



Designing Of Traffic Signal At Abhishek Circle

1 Prof. Anusha G S, 2 Tejaswini V, 3 Amith C

1 Assistant Professor, Dept of Civil Engineering , Vidya Vikas Institute of Engineering and Technology , Mysuru

2 , 3 UG Student , Dept of Civil Engineering , Vidya Vikas Institute of Engineering and Technology , Mysuru

Abstract

This study focuses on evaluating the Levels of Service (LOS) for both vehicles at Abhishek Circle in Mysore, a busy intersection with high traffic and pedestrian activity. Data collection through traffic volume survey and traffic flow analysis is conducted. Key challenges identified include heavy vehicle volumes and traffic delays due to inefficient signal timings. Solutions for improving the intersection include optimizing traffic signal and reorganizing traffic lanes to enhance safety and flow for vehicles by designing the traffic signal which leads to reduction in the accident rates in the intersection.

Introduction

An intersection is where two or more roads meet at the same level, unlike interchanges that use bridges or tunnels. Unsignalized intersections are controlled by installation of the signal, stop signs, while signalized intersections use traffic lights to manage cross-traffic, improving safety and reducing crashes. The Level of Service (LOS) measures traffic conditions, including speed, travel time and comfort for vehicles. Traffic facilities are categorized into uninterrupted, interrupted, and others. In India, vehicular traffic face high vulnerability to accidents at intersections, often overlooked in road planning. With growing foot traffic in urban areas at signalized intersections are crucial. One kind of that Abhishek circle which is facing lots of problem regarding traffic congestion.

Literature review

B.V. Suresh Kumar et al (2017): The study focuses on the challenges of urban transportation in India, where a mix of high-speed automobiles, low-speed cycles, cycle rickshaws, and animal-drawn carts share the same roads. Unsignalized intersections, which are common in both urban and rural areas, are critical elements in managing traffic flow. The study employs the conflict technique to calculate the capacity of unsignalized

intersections under mixed traffic conditions, particularly in Visakhapatnam. Traffic surveys were conducted to measure parameters such as volume, flow, and capacity. The capacity findings from the conflict technique were then compared to the Highway Capacity Manual (HCM) to evaluate and validate the approach-wise capacities. This methodology helps in understanding the traffic dynamics and improving the management of unsignalized intersections.

Jaladhi Chitaria et al (2018): Unsignalized intersections often act as bottlenecks in traffic systems, especially during rush hour, and are a common cause of accidents, particularly in countries like India where traffic rules are not always strictly enforced. To ensure smooth traffic flow and minimize conflicts, it is crucial to determine the capacity of these intersections. This study focuses on the CCD crossroads near Shyamal in the Satellite area of Ahmedabad. The analysis involves collecting traffic volume data to assess factors such as the number, movements, and classifications of vehicles at the intersection.

B RaghuramKadali et.al. (2015): The study focuses on evaluating the Level of Service (LOS) for pedestrians at unsignalized mid-block crosswalks, taking into account various factors such as land-use type (shopping, residential, and commercial areas), traffic conditions, and pedestrian characteristics (e.g., gender and age). The analysis used a probit model in NLOGIT software, considering factors like the number of vehicles encountered, street crossing burden, land-use conditions, and street geometry.

The results show that safety, crossing burden, land-use type, number of vehicles, medians, and the number of lanes significantly influence pedestrian LOS at unsignalized crosswalks in mixed traffic. The findings highlight the importance of land-use planning and the need for appropriate pedestrian access strategies, particularly for unprotected crosswalks in areas with mixed traffic. The study's conclusions are vital for improving pedestrian accessibility, determining safe distances from vehicles, and making informed decisions on infrastructure planning based on land-use types.

PROBLEM STATEMENT:

Accident rates which are collected from Hebbal police station of the Abhishek circle
Which gives the detail information about the condition of the area.

