

1 Summary of Traffic Assessment

1.1 Introduction

This section of the report presents the summary of the detailed report on traffic estimations for Bundelkhand Green Field Expressway. The following sections briefly illustrate how the traffic (Diverted & induced) is arrived from traffic diversions from alternate routes at the project catchment and growth rates adopted for traffic projection to the horizon period. Finally MSA estimations are given for different traffic scenarios and growth options. Different traffic scenarios and growth options facilitate the authorities to take appropriate decisions while finalizing the pavement design.

1.2 Basis for Traffic Estimation

Since Bundelkhand Express way is a green field expressway, traffic onto the Expressway has been derived through two components

- Diverted Traffic and
- Induced Traffic

The traffic diversion are derived from the actual traffic counts carried on the competing roads and alternate routes at 15 locations wherein the people and goods are using the alternate routes for commuting between pair of nodes in the absence of the green field highway.

The second component, the induced traffic is derived from the project corridor catchment socio economic and travel characteristics. Induced traffic constitutes about 8%-10% of the diverted traffic. As the traffic generation on to the Green Field Expressway is based on some realistic assumptions, there may be a scope for variation in realization of the traffic once the Green field expressway is operational. To account for such variations consultants suggested two traffic estimations under two scenarios and are given in DPR- traffic (diverted and induced) report. The two scenarios would be:

- Realistic Traffic Numbers(BAU :Business As Usual)
- Optimistic Scenario Traffic Numbers

The two tables below present traffic numbers under the two scenarios

Table 1: Traffic under Business As Usual Scenario

Sections	Car	Bus	4 W	LCV	2A	3A	MAV	PCU
Section 1	1350	215	144	493	282	194	1480	10750
Section 2	1918	355	259	607	438	388	1879	14733
Section 3	2325	441	358	748	567	330	2268	17583
Section 4	1776	290	124	493	281	466	804	9075
Section 5	2194	362	247	642	400	450	1716	14398
Section 6	2014	272	133	468	283	460	1104	10591
Section 7	1922	335	204	426	318	327	1327	11345
Section 8	1611	246	283	420	324	281	1349	10901

Table 2: Traffic Under Optimistic Scenario

Sections	Car	Bus	4 W	LCV	2A	3A	MAV	PCU
Section 1	1477	253	166	717	366	278	1702	12815
Section 2	2108	413	303	880	557	516	2180	17583
Section 3	2523	499	404	1015	695	405	2562	20277
Section 4	2086	389	207	762	423	569	1126	12257
Section 5	2465	438	311	895	530	617	2087	17827
Section 6	2346	356	206	702	410	599	1488	14035
Section 7	2106	389	237	568	400	396	1540	13289
Section 8	1767	287	329	526	390	406	1553	12839

Traffic numbers presented under the two scenarios (BAU& Optimistic) will form the basis for the design of pavement crust as well as Toll revenue estimation. As the project corridor is a green field expressway, and vulnerable for traffic variations, precise prediction of traffic would be difficult. For this reason, options are provided to take appropriate decisions while designing the pavement as well as financial analysis.

1.3 Design Life: 20 Year

1.4 Traffic Projections for the Horizon Year

The traffic on to Green Field Expressway is derived scientifically using proven mathematical tools and probability theory. Even though the numbers are derived mathematically, they are based on number of realistic assumptions and also based on traffic expert prior experience on similar projects and judgements. Due to this reason the future predictions also may be influenced by the project area characteristics and may be susceptible for variations. Under such situations, one growth rate for future traffic predictions may not justify project development. To accommodate variations in traffic for future, multiple growth scenarios have been suggested by the consultants. Consultants suggested three growth scenarios while preparing the DPR for traffic. In addition to the three growth scenarios, one more growth scenario as suggested by IRC is also included.

