REDESIGN OF ROTARY INTERSECTION BY USING AUTO CAD CIVIL 3D- A CASE STUDY AMIR AHMED CIRCLE IN SHIVAMOGGA CITY

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Abstract

As population rises city will also develops, and hence vehicular traffic tends to rise automatically, to overcome traffic congestion problems in the developing cities, rotary intersections are the better solutions than any other crossing type except for expressways. In some metropolitan cities due to improper design, rising vehicular traffic leads lots of accidents, congestion and discomforts were visualized in rotary Intersections while turning and changing the direction. Present study is carried at Amir Ahmed circle in Shivamogga city where similar problems were observed due to commercialization and raised vehicular traffic which has resulted traffic jam in and around rotary intersection and discomfort in vehicle turning and changing direction during peak hour traffic. In present work, an attempt is made in modifying and upgrading rotary intersection by using Auto Cad Civil 3D Software to have proper vehicular movements and to enhance the safety for traffic movement.

Key Words: *Civil 3D, AMIR AHMAD CIRCLE, Metropolitan Areas, Traffic Congestion, Roundabout, Intersections, Traffic Flow.*

1. INTRODUCTION

Rotary intersections are a specific kind of at-grade crossing point that are positioned such that traffic can move around a central traffic island in one direction. Traffic flows around a central island after first showing consideration for the oncoming traffic. The vehicles entering the rotation are gently forced by design to go in a clockwise direction. At that time, they veer off the rotating route and onto the optimal one.

Any roadway's traffic crossings are confusing spots. This is due to the necessity of cars going in different directions occupying the same space at once. Additionally, pedestrians search for the same junction space. During crossing, drivers must make a split-second decision while considering their trajectory, the geometry of the intersection, the speed and bearing of other vehicles, and other factors. A small error in judgement can result in tragic accidents. Additionally, it results in delay, which is dependent on the type, geometry, and geometry of the control at the crossing point. Sharukh Marfani, et. al. (2018) found that Traffic flow largely depends on how intersections are presented, which affects the street's capacity. Accordingly, looking into crossing locations is important for the traffic builds, especially due to the urban scenario, both from the accident viewpoint and the limit standpoint. Junaid Yaqoob, Er. et. al (2016) designed Rotary intresection at Janglatmandi, Anantnag to reduce traffic congestion at the intersection, it is found

that rotary is a device that improves driver awareness, boosts roadside wellbeing, reduces car idling, and efficiently moves traffic through area. Sandeep b. Rajurkar et. al. (2018) at charkop market, Kandivali (west) Mumbai focused on the relationship between traffic volume, condition, and geometric structure to determine ideal operation of the rotary intersections in urban city locations with high traffic volume. Ishanya P, et. al. (2017) at Nanthur Intersection situated just outskirt of the Mangaluru city. Due to heavy traffic, an attempt was made to build traffic signals in accordance with IRC rules for the peak traffic, however it was unsuccessful. Further it was then successfully redesigned, and updated roundabout design components are recommended as a cost-effective alternative to other types of grade separated intersections for easing delays and congestion.

2. NEED FOR THE STUDY

The last few years have seen a significant change in Shivamogga City's infrastructure and economic growth, making it one of Karnataka's emerging smart cities which again leading to Increased traffic flow and traffic jams in some major intersections of the Shivamogga city like Amir Ahmed Circle, which is the main commercial areas where we can find the city market (Gandhi Bazaar) and a recently built Shivamogga city central mall. Vehicles entering the city central mall either slow down or occasionally stop to enter the parking lot, which blocks traffic in the rotary intersection and increases traffic congestion in surrounding area. In study location It is observed that blocking of rotary intersection is mainly due to improper geometric design of rotary intersection and increased vehicular moment mainly during peak hours. Present study is taken up to upgrade the rotary intersection to the present trend of traffic flow also keeping the future possible traffic flow trend in mind.

3. METHODOLOGY

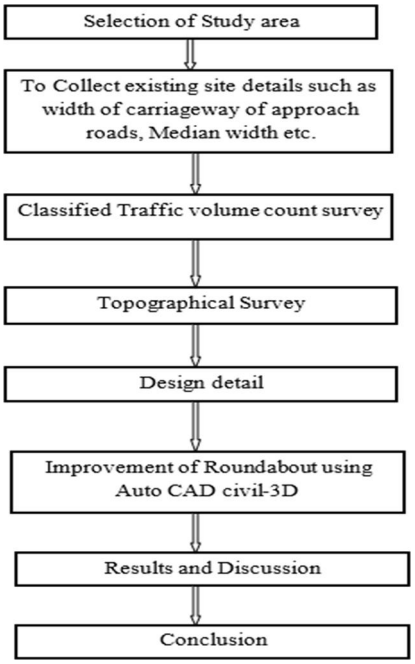

Figure 1: Study Methodology

4. STUDY AREA

The present study is carried out at "AMIR AHMED CIRCLE". Which connects the BH road National Highway and other commercial roads of Shivamogga city rotary intersection situated very close to BEARYS City Centre Mall (NH-206). There are five approach routes to this Rotary intersection.

