option-2 (original STRR)	Option-3
1	Length of Alignment (km)	6.7	7	8.8
2	Built-up stretch	Nil	Nil	Nil
3	Terrain	Plain	Plain	Plain
4	Speed	100 kmph	100 kmph	100 kmph
5	Geometries	Geometry is good, supports 100 kmph speed. Good sight distance with curves widely spaced.	Geometry is good, supports 100 kmph speed. Good sight distance with curves widely spaced.	Geometry is good, supports 100 kmph speed. Good sight distance with curves widely spaced.

S. No.	Description	Option-1	Option-2 (original STRR)	Option-3
6	Existing Land use pattern through proposed alignment	Mostly Barren Land	Barren Land / Forest Land	Barren Land / Forest Land
7	Proposed ROW (m)	75	75	75
8	Total Additional land required in Hec.	50.25	52.5	66
9	No of affected Structures (tentative)	0	0	0
10	ROB	0	0	0
11	Bridge	0	0	0
12	Interchange	0	0	0
13	Environmental Impact	No significant environmental impact is envisaged	The proposed alignment passes through Savanadurga Reserve Forest. Thus Reserve forest clearances required.	The proposed alignment passes through Savanadurga Reserve Forest. Thus Reserve forest clearances required.
15	Tentative civil cost (INR in crores)	316.1395	330.295	415.228
16	Merits	1. Away from forest land, resulting ease in construction 2.Better alignment geometry		
17	Demerits		The proposed alignment passes through Savanadurga Reserve Forest. Thus Reserve forest clearances required. This will delay the project implementation	The proposed alignment passes through Savanadurga Reserve Forest. Thus Reserve forest clearances required. This will delay the project implementation
18	Recommendation	Recommended	Not Recommended	Not Recommended

5. Siddadevarabetta Forest Area

Chainage km 54.000 to km 58.000 (Original km 43.000 to km 46.700)

Alignment options



Comparative statement

The comparative statements of all four options of proposed modifications are given below

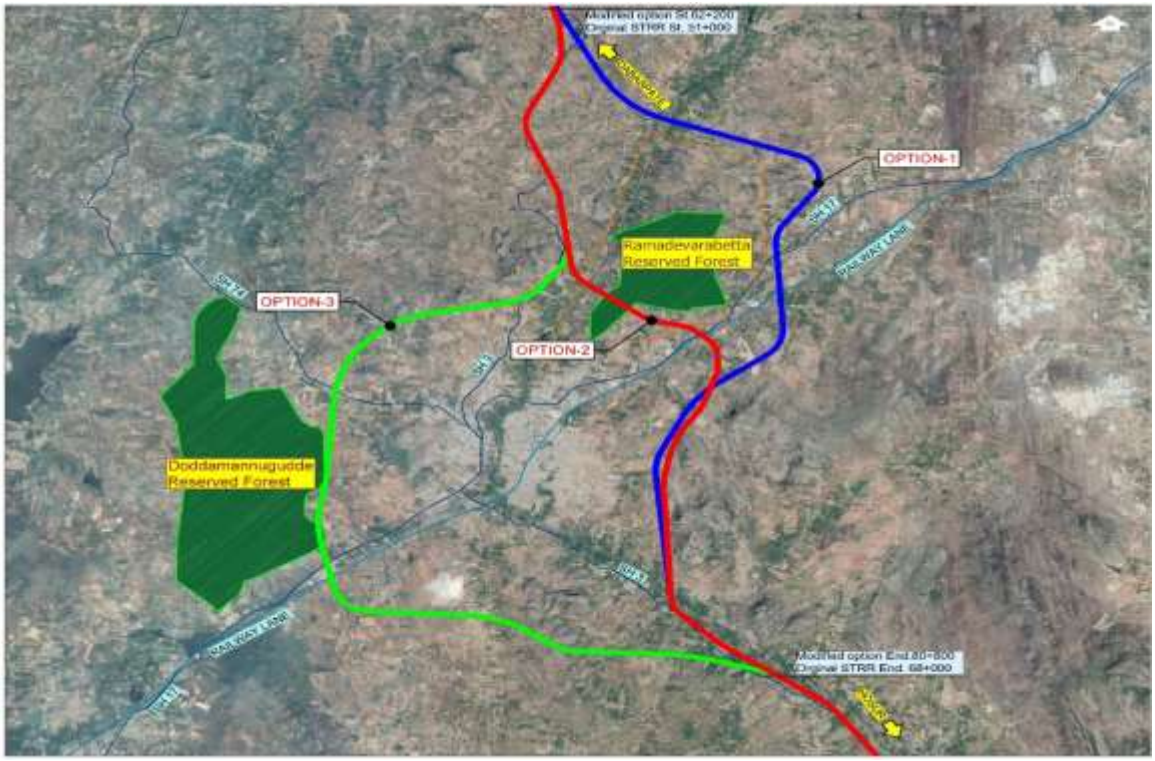
S. No.	Description	Option-1	Option-2 (original STRR)
1	Length of Alignment (km)	4	3.7
2	Built-up stretch	Nil	Nil
3	Terrain	Plain	Plain
4	Speed	100 kmph	100 kmph
5	Geometries	Geometry is good, supports 100 kmph speed. Good sight distance with curves widely spaced.	Geometry is good, supports 100 kmph speed. Good sight distance with curves widely spaced.
6	Existing Land use pattern through proposed alignment	Mostly Barren Land	Barren Land / Forest Land
7	Proposed ROW (m)	75	75
8	Total Additional land required in Hec.	30	27.75

S. No.	Description	Option-1	Option-2 (original STRR)
9	No of affected Structures (tentative)	0	0
10	ROB	0	0
11	Bridge	0	0
12	Interchange	0	0
13	Environmental Impact	No significant environmental impact is envisaged	The proposed alignment passes through Siddadevarabetta Reserve Forest. Thus Reserve forest clearances required.
15	Tentative civil cost (INR in crores)	188.74	174.5845
16	Merits	Away from forest land, resulting ease in construction	
17	Demerits		The proposed alignment passes through Siddadevarabetta Reserve Forest. Thus Reserve forest clearances required.
18	Recommendation	Recommended	Not Recommended

6. Ramanagara vulture Sanctuary area

Chainage km 62.200 to km 80.800 (Original km 51.000 to km 68.000)

Alignment options



Comparative statement

The comparative statements of all four options of proposed modifications are given below