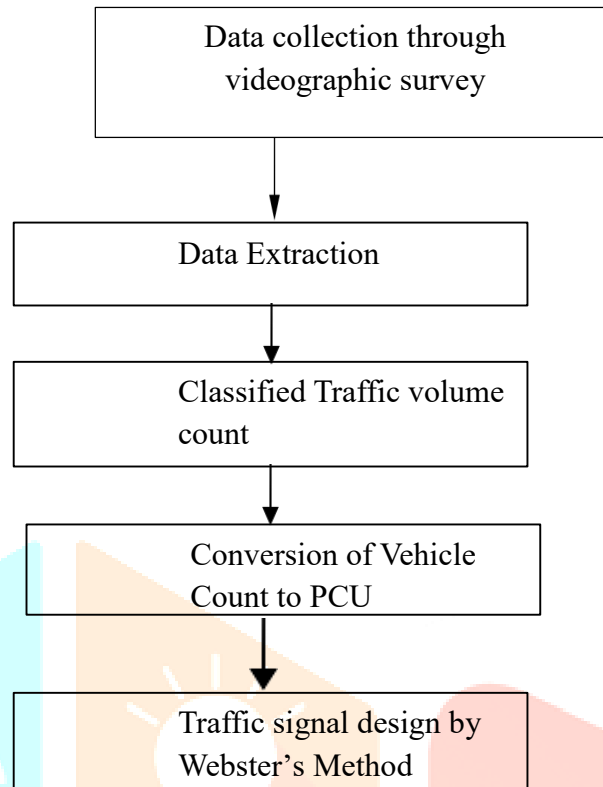
Table 1: Accident rates from past years

MONTH	YEAR	NUMBER OF PEOPLE INJURED
AUGUST	2023	1
SEPTEMBER	2023	1
JULY	2024	2
DECEMBER	2024	1

Objective

- To provide a signal time designing to improve the flow of vehicles at the Abhishek Circle, Mysuru.
- To determine Vehicular level of service
- Reduction of traffic congestion and Improve the intersection.

Methodology



Abhishek circle selected as the study area as it is observed that the accidents rates due to traffic congestion are more and also there is no traffic signal for vehicles through there is a high vehicular flow. The data has collected by doing the videographic survey and recorded the movement of vehicles at Abhishek circle intersection. The video graphic survey has conducted during peak hours and non peak hours on weekdays and weekend. The number of vehicles moving towards Water tank road to Ringroad, Kumbar koplu to Manchegowdana koplu and vice versa doing survey during peak hours and non peak hours on weekdays and weekends. The data is extracted based on the type of vehicle moving at the interval of 1 minutes for the duration of 1 hour. The total number of vehicles is noted based on the direction of vehicular flow. The vehicles are classified as heavy motor vehicles(HMV), low motor vehicles(LMV), heavy commercial vehicles(HCV) and low commercial vehicles(LCV). The data extracted is then converted to PCU based on the Indian Standard specification. The total number of vehicles travelled in a specified direction per an hour is converted to PCU

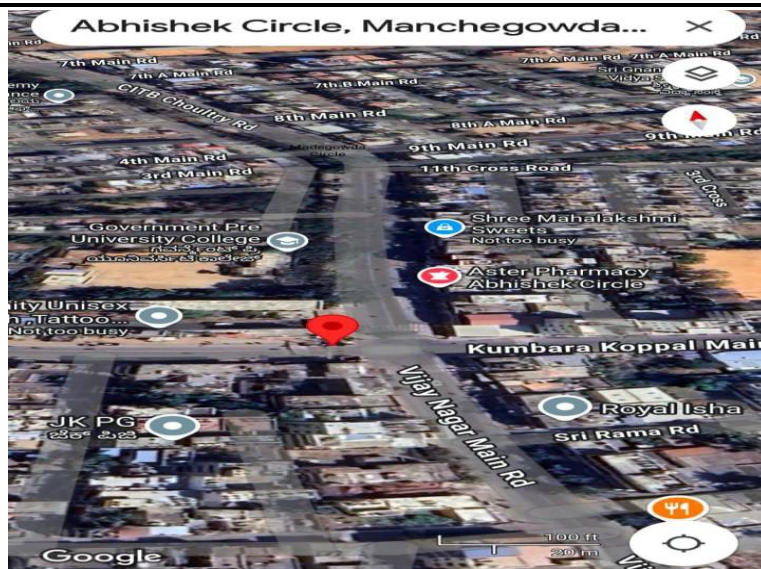


Fig 1 : Location of Abhishek circle



Fig 2 : Top view of Abhishek Circle

Data Extraction

The collection of data is done through the video graphic survey . The video of one minute interval is shorted and extracted the number and type of the vehicle is listed .

Weekday Peak Hour

Weekdays Peak Hour - Water tank to Ring Road																								
D a y s	STRAIGHT								RIGHT								LEFT							
	H MV			L MV			H C V	L C V	H MV			L MV			H C V	L C V	H MV			L MV			H C V	L C V
	T r u c k	B u s	C a r	3 W h e e l e r	2 W h e e l e r	C y c l e			T r u c k	B u s	C a r	3 W h e e l e r	2 W h e e l e r	C y c l e			T r u c k	B u s	C a r	3 W h e e l e r	2 W h e e l e r	C y c l e		
1	2	30	275	147	276		1	21	1	25	229	280	397	1	4	15		8	227	359	356			15
2	5	26	265	144	198	1	2	32	2	32	221	272	170		6	225		23	226	350	176	1		20
3	3	44	280	150	139		3	36	4	76	230	290	175		8	24		26	230	361	180			26
4	8	97	281	152	148		3	32	1	80	230	291	180	1	4	23		28	230	366	182			22
5	1	100	105	177	198		2	36	1	70	244	320	313		1	20		34	257	379	208			18

