

Impact of State-wise vehicle contribution on traffic growth rates for National Highways

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ABSTRACT

Road transport is the dominant mode of transport in India, because of advantages like flexibility, door-to-door service and easy accessibility to rural habitations[1]. In order to provide a better level of service to the long distance traveling vehicular traffic along the National Highways and to augment their capacity, it is required to forecast the traffic in long term duration during the time horizon of the study[2]. The stretch under consideration is National Highway No.2 from Km. 398.240 to Km. 521.120, located in the States of Jharkhand and West Bengal of Indian peninsula and the length is 122.880 Km. These states registered vehicles constitute majority of the vehicles plying on the stretch followed by Bihar, Rajasthan, Haryana and Nagaland registered vehicles. To establish the future traffic growth rates, the traffic growth rates of these states must be taken into consideration. The approaches explored for this study are past trends in traffic growth of the states and their growth in socio economic parameters for Transport demand elasticity approach i.e., econometric model.

1. Introduction

Road transport in India is accounting for 70% of freight movement and 85% of passenger traffic. The NH network constitutes about 2% of the country's road network, but carries about 40% of the total traffic. Over the last decade, the numbers of LMVs and heavy vehicles have increased at about 9% and 7.6%, respectively[3]. The National Highways Authority of India (NHAI) is contemplating to enhance the traffic capacity and safety for efficient transportation of goods as well as passenger traffic on the heavily trafficked National Highway sections. The stretch under consideration is NH-2 from Km. 398.240 (Barwa adda) to Km. 521.120 (Panagarh), located in the States of Jharkhand and West Bengal. The present condition of the stretch is 4 lane divided carriageway with paved shoulders and of flexible pavement type. The length of the project corridor is about 122.880 Km. Generally the freight movement on any National highway comprises of different state vehicles. Jharkhand and West Bengal state registered commercial vehicles constitute majority of the vehicles plying on the stretch followed by Bihar, Rajasthan, Uttar Pradesh, Haryana and Nagaland registered vehicles. The traffic growth rates along the stretch have to be calculated considering the growth of socio economic parameters of all these states by considering major growth centers and trend growth of registered vehicles. Traffic growth rates are calculated in different methods like trend analysis and econometric method and the suitable values are adopted for capacity,

level of service and financial viability of the proposed investment. The index map of the project stretch is shown in Figure – 1.



Figure - 1: Index map of project stretch

2. Corridor Importance

National Highway No. 2 or NH-2, commonly referred as Delhi–Kolkata Road, is a busy National Highway in India that runs through the states of Delhi, Haryana, Uttar Pradesh, Bihar, Jharkhand, and West Bengal. It constitutes a major portion of the historical Grand Trunk Road along with NH-91 and NH-1 in India. The road is the part of National Highway network of India, and it is officially listed as running over 1,465 Km from Delhi to Kolkata. This national highway has given a new life to public transport in Northern India.

3. Traffic Volume

An accurate estimate of the traffic that is likely to use the Project road is very important as it forms the basic input in planning, design, operation and financing. A thorough knowledge of the travel characteristics of the traffic likely to use the Project road as well as other major roads in the influence area of the study corridor is essential for future traffic estimation[4]. To understand the state-wise vehicle composition along the project stretch and to find out the modal split, detailed traffic volume count surveys and Origin-Destination surveys are carried out along the project stretch at strategic points as shown in Figure – 2 and the Annual Average Daily Traffic (AADT) is calculated for the horizon year.

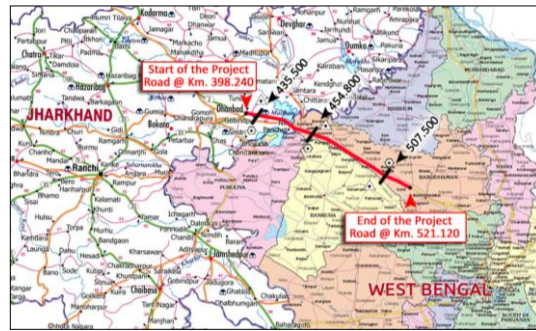


Figure – 2: Traffic survey locations

The Annual Average Daily Traffic (AADT) along the stretch is obtained by multiplying the Average Daily Traffic (ADT) with the seasonal correction factor of 1.03 for petrol vehicles and 1.05 for diesel vehicles. The seasonal variation of traffic along the corridor is given in Figure – 3. The AADT of vehicles at the three locations is presented in Table – 1.

