

## **Attachment-10**

### **Alternative Option Analysis**

- In the Catchment 4 alignment options have been studied
  - I. **Widening of Existing Road** to 6 lane. Proposed Length is 124km.
  - II. **Widening of Existing Road** with combined bypasses of Baghpat and Baraut, Kishapur Baral, Ailum, Shamli, combined bypass of Thanabhawan and Jalalabad, Rampur Maniharan entailing about 70% bypass length out of existing 124 km, resulting into total 130 km
  - III. **Proposed Greenfield alignment** at RHS of NH-709B towards Dehradun. Proposed Length is 118.533Km.
  - IV. **Proposed Greenfield Alignment** at LHS of NH-709B towards Yamuna Nagar. Proposed Length is 124Km

#### **Criteria for Fixing Alignment for Greenfield highway**

1. The Greenfield alignment between two terminal stations should be short and straight as far as possible, but due to engineering, social and environmental considerations some deviations may be required.
2. The project should be constructible and easy to maintain; the Greenfield project should reduce the vehicle operation cost with respect to the existing option already available *i.e.* using the NH/SHs in combination to reach from point A to point B.
3. It should be safe at all stages *i.e.* during design, construction and operation stages. Safety audits at each stage should confirm the same.
4. The project initial cost, maintenance cost, and operating cost should be optimum to be considered economical with respect to its options.
5. The Greenfield alignment should be finalised giving due consideration to siting/location of major structures including Major/Minor Bridges, Interchanges and ROBs. The space requirement of interchanges to be kept into consideration to avoid major resettlement.
6. The location of spurs for connecting the important towns to be decided while fixing the alignment options.
7. The alignment should follow the unused / barren land to the extent possible to reduce the cost of land acquisition.
8. Alignment so chosen shall involve minimum R&R, cause least disturbance to ecology and environment and shall have socio and economic benefit.
9. The proposed options in the present case connects the underdeveloped regions of the state which would lead to the development of new growth centres along the proposed highway *i.e.* paving the way for economic development of the region.

#### **Obligatory points through which Greenfield alignment options should not pass are detailed below:**

**Habitations:** Proposed alignment is fixed in such a way that traverses at a minimum distance of 150 m from built up areas and avoiding important buildings and structures.

**Water Bodies:** The Greenfield alignment has been fixed taking due consideration & importance of retaining the existing water bodies as far as feasible.

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Project Director  
National Highway Authority of India  
PIU-Baghpat



**Railway Crossings and Important Structures:** The components which increases the project cost are the presence of the Major bridges, ROB's and other structures. In order to reduce the project cost number of structures and its length were given due consideration while finalising the Greenfield Option.

The comparative statement for proposed alignment is given in below table:

Sl. No	Factor	Option I	Option II	Option III	Option IV
1	Length (Km)	124	130	118.5	124
2	Lane Configuration	6 Lane	6 Lane	6 Lane	6 Lane
3	Proposal	Existing Widening Throughout	30% Existing Widening with 70% Realignment/Bypasses	Greenfield	Greenfield
4	District	➤ Baghpat ➤ Shamli ➤ Saharanpur	➤ Baghpat ➤ Shamli ➤ Saharanpur	➤ Baghpat ➤ Shamli ➤ Muzaffarnagar ➤ Saharanpur	➤ Baghpat ➤ Shamli ➤ Saharanpur
5	Start Point	EPE Crossing, Khekra	EPE Crossing, Khekra	EPE Crossing, Khekra	EPE Crossing, Khekra
6	End Point	Crossing of NH-709B & Saharanpur Bypass	Crossing of NH-709B & Saharanpur Bypass	At RHS of NH-709B on Saharanpur Bypass towards Dehradun	At LHS of NH-709B on Saharanpur Bypass towards Yamuna Nagar
7	Connecting Highways	EPE, NH-709B, NH-334B, NH-709A, NH-709AD, Saharanpur Bypass	EPE, NH-709B, NH-334B, NH-709A, NH-709AD, Saharanpur Bypass	EPE, NH-709B, NH-334B, NH-709A, NH-709AD, Saharanpur Bypass	EPE, NH-709B, NH-334B, NH-709A, NH-709AD, Saharanpur Bypass
8	Geometrics	➤ Good Design speed 100 Kmph	➤ Good Design Speed 100 Kmph	➤ Good Design speed 100 Kmph	➤ Good Design speed 100 Kmph
9	PROW (m)	70	70	70	70
10	Approx. Travel Time	2 hr 30 min	2 hrs	1 hr 45 min	1 hr 50 min
11	Land Acquisition (Hectare)	662	954	994	1035