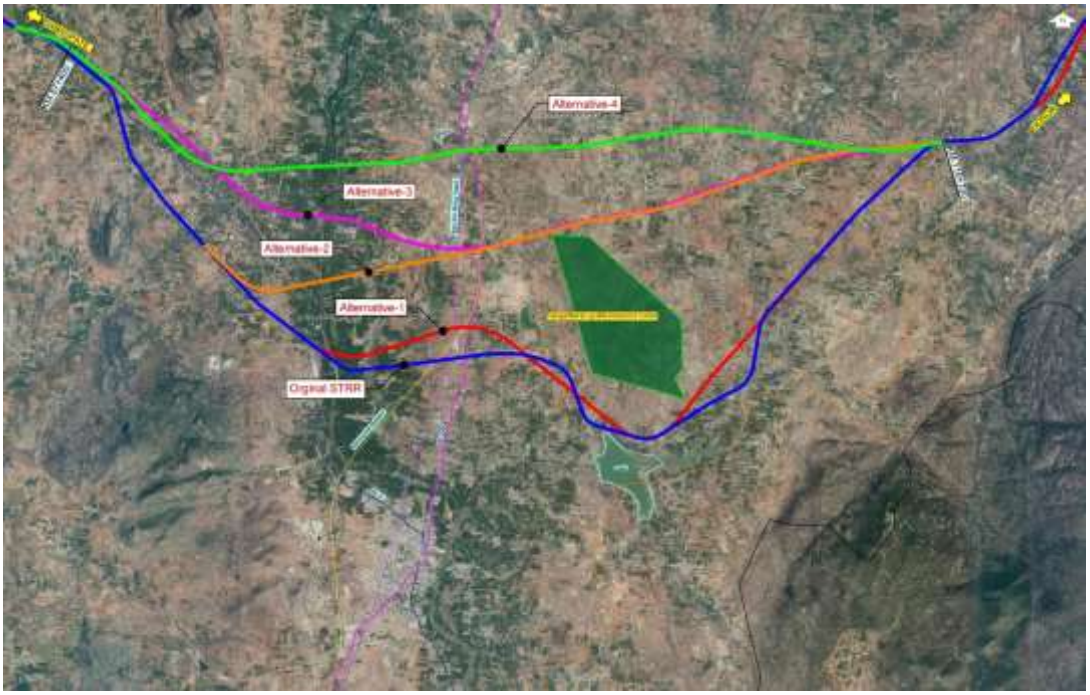
S. No.	Description	Option-1	Option-2 (original STRR)	Option-3
1	Length of Alignment (km)	18.6	17	25.05
2	Built-up stretch	Nil	Nil	Nil
3	Terrain	Plain	Plain	Plain
4	Speed	100 kmph	100 kmph	100 kmph
5	Geometries	Geometry is good, supports 100 kmph speed. Good sight distance with curves widely spaced.	Geometry is good, supports 100 kmph speed. Good sight distance with curves widely spaced.	Geometry is good, supports 100 kmph speed. Good sight distance with curves widely spaced.
6	Existing Land use pattern through proposed alignment	Agricultural Land/Barren Land	Agricultural Land / Forest Land/Residential	Agricultural Land/Barren Land/Forest Land
7	Proposed ROW (m)	75	75	75
8	Total Additional land required in Hec.	139.5	127.5	187.875

S. No.	Description	Option-1	Option-2 (original STRR)	Option-3
9	No of affected Structures (tentative)	0	0	10
10	ROB	1	1	1
11	Bridge	1	1	1
12	Interchange	1	1	2
13	Environmental Impact	No significant environmental impact is envisaged	The alignment is passing through the Ramadevarabetta Reserve forest	The proposed alignment pass through close proximity of Doddamannugudde Reserve Forest
15	Tentative civil cost (INR in crores)	992.641	917.145	1347.98425
16	Merits	1.Not demolishing any major structure 2.No forest land is involved, resulting ease of construction		
17	Demerits		The alignment is passing through the mid of Ramadevarabetta Vulture Sanctuary	1. Larger alignment length 2. The proposed alignment pass through close proximity of Doddamannugudde Reserve Forest. 3. the existing railway line and the National highway are in close proximity (250m) therefore vertical geometry not suitable for ROB & interchange provision in NH 275
18	Recommendation	Recommended	Not Recommended	Not Recommended

7. Kanakapura

Chainage km 86.750 to km 106.000 (Original km 74.000 to km 99.000)

Alignment options



The comparative statements of all four options of proposed modifications are given below:

S. No.	Description	Original STRR	Alt 1 (Modified)	Alt 2	Alt 3	Alt 4
1	Length of Alignment (km)	25	24.65	21.10	19.61	19.25
2	Built-up stretch	Nil	Nil	Nil	Nil	Nil
3	Terrain	Plain/rolling	Plain/rolling	Plain/rolling	Plain/rolling	Plain/rolling
4	Speed	100 kmph	100 kmph	100 kmph	100 kmph	100 kmph
5	Geometries	Geometry is good, supports 100 kmph speed.	Geometry is good, supports 100 kmph speed. Good sight distance with curves widely spaced.	Geometry is good, supports 100 kmph speed. Good sight distance with curves widely spaced.	Geometry is good, supports 100 kmph speed.	Geometry is good, supports 100 kmph speed.
6	Existing Land use pattern through proposed alignment	Barren/Agricultural Land	Barren/Agricultural Land	Barren/Agricultural Land	Barren/Agricultural Land	Barren/Agricultural Land

S. No.	Description	Original STRR	Alt 1 (Modified)	Alt 2	Alt 3	Alt 4
7	Proposed ROW (m)	75	75	75	75	75
8	Total Additional land required in Hec.	172.5	176.25	148.125	141.75	138.75
9	No of affected Structures (tentative)	75	20	5	5	5
10	ROB	0	0	0	0	0
11	Major Bridge	1	1	1	1	1
12	Interchange	1	1	1	1	1
13	Environmental Impact	Pass through reserve forest land and heavily built up area.	No significant environmental impact is envisaged	No significant environmental impact is envisaged	No significant environmental impact is envisaged	No significant environmental impact is envisaged
15	Tentative civil cost (INR in crores)	1416.13	1390.54	1202.25	1150.86	1074.49
16	Merits	-	Improved geometry as compare to original, Avoid acquisition in built-up and reserve forest area	Length is shorter as compare to proposed & original, Avoid acquisition in built-up and reserve forest area. No significant environmental impact	Length is shorter as compare to proposed, original and Alt-1, Avoid acquisition in built-up and reserve forest area. No significant environmental impact	Good horizontal geometry. The length will be shorter compared to originally proposed alignment. Very less structures will be affected. No significant environmental impact
17	Demerits	Passes through large number of structures including religious structure, resulting higher land & social cost. The existing NH and proposed Kankapura bypass are at the distance of	The proposed flyover will be combined for both existing NH 209 and its newly proposed bypass resulting more length.	Comparatively poor horizontal geometry. Large amount of cutting involved. Pass through close to reserve forest area. There is major water pipe (2 no) line run parallel to NH 209. Interchange length will be more as they	Comparatively poor horizontal geometry. Large amount of cutting involved. Pass through close to reserve forest area. There is major water pipe (2 no) line run parallel to NH 209. Interchange length will be more as they	Some amount cutting is expected due to rolling terrain.

S. No.	Description	Original STRR	Alt 1 (Modified)	Alt 2	Alt 3	Alt 4
		about 800m. This envisage a combined structure. Higher construction cost.		are at close proximity to road. The interchange proposal may encroach the existing water body	are at close proximity to road. The interchange proposal may encroach the existing water body	
18		Not Recommended	Not Recommended	Not Recommended	Not Recommended	Recommended

End point of Tamil Nadu/Karnataka

The end of STRR will need integration with the alignment under finalization for 4 lanes of Sarjapur, Karnataka/Tamil Nadu border near Bagalur town. In order to provide efficient connectivity it envisaged during the joint site visit with PD/NHAI/Bangalore during 8 to 10 January 2018 that bypass the Bagalur town is also vital. Thus, the alignment extended to cover Bagalur town and joining the alignment in Kalakunde. This section dealt with M/s Kerala Industrial and Technical Consultancy Organization Ltd (KITCO). Accordingly, the proposal modified after discussed with RO/NHAI/Bangalore. The alignment also slightly modified in few locations in Karnataka portion. The Modifications also further discussed with CGM/NHAI on 31/1/2018 and agreed upon.