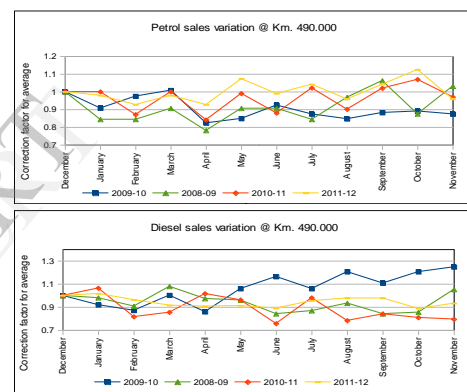


Figure - 3: Traffic seasonal variation

Table - 1: Annual Average Daily Traffic

Vehicle Type	Km. 435.500	Km. 454.800	Km. 507.500
Passenger Vehicles	7257	8063	9994
2 Axle	985	1923	3930
3 Axle	3208	3005	4835
M Axle	1392	1945	2512
HEM	130	25	26
LCV/LGV	159	573	1618
Mini LCV	374	558	1894
Tractor and Tractor with trailer	72	51	90
Non Motorized Vehicles	571	425	1959
Govt. Exempted Vehicles	35	91	157
Total Vehicles	27027	32355	54690

The AADT modal split is given in Figure - 4. It is observed that, more than 55% of the vehicles along the stretch are long distance traveling commercial vehicles.

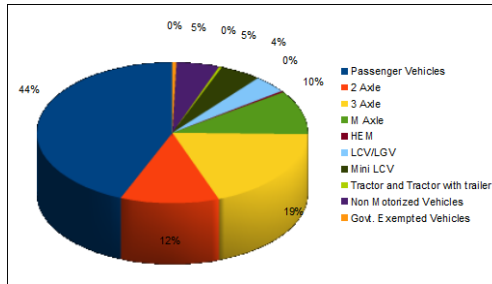


Figure - 4: Model split

The peak hour volume is taken as the highest hourly volume based on actual traffic counts. The peak hour factor of 6.30% indicates the fairly uniform distribution of the traffic volume during the day.

4. Origin-Destination and Number Plate Survey

The origin and destination of trips on the existing road is required to estimate the information regarding travel characteristics of different users on the project road. The O-D data is also essential for identifying the major influence zones along the road, as traffic growth of the project road is directly dependent upon the growth in economic activity of the influencing area and the road network. The data collected from the O-D survey is analysed to assess the project influencing zones for different categories of goods vehicles. Kolkata and Durgapur in the state of West Bengal, Dhanbad and Ranchi in the state of Jharkhand, Punjab, UP and Bihar are the major influencing zones in terms of trip generation and attraction. The location and percentage attraction by vehicle type is given in Table - 2.

Table - 2: Zone of influence

Vehicle type	Zone of Influence	% Attraction
LCV	Kolkata	25%
	Durgapur	18%
2 Axle	Kolkata	25%
	Bihar, UP & Punjab	15%
	Durgapur	13%
3 Axle	Asansol, Ranchi	8%
	Kolkata	29%
	Durgapur	12%
M Axle	Bihar, UP & Punjab	12%
	Kolkata	35%

To arrive at the contribution of different state vehicles in traffic growth rate calculations, registered number of all vehicles is noted including the state and district name. The traffic on project corridor has been classified as passenger and goods transport vehicles. Goods traffic includes Light commercial vehicle (LCV and Mini LCV), 2, 3 and M axle vehicles.

