# BAB VI

# KESIMPULAN DAN SARAN

## 6.1. Kesimpulan

Berdasarkan hasil pengamatan dan analisis yang dilakukan maka dapat disimpulkan bahwa :

1. Pengaruh aktivitas pasar dan terminal terhadap kinerja simpang empat bersinyal Secang antara lain :
   a. Hambatan samping yang terjadi sebelum simpang sangat tinggi (VH) sehingga kinerja simpang tidak maksimal, ini terlihat pada pagi hari dimana jumlah kendaraan yang keluar dari lengan sedikit dikarenakan sudah terkena hambatan samping. Hal ini terjadi pada lengan selatan (Secang – Magelang) dan barat (Secang – Temanggung), sedangkan lengan utara (Secang – Semarang) dan timur (Secang – Alternatif Grabak/Magelang) masih tergolong sedang (M).
   b. Tingkat pelayanan pada lengan selatan (Secang – Magelang) dan barat (Secang – Temanggung) temasuk dalam kelas D, dimana arus lalu lintas sudah mulai tidak stabil, volume kira-kira sama dengan kapasitas, dan sering terjadi kemacetan. Pada lengan utara (Secang – Semarang) dan timur (Secang – Alternatif Grabak/Magelang) temasuk dalam kelas B dimana arus lalu lintas masih stabil dan kecepatan mulai dipengaruhi oleh keadaan lalu lintas, tetapi tetap dapat dipilih sesuai kehendak.

2. Simpang empat bersinyal Secang mempunyai arus lalu lintas ( Q ) tertinggi pada sore hari sebesar 790 smp/jam dan kapasitas ( C ) sebesar 570,9 smp/jam dengan nilai derajat kejenuhan ( DS ) sebesar 1,38.
3. Dalam analisis ini digunakan 5 (lima) alternatif desain untuk meminimalkan derajat kejenuhan pada setiap pendekat. Alternatif desain yang digunakan antara lain sebagai berikut.
   a. Alternatif I, yaitu menertibkan parkir sejauh 80 m, C = 713,6 smp/jam dan DS = 1,11.
   b. Alternatif II, yaitu desain geometrik simpang serta pengaturan waktu hijau, C = 850.7 smp/ jam dan DS = 0,93.
   c. Alternatif III, yaitu memindahkan arus lalu lintas kendaraan ringan dan motor ke jalur alternatif yang lain, C = 571,4 smp/ jam dan DS = 1,10.
   d. Alternatif IV, yaitu gabungan alternatif I dan II, dengan nilai C = 1063,40 smp/jam dan DS = 0,74.
   e. Alternatif V, yaitu gabungan Alternatif I, II dan III, dengan nilai C = 1064,90 smp/jam dan DS = 0,62

Dapat diambil kesimpulan dari beberapa alternatif dipilih yang terbaik, yaitu alternatif V dengan penggabungan alternatif I, II dan III, yaitu larangan berhenti dan parkir dekat simpang, dengan mendesain geometrik serta mengubah waktu *green,* dan memindahkan arus kendaraan ringan dan motor ke jalur alternatif yang menuju Magelang – Temanggung – Semarang di dapat nilai C = 1064,90 smp/jam dan DS = 0,62.

## 6.2.Saran

Berdasarkan hasil penelitian penulis memberikan beberapa masukan yang kiranya bisa bermanfaat :

1. Perlunya penambahan lebar jalan untuk pendekat barat dan selatan, serta mengubah pengaturan waktu hijau
2. Melakukan penertiban terhadap parkir kendaraan yang terlalu dekat dengan simpang.
3. Petugas lalu lintas dalam hal ini Polisi, diharapkan dapat membantu dan siaga untuk membantu kelancaran lalu lintas pada periode jam puncak.

## DAFTAR PUSTAKA


Abubakar, Iskandar, dkk., 1996, *Menuju Lalu Lintas dan Angkutan Jalan yang Tertib*, Direktorat Jenderal Perhubungan Darat, Departemen Perhubungan Republik Indonesia.

Abubakar, Iskandar, dkk., 1999, *Rekayasa Lalu Lintas, Direktorat Bina Sistem Lalu Lintas dan Angkutan Kota*, Direktorat Jenderal Perhubungan Darat, Departemen Perhubungan Republik Indonesia.

Anonim, 1995, *Kamus Besar Bahasa Indonesia*, Balai Pustaka, Jakarta.

Anonim, 2008, *Kota Magelang Dalam Angka*, BPS., Magelang.

Anonim, 1997, *Manual Kapasitas Jalan Indonesia*, Direktoral Jenderal Bina Marga, Departeman Pekerjaan Umum.

Hobbs F. D., 1995, *Perencanaan dan Teknik Lalu-Lintas,* Universitas Gadjah Mada Yogyakarta.

Malkhamah. S., 1996, *Survei Lampu Lalu-Lintas dan Pengantar Managemen Lalu-Lintas,* Biro Penerbit KMTS FT UGM, Yogyakarta.

Morlok Edward K, 1998, *Pengantar Teknik dan Perencanaan Transportasi,* Erlangga, Jakarta.

Munawar. A, 2004, *Program Komputer untuk Analisis Lalu Lintas,* Beta Offset, Yogyakarta.

Oglesby H.C dan Hicks. G R., 1988 *Teknik Jalan Raya*, Erlangga, Jakarta.

# Lampiran 1

(Data Arus Kendaraan)

SESI I

hari/tanggal : sabtu/09 januari 2010
arah : MGL - SCG **S**

| waktu | Kendaraan/jam | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | motor (MC) | | | tak bermotor | | | mobil (LV) | | | BERAT (HV) | | |
| | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan |
| 08.00 - 08.15 | 56 | 100 | 11 | 0 | 1 | 1 | 19 | 56 | 6 | 18 | 20 | 0 |
| 08.15 - 08.30 | 59 | 114 | 13 | 1 | 3 | 1 | 25 | 59 | 4 | 20 | 28 | 1 |
| 08.30 - 08.45 | 63 | 95 | 11 | 1 | 0 | 1 | 18 | 52 | 8 | 18 | 24 | 1 |
| 08.45 - 09.00 | 48 | 93 | 9 | 2 | 2 | 0 | 23 | 54 | 7 | 17 | 23 | 1 |
| 09.00 - 09.15 | 56 | 103 | 19 | 1 | 1 | 2 | 29 | 53 | 7 | 20 | 19 | 0 |
| 09.15 - 09.30 | 58 | 106 | 23 | 1 | 1 | 2 | 23 | 43 | 5 | 16 | 21 | 1 |
| 09.30 - 09.45 | 61 | 98 | 16 | 0 | 2 | 1 | 28 | 49 | 4 | 18 | 18 | 0 |
| 09.45 - 10.00 | 46 | 103 | 18 | 1 | 0 | 1 | 20 | 51 | 6 | 19 | 16 | 2 |

hari/tanggal : sabtu/09 januari 2010
arah : TMG - SCG **B**

| waktu | Kendaraan/jam | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | motor (MC) | | | tak bermotor | | | mobil (LV) | | | BERAT (HV) | | |
| | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan |
| 08.00 - 08.15 | 25 | 22 | 56 | 0 | 1 | 1 | 8 | 4 | 31 | 9 | 2 | 25 |
| 08.15 - 08.30 | 24 | 18 | 64 | 1 | 2 | 2 | 11 | 2 | 25 | 5 | 1 | 24 |
| 08.30 - 08.45 | 38 | 23 | 76 | 1 | 1 | 0 | 8 | 3 | 34 | 6 | 1 | 16 |
| 08.45 - 09.00 | 31 | 18 | 81 | 1 | 2 | 1 | 12 | 5 | 28 | 8 | 2 | 13 |
| 09.00 - 09.15 | 34 | 16 | 63 | 0 | 1 | 1 | 9 | 1 | 25 | 5 | 1 | 18 |
| 09.15 - 09.30 | 34 | 23 | 58 | 1 | 0 | 0 | 14 | 4 | 34 | 6 | 3 | 26 |
| 09.30 - 09.45 | 28 | 24 | 76 | 1 | 1 | 1 | 13 | 5 | 24 | 4 | 0 | 24 |
| 09.45 - 10.00 | 35 | 18 | 68 | 2 | 0 | 1 | 11 | 1 | 29 | 6 | 1 | 19 |

hari/tanggal : sabtu/09 januari 2010
arah : SMG - SCG **U**

| waktu | Kendaraan/jam | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | motor (MC) | | | tak bermotor | | | mobil (LV) | | | BERAT (HV) | | |
| | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan |
| 08.00 - 08.15 | 15 | 136 | 37 | 0 | 2 | 1 | 3 | 73 | 15 | 2 | 41 | 7 |
| 08.15 - 08.30 | 17 | 132 | 27 | 1 | 3 | 1 | 6 | 64 | 15 | 1 | 24 | 6 |
| 08.30 - 08.45 | 12 | 111 | 21 | 0 | 0 | 0 | 5 | 63 | 13 | 2 | 22 | 5 |
| 08.45 - 09.00 | 22 | 108 | 34 | 0 | 2 | 2 | 5 | 65 | 6 | 2 | 36 | 5 |
| 09.00 - 09.15 | 19 | 115 | 28 | 0 | 1 | 0 | 3 | 55 | 9 | 3 | 34 | 2 |
| 09.15 - 09.30 | 17 | 133 | 27 | 1 | 0 | 0 | 4 | 57 | 11 | 0 | 29 | 6 |
| 09.30 - 09.45 | 20 | 128 | 24 | 0 | 0 | 2 | 2 | 61 | 13 | 0 | 24 | 4 |
| 09.45 - 10.00 | 16 | 130 | 31 | 1 | 1 | 1 | 3 | 64 | 9 | 1 | 35 | 6 |

hari/tanggal : sabtu/09 januari 2010
arah : Alternatif - SCG **T**

| waktu | Kendaraan/jam | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | motor (MC) | | | tak bermotor | | | mobil (LV) | | | BERAT (HV) | | |
| | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan |
| 08.00 - 08.15 | 25 | 24 | 16 | 0 | 1 | 1 | 11 | 5 | 2 | 1 | 5 | 1 |
| 08.15 - 08.30 | 16 | 31 | 20 | 1 | 0 | 2 | 10 | 3 | 5 | 3 | 1 | 2 |
| 08.30 - 08.45 | 24 | 25 | 14 | 1 | 2 | 0 | 7 | 4 | 1 | 0 | 3 | 3 |
| 08.45 - 09.00 | 19 | 24 | 13 | 0 | 4 | 0 | 9 | 8 | 3 | 1 | 2 | 1 |
| 09.00 - 09.15 | 24 | 16 | 9 | 1 | 0 | 1 | 6 | 9 | 4 | 2 | 2 | 2 |
| 09.15 - 09.30 | 19 | 23 | 18 | 3 | 1 | 2 | 9 | 6 | 5 | 1 | 3 | 2 |
| 09.30 - 09.45 | 13 | 21 | 24 | 1 | 2 | 1 | 7 | 5 | 2 | 3 | 1 | 1 |
| 09.45 - 10.00 | 17 | 18 | 17 | 2 | 0 | 1 | 8 | 6 | 3 | 0 | 2 | 1 |

SESI II

hari/tanggal : sabtu/09 januari 2010
arah : MGL - SCG

**S**

| waktu | Kendaraan/jam | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | motor (MC) | | | tak bermotor | | | mobil (LV) | | | BERAT (HV) | | |
| | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan |
| 12.00 - 12.15 | 34 | 80 | 15 | 1 | 0 | 0 | 28 | 87 | 4 | 21 | 15 | 1 |
| 12.15 - 12.30 | 46 | 95 | 14 | 1 | 1 | 1 | 27 | 76 | 5 | 20 | 26 | 0 |
| 12.30 - 12.45 | 56 | 86 | 14 | 0 | 2 | 1 | 37 | 75 | 3 | 15 | 28 | 0 |
| 12.45 - 13.00 | 54 | 94 | 10 | 1 | 0 | 0 | 35 | 82 | 6 | 16 | 34 | 1 |
| 13.00 - 13.15 | 67 | 86 | 7 | 2 | 0 | 1 | 38 | 73 | 2 | 22 | 35 | 0 |
| 13.15 - 13.30 | 53 | 84 | 14 | 1 | 1 | 1 | 24 | 68 | 5 | 16 | 21 | 0 |
| 13.30 - 13.45 | 57 | 78 | 11 | 0 | 0 | 1 | 35 | 67 | 1 | 14 | 23 | 1 |
| 13.45 - 14.00 | 60 | 86 | 12 | 2 | 1 | 0 | 35 | 76 | 3 | 14 | 24 | 1 |

hari/tanggal : sabtu/09 januari 2010
arah : TMG - SCG

**B**

| waktu | Kendaraan/jam | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | motor (MC) | | | tak bermotor | | | mobil (LV) | | | BERAT (HV) | | |
| | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan |
| 12.00 - 12.15 | 36 | 20 | 65 | 1 | 1 | 2 | 11 | 6 | 32 | 8 | 4 | 19 |
| 12.15 - 12.30 | 34 | 21 | 70 | 2 | 2 | 0 | 12 | 4 | 29 | 6 | 2 | 21 |
| 12.30 - 12.45 | 40 | 19 | 80 | 2 | 2 | 0 | 9 | 5 | 27 | 5 | 2 | 14 |
| 12.45 - 13.00 | 35 | 16 | 81 | 0 | 3 | 1 | 12 | 4 | 29 | 7 | 1 | 24 |
| 13.00 - 13.15 | 37 | 19 | 70 | 1 | 3 | 1 | 12 | 3 | 28 | 9 | 3 | 26 |
| 13.15 - 13.30 | 41 | 21 | 73 | 2 | 1 | 4 | 14 | 2 | 31 | 7 | 3 | 18 |
| 13.30 - 13.45 | 37 | 14 | 76 | 1 | 1 | 0 | 15 | 3 | 34 | 6 | 4 | 19 |
| 13.45 - 14.00 | 38 | 20 | 72 | 0 | 1 | 1 | 14 | 4 | 29 | 8 | 2 | 20 |

hari/tanggal : sabtu/09 januari 2010
arah : SMG - SCG

**U**

| waktu | Kendaraan/jam | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | motor (MC) | | | tak bermotor | | | mobil (LV) | | | BERAT (HV) | | |
| | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan |
| 12.00 - 12.15 | 11 | 82 | 34 | 0 | 1 | 0 | 6 | 76 | 15 | 0 | 18 | 3 |
| 12.15 - 12.30 | 16 | 76 | 25 | 2 | 0 | 1 | 4 | 92 | 7 | 0 | 25 | 5 |
| 12.30 - 12.45 | 14 | 82 | 36 | 0 | 0 | 3 | 3 | 84 | 9 | 1 | 26 | 6 |
| 12.45 - 13.00 | 15 | 86 | 27 | 0 | 1 | 3 | 2 | 91 | 13 | 1 | 28 | 2 |
| 13.00 - 13.15 | 11 | 95 | 28 | 2 | 0 | 1 | 1 | 85 | 11 | 0 | 31 | 6 |
| 13.15 - 13.30 | 16 | 92 | 24 | 1 | 2 | 1 | 3 | 86 | 12 | 1 | 24 | 3 |
| 13.30 - 13.45 | 13 | 84 | 29 | 1 | 1 | 2 | 2 | 86 | 9 | 0 | 29 | 2 |
| 13.45 - 14.00 | 15 | 90 | 31 | 0 | 2 | 0 | 3 | 82 | 8 | 1 | 29 | 2 |

hari/tanggal : sabtu/09 januari 2010
arah : Alternatif - SCG

**T**

| waktu | Kendaraan/jam | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | motor (MC) | | | tak bermotor | | | mobil (LV) | | | BERAT (HV) | | |
| | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan |
| 12.00 - 12.15 | 11 | 10 | 4 | 0 | 2 | 1 | 6 | 6 | 3 | 2 | 2 | 1 |
| 12.15 - 12.30 | 16 | 11 | 9 | 1 | 0 | 3 | 2 | 8 | 6 | 1 | 1 | 4 |
| 12.30 - 12.45 | 11 | 9 | 10 | 1 | 1 | 2 | 8 | 6 | 8 | 1 | 2 | 1 |
| 12.45 - 13.00 | 14 | 12 | 8 | 0 | 1 | 2 | 5 | 9 | 4 | 1 | 3 | 2 |
| 13.00 - 13.15 | 18 | 8 | 6 | 1 | 0 | 1 | 10 | 10 | 4 | 0 | 1 | 1 |
| 13.15 - 13.30 | 16 | 13 | 6 | 3 | 1 | 0 | 6 | 7 | 3 | 1 | 3 | 3 |
| 13.30 - 13.45 | 14 | 9 | 4 | 1 | 1 | 2 | 4 | 5 | 4 | 2 | 1 | 1 |
| 13.45 - 14.00 | 15 | 14 | 8 | 2 | 0 | 2 | 3 | 6 | 3 | 0 | 2 | 2 |