Sl. No	Factor	Option I	Option II	Option III	Option IV
12	Bridges/ structures	➤ Bridge-4 ➤ ROB - 3 ➤ Cloverleaf -5 VUP -112	➤ Bridge -6 ➤ ROB - 3 ➤ Cloverleaf - 5 VUP – 102	➤ Bridge (Minor) -25 ➤ ROB -1 ➤ Cloverleaf -5 VUP -89	➤ Bridge-4 ➤ ROB -0 ➤ Cloverleaf -5 VUP -105
13	Junctions Approx. (No.)	➤ NH/SH – 5 ➤ MDR - 7 ➤ Vill. Roads- 105	➤ NH/SH – 5 ➤ MDR - 7 ➤ Vill. Roads-95	➤ NH/SH - 5 ➤ MDR - 7 ➤ Vill. Roads- 82	➤ NH/SH - 5 ➤ MDR - 7 ➤ Vill. Roads- 82
14	Environmental Constraints	➤ Water bodies-25 ➤ Buildings- 8000 ➤ Temples-5 ➤ Forest- 186 Ha. (approx.)	➤ Water bodies-7 ➤ Buildings-350 ➤ Temples-2 ➤ Forest- 68 Ha. (approx.)	➤ Water bodies-2 ➤ Buildings-15 ➤ Temples- 0 ➤ Forest- 2.26	➤ Water bodies-3 ➤ Buildings-35 ➤ Temples- 0 ➤ Forest- 3.0 (approx.)
15	No. of Settlements	8000	125	15	35
16	Utility Relocation	10 HT Line	12 HT Line	10 HT Line	10 HT Line
17	Social Impact	➤ Residential/Cultivation/ barren land acquisition	➤ Residential/Cultivation/ barren land acquisition	➤ Cultivation/ barren land acquisition	➤ Cultivation/ barren land acquisition
18	NH / Expressway connectivity	5	5	5	5
19	Civil Construction Cost (in Crore)	3100 Cr.	3680 Cr.	3555 Cr.	3720 Cr.
20	LA & R&R Cost (in Crore)	4200	2414	1790	1870
21	Total Capital Cost	7300	6094	5345	5590
22	Merits & Demerits	Alignment passing through heavily built up area. There are 15-20 built up sections (almost 10-15% in Length) like Baghpat, Baraut, Shamli, Kandhla, & many more locations. Huge cost of LA	This option primarily follows 30% existing alignment and for remaining 70% existing length bypasses/combined bypasses are required. Requires considerable R&R, utility	Alignment passing through greenfield/agricultural Land and the alignment is the least distance and least cost resulting into least Vehicle Operating cost,	Alignment passing through greenfield/agricultural Land. This alignment has lesser merit as compared to Option 3 hence not recommended