5. State wise Contribution

The results obtained from the Number plate survey were used to identify the project influence area. The ratio of the total traffic originated/destined to a particular zone to the total traffic gives the influence factor for that particular zone. Mode wise comparative study of the influence factors indicated that the States of Jharkhand and West Bengal, where the project stretch lies are the major influence regions with an influence factor of about 30% for all modes. The state of Bihar which is very close to the project stretch, is found to have influence of about 12%, as shown in Table - 3. Most of the passenger vehicles belongs to Jharkhand state, where as commercial vehicles belongs to Jharkhand and West Bengal, as well as Haryana, Bihar, Rajasthan, Nagaland and Uttar Pradesh. These factors have all been accounted in the derivation of traffic growth rates.

Table - 3: Statewise contribution

Name of the State	Car	Mini Bus	Bus	LCV	2 Axle	3 Axle	M Axle	Mini LCV
Jharkhand	36%	18%	32%	26%	19%	22%	19%	28%
West Bengal	53%	55%	62%	56%	55%	47%	37%	60%
Haryana	3%	0%	0%	5%	6%	10%	10%	3%
Uttar Pradesh	2%	0%	2%	1%	7%	7%	10%	3%
Bihar	4%	7%	4%	5%	6%	4%	5%	4%
Nagaland	2%	20%	0%	4%	4%	7%	14%	1%
Rajasthan	1%	0%	0%	3%	4%	3%	6%	2%

6. Traffic Forecast

The accuracy of measuring traffic growth is linked to the ability of highway planners to adequately monitor the patterns and trends of highway usage by various types of vehicles. This task is directly related to the selection of data collection sites, the reliability of data collection equipment and the ability to project

the growth rates[5].

The most important parameter, on which the future forecast of traffic depends, is the Growth rate. However, for a small stretch where most of the traffic neither originates nor ends within the stretch, growth potential of the origin and destination (Zone of Influence) need to be assessed to arrive at the growth potential of the stretch. It is ideal to identify future growth potential of each zone for goods and passenger movements and for each category of vehicles separately. The past motor vehicle registration data at the state level provides a valuable indication regarding the trends in the traffic growth and presents a dependable tool for estimating future growth rates in different categories of vehicles.

A more rational method will be to establish a relationship between the socio-economic variables such as Population, Net State Domestic Product (NSDP) and Per-Capita Income (PCI) on the one hand and the past registration data of different categories of vehicles on the other to determine the elasticity of transport demand with respect to different categories of vehicles. According to IRC: 108 - 1996, an econometric model could be derived in the form

$$\log_e P = A_0 + A_1 \log_e (E.I)$$

Where:

P = number of vehicles of any particular category;

E.I = Economic Indicator such as NSDP, Per-capita income or population;

A_0 = Constant;

A_1 = Regression coefficient (Elasticity value).

Based on future economic growth prospects in terms of income growth, Per-capita growth and population growth, the future traffic growth rate by vehicle type are estimated by suitably adjusting the elasticity values.

6.1 Secondary Data Collection

The analyzed traffic data from the primary surveys and processed data from secondary sources pertaining to the stretch together provide basic input for design, future projection of traffic. As it is observed from the number plate data, Jharkhand and West Bengal state registered vehicles constitute majority of the vehicles followed by Bihar, Rajasthan, Uttar Pradesh, Haryana and Nagaland registered vehicles, following secondary information like statistical data, economic indicators and vehicle registration data (past traffic data) of these states have been collected as shown in Tables – 4 to 10.

Table – 4: Vehicle registration & Economic indicators of Jharkhand[6,7]

S.No	Year	Vehicular Registration Data				Economic Indicators			
		Cars/Jeeps	Trucks	2 Wheelers	Buses	GSDP (Rs in Crs)	PCI (Rs)	Pop (in 00's)	NSDP (Rs in Crs)
1	2004-05	128959	65662	1049303	9878	59758	18510	286640	53056
2	2005-06	144462	68915	1164854	10238	57848	17406	291160	50678
3	2006-07	161941	73990	1302967	10792	59226	17427	295670	51527
4	2007-08	179322	79678	1428934	11270	71377	20996	300080	63005
5	2008-09	200258	86170	1570575	11699	70129	19867	304380	60472
6	2009-10	226475	93387	1738566	12256	73618	20646	308651	63724
7	2010-11	261161	99712	1947572	12847	78045	21734	312934	68013
Average Yearly Growth Rate %		12.49	7.22	10.86	4.48	4.82	3.07	1.47	4.59