Final updated alignment incorporating all modifications given **Fig 7.** The final alignment drawings on google images given in separate volume.

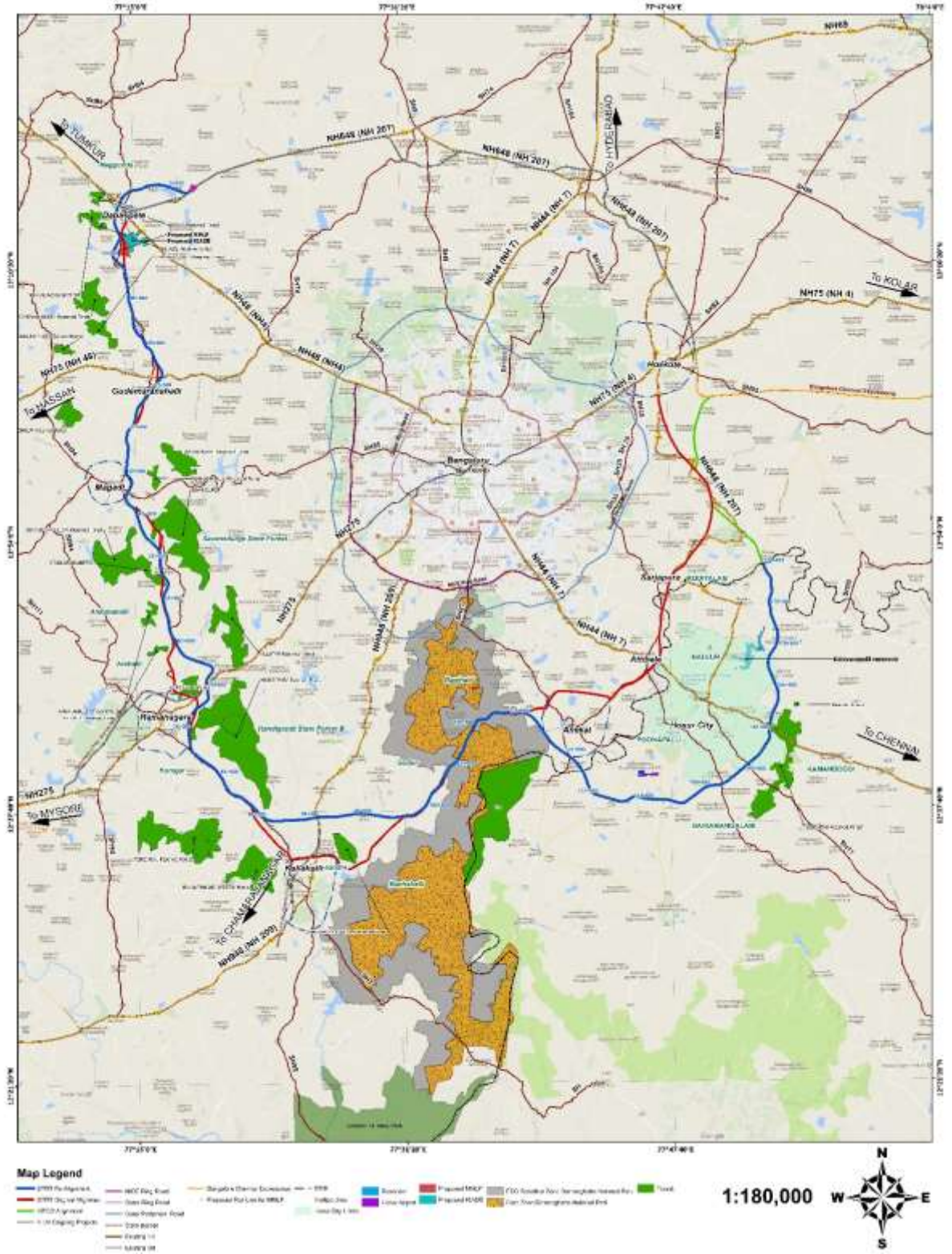


Fig 7: Final Alignment

1.5 Satellite Towns Ring Road (STRR) Bangalore West Side

Bangalore town is thickly populated and In order to ensure safe, smooth, efficient, and high speed transport corridor to this city, it is impetus that the infrastructure of city and adjoining towns anticipated the development. National Highways NH 648 (NH 207), NH 48 (NH 4), NH 275, NH 948, NH 209 & NH 75 (Hassan road), and majority of State Highways SH 3, SH 85, & SH 35 pass through Bangalore city comprising heavy commercial traffic movement. Most of these traffic pass through the Bangalore city and resulting huge traffic jams. Also, the NICE ring road currently has only four lanes configuration with very congested traffic level. Further, the toll rates are also exorbitant in comparison to NHAI toll rates due to private operator (about 4 times and without return passage).

The STRR will function as an alternative and there is huge potential for the traffic to get divert the proposed STRR facility. Provision of STTR will ensure high speed connectivity primarily to Bangalore International airport and to the proposed Bangalore – Chennai Expressway.

Therefore, reviving the STRR project with considering current development in the region including development of STRR west side is absolute necessary on priority basis and it is propose to consider a 6lanes carriageway configuration throughout as minimum requirement.

1.5.1 Road under progress in STRR

Dobbaspet to Hoskote (80.20km)

The stretch of NH 207 from Dobbaspet to Hoskote (length 80.20km) on east side of STRR has taken up for implementation to 4lanes divided carriageway configuration with 45m land width by NHAI. However, the civil work currently held up due to contract complications. NHAI is currently reviving this project with 60m right of way and 6lanes project facilities.

Hoskote to Sarjapur/Bagalur

The portion from Hoskote to Sarjapur/Bagalur (length about 25km) is currently under detailed project report stage by KITCO consultants in NHAI. The alignment is already finalize by NHAI to this portion. This alignment will be integrate with our current study to complete the ring for entire STRR alignment.

Bangalore – Chennai Expressway

The Bangalore - Chennai Expressway is a proposed greenfield expressway between the cities of Bangalore (Karnataka) and Chennai (Tamil Nadu). This project formulated under NHDP Phase IV program and currently consider under Bharatmala Scheme. This high speed travel corridor will run parallel to existing NH 4 and will be develop with total access control facility. The proposed expressway starts from Hoskote (the junction of NH 4 & NH 207) and ends in Sriperumbudur (just 40km away from Chennai) in Tamil Nadu. The total length of this proposed facility will be 262.3km. The expressway passes through Bangalore Rural & Kolar districts in Karnataka state (about 75.6km), Chittoor district of Andhra Pradesh (88.31km), and Vellore, Kanchipuram, Tiruvallur districts of Tamil Nadu (98.33km). The proposed configuration will be 4lanes carriageway with 5 major interchanges with fully access control facilities.

1.6 Declaration of STRR (west side) as NH

The proposed STRR declared as National highway with a serial number 462 and new National highway number 948A as per MORTH Gazette notification no 6, dated 02/01/2018. The copy of Gazette enclosed in **Annexure 1.**

1.7 Project road

The project road currently intends to connect Dobbaspet, Magadi, Ramanagara, Kankapura, Anekal, Hosur & Sarjapur. The proposed road passes through Bangalore Rural, Bangalore Urban, and Ramanagara districts in Karnataka state and Hosur town in Krishnagiri district of Tamil Nadu state. The total length of this alignment will be about 190km. Start point co-ordinate of STRR -750104.8329/1465840.4410 (near Dobbaspet). End point coordinates of STRR merging with KITCO alignment at Tamil Nadu/Karnataka Border – 83614.6946/1424665.8098 (near Sampangere).