SESI III

hari/tanggal : sabtu/09 januari 2010
arah : MGL - SCG **S**

| waktu | Kendaraan/jam | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | motor (MC) | | | tak bermotor | | | mobil (LV) | | | BERAT (HV) | | |
| | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan |
| 17.00 - 17.15 | 61 | 124 | 14 | 1 | 2 | 0 | 46 | 101 | 10 | 20 | 38 | 3 |
| 17.15 - 17.30 | 56 | 135 | 12 | 2 | 1 | 1 | 51 | 98 | 8 | 21 | 40 | 2 |
| 17.30 - 17.45 | 67 | 128 | 10 | 1 | 2 | 0 | 53 | 119 | 11 | 19 | 38 | 2 |
| 17.45 -18.00 | 40 | 112 | 9 | 1 | 3 | 2 | 46 | 122 | 12 | 15 | 28 | 3 |
| 18.00 - 18.15 | 54 | 103 | 11 | 4 | 0 | 1 | 49 | 116 | 12 | 28 | 29 | 2 |
| 18.15 - 18.30 | 59 | 99 | 12 | 0 | 2 | 1 | 50 | 110 | 10 | 18 | 34 | 1 |
| 18.30 - 18.45 | 68 | 114 | 9 | 2 | 1 | 2 | 48 | 102 | 9 | 19 | 31 | 2 |
| 18.45 - 19.00 | 68 | 109 | 13 | 1 | 3 | 2 | 42 | 97 | 8 | 23 | 32 | 2 |

hari/tanggal : sabtu/09 januari 2010
arah : TMG - SCG **B**

| waktu | Kendaraan/jam | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | motor (MC) | | | tak bermotor | | | mobil (LV) | | | BERAT (HV) | | |
| | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan |
| 17.00 - 17.15 | 34 | 20 | 29 | 1 | 2 | 1 | 20 | 3 | 46 | 7 | 2 | 11 |
| 17.15 - 17.30 | 35 | 22 | 34 | 0 | 2 | 3 | 19 | 7 | 40 | 6 | 1 | 8 |
| 17.30 - 17.45 | 36 | 21 | 54 | 4 | 3 | 0 | 16 | 5 | 55 | 8 | 2 | 12 |
| 17.45 -18.00 | 38 | 23 | 63 | 2 | 1 | 0 | 18 | 4 | 56 | 6 | 2 | 4 |
| 18.00 - 18.15 | 28 | 26 | 46 | 2 | 1 | 3 | 16 | 6 | 49 | 8 | 1 | 13 |
| 18.15 - 18.30 | 34 | 18 | 60 | 0 | 3 | 4 | 19 | 3 | 37 | 6 | 1 | 10 |
| 18.30 - 18.45 | 35 | 18 | 54 | 2 | 2 | 1 | 21 | 4 | 49 | 6 | 3 | 14 |
| 18.45 - 19.00 | 38 | 27 | 48 | 0 | 1 | 3 | 19 | 5 | 47 | 7 | 3 | 10 |

hari/tanggal : sabtu/09 januari 2010
arah : SMG - SCG **U**

| waktu | Kendaraan/jam | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | motor (MC) | | | tak bermotor | | | mobil (LV) | | | BERAT (HV) | | |
| | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan |
| 17.00 - 17.15 | 4 | 101 | 18 | 1 | 0 | 1 | 3 | 84 | 28 | 2 | 20 | 3 |
| 17.15 - 17.30 | 6 | 112 | 24 | 0 | 1 | 3 | 4 | 73 | 21 | 1 | 19 | 4 |
| 17.30 - 17.45 | 5 | 115 | 21 | 0 | 2 | 1 | 2 | 67 | 23 | 3 | 11 | 5 |
| 17.45 -18.00 | 6 | 95 | 29 | 3 | 1 | 4 | 2 | 86 | 19 | 2 | 13 | 3 |
| 18.00 - 18.15 | 9 | 108 | 14 | 1 | 2 | 2 | 3 | 80 | 16 | 0 | 15 | 6 |
| 18.15 - 18.30 | 8 | 98 | 28 | 1 | 5 | 3 | 1 | 81 | 18 | 1 | 14 | 2 |
| 18.30 - 18.45 | 5 | 101 | 18 | 2 | 0 | 1 | 3 | 69 | 16 | 2 | 13 | 5 |
| 18.45 - 19.00 | 3 | 93 | 13 | 1 | 2 | 0 | 3 | 59 | 18 | 1 | 16 | 2 |

hari/tanggal : sabtu/09 januari 2010
arah : Alternatif - SCG **T**

| waktu | Kendaraan/jam | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | motor (MC) | | | tak bermotor | | | mobil (LV) | | | BERAT (HV) | | |
| | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan |
| 17.00 - 17.15 | 9 | 16 | 13 | 2 | 1 | 0 | 12 | 6 | 1 | 2 | 3 | 1 |
| 17.15 - 17.30 | 18 | 14 | 18 | 2 | 1 | 3 | 12 | 6 | 3 | 1 | 1 | 1 |
| 17.30 - 17.45 | 21 | 15 | 12 | 0 | 2 | 1 | 5 | 7 | 6 | 2 | 1 | 3 |
| 17.45 -18.00 | 19 | 12 | 16 | 1 | 0 | 3 | 8 | 3 | 5 | 1 | 2 | 2 |
| 18.00 - 18.15 | 16 | 25 | 18 | 3 | 1 | 0 | 5 | 3 | 2 | 1 | 1 | 0 |
| 18.15 - 18.30 | 17 | 13 | 13 | 1 | 1 | 1 | 11 | 1 | 3 | 2 | 1 | 2 |
| 18.30 - 18.45 | 18 | 15 | 16 | 0 | 2 | 1 | 4 | 5 | 1 | 3 | 0 | 2 |
| 18.45 - 19.00 | 18 | 18 | 15 | 1 | 2 | 1 | 8 | 5 | 5 | 1 | 0 | 3 |

SESI I

hari/tanggal : MINGGU/10 januari 2010

arah : MGL - SCG **S**

| waktu | motor (MC) | | | tak bermotor | | | mobil (LV) | | | BERAT (HV) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan |
| 08.00 - 08.15 | 54 | 96 | 19 | 0 | 1 | 2 | 15 | 48 | 7 | 14 | 18 | 2 |
| 08.15 - 08.30 | 68 | 95 | 19 | 1 | 1 | 0 | 20 | 52 | 7 | 18 | 23 | 1 |
| 08.30 - 08.45 | 51 | 105 | 15 | 0 | 0 | 1 | 27 | 43 | 6 | 15 | 13 | 1 |
| 08.45 - 09.00 | 43 | 111 | 14 | 1 | 2 | 0 | 24 | 48 | 7 | 16 | 16 | 1 |
| 09.00 - 09.15 | 48 | 117 | 13 | 0 | 1 | 1 | 28 | 51 | 4 | 14 | 16 | 0 |
| 09.15 - 09.30 | 50 | 102 | 24 | 1 | 2 | 0 | 11 | 42 | 6 | 20 | 18 | 1 |
| 09.30 - 09.45 | 43 | 95 | 18 | 0 | 1 | 2 | 23 | 41 | 5 | 14 | 18 | 0 |
| 09.45 - 10.00 | 51 | 94 | 11 | 1 | 1 | 1 | 19 | 48 | 7 | 17 | 20 | 1 |

hari/tanggal : MINGGU/10 januari 2010

arah : TMG - SCG **B**

| waktu | motor (MC) | | | tak bermotor | | | mobil (LV) | | | BERAT (HV) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan |
| 08.00 - 08.15 | 35 | 20 | 61 | 1 | 1 | 2 | 10 | 5 | 30 | 10 | 3 | 21 |
| 08.15 - 08.30 | 41 | 14 | 76 | 1 | 2 | 1 | 13 | 4 | 27 | 6 | 1 | 24 |
| 08.30 - 08.45 | 37 | 28 | 80 | 1 | 1 | 2 | 6 | 5 | 36 | 7 | 2 | 20 |
| 08.45 - 09.00 | 40 | 18 | 75 | 0 | 3 | 0 | 15 | 3 | 29 | 6 | 2 | 16 |
| 09.00 - 09.15 | 34 | 21 | 71 | 2 | 2 | 1 | 14 | 4 | 31 | 4 | 1 | 20 |
| 09.15 - 09.30 | 36 | 21 | 76 | 0 | 1 | 0 | 11 | 2 | 34 | 5 | 0 | 18 |
| 09.30 - 09.45 | 34 | 24 | 70 | 1 | 1 | 2 | 9 | 2 | 28 | 5 | 1 | 20 |
| 09.45 - 10.00 | 37 | 22 | 80 | 1 | 1 | 0 | 10 | 3 | 24 | 8 | 1 | 21 |

hari/tanggal : MINGGU/10 januari 2010

arah : SMG - SCG **U**

| waktu | motor (MC) | | | tak bermotor | | | mobil (LV) | | | BERAT (HV) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan |
| 08.00 - 08.15 | 14 | 140 | 40 | 1 | 3 | 0 | 6 | 75 | 18 | 3 | 45 | 6 |
| 08.15 - 08.30 | 16 | 135 | 31 | 2 | 0 | 1 | 8 | 73 | 17 | 2 | 39 | 7 |
| 08.30 - 08.45 | 13 | 124 | 26 | 0 | 1 | 2 | 6 | 76 | 14 | 1 | 30 | 8 |
| 08.45 - 09.00 | 23 | 113 | 35 | 1 | 0 | 1 | 4 | 68 | 11 | 2 | 35 | 10 |
| 09.00 - 09.15 | 18 | 108 | 30 | 0 | 1 | 0 | 3 | 60 | 16 | 2 | 30 | 8 |
| 09.15 - 09.30 | 20 | 135 | 31 | 0 | 0 | 0 | 4 | 61 | 12 | 1 | 36 | 5 |
| 09.30 - 09.45 | 20 | 125 | 28 | 0 | 1 | 2 | 1 | 58 | 11 | 2 | 29 | 6 |
| 09.45 - 10.00 | 17 | 123 | 34 | 2 | 1 | 0 | 2 | 62 | 14 | 1 | 34 | 7 |

hari/tanggal : MINGGU/10 januari 2010

arah : Alternatif - SCG **T**

| waktu | motor (MC) | | | tak bermotor | | | mobil (LV) | | | BERAT (HV) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan |
| 08.00 - 08.15 | 21 | 24 | 23 | 1 | 1 | 0 | 10 | 4 | 5 | 0 | 0 | 1 |
| 08.15 - 08.30 | 16 | 26 | 25 | 2 | 0 | 0 | 9 | 2 | 2 | 0 | 1 | 1 |
| 08.30 - 08.45 | 22 | 30 | 15 | 0 | 1 | 0 | 9 | 3 | 2 | 1 | 0 | 0 |
| 08.45 - 09.00 | 15 | 18 | 13 | 1 | 1 | 1 | 11 | 5 | 4 | 2 | 0 | 1 |
| 09.00 - 09.15 | 16 | 24 | 14 | 1 | 1 | 1 | 10 | 3 | 3 | 1 | 2 | 1 |
| 09.15 - 09.30 | 18 | 28 | 9 | 0 | 2 | 1 | 6 | 6 | 2 | 0 | 1 | 1 |
| 09.30 - 09.45 | 13 | 20 | 17 | 1 | 1 | 0 | 7 | 3 | 2 | 0 | 2 | 0 |
| 09.45 - 10.00 | 17 | 18 | 13 | 1 | 0 | 1 | 7 | 4 | 3 | 0 | 0 | 1 |