Table – 5: Vehicle registration & Economic indicators of West Bengal[6,8]

S.No	Year	Vehicular Registration Data					Economic Indicators			
		Cars/Jeeps	Trucks	2 W	Buses	3 W	GSDP (Rs in Crs)	PCI (Rs)	Pop (in 000's)	NSDP (Rs in Crs)
1	2004-05	528101	223826	1687045	33613	56038	208656	22649	83902	190029
2	2005-06	556230	235269	1833820	43599	40315	221789	23808	84843	201994
3	2006-07	602420	256072	2081355	44599	42195	239077	25400	85767	217849
4	2007-08	668365	289641	2391001	48715	44050	257632	27094	86661	234798
5	2008-09	708364	309756	2591429	50838	49391	270248	27914	87505	244262
6	2009-10	765678	336443	2912348	54535	60859	296843	30372	88335	268292
7	2010-11	840653	368169	3330511	56970	72081	317786	32228	89158	287337
Average Yearly Growth Rate %		8.07	8.68	12.03	9.55	5.8	7.27	6.07	1.02	7.15

Table – 6: Vehicle registration & Economic indicators of Bihar[6,9]

S.No	Year	Vehicular Registration Data					Economic Indicators			
		Cars/Jeeps	Trucks	2 W	Buses	3 W	GSDP (Rs in Crs)	PCI (Rs)	Pop (in 00's)	NSDP (Rs in Crs)
1	2004-05	111376	49437	903261	16158	77781	7914	88662	70167	
2	2005-06	118759	50016	964594	16271	78494	7813	90162	70447	
3	2006-07	130598	52005	1077579	17192	92427	9150	91631	83846	
4	2007-08	143050	54414	1197875	18533	99492	9685	93068	90133	
5	2008-09	159347	58012	1364757	19654	113994	10994	94474	103867	
6	2009-10	184163	66485	1606613	21209	125875	12012	95849	115131	
7	2010-11	212723	73472	1899017	22703	144472	13632	97189	132488	
Average Yearly Growth Rate %		11.43	6.92	13.25	5.86	11.01	9.66	1.54	11.35	

Table – 7: Vehicle registration & Economic indicators of Rajasthan[6,10]

S.No	Year	Vehicular Registration Data					Economic Indicators			
		Cars/Jeeps	Trucks	2 W	Buses	3 W	GSDP (Rs in Crs)	PCI (Rs)	Pop (in 000's)	NSDP (Rs in Crs)
1	2004-05	371681	191207	3016763	58092	61128	127746	18565	60670	112636
2	2005-06	417701	206382	3399916	60979	67779	136285	19445	61818	120202
3	2006-07	467675	225020	3833746	63320	75826	152189	21342	62951	134350
4	2007-08	524723	242283	4261695	65605	82588	160016	21922	64077	140471
5	2008-09	585161	252428	4715835	69298	89325	174556	23356	65200	152284
6	2009-10	659616	270886	5230454	73257	95932	184189	24166	66310	160248
7	2010-11	748295	295756	5859719	77980	102967	204398	26436	67402	178184
Average Yearly Growth Rate %		12.37	7.55	11.07	5.03	9.09	8.18	6.35	1.77	7.98

Table – 8: Vehicle registration & Economic indicators of Uttar Pradesh[6,11]

S.No	Year	Vehicular Registration Data				Economic Indicators			
		Cars/Jeeps	Trucks	2 W	Buses	GSDP (Rs in Crs)	PCI (Rs)	Pop (in 000's)	NSDP (Rs in Crs)
1	2004-05	606045	101355	5632044	24081	-	12950	178409	231029
2	2005-06	728576	106760	6083655	25549	-	13445	181875	244514
3	2006-07	751920	107559	7138789	25134	-	14241	185322	263935
4	2007-08	825191	115552	7737237	25339	-	14875	188804	280851
5	2008-09	910718	122520	8521198	27931	-	15715	192375	302192
6	2009-10	1032379	137436	9493677	28124	-	16374	195844	320675
7	2010-11	1161335	150670	10563850	31922	-	17349	199348	345848
Average Yearly Growth Rate %		11.56	6.89	11.03	4.95	-	5.00	1.87	6.96