Terrain

The project road stretch is passing through Plain and rolling terrain

Land use

The land use by the side of this road predominantly barren and agriculture

Project proposals

The proposal envisages a six lanes divided carriageway configuration with raised median as per the latest circular issued. All provisions of structure will be consider as per IRC SP 87-2013 Manual. The design speed for the proposed road shall be 100km/h as terrain is plain/rolling.

Proposed ROW

A 75m corridor will propose for the entire alignment as intimated by NHAI except in interchange locations additional width as per requirement will proposed.

Road Configuration

Six lanes divided carriageway configuration with raised median will proposed as per 6lanes manual. The structures will proposed for 8lanes configuration. The proposed project road will be consider for fully access controlled facilities as per NHAI guidelines. All major cross roads will be provide with grade separated structures to ensure uninterrupted free flow through traffic and to provide safety to local traffic. As far possible the minor cross roads will elevated and the main carriageway will kept on ground level to ensure safe geometry standards. Service roads will envisage as per requirement for segregation of local traffic needs.

The proposed alignment crisscrosses the existing SH 3 at many locations. All endeavor will made not to disturb any existing network and try restoring the existing SH 3 where it affected due to proposed STRR proposals.

The details of some of major cross roads given below.

Table 3: Major Cross road locations

S No	Tentative location (km)	Cross road
1	0.000 (Kar)	NH 648 (old NH 207)
2	6.8	SH 3
3	8.6	NH 48 (old NH 4)

S No	Tentative location (km)	Cross road
4	30.1	NH 75 (old NH 48)
5	44.2	SH 85
6	70.0	NH 275 (Ramanagara)
7	95.4	NH 948 (old NH 209)
8	131.7	SH 35
9	139.5	17B
10	144.550	17A
11	151.800	SH 85
12	155.600	SH 17
13	160.900	NH 44 (old NH 7)

Horizontal Geometry

The tentative horizontal geometry for the proposed road worked out and the details are given in **Annexure 2.** It is evident from the table that the entire corridor is cater for 100km per hour design speed.

Proposed Design Standards

The geometry design standard as per IRC: SP: 87- 2013 adopted. The details are given below.

Table 4: Proposed Highway Design Standards

No.	Description	Unit	Plain & Rolling			
1	Design Speed	Km/h	100 (Ruling)			
			80 (Minimum)			
2	ROW Width	m	60 (Minimum)			
3	Pavement Width: Per Lane	m	3.5			
	Two Lanes	m	7			
	Three Lanes	m	10.5			
4	Cross Slope	%	- 2.5			
5	Gradient: Ruling Limiting	%	2.5 3.3			
6	Maximum Super-elevation	%	7% (If radius of curve is less than desirable minimum) 5% (If radius of curve is more than desirable minimum)			
7	Shoulder width		Open Area	Built-up area	Approaches to G.S.S.	Approaches to Bridges
	Paved	m	1.5	2.0	2.0	1.5
	Earthen	m	2.0	-	-	2.0
8	Shoulder's cross slope					
	Paved	%	- 2.5			
	Unpaved	%	- 3			

No.	Description	Unit	Plain & Rolling
9	Horizontal Curvature: Desirable minimum	m	400
	Absolute minimum	m	250
10	Sight Distance for various speeds	Absolute Minimum (S.S.D)	Desirable Minimum (I.S.D)
	100 km/h	180 m	360 m
	80 km/h	130 m	260 m
11	Ramp Design:		
	Ramp width	m	3.75/5.5/7.0
	Ramp Design speed	Km/h	65
	Radius of curvature	m	150 (Minimum)
	Super elevation maximum	%	7
	Stopping sight distance	m	90
12	Minimum Length of Horizontal Curves:		
	For deflection angle=5°	m	150
	For deflection angle=4°	m	180
	For deflection angle=3°	m	210
	For deflection angle=2°	m	240
	For deflection angle=1°	m	270
	For deflection angle<1°	m	0 (Not Required)
13	Minimum Length Between same side Curves:	m	280 (10 sec travel time as per 100 kmph design speed)
14	Vertical clearance at VUP/LVUP/PUP	m	5.5/3.5/3.0 (min)

15	Vertical Curve, values for “K”, where K= L/(G1-G2), in m:		
	Design speed (km/h)	Minimum (S.S.D)	Desirable (I.S.D)
	65	18.4	33.8
	80	32.6	60
	100	73.6	135

16	Minimum Length of vertical curves:		
	Design speed (km/h)	Maximum grade change(percent) not requiring vertical curve	Maximum length of a vertical curve(m)
	65	0.8	40
	80	0.6	50
	100	0.5	60

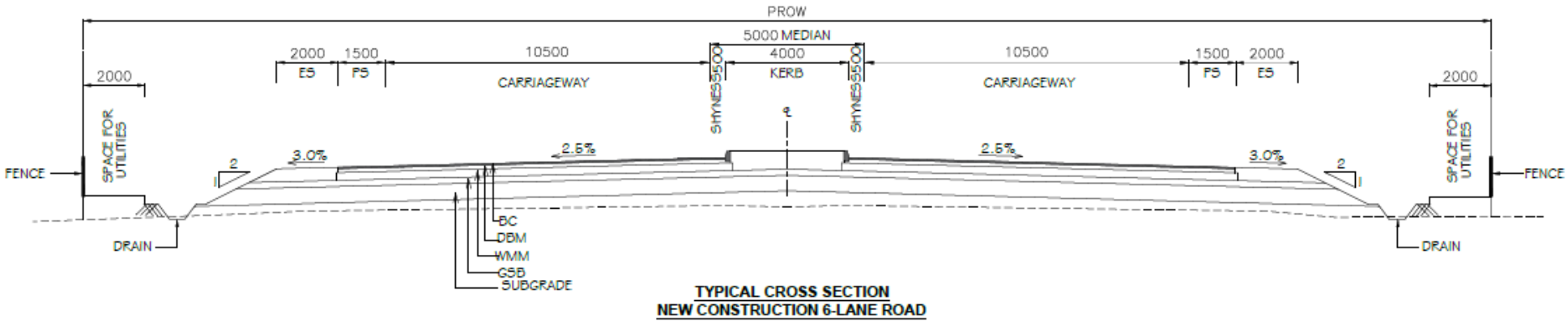


Fig. 8: Proposed Typical Cross Section of Road

1.8 Environment Studies

Environmental expert carried out reconnaissance survey of the project road. Important environmental components along the corridor of impact zone of Banneragatta National Park identified. The alignment corridor is passing through this wildlife Sanctuary between km 116 to km 129. The alignment is pass through Buffer as well as core zones in this wildlife park. Though 3 options studied to avoid this location either partly or to maximum extent, no alignment option could found feasible due to its terrain condition as it unable to cater the high speed traffic corridor. So a joint meeting and site visit with PCCF/DFO and PIU/PD/NHAI held on 12/9/2017 & 19/9/2017 and it concluded that the original suggested option found feasible technically for consideration. The portion of alignment passes through Banneragatta National Park given in **Fig 9.**