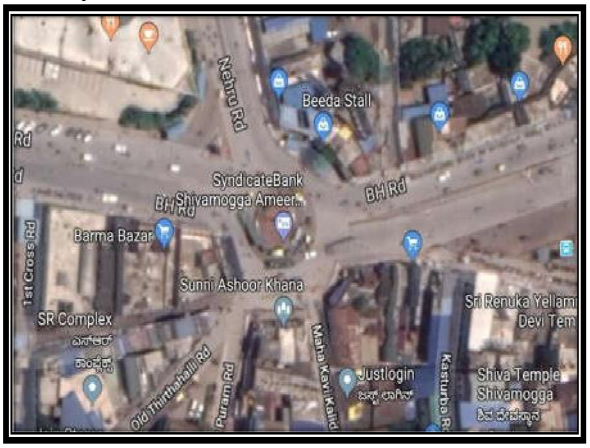

Figure 2: Study location (Source: Google maps)

4.1 STUDY LOCATION GEOMETRIC DETAILS

Table 1- Carriage way width and median width

Sl. Num	Direction of road-towards	Width of the carriageway (m)	Median width (m)
1.	Bhadravathi	18.4	1.1
2.	Thirthahalli	7.3	-
3.	Bus stand	18.4	0.9
4.	Gopi circle	18.4	0.9
5.	Maha kavi kalidasa road	5	-
6.	Diameter of central island = 13.3 m		
7.	Radius of central island = 6.65 m		

5. DATA COLLECTION

The video graphic method is used to collect the traffic data. for seven days 24 hours by considering the various types of vehicles moving toward the junction from all the five directions and after that changing over the abilities basic factor called Passenger Car Unit (PCU) detail of the traffic volume collected is summarized in Appendix-1

5.1 TOPOGRAPHICAL SURVEY

Closed traverse, which is connected to ongoing control sites, is the foundation of the topographic survey. Permanent points are connected to all benchmarks. The survey's primary goal is to create a current topographical survey map, which is a crucial input for other engineering tasks like planning, buying land, creating roads, etc. Based on the control point built up utilizing DGPS/Total Station and tallness control via programmed level, Total Stations are used for undertaking geographical review by catching information of every single geological element utilizing suitable codes

Figure 3: DGPS control points were observed at study location

6. ROTARY DESIGN

6.1. Design speed

According IRC:65-1976 guideline for traffic rotaries for urban roads taken as 30 KMPH

6.2. Radius of entry curve(R1)

R1=V2/127 f

According IRC co-efficient of friction for urban roads taken as 0.47

R1=302/127*0.47 i.e. R1=15.078m

As per IRC recommendations for urban roads 15-25m is suggested.

Therefore, Adopting R1=20m

6.3. Radius of exit curve (R2)

As per IRC recommendations for urban roads radius at exit curve is 1.5 to 2 times of radius at entry curve.

R2=2*15 ie R2=30m

6.4. Radius of central island (R)

As per IRC recommendations for urban roads R is equal to 1.33 times of the radius at entry curve.

R=1.33*15 i.e. R=19.95m

6.5. Weaving length and width

The width of the weaving section, the average width of the entry, the volume of traffic, and the percentage of weaving traffic are used for determine the weaving length.

a. Weaving section width

W=e1+e2/2+3.5

As per IRC recommendations carriageway width at entry and exit for urban roads taken as 7.0m (e1=e2=7.0m)

Therefore, W=7+7/2+3.5 W=10.5m

b. Length of weaving section

As per IRC guidelines, the minimum weaving length for urban roads taken as 30m

As per IRC recommendations for urban roads the length to width ratio must be equal or greater than 4.

L=4*10.5 L=42m

6.6. Capacity of the Rotary Intersection

The Proportion of weaving traffic

P=b+c/a+b+c+d

P12=6090+10720+4411+181+381+324/1562+5836+6518+6090+10720+4411+181+381+324+327=0.608

P23=100+101+76+1562+5836+6090/4411+6518+10720+100+101+76+1562+5836+6090+118=0.387

P34=6346+7786+324+100+6518+10720/4411+101+76+6346+7786+324+100+6518+10720+2510=0.817

P45=11452+181+1562+6346+4411+76/101+7786+324+11452+181+1562+6346+4411+76+3794=0.666

P51=6518+381+5836+101+7786+11452/324+181+1562+6518+381+5836+101+7786+11452+8988=0.743

Highest value should be considered for design.

