

## LAMPIRAN

### Lampiran 1 Foto-foto Simpang Bersinyal Batikan

1. Foto dari arah Jl.Kusumanegara



2. Foto dari arah Jl.Ki Mangunsarkoro



3. Foto dari arah Jl.Sultan Agung



4. Foto dari arah Jl.Batikan





## Lampiran 2 Foto-foto Pelaksanaan Survei

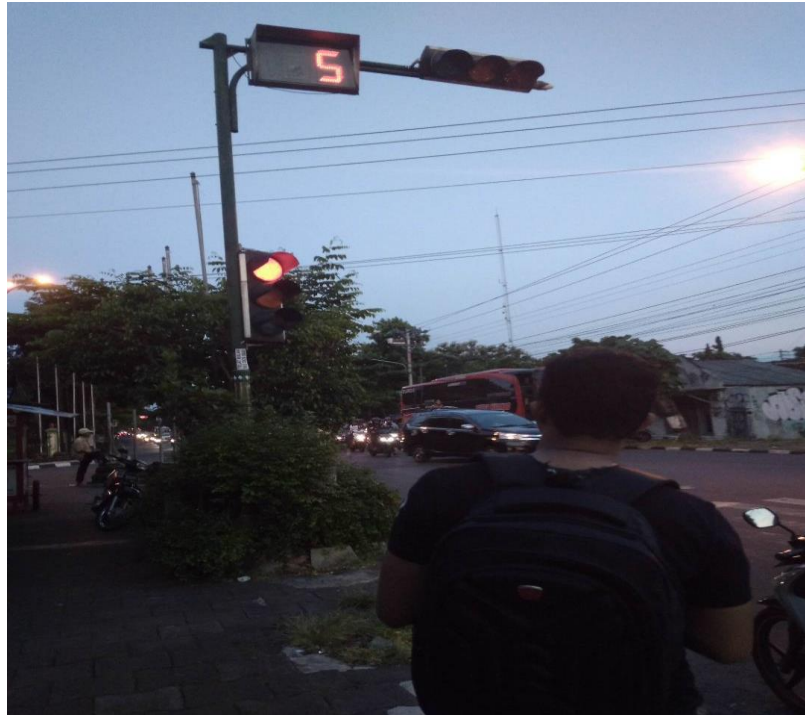
### 1. Foto survei volume lalu lintas



### 2. Foto survei geometrik jalan



3. Foto survei waktu siklus



4. Foto survei kecepatan



### Lampiran 3 Data Survey Volume Lalu Lintas

Arah	Jam	MC	LV	HV	UM	Jam	MC	LV	HV	UM	Jam	MC	LV	HV	UM
B-T	06:00 - 06:15	231	37	4	11	12:00 - 12:15	218	81	9	7	12:00 - 12:15	218	81	9	7
	06:15 - 06:30	339	59	9	3	12:15 - 12:30	221	73	7	4	12:15 - 12:30	221	73	7	4
	06:30 - 06:45	328	43	6	5	12:30 - 12:45	193	96	5	8	12:30 - 12:45	193	96	5	8
	06:45 - 07:00	382	48	5	2	12:45 - 13:00	273	82	11	9	12:45 - 13:00	273	82	11	9
	07:00 - 07:15	311	62	4	0	13:00 - 13:15	219	76	6	3	13:00 - 13:15	219	76	6	3
	07:15 - 07:30	319	52	6	4	13:15 - 13:30	172	90	5	11	13:15 - 13:30	172	90	5	11
	07:30 - 07:45	263	32	7	1	13:30 - 13:45	236	77	8	9	13:30 - 13:45	236	77	8	9
	07:45 - 08:00	209	53	3	6	13:45 - 14:00	208	63	7	5	13:45 - 14:00	208	63	7	5
B-S	06:00 - 06:15	93	12	0	3	12:00 - 12:15	97	21	0	3	16:00 - 16:15	93	19	0	1
	06:15 - 06:30	129	9	0	0	12:15 - 12:30	102	18	0	0	16:15 - 16:30	107	21	0	0
	06:30 - 06:45	136	5	0	2	12:30 - 12:45	117	19	0	0	16:30 - 16:45	148	31	0	3
	06:45 - 07:00	82	15	0	0	12:45 - 13:00	84	22	0	4	16:45 - 17:00	129	32	0	0
	07:00 - 07:15	176	21	0	0	13:00 - 13:15	89	25	0	1	17:00 - 17:15	123	24	0	1
	07:15 - 07:30	129	6	0	1	13:15 - 13:30	93	17	0	2	17:15 - 17:30	132	29	0	0
	07:30 - 07:45	92	11	0	0	13:30 - 13:45	92	18	0	5	17:30 - 17:45	143	35	0	1
	07:45 - 08:00	37	7	0	0	13:45 - 14:00	98	14	0	7	17:45 - 18:00	133	33	0	0
S-B	06:00 - 06:15	157	33	2	1	12:00 - 12:15	71	32	0	0	16:00 - 16:15	72	23	0	3
	06:15 - 06:30	189	27	0	4	12:15 - 12:30	84	39	0	1	16:15 - 16:30	86	29	1	0
	06:30 - 06:45	193	41	0	0	12:30 - 12:45	92	21	2	2	16:30 - 16:45	102	35	0	5