SESI II

hari/tanggal : MINGGU/10 januari 2010

arah : MGL - SCG **S**

| waktu | motor (MC) | | | tak bermotor | | | mobil (LV) | | | BERAT (HV) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan |
| 12.00 - 12.15 | 48 | 93 | 10 | 0 | 0 | 1 | 34 | 78 | 3 | 19 | 19 | 0 |
| 12.15 - 12.30 | 60 | 89 | 10 | 1 | 0 | 0 | 23 | 67 | 6 | 14 | 20 | 0 |
| 12.30 - 12.45 | 60 | 78 | 12 | 1 | 0 | 0 | 35 | 76 | 3 | 11 | 23 | 0 |
| 12.45 - 13.00 | 64 | 84 | 14 | 0 | 0 | 0 | 32 | 63 | 2 | 10 | 27 | 0 |
| 13.00 - 13.15 | 45 | 87 | 10 | 1 | 0 | 0 | 29 | 70 | 4 | 11 | 31 | 0 |
| 13.15 - 13.30 | 52 | 72 | 12 | 1 | 1 | 1 | 32 | 67 | 5 | 14 | 28 | 1 |
| 13.30 - 13.45 | 48 | 69 | 9 | 0 | 1 | 0 | 25 | 56 | 2 | 18 | 30 | 1 |
| 13.45 - 14.00 | 56 | 71 | 10 | 0 | 0 | 1 | 28 | 58 | 2 | 16 | 22 | 0 |

hari/tanggal : MINGGU/10 januari 2010

arah : TMG - SCG **B**

| waktu | motor (MC) | | | tak bermotor | | | mobil (LV) | | | BERAT (HV) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan |
| 12.00 - 12.15 | 18 | 13 | 54 | 0 | 0 | 0 | 13 | 0 | 38 | 1 | 0 | 13 |
| 12.15 - 12.30 | 14 | 15 | 49 | 0 | 1 | 1 | 8 | 5 | 42 | 2 | 0 | 13 |
| 12.30 - 12.45 | 22 | 11 | 44 | 0 | 2 | 0 | 6 | 4 | 43 | 2 | 1 | 14 |
| 12.45 - 13.00 | 23 | 17 | 36 | 2 | 1 | 1 | 8 | 5 | 37 | 3 | 1 | 11 |
| 13.00 - 13.15 | 20 | 14 | 40 | 1 | 0 | 1 | 7 | 3 | 48 | 2 | 0 | 15 |
| 13.15 - 13.30 | 18 | 11 | 38 | 1 | 2 | 0 | 11 | 0 | 40 | 4 | 0 | 11 |
| 13.30 - 13.45 | 21 | 9 | 42 | 0 | 0 | 0 | 8 | 4 | 42 | 1 | 1 | 9 |
| 13.45 - 14.00 | 23 | 15 | 42 | 0 | 1 | 0 | 10 | 2 | 36 | 2 | 1 | 12 |

hari/tanggal : MINGGU/10 januari 2010

arah : SMG - SCG **U**

| waktu | motor (MC) | | | tak bermotor | | | mobil (LV) | | | BERAT (HV) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan |
| 12.00 - 12.15 | 10 | 84 | 21 | 2 | 0 | 0 | 3 | 87 | 10 | 0 | 20 | 2 |
| 12.15 - 12.30 | 14 | 89 | 29 | 0 | 0 | 0 | 1 | 68 | 6 | 0 | 30 | 4 |
| 12.30 - 12.45 | 6 | 82 | 19 | 0 | 1 | 2 | 3 | 85 | 8 | 0 | 25 | 3 |
| 12.45 - 13.00 | 18 | 77 | 28 | 1 | 1 | 0 | 2 | 90 | 8 | 0 | 25 | 3 |
| 13.00 - 13.15 | 9 | 105 | 25 | 1 | 0 | 0 | 3 | 89 | 9 | 0 | 23 | 2 |
| 13.15 - 13.30 | 6 | 92 | 19 | 1 | 0 | 0 | 1 | 72 | 2 | 1 | 20 | 2 |
| 13.30 - 13.45 | 11 | 84 | 22 | 0 | 1 | 1 | 2 | 83 | 6 | 0 | 16 | 1 |
| 13.45 - 14.00 | 14 | 93 | 18 | 0 | 0 | 0 | 2 | 88 | 4 | 0 | 18 | 3 |

hari/tanggal : MINGGU/10 januari 2010

arah : Alternatif - SCG **T**

| waktu | motor (MC) | | | tak bermotor | | | mobil (LV) | | | BERAT (HV) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan |
| 12.00 - 12.15 | 14 | 5 | 8 | 1 | 0 | 0 | 5 | 5 | 2 | 0 | 1 | 0 |
| 12.15 - 12.30 | 11 | 9 | 6 | 0 | 1 | 0 | 2 | 1 | 4 | 0 | 1 | 0 |
| 12.30 - 12.45 | 11 | 12 | 5 | 0 | 0 | 1 | 2 | 7 | 1 | 1 | 3 | 1 |
| 12.45 - 13.00 | 16 | 10 | 5 | 1 | 1 | 1 | 5 | 4 | 2 | 0 | 1 | 0 |
| 13.00 - 13.15 | 12 | 15 | 3 | 1 | 0 | 0 | 3 | 9 | 1 | 0 | 2 | 0 |
| 13.15 - 13.30 | 14 | 10 | 2 | 1 | 2 | 1 | 4 | 5 | 5 | 0 | 2 | 2 |
| 13.30 - 13.45 | 12 | 8 | 4 | 0 | 0 | 1 | 2 | 3 | 2 | 0 | 0 | 0 |
| 13.45 - 14.00 | 11 | 7 | 5 | 0 | 1 | 0 | 2 | 4 | 1 | 1 | 3 | 1 |

SESI III

hari/tanggal : MINGGU/10 januari 2010

arah : MGL - SCG **S**

| waktu | motor (MC) | | | tak bermotor | | | mobil (LV) | | | BERAT (HV) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan |
| 17.00 - 17.15 | 56 | 117 | 7 | 0 | 2 | 0 | 40 | 95 | 9 | 15 | 32 | 2 |
| 17.15 - 17.30 | 55 | 129 | 4 | 1 | 0 | 0 | 45 | 96 | 2 | 21 | 37 | 2 |
| 17.30 - 17.45 | 67 | 125 | 10 | 0 | 1 | 1 | 47 | 123 | 10 | 8 | 33 | 3 |
| 17.45 -18.00 | 41 | 90 | 5 | 1 | 0 | 4 | 33 | 83 | 8 | 9 | 16 | 0 |
| 18.00 - 18.15 | 55 | 125 | 4 | 1 | 0 | 1 | 37 | 92 | 8 | 18 | 19 | 1 |
| 18.15 - 18.30 | 51 | 95 | 8 | 3 | 0 | 0 | 31 | 94 | 1 | 16 | 27 | 1 |
| 18.30 - 18.45 | 64 | 97 | 9 | 1 | 0 | 1 | 22 | 86 | 3 | 10 | 24 | 3 |
| 18.45 - 19.00 | 59 | 104 | 3 | 0 | 1 | 0 | 27 | 98 | 3 | 9 | 33 | 0 |

hari/tanggal : MINGGU/10 januari 2010

arah : TMG - SCG **B**

| waktu | motor (MC) | | | tak bermotor | | | mobil (LV) | | | BERAT (HV) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan |
| 17.00 - 17.15 | 31 | 17 | 21 | 0 | 1 | 1 | 14 | 1 | 41 | 5 | 1 | 7 |
| 17.15 - 17.30 | 37 | 15 | 33 | 1 | 1 | 1 | 9 | 5 | 34 | 7 | 0 | 4 |
| 17.30 - 17.45 | 31 | 11 | 60 | 0 | 0 | 2 | 10 | 4 | 52 | 4 | 1 | 10 |
| 17.45 -18.00 | 32 | 13 | 53 | 0 | 0 | 1 | 14 | 6 | 42 | 1 | 1 | 6 |
| 18.00 - 18.15 | 31 | 10 | 40 | 1 | 2 | 1 | 17 | 3 | 38 | 3 | 0 | 4 |
| 18.15 - 18.30 | 27 | 11 | 56 | 1 | 2 | 1 | 11 | 1 | 31 | 4 | 0 | 8 |
| 18.30 - 18.45 | 29 | 15 | 45 | 0 | 0 | 2 | 14 | 4 | 46 | 7 | 1 | 5 |
| 18.45 - 19.00 | 34 | 14 | 51 | 1 | 1 | 1 | 9 | 2 | 42 | 6 | 1 | 6 |

hari/tanggal : MINGGU/10 januari 2010

arah : SMG - SCG **U**

| waktu | motor (MC) | | | tak bermotor | | | mobil (LV) | | | BERAT (HV) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan |
| 17.00 - 17.15 | 5 | 82 | 17 | 1 | 1 | 0 | 2 | 76 | 15 | 1 | 12 | 1 |
| 17.15 - 17.30 | 1 | 95 | 21 | 2 | 0 | 1 | 2 | 53 | 9 | 0 | 15 | 3 |
| 17.30 - 17.45 | 2 | 76 | 29 | 0 | 1 | 0 | 1 | 53 | 11 | 0 | 10 | 3 |
| 17.45 -18.00 | 3 | 70 | 13 | 1 | 1 | 0 | 0 | 76 | 8 | 0 | 16 | 2 |
| 18.00 - 18.15 | 2 | 106 | 11 | 1 | 2 | 0 | 1 | 60 | 11 | 0 | 8 | 2 |
| 18.15 - 18.30 | 2 | 76 | 8 | 0 | 2 | 1 | 3 | 50 | 12 | 1 | 15 | 2 |
| 18.30 - 18.45 | 1 | 91 | 9 | 2 | 1 | 0 | 1 | 59 | 11 | 0 | 9 | 1 |
| 18.45 - 19.00 | 1 | 91 | 9 | 1 | 0 | 2 | 1 | 52 | 9 | 0 | 10 | 3 |

hari/tanggal : MINGGU/10 januari 2010

arah : Alternatif - SCG **T**

| waktu | motor (MC) | | | tak bermotor | | | mobil (LV) | | | BERAT (HV) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan |
| 17.00 - 17.15 | 11 | 14 | 12 | 1 | 0 | 4 | 6 | 4 | 2 | 0 | 1 | 0 |
| 17.15 - 17.30 | 17 | 15 | 11 | 2 | 0 | 1 | 6 | 2 | 3 | 0 | 0 | 1 |
| 17.30 - 17.45 | 14 | 19 | 13 | 1 | 0 | 2 | 4 | 5 | 1 | 1 | 0 | 0 |
| 17.45 -18.00 | 11 | 16 | 9 | 0 | 1 | 0 | 4 | 2 | 1 | 0 | 0 | 1 |
| 18.00 - 18.15 | 9 | 8 | 12 | 0 | 1 | 1 | 1 | 6 | 1 | 1 | 0 | 1 |
| 18.15 - 18.30 | 11 | 12 | 9 | 1 | 1 | 3 | 5 | 6 | 1 | 1 | 1 | 0 |
| 18.30 - 18.45 | 9 | 14 | 8 | 0 | 0 | 1 | 4 | 5 | 2 | 0 | 0 | 0 |
| 18.45 - 19.00 | 6 | 13 | 9 | 1 | 1 | 2 | 2 | 1 | 4 | 0 | 0 | 0 |

SESI I

hari/tanggal : SENIN/11 januari 2010
arah : MGL - SCG

**S**

| waktu | motor (MC) | | | tak bermotor | | | mobil (LV) | | | BERAT (HV) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan |
| 08.00 - 08.15 | 52 | 96 | 17 | 1 | 0 | 0 | 18 | 46 | 9 | 16 | 15 | 1 |
| 08.15 - 08.30 | 61 | 112 | 16 | 1 | 0 | 0 | 23 | 51 | 7 | 19 | 27 | 0 |
| 08.30 - 08.45 | 60 | 105 | 21 | 3 | 0 | 1 | 29 | 54 | 5 | 16 | 12 | 0 |
| 08.45 - 09.00 | 59 | 108 | 12 | 0 | 2 | 0 | 25 | 54 | 3 | 17 | 19 | 2 |
| 09.00 - 09.15 | 50 | 110 | 18 | 0 | 1 | 1 | 27 | 52 | 7 | 14 | 16 | 0 |
| 09.15 - 09.30 | 55 | 102 | 26 | 1 | 2 | 0 | 19 | 48 | 4 | 19 | 25 | 1 |
| 09.30 - 09.45 | 48 | 95 | 17 | 0 | 0 | 2 | 27 | 41 | 7 | 16 | 22 | 0 |
| 09.45 - 10.00 | 53 | 101 | 15 | 2 | 0 | 1 | 23 | 52 | 8 | 18 | 19 | 0 |

hari/tanggal : SENIN/11 januari 2010
arah : TMG - SCG

**B**

| waktu | motor (MC) | | | tak bermotor | | | mobil (LV) | | | BERAT (HV) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan |
| 08.00 - 08.15 | 31 | 14 | 58 | 1 | 2 | 0 | 7 | 3 | 23 | 6 | 0 | 20 |
| 08.15 - 08.30 | 30 | 17 | 75 | 1 | 3 | 0 | 10 | 3 | 24 | 1 | 0 | 19 |
| 08.30 - 08.45 | 40 | 22 | 79 | 0 | 0 | 1 | 4 | 5 | 31 | 2 | 1 | 19 |
| 08.45 - 09.00 | 38 | 15 | 76 | 0 | 1 | 1 | 13 | 3 | 24 | 5 | 1 | 16 |
| 09.00 - 09.15 | 27 | 20 | 68 | 0 | 3 | 1 | 10 | 4 | 28 | 3 | 0 | 21 |
| 09.15 - 09.30 | 33 | 21 | 71 | 3 | 0 | 0 | 6 | 1 | 30 | 4 | 0 | 15 |
| 09.30 - 09.45 | 34 | 22 | 70 | 1 | 0 | 1 | 8 | 2 | 21 | 4 | 1 | 17 |
| 09.45 - 10.00 | 37 | 19 | 78 | 2 | 1 | 0 | 10 | 5 | 17 | 5 | 0 | 18 |

hari/tanggal : SENIN/11 januari 2010
arah : SMG - SCG

**U**

| waktu | motor (MC) | | | tak bermotor | | | mobil (LV) | | | BERAT (HV) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan |
| 08.00 - 08.15 | 15 | 136 | 37 | 0 | 2 | 1 | 3 | 73 | 15 | 2 | 41 | 7 |
| 08.15 - 08.30 | 17 | 132 | 27 | 1 | 0 | 1 | 6 | 64 | 15 | 1 | 24 | 6 |
| 08.30 - 08.45 | 12 | 111 | 21 | 0 | 0 | 0 | 5 | 63 | 13 | 2 | 22 | 5 |
| 08.45 - 09.00 | 22 | 108 | 34 | 0 | 2 | 2 | 5 | 65 | 6 | 2 | 36 | 5 |
| 09.00 - 09.15 | 19 | 115 | 28 | 0 | 1 | 0 | 3 | 55 | 9 | 3 | 34 | 2 |
| 09.15 - 09.30 | 17 | 133 | 27 | 1 | 0 | 0 | 4 | 57 | 11 | 0 | 29 | 6 |
| 09.30 - 09.45 | 20 | 128 | 24 | 0 | 0 | 2 | 2 | 61 | 13 | 0 | 24 | 4 |
| 09.45 - 10.00 | 16 | 130 | 31 | 1 | 1 | 1 | 3 | 64 | 9 | 1 | 35 | 6 |

hari/tanggal : SENIN/11 januari 2010
arah : Alternatif - SCG

**T**

| waktu | motor (MC) | | | tak bermotor | | | mobil (LV) | | | BERAT (HV) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan |
| 08.00 - 08.15 | 19 | 26 | 24 | 1 | 0 | 3 | 8 | 1 | 6 | 2 | 0 | 0 |
| 08.15 - 08.30 | 17 | 28 | 21 | 0 | 2 | 0 | 6 | 3 | 2 | 0 | 1 | 1 |
| 08.30 - 08.45 | 19 | 24 | 9 | 1 | 1 | 1 | 8 | 3 | 3 | 1 | 0 | 0 |
| 08.45 - 09.00 | 17 | 19 | 16 | 2 | 2 | 0 | 8 | 6 | 6 | 3 | 0 | 1 |
| 09.00 - 09.15 | 12 | 24 | 4 | 1 | 0 | 3 | 4 | 2 | 5 | 1 | 2 | 1 |
| 09.15 - 09.30 | 16 | 27 | 16 | 0 | 3 | 1 | 3 | 4 | 2 | 0 | 1 | 0 |
| 09.30 - 09.45 | 14 | 20 | 21 | 0 | 1 | 0 | 7 | 4 | 2 | 0 | 2 | 0 |
| 09.45 - 10.00 | 20 | 15 | 13 | 1 | 1 | 0 | 3 | 7 | 5 | 1 | 0 | 2 |