Table – 9: Vehicle registration & Economic indicators of Haryana[6,12]

S.No	Year	Vehicular Registration Data					Economic Indicators			
		Cars/Jeeps	Trucks	2 W	Buses	3 W	GSDP (Rs in Crs)	PCI (Rs)	Pop (in 000's)	NSDP (Rs in Crs)
1	2004-05	402585	128715	1729236	11297	43239	95795	37972	22707	86222
2	2005-06	469109	134714	1881174	19986	45858	104610	40628	23140	94013
3	2006-07	551020	154013	2172669	22101	52620	116349	44425	23569	104705
4	2007-08	650265	167983	2463672	26906	63914	126192	47054	23997	112917
5	2008-09	730544	175091	2768197	29516	73134	136540	49806	24425	121650
6	2009-10	836293	189021	2975418	33520	83745	151563	54884	24849	136382
7	2010-11	968980	203421	3370426	35646	94770	166095	59221	25270	149651
Average Yearly Growth Rate %		15.78	7.98	11.80	23.14	14.06	9.61	8.19	1.80	9.64

Table – 10: Vehicle registration & Economic indicators of Nagaland[6,13]

S.No	Year	Vehicular Registration Data					Economic Indicators			
		Cars/Jeeps	Trucks	2 W	Buses	3 W	GSDP (Rs in Crs)	PCI (Rs)	Pop (in 000's)	NSDP (Rs in Crs)
1	2004-05	56865	44002	39989	3863	9100	5839	30441	1781	5421
2	2005-06	59994	47089	42851	4060	9548	6436	33072	1810	5986
3	2006-07	63946	51466	45961	4262	10408	6938	35074	1840	6454
4	2007-08	67562	55974	48976	4422	12939	7445	37317	1870	6978
5	2008-09	70760	60684	52119	4694	13143	7917	39041	1901	7422
6	2009-10	73872	65729	55208	5041	13403	8262	40057	1932	7739
7	2010-11	76562	77968	61085	5573	14284	8591	40957	1963	8040
Average Yearly Growth Rate %		5.09	10.07	7.33	6.32	8.06	6.67	5.09	1.64	6.81

registered vehicles and the growth rate obtained by regression analysis for all categories have been found out for trucks.

- ✓ For passenger vehicles and buses, the mean growth rate of registered vehicular growth rate and that from regression analysis have been adopted.

The elasticity analysis and the econometric models for different types of vehicles for different states are presented in Table – 11 and Table - 12.

Table - 11: Elasticity analysis

Mode	Economic Indicator	Jharkhand		West Bengal		Bihar		Rajasthan		Uttar Pradesh		Haryana		Nagaland	
		E Value	R ²	E Value	R ²	E Value	R ²	E Value	R ²	E Value	R ²	E Value	R ²	E Value	R ²
Cars/Jeep	PCI	2.23	0.65	1.33	0.99	1.11	0.98	2.28	0.96	2.06	0.97	2.20	0.96	0.99	0.98
Truck	NSDP	1.20	0.81	1.24	0.99	0.60	0.93	0.94	0.99	0.97	0.94	0.85	0.98	1.33	0.92
2W	PCI	1.96	0.65	1.94	0.99	1.29	0.98	2.15	0.96	2.15	0.99	1.72	0.97	1.31	0.94
Bus	Pop	3.00	0.99	7.70	0.90	3.91	0.96	2.72	0.98	2.20	0.83	9.62	0.88	3.58	0.97