	06:45 - 07:00	154	38	1	4	12:45 - 13:00	69	28	1	0	16:45 - 17:00	128	41	0	1
	07:00 - 07:15	203	29	3	3	13:00 - 13:15	63	31	0	0	17:00 - 17:15	98	47	0	2
	07:15 - 07:30	174	38	1	1	13:15 - 13:30	71	38	0	0	17:15 - 17:30	117	31	1	6
	07:30 - 07:45	138	19	2	2	13:30 - 13:45	62	35	1	1	17:30 - 17:45	99	30	0	4
	07:45 - 08:00	142	27	1	1	13:45 - 14:00	54	32	0	0	17:45 - 18:00	84	26	0	3
S-T	06:00 - 06:15	152	22	1	1	12:00 - 12:15	63	18	0	1	16:00 - 16:15	83	18	0	2
	06:15 - 06:30	173	24	0	3	12:15 - 12:30	52	21	0	0	16:15 - 16:30	88	21	1	0
	06:30 - 06:45	182	14	1	0	12:30 - 12:45	72	17	0	2	16:30 - 16:45	97	23	0	0
	06:45 - 07:00	154	26	0	1	12:45 - 13:00	76	18	0	0	16:45 - 17:00	115	27	1	0
	07:00 - 07:15	191	21	0	0	13:00 - 13:15	56	21	0	0	17:00 - 17:15	123	17	0	3
	07:15 - 07:30	152	17	1	0	13:15 - 13:30	59	19	0	3	17:15 - 17:30	96	19	0	1
	07:30 - 07:45	172	19	1	2	13:30 - 13:45	66	18	0	1	17:30 - 17:45	96	21	0	2
	07:45 - 08:00	142	19	0	1	13:45 - 14:00	78	12	0	1	17:45 - 18:00	92	20	0	2
U-B	06:00 - 06:15	52	28	1	2	12:00 - 12:15	107	36	1	2	16:00 - 16:15	92	39	1	0
	06:15 - 06:30	79	31	0	4	12:15 - 12:30	102	32	2	1	16:15 - 16:30	117	35	2	1
	06:30 - 06:45	92	25	2	3	12:30 - 12:45	118	31	2	0	16:30 - 16:45	132	44	0	2
	06:45 - 07:00	59	24	1	0	12:45 - 13:00	113	35	1	0	16:45 - 17:00	127	46	1	0
	07:00 - 07:15	62	14	0	1	13:00 - 13:15	98	41	1	3	17:00 - 17:15	102	52	3	0
	07:15 - 07:30	77	21	0	2	13:15 - 13:30	96	43	0	0	17:15 - 17:30	118	61	1	1
	07:30 - 07:45	84	26	1	3	13:30 - 13:45	109	36	2	4	17:30 - 17:45	132	46	2	0
	07:45 - 08:00	83	19	1	1	13:45 - 14:00	111	32	3	2	17:45 - 18:00	114	43	2	0
U-T	06:00 - 06:15	69	17	1	2	12:00 - 12:15	91	38	1	1	16:00 - 16:15	97	38	2	2
	06:15 - 06:30	93	19	0	1	12:15 - 12:30	103	41	0	0	16:15 - 16:30	104	37	1	4
	06:30 - 06:45	95	13	2	0	12:30 - 12:45	93	31	1	0	16:30 - 16:45	99	29	0	0
	06:45 - 07:00	75	23	1	0	12:45 - 13:00	84	33	2	2	16:45 - 17:00	126	41	1	0
	07:00 - 07:15	105	18	0	1	13:00 - 13:15	87	39	0	0	17:00 - 17:15	132	33	2	1
	07:15 - 07:30	81	13	2	1	13:15 - 13:30	111	30	1	0	17:15 - 17:30	124	38	2	3