SESI II

hari/tanggal : SENIN/11 januari 2010
arah : MGL - SCG

**S**

| waktu | motor (MC) | | | tak bermotor | | | mobil (LV) | | | BERAT (HV) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan |
| 12.00 - 12.15 | 45 | 98 | 8 | 0 | 2 | 1 | 30 | 82 | 4 | 24 | 16 | 0 |
| 12.15 - 12.30 | 52 | 94 | 13 | 1 | 2 | 1 | 25 | 76 | 2 | 16 | 19 | 0 |
| 12.30 - 12.45 | 54 | 84 | 15 | 0 | 1 | 0 | 37 | 73 | 1 | 12 | 20 | 1 |
| 12.45 - 13.00 | 60 | 76 | 9 | 0 | 1 | 2 | 36 | 69 | 6 | 10 | 28 | 1 |
| 13.00 - 13.15 | 50 | 79 | 12 | 2 | 2 | 0 | 28 | 75 | 2 | 16 | 34 | 0 |
| 13.15 - 13.30 | 53 | 83 | 14 | 2 | 0 | 1 | 36 | 69 | 3 | 14 | 30 | 0 |
| 13.30 - 13.45 | 42 | 84 | 8 | 1 | 0 | 0 | 27 | 64 | 1 | 19 | 27 | 0 |
| 13.45 - 14.00 | 46 | 86 | 9 | 1 | 1 | 0 | 29 | 60 | 1 | 21 | 24 | 0 |

hari/tanggal : SENIN/11 januari 2010
arah : TMG - SCG

**B**

| waktu | motor (MC) | | | tak bermotor | | | mobil (LV) | | | BERAT (HV) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan |
| 12.00 - 12.15 | 34 | 19 | 54 | 2 | 2 | 1 | 8 | 4 | 29 | 7 | 2 | 18 |
| 12.15 - 12.30 | 36 | 16 | 76 | 2 | 1 | 0 | 10 | 6 | 25 | 5 | 2 | 16 |
| 12.30 - 12.45 | 34 | 21 | 75 | 1 | 0 | 0 | 8 | 4 | 31 | 6 | 1 | 24 |
| 12.45 - 13.00 | 40 | 19 | 72 | 1 | 2 | 1 | 14 | 5 | 32 | 8 | 3 | 15 |
| 13.00 - 13.15 | 35 | 24 | 75 | 2 | 0 | 0 | 13 | 4 | 29 | 5 | 2 | 23 |
| 13.15 - 13.30 | 37 | 19 | 72 | 0 | 1 | 1 | 10 | 3 | 27 | 6 | 1 | 19 |
| 13.30 - 13.45 | 41 | 23 | 73 | 1 | 1 | 0 | 10 | 3 | 29 | 5 | 1 | 21 |
| 13.45 - 14.00 | 37 | 19 | 76 | 2 | 0 | 2 | 12 | 2 | 28 | 7 | 2 | 18 |

hari/tanggal : SENIN/11 januari 2010
arah : SMG - SCG

**U**

| waktu | motor (MC) | | | tak bermotor | | | mobil (LV) | | | BERAT (HV) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan |
| 12.00 - 12.15 | 7 | 75 | 24 | 1 | 0 | 2 | 2 | 76 | 13 | 1 | 18 | 4 |
| 12.15 - 12.30 | 10 | 97 | 31 | 0 | 1 | 1 | 2 | 84 | 7 | 0 | 26 | 2 |
| 12.30 - 12.45 | 13 | 89 | 15 | 1 | 1 | 1 | 1 | 85 | 6 | 0 | 31 | 3 |
| 12.45 - 13.00 | 12 | 84 | 21 | 1 | 2 | 0 | 3 | 93 | 3 | 0 | 29 | 3 |
| 13.00 - 13.15 | 16 | 80 | 27 | 3 | 1 | 0 | 1 | 82 | 10 | 0 | 17 | 1 |
| 13.15 - 13.30 | 9 | 100 | 21 | 0 | 3 | 0 | 1 | 76 | 8 | 1 | 24 | 2 |
| 13.30 - 13.45 | 11 | 93 | 17 | 1 | 1 | 1 | 2 | 84 | 7 | 0 | 20 | 3 |
| 13.45 - 14.00 | 11 | 72 | 23 | 1 | 0 | 1 | 1 | 77 | 7 | 2 | 24 | 2 |

hari/tanggal : SENIN/11 januari 2010
arah : Alternatif - SCG

**T**

| waktu | motor (MC) | | | tak bermotor | | | mobil (LV) | | | BERAT (HV) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan |
| 12.00 - 12.15 | 18 | 10 | 11 | 2 | 0 | 0 | 5 | 9 | 6 | 0 | 1 | 3 |
| 12.15 - 12.30 | 19 | 9 | 7 | 1 | 0 | 1 | 3 | 3 | 3 | 0 | 1 | 0 |
| 12.30 - 12.45 | 12 | 13 | 6 | 1 | 1 | 2 | 1 | 7 | 4 | 1 | 1 | 1 |
| 12.45 - 13.00 | 13 | 9 | 3 | 0 | 2 | 1 | 5 | 6 | 3 | 0 | 1 | 0 |
| 13.00 - 13.15 | 16 | 11 | 9 | 1 | 1 | 1 | 6 | 3 | 2 | 0 | 2 | 0 |
| 13.15 - 13.30 | 16 | 10 | 7 | 1 | 0 | 1 | 2 | 6 | 2 | 0 | 2 | 1 |
| 13.30 - 13.45 | 18 | 8 | 6 | 0 | 1 | 1 | 2 | 4 | 5 | 2 | 0 | 1 |
| 13.45 - 14.00 | 17 | 11 | 3 | 1 | 1 | 1 | 2 | 6 | 1 | 2 | 2 | 1 |

SESI III

hari/tanggal : SENIN/11 januari 2010
arah : MGL - SCG

**S**

| waktu | motor (MC) | | | tak bermotor | | | mobil (LV) | | | BERAT (HV) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan |
| 17.00 - 17.15 | 50 | 109 | 9 | 0 | 2 | 1 | 48 | 88 | 5 | 20 | 29 | 1 |
| 17.15 - 17.30 | 52 | 115 | 5 | 2 | 1 | 2 | 52 | 98 | 8 | 15 | 15 | 3 |
| 17.30 - 17.45 | 68 | 120 | 3 | 0 | 0 | 0 | 43 | 102 | 14 | 22 | 37 | 1 |
| 17.45 -18.00 | 43 | 117 | 8 | 1 | 0 | 1 | 40 | 105 | 9 | 17 | 19 | 1 |
| 18.00 - 18.15 | 50 | 91 | 8 | 1 | 1 | 1 | 33 | 97 | 8 | 13 | 18 | 2 |
| 18.15 - 18.30 | 48 | 116 | 9 | 1 | 2 | 1 | 46 | 86 | 6 | 18 | 30 | 0 |
| 18.30 - 18.45 | 59 | 122 | 4 | 2 | 1 | 0 | 49 | 96 | 3 | 10 | 26 | 1 |
| 18.45 - 19.00 | 49 | 104 | 8 | 1 | 0 | 1 | 41 | 81 | 7 | 15 | 31 | 0 |

hari/tanggal : SENIN/11 januari 2010
arah : TMG - SCG

**B**

| waktu | motor (MC) | | | tak bermotor | | | mobil (LV) | | | BERAT (HV) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan |
| 17.00 - 17.15 | 25 | 14 | 68 | 0 | 1 | 1 | 22 | 6 | 43 | 10 | 2 | 12 |
| 17.15 - 17.30 | 39 | 11 | 43 | 2 | 0 | 3 | 17 | 3 | 45 | 9 | 2 | 11 |
| 17.30 - 17.45 | 28 | 10 | 50 | 0 | 2 | 1 | 11 | 4 | 58 | 7 | 0 | 9 |
| 17.45 -18.00 | 41 | 17 | 48 | 1 | 0 | 1 | 15 | 5 | 39 | 7 | 0 | 8 |
| 18.00 - 18.15 | 24 | 13 | 59 | 0 | 1 | 1 | 17 | 1 | 50 | 8 | 1 | 4 |
| 18.15 - 18.30 | 34 | 11 | 49 | 0 | 1 | 0 | 12 | 1 | 46 | 3 | 3 | 8 |
| 18.30 - 18.45 | 36 | 15 | 46 | 2 | 1 | 0 | 9 | 2 | 41 | 9 | 1 | 9 |
| 18.45 - 19.00 | 26 | 15 | 53 | 1 | 0 | 0 | 13 | 4 | 38 | 7 | 1 | 7 |

hari/tanggal : SENIN/11 januari 2010
arah : SMG - SCG

**U**

| waktu | motor (MC) | | | tak bermotor | | | mobil (LV) | | | BERAT (HV) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan |
| 17.00 - 17.15 | 8 | 98 | 21 | 1 | 1 | 4 | 5 | 84 | 19 | 0 | 13 | 6 |
| 17.15 - 17.30 | 11 | 92 | 18 | 0 | 3 | 1 | 4 | 71 | 16 | 2 | 13 | 4 |
| 17.30 - 17.45 | 6 | 107 | 18 | 0 | 0 | 5 | 2 | 86 | 14 | 1 | 15 | 5 |
| 17.45 -18.00 | 3 | 112 | 19 | 2 | 0 | 1 | 1 | 81 | 9 | 0 | 9 | 5 |
| 18.00 - 18.15 | 8 | 108 | 17 | 1 | 0 | 3 | 3 | 69 | 16 | 0 | 11 | 4 |
| 18.15 - 18.30 | 9 | 82 | 9 | 1 | 0 | 2 | 3 | 83 | 9 | 0 | 12 | 3 |
| 18.30 - 18.45 | 8 | 94 | 13 | 0 | 2 | 2 | 2 | 76 | 12 | 1 | 8 | 1 |
| 18.45 - 19.00 | 6 | 98 | 14 | 1 | 2 | 0 | 2 | 77 | 10 | 0 | 7 | 4 |

hari/tanggal : SENIN/11 januari 2010
arah : Alternatif - SCG

**T**

| waktu | motor (MC) | | | tak bermotor | | | mobil (LV) | | | BERAT (HV) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan | kiri | lurus | kanan |
| 17.00 - 17.15 | 14 | 11 | 9 | 0 | 0 | 2 | 8 | 9 | 6 | 1 | 0 | 1 |
| 17.15 - 17.30 | 15 | 16 | 13 | 4 | 1 | 0 | 4 | 4 | 4 | 1 | 1 | 1 |
| 17.30 - 17.45 | 19 | 14 | 12 | 1 | 3 | 0 | 9 | 6 | 6 | 0 | 2 | 2 |
| 17.45 -18.00 | 16 | 18 | 9 | 0 | 1 | 1 | 6 | 8 | 2 | 0 | 2 | 1 |
| 18.00 - 18.15 | 8 | 13 | 10 | 0 | 1 | 0 | 6 | 4 | 3 | 1 | 1 | 1 |
| 18.15 - 18.30 | 12 | 11 | 9 | 0 | 1 | 1 | 8 | 8 | 5 | 0 | 1 | 1 |
| 18.30 - 18.45 | 14 | 9 | 12 | 1 | 1 | 1 | 7 | 8 | 4 | 1 | 0 | 0 |
| 18.45 - 19.00 | 13 | 10 | 11 | 0 | 2 | 1 | 8 | 6 | 3 | 1 | 3 | 1 |

# Lampiran 2

(Data Hambatan Samping)

hari/tanggal : sabtu/9 januari 2010

arah : MGL - SCG

| waktu | pejalan kaki /penyebrang | parkir /berhenti | kendaraan keluar & masuk | kendaraan lambat |
|---|---|---|---|---|
| 08.00 - 08.15 | 127 | 70 | 47 | 5 |
| 08.15 - 08.30 | 174 | 50 | 53 | 11 |
| 08.30 - 08.45 | 172 | 62 | 64 | 3 |
| 08.45 - 09.00 | 198 | 72 | 57 | 7 |
| 09.00 - 09.15 | 174 | 50 | 54 | 7 |
| 09.15 - 09.30 | 200 | 59 | 45 | 7 |
| 09.30 - 09.45 | 208 | 70 | 46 | 5 |
| 09.45 - 10.00 | 175 | 63 | 58 | 6 |
| 12.00 - 12.15 | 168 | 61 | 48 | 4 |
| 12.15 - 12.30 | 158 | 75 | 32 | 4 |
| 12.30 - 12.45 | 152 | 63 | 27 | 4 |
| 12.45 - 13.00 | 122 | 50 | 32 | 3 |
| 13.00 - 13.15 | 148 | 50 | 23 | 5 |
| 13.15 - 13.30 | 124 | 72 | 13 | 12 |
| 13.30 - 13.45 | 118 | 68 | 17 | 3 |
| 13.45 - 14.00 | 162 | 62 | 20 | 8 |
| 17.00 - 17.15 | 102 | 31 | 26 | 6 |
| 17.15 - 17.30 | 77 | 32 | 19 | 10 |
| 17.30 - 17.45 | 89 | 19 | 43 | 5 |
| 17.45 -18.00 | 77 | 41 | 59 | 8 |
| 18.00 - 18.15 | 101 | 52 | 48 | 13 |
| 18.15 - 18.30 | 96 | 47 | 39 | 13 |
| 18.30 - 18.45 | 109 | 40 | 35 | 6 |
| 18.45 - 19.00 | 90 | 31 | 58 | 12 |

hari/tanggal : sabtu/9 januari 2010

arah : TMG - SCG

| waktu | pejalan kaki /penyebrang | parkir /berhenti | kendaraan keluar & masuk | kendaraan lambat |
|---|---|---|---|---|
| 08.00 - 08.15 | 193 | 73 | 45 | 4 |
| 08.15 - 08.30 | 182 | 96 | 47 | 7 |
| 08.30 - 08.45 | 198 | 102 | 53 | 5 |
| 08.45 - 09.00 | 207 | 116 | 32 | 12 |
| 09.00 - 09.15 | 210 | 84 | 48 | 3 |
| 09.15 - 09.30 | 198 | 94 | 36 | 3 |
| 09.30 - 09.45 | 237 | 78 | 38 | 7 |
| 09.45 - 10.00 | 226 | 98 | 48 | 5 |
| 12.00 - 12.15 | 130 | 45 | 36 | 7 |
| 12.15 - 12.30 | 167 | 53 | 27 | 6 |
| 12.30 - 12.45 | 159 | 60 | 34 | 8 |
| 12.45 - 13.00 | 180 | 67 | 46 | 9 |
| 13.00 - 13.15 | 183 | 43 | 36 | 8 |
| 13.15 - 13.30 | 204 | 62 | 27 | 10 |
| 13.30 - 13.45 | 187 | 48 | 37 | 5 |
| 13.45 - 14.00 | 196 | 45 | 46 | 4 |
| 17.00 - 17.15 | 175 | 53 | 32 | 7 |
| 17.15 - 17.30 | 159 | 57 | 28 | 11 |
| 17.30 - 17.45 | 147 | 67 | 37 | 11 |
| 17.45 -18.00 | 165 | 74 | 29 | 8 |
| 18.00 - 18.15 | 154 | 34 | 35 | 13 |
| 18.15 - 18.30 | 165 | 53 | 25 | 11 |
| 18.30 - 18.45 | 162 | 57 | 21 | 10 |
| 18.45 - 19.00 | 113 | 38 | 29 | 7 |