Table - 12: Econometric models

State	Vehicle type	Econometric model
Jharkhand	Car / Jeep (Pv)	Ln Pv = 2.14 Ln PCI – 9.02
	Bus (B)	Ln B = 3.00 Ln P – 28.54
	2 Wheelers (Tw)	Ln Tw = 1.85 Ln PCI – 4.04
	Trucks (T)	Ln T = 1.2 Ln NSDP – 1.87
West Bengal	Car / Jeep (Pv)	Ln Pv = 1.33 Ln PCI – 0.21
	Bus (B)	Ln B = 7.7 Ln P – 76.75
	2 Wheelers (Tw)	Ln Tw = 1.94 Ln PCI – 5.08
	3 Wheelers (3w)	Ln 3w = 5.87 Ln P – 55.89
	Trucks (T)	Ln T = 1.24 Ln NSDP – 2.82
Bihar	Car / Jeep (Pv)	Ln Pv = 1.67 + 1.11 Ln PCI
	Bus (B)	Ln B = 3.91 Ln P – 34.9
	2 Wheelers (Tw)	Ln Tw = 2.19 + 1.29 Ln PCI
	Trucks (T)	Ln T = 4.05 + 0.6 Ln NSDP
Rajasthan	Car / Jeep (Pv)	Ln Pv = 2.28 Ln PCI – 9.53
	Bus (B)	Ln B = 2.72 Ln P – 19.03
	2 Wheelers (Tw)	Ln Tw = 2.15 Ln PCI – 6.18
	3 Wheelers (3w)	Ln 3w = 4.94 Ln P – 43.38
	Trucks (T)	Ln T = 1.2 + 0.94 Ln NSDP
Uttar Pradesh	Car / Jeep (Pv)	Ln Pv = 2.06 Ln PCI – 6.17
	Bus (B)	Ln B = 2.2 Ln P – 16.5
	2 Wheelers (Tw)	Ln Tw = 2.15 Ln PCI – 4.78
	Trucks (T)	Ln T = 0.97 Ln NSDP – 0.42
Haryana	Car / Jeep (Pv)	Ln Pv = 2.2 Ln PCI – 10.21
	Bus (B)	Ln B = 9.62 Ln P – 86.90
	2 Wheelers (Tw)	Ln Tw = 1.72 Ln PCI – 3.69
	3 Wheelers (3w)	Ln 3w = 7.78 Ln P – 67.45
	Trucks (T)	Ln T = 2.06 + 0.85 Ln NSDP
Nagaland	Car / Jeep (Pv)	Ln Pv = 0.66 + 0.99 Ln PCI
	Bus (B)	Ln B = 3.58 Ln P – 18.52
	2 Wheelers (Tw)	Ln Tw = 1.31 Ln PCI – 2.97
	3 Wheelers (3w)	Ln 3w = 4.97 Ln P – 28.11
	Trucks (T)	Ln T = 1.33 Ln NSDP – 0.8

6.2 Estimation of Growth Rates

To arrive at a realistic and rational assessment of growth factor, efforts have been made to collect various secondary data and statistical information. The growth factors derived from past traffic data on the stretch supplemented by registration trend and the statistical parameters would have been the ideal method. However, due to irregular, erratic and insufficient past traffic data available, the derivation of elasticity and growth factors was based on registration data of vehicles and the economic parameters. The growth trend has been derived for the following categories of vehicles:

Pv = Passenger Vehicles (Car, jeep and Van etc.)

T = Trucks (Mini LCV, LCV, 2 Axle, 3 Axle and M Axle)

B = Bus, Mini Bus

The following steps have been adopted to derive the elasticity and growth factors:

- ✓ Growth rate of registered vehicles in zone of influence is found out.
- ✓ Growth rates of NSDP/GSDP, Per Capita Income (PCI) and population (P) are obtained.
- ✓ For passenger vehicles and buses, number of registered vehicles has been regressed with population data of the state.
- ✓ For trucks, number of registered trucks has been regressed with NSDP of the state.
- ✓ Mean value of average growth rate of

The final % contribution of different vehicles from different states for this stretch under consideration have been derived from the number plate analysis and local area transport network justification are given in Table – 13.