6	1	98	150	187	148		1	33	1	82	230	301	180		6	23		20	230	288	200			23
7	3	91	263	153	147		1	26	1	77	168	226	188		3	21		27	236	372	186			26
8		27	118	101	124	1		9		26	132	155	192			8		7	92	348	166			19
9		79	299	208	161		2	24	1	69	270	290	181		4	20		30	231	250	186			29
10	1	80	270	170	160		1	20	1	70	191	236	1		3	23		23	211	387	196			20
11	9	94	278	158	143		3	33	2	77	232	292	182		8	23		27	237	360	180			33
12		77	109	187	202			37		64	234	333	216		1	32		37	263	372	212			24
13	1	101	107	179	200		1	38	1	72	251	216	320			21		33	259	382	211	4		20
14		35	216	233	108	3		16		25	161	208	333	2		9		16	156	132	107	1		8
15	2	103	166	198	152			38	1	78	253	321	217		1	20		30	260	370	209			22

Weekdays Peak Hour - Ring Road to Watertank																								
Days	STRAIGHT								RIGHT								LEFT							
	HMV			LMV			HC V	LC V	HMV			LMV			HC V	LC V	HMV			LMV			HC V	LC V
	T r u c k	Bus	Car	3 Wheeler	2 Wheeler	Cycle			T r u c k	Bus	Car	3 Wheeler	2 Wheeler	Cycle			T r u c k	Bus	Car	3 Wheeler	2 Wheeler	Cycle		
1	2	43	254	380	194	2		6	22	9	206	191			6		15	166	180	200	3		9	
2	6	48	260	390	198	3		12	28	6	192	188			5		18	182	192	222	6		12	
3	5	45	281	152	148	1		12	30	9	161	172			7	5	29	198	208	109	4		7	
4	2	65	296	398	207	1		13	34	0	198	101			9		21	193	222	121	3		2	
5	1	68	283	390	190	2		16	29	2	225	101			4	1	25	191	224	120	1		3	
6	1	40	270	363	195			8	1	24	0	184	104	1		5		28	161	204	239	1	5	
7	2	55	266	392	198	1		12	32	2	162	98			2	3	22	192	231	107	2		12	
8	1	62	142	187	202			16	27	9	197	109			7	1	32	227	236	141	2		6	
9		72	176	162	216	2	2	12		29	8	208	102			9		34	223	226	220	3		8
10	3	78	162	171	209	1		9	22	6	193	116	1		5		42	198	236	241	5		6	
11	6	46	154	186	194	3		17	19	3	182	124	2		4		46	187	246	276	7		9	
12	2	36	159	192	212	1		11	11	6	176	131			2		52	191	231	254			3	
13	5	47	162	164	169		1	9	12	4	192	118	1		1		35	186	218	234	1		5	
14	1	32	171	176	182	1		5	15	7	174	104			3		48	174	196	268	2		4	
15	4	29	152	184	194	2		7	19	2	213	92	1		5		29	150	175	201	1		6	

Weekdays Peak Hour - Manchegowda kopalu to Kumbar Kopalu																								
Da ys	STRAIGHT								RIGHT								LEFT							
	HMV			LMV			H C V	L C V	HMV			LMV			H C V	L C V	HMV			LMV			H C V	L C V
	T r u c k	B u s	C a r	3 W h e e r	2 W h e e r	C y c l e			T r u c k	B u s	C a r	3 W h e e r	2 W h e e r	C y c l e			T r u c k	B u s	C a r	3 W h e e r	2 W h e e r	C y c l e		
1		14	289	350	198	3		25		17	140	280	114	4		5		10	160	170	100	1		3
2		17	264	357	193	6		13		19	132	286	118			4		6	148	180	115	2		5
3		19	276	334	178	2		17		21	126	275	119	1		8		12	157	174	116			4
4		21	234	324	167	1		21		24	151	264	126	5		7		9	163	185	124	1		3
5		15	256	287	178	4		17		15	149	273	134			9		5	172	176	135			2
6		18	214	298	156	5		1		19	137	258	125	7		4		6	123	150	142	1		7
7		13	222	351	198	1		25		25	128	296	105	2		3		8	138	169	135			5
8		8	234	298	145	7		18		16	134	313	128			2		10	146	139	134	2		1
9		22	219	268	167	8		19		23	128	258	132	2		8		9	137	148	129	1		3
10		17	227	327	151	2		16		24	129	254	127	4		4		5	142	158	137			5
11		18	236	345	176	9		13		19	137	239	134	1		5		4	139	152	126			4
12		14	196	287	162	2		21		27	142	264	118			6		3	129	176	137			2
13		21	184	290	171	3		25		15	138	249	127			2		6	137	184	129			4
14		15	199	312	146	1		26		12	128	238	152	1		4		7	146	159	134	1		2
15		10	212	278	185	3		18		9	119	246	139			1		8	145	173	128			1