hari/tanggal : sabtu/9 januari 2010
arah : SMG - SCG

| waktu | pejalan kaki /penyebrang | parkir /berhenti | kendaraan keluar & masuk | kendaraan lambat |
|---|---|---|---|---|
| 08.00 - 08.15 | 63 | 23 | 28 | 5 |
| 08.15 - 08.30 | 64 | 21 | 17 | 11 |
| 08.30 - 08.45 | 79 | 18 | 12 | 1 |
| 08.45 - 09.00 | 65 | 18 | 11 | 7 |
| 09.00 - 09.15 | 72 | 15 | 14 | 3 |
| 09.15 - 09.30 | 73 | 28 | 9 | 5 |
| 09.30 - 09.45 | 59 | 26 | 16 | 6 |
| 09.45 - 10.00 | 81 | 15 | 18 | 6 |
| 12.00 - 12.15 | 59 | 26 | 19 | 3 |
| 12.15 - 12.30 | 45 | 28 | 29 | 9 |
| 12.30 - 12.45 | 53 | 32 | 23 | 9 |
| 12.45 - 13.00 | 57 | 24 | 21 | 6 |
| 13.00 - 13.15 | 45 | 25 | 16 | 5 |
| 13.15 - 13.30 | 34 | 17 | 14 | 7 |
| 13.30 - 13.45 | 29 | 14 | 23 | 7 |
| 13.45 - 14.00 | 54 | 16 | 21 | 5 |
| 17.00 - 17.15 | 104 | 23 | 21 | 5 |
| 17.15 - 17.30 | 112 | 35 | 14 | 8 |
| 17.30 - 17.45 | 84 | 31 | 15 | 10 |
| 17.45 -18.00 | 102 | 27 | 13 | 16 |
| 18.00 - 18.15 | 108 | 19 | 17 | 7 |
| 18.15 - 18.30 | 98 | 25 | 24 | 12 |
| 18.30 - 18.45 | 84 | 21 | 17 | 7 |
| 18.45 - 19.00 | 93 | 16 | 26 | 7 |

hari/tanggal : sabtu/9 januari 2010
arah : Alternatif - SCG

| waktu | pejalan kaki /penyebrang | parkir /berhenti | kendaraan keluar & masuk | kendaraan lambat |
|---|---|---|---|---|
| 08.00 - 08.15 | 29 | 29 | 29 | 4 |
| 08.15 - 08.30 | 39 | 39 | 39 | 7 |
| 08.30 - 08.45 | 35 | 35 | 35 | 5 |
| 08.45 - 09.00 | 49 | 49 | 49 | 6 |
| 09.00 - 09.15 | 46 | 46 | 46 | 5 |
| 09.15 - 09.30 | 28 | 28 | 28 | 9 |
| 09.30 - 09.45 | 48 | 48 | 48 | 6 |
| 09.45 - 10.00 | 35 | 35 | 35 | 5 |
| 12.00 - 12.15 | 30 | 30 | 30 | 4 |
| 12.15 - 12.30 | 45 | 45 | 45 | 9 |
| 12.30 - 12.45 | 35 | 35 | 35 | 7 |
| 12.45 - 13.00 | 36 | 36 | 36 | 6 |
| 13.00 - 13.15 | 46 | 46 | 46 | 8 |
| 13.15 - 13.30 | 26 | 26 | 26 | 7 |
| 13.30 - 13.45 | 35 | 35 | 35 | 7 |
| 13.45 - 14.00 | 25 | 25 | 25 | 5 |
| 17.00 - 17.15 | 45 | 45 | 45 | 6 |
| 17.15 - 17.30 | 24 | 24 | 24 | 9 |
| 17.30 - 17.45 | 37 | 37 | 37 | 6 |
| 17.45 -18.00 | 41 | 41 | 41 | 10 |
| 18.00 - 18.15 | 34 | 34 | 34 | 7 |
| 18.15 - 18.30 | 26 | 26 | 26 | 8 |
| 18.30 - 18.45 | 18 | 18 | 18 | 9 |
| 18.45 - 19.00 | 26 | 26 | 26 | 8 |

hari/tanggal : minggu/10 januari 2010
arah : MGL - SCG

| waktu | pejalan kaki /penyebrang | parkir /berhenti | kendaraan keluar & masuk | kendaraan lambat |
|---|---|---|---|---|
| 08.00 - 08.15 | 143 | 65 | 58 | 9 |
| 08.15 - 08.30 | 176 | 51 | 52 | 5 |
| 08.30 - 08.45 | 172 | 84 | 71 | 4 |
| 08.45 - 09.00 | 208 | 53 | 54 | 4 |
| 09.00 - 09.15 | 196 | 64 | 48 | 5 |
| 09.15 - 09.30 | 185 | 56 | 68 | 3 |
| 09.30 - 09.45 | 255 | 48 | 60 | 7 |
| 09.45 - 10.00 | 221 | 53 | 72 | 5 |
| 12.00 - 12.15 | 89 | 41 | 18 | 2 |
| 12.15 - 12.30 | 193 | 65 | 46 | 2 |
| 12.30 - 12.45 | 227 | 66 | 65 | 2 |
| 12.45 - 13.00 | 263 | 74 | 71 | 3 |
| 13.00 - 13.15 | 201 | 58 | 52 | 3 |
| 13.15 - 13.30 | 224 | 74 | 64 | 4 |
| 13.30 - 13.45 | 235 | 53 | 38 | 2 |
| 13.45 - 14.00 | 185 | 68 | 44 | 1 |
| 17.00 - 17.15 | 69 | 19 | 19 | 5 |
| 17.15 - 17.30 | 80 | 25 | 36 | 4 |
| 17.30 - 17.45 | 96 | 29 | 42 | 6 |
| 17.45 -18.00 | 92 | 45 | 67 | 7 |
| 18.00 - 18.15 | 117 | 39 | 37 | 5 |
| 18.15 - 18.30 | 108 | 47 | 47 | 7 |
| 18.30 - 18.45 | 76 | 46 | 32 | 5 |
| 18.45 - 19.00 | 99 | 41 | 54 | 3 |

hari/tanggal : minggu/10 januari 2010
arah : TMG - SCG

| waktu | pejalan kaki /penyebrang | parkir /berhenti | kendaraan keluar & masuk | kendaraan lambat |
|---|---|---|---|---|
| 08.00 - 08.15 | 211 | 95 | 44 | 5 |
| 08.15 - 08.30 | 227 | 105 | 38 | 6 |
| 08.30 - 08.45 | 202 | 112 | 58 | 7 |
| 08.45 - 09.00 | 246 | 121 | 35 | 6 |
| 09.00 - 09.15 | 260 | 96 | 42 | 6 |
| 09.15 - 09.30 | 250 | 103 | 46 | 4 |
| 09.30 - 09.45 | 287 | 127 | 56 | 7 |
| 09.45 - 10.00 | 270 | 116 | 48 | 3 |
| 12.00 - 12.15 | 103 | 36 | 20 | 0 |
| 12.15 - 12.30 | 92 | 55 | 48 | 4 |
| 12.30 - 12.45 | 160 | 56 | 23 | 5 |
| 12.45 - 13.00 | 139 | 58 | 27 | 5 |
| 13.00 - 13.15 | 157 | 54 | 31 | 3 |
| 13.15 - 13.30 | 151 | 47 | 25 | 6 |
| 13.30 - 13.45 | 144 | 71 | 16 | 1 |
| 13.45 - 14.00 | 188 | 66 | 33 | 2 |
| 17.00 - 17.15 | 174 | 85 | 39 | 2 |
| 17.15 - 17.30 | 211 | 67 | 32 | 5 |
| 17.30 - 17.45 | 165 | 87 | 25 | 2 |
| 17.45 -18.00 | 158 | 65 | 31 | 3 |
| 18.00 - 18.15 | 156 | 86 | 23 | 6 |
| 18.15 - 18.30 | 176 | 87 | 25 | 9 |
| 18.30 - 18.45 | 151 | 69 | 24 | 3 |
| 18.45 - 19.00 | 143 | 65 | 21 | 6 |

hari/tanggal : minggu/10 januari 2010
arah : SMG - SCG

| waktu | pejalan kaki /penyebrang | parkir /berhenti | kendaraan keluar & masuk | kendaraan lambat |
|---|---|---|---|---|
| 08.00 - 08.15 | 64 | 17 | 19 | 6 |
| 08.15 - 08.30 | 76 | 27 | 24 | 5 |
| 08.30 - 08.45 | 83 | 25 | 18 | 4 |
| 08.45 - 09.00 | 59 | 17 | 14 | 5 |
| 09.00 - 09.15 | 84 | 19 | 30 | 5 |
| 09.15 - 09.30 | 88 | 14 | 21 | 3 |
| 09.30 - 09.45 | 63 | 23 | 25 | 5 |
| 09.45 - 10.00 | 74 | 15 | 27 | 6 |
| 12.00 - 12.15 | 69 | 34 | 24 | 2 |
| 12.15 - 12.30 | 53 | 25 | 29 | 0 |
| 12.30 - 12.45 | 65 | 32 | 32 | 4 |
| 12.45 - 13.00 | 41 | 18 | 16 | 5 |
| 13.00 - 13.15 | 38 | 13 | 21 | 2 |
| 13.15 - 13.30 | 54 | 16 | 20 | 4 |
| 13.30 - 13.45 | 35 | 12 | 23 | 4 |
| 13.45 - 14.00 | 43 | 23 | 28 | 0 |
| 17.00 - 17.15 | 97 | 32 | 14 | 8 |
| 17.15 - 17.30 | 106 | 24 | 23 | 5 |
| 17.30 - 17.45 | 97 | 35 | 32 | 4 |
| 17.45 -18.00 | 102 | 32 | 21 | 2 |
| 18.00 - 18.15 | 87 | 24 | 24 | 5 |
| 18.15 - 18.30 | 90 | 32 | 12 | 7 |
| 18.30 - 18.45 | 96 | 23 | 34 | 4 |
| 18.45 - 19.00 | 72 | 21 | 23 | 7 |

hari/tanggal : minggu/10 januari 2010
arah : Alternatif - SCG

| waktu | pejalan kaki /penyebrang | parkir /berhenti | kendaraan keluar & masuk | kendaraan lambat |
|---|---|---|---|---|
| 08.00 - 08.15 | 32 | 4 | 12 | 6 |
| 08.15 - 08.30 | 26 | 3 | 15 | 6 |
| 08.30 - 08.45 | 29 | 8 | 8 | 3 |
| 08.45 - 09.00 | 21 | 5 | 3 | 7 |
| 09.00 - 09.15 | 19 | 8 | 7 | 6 |
| 09.15 - 09.30 | 27 | 3 | 2 | 4 |
| 09.30 - 09.45 | 31 | 2 | 8 | 5 |
| 09.45 - 10.00 | 29 | 4 | 6 | 6 |
| 12.00 - 12.15 | 42 | 7 | 5 | 4 |
| 12.15 - 12.30 | 32 | 4 | 10 | 2 |
| 12.30 - 12.45 | 35 | 6 | 5 | 3 |
| 12.45 - 13.00 | 32 | 6 | 12 | 5 |
| 13.00 - 13.15 | 26 | 9 | 8 | 2 |
| 13.15 - 13.30 | 37 | 3 | 5 | 8 |
| 13.30 - 13.45 | 24 | 6 | 12 | 1 |
| 13.45 - 14.00 | 35 | 4 | 5 | 3 |
| 17.00 - 17.15 | 49 | 9 | 12 | 7 |
| 17.15 - 17.30 | 32 | 6 | 13 | 6 |
| 17.30 - 17.45 | 46 | 4 | 7 | 4 |
| 17.45 -18.00 | 32 | 7 | 5 | 6 |
| 18.00 - 18.15 | 19 | 6 | 4 | 6 |
| 18.15 - 18.30 | 34 | 8 | 8 | 7 |
| 18.30 - 18.45 | 24 | 7 | 10 | 4 |
| 18.45 - 19.00 | 29 | 8 | 10 | 6 |

hari/tanggal : senin/11 januari 2010
arah : MGL - SCG

| waktu | pejalan kaki /penyebrang | parkir /berhenti | kendaraan keluar & masuk | kendaraan lambat |
|---|---|---|---|---|
| 08.00 - 08.15 | 203 | 74 | 41 | 4 |
| 08.15 - 08.30 | 253 | 82 | 37 | 1 |
| 08.30 - 08.45 | 286 | 85 | 64 | 6 |
| 08.45 - 09.00 | 306 | 90 | 69 | 7 |
| 09.00 - 09.15 | 301 | 88 | 57 | 5 |
| 09.15 - 09.30 | 278 | 78 | 73 | 3 |
| 09.30 - 09.45 | 312 | 68 | 54 | 3 |
| 09.45 - 10.00 | 295 | 83 | 49 | 5 |
| 12.00 - 12.15 | 190 | 82 | 38 | 6 |
| 12.15 - 12.30 | 191 | 95 | 42 | 6 |
| 12.30 - 12.45 | 281 | 100 | 73 | 3 |
| 12.45 - 13.00 | 295 | 86 | 82 | 6 |
| 13.00 - 13.15 | 248 | 74 | 65 | 6 |
| 13.15 - 13.30 | 284 | 70 | 78 | 8 |
| 13.30 - 13.45 | 290 | 76 | 45 | 2 |
| 13.45 - 14.00 | 248 | 89 | 38 | 5 |
| 17.00 - 17.15 | 164 | 34 | 26 | 5 |
| 17.15 - 17.30 | 118 | 43 | 38 | 15 |
| 17.30 - 17.45 | 180 | 29 | 59 | 2 |
| 17.45 -18.00 | 206 | 58 | 78 | 3 |
| 18.00 - 18.15 | 176 | 67 | 49 | 4 |
| 18.15 - 18.30 | 232 | 58 | 56 | 4 |
| 18.30 - 18.45 | 192 | 64 | 62 | 6 |
| 18.45 - 19.00 | 122 | 42 | 41 | 4 |