Growth Scenarios Suggested are:

- Realistic (BAU: Business As Usual)
- Optimistic
- Pessimistic Scenario
- Minimum Growth Rate as Per IRC

All the four cases are presented in tables below

Table 3: Growth Rate under Realistic Scenario

Vehicle Type	up to 2020	2021-2025	2026-2030	>2030
Car	9.7	9.6	9.4	8.3
Bus	8.4	8.2	8.0	6.9
LCV	7.8	6.8	6.3	5.5
2 AT	6.9	6.1	5.6	4.9
3AT	9.3	8.2	7.6	6.6
MAV	8.6	7.6	7.0	6.1

Table 4: Growth Rate under Optimistic Scenario

Vehicle Type	up to 2020	2021-2025	2026-2030	>2030
Car	10.7	10.4	10.3	9.1
Bus	9.0	8.8	8.7	7.5
LCV	8.3	7.3	6.8	5.9
2 AT	7.4	6.5	6.1	5.2
3AT	10.0	8.8	8.2	7.1
MAV	9.2	8.1	7.6	6.5

Table 5: Growth Rate under Pessimistic Scenario

Vehicle Type	up to 2020	2021-2025	2026-2030	>2030
Car	8.8	9.6	9.4	8.3
Bus	7.8	8.2	8.0	6.9
LCV	7.2	6.3	5.9	5.0
2 AT	6.4	5.6	5.2	4.5
3AT	8.6	7.6	7.0	6.0
MAV	8.0	7.0	6.5	5.6

Table 6: Minimum Growth As Recommended by IRC

Vehicle Type	up to 2020	2021-2025	2026-2030	>2030
Car	5.0	5.0	5.0	4.0
Bus	5.0	5.0	5.0	4.0
LCV	5.0	5.0	5.0	4.0
2 AT	5.0	5.0	5.0	4.0
3AT	5.0	5.0	5.0	4.0
MAV	5.0	5.0	5.0	4.0

1.5 Basis for Arrival of the Traffic Growth Rates

Growth rates are arrived based on the following parameters:

- GDP
- NSDP
- Vehicle Registrations
- Traffic Contribution from each state

Different states contribution for growth rate, and the basis is demonstrated in the following tables:

Table 7: Growth Rate Calculation Demonstration: GDP-NSDP & Vehicle Registration

State Share	Commercial Share	GDP growth	NSDP Growth	commercial vehicle growth	Elasticity
Uttar Pradesh	80%	7.50%	5.60%	14%	1.3
Delhi	5%		8.10%	21%	1.2
Madhya Pradesh	10%		7.90%	14%	1.2
Jharkhand	3%		5.30%	0%	1.1
West Bengal	2%		4.50%	10%	1.1

Table 8: Projected NSDP (%) Component (A)

	Uttar Pradesh	Delhi	MP	Jharkhand	WB
2018-20	6.9	7.4	7.3	6.7	6.7

Table 9: Suggested Elasticity (2018-20) Component (B)

	Uttar Pradesh	Delhi	MP	Jharkhand	WB
3AT	1.4	1.2	1.2	1.0	1.1
MAV	1.3	1.2	1.2	1.0	1.1

Table 10: Growth Rates for the Project Corridor (A*B)

	Uttar Pradesh	Delhi	MP	Jharkhand	WB	Growth rate for project	Adopted traffic growth rate
3AT	9.7	8.9	8.8	6.7	7.4	9.4	9.3
MAV	9.0	8.9	8.8	6.7	7.4	8.8	8.6

Table 11: Growth Rates Adopted for Traffic Projections at the Project Corridor

	Uttar Pradesh	Delhi	MP	Jharkhand	WB
3AT	9.7	8.9	8.8	6.7	7.4
MAV	9.0	8.9	8.8	6.7	7.4

1.6 Rationality and Process Involved in Traffic Diversion

Traffic on to the project corridor is derived from the existing alternate corridor, for which traffic volume counts and OD survey has been carried at 15 locations. Traffic on to the project corridor is derived from the following parameters:

- Existing Traffic on parallel roads and traffic crossing the project corridor
- OD information on alternate and competing roads
- Existing Toll Rates and Project corridor Toll Rates
- Potential traffic that can be assigned on to the project corridor
- Probability theory (Diversion Curves) for actual traffic assignment.