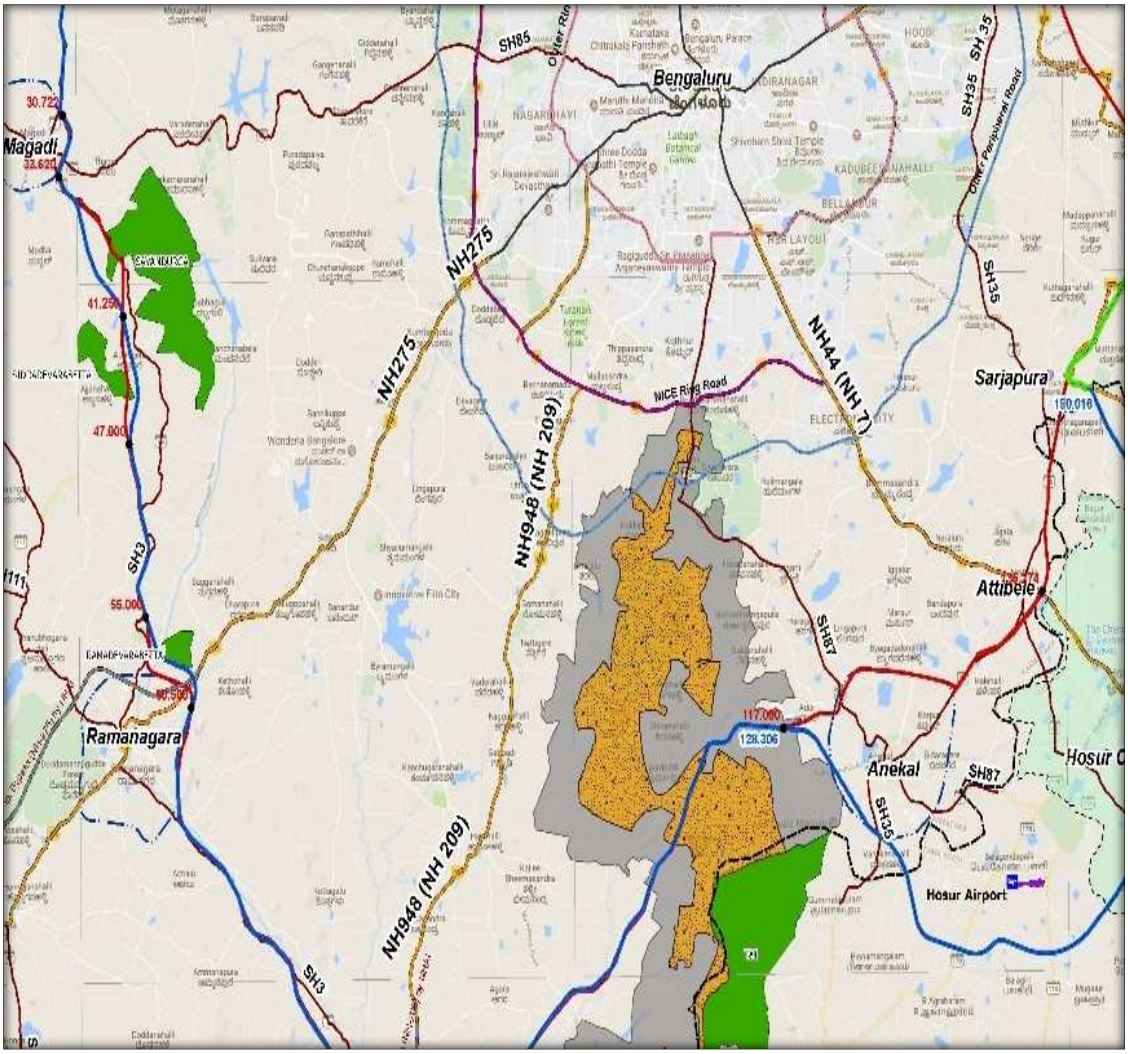


Fig 9: Alignment passes through Banneragatta National Park

The environment study will identify trees, forests, National park and its core and buffer zones, public utilities, community resources, cultural sites, high pollution zones, accident prone zones/area etc. On the basis of back ground, information screening exercise will be conduct subsequently. The data collected will be compile to develop environmental scenario and sensitive component within that. Full road length and corridor of impact will put under screening to identify hot spot zones. On the basis of this environment impact assessment and Environmental, management plan will be frame.

The following mitigation measures will be consider in subsequent project stages

- Adequate drainage facilities along the road
- Provision of service roads
- Appropriate noise barriers at sensitive locations
- Development of strip plantation on both sides and median shrubs
- Regular monitoring of ambient air quality, noise level and water quality during construction.
- Grade separation/ interchanges at major intersections.
- Elevated arrangement for through traffic with barricade.

1.9 Social Assessment

The social assessment presents to determine the magnitude of actual potential impact due to this new road development. The idea of social study is to minimize the social impact with best possible engineering solutions at the optimal point. The social screening survey will be carry out to assess the negative impact and to suggest the mitigation measures

- To avoid / minimize the adverse impact on nearby communities and natural environment,
- People and properties falling on direct path of road development,
- People indirectly affected by the way of disruption of livelihood, breakage in community linkages
- Impact on land acquisition and resettlement, on indigenous people (SC &ST) and on human safety etc.

In order to minimize or avoid the adverse impact, all necessary modifications will made in design stage. However, in case of unavoidable negative impacts, these will be mitigate through suggested appropriate measures needs to be adopt during construction and operational stages.

To ensure that the project affected persons are duly compensated a Resettlement Action Plan (RAP) would be drawn up as an integral part of project design proposal to ensure that highway improvement are socially sound, sustainable and contribute to the development of social goals. The prime objective of this RAP is to ensure and provide a policy framework to ensure that the affected and displaced persons are aptly resettled and rehabilitated (to improve their livelihood and standard of living or at least to restore them in real terms).

Land use

The terrain along this alignment is predominantly mix of plain and rolling. The land use pattern along this project road comprises of agricultural, built up, barren, industrial, and forest. However, the main land use pattern is agricultural and barren. The tentative land uses along the project are as below.

Table 5: Tentative Land Uses along the Project

S. No	Land use pattern	% of land use
1	Agriculture	82
2	Barren	5
3	Built up	3
4	Industrial	3
5	Forest	7

Based on the findings during the initial assessment study some measures have noted for consideration that will reduce the detrimental effects of project appreciably.

- Alternative alignments such as realignment are attempt in the original STRR in order to find a suitable alignment that would have minimum adverse impact on social aspects and minimum land acquisition.

- The alignment avoids schools, places of worships, public utilities and other common resources.

- It will be ensure that the likely affected common properties used by local people will suitably rehabilitated before the start of civil construction work and budgetary provision for the same will be made in the project estimates.

Approximate Land requirement

The STRR alignment passes through following districts and talukas in Karnataka and Tamil Nadu states.

No	state	District	Talukas
1	Karnataka	Bangalore Rural	Neelmangala
			Magadi
2		Bangalore Urban	Anekal
3		Ramanagara	Ramanagara
4	Tamil Nadu	Krishnagiri	Hosur
			Denkanikottai

It is propose to acquire a strip of land of 75m corridor for the proposed STRR so to accommodate the 6lanes carriageway configuration and other amenities as per six lanes Manual and standards.