hari/tanggal : senin/11 januari 2010
arah : TMG - SCG

| waktu | pejalan kaki /penyebrang | parkir /berhenti | kendaraan keluar & masuk | kendaraan lambat |
|---|---|---|---|---|
| 08.00 - 08.15 | 244 | 109 | 53 | 5 |
| 08.15 - 08.30 | 354 | 147 | 38 | 8 |
| 08.30 - 08.45 | 431 | 169 | 61 | 5 |
| 08.45 - 09.00 | 422 | 151 | 43 | 6 |
| 09.00 - 09.15 | 360 | 150 | 53 | 4 |
| 09.15 - 09.30 | 343 | 119 | 47 | 7 |
| 09.30 - 09.45 | 332 | 142 | 46 | 5 |
| 09.45 - 10.00 | 358 | 124 | 59 | 7 |
| 12.00 - 12.15 | 203 | 68 | 46 | 7 |
| 12.15 - 12.30 | 236 | 73 | 72 | 5 |
| 12.30 - 12.45 | 209 | 68 | 59 | 3 |
| 12.45 - 13.00 | 218 | 58 | 47 | 6 |
| 13.00 - 13.15 | 185 | 49 | 52 | 5 |
| 13.15 - 13.30 | 179 | 69 | 37 | 4 |
| 13.30 - 13.45 | 188 | 85 | 35 | 5 |
| 13.45 - 14.00 | 155 | 67 | 48 | 7 |
| 17.00 - 17.15 | 182 | 127 | 25 | 6 |
| 17.15 - 17.30 | 202 | 98 | 26 | 9 |
| 17.30 - 17.45 | 175 | 107 | 18 | 11 |
| 17.45 -18.00 | 223 | 105 | 11 | 5 |
| 18.00 - 18.15 | 164 | 120 | 24 | 7 |
| 18.15 - 18.30 | 216 | 89 | 29 | 5 |
| 18.30 - 18.45 | 185 | 69 | 21 | 8 |
| 18.45 - 19.00 | 208 | 76 | 28 | 4 |

hari/tanggal : senin/11 januari 2010
arah : SMG - SCG

| waktu | pejalan kaki /penyebrang | parkir /berhenti | kendaraan keluar & masuk | kendaraan lambat |
|---|---|---|---|---|
| 08.00 - 08.15 | 75 | 29 | 23 | 7 |
| 08.15 - 08.30 | 93 | 31 | 19 | 3 |
| 08.30 - 08.45 | 109 | 18 | 23 | 1 |
| 08.45 - 09.00 | 69 | 15 | 15 | 6 |
| 09.00 - 09.15 | 81 | 21 | 26 | 5 |
| 09.15 - 09.30 | 93 | 28 | 11 | 7 |
| 09.30 - 09.45 | 74 | 15 | 28 | 3 |
| 09.45 - 10.00 | 87 | 18 | 19 | 5 |
| 12.00 - 12.15 | 54 | 23 | 21 | 7 |
| 12.15 - 12.30 | 73 | 28 | 17 | 7 |
| 12.30 - 12.45 | 45 | 17 | 16 | 7 |
| 12.45 - 13.00 | 65 | 12 | 24 | 6 |
| 13.00 - 13.15 | 58 | 16 | 11 | 9 |
| 13.15 - 13.30 | 74 | 25 | 14 | 4 |
| 13.30 - 13.45 | 43 | 30 | 25 | 5 |
| 13.45 - 14.00 | 59 | 28 | 15 | 6 |
| 17.00 - 17.15 | 83 | 30 | 18 | 10 |
| 17.15 - 17.30 | 91 | 26 | 25 | 7 |
| 17.30 - 17.45 | 78 | 35 | 16 | 5 |
| 17.45 -18.00 | 84 | 19 | 15 | 5 |
| 18.00 - 18.15 | 102 | 29 | 20 | 5 |
| 18.15 - 18.30 | 89 | 24 | 27 | 6 |
| 18.30 - 18.45 | 60 | 17 | 19 | 8 |
| 18.45 - 19.00 | 83 | 32 | 18 | 5 |

hari/tanggal : senin/11 januari 2010
arah : Alternatif - SCG

| waktu | pejalan kaki /penyebrang | parkir /berhenti | kendaraan keluar & masuk | kendaraan lambat |
|---|---|---|---|---|
| 08.00 - 08.15 | 28 | 3 | 11 | 6 |
| 08.15 - 08.30 | 36 | 1 | 7 | 6 |
| 08.30 - 08.45 | 18 | 6 | 1 | 4 |
| 08.45 - 09.00 | 27 | 2 | 5 | 5 |
| 09.00 - 09.15 | 25 | 3 | 7 | 8 |
| 09.15 - 09.30 | 31 | 1 | 4 | 5 |
| 09.30 - 09.45 | 49 | 5 | 10 | 3 |
| 09.45 - 10.00 | 30 | 1 | 12 | 5 |
| 12.00 - 12.15 | 36 | 2 | 8 | 6 |
| 12.15 - 12.30 | 28 | 9 | 3 | 4 |
| 12.30 - 12.45 | 47 | 4 | 16 | 5 |
| 12.45 - 13.00 | 37 | 3 | 8 | 8 |
| 13.00 - 13.15 | 34 | 14 | 11 | 6 |
| 13.15 - 13.30 | 28 | 7 | 18 | 4 |
| 13.30 - 13.45 | 39 | 4 | 9 | 4 |
| 13.45 - 14.00 | 45 | 8 | 7 | 4 |
| 17.00 - 17.15 | 37 | 5 | 9 | 5 |
| 17.15 - 17.30 | 39 | 3 | 11 | 7 |
| 17.30 - 17.45 | 42 | 5 | 2 | 6 |
| 17.45 -18.00 | 28 | 5 | 7 | 5 |
| 18.00 - 18.15 | 34 | 3 | 8 | 4 |
| 18.15 - 18.30 | 29 | 11 | 7 | 5 |
| 18.30 - 18.45 | 31 | 15 | 9 | 4 |
| 18.45 - 19.00 | 28 | 9 | 2 | 5 |

# Lampiran 3

(Data Jumlah Penduduk Kab. Magelang Tahun 2008)

Jumlah Rumahtangga dan Penduduk dan Menurut Kecamatan, 2008

*Number of Households and Population by Districts, 2008*

| Kecamatan *Districts* | RumahTangga *Families* | Jumlah Penduduk Laki Laki/*Male* | Perempuan/*Female* | Jumlah *Total* |
|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) |
| 01. Salaman | 19 481 | 33 949 | 34 841 | 68 790 |
| 02. Borobudur | 15 615 | 28 324 | 27 825 | 56 149 |
| 03. Ngluwar | 9 008 | 15 081 | 14 841 | 29 922 |
| 04. Salam | 12 067 | 22 303 | 21 456 | 43 759 |
| 05. Srumbung | 11 833 | 22 614 | 22 302 | 44 916 |
| 06. Dukun | 12 618 | 21 696 | 21 914 | 43 610 |
| 07. Muntilan | 20 252 | 36 317 | 36 924 | 73 241 |
| 08. Mungkid | 18 050 | 33 456 | 34 995 | 68 451 |
| 09. Sawangan | 15 134 | 28 223 | 28 587 | 56 810 |
| 10. Candimulyo | 11 808 | 23 843 | 23 627 | 47 470 |
| 11. Mertoyudan | 27 750 | 47 831 | 48 619 | 96 450 |
| 12. Tempuran | 12 021 | 23 692 | 23 513 | 47 205 |
| 13. Kajoran | 14 362 | 28 430 | 27 677 | 56 107 |
| 14. Kaliangkrik | 14 088 | 28 192 | 28 380 | 56 572 |
| 15. Bandongan | 13 997 | 28 097 | 27 856 | 55 953 |
| 16. Windusari | 12 006 | 24 942 | 25 521 | 50 463 |
| 17. Secang | 19 828 | 37 663 | 37 298 | 74 961 |
| 18. Tegalrejo | 12 547 | 26 586 | 24 977 | 51 563 |
| 19. Pakis | 15 266 | 27 373 | 28 033 | 55 406 |
| 20. Grabag | 21 758 | 43 228 | 43 232 | 86 460 |
| 21. Ngablak | 10 988 | 20 435 | 20 281 | 40 716 |
| Jumlah / *Total* | 320 477 | 602 275 | 602 699 | 1 204 974 |
| Jumlah / *Total* | 324 395* | 591 898 | 597 064 | 1 188 962 |

* Jumlah Keluarga

Sumber: Badan Pusat Statistik Kabupaten Magelang

*Source: BPS-Statistics of Magelang Regency*

Lampiran 3| Hala...
Data Jumlah Pendu...
Kab. Magelang Tahun 2...

# Lampiran 4

(Fomulir MKJI 1997 pada Hari Sabtu 9 Januari 2010)

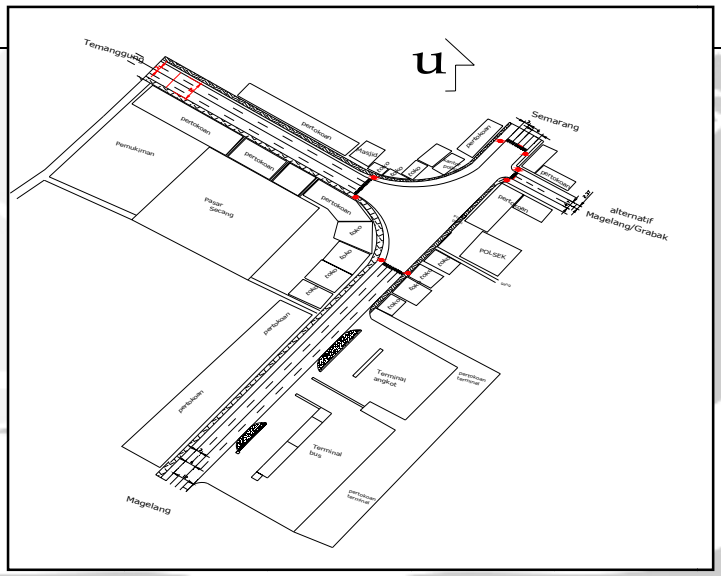
Formulir SIG - I

| | | |
|---|---|---|
| **SIMPANG BERSINYAL**<br>FORMULIR SIG-I :<br>- GEOMETRI<br><br>- PENGATURAN LALULINTAS<br>- LINGKUNGAN | Tanggal : 9 Januari 2010 | Ditangani oleh : Thomas R. Iristha |
| | Kota : Secang, Magelang | |
| | Simpang : Secang | |
| | Ukuran Kota/jumlah penduduk (isi dalam jutaan) : 1.2 | |
| | Perihal : 3 fase | |
| | Periode : jam puncak sabtu pagi, 9 januari 2010 pukul 08.00 - 09.00 wib | |

**FASE SINYAL YANG ADA (Gambarkan Sket Fase)**

| | | | | |
|---|---|---|---|---|
| **g = 34** | **g = 34** | **g = 22** | **g =** | Waktu siklus : c<br>**105** |
| **IG= 5** | **IG= 5** | **IG= 5** | **IG =** | Waktu hilang total :<br>**LTI = Σ IG = 15** |

**SKETSA SIMPANG**




**KONDISI LAPANGAN**

| Kode Pendekat | Tipe lingkungan jalan (com/res/ra) | Hambatan Samping (Tinggi/Rendah) | Median Ya/Tidak | kelandaian +/- % | Belok kiri langsung Ya/Tidak | Jarak ke kendaraan parkir (m) | Lebar Pendekat ( m ) Pendekat $W_A$ | Masuk $W_{ENTRY}$ | Belok kiri lgs. $W_{LTOR}$ | Keluar $W_{EXIT}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
| U | com | R | T | 0 | T | | 6.0 | 6.0 | 0.0 | 6.0 |
| S | com | T | T | 0 | Y | | 6.0 | 3.0 | 3.0 | 6.0 |
| T | com | R | T | 0 | T | | 2.4 | 2.4 | 0.0 | 2.4 |
| B | com | T | T | 0 | Y | | 6 | 3 | 3.0 | 6.0 |

| **SIMPANG BERSINYAL** | Tanggal : 9 Januari 2010 | Ditangani oleh : Thomas R. Iristha |
|---|---|---|
| Formulir SIG-II : | Kota : Secang, Magelang | |
| ARUS LALULINTAS | Simpang : Secang | Periode : jam puncak sabtu pagi, 9 januari 2010 pukul 08.00 - 09.00 wib |
| | Perihal : 3 fase | |

| Kode Pendekat | Arah | Arus LaluLintas Kendaraan Bermotor ( MV ) | | | | | | | | | | | | | | Kend.tak bermotor | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Kendaraan Ringan(LV) emp terlindung = 1,0 emp terlawan = 1,0 | | | Kendaraan Berat(HV) emp terlindung = 1,3 emp terlawan = 1,3 | | | Sepeda Motor(MC) emp terlindung = 0,2 emp terlawan = 0,4 | | | Kendaraan Bermotor Total MV | | | Rasio Berbelok | | Arus UM | Rasio $P_{UM}$ = UM/ MV |
| | | kend/ jam | smp/jam | | kend/ jam | smp/jam | | kend/ jam | smp/jam | | kend/ jam | smp/jam | | Kiri | Kanan | kend/ jam | |
| | | | Terlindung | Terlawan | | Terlindung | Terlawan | | Terlindung | Terlawan | | Terlindung | Terlawan | $P_{LT}$ | $P_{RT}$ | | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) |
| U | LT(tanpa LTOR) | 19 | 19 | 19 | 7 | 9.1 | 9.1 | 66 | 13.2 | 26.4 | 92 | 41.3 | 54.5 | 0.062 | | 1 | |
| | ST | 265 | 265 | 265 | 123 | 159.9 | 159.9 | 487 | 97.4 | 194.8 | 875 | 522.3 | 619.7 | | | 7 | |
| | RT | 49 | 49 | 49 | 23 | 29.9 | 29.9 | 119 | 23.8 | 47.6 | 191 | 102.7 | 126.5 | | 0.154 | 4 | |
| | **Total** | 333 | 333 | 333 | 153 | 198.9 | 198.9 | 672 | 134.4 | 268.8 | 1158 | 666.3 | 800.7 | | | 12 | 0.0104 |
| S | LTOR | 85.00 | 85 | 85 | 73 | 94.9 | 94.9 | 226 | 45.2 | 90.4 | 384 | 225.1 | 270.3 | 0.327 | | 4 | |
| | ST | 221.00 | 221 | 221 | 95 | 123.5 | 123.5 | 402 | 80.4 | 160.8 | 718 | 424.9 | 505.3 | | | 6 | |
| | RT | 25.00 | 25 | 25 | 3 | 3.9 | 3.9 | 44 | 8.8 | 17.6 | 72 | 37.7 | 46.5 | | 0.055 | 3 | |
| | **Total** | 331 | 331 | 331 | 171 | 222.3 | 222.3 | 672 | 134.4 | 268.8 | 1174 | 687.7 | 822.1 | | | 13 | 0.0111 |
| T | LT(tanpa LTOR) | 37.00 | 37 | 37 | 5 | 6.5 | 6.5 | 84 | 16.8 | 33.6 | 126 | 60.3 | 77.1 | 0.407 | | 2 | |
| | ST | 20.00 | 20 | 20 | 11 | 14.3 | 14.3 | 104 | 20.8 | 41.6 | 135 | 55.1 | 75.9 | | | 7 | |
| | RT | 11.00 | 11 | 11 | 7 | 9.1 | 9.1 | 63 | 12.6 | 25.2 | 81 | 32.7 | 45.3 | | 0.221 | 3 | |
| | **Total** | 68 | 68 | 68 | 23 | 29.9 | 29.9 | 251 | 50.2 | 100.4 | 342 | 148.1 | 198.3 | | | 12 | 0.0351 |
| B | LTOR | 39.00 | 39 | 39 | 28.00 | 36.4 | 36.4 | 118 | 23.6 | 47.2 | 185 | 99.0 | 122.6 | 0.668 | | 3 | |
| | ST | 14.00 | 14 | 14 | 6.00 | 7.8 | 7.8 | 81 | 16.2 | 32.4 | 101 | 38.0 | 54.2 | | | 6 | |
| | RT | 118.00 | 118 | 118 | 78.00 | 101.4 | 101.4 | 277 | 55.4 | 110.8 | 473 | 274.8 | 330.2 | | 0.667 | 4 | |
| | **Total** | 171 | 171 | 171 | 112 | 145.6 | 145.6 | 476 | 95.2 | 190.4 | 759 | 411.8 | 507.0 | | | 13 | 0.0171 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **SIMPANG BERSINYAL**<br>Formulir SIG - III :<br>-WAKTU ANTAR HIJAU<br>-WAKTU HILANG | | | Tanggal : 9 Januari 2010<br>Ditangani oleh : Thomas R. Iristha<br>Kota : Secang, Magelang<br>Simpang : Secang<br>Perihal : 3 fase | | | | |
| LALULINTAS<br>BERANGKAT | | LALU LINTAS DATANG | | | | | Waktu merah semua (dtk) |
| Pendekat | Kecepatan $V_{EV}$ (m/dtk) | Pendekat | Utara | Timur | Selatan | Barat | |
| | | Kecepatan $V_{AV}$ (m/dtk) | 10 | 10 | 10 | 10 | |
| Utara | 10 | Jarak berangkat-datang (m) | | | | | |
| | | Waktu berangkat-datang (dtk)*) | | | | | |
| Timur | 10 | Jarak berangkat-datang (m) | | | | | |
| | | Waktu berangkat-datang (dtk)*) | | | | | |
| Selatan | 10 | Jarak berangkat-datang (m) | | | | | |
| | | Waktu berangkat-datang (dtk)*) | | | | | |
| Barat | 10 | Jarak berangkat-datang (m) | | | | | |
| | | Waktu berangkat-datang (dtk)*) | | | | | |
| | | Penentuan waktu all red didasarkan pada aturan fase | Penentuan waktu merah semua : (data ini dapat dirubah sendiri sesuai fase) | | | | |
| | | | Fase 1 --> Fase 2 | | | | 2 |
| | | | Fase 2 --> Fase 3 | | | | 2 |
| | | | Fase 3 --> Fase 1 | | | | 2 |
| | | | Jumlah fase | 3 | kuning/fase | 3 | 9 |
| | | | Waktu hilang total (LTI)= Merah semua total+waktu kuning (dtk / siklus ) | | | | 15 |