	07:30 - 07:45	85	14	1	0	13:30 - 13:45	71	46	0	1	17:30 - 17:45	105	37	1	1
	07:45 - 08:00	81	11	1	1	13:45 - 14:00	82	40	1	0	17:45 - 18:00	109	33	1	1
U-S	06:00 - 06:15	19	7	0	0	12:00 - 12:15	30	14	0	0	16:00 - 16:15	37	8	0	0
	06:15 - 06:30	27	3	0	0	12:15 - 12:30	33	12	0	0	16:15 - 16:30	31	9	0	0
	06:30 - 06:45	25	8	0	0	12:30 - 12:45	29	17	0	0	16:30 - 16:45	37	11	0	0
	06:45 - 07:00	17	9	0	0	12:45 - 13:00	27	18	0	0	16:45 - 17:00	46	14	0	0
	07:00 - 07:15	26	6	0	0	13:00 - 13:15	32	11	0	0	17:00 - 17:15	72	12	0	0
	07:15 - 07:30	18	7	0	0	13:15 - 13:30	29	9	0	0	17:15 - 17:30	59	11	0	0
	07:30 - 07:45	24	6	0	0	13:30 - 13:45	26	12	0	0	17:30 - 17:45	58	14	0	0
	07:45 - 08:00	22	8	0	0	13:45 - 14:00	28	12	0	0	17:45 - 18:00	52	13	0	0
T-B	06:00 - 06:15	438	93	6	8	12:00 - 12:15	411	67	6	2	16:00 - 16:15	574	91	21	4
	06:15 - 06:30	579	114	9	6	12:15 - 12:30	402	69	8	0	16:15 - 16:30	591	75	17	0
	06:30 - 06:45	621	129	7	9	12:30 - 12:45	399	71	5	4	16:30 - 16:45	619	98	21	1
	06:45 - 07:00	429	83	9	10	12:45 - 13:00	421	65	7	0	16:45 - 17:00	627	102	15	5
	07:00 - 07:15	591	95	10	7	13:00 - 13:15	417	63	4	5	17:00 - 17:15	642	73	19	0
	07:15 - 07:30	508	103	8	5	13:15 - 13:30	398	78	4	1	17:15 - 17:30	649	83	22	1
	07:30 - 07:45	518	92	12	9	13:30 - 13:45	419	73	5	2	17:30 - 17:45	647	92	18	1
	07:45 - 08:00	358	37	9	6	13:45 - 14:00	417	62	9	2	17:45 - 18:00	635	90	11	4
T-S	06:00 - 06:15	168	26	0	0	12:00 - 12:15	201	26	2	3	16:00 - 16:15	201	29	0	2
	06:15 - 06:30	157	29	0	2	12:15 - 12:30	218	22	1	0	16:15 - 16:30	218	31	0	0
	06:30 - 06:45	183	31	1	0	12:30 - 12:45	193	29	3	6	16:30 - 16:45	234	38	0	1
	06:45 - 07:00	197	24	0	1	12:45 - 13:00	197	31	2	1	16:45 - 17:00	251	41	0	3
	07:00 - 07:15	142	33	0	0	13:00 - 13:15	217	21	2	4	17:00 - 17:15	242	35	0	3
	07:15 - 07:30	158	25	1	2	13:15 - 13:30	195	23	3	3	17:15 - 17:30	236	38	0	0
	07:30 - 07:45	189	21	0	1	13:30 - 13:45	192	28	1	4	17:30 - 17:45	239	33	0	2
	07:45 - 08:00	165	28	0	0	13:45 - 14:00	189	26	2	3	17:45 - 18:00	235	39	0	1