P=0.817

Practical capacity Qp= ((280 W (1+e/w) (1-P/3))/(1+W/L))

Qp= ((280*10.5(1+7/10.5) (1-0.817/3))/(1+10.5/42))

Qp=2848.70 PCU/hr

Check for Acceptance

1. e/w should lies between 0.4 to 1.0
   e/w=7/10.5 =0.67
2. W/L should lies between 0.12 to 0.4
   W/L=10.5/42 =0.25
3. P should lies between 0.4 to 1.0
   P=0.819
4. L should lies between 30 to 60m
   L=42m Hence ok

Table 2: Rotary design particulars

Particulars	Dimensions
Design Speed	30 Kmph
Entry and Exit Angles	45 Degree
Friction factor(f)	0.47
Radius of Entry(R_1)	20m
Radius of Exit(R2)	30m
Radius of Central Island (R)	19.95m
Carriage way width at entry and exit (e_1)	7.0m
Non-weaving section width (e_2)	7.0m
Weaving section width (W)	10.5m
Weaving Length(l)	42m
Proportion of weaving ratio (p)	0.817
Capacity of Rotary (Qp)	2848.70 vehicles/hr

7. DESIGN AND IMPROVEMENT OF ROTARY INTERSECTION USING AUTO CAD-CIVIL3D

A robust Building Information Modelling (BIM) programme called Auto CAD civil 3D is used to plan, analyse, and document engineering projects like land development, transportation, and environmental projects. Points, surface parcels, alignments, profiles, and grading are some of these civil 3D objects. Using the data collected by Total Station survey, Digital Terrain Model is generated primarily based on which strip maps might be plotted and geometric designs done. Obtained records of pinnacle survey is available in CSV layout that need to be imported to the civil 3D record for the geometric layout

The model's objects all interact with one another in a hierarchical manner. This method makes sure that changes made to one object are actually

reflected in all of its related neighbours. Designed hierarchy that can be viewed in an interface component called the TOOLSPACE palette. The Country Kit in Auto CAD Civil 3D is an endeavour for enhance software's usability for the Indian context. Kit includes

1. Alignment curve regulations from the Indian Roads Congress include minimum transition lengths for special speeds and curve radii, as well as horizontal curves with a minimum radius and super elevation. as stated in its e-book 'recommendations for design of Horizontal Curves for Highways and design Tables [IRC:38-1988].

2. Vertical curve standards including absolute minimum sight distance, passing sight distance and headlight sight distance as per Indian Roads Congress Vertical Curves for Highways [IRC SP:23-1993].