Dari gambar 5.1.

*) Waktu untuk berangkat = ( $L_{EV}$ + $I_{EV}$ ) / $V_{EV}$, dimana $I_{EV}$ = 2 m

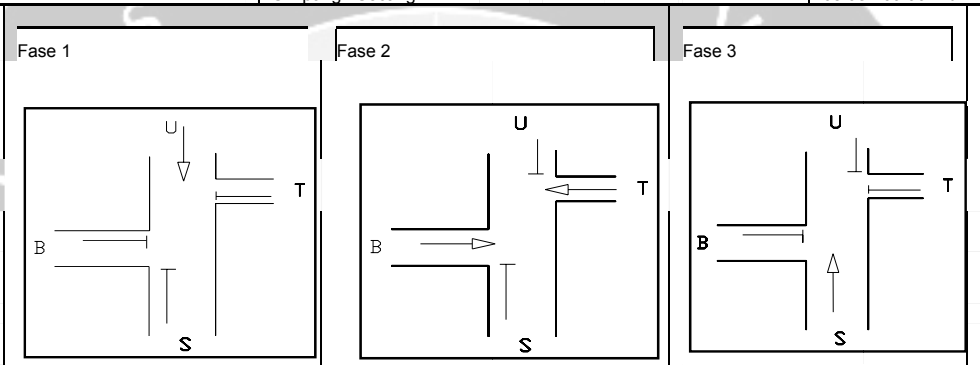
Waktu untuk datang = $L_{AV}$ / $V_{AV}$

Tabel Formulir SIG - IV

| | | |
|---|---|---|
| **SIMPANG BERSINYAL**<br>Formulir SIG-IV : PENENTUAN WAKTU SINYAL<br><br>KAPASITAS | Tanggal : 9 Januari 2010<br>Kota : Secang, Magelang<br><br>Simpang : Secang | Ditangani oleh : Thomas R. Iristha<br>Perihal : 3 fase<br>Periode : jam puncak sabtu pagi, 9 januari 2010 pukul 08.00 - 09.00 wib |

Distribusi arus lalu lintas(smp/jam)

| | | | |
|---|---|---|---|
| | 102.7 | 522.3 | 41.3 U |
| | 99.0 | | 32.7 |
| B | 38.0 | | 55.1 T |
| | 274.8 | | 60.3 |
| | 270.3 | 505.3 S | 46.5 |




| Kode Pen-dekat | Hijau dalam fase no. | Tipe Pen-dekat (P / O) | Rasio kendaraan berbelok | | | Arus RT smp/j | | Lebar efektif | Arus jenuh smp/jam Hijau | | | | | | | | Arus lalu lintas | Rasio Arus | Rasio fase | Waktu hijau | Kapa-sitas | Derajat jenuh |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Arah dari | Arah lawan | | Nilai dasar smp/jhijau | Faktor Penyesuaian | | | | | | Nilai disesu-aikan smp/jam hijau | | | | | | |
| | | | | | | | | | | Semua tipe pendekat | | | | Hanya tipe P | | | | | | | | |
| | | | | | | | | | | Ukuran kota | Hambatan Samping | kelan-daian | Parkir | Belok Kanan | Belok Kiri | | | | | | | |
| | | | $P_{LTOR}$ | $P_{LT}$ | $P_{RT}$ | $Q_{RT}$ | $Q_{RTo}$ | $W_E$ | **So** | $F_{CS}$ | $F_{SF}$ | $F_G$ | $F_P$ | $F_{RT}$ | $F_{LT}$ | **S** | **Q** | **Q/S** | $\frac{FR_{CRIT}}{IFR}$ | **g** | **Sxg/c** | **Q / C** |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) | (19) | (20) | (21) | (22) | (23) |
| U | 1 | p | 0.000 | 0.062 | 0.154 | 102.7 | | 6.00 | 4650 | 1.0 | 0.934 | 1.00 | 0.80 | 1.04 | 0.99 | 3577.0 | 625.0 | 0.175 | 0.265 | 34 | 1158.3 | 0.5396 |
| S | 2 | P | 0.327 | 0.000 | 0.055 | 37.7 | | 3.00 | 2325 | 1.0 | 0.933 | 1.00 | 0.80 | 1.01 | 1.00 | 1760.8 | 462.6 | 0.263 | 0.399 | 34 | 570.2 | 0.8114 |
| T | 3 | p | 0.000 | 0.407 | 0.221 | 32.7 | | 2.37 | 1837 | 1.0 | 0.919 | 1.00 | 0.80 | 1.06 | 0.93 | 1334.8 | 87.8 | 0.066 | 0.100 | 22 | 279.7 | 0.3139 |
| B | 3 | P | 0.668 | 0.000 | 0.667 | 274.8 | | 3.00 | 2325 | 1.0 | 0.923 | 1.00 | 0.80 | 1.17 | 1.00 | 2015.0 | 312.8 | 0.155 | 0.236 | 22 | 422 | 0.7409 |
| Waktu hilang total | | | 15 | Waktu siklus pra penyesuaian $c_{ua}$ (det) | | | | | | | 80.5 | | | | | | IFR = | | Total g = | 90 | | |
| LTI ( det ) | | | | Waktu siklus disesuaian c (det) | | | | | | | 105 | | | | | | $\Sigma FR_{CRIT}$ | 0.658 | | | | |

## Formulir SIG - V

| | | |
|---|---|---|
| **SIMPANG BERSINYAL** | Tanggal : 9 Januari 2010 | Ditangani oleh : Thomas R. Iristha |
| Formulir SIG-V : PANJANG ANTRIAN | Kota : Secang, Magelang | Kondisi Eksiting |
| JUMLAH KENDARAAN TERHENTI | Simpang : Secang | Periode : jam puncak sabtu pagi, 9 januari 2010 pukul 08.00 - 09.00 wib |
| TUNDAAN | Waktu siklus : | |

| Kode Pendekat | Arus Lalu Lintas smp/jam **Q** | Kapasitas smp / jam **C** | Derajat Kejenuhan **DS= Q/C** | Rasio Hijau **GR = g/c** | Jumlah kendaraan antri (smp) | | | | Panjang Antrian ( m ) **QL** | Angka Henti stop/smp **NS** | Jumlah Kendaraan Terhenti smp/jam $N_{SV}$ | Tundaan | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | **$NQ_1$** | **$NQ_2$** | **Total NQ= $NQ_1$+$NQ_2$** | **$NQ_{MAX}$** liat gbe22 | | | | Tundaan lalu lintas rata-rata det/smp **DT** | Tundaan geometrik rata-rata det/smp **DG** | Tundaan rata-rata det/smp **D = DT+DG** | Tundaan total smp.det **D x Q** |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) |
| U | 625.0 | 1158.3 | 0.5396 | 0.324 | 0.1 | 14.9 | 15.0 | 23.0 | 77 | 0.742 | 464 | 29.4 | 3.2 | 32.6 | 20350 |
| S | 462.6 | 570.2 | 0.8114 | 0.324 | 1.6 | 12.4 | 14.0 | 21.7 | 144 | 0.932 | 431 | 42.7 | 3.9 | 46.6 | 21540 |
| T | 87.8 | 279.7 | 0.3139 | 0.210 | 0.0 | 2.2 | 2.2 | 6.1 | 52 | 0.762 | 67 | 35.1 | 3.4 | 38.5 | 3378 |
| B | 312.8 | 422.2 | 0.7409 | 0.210 | 0.9 | 8.5 | 9.5 | 15.7 | 105 | 0.932 | 292 | 46.6 | 4.3 | 50.9 | 15922 |
| | | | | | | | | | | | | | | | |
| LTOR(semua) | 384 | | | | | | | | | | | 0.0 | 6.0 | 6.0 | 2306.4 |
| Arus total. Q tot. | | | | | | | | | | Total : | 1253 | | | Total : | 63497 |
| Arus kor. Q kor. | 1873 | | | | | | | | | Kendaraan terhenti rata-rata stop/smp : | 0.67 | | | Tundaan simpang rata-rata(det/smp) : | 33.91 |

| **SIMPANG BERSINYAL** | Tanggal : 9Januari 2010 | Ditangani oleh : Thomas R. Iristha |
|---|---|---|
| Formulir SIG-II : | Kota : Secang, Magelang | |
| ARUS LALULINTAS | Simpang : Secang | Periode : jam puncak sabtu siang, 9 januari 2010 pukul 12.00 - 13.00 wib |
| | Perihal : 3 fase | |

| Kode Pendekat | Arah | Arus LaluLintas Kendaraan Bermotor ( MV ) | | | | | | | | | | | | Kend.tak bermotor | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Kendaraan Ringan(LV) | | | Kendaraan Berat(HV) | | | Sepeda Motor(MC) | | | Kendaraan Bermotor Total MV | | | Rasio Berbelok | | Arus UM | Rasio $P_{UM}$ = UM/ MV |
| | | emp terlindung = 1,0 emp terlawan = 1,0 | | | emp terlindung = 1,3 emp terlawan = 1,3 | | | emp terlindung = 0,2 emp terlawan = 0,4 | | | | | | | | | |
| | | kend/ jam | smp/jam | | kend/ jam | smp/jam | | kend/ jam | smp/jam | | kend/ jam | smp/jam | | Kiri $P_{LT}$ | Kanan $P_{RT}$ | kend/ jam | |
| | | | Terlindung | Terlawan | | Terlindung | Terlawan | | Terlindung | Terlawan | | Terlindung | Terlawan | | | | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) |
| U | LT(tanpa LTOR) | 15 | 15 | 15 | 2 | 2.6 | 2.6 | 66 | 13.2 | 26.4 | 83 | 30.8 | 44.0 | 0.045 | | 2 | |
| | ST | 343 | 343 | 343 | 97 | 126.1 | 126.1 | 487 | 97.4 | 194.8 | 927 | 566.5 | 663.9 | | | 2 | |
| | RT | 44 | 44 | 44 | 16 | 20.8 | 20.8 | 119 | 23.8 | 47.6 | 179 | 88.6 | 112.4 | | 0.129 | 7 | |
| | **Total** | 402 | 402 | 402 | 115 | 149.5 | 149.5 | 672 | 134.4 | 268.8 | 1189 | 685.9 | 820.3 | | | 11 | 0.0093 |
| S | LTOR | 127.00 | 127 | 127 | 72 | 93.6 | 93.6 | 56 | 11.2 | 22.4 | 255 | 231.8 | 243.0 | 0.291 | | 3 | |
| | ST | 320.00 | 320 | 320 | 103 | 133.9 | 133.9 | 326 | 65.2 | 130.4 | 749 | 519.1 | 584.3 | | | 3 | |
| | RT | 18.00 | 18 | 18 | 2 | 2.6 | 2.6 | 122 | 24.4 | 48.8 | 142 | 45.0 | 69.4 | | 0.057 | 2 | |
| | **Total** | 465 | 465 | 465 | 177 | 230.1 | 230.1 | 504 | 100.8 | 201.6 | 1146 | 795.9 | 896.7 | | | 8 | 0.0070 |
| T | LT(tanpa LTOR) | 21.00 | 21 | 21 | 5 | 6.5 | 6.5 | 52 | 10.4 | 20.8 | 78 | 37.9 | 48.3 | 0.307 | | 2 | |
| | ST | 29.00 | 29 | 29 | 8 | 10.4 | 10.4 | 42 | 8.4 | 16.8 | 79 | 47.8 | 56.2 | | | 4 | |
| | RT | 21.00 | 21 | 21 | 8 | 10.4 | 10.4 | 31 | 6.2 | 12.4 | 60 | 37.6 | 43.8 | | 0.305 | 8 | |
| | **Total** | 71 | 71 | 71 | 21 | 27.3 | 27.3 | 125 | 25.0 | 50.0 | 217 | 123.3 | 148.3 | | | 14 | 0.0645 |
| B | LTOR | 44.00 | 44 | 44 | 26.00 | 33.8 | 33.8 | 145 | 29.0 | 58.0 | 215 | 106.8 | 135.8 | 0.866 | | 5 | |
| | ST | 19.00 | 19 | 19 | 9.00 | 11.7 | 11.7 | 76 | 15.2 | 30.4 | 104 | 45.9 | 61.1 | | | 8 | |
| | RT | 117.00 | 117 | 117 | 78.00 | 101.4 | 101.4 | 296 | 59.2 | 118.4 | 491 | 277.6 | 336.8 | | 0.645 | 3 | |
| | **Total** | 180 | 180 | 180 | 113 | 146.9 | 146.9 | 517 | 103.4 | 206.8 | 810 | 430.3 | 533.7 | | | 16 | 0.0198 |