Table – 13: % Vehicle contribution

State	2W	3W	Car	Bus	2 Axle	3 Axle	M Axle	LCV	Mini LCV
Jharkhand	80%	80%	36%	32%	19%	22%	19%	26%	28%
Haryana			3%	0%	6%	10%	10%	5%	3%
Bihar			4%	4%	6%	4%	5%	5%	4%
West Bengal	20%	20%	53%	62%	55%	47%	37%	56%	60%
Uttar Pradesh			2%	2%	7%	7%	10%	1%	3%
Rajasthan			1%	0%	4%	3%	6%	3%	2%
Nagaland			2%	0%	4%	7%	14%	4%	1%

The weighted average of traffic growth rates for different category of vehicles from % vehicle contribution and econometric models for financial analysis and pavement design are presented in Table – 14.

Table – 14: Projected growth rates for different category of vehicles

Year from	Year to	2W	3W	Car / Jeep	Bus	Trucks			LCV and Mini LCV
						2 Axle	3 Axle	M Axle	
2013	2014	8.8	4.4	9.1	7.5	6.3	8.2	8.2	8.3
2014	2015	8.8	4.4	9.1	7.5	6.3	8.2	8.2	8.3
2015	2016	8.8	4.4	9.1	7.5	6.3	8.2	8.2	8.3
2016	2017	7.8	3.4	8.1	6.5	5.3	7.2	7.2	7.3
2017	2018	7.8	3.4	8.1	6.5	5.3	7.2	7.2	7.3
2018	2019	7.8	3.4	8.1	6.5	5.3	7.2	7.2	7.3
2019	2020	7.8	3.4	8.1	6.5	5.3	7.2	7.2	7.3
2020	2021	7.8	3.4	8.1	6.5	5.3	7.2	7.2	7.3
2021	2022	6.8	2.4	7.1	5.5	4.3	6.2	6.2	6.3
2022	2023	6.8	2.4	7.1	5.5	4.3	6.2	6.2	6.3
2023	2024	6.8	2.4	7.1	5.5	4.3	6.2	6.2	6.3
2024	2025	6.8	2.4	7.1	5.5	4.3	6.2	6.2	6.3
2025	2026	6.8	2.4	7.1	5.5	4.3	6.2	6.2	6.3
2026	2027	5.8	2.2	6.1	4.5	3.3	5.2	5.2	5.3
2027	2028	5.8	2.2	6.1	4.5	3.3	5.2	5.2	5.3
2028	2029	5.8	2.2	6.1	4.5	3.3	5.2	5.2	5.3
2029	2030	5.8	2.2	6.1	4.5	3.3	5.2	5.2	5.3
2030	2031	5.8	2.2	6.1	4.5	3.3	5.2	5.2	5.3
2031	2032	4.8	2	5.1	3.9	2.6	4.2	4.2	4.3
2032	2033	4.8	2	5.1	3.9	2.6	4.2	4.2	4.3
2033	2034	4.8	2	5.1	3.9	2.6	4.2	4.2	4.3
2034	2035	4.8	2	5.1	3.9	2.6	4.2	4.2	4.3
2035	2036	4.8	2	5.1	3.9	2.6	4.2	4.2	4.3
2036	2037	4.8	2	5.1	3.9	2.6	4.2	4.2	4.3
2037	2038	4.8	2	5.1	3.9	2.6	4.2	4.2	4.3
2038	2039	4.8	2	5.1	3.9	2.6	4.2	4.2	4.3
2039	2040	4.8	2	5.1	3.9	2.6	4.2	4.2	4.3
2040	2041	4.8	2	5.1	3.9	2.6	4.2	4.2	4.3
2041	2042	4.8	2	5.1	3.9	2.6	4.2	4.2	4.3
2042	2043	4.8	2	5.1	3.9	2.6	4.2	4.2	4.3
2043	2044	4.8	2	5.1	3.9	2.6	4.2	4.2	4.3

This kind of approach for calculating traffic growth rates for any particular road stretch will provide the realistic information about the vehicular traffic which is going to use the facility after improvement, financial benefits to the concessionaire and economic benefits to the society.

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