Weekdays Peak Hour - Kumbar Kopalu Manchegowda kopalu to																								
D a y s	STRAIGHT								RIGHT								LEFT							
	HMV			LMV			H C V	L C V	HMV			LMV			H C V	L C V	HMV			LMV			H C V	L C V
	T r u c k	B u s	C a r	3 W h e e l e r	2 W h e e l e r	C y c l e			T r u c k	B u s	C a r	3 W h e l e r	2 W h e l e r	C y c l e			T r u c k	B u s	C a r	3 W h e l e r	2 W h e l e r	C y c l e		
1	2	10	250	350	188	2		3		12	180	178	96	1		2		5	180	200	108	3		2
2	1	9	253	250	167	1		4		8	178	168	101	2		3		4	176	212	115			3
3	3	5	212	267	181			1		6	169	175	119			1		2	156	196	96	1		1
4		7	236	249	167	1		2		7	150	158	88	1		2		3	169	197	89			1
5	2	6	196	237	159			3		4	167	169	86					1	137	150	116	2		2
6		8	188	267	139	2		7		2	159	180	97	1		1		2	196	167	104	1		2
7	1	11	211	259	146			5		11	186	159	93						168	159	102			1
8	1	15	234	249	189			1		9	164	161	108			2		2	139	164	118			
9	2	18	199	258	212	1		2		5	192	139	116	1		1		3	168	159	121	1		2
10	1	13	237	237	237	2				7	153	140	104			2		4	173	198	98			1
11	2	14	196	249	198	1		2		4	169	167	95	1		1		5	184	212	126	2		2
12	3	10	187	268	194			1		8	162	173	86			3		2	195	219	109	1		3
13	2	19	219	312	167					9	184	181	105	2		1			176	205	94	1		1

14	1	9	235	329	158	1		3		12	141	169	115			2		3	180	194	107			2
15	2	13	189	287	193			1		6	156	158	118	1		1		5	163	180	116	2		1

Weekday Non Peak Hour

Weekdays Non Peak Hour - Watertank to Ring Road																									
Day s	STRAIGHT								RIGHT								LEFT								
	HMV			LMV			H C V	L C V	HMV			LMV			H C V	LC V	HMV			LMV			H C V	L C V	
	T r u c k	B u s	C a r	3 W h e l e r	2 W h e l e r	C y c l e			T r u c k	B u s	C a r	3 W h e l e r	2 W h e l e r	C y c l e			T r u c k	B u s	C a r	3 W h e l e r	2 W h e l e r	C y c l e			
1		20	115	47	98	1		1		5	23	17	59	1		2				10	11	45			1
2		22	111	45	101	3		5		8	39	15	81	3		3				7	8	59			4
3		20	110	43	98	1		2		5	35	16	78	1		2				15	19	58			3
4		21	120	45	97	1		2		4	35	30	85	1		2				42	88	102			2
5		18	13	49	97	1		1		7	37	11	61	1		2				12	7	55			2
6		20	9	51	101	1		1		8	40	28	68			1				15	10	58			4
7		22	112	38	102	1		3		6	38	18	82			3				17	21	61			4
8		12	108	41	95	1		3		4	32	18	82			1				18	20	54			2
9		22	116	45	101	1				10	38	17	76	1		2				16	21	58			3
10		21	108	45	99	1		4		6	36	38	78	1		2				18	20	60			3
11		14	118	48	94	1		1		4	32	11	49	1		1				10	4	46			1
12		22	108	48	93	4	1	2		4	38	22	86	2		3				41	89	103	1		3
13		21	90	42	97	1		2		4	33	45	77	1		5				14	18	56			2
14		18	27	48	97	1		1		7	38	30	66			16			6	16	12	56			6
15		20	110	36	98	2		2		8	36	16	83			2			9	12	28	57			3

Weekdays Non Peak Hour - Ring Road to Watertank																									
Day s	STRAIGHT								RIGHT								LEFT								
	HMV			LMV			H C V	L C V	HMV			LMV			H C V	L C V	HMV			LMV			H C V	L C V	
	T r u c k	B u s	C a r	3 W h e e l e r	2 W h e e l e r	C y c l e			T r u c k	B u s	C a r	3 W h e e l e r	2 W h e e l e r	C y c l e			T r u c k	B u s	C a r	3 W h e e l e r	2 W h e e l e r	C y c l e			
1		8	111	33	126	5		2			6	16	17							3	11	58	3		2
2		14	98	48	137	6		4			11	18	21							14	12	68	11		4
3		11	120	49	157	5		4			9	28	25							10	32	67	9		4
4		7	112	30	147	2		1		1	10	27	28			3				4	74	98			
5		10	108	29	121	3					8	16	21					2	6	14	48			1	
6		13	111	31	128						10	14	25	1				6	8	18	52			4	
7		12	116	47	153	3		2		2	8	25	27	1					15	34	66			3	
8	1	11	82	49	143	2		2			8	24	26						12	28	64	8		3	
9		13	121	47	163			2			7	31	24						9	35	66	10		4	
10		7	154	16 6	84			3		12	118	132	78	2					9	37	64	9		4	
11		11	118	56	153						7	18	25						8	31	54	5		4	
12		9	113	33	121	2		2			7	13	27						4	16	92	2		2	
13		8	115	32	133	5		1		1	12	28	26			2			6	54	67			1	
14		13	107	48	109	4					8	27	24						9	30	66			2	
15		12	108	26	94	1					12	16	28			9			8	17	56	2		3	