c. skenario 3

simpang bersinyal : Penentuan Waktu Siklus Dan Kapasitas																						
Pergerakan																						
<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">fase 1</div> <div style="text-align: center;">fase 2</div> <div style="text-align: center;">fase 3</div> <div style="text-align: center;">fase 4</div> </div>																						
kode pendekat	Hijau dalam Fase	tipe pendekat	Rasio kendaraan berbelok			Arus RT smp/jam		lebar efektif	Arus jenuh smp/jam hijau						Arus lalu lintas smp/jam Q	Rasio arus FR Q/S	Rasio Fase PR = Frcrit IFR	Waktu hijau det g	kapasitas smp/jam S x g/c C	derajat kejenuhan Q/C		
						arah dari	arah lawan		faktor penyesuaian			nilai diseuaikan smp/jam waktu hijau S										
			P LTOR	P LT	P RT	Q RT	Q RTO	We	Nilai dasar smp/jam Hijau (S0)	semua tipe pendekat			hanya tipe P									
			ukuran kota Fcs	Hambatan Samping Fsf	kelandaian FG	Parkir Fp	Belok kanan Frt	belok kiri Flt														
U		p		0.384	0.468			6.3	3780	0.83	0.93	1	1	1.12168	0.93856	3071.74	662.1	0.21555	0.19636	24	460.760369	1.43697
T		p	0.262					6.3	3780	0.83	0.93	1	1	1	1	2917.78	1299.8	0.44548	0.40583	50	911.806875	1.42552
S		p		0.582	0.418			4.4	2640	0.83	0.93	1	1	1.10868	0.90688	2048.9	410	0.20011	0.1823	22	281.723907	1.45533
B		p			0.303			6.3	3780	0.83	0.93	1	1	1.07878	1	3147.64	744.6	0.23656	0.21551	26	511.492291	1.45574
																E Frcrit	1.09769					
																Cua	476.923					
																C	160					
LTI = 38																						



## Lampiran 5 Tabel Hasil *Running* Pemodelan

### 1. Hasil *Running* kondisi eksisting

MOVEMENT	QLEN	QLENM AX	VEHS(A LL)	PERS(AL L)	LOS(AL L)	LOSVA L(ALL)	VEHDEL AY(ALL )	PERSDE LAY(AL L)	STOPDE LAY(AL L)	STOPS( ALL)	EMISSIO NSCO	EMISSI ONSNO X	EMISSI ONSVO C	FUELCO NSUMPT ION
Jl.Sultan Agung : Jl. Kusumanegara	76.26	151.76	167	167	LOS_F	6	104.4	104.4	83.08	6.53	458.389	89.186	106.236	6.558
Jl.Sultan Agung : Jl.Batikan	76.26	151.76	73	73	LOS_F	6	122.82	122.82	99.87	6.11	219.016	42.613	50.759	3.133
Jl. Kusumanegara : Jl.Sultan Agung	210.14	390.41	132	132	LOS_F	6	168.52	168.52	132.55	12.05	580.385	112.922	134.51	8.303
Jl. Kusumanegara : Jl.Batikan	184.41	361.6	68	68	LOS_F	6	117.46	117.46	86.63	11.56	232.268	45.191	53.83	3.323
Jl.Batikan : Jl.Sultan Agung	34.94	70.4	72	72	LOS_F	6	81.17	81.17	70.94	4.08	140.753	27.385	32.621	2.014
Jl.Batikan : Jl. Kusumanegara	34.94	70.4	58	58	LOS_F	6	85.77	85.77	74.58	4.67	115.446	22.462	26.756	1.652
Jl. KI Mangunsarkoro : Jl.Sultan Agung	49.56	86.27	69	69	LOS_F	6	113.44	113.44	98.08	5.33	178.191	34.669	41.297	2.549
Jl. KI Mangunsarkoro : Jl. Kusumanegara	49.56	86.27	85	85	LOS_F	6	123.24	123.24	106.33	5.72	250.415	48.722	58.036	3.582
Jl. KI Mangunsarkoro : Jl.Batikan	49.56	86.27	31	31	LOS_F	6	132.39	132.39	116.47	5.81	95.781	18.635	22.198	1.37
Rata-Rata	111.06	390.41	755	755	LOS_F	6	119.02	119.02	97.22	7.3	2257.468	439.221	523.19	32.296