The Draft 3a for Karnataka portion submitted on 4800182-GGN-OC-026A dated 02/12/2017 and Draft 3a for Tamil Nadu portion submitted vide reference 4800182-GGN-OC-034 dated 29/12/2017. The updated draft 3a considering Bagalur portion resubmitted on vide reference 4800182-GGN-OC-047 dated 19/01/2018.

Annexures

रजिस्ट्री सं० डी० एल०-33004/99 REGD. NO. D. L.-33004/99

भारत का राजपत्र
The Gazette of India

असाधारण
EXTRAORDINARY
भाग II—खण्ड 3—उप-खण्ड (ii)
PART II—Section 3—Sub-section (ii)
प्राधिकार से प्रकाशित
PUBLISHED BY AUTHORITY

सं. 06] नई दिल्ली, मंगलवार, जनवरी 2, 2018/पौष 12, 1939
No. 06] NEW DELHI, TUESDAY, JANUARY 2, 2018/PAUSHA 12, 1939

सड़क परिवहन और राजमार्ग मंत्रालय

अधिसूचना

नई दिल्ली, 01 जनवरी, 2018

का.आ. 06(अ).—केन्द्रीय सरकार, राष्ट्रीय राजमार्ग अधिनियम, 1956 (1956 का 48) की धारा 2 की उप-धारा (2) द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए, निम्नलिखित तालिका के स्तम्भ (2) और (3) में विनिर्दिष्ट प्रत्येक राजमार्ग को राष्ट्रीय राजमार्ग घोषित करती है।

राजमार्गों, जिन्हें अब इस अधिसूचना द्वारा राष्ट्रीय राजमार्ग घोषित किया जाना है, को तालिका के स्तम्भ (1), (2) और (3) में यथा-निर्दिष्ट क्रमश: नई क्रम संख्याओं, नई राष्ट्रीय राजमार्ग संख्याओं तथा राष्ट्रीय राजमार्गों के विवरण के साथ उक्त अधिनियम की अनुसूची में अंत:स्थापित किया गया समझा जाएगा।

तालिका

क्र. सं.	नई राष्ट्रीय राजमार्ग संख्या	राष्ट्रीय राजमार्गों का विवरण
(1)	(2)	(3)
461	744ए	तमिलनाडु राज्य में आलमपट्टी के निकट रारा-744 के साथ अपने जंक्शन से प्रारंभ होकर वदागरई, नेदूम्मादुरई, ईलियारपाथी, ईरूक्कीलाईवेल्लूर, कोंड़ागई, मनलूर, कुन्नाथूर, परयानकुलम, थमराईपट्टी, ईरानियम, उसीलामपट्टी, कुलामंगलम, कलवेल्लीपट्टी, टाटामपट्टी को जोड़ने वाला और वाड़ीपट्टी के निकट रारा-44 के साथ अपने जंक्शन पर समाप्त होने वाला राजमार्ग (मदुरई रिंग रोड)।
462	948ए	कर्नाटक राज्य में दोबासपेटे (मन्ने) के निकट रारा-648 और रारा-48 के अपने जंक्शन से प्रारंभ होकर नीजागल, केंगल, गुडेमरानाहल्ली, हरथी, मेलाहल्ली, हुलीकेरेगुच्चूर, रायसंदरा, बनवासी, थोकासंदरा से तमिलनाडु राज्य में अचेत्तिपल्ली, अलूर को जोड़ने वाला कर्नाटक राज्य में सरजापुर के निकट रारा-648 के साथ अपने जंक्शन पर समाप्त होने वाला राजमार्ग (बैंगलुरु रिंग रोड)।

[फा. सं. एनएच-14012/27/2014-पीएंडएम (पार्ट-8)]

राजेश गुप्ता, उप सचिव

पाद टिप्पणी : राष्ट्रीय राजमार्ग अधिनियम, 1956 (1956 का 48) और इसकी अनुसूची, भारत के राजपत्र, दिनांकित 4 अप्रैल, 2011 को प्रकाशित अधिसूचना संख्या का.आ. 689(अ), दिनांकित 4 अप्रैल, 2011 द्वारा प्रतिस्थापित किया गया था और इसमें पिछली बार संशोधन अधिसूचना संख्या 3708 दिनांकित 05.12.2017 द्वारा किया गया था।

MINISTRY OF ROAD TRANSPORT AND HIGHWAYS

NOTIFICATION

New Delhi, the 1st January, 2018

S.O. 06(E).—In exercise of the powers conferred by sub-section (2) of section 2 of the National Highways Act, 1956 (48 of 1956), the Central Government hereby declares each of the highways specified in columns (2) and (3) of the Table below to be a national highway.

The said highways, now declared to be national highways, shall be deemed to be specified in the Schedule to the said Act with the new serial numbers, the new national highways numbers and the description of the national highways thereof, as indicated in columns (1), (2) and (3) respectively, of the said Table.

TABLE

Serial No.	New National Highway No.	Description of National Highways
(1)	(2)	(3)
461	744A	The highway starting from its junction with NH-744 near Alampatti connecting Vadagarai, Nedummadurai, Eliyarpathi, Erukkilaivellur, Kondagai, Manalur, Kunnathur, Parayankulam, Thamaraipatti, Iraniyam, Usilampatti, Kulamangalam, Kalvellipatti, Tatampatti and terminating at its junction with NH-44 near Vadipatti in the State of Tamil Nadu (Madurai Ring Road)
462	948A	The highway starting from its junction of NH 648 & NH-48 near Dobaspete (Manne), Nijagal, Kengal, Gudemaranahalli, Harthi, Melahalli, Hulikeregunnur, Rayasandra, Banavasi, Thokasandra in the State of Karnataka connecting Achettipalli, Alur in the State of Tamil Nadu and terminating at its junction with NH-648 near Sarjapur in the State of Karnataka (Bengaluru Ring Road)

[F. No. NH-14012/27/2014-P&M (Pt-8)]

RAJESH GUPTA, Dy. Secy.

Foot Note : The Schedule to the National Highways Act, 1956 (48 of 1956) was substituted *vide* notification number S.O. 689(E), dated 4th April, 2011 publised in the Gazette of India, dated the 4th April, 2011 and subsequently amended *vide* notification No. 3708, dated 05.12. 2017.

Uploaded by Dte. of Printing at Government of India Press, Ring Road, Mayapuri, New Delhi-110064
and Published by the Controller of Publications, Delhi-110054.