Weekdays Non Peak Hour - Manchegowda kopalu to Kumbar Kopalu																								
Day s	STRAIGHT							RIGHT							LEFT									
							H C V	L C V							H C V	LC V							H C V	L C V
	HMV			LMV					HMV			LMV					HMV			LMV				
	Tr uc k	B u s	C a r	3 Whe eler	2 Whe eler	Cy cle			T r u c k	B u s	Car	3 Whe eler	2 Whe eler	Cy cle			T r u c k	B u s	Car	3 Whe eler	2 Whe eler	Cy cle		
1			5	9	16					10	20	45			9			3	16	41	63	5		1
2			4	8	13					9	21	40	1		9			7	15	42	66	9		
3			7	13	24		4			8	18	44			8			4	17	43	57			2
4			1 1	7	16					8	23	46			16			4	16	33	67			1
5			5	17	21					15	22	36			2			3	7	24	62			4
6			6	16	24					23	34	31	1		3			4	12	14	27			3

7				8	13	14						10	20	44			16		9	18	46	72			3
8				7	16	29			3			25	34	41						13	47	51			1
9				6	9	21			2			11	14	33			1			7	24	36	3		2
10				8	17	28			2			16	22	37			4			6	17	29	4		5
11				7	14	23						12	25	47			13		6	18	43	67	5		2
12				9	15	28						8	27	46	1		17		7	15	37	63			2
13				3	12	27	4		2			11	19	41			16		4	17	45	64			1
14				6	9	21			3			18	28	34	1		2		3	19	36	52	2		1
15				3	14	19	2					9	22	47	2		5		2	11	29	45			3

Weekdays Non Peak Hour - Kumbar Kopaluto Manchegowda kopalu																								
Days	STRAIGHT								RIGHT								LEFT							
	HMV			LMV			H C V	L C V	HMV			LMV			H C V	L C V	HMV			LMV			H C V	L C V
	Tr	u	c	3	2	C			Tr	u	c	3	2	C			Tr	u	c	3	2	C		
	k	s	Car	Whe	Whe	ycle			k	s	Car	Whe	Whe	ycle			k	s	Car	Whe	Whe	ycle		
1																								
2			5	3	6			3		3	39	40	55			2			5	9	38			2
3			9	6	9						31	37	43							7	44	1		
4			7	9	14	1					25	47	39							3	25			
5		1	3	14	7			2			28	29	58						3	11	21			1
6			11	11	19				1	22	36	41			1					15	35	3		
7			15	8	8					36	29	29								8	41			
8		2	7	12	13			1		24	26	33							2	19	29			4
9			8	7	25				2	38	30	40			1					11	36	2		
10			12	19	9	2					43	45	22							9	48			
11			6	4	21						29	44	39						1	4	23			
12		1	18	9	13			4		3	41	37	21			3				14	29			3
13			8	2	6	1					21	24	44							7	37	1		
14		1	9	15	9						38	41	21						2	9	31			
15			11	12	18			3		2	29	28	37			2				6	28			2
15			6	4	11	1		1			33	37	44						1	17	35	2		1

Weekend Peak Hour

Weekend Peak Hour - Watertank to Ring Road																								
Day s	STRAIGHT								RIGHT								LEFT							
	HMV			LMV			H C V	L C V	HMV			LMV			H C V	L C V	HMV			LMV			H C V	L C V
	T r u c k	Bus	Car	3 Wheeler	2 Wheeler	Cycle			T r u c k	Bus	Car	3 Wheeler	2 Wheeler	Cycle			T r u c k	Bus	Car	3 Wheeler	2 Wheeler	Cycle		
1		79	299	208	161		2	4	1	69	271	293	182		4	21		30	231	254	192			17
2		64	265	196	175					62	289	307	198	1				22	245	231	179	2		4
3		71	301	188	143		2			51	263	281	163		2			19	226	226	154		5	
4		82	284	210	169	1		5		64	244	269	201	1		18		14	208	249	189	1		10
5		55	225	221	138		1		1	46	269	306	189		3			15	211	217	148		2	
6		73	308	199	172	1		9		73	293	296	178			8		23	228	239	187			8