3. Reports on popular alignments and corridors

7.1 DESIGN METHODOLOGY

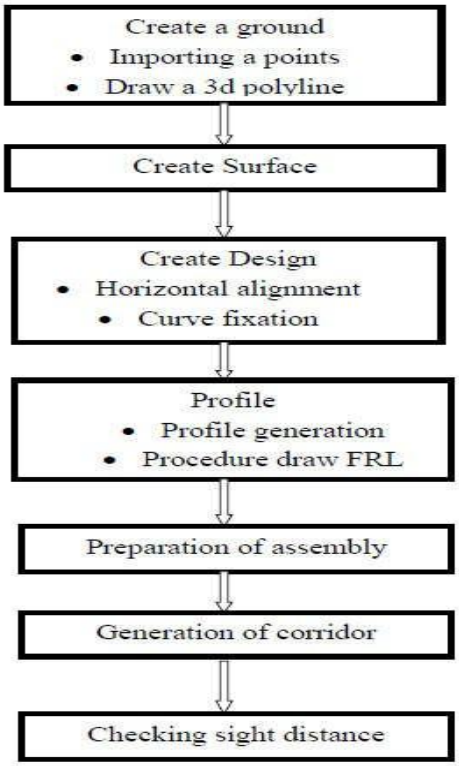

Figure 4: Design Methodology

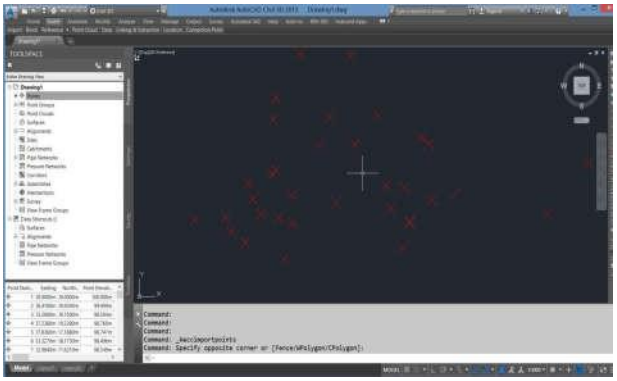

Figure 5: Importing a points in civil-3d

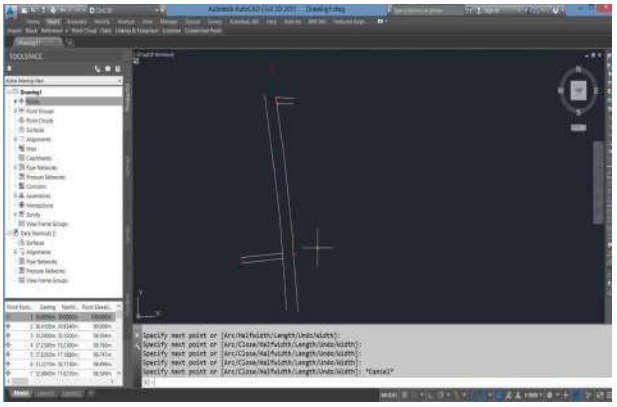

Figure 6: Draw a 3d polyline on the points in civil 3d

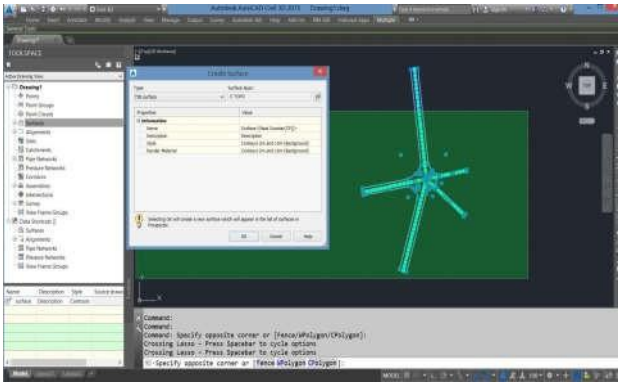

Figure 7: Surface creation in civil 3d

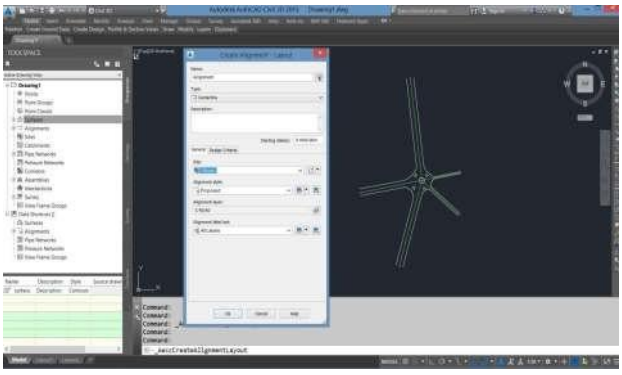

Figure 8: Creating a Alignment in civil-3d

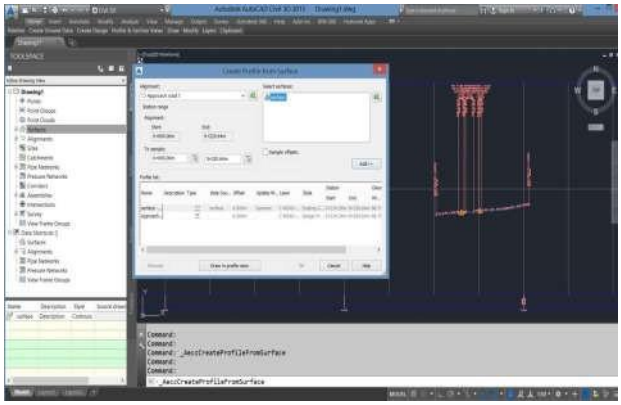

Figure 9: Generation profile in civil 3d

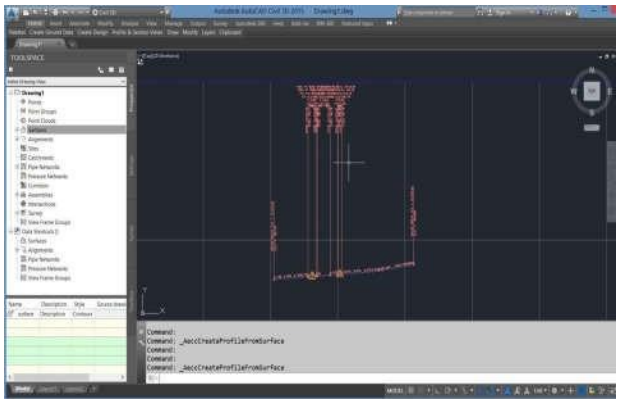

Figure 10: Draw the FRL on existing profile in civil 3d

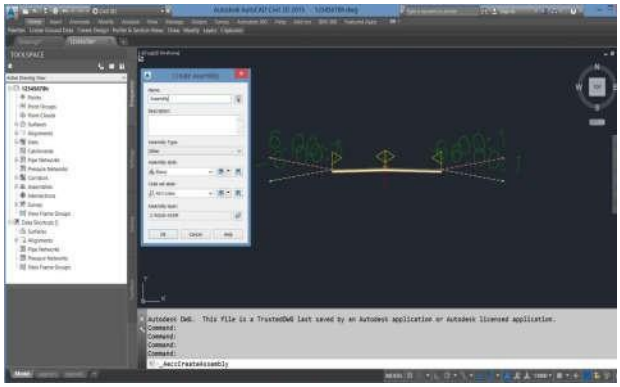

Figure 11: Creation of assembly in civil 3d

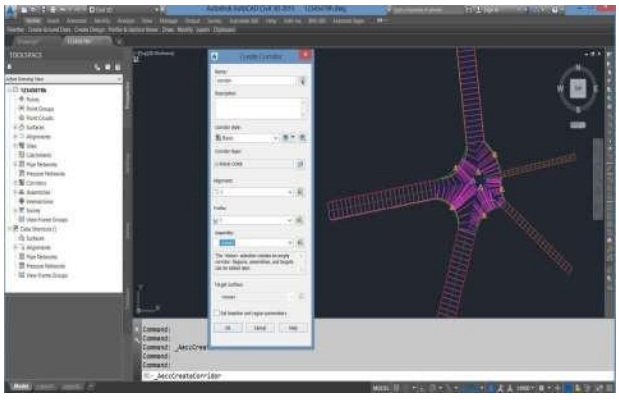

Figure 12: Creation of corridor in civil 3d

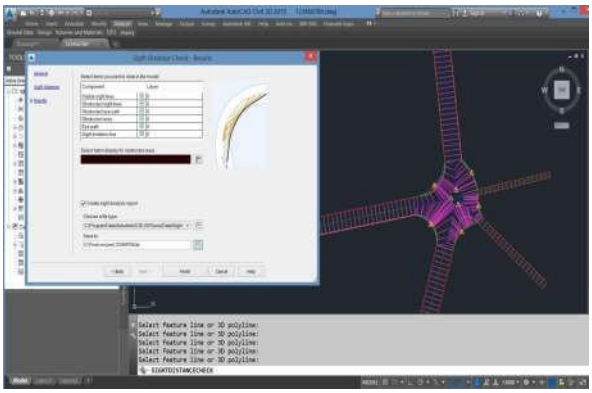

Figure 13: Checking sight distance in civil 3D

8. RESULTS AND DISCUSSION

Once the analysis of traffic studies is finished the next step is understanding the obtained result and provide a proper design to the project as per IRC recommendation.

1. Existing rotary intersections horizontal geometry, vertical geometry and sight distance deficiencies are noted. As per IRC standards deficiencies are improved in Auto CAD civil-3D.

2. Channelizing islands are need to be provided at the existing intersection.

3. The present study location requires to have the necessary traffic signs and pavement markings, such as pedestrian crosswalk markings, Centre line markings, Edge markings, Turn markings, Direction markings, Lane markings, Median markings, Regulatory signs, including give-way signs, speed limit boards, etc., there should be warning signs like "Pedestrian crossing," and "Roundabout ahead"

By upgrading the rotary intersection, we can achieve smooth, uniform and un-interrupted traffic flow. As this rotary section is connected to major roads that give access to Bhadravathi, Thirthahalli, city bus stand etc. heavy vehicles, buses will be able to reach their destination without any interruption. Traffic blocking due to the vehicle that enters the central mall can also be prevented.

9. ACKNOWLEDGEMENT