Horizontal Curve Details

Max. restricted Superelevation			5.0%										
Sl. No.	Easting, X	Northing, Y	Radius	Transition Length, L_s	Start Chainage of		End Chainage of		HIP Chainage	Design Speed, V	Δ	L_c	e
					Transition	Curve	Curve	Transition					
1	749817.874	1465637.810	500.000	95.000	25.226	120.226	553.518	648.518	336.872	100	1.056584	433.292	5.00%
2	746423.057	1466930.419	3500.000	0.000		2446.087	5296.78		3871.434	100	0.814484	2850.693	NR
3	744672.988	1466098.371	2000.000	0.000		5397.42	6046.479		5721.95	100	0.32453	649.059	NR
4	742975.635	1465894.953	2000.000	0.000		6261.161	8374.567		7317.864	100	1.056703	2113.406	NR
5	741634.620	1462676.758	2000.000	0.000		9818.959	11467.953		10643.456	100	0.824497	1648.994	NR
6	742493.933	1460756.852	600.000	80.000	12364.875	12444.875	12922.738	13002.738	12683.807	100	0.929772	477.863	5.00%
7	741456.747	1458769.984	800.000	65.000	14279.236	14344.236	15332.154	15397.154	14838.195	100	1.316148	987.918	5.00%
8	742941.853	1457322.813	650.000	80.000	16576.873	16656.873	17010.604	17090.604	16833.739	100	0.667278	353.731	5.00%
9	743381.309	1454458.956	700.000	70.000	19626.287	19696.287	19757.732	19827.732	19727.01	100	0.187779	61.445	5.00%
10	743367.612	1453889.392	750.000	70.000	20125.451	20195.451	20397	20467	20296.226	100	0.362066	201.549	5.00%
11	743805.387	1452553.089	800.000	70.000	21579.996	21649.996	21753.774	21823.774	21701.885	100	0.217223	103.778	5.00%
12	744012.587	1450719.049	1000.000	80.000	23269.515	23349.515	23740.838	23820.838	23545.177	100	0.471323	391.323	4.44%
13	744452.741	1450035.105	1000.000	60.000	24161.074	24221.074	24489.705	24549.705	24355.39	100	0.328631	268.631	4.44%
14	744917.228	1449652.479	650.000	80.000	24743.46	24823.46	25085.991	25165.991	24954.726	100	0.52697	262.531	5.00%
15	745264.454	1448830.041	650.000	80.000	25652.462	25732.462	25957.231	26037.231	25844.847	100	0.468874	224.769	5.00%
16	745923.850	1448223.914	650.000	80.000	26531.922	26611.922	26864.26	26944.26	26738.091	100	0.511288	252.338	5.00%
17	746288.837	1447208.980	3000.000	0.000		27472.434	28155.162		27813.798	100	0.227576	682.728	NR
18	747228.370	1445670.946	600.000	90.000	29179.869	29269.869	29896.891	29986.891	29583.38	100	1.195037	627.022	5.00%
19	745140.889	1442768.417	1200.000	40.000	33033.643	33073.643	33181.288	33221.288	33127.466	100	0.123038	107.645	3.70%
20	744373.440	1441949.703	2000.000	0.000		33669.25	34798.942		34234.096	100	0.564846	1129.692	NR
21	744004.321	1440022.519	1850.000	0.000		35552.388	36763.962		36158.175	100	0.654905	1211.574	NR
22	743332.060	1439408.223	650.000	80.000	36789.949	36869.949	37214.709	37294.709	37042.329	100	0.653476	344.760	5.00%
23	743131.962	1438381.885	650.000	90.000	37872.283	37962.283	38203.956	38293.956	38083.12	100	0.510267	241.673	5.00%
24	743369.906	1437606.168	650.000	80.000	38721.58	38801.58	38984.098	39064.098	38892.839	100	0.403873	182.518	5.00%
25	743140.818	1434618.981	650.000	80.000	41577.119	41657.119	42102.188	42182.188	41879.654	100	0.807798	445.069	5.00%
26	743849.013	1433756.014	650.000	80.000	42533.322	42613.322	43292.137	43372.137	42952.73	100	1.167407	678.815	5.00%
27	743543.081	1433053.656	1000.000	50.000	43623.076	43673.076	43695.965	43745.965	43684.521	100	0.072889	22.889	4.44%
28	743437.882	1432788.035	1500.000	35.000	43857.757	43892.757	44047.549	44082.549	43970.153	100	0.126529	154.792	2.96%
29	742990.634	1431918.113	650.000	80.000	44552.102	44632.102	45221.215	45301.215	44926.659	100	1.029404	589.113	5.00%
30	743378.245	1431231.312	800.000	60.000	45471.027	45531.027	45852.463	45912.463	45691.745	100	0.476795	321.436	5.00%
31	744112.465	1430752.123	1250.000	40.000	46085.375	46125.375	46973.285	47013.285	46549.33	100	0.710328	847.910	3.56%
32	744764.692	1428655.960	3000.000	0.000		48472.603	48981.424		48727.014	100	0.169607	508.821	NR
33	745284.136	1427637.715	1000.000	50.000	49663.752	49713.752	50022.825	50072.825	49868.289	100	0.359073	309.073	4.44%
34	746912.338	1426123.512	1500.000	35.000	51414.087	51449.087	52661.469	52696.469	52055.278	100	0.831589	1212.382	2.96%
35	746915.056	1424589.131	1500.000	40.000	53370.289	53410.289	53697.587	53737.587	53553.938	100	0.218198	287.298	2.96%
36	747168.961	1423449.676	1000.000	80.000	54451.386	54531.386	54906.278	54986.278	54718.832	100	0.454892	374.892	4.44%
37	747885.530	1422486.573	700.000	90.000	55452.906	55542.906	56230.828	56320.828	55886.867	100	1.111318	687.922	5.00%
38	747192.790	1420931.769	800.000	90.000	57245.636	57335.636	57771.427	57861.427	57553.532	100	0.657239	435.791	5.00%
39	747501.723	1419455.025	1500.000	60.000	58924.912	58984.912	59129.055	59189.055	59056.984	100	0.136095	144.143	2.96%
40	747845.956	1418489.152	1000.000	100.000	59884.768	59984.768	60179.491	60279.491	60082.13	100	0.294723	194.723	4.44%
41	747914.224	1417492.450	1000.000	100.000	60894.232	60994.232	61167.454	61267.454	61080.843	100	0.273222	173.222	4.44%
42	748138.459	1416817.159	2000.000	0.000		61626.882	61956.929		61791.906	100	0.165023	330.047	NR
43	749431.291	1414416.902	2000.000	0.000		63726.881	65233.256		64480.069	100	0.753188	1506.375	NR
44	752964.762	1413174.193	500.000	90.000	67519.82	67609.82	68469.284	68559.284	68039.552	100	1.898928	859.464	5.00%
45	752009.286	1411806.338	650.000	80.000	69259.851	69339.851	69762.688	69842.688	69551.27	100	0.773594	422.837	5.00%
46	752241.096	1409585.800	650.000	90.000	71357.865	71447.865	72057.219	72147.219	71752.542	100	1.07593	609.354	5.00%
47	750659.199	1408433.669	2000.000	0.000		73197.18	74155.528		73676.354	100	0.479174	958.348	NR
48	749961.361	1407060.565	1000.000	50.000	74888.433	74938.433	75463.741	75513.741	75201.087	100	0.575308	525.308	4.44%
49	750274.572	1404037.511	650.000	90.000	77949.989	78039.989	78418.346	78508.346	78229.168	100	0.72055	378.357	5.00%
50	751063.186	1403281.933	2000.000	0.000		79166.063	79465.767		79315.915	100	0.149852	299.704	NR
51	752893.204	1402023.896	750.000	70.000	81379.001	81449.001	81623.142	81693.142	81536.072	100	0.325522	174.141	5.00%
52	753784.701	1400840.393	650.000	100.000	82888.314	82988.314	83046.923	83146.923	83017.619	100	0.244014	58.609	5.00%