2. Hasil *Running* skenario 1 waktu siklus 130 detik

MOVEMENT	QLE N	QLENM AX	VEHS( ALL)	PERS( ALL)	LOS(A LL)	LOS VAL (ALL )	VEHD ELAY( ALL)	PERS DELA Y(ALL )	STOP DELA Y(AL L)	STO PS(A LL)	EMISS IONS CO	EMISS IONS NOX	EMISSI ONSV OC	FUELCON SUMPTIO N
Jl.Sultan Agung: Jl. Kusumanegara	91.3	165.639	136	136	LOS_F	6	128.58	128.6	108.9	6.15	415.3	80.796	96.243	5.940898
Jl.Sultan Agung: Jl.Batikan	91.3	165.639	60	60	LOS_F	6	139.92	139.9	117.8	6.6	198.2	38.567	45.94	2.835777
Jl.Batikan : Jl.Sultan Agung	179	390.622	200	200	LOS_F	6	137.77	137.8	96.9	16.6	913.5	177.73	211.71	13.068692
Jl.Batikan : Jl. Kusumanegara	155	361.814	91	91	LOS_F	6	100.26	100.3	65.47	16.4	334.3	65.033	77.466	4.781841
Jl. KI Mangunsarkoro: Jl.Sultan Agung	48.6	103.212	66	66	LOS_F	6	111.89	111.9	99.34	5.45	166.8	32.452	38.656	2.386187
Jl. KI Mangunsarkoro: Jl. Kusumanegara	48.6	103.212	52	52	LOS_F	6	115.54	115.5	101.8	6.85	134.6	26.188	31.194	1.925555
Jl. KI Mangunsarkoro: Jl.Batikan	48.2	86.2716	68	68	LOS_F	6	116.77	116.8	102.4	4.87	175.3	34.099	40.618	2.507302
Jl.kusumanegara : Jl.Batikan	48.2	86.2716	83	83	LOS_F	6	105.26	105.3	90.31	5.28	217.5	42.31	50.399	3.111024
Jl.kusumanegara : Jl.Sultan Agung	48.2	86.2716	31	31	LOS_F	6	119.74	119.7	103	5.84	90.42	17.592	20.955	1.293499
Rata-Rata	104	390.622	787	787	LOS_F	6	122.41	122.4	97.49	9.79	2633	512.26	610.19	37.666176

3. Hasil *Running* skenario 1 waktu siklus 149 detik

MOVEMENT	QLE N	QLENM AX	VEHS( ALL)	PERS( ALL)	LOS(A LL)	LOS VAL (ALL )	VEHD ELAY( ALL)	PERS DELA Y(ALL )	STOP DELA Y(AL L)	STO PS(A LL)	EMISS IONS CO	EMISS IONS NOX	EMISSI ONSV OC	FUELCON SUMPTIO N
Jl.Sultan Agung: Jl. Kusumanegara	89.7	165.62	154	154	LOS_F	6	144.99	145	123.4	8.36	547.3	106.49	126.84	7.83
Jl.Sultan Agung: Jl.Batikan	89.7	165.62	67	67	LOS_F	6	155.24	155.2	130.3	8.82	252.8	49.191	58.596	3.617
Jl.Batikan : Jl.Sultan Agung	168	388.73	221	221	LOS_F	6	115.81	115.8	79.89	11.3	784	152.54	181.7	11.216
Jl.Batikan : Jl. Kusumanegara	145	359.92	102	102	LOS_E	5	78.12	78.12	50.77	9.87	268.5	52.234	62.22	3.841
Jl. KI Mangunsarkoro: Jl.Sultan Agung	44.1	103.21	62	62	LOS_F	6	93.72	93.72	83.45	4.39	134.4	26.141	31.138	1.922
Jl. KI Mangunsarkoro: Jl. Kusumanegara	44.1	103.21	45	45	LOS_F	6	94.28	94.28	83.17	4.64	95.13	18.509	22.047	1.361
Jl. KI Mangunsarkoro: Jl.Batikan	45.5	86.27	69	69	LOS_F	6	96.64	96.64	85.45	3.49	145	28.219	33.613	2.075
Jl.kusumanegara : Jl.Batikan	45.5	86.27	78	78	LOS_F	6	89.48	89.48	78.21	3.03	163.6	31.837	37.924	2.341
Jl.kusumanegara : Jl.Sultan Agung	45.5	86.27	30	30	LOS_F	6	98.38	98.38	86.08	3.87	70.13	13.644	16.252	1.003
Rata-Rata	98.6	388.73	828	828	LOS_F	6	112.25	112.3	89.44	7.79	2458	478.25	569.68	35.165