The authors would like to thank the Department of Traffic Police Shimoga for their assistance with the video-graphic data collection in the survey

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APPENDIX-1

PCU values		0.75	1	1	1	2.8	2.8	2.8	2.8	2.8	2.8	4	4	0.5		
Direction	Date	Two Wheeler	Auto riksha	Car/Jeep	LCV	Mini Bus	Standard bus	2 Axle	3 Axle	MAV	Agri Tractor	Tractor with trolley	Animal drawn	Hand drawn	Cycle	Total Volume	PCU's
Gopi circle to Bhadravathi	DAY-1	5069	2235	1168	81	27	146	2	0	0	0	0	2	0	8	8738	7788
	DAY-2	5107	2269	1203	89	35	149	2	0	0	0	0	2	1	11	8864	7918
	DAY-3	5139	2302	1235	95	39	158	2	0	0	0	0	2	1	8	8979	8057
	DAY-4	5120	2288	1219	85	39	148	3	1	0	0	0	3	2	7	8915	7990
	DAY-5	5324	2379	1307	95	45	158	4	1	0	1	3	3	2	10	9332	8393
	DAY-6	5580	2592	1665	123	33	157	7	0	0	2	0	0	0	10	10169	9127
	DAY-7	5109	1538	1054	46	16	119	10	5	4	0	0	0	0	17	7918	6909
	Total	5207	2229	1264	87	33	148	4	1	1	0	0	2	1	10	8903	8020
Gopi circle to Maha kavi kalidasa road	DAY-1	270	21	0	0	0	0	0	0	0	0	0	0	0	10	305	233
	DAY-2	277	27	0	0	0	0	0	0	0	0	0	0	0	12	316	241
	DAY-3	272	30	0	0	0	0	0	0	0	0	0	0	0	9	313	239
	DAY-4	274	33	0	0	0	0	0	0	0	0	0	0	0	8	315	243
	DAY-5	279	36	0	0	0	0	0	0	0	0	0	0	0	11	326	251
	DAY-6	283	37	0	0	0	0	0	0	0	0	0	0	0	13	331	254
	DAY-7	283	38	0	0	0	0	0	0	0	0	0	0	0	15	340	234
	Total	277	32	0	0	0	0	0	0	0	0	0	1	0	11	323	248
Gopi circle to Old Thirathalli Road	DAY-1	3508	989	560	104	13	5	4	0	0	2	0	0	0	14	5197	4357
	DAY-2	3535	1016	590	113	17	6	7	0	0	2	0	0	0	15	5301	4467
	DAY-3	3568	1048	620	125	20	9	9	0	0	2	0	0	0	13	5414	4588
	DAY-4	3553	1031	605	116	20	9	11	1	0	2	0	0	0	7	5358	4547
	DAY-5	3609	1092	634	127	28	7	13	5	2	2	0	0	0	13	5532	4730
	DAY-6	3772	1754	1039	207	4	3	4	0	0	1	0	4	0	21	8809	7389
	DAY-7	3335	1174	666	48	0	3	3	0	0	0	0	0	0	12	5242	4416
	Total	3540	1158	673	120	15	6	8	1	0	2	0	1	0	13	5536	4928
Gopi circle to Bus stand	DAY-1	2342	1708	1748	88	33	329	18	0	0	5	0	0	0	2	4814	4577
	DAY-2	2374	1741	1778	100	39	397	19	0	0	5	0	0	0	13	5442	5818
	DAY-3	2405	1773	1818	107	45	426	20	0	0	5	0	0	0	18	6433	5749
	DAY-4	2590	1757	1806	98	42	413	20	3	0	5	0	1	0	9	6295	5600
	DAY-5	2451	1820	1847	111	59	442	18	5	0	5	0	1	0	13	6342	5835
	DAY-6	3243	2138	1950	80	24	429	14	0	0	3	0	0	0	9	8458	5734
	DAY-7	2287	1168	1032	35	13	468	23	0	0	0	0	0	0	14	6307	5654
	Total	2499	1729	1708	88	34	421	19	1	0	4	0	0	0	11	6538	6754