Weekend Peak Hour - Ring Road to Watertank																								
Day s	STRAIGHT										RIGHT						LEFT							
	H MV			L MV			H C V	L C V	H MV		L MV			H C V	L C V	H MV		L MV			H C V	L C V		
	T r u c k			3 W h e e l e r	2 W h e e l e r	C y c l e			T r u c k			3 W h e e l e r	2 W h e e l e r	C y c l e			T r u c k			3 W h e e l e r	2 W h e e l e r	C y c l e		
	Bus	Car							Bus	Car							Bus	Car						
1	1	68	283	390	192	2		17		27	189	221	102			7	1	26	182	233	127	1		3
2		55	259	368	186					22	178	201	114	1				19	169	215	108			
3		49	281	349	202	1		9		18	195	194	99			2		17	155	193	122	2		2
4	2	38	243	388	179		5		1	16	164	189	81	1			1	25	188	212	97			1
5		46	227	347	198	2		5		24	159	211	94			3		13	196	189	101	1		
6	1	57	279	376	191	1		8		19	182	217	105			1		24	191	229	118			2

Weekend Peak Hour - Manchegowda kopalu to Kumbar Kopalu																								
Day s	STRAIGHT								RIGHT								LEFT							
	HMV			LMV			H C V	L C V	HMV			LMV			H C V	L C V	HMV			LMV			H C V	L C V
	T r u c k	Bus	Car	3 Whe ler	2 Whe ler	C yc le			T r u c k	Bus	Car	3 Whe eler	2 Whe eler	C yc le			T r u c k	Bu s	Ca r	3 Whe eler	2 Whe eler	C yc le		
1		28	291	376	198	1		7		24	167	26 4	128	1		4		18	174	196	117			2
2		25	277	354	181					19	155	24 7	115					15	156	187	108			
3		19	284	387	174	2		4		17	188	25 1	127	2		3		21	183	169	97	2		3
4		17	259	391	168			5		29	169	26 9	111			4		13	149	177	102			
5		26	298	342	194	1				26	149	24 4	123	1				19	171	192	117	1		4
6		29	281	379	184			3		16	158	27 1	131			2		26	182	201	99	1		1

Weekend Peak Hour - Kumbar Kopalu Manchegowda kopalu to																								
D a y s	STRAIGHT								RIGHT								LEFT							
	HMV			LMV			H C V	L C V	HMV			LMV			H C V	L C V	HMV			LMV			H C V	L C V
	T r u c k	Bus	Car	3 W h e l e r	2 W h e l e r	C y c l e			T r u c k	Bus	Car	3 W h e l e r	2 W h e l e r	C y c l e			T r u c k	Bus	Car	3 W h e l e r	2 W h e l e r	C y c l e		
1		28	286	387	221	1		4		22	173	184	118	1		6		19	198	211	127			3
2		25	279	376	214					17	159	165	105					14	201	193	102	1		
3		19	281	364	203	2		3		14	177	147	101	2		3		11	192	189	96			4
4		29	268	381	198					29	168	179	96			4		9	176	201	121	2		2
5		16	277	347	225	1		2		21	159	152	116	1				21	181	178	117			
6		22	291	392	231	1		1		18	176	189	111			2		17	189	207	122	1		1

Weekend Non Peak Hour

Weekend Non Peak Hour - Watertank to Ring Road																									
Da ys	STRAIGHT								RIGHT								LEFT								
	HMV			LMV			H C V	L C V	HMV			LMV			H C V	L C V	HMV			LMV			H C V	L C V	
	T r u c k	B u s	C a r	3 W h e l e r	2 W h e l e r	C y c l e			T r u c k	B u s	C a r	3 W h e l e r	2 W h e l e r	C y c l e			T r u c k	B u s	C a r	3 W h e l e r	2 W h e l e r	C y c l e			
1		20	29	51	102	1		1		9	38	29	69			1				15	17	59			4
2		14	18	39	96					7	29	22	58							9	24	55	1		
3		19	19	47	91	1		1		5	22	18	49			2				6	11	39			
4		27	21	33	84			1		11	18	26	63							11	15	65			2
5		22	32	42	106	1				6	27	32	71			1				8	19	48	1		
6		16	25	54	92			1		8	33	35	66			1				16	8	53			1

Weekend Non Peak Hour - Ring Road to Watertank																								
Da ys	STRAIGHT								RIGHT								LEFT							
	HMV			LMV			H C V	L C V	HMV			LMV			H C V	LC V	HMV			LMV			H C V	L C V
	T r u c k	Bus	Car	3 Whee ler	2 Whee ler	C yc le			T r u c k	B u s	Car	3 Whe eler	2 Whe eler	C yc le			T r u c k	Bus	Car	3 Whe eler	2 Whe eler	C yc le		
1		13	78	31	127			1			14	27	42	1				6	9	19	52			4
2		9	67	27	119	1				9	19	38						8	7	14	39			
3		11	58	33	122			1			19	25	31	1				9	14	9	44			3
4		7	73	39	131	1				7	17	45				1		5	6	11	58			
5		14	71	27	113					18	29	29						15	12	23	36			2
6		6	69	22	125			1			11	21	49	1				18	19	18	57			1