Annexure -2

Max. restricted Superelevation			5.0%										
Sl. No.	Easting, X	Northing, Y	Radius	Transition Length, L_s	Start Chainage of		End Chainage of		HIP Chainage	Design Speed, V	Δ	L_c	e
					Transition	Curve	Curve	Transition					
53	754078.968	1400164.094	1000.000	50.000	83647.126	83697.126	83813.305	83863.305	83755.216	100	0.166179	116.179	4.44%
54	754689.562	1399230.721	650.000	90.000	84593.816	84683.816	85048.206	85138.206	84866.011	100	0.699062	364.390	5.00%
55	755808.565	1398863.651	1000.000	0.000		85859.5	86215.009		86037.255	100	0.355509	355.509	4.44%
56	757077.887	1397879.082	2000.000	0.000		87471.37	87811.346		87641.358	100	0.169988	339.976	NR
57	757488.385	1397430.488	2000.000	0.000		88215.531	88282.492		88249.012	100	0.03348	66.961	NR
58	758786.973	1396103.449	2000.000	0.000		89175.912	90916.621		90046.267	100	0.870355	1740.709	NR
59	760836.145	1396255.613	5000.000	0.000		91963.858	92119.391		92041.625	100	0.031107	155.533	NR
60	762910.332	1396344.888	2000.000	0.000		93959.962	94274.836		94117.399	100	0.157437	314.874	NR
61	764242.282	1396615.513	2000.000	0.000		95293.277	95658.184		95475.731	100	0.182453	364.907	NR
62	766376.879	1396653.934	5000.000	0.000		97275.271	97944.059		97609.665	100	0.133758	668.788	NR
63	769210.790	1397087.326	5000.000	0.000		99686.75	101252.38		100469.565	100	0.313126	1565.630	NR
64	772684.423	1396521.865	5000.000	0.000		103111.9	104835.745		103973.823	100	0.344769	1723.845	NR
65	774056.052	1396776.278	2000.000	0.000		105234.161	105485.918		105360.04	100	0.125879	251.757	NR
66	774965.788	1396837.668	850.000	65.000	105993.299	106058.299	106476.645	106541.645	106267.472	100	0.568642	418.346	5.00%
67	776299.358	1397796.599	1500.000	35.000	107499.164	107534.164	108262.906	108297.906	107898.535	100	0.509162	728.742	2.96%
68	777043.785	1399377.357	1500.000	35.000	109302.365	109337.365	109931.731	109966.731	109634.548	100	0.419578	594.366	2.96%
69	777844.317	1400092.658	800.000	90.000	110451.791	110541.791	110862.552	110952.552	110702.172	100	0.513451	320.761	5.00%
70	778070.518	1400682.551	800.000	90.000	111188.498	111278.498	111385.286	111475.286	111331.892	100	0.245985	106.788	5.00%
71	778507.113	1401346.502	2000.000	0.000		112007.45	112245.364		112126.407	100	0.118957	237.914	NR
72	778924.577	1402153.240	650.000	80.000	112850.035	112930.035	113137.799	113217.799	113033.917	100	0.442713	207.764	5.00%
73	779777.632	1402835.110	650.000	85.000	113943.905	114028.905	114220.611	114305.611	114124.758	100	0.425702	191.706	5.00%
74	780520.723	1404234.387	1500.000	100.000	115517.949	115617.949	115799.239	115899.239	115708.594	100	0.187526	181.290	2.96%
75	780804.115	1405129.011	800.000	80.000	116513.872	116593.872	116700.038	116780.038	116646.955	100	0.232707	106.166	5.00%
76	781524.479	1406364.047	2000.000	0.000		117994.011	118159.347		118076.679	100	0.082668	165.336	NR
77	782060.678	1407404.880	450.000	115.000	118919.24	119034.24	119434.918	119549.918	119234.579	100	1.145952	400.678	5.00%
78	783041.313	1407432.966	650.000	80.000	119845.355	119925.355	120449.15	120529.15	120187.253	100	0.928914	523.795	5.00%
79	783692.233	1408196.526	850.000	90.000	120696.425	120786.425	121516.581	121606.581	121151.503	100	0.964889	730.156	5.00%
80	784862.508	1408149.298	3000.000	0.000		122119.697	122477.582		122298.64	100	0.119295	357.885	NR
81	787800.494	1408325.829	2500.000	0.000		123831.583	126399.419		125115.501	100	1.027134	2567.836	NR
82	790296.287	1404706.357	4000.000	0.000		128684.443	130073.101		129378.772	100	0.347164	1388.658	NR
83	793499.543	1402419.736	5000.000	0.000		131736.628	134780.507		133258.568	100	0.608776	3043.879	NR
84	794624.043	1399311.199	1200.000	67.000	135874.595	135941.595	137012.428	137079.428	136477.012	100	0.948195	1070.833	3.70%
85	798283.200	1398252.764	1500.000	55.000	139517.933	139572.933	140841.454	140896.454	140207.194	100	0.882347	1268.521	2.96%
86	799385.625	1398971.605	800.000	90.000	141087.314	141177.314	141760.961	141850.961	141469.138	100	0.842059	583.647	5.00%
87	800790.478	1398646.865	3000.000	0.000		142558.75	143233.889		142896.32	100	0.225046	675.139	NR
88	803021.053	1398612.954	2000.000	0.000		144851.857	145396.198		145124.028	100	0.272171	544.341	NR
89	804753.174	1398117.089	800.000	65.000	146501.503	146566.503	147239.361	147304.361	146902.932	100	0.922323	672.858	5.00%
90	807476.420	1400104.230	1850.000	0.000		149743.364	150738.023		150240.694	100	0.537654	994.659	NR
91	809345.391	1400286.652	3000.000	0.000		151167.048	152987.383		152077.216	100	0.606778	1820.335	NR
92	813294.280	1403640.360	3000.000	0.000		156762.599	157688.11		157225.355	100	0.308504	925.511	NR
93	814413.110	1405432.010	600.000	0.000		159108.841	159539.547		159324.194	100	0.717843	430.706	5.00%
94	814282.316	1406244.416	2000.000	0.000		159779.117	160487.99		160133.554	100	0.354436	708.873	NR
95	814650.674	1408111.284	2000.000	0.000		161752.195	162309.485		162030.84	100	0.278645	557.290	NR
96	815605.589	1409975.185	2500.000	0.000		162958.952	165138.277		164048.615	100	0.87173	2179.325	NR
97	813929.483	1413958.702	2000.000	0.000		167195.48	169207.198		168201.339	100	1.005859	2011.718	NR
98	815594.587	1416353.397	2500.000	0.000		169695.526	172137.23		170916.378	100	0.976682	2441.704	NR
99	814498.917	1419212.299	400.000	115.000	173728.122	173843.122	173899.312	174014.312	173871.217	100	0.427975	56.190	5.00%
100	814507.756	1419626.858	1000.000	80.000	174081.9	174161.9	174409.177	174489.177	174285.539	100	0.327277	247.277	4.44%
101	814270.960	1420557.255	1000.000	80.000	174882.32	174962.32	175513.558	175593.558	175237.939	100	0.631238	551.238	4.44%
102	814606.225	1421497.444	1000.000	80.000	175978.55	176058.55	176396.401	176476.401	176227.476	100	0.417851	337.851	4.44%
103	814570.370	1422291.998	5000.000	0.000		176950.223	177092.414		177021.319	100	0.028438	142.191	NR
104	814534.451	1423147.511	1000.000	80.000	177494.969	177574.969	178162.952	178242.952	177868.961	100	0.667983	587.983	4.44%
105	814121.069	1423670.800	1000.000	80.000	178370.371	178450.371	178603.651	178683.651	178527.011	100	0.23328	153.280	4.44%
106	813726.706	1424454.928	2000.000	0.000		179326.52	179482.676		179404.598	100	0.078078	156.156	NR

Annexure -2