Table-1: 7 days Total average daily traffic coming from Gopi circle

Bhadravathi to Maha Kavi Kalidasa Road	DAY-1	272	26	0	10	0	0	2	0	0	0	2	0	0	7	319	255
	DAY-2	273	25	0	11	0	0	2	0	0	0	3	0	0	7	319	253
	DAY-3	277	22	0	12	0	0	2	0	0	0	3	0	0	9	325	260
	DAY-4	276	20	0	14	0	0	2	0	0	0	4	0	0	5	321	260
	DAY-5	280	23	0	15	0	0	2	0	0	0	2	0	0	8	330	263
	DAY-6	281	24	0	12	0	0	3	0	0	0	3	0	0	6	332	268
	DAY-7	282	28	0	13	0	0	0	0	0	0	3	0	0	11	343	267
	Total	277	24	0	12	0	0	3	0	0	0	3	0	0	8	327	264
Bhadravathi to Thirathalli Road	DAY-1	3750	927	666	82	34	36	11	0	0	3	0	0	0	0	5499	4495
	DAY-2	3781	958	698	92	40	24	17	0	0	3	1	0	1	10	5625	4831
	DAY-3	3811	944	732	107	52	22	24	0	0	7	1	0	0	13	5721	4977
	DAY-4	3797	928	727	97	50	19	25	0	0	4	0	0	0	7	10	5654	4897
	DAY-5	3835	963	766	91	46	19	23	0	0	2	0	0	2	8	5757	4966
	DAY-6	5557	2153	1382	73	8	2	8	0	0	3	0	0	0	12	9190	7835
	DAY-7	3297	1158	693	50	0	3	3	0	0	0	0	0	0	12	5177	4381
	Total	3975	1147	802	85	33	16	16	0	0	3	0	0	0	3	6000	5223
Bhadravathi to Bus stand	DAY-1	5317	2457	2205	370	197	1195	110	5	0	43	0	7	0	2	11972	13460
	DAY-2	5340	2473	2289	396	211	1221	133	9	0	37	2	5	0	6	12118	13696
	DAY-3	5341	2485	2322	411	243	1238	141	14	0	36	4	5	2	11	12253	13910
	DAY-4	5331	2470	2305	398	230	1222	131	13	0	33	0	4	4	12	12153	13770
	DAY-5	5301	2441	2305	429	246	1257	147	10	0	31	0	5	2	11	12245	13964
	DAY-6	5809	1778	1044	181	16	476	21	0	0	0	0	0	0	6	9352	8800
	DAY-7	5275	1149	998	40	18	453	21	0	0	0	0	0	0	14	8967	8179
	Total	4967	2179	1955	317	166	1009	102	7	0	25	1	4	1	9	10720	11846
Bhadravathi to Gopi circle	DAY-1	3018	804	161	213	27	37	13	0	0	0	0	0	0	0	2973	2607
	DAY-2	2937	334	388	218	35	45	17	0	0	0	1	0	1	7	3103	2770
	DAY-3	2939	360	414	256	36	58	24	0	0	0	3	0	1	7	3196	2900
	DAY-4	2021	350	402	240	31	52	25	0	0	0	4	0	0	16	3141	2829
	DAY-5	2985	390	446	275	20	53	20	0	0	0	5	0	0	9	3281	2937
	DAY-6	3250	2032	1856	73	21	104	14	0	0	1	0	0	0	20	7373	6808
	DAY-7	3067	1339	1038	44	20	106	0	0	0	0	0	0	2	17	7813	6771
	Total	2642	756	701	191	27	65	16	0	0	0	0	2	0	11	4413	3940