4. Hasil *Running* skenario 2

MOVEMENT	QLEN	QLENM AX	VEHS(A LL)	PERS(A LL)	LOS(AL L)	LOSVA L(ALL)	VEHDEL AY(ALL )	PERSDE LAY(AL L)	STOPDE LAY(AL L)	STOPS( ALL)	EMISSIO NSCO	EMISSI ONSNO X	EMISSI ONSVO C	FUELC ONSUM PTION
Jl.Sultan Agung: Jl. Kusumanegara	98.06	173.4	117	117	LOS_F	6	130.69	130.69	115.5	6.11	359.171	69.882	83.241	5.138
Jl.Sultan Agung: jl.Batikan	98.06	173.4	53	53	LOS_F	6	147	147	125.56	7.21	184.087	35.817	42.664	2.634
jl.Batikan : Jl.Sultan Agung	52.26	103.22	62	62	LOS_F	6	139.13	139.13	124.67	8.39	197.283	38.384	45.722	2.822
jl.Batikan : Jl. Kusumanegara	52.26	103.22	47	47	LOS_F	6	131.26	131.26	117.12	8.32	139.034	27.051	32.222	1.989
Jl. KI Mangunsarkoro: Jl.Sultan Agung	54.59	86.27	59	59	LOS_F	6	139.41	139.41	121.91	6.24	180.64	35.146	41.865	2.584
Jl. KI Mangunsarkoro: Jl. Kusumanegara	54.59	86.27	70	70	LOS_F	6	119.49	119.49	105.32	5.39	198.706	38.661	46.052	2.843
Jl. KI Mangunsarkoro: jl.Batikan	54.59	86.27	23	23	LOS_F	6	125.2	125.2	109.03	5.96	69.148	13.454	16.026	0.989
jl.kusumanegara : jl.Batikan	136.15	299.89	301	301	LOS_F	6	97.19	97.19	64.1	10.4	955.111	185.83	221.356	13.664
jl.kusumanegara : Jl.Sultan Agung	0.28	21.67	175	175	LOS_A	1	0.1	0.1	0	0	62.688	12.197	14.529	0.897
Rata-Rata	68.27	299.89	907	907	LOS_F	6	95.5	95.5	76.92	6.64	2346.055	456.457	543.721	33.563



5. Hasil *Running* skenario 3

MOVEMENT	QLEN	QLENM AX	VEHS(A LL)	PERS(A LL)	LOS(AL L)	LOSVA L(ALL)	VEHDEL AY(ALL )	PERSDE LAY(AL L)	STOPDE LAY(AL L)	STOPS( ALL)	EMISSI ONSCO	EMISSI ONSNO X	EMISSI ONSVO C	FUELC ONSUM PTION
Jl.Sultan Agung: Jl. Kusumanegara	93.86	173.39	44	44	LOS_F	6	118.39	118.39	102.59	6.09	125.538	24.425	29.095	1.796
Jl.Sultan Agung: Jl.Batikan	93.86	173.39	111	111	LOS_F	6	115.75	115.75	96.1	7	332.06	64.607	76.958	4.75
Jl.Batikan : Jl.Sultan Agung	43.04	100.58	48	48	LOS_F	6	98.85	98.85	89.72	4.13	106.393	20.7	24.658	1.522
Jl.Batikan : Jl. Kusumanegara	43.04	100.58	74	74	LOS_F	6	101.09	101.09	91.64	3.72	158.145	30.769	36.652	2.262
Jl. KI Mangunsarkoro: Jl.Sultan Agung	47.28	86.27	92	92	LOS_F	6	110.73	110.73	96.09	5.36	236.201	45.956	54.742	3.379
Jl. KI Mangunsarkoro: Jl. Kusumanegara	47.28	86.27	28	28	LOS_F	6	111.96	111.96	97.82	5.61	76.044	14.795	17.624	1.088
Jl. KI Mangunsarkoro: Jl.Batikan	47.28	86.27	64	64	LOS_F	6	113.44	113.44	97.05	6.64	187.84	36.547	43.534	2.687
Jl.kusumanegara : Jl.Batikan	53.87	132.35	403	403	LOS_E	5	70.43	70.43	52.13	5.26	870.968	169.459	201.855	12.46
Jl.kusumanegara : Jl.Sultan Agung	0	0	183	183	LOS_A	1	0.65	0.65	0	0	66.987	13.033	15.525	0.958
Rata-Rata	47.61	173.39	1047	1047	LOS_E	5	75.8	75.8	62.15	4.5	2152.59	418.816	498.883	30.795