Weekend Non Peak Hour - Manchegowda kopalu to Kumbar Kopalu																								
Days	STRAIGHT								RIGHT								LEFT							
	H MV			L MV			H C V	L C V	H MV			L MV			H C V	L C V	H MV			L MV			H C V	L C V
	Tr u c k	B u s	C a r	3 W h e l e r	2 W h e l e r	C y c l e			Tr u c k	B u s	C a r	3 W h e l e r	2 W h e l e r	C y c l e			Tr u c k	B u s	C a r	3 W h e l e r	2 W h e l e r	C y c l e		
1			8	11	17			2			16	21	38	1		4			6	14	27	4		5
2			5	8	14	1					11	17	27						9	11	19			3
3			7	6	12			3			8	14	29			2			5	9	25	2		
4			9	15	9	1		1			12	25	33	1					14	6	16			2
5			11	19	7						19	9	43			1			19	19	33	1		
6			15	13	15	1		1			9	26	36			1			11	7	24	1		1

Weekend Non Peak Hour - Kumbar Kopalu Manchegowda kopalu to																								
Days	STRAIGHT								RIGHT								LEFT							
	H MV			L MV			H C V	L C V	H MV			L MV			H C V	L C V	H MV			L MV			H C V	L C V
	T r u c k	B u s	C a r	3 W h e l e r	2 W h e l e r	C y c l e			T r u c k	B u s	C a r	3 W h e l e r	2 W h e l e r	C y c l e			T r u c k	B u s	C a r	3 W h e l e r	2 W h e l e r	C y c l e		
1			11	17	27	1					7	46	51	49	1	3			9	22	47			6
2			8	9	19						6	41	46	44					6	17	39	1		
3			15	15	17						9	33	37	38	1	2			11	15	23			4
4			9	6	25	2					13	29	29	29					16	27	29	1		
5			6	12	29						11	38	55	41	1	2			8	29	44			2
6			18	11	31	1					8	51	59	37		1			14	21	53			1

Analysis and Results:

WEBSTER'S EQUATION

$$❖ Y = y_a + y_b$$

$$\text{Where } y_a = q_a / s_a$$

$$y_b = q_b / s_b$$

$$❖ L = 2n + 1$$

$$❖ C_o = 1.5L + 5 / 1 - Y$$

$$❖ G_a = y_a / y (C_o - L)$$

$$❖ G_b = y_b / y (C_o - L)$$

$$❖ R_A = G_B + A_B$$

$$❖ R_B = G_A + A_A$$

Where q_a = normal flow of traffic

s_b = saturation flow of traffic

L = total loss of time

C_o = optimum cycle time

N = number of lanes

R = Red time

G = Green time

Analysis :

DIRECTION1 : WATERTANK AND RINGROAD TO MANCHEGOWDANAKOPPAL AND KUMBARKOPPAL

Here WATERTANK AND RINGROAD = ROAD A

MANCHEGOWDANAKOPPAL AND KUMBARKOPPAL = ROAD B

From the data extraction the average of 15 days is calculated through which the saturation flow and the normal is given below ;

$$q_a = 260$$

$$q_b = 145$$

$$S_a = 1400$$

$$S_b = 1335$$

$$n = 2$$

$$R = 12 \text{ sec (Assume)}$$

$$A = 2 \text{ sec (Assume)}$$

$$Y = 260 / 1400 + 145 / 1335$$

$$= 0.185 + 0.108$$

$$= 0.33$$

$$L = 2n + R$$

$$= 2(2)+12$$

$$= 16$$

$$C_o = 1.5(16)+5/1-0.402$$

$$= 48.16$$

$$G_A = 0.161/0.172(48.16-16)$$

$$= 30.103$$

$$G_B = 0.162/0.172(48.16-16)$$

$$= 30.29$$

$$\text{Therefore; } R_A = G_B + A_B; 30.103+2= 32.103$$

$$R_B = G_A + A_A; 30.29+2 = 32.29$$

DIRECTION 2: MANCHEGOWDANAKOPPAL AND KUMBARKOPPAL TO WATERTANK AND RINGROAD

Here MANCHEGOWDANAKOPPAL AND KUMBARKOPPAL = ROAD A

WATERTANK AND RINGROAD =ROAD B

From the data extraction the average of 15days is calculated through which the saturation flow and the normal is given below ;