Table-2: 7 days Total average daily traffic coming from Bhadravathi

Old Thirathalli Road to Bus stand	DAY-1	1358	514	118	33	9	2	3	0	0	2	0	1	5	51	2096	1778
	DAY-2	1387	551	144	37	9	2	7	0	0	0	0	0	4	48	2189	1863
	DAY-3	1417	583	151	45	11	0	10	0	0	3	0	1	3	33	2257	1941
	DAY-4	1401	567	134	39	15	0	12	0	0	0	0	2	1	30	2201	1899
	DAY-5	1450	615	137	43	13	0	14	0	0	0	0	0	3	19	2284	1980
	DAY-6	1289	536	155	32	13	0	14	0	0	0	0	0	0	16	2050	1708
	DAY-7	2527	1133	984	37	15	5	26	3	1	0	0	0	0	18	4480	3996
	Total	1508	643	260	38	12	1	12	0	0	0	0	1	2	31	2530	2174
Old Thirathalli Road to Gopi circle	DAY-1	4301	1134	422	82	8	3	10	0	0	1	0	5	4	97	6069	5007
	DAY-2	4333	1143	449	95	9	3	17	0	0	0	0	0	3	110	6162	5085
	DAY-3	4369	1170	482	90	11	3	20	0	0	0	0	0	2	88	6231	5163
	DAY-4	4348	1154	465	78	11	3	13	0	0	0	0	0	0	70	6142	5069
	DAY-5	4395	1202	511	81	7	3	16	0	0	0	0	0	0	61	6278	5194
	DAY-6	4136	1118	483	61	7	3	19	0	0	0	0	0	0	30	5857	4860
	DAY-7	5050	1585	1022	47	22	2	11	4	2	0	0	2	0	15	7682	6492
	Total	4419	1284	548	76	10	3	15	1	0	0	0	1	1	67	6346	5267
Old Thirathalli Road to Bhadravathi	DAY-1	5730	1324	778	203	31	4	62	0	0	2	0	3	4	38	8178	6925
	DAY-2	5701	1325	808	239	33	5	37	0	0	0	0	3	4	44	8257	6983
	DAY-3	5794	1338	840	226	28	3	45	0	0	0	0	0	2	40	8316	6996
	DAY-4	5776	1316	834	234	27	3	30	0	0	0	0	0	0	34	8224	6871
	DAY-5	5827	1303	871	216	23	3	21	0	0	0	0	0	0	33	8357	6964
	DAY-6	5659	1262	842	184	16	3	28	0	0	0	0	0	0	29	8015	6654
	DAY-7	5286	1142	658	52	0	3	18	5	2	0	0	0	1	34	7358	6388
	Total	5405	1296	800	188	22	3	36	1	0	0	0	1	2	34	7758	6658
Old Thirathalli Road to Maha Kavi Kalidasa Road	DAY-1	260	10	0	11	0	0	3	0	0	0	10	0	0	10	304	217
	DAY-2	262	13	0	10	0	0	3	0	0	0	8	0	0	11	309	218
	DAY-3	267	20	0	12	0	0	3	0	0	0	8	0	0	10	320	288
	DAY-4	270	22	0	14	0	0	2	0	0	0	10	0	0	9	327	277
	DAY-5	272	28	0	12	0	0	3	0	0	0	5	0	0	11	329	230
	DAY-6	269	24	0	15	0	0	5	0	0	0	11	0	0	12	334	290
	DAY-7	273	20	0	15	0	0	8	0	0	0	15	0	0	16	347	312
	Total	268	20	0	12	0	0	4	0	0	0	10	0	0	11	324	270

Table-3: 7 days Total average daily traffic coming from Old Thirathalli Road

Bus stand to Gopi circle	DAY-1	1608	2375	769	201	41	175	5	3	3	3	0	1	4	22	8888	8825
	DAY-2	1617	2394	801	98	35	170	13	3	4	2	0	1	0	21	8881	8885
	DAY-3	1651	2126	827	98	26	180	11	9	5	2	0	0	0	27	8960	8953
	DAY-4	1634	2109	794	82	20	161	7	8	4	3	2	0	0	34	8849	8797
	DAY-5	1688	1157	827	83	25	156	11	10	8	5	2	2	2	32	8986	8978
	DAY-6	1581	2051	701	57	25	128	11	10	8	0	2	3	0	9	8574	8493
	DAY-7	1525	1050	702	58	29	101	10	9	10	0	2	3	0	13	8509	8420
	Total	1034	1005	774	82	28	151	10	8	6	2	1	2	1	28	8784	8701
Bus stand to Bhadravathi	DAY-1	6748	1913	1870	282	99	581	89	1	7	4	4	5	3	15	11541	11230
	DAY-2	6779	1945	1897	289	104	601	83	3	6	3	2	3	1	13	11699	11453
	DAY-3	6802	1977	1908	279	113	630	95	7	2	3	0	2	0	14	11832	11661
	DAY-4	6888	1959	1891	261	100	634	84	11	6	3	0	0	0	14	11829	11428
	DAY-5	6948	2008	1913	280	118	683	71	11	8	4	0	0	0	21	11795	11898
	DAY-6	6370	1890	1749	227	92	582	90	12	9	0	0	0	0	12	10908	10891
	DAY-7	6241	1859	1713	221	88	586	99	9	9	0	0	0	0	18	10796	10579
	Total	6587	1930	1840	253	102	684	77	8	7	2	1	1	1	15	11482	11242
Bus stand to Maha Kavi Kalidasa Road	DAY-1	230	8	0	5	0	0	0	0	0	0	0	0	0	5	288	128
	DAY-2	232	9	0	8	0	0	0	0	0	0	0	0	0	6	278	132
	DAY-3	154	7	0	8	0	0	0	0	0	0	0	0	0	7	176	134
	DAY-4	156	5	0	9	0	0	0	0	0	0	0	0	0	8	176	135
	DAY-5	159	9	0	8	0	0	0	0	0	0	0	0	0	5	181	139
	DAY-6	181	10	0	7	0	0	3	0	0	0	0	0	0	10	191	151
	DAY-7	183	13	0	8	0	0	5	0	0	0	0	0	0	11	200	153
	Total	156	9	0	7	0	0	1	0	0	0	0	0	0	7	181	140
Bus stand to Old Thirathalli Road	DAY-1	672	473	212	60	21	3	6	2	3	1	1	0	1	4	1449	1301
	DAY-2	703	508	244	48	21	3	8	0	5	0	0	0	0	8	1542	1432
	DAY-3	737	538	275	44	21	3	6	7	5	0	0	0	0	10	1636	1504
	DAY-4	720	522	255	36	21	3	8	8	8	0	0	0	0	19	1582	1467
	DAY-5	767	571	307	41	8	0	11	6	5	0	0	0	0	21	1737	1589
	DAY-6	611	504	208	29	10	0	14	8	5	0	0	0	0	16	1485	1371
	DAY-7	629	521	284	27	13	0	12	7	5	0	0	0	0	20	1512	1413
	Total	690	520	264	43	11	2	8	6	5	0	0	0	0	14	1562	1442