Traffic Commercial traffic assigned on to the project corridor is demonstrated in the following figures:

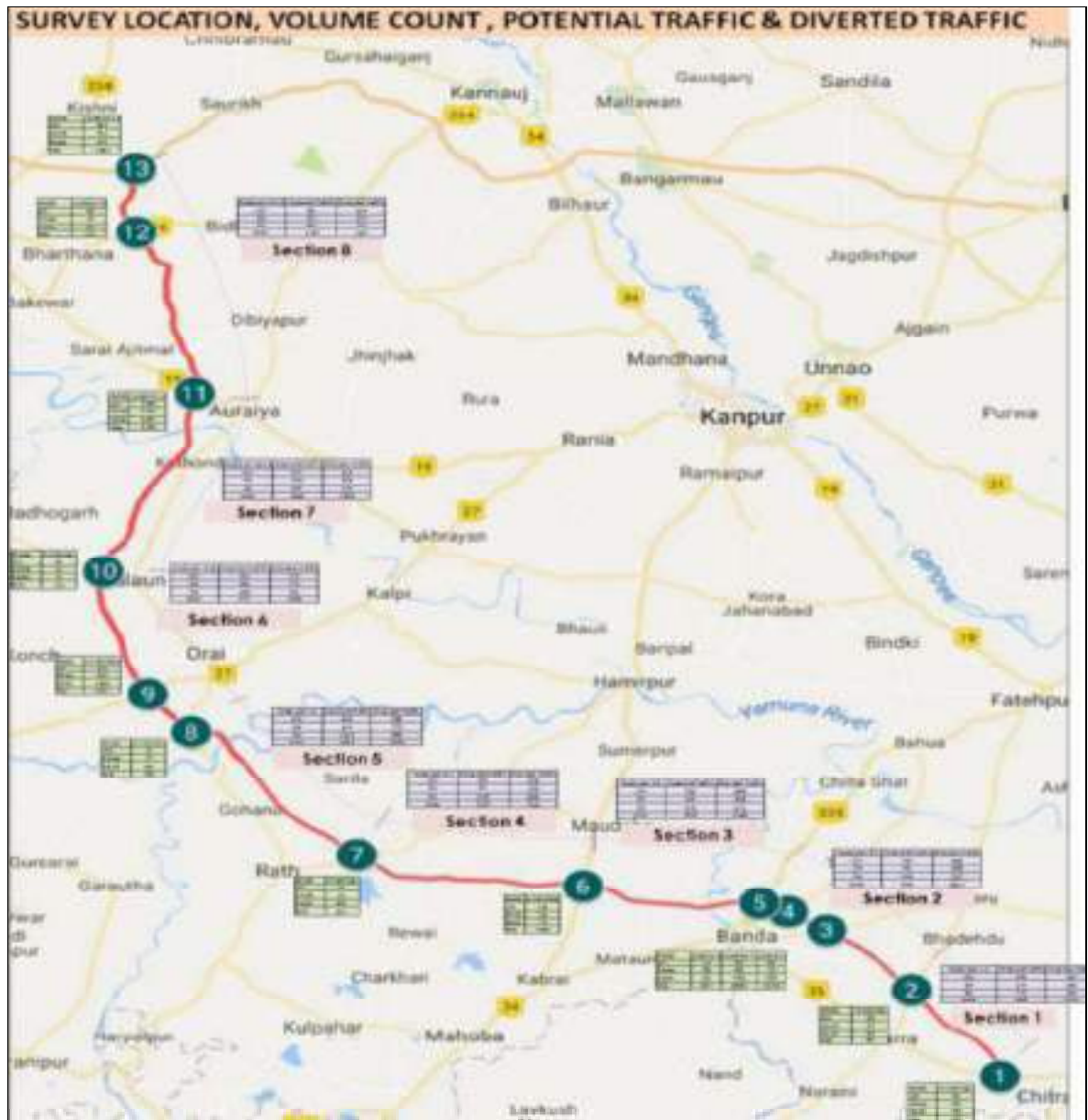


Figure 1: Potential Traffic Assignment on to the Project Corridor



Figure 2: Potential and Diverted Traffic Assignment on to the Project Corridor between Two Nodes



Figure 3: Project Corridor and Alternate- Competing Routes between pair of Nodes

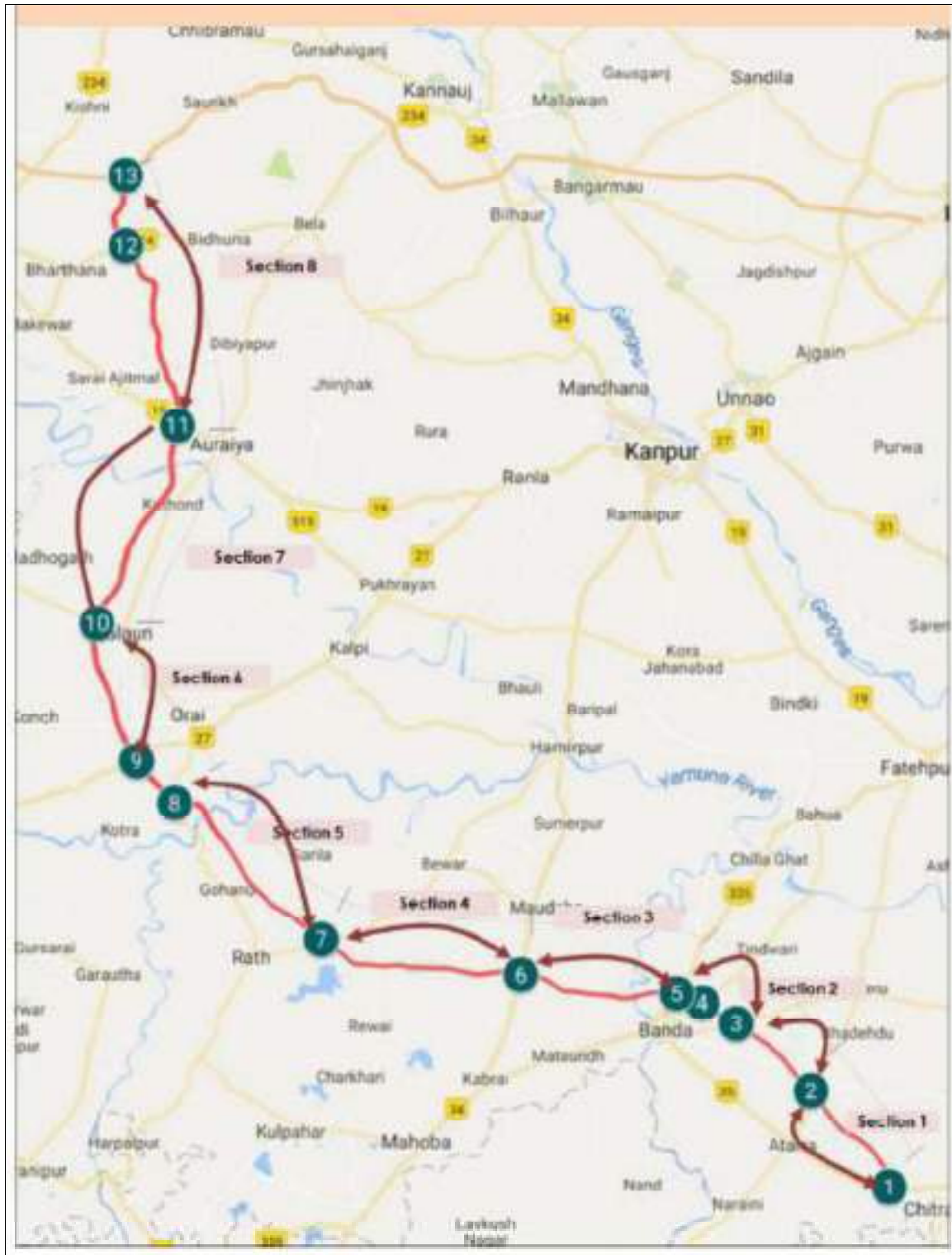


Figure 4: Project Corridor and Alternate Routes between Successive Node Pairs

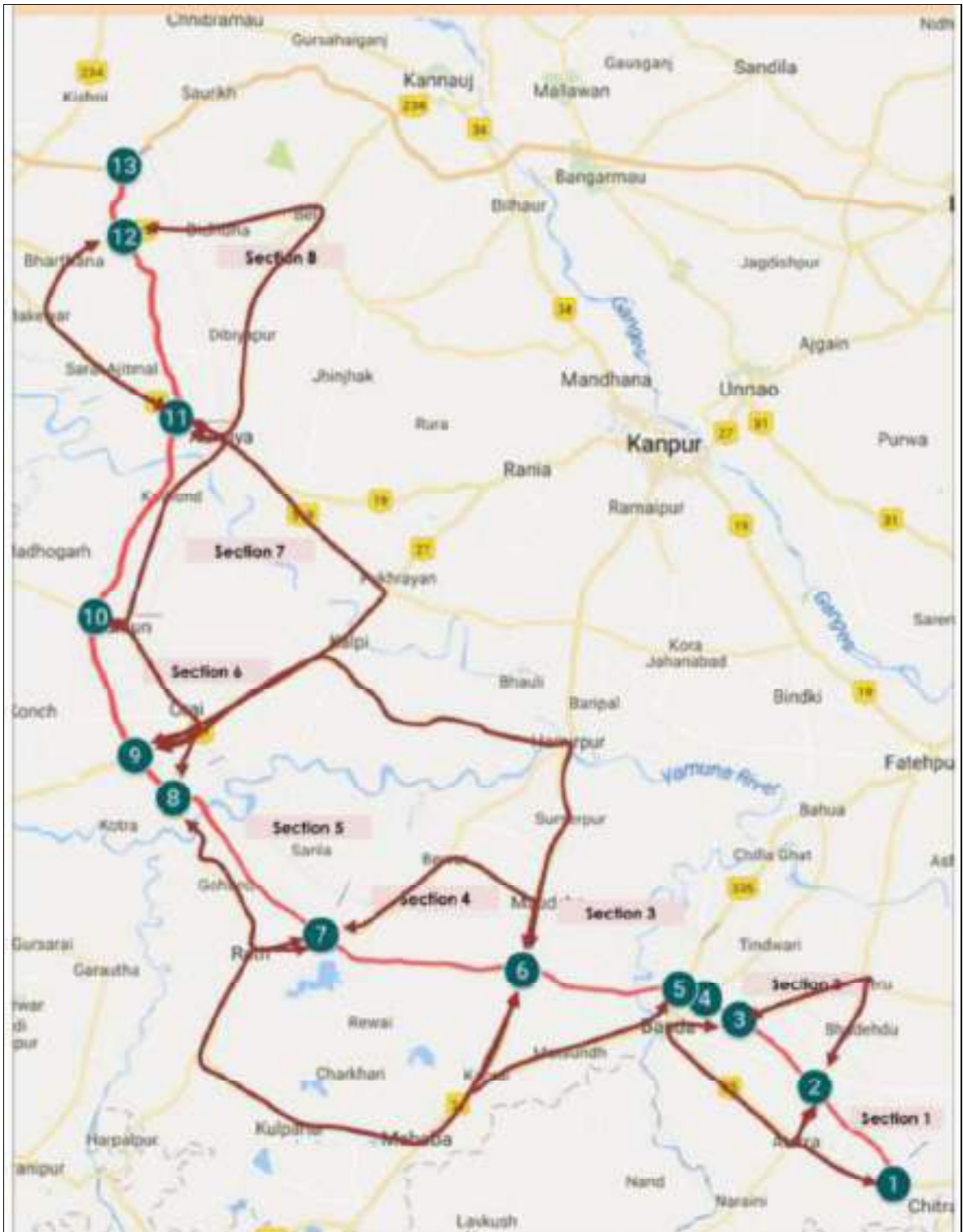


Figure 5: Project Corridor and Existing Alternate Routes between Different Nodes