$$q_a = 148$$

$$q_b = 390$$

$$S_a = 1335$$

$$S_b = 1400$$

$$n=2$$

$$R=12\text{sec (Assume)}$$

$$A= 2\text{sec (Assume)}$$

$$Y = 148/1335+390/1400$$

$$= 0.38$$

$$L = 2n + R$$

$$= 2(2)+12$$

$$= 16$$

$$C_o = 1.5(16)+5/1-0.38$$

$$= 46.7741$$

$$G_A = 0.161/0.172(46.77-16)$$

$$= 28.80$$

$$G_B = 0.162/0.172(46.77-16)$$

$$= 28.98$$

$$\text{Therefore; } R_A = G_B + A_B; 28.80 + 2 = 30.80$$

$$R_B = G_A + A_A; 28.98 + 2 = 30.98$$

DIRECTION 3 : RINGROAD AND MANCHEGOWDANAKOPPAL TO KUMBARKOPPAL AND WATERTANK

Here RINGROAD AND MANCHEGOWDANAKOPPAL = ROAD A

KUMBARKOPPAL AND WATERTANK = ROAD B

From the data extraction the average of 15 days is calculated through which the saturation flow and the normal is given below ;

$$q_a = 260$$

$$q_b = 145$$

$$S_a = 1400$$

$$S_b = 1335$$

$$n = 2$$

$$R = 12 \text{ sec (Assume)}$$

$$A = 2 \text{ sec (Assume)}$$

$$Y = 260/1400 + 145/1335$$

$$= 0.185 + 0.108$$

$$= 0.33$$

$$L = 2n + R$$

$$= 2(2) + 12$$

$$= 16$$

$$C_o = 1.5(16) + 5/1 - 0.402$$

$$= 48.16$$

$$G_A = 1030.162/0.172(48.16 - 16)$$

$$= 30.29$$

$$G_B = 0.161/0.172(48.16 - 16)$$

$$= 30.103$$

$$\text{Therefore; } R_A = G_B + A_B; 30.103 + 2 = 32.29$$

$$R_B = G_A + A_A; 30.29 + 2 = 32.103$$

DIRECTION 4 : KUMBARKOPPAL AND WATERTANK TO RINGROAD AND MANCHEGOWDANAKOPPAL

Here KUMBARKOPPAL AND WATERTANK = ROAD A

RINGROAD ANF MANCHEGOWDANKOPPAL = ROAD B

From the data extraction the average of 15days is calculated through which the saturation flow and the normal is given below ;

$$q_a = 148$$

$$q_b = 390$$

$$S_a = 1335$$

$$S_b = 1400$$

$$n = 2$$

$$R = 12 \text{ sec (Assume)}$$

$$A = 2 \text{ sec (Assume)}$$

$$Y = 148/1335 + 390/1400$$

$$= 0.38$$

$$L = 2n + R$$

$$= 2(2) + 12$$

$$= 16$$

$$C_o = 1.5(16) + 5/1 - 0.38$$

$$= 46.7741$$

$$G_A = 0.162/0.172(46.77 - 16)$$

$$= 28.98$$

$$G_B = 0.161/0.172(46.77 - 16)$$

$$= 28.80$$

$$\text{Therefore; } R_A = G_B + A_B; 28.80 + 2 = 30.98$$

$$R_B = G_A + A_A; 28.98 + 2 = 30.80$$

Results :

Direction	Red time (R)sec	Amber time (A) sec	Green time (G) sec
Watertank and ringroad(A) to manchegowdanakoppal and kumbarkoppal(B)	A= 32.103 B= 32.29	2	A= 30.103 B= 30.29
Manchegowdanakoppal and kumbarkoppal(A) to watertank and ringroad(B)	A= 30.80 B= 30.98	2	A= 28.80 B= 28.98
Ringroad and manchegowdanakoppal(A) to kumbarkoppal and watertank(B)	A= 32.29 B= 32.10	2	A= 30.29 B=30.10
Kumbarkoppal and watertank(A) to ringroad and manchegowdanakoppal(B)	A=30.98 B= 30.80	2	A=28.98 B= 28.80

DIRECTION1 : WATERTANK AND RINGROAD (A) TO MANCHEGOWDANAKOPPAL AND KUMBARKOPPAL (B)

A= 32.103	A=2	A=30.103
B= 32.29	A=2	B=30.29

DIRECTION 2: MANCHEGOWDANAKOPPAL AND KUMBARKOPPAL (A) TO WATERTANK AND RINGROAD (B)

A=30.80	A=2	A=28.80
B=30.98	A=2	B=28.98

DIRECTION 3 : RINGROAD AND MANCHEGOWDANAKOPPALL (A) TO KUMBARKOPPAL AND WATERTANK (B)

A=32.29	A=2	A=30.39
B=32.10	A=2	B=30.10

DIRECTION 4 : KUMBARKOPPAL AND WATERTANK TO RINGROAD (A) AND MANCHEGOWDANAKOPPAL (B)

A=30.98	A=2	A=28.98
B=30.80	A=2	B=28.80

Conclusion:

In the selected study area, the accident rates are more due to traffic congestion. To improve vehicular flow the traffic signal time is designed in this study.

The road's traffic characteristics can be changed. Accident rates can be reduced by taking the steps outlined above. The Webster's method is used for designing of traffic signal and summarized in the form of signal diagram.

Vehicle level of service which is high congestion of vehicle Which is Los F, it is concluded to extend the width of the road by increasing the number of lanes

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