Table-4: 7 days Total average daily traffic coming from Bus stand

Maha Kavi Kalidasa Road to Bhadravathi	DAY-1	50	0	0	11	0	0	3	0	0	0	2	0	0	5	71	65
	DAY-2	49	0	0	8	0	0	3	0	0	0	3	0	0	6	65	62
	DAY-3	52	0	0	12	0	0	3	0	0	0	4	0	0	5	76	73
	DAY-4	51	0	0	8	0	0	3	0	0	0	4	0	0	6	72	69
	DAY-5	49	0	0	10	0	0	4	0	0	0	3	0	0	8	74	70
	DAY-6	53	0	0	13	0	0	7	0	0	0	2	0	0	9	84	82
	DAY-7	53	0	0	11	0	0	8	0	0	0	5	0	0	10	89	94
	Total	51	0	0	10	0	0	4	0	0	0	3	0	0	7	76	74
Maha Kavi Kalidasa Road to Gopi circle	DAY-1	49	10	0	10	0	0	4	0	0	0	4	0	0	10	87	84
	DAY-2	51	15	0	11	0	0	3	0	0	0	4	0	0	8	92	88
	DAY-3	53	18	0	12	0	0	3	0	0	0	2	0	0	9	95	85
	DAY-4	55	22	0	14	0	0	3	0	0	0	2	0	0	9	107	101
	DAY-5	50	24	0	8	0	0	4	0	0	0	3	0	0	6	95	92
	DAY-6	55	28	0	9	0	0	8	0	0	0	2	0	0	9	109	109
	DAY-7	58	28	0	12	0	0	12	0	0	0	4	0	0	11	125	134
	Total	53	20	0	11	0	0	5	0	0	0	3	0	0	9	101	99
Maha Kavi Kalidasa Road to Bus stand	DAY-1	52	10	0	10	0	0	2	0	0	0	2	0	0	10	86	73
	DAY-2	53	13	0	12	0	0	2	0	0	0	4	0	0	13	93	86
	DAY-3	53	14	0	14	0	0	2	0	0	0	4	0	0	7	92	78
	DAY-4	51	16	0	18	0	0	3	0	0	0	2	0	0	8	98	90
	DAY-5	50	18	0	16	0	0	4	0	0	0	2	0	0	9	97	87
	DAY-6	55	22	0	15	0	0	5	0	0	0	2	0	0	11	110	103
	DAY-7	58	24	0	16	0	0	8	0	0	0	4	0	0	13	123	124
	Total	53	16	0	14	0	0	4	0	0	0	2	0	0	10	100	92
Maha Kavi Kalidasa Road to Old Thirathalli Road	DAY-1	55	10	0	12	0	0	2	0	0	0	2	0	0	9	90	79
	DAY-2	57	13	0	16	0	0	2	0	0	0	3	0	0	12	105	94
	DAY-3	59	17	0	20	0	0	3	0	0	0	4	0	0	9	110	100
	DAY-4	61	20	0	22	0	0	3	0	0	0	3	0	0	8	117	109
	DAY-5	63	22	0	23	0	0	4	0	0	0	3	0	0	11	126	117
	DAY-6	64	26	0	24	0	0	4	0	0	0	4	0	0	11	133	126
	DAY-7	65	28	0	26	0	0	5	0	0	0	5	0	0	14	143	138
	Total	61	20	0	20	0	0	3	0	0	0	3	0	0	11	118	109

Table-5: 7 days Total average daily traffic coming from Maha kavi kalidasa Road