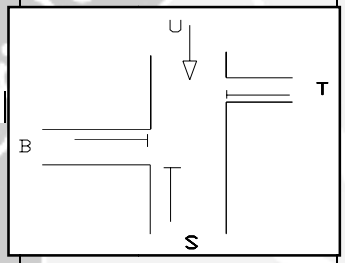
Tabel Formulir SIG - IV

| | | |
|---|---|---|
| **SIMPANG BERSINYAL**<br>Formulir SIG-IV : PENENTUAN WAKTU SINYAL<br>KAPASITAS | Tanggal : 9Januari 2010<br>Kota : Secang, Magelang<br>Simpang : Secang | Ditangani oleh : Thomas R. Iristha<br>Perihal : 3 fase<br>Periode : jam puncak sabtu siang, 9 januari 2010 pukul 12.00 - 13.00 wib |

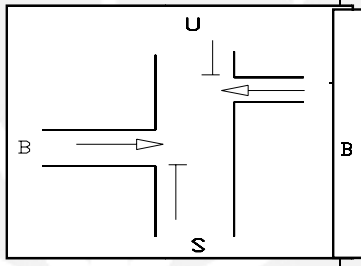
Distribusi arus lalu lintas(smp/jam)

| | | | |
|---|---|---|---|
| | 88.6 | 566.5 | 30.8 U |
| | 106.8 | | 37.6 |
| B | 45.9 | | 47.8 T |
| | 277.6 | | 37.9 |
| | 243.0 | 584.3 S | 69.4 |

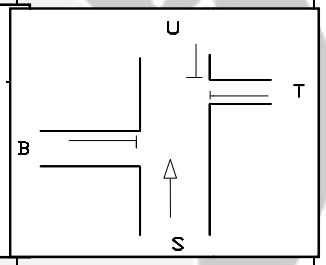
Fase 1




Fase 2




Fase 3




Fase 4

| Kode Pen-dekat | Hijau dalam fase no. | Tipe Pen-dekat (P / O) | Rasio kendaraan berbelok $P_{LTOR}$ | Rasio kendaraan berbelok $P_{LT}$ | Rasio kendaraan berbelok $P_{RT}$ | Arus RT smp/j Arah dari $Q_{RT}$ | Arus RT smp/j Arah lawan $Q_{RTO}$ | Lebar efektif (m) $W_E$ | Arus jenuh smp/jam Hijau: Nilai dasar smp/j hijau So | Faktor Penyesuaian: Semua tipe pendekat: Ukuran kota $F_{CS}$ | Hambatan Samping $F_{SF}$ | kelandaian $F_G$ | Parkir $F_P$ | Hanya tipe P: Belok Kanan $F_{RT}$ | Belok Kiri $F_{LT}$ | Nilai disesuaikan smp/jam hijau S | Arus lalu lintas smp/j Q | Rasio Arus FR = Q/S | Rasio fase PR = $FR_{CRIT}$/IFR | Waktu hijau det g | Kapasitas smp/j C = Sxg/c | Derajat jenuh DS= Q / C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) | (19) | (20) | (21) | (22) | (23) |
| U | 1 | p | 0.000 | 0.045 | 0.129 | 88.6 | | 6.00 | 4650 | 1.0 | 0.934 | 1.00 | 0.80 | 1.034 | 0.99 | 3567.1 | 655.1 | 0.184 | 0.252 | 34 | 1155.1 | 0.5672 |
| S | 2 | P | 0.291 | 0.000 | 0.057 | 45.0 | | 3.00 | 2325 | 1.0 | 0.936 | 1.00 | 0.80 | 1.015 | 1.00 | 1766.2 | 564.1 | 0.319 | 0.439 | 34 | 571.9 | 0.9863 |
| T | 3 | p | 0.000 | 0.307 | 0.305 | 37.6 | | 2.37 | 1837 | 1.0 | 0.901 | 1.00 | 0.80 | 1.079 | 0.95 | 1359.1 | 85.4 | 0.063 | 0.086 | 22 | 284.8 | 0.2999 |
| B | 3 | P | 0.866 | 0.000 | 0.645 | 277.6 | | 3.00 | 2325 | 1.0 | 0.922 | 1.00 | 0.80 | 1.17 | 1.00 | 2002.8 | 323.5 | 0.162 | 0.222 | 22 | 420 | 0.7709 |
| Waktu hilang total | | | | Waktu siklus pra penyesuaian $c_{ua}$ (det) | | | | | | | 100.9 | | | | | | IFR = | | Total g = | 90 | | |
| LTI ( det ) | | | 15 | Waktu siklus disesuaian c (det) | | | | | | | 105 | | | | | | $\Sigma FR_{CRIT}$ | 0.727 | | | | |

## Formulir SIG - V

| | | |
|---|---|---|
| **SIMPANG BERSINYAL** | Tanggal : 9Januari 2010 | Ditangani oleh : Thomas R. Iristha |
| Formulir SIG-V : PANJANG ANTRIAN | Kota : Secang, Magelang | Kondisi Eksiting |
| JUMLAH KENDARAAN TERHENTI | Simpang : Secang | Periode : jam puncak sabtu siang, 9 januari 2010 pukul 12.00 - 13.00 wib |
| TUNDAAN | Waktu siklus : | |

| Kode Pendekat | Arus Lalu Lintas smp/jam **Q** | Kapasitas smp / jam **C** | Derajat Kejenuhan **DS= Q/C** | Rasio Hijau **GR = g/c** | Jumlah kendaraan antri (smp) | | | | Panjang Antrian ( m ) **QL** | Angka Henti stop/smp **NS** | Jumlah Kendaraan Terhenti smp/jam **$N_{SV}$** | Tundaan | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | **$NQ_1$** | **$NQ_2$** | **Total $NQ=NQ_1+NQ_2$** | **$NQ_{MAX}$** liat gbe22 | | | | Tundaan lalu lintas rata-rata det/smp **DT** | Tundaan geo-metrik rata-rata det/smp **DG** | Tundaan rata-rata det/smp **D = DT+DG** | Tundaan total smp.det **D x Q** |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) |
| U | 655.1 | 1155.1 | 0.5672 | 0.324 | 0.2 | 15.8 | 16.0 | 24.3 | 81 | 0.753 | 493 | 29.9 | 3.2 | 33.1 | 21678 |
| S | 564.1 | 571.9 | 0.9863 | 0.324 | 10.0 | 16.3 | 26.3 | 37.9 | 253 | 1.441 | 813 | 98.2 | 4.8 | 103.1 | 58139 |
| T | 85.4 | 284.8 | 0.2999 | 0.210 | 0.0 | 2.1 | 2.1 | 6.1 | 51 | 0.759 | 65 | 35.0 | 3.5 | 38.5 | 3286 |
| B | 323.5 | 419.6 | 0.7709 | 0.210 | 1.2 | 8.9 | 10.1 | 16.5 | 110 | 0.959 | 310 | 49.0 | 4.2 | 53.2 | 17224 |
| | | | | | | | | | | | | | | | |
| LTOR(semua) | 377 | | | | | | | | | | | 0.0 | 6.0 | 6.0 | 2259 |
| Arus total. Q tot. | | | | | | | | | | | | | | | |
| | | | | | | | | | | | Total : | 1681 | | Total : | 102585 |
| Arus kor. Q kor. | 2005 | | | | | | | | | | | | | | |
| | | | | | | | | | | | Kendaraan terhenti rata-rata stop/smp : | 0.84 | | Tundaan simpang rata-rata(det/smp) : | 51.18 |

| **SIMPANG BERSINYAL** | Tanggal : 9Januari 2010 | Ditangani oleh : Thomas R. Iristha |
|---|---|---|
| Formulir SIG-II : | Kota : Secang, Magelang | |
| ARUS LALULINTAS | Simpang : Secang | Periode : jam puncak sabtu sore, 9 januari 2010 pukul 17.00 - 18.00 wib |
| | Perihal : 3 fase | |

| Kode Pendekat | Arah | Arus LaluLintas Kendaraan Bermotor ( MV ) | | | | | | | | | | | | Rasio Berbelok | | Kend.tak bermotor | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Kendaraan Ringan(LV) emp terlindung = 1,0 emp terlawan = 1,0 | | | Kendaraan Berat(HV) emp terlindung = 1,3 emp terlawan = 1,3 | | | Sepeda Motor(MC) emp terlindung = 0,2 emp terlawan = 0,4 | | | Kendaraan Bermotor Total MV | | | | | Arus UM | Rasio $P_{UM}$ = UM/ MV |
| | | kend/ jam | smp/jam Terlindung | smp/jam Terlawan | kend/ jam | smp/jam Terlindung | smp/jam Terlawan | kend/ jam | smp/jam Terlindung | smp/jam Terlawan | kend/ jam | smp/jam Terlindung | smp/jam Terlawan | Kiri $P_{LT}$ | Kanan $P_{RT}$ | kend/ jam | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) |
| U | LT(tanpa LTOR) | 11 | 11 | 11 | 8 | 10.4 | 10.4 | 21 | 4.2 | 8.4 | 40 | 25.6 | 29.8 | 0.041 | | 4 | |
| | ST | 310 | 310 | 310 | 63 | 81.9 | 81.9 | 423 | 84.6 | 169.2 | 796 | 476.5 | 561.1 | | | 4 | |
| | RT | 91 | 91 | 91 | 15 | 19.5 | 19.5 | 92 | 18.4 | 36.8 | 198 | 128.9 | 147.3 | | 0.204 | 9 | |
| | **Total** | 412 | 412 | 412 | 86 | 111.8 | 111.8 | 536 | 107.2 | 214.4 | 1034 | 631.0 | 738.2 | | | 17 | 0.0164 |
| S | LTOR | 196.00 | 196 | 196 | 75 | 97.5 | 97.5 | 224 | 44.8 | 89.6 | 495 | 338.3 | 383.1 | 0.300 | | 5 | |
| | ST | 440.00 | 440 | 440 | 144 | 187.2 | 187.2 | 499 | 99.8 | 199.6 | 1083 | 727.0 | 826.8 | | | 8 | |
| | RT | 41.00 | 41 | 41 | 10 | 13.0 | 13.0 | 45 | 9.0 | 18.0 | 96 | 63.0 | 72.0 | | 0.056 | 3 | |
| | **Total** | 677 | 677 | 677 | 229 | 297.7 | 297.7 | 768 | 153.6 | 307.2 | 1674 | 1128.3 | 1281.9 | | | 16 | 0.0096 |
| T | LT(tanpa LTOR) | 37.00 | 37 | 37 | 6 | 7.8 | 7.8 | 67 | 13.4 | 26.8 | 110 | 58.2 | 71.6 | 0.426 | | 5 | |
| | ST | 22.00 | 22 | 22 | 7 | 9.1 | 9.1 | 57 | 11.4 | 22.8 | 86 | 42.5 | 53.9 | | | 4 | |
| | RT | 15.00 | 15 | 15 | 7 | 9.1 | 9.1 | 59 | 11.8 | 23.6 | 81 | 35.9 | 47.7 | | 0.263 | 7 | |
| | **Total** | 74 | 74 | 74 | 20 | 26.0 | 26.0 | 183 | 36.6 | 73.2 | 277 | 136.6 | 173.2 | | | 16 | 0.0578 |
| B | LTOR | 73.00 | 73 | 73 | 27.00 | 35.1 | 35.1 | 143 | 28.6 | 57.2 | 243 | 136.7 | 165.3 | 1.001 | | 7 | |
| | ST | 19.00 | 19 | 19 | 7.00 | 9.1 | 9.1 | 86 | 17.2 | 34.4 | 112 | 45.3 | 62.5 | | | 8 | |
| | RT | 197.00 | 197 | 197 | 35.00 | 45.5 | 45.5 | 180 | 36.0 | 72.0 | 412 | 278.5 | 314.5 | | 0.605 | 4 | |
| | **Total** | 289 | 289 | 289 | 69 | 89.7 | 89.7 | 409 | 81.8 | 163.6 | 767 | 460.5 | 542.3 | | | 19 | 0.0248 |

Tabel Formulir SIG - IV

| | | |
|---|---|---|
| **SIMPANG BERSINYAL**<br>Formulir SIG-IV : PENENTUAN WAKTU SINYAL<br>KAPASITAS | Tanggal : 9Januari 2010<br>Kota : Secang, Magelang<br>Simpang : Secang | Ditangani oleh : Thomas R. Iristha<br>Perihal : 3 fase<br>Periode : jam puncak sabtu sore, 9 januari 2010 pukul 17.00 - 18.00 wib |

Distribusi arus lalu lintas(smp/jam)

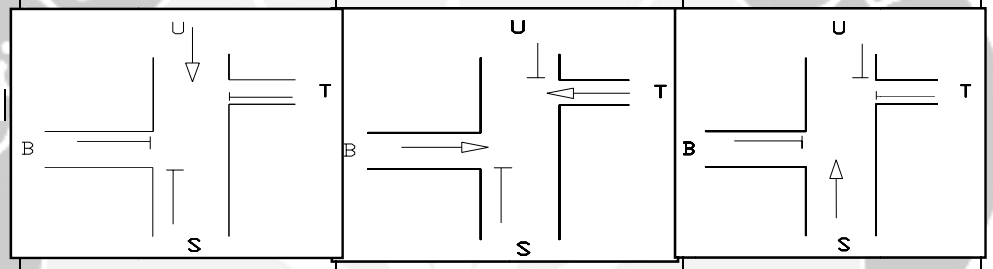
128.9 476.5 25.6 U

136.7 35.9

B 45.3 42.5 T

278.5 58.2

383.1 826.8 72.0 S




Fase 4

| Kode Pendekat | Hijau dalam fase | Tipe Pendekat (P / O) | Rasio kendaraan berbelok | | | Arus RT smp/j | | Lebar efektif | Arus jenuh smp/jam Hijau | | | | | | | Arus lalu lintas | Rasio Arus | Rasio fase | Waktu hijau | Kapasitas | Derajat jenuh |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Arah dari | Arah lawan | | Nilai dasar | Faktor Penyesuaian | | | | | | Nilai disesuaikan | | | | | |
| | | | | | | | | | | Semua tipe pendekat | | | | Hanya tipe P | | | | | | | |
| | | | | | | | | | | Ukuran kota | Hambatan Samping | kelandaian | Parkir | Belok Kanan | Belok Kiri | | | | | | |
| | | | $P_{LTOR}$ | $P_{LT}$ | $P_{RT}$ | $Q_{RT}$ | $Q_{RTO}$ | $W_E$ | So | $F_{CS}$ | $F_{SF}$ | $F_G$ | $F_P$ | $F_{RT}$ | $F_{LT}$ | S | Q | Q/S | $\frac{FR_{CRIT}}{IFR}$ | g | Sxg/c | Q / C |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) | (19) | (20) | (21) | (22) | (23) |
| U | 1 | p | 0.000 | 0.041 | 0.204 | 128.9 | | 6.00 | 4650 | 1.0 | 0.930 | 1.00 | 0.80 | 1.053 | 0.99 | 3620.2 | 605.4 | 0.167 | 0.200 | 34 | 1172.3 | 0.5164 |
| S | 2 | P | 0.300 | 0.000 | 0.056 | 63.0 | | 3.00 | 2325 | 1.0 | 0.934 | 1.00 | 0.80 | 1.015 | 1.