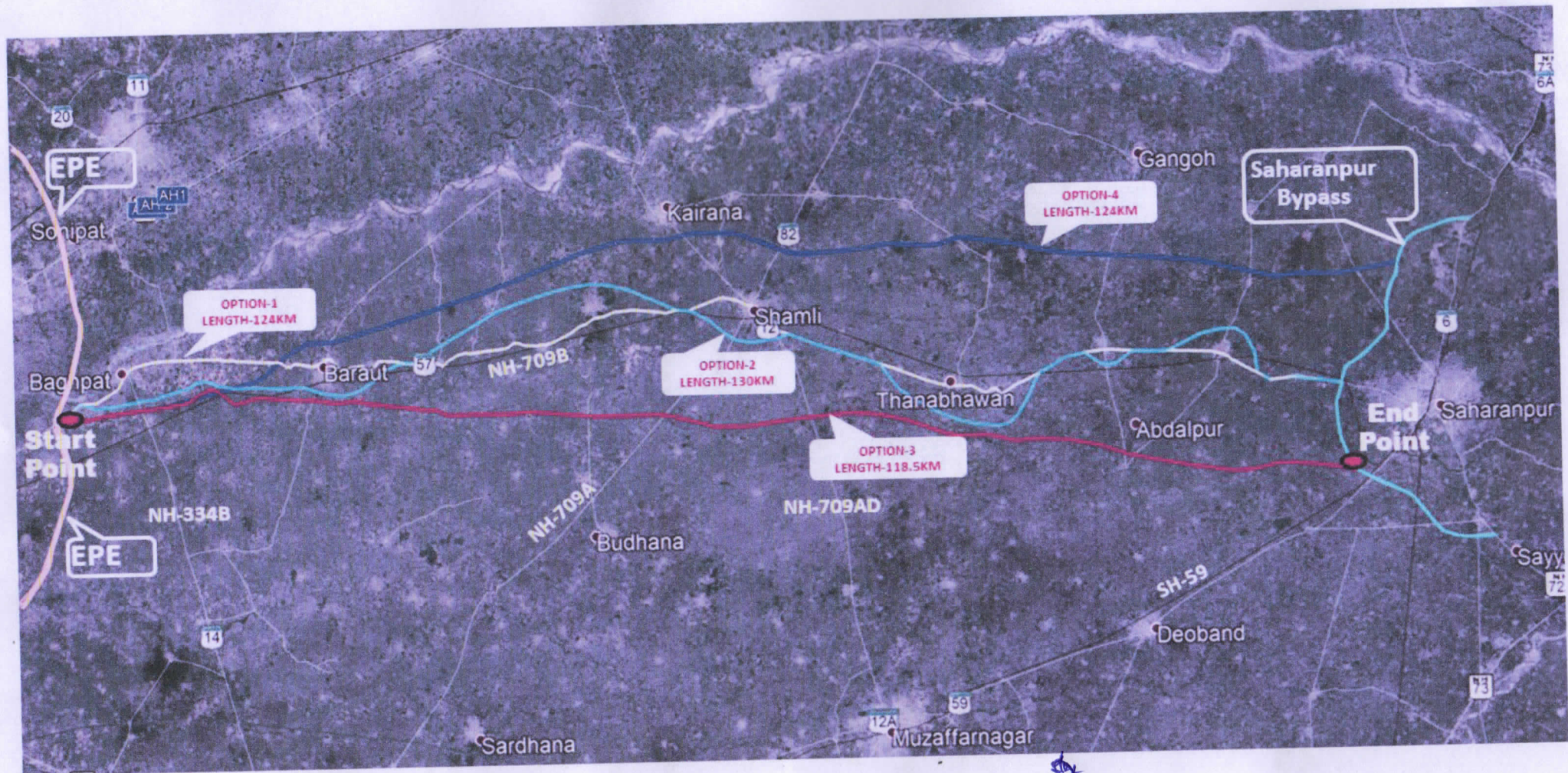
  
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Sl. No	Factor	Option I	Option II	Option III	Option IV
		and R&R and utility shifting is involved. <b>Hence not recommended</b>	shifting and length of travel is highest as compared to all options. <b>Hence not recommended</b>	least displacement of people and least disturbance to ecology and environment. <b>Hence recommended</b>	
				Recommended	

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 National Highway Authority of India  
 PIU-Baghat





Date 28/12/2020

Place: - Baghpat

Project Director  
NHAI-PIU Baghpat  
Uttar Pradesh  
Name: - Sanjay Kumar Mishra

Signature & Seal  
Project Director  
National Highway Authority of India  
PIU-Baghpat