Dhoraji-Jamkandorna -Kalavad

NH-927D

Executive Summary

ES.1 PROJECT DESCRIPTION

National Highway No. 927D (NH 927D) lies in western India in Gujarat. Earlier it was SH-26 and recently converted into NH-927D. The SH-26 notified into NH-927D vide S.O. No. 1522(E). The project road connects Dhoraji in Rajkot district to Jamnagar. The project road starts from Existing km 107+500 of SH-26 (old) at the Junction of NH-27 where grade separation by VUP exists with SH-26 and NH-27. The project end point exists at existing km 48+850 before the Kalawad town. The proposed length of project highway is 58.300 km. The existing project highway is mainly having two lane configurations, intermediate lane configuration. However, the highway sections passing through Jamkandorna is having four lane configurations with deficient geometry.

ES.2 SOCIO-ECONOMIC PROFILE OF THE PROJECT INFLUENCE AREA

The project influence areas of the proposed project comprises of two districts, i.e., Jamnagar, Rajkot in the state of Gujarat. Existing NH-927D starts from Dhoraji Junction of NH-27 connecting Jamkandorna, Kalavad. The project stretch having 23.35 km length in Jamnagar district and 35.3 km in Rajkot district. It is expected that about 53,30,000 persons likely to be benefited in Jamnagar and Rajkot districts in project influence area. The Project area is having 217 person per sq.km, sex ratio 942, literacy rate 74%, 8.0% schedule caste population and 0.5% of schedule tribe population.

ES.3 TRAFFIC STUDIES AND ANALYSIS

To capture traffic flow characteristics and travel pattern of users passing through the project road and other characteristics related to miscellaneous requirements as per the TOR Traffic survey has been conducted in Month of July 2015. The CVC has been conducted at Km 75+000 and Km 105+000. OD Survey & Axle Load at Km 75+000 & TMC has been conducted at six locations.

ES.3.1 Classified Traffic Volume Counts

The Annual Average Daily Traffic (AADT) in terms of Vehicles and PCU for both directions traffic is shown in **Table ES.1** given below:

Table ES.1: Annual Average Daily Traffic (AADT)

Categories	Km 75+000 (Both Direction)		Km 105+000 (Both Direction)	
	Vehicles	PCU	Vehicles	PCU
2 Wheeler	1,030	515	3,495	1,748
3 Wheeler	101	101	644	644

Categories	Km 75+000 (Both Direction)		Km 105+000 (Both Direction)	
	Vehicles	PCU	Vehicles	PCU
Passenger Car	625	625	1,369	1,369
Mini LCV	112	112	253	253
Mini Bus	12	19	56	85
Standard Bus	122	366	192	576
LCV - 4 Tyre	36	54	122	183
LCV - 6 Tyre	47	71	119	179
2-Axle	102	306	275	825
3-Axle	109	327	222	666
MAV (4 to 6)	87	392	31	140
OSV (7++ Axle)	-	-	2	9
HCM/EME	1	5	5	23
Tractors-With Trailer	9	41	30	135
Tractors-Without Trailer	9	14	19	29
Bi-Cycle	24	13	20	10
Cycle-Rickshaw	2	4	2	4
Animal-Drawn	7	42	2	12
Hand-Drawn	-	-	2	6
Exempted Vehicle	6	6	13	13
Total Commercial Traffic	**516**	**1,540**	**1,024**	**2,686**
Total Tollable Traffic	**1,253**	**2,277**	**2,646**	**4,308**
Total Traffic	**2,441**	**3,013**	**6,873**	**6,909**

From the survey data it is understood that at all the locations 70% to 80% traffic composes of 2 Wheelers, 3 Wheelers & Cars, while 10% to 20% is commercial traffic.

ES.3.2 Turning Movement Survey

The turning movement survey was conducted at Two major intersections on the stretch under two lane paved shoulder configuration from Km. 48+850 to Km. 107+500 to obtain information on directional movement of traffic at intersections along the highway. The 24

hour count data for each location has been analyzed for the total & peak hour traffic volume and cross road traffic.

Table ES.2: Cross Road Traffic at all the major intersections (in PCU)

S. No.	Location	Type of Junction	Cross Road	Cross Road Traffic (in PCU's)		
				Slow	Fast	Total
1	Km 89+900	3 Arm Junction SH-1	Along Gondal Road	750	6220	6970
2	Km 91+250	3 Arm Junction SH-1	Along Aarani Road	121	6441	6562

ES.3.3 Axle Load Survey

The primarily objective of axle load survey is to determine the Vehicle Damaging Factor (VDF) of commercial vehicles and over loading. The survey was conducted at km 75+000 for 2 days (12 hrs each) on random sampling basis to cover directional traffic for both empty and loaded commercial vehicles using portable weighing pads. The summarized VDF values are presented in **Table ES.3** given below:

Table ES.3: Recommended VDF

Vehicles	Km. 75+000	Remarks
LCV	0.50	At km 75+000, the value is revised based on the past experience.
Bus	0.80	At both the locations, the value is revised based on the past experience.
2T	4.41	Values adopted as per the findings.
3T	4.07	Values adopted as per the findings.
MAV	5.09	Values adopted as per the findings.

ES.3.4 Speed and Delay Surveys

The survey was conducted by adopting moving car observer method. The study corridor was demarcated into two homogeneous sections. The range of speed found along the project corridor is 45km/hr to 55 km/hr.

ES.3.5 Traffic Forecast

Traffic projections are made by applying the mode-wise growth rates to the base year (2015) traffic. Mode-wise projections are made up to time horizon year 2045 (30 years).

Table ES.4: Adopted Growth Rate as per Most Likely Scenario

Adopted Growth Rates	Y16 - Y18	Y19 - Y21	Y22 - Y24	Y25 - Y29	Y30 - Y34	Y35 - Y39	Y40 - Y44	Y45 - Y49
2 Wheelers	5.40%	5.50%	5.20%	5.00%	5.00%	5.00%	5.00%	5.00%
3 Wheelers	5.90%	6.00%	5.60%	5.00%	5.00%	5.00%	5.00%	5.00%
Cars	6.70%	6.80%	6.40%	5.30%	5.00%	5.00%	5.00%	5.00%

Table ES.5: Traffic Forecast as per Most Likely Growth Rate

S. No.	Year	Total AADT (PCU)	
		Km. 75+000	Km. 105+000
1	2015	3,013	6,909
2	2016	3,164	7,253
3	2017	3,322	7,615
4	2018	3,487	7,996
5	2019	3,661	8,396
6	2020	3,843	8,815
7	2021	4,035	9,256
8	2022	4,238	9,718
9	2023	4,450	10,205
10	2024	4,670	10,715
11	2025	4,902	11,252
12	2026	5,145	11,812
13	2027	5,402	12,402
14	2028	5,671	13,023
15	2029	5,955	13,673
16	2030	6,250	14,354
17	2031	6,562	15,070
18	2032	6,890	15,821
19	2033	7,235	16,612

S. No.	Year	Total AADT (PCU)	
		Km. 75+000	Km. 105+000
20	2034	7,597	17,443
21	2035	7,976	18,315
22	2036	8,373	19,230
23	2037	8,793	20,192
24	2038	9,233	21,201
25	2039	9,692	22,261
26	2040	10,177	23,376
27	2041	10,684	24,544
28	2042	11,218	25,771
29	2043	11,778	27,058
30	2044	12,367	28,412
31	2045	12,985	29,833

ES.4 ENGINEERING SURVEYS AND INVESTIGATIONS

The consultants have carried out engineering surveys and investigations that include Topographic Surveys, Road Inventory and Pavement Condition Surveys, Alignment Studies, Pavement Surface Roughness Survey, Environmental Screening and Assessment, Social Screening Assessment, Pavement Composition Investigations, Preliminary Material Investigations for Construction Materials, Inventory and Condition Surveys for Bridges, Culverts and other Structures.

ES.4.1 Land Use and Terrain

Land use pattern along the project corridor is mainly agricultural land and built-up. Barren land and forest area are in very few stretches along the project road.

ES.4.2 Carriageway Width

The existing carriageway width, in 56.86 % of the Highway is of Intermediate lane i.e. 6.10m and 39.38% of the highway is 2-lane i.e. 7.0m. Remaining 3.76% of the highway is of 4-lane carriageway with divider. The stretch wise carriageway width is given in **Table ES.6 below:**

Table ES.6: Existing Road Carriage Width

major junctions involve 3 no. with NH & 4 no. with SH.

Table ES.7: Existing Major Junctions

S. No.	Existing Km	Type of Intersection	Cross Road Type	Cross Road Leading to		Remarks
				LHS	RHS	
1	107+500	4-Lagged	NH-27	Porbandar	Rajkot/ Jetpur	Start Point of Project Road and VUP on NH-27 is already there
2	91+217	3-Lagged	SH-1	Arani & Khajurda		
3	89+925	3-Lagged	SH-1		Gondal	In Jamkandorna Village with 4-lane section

ES.4.3 Existing Cross Drainage Structure

Table ES.8: Existing Major Bridges

S. No.	Location (Km)	River	Span (m)	Super Structure	Sub Structure	Width (m)	Remarks
1	101+185 (102/1	Badar	20×13.2	RCC Girder Type	Stone Masonry	7.1	High level with cracks in super structure & damaged railing
2	56+765 (57/1)	Local Stream	6×10.0 (Skew)	RCC Solid Slab Type	Stone Masonry	9.0	Superstructure in poor condition

Minor Bridges

There are 23 existing Minor Bridges on the project stretch. The types of superstructure for the Minor Bridges were found to be RCC Solid Slab & Arch type resting on Stone Masonry Sub-Structure. Some common distresses observed were exposed and corroded reinforcement in slabs; spalling of concrete, damaged/missing railing, growth of vegetation on pier caps &/in vent ways, damaged wearing coat, damaged expansion joints & settlement of embankment around abutments etc. Many bridges were found to be submersible in nature and having Guard Stones instead of Railing & Crash Barrier.

Table ES.9: Existing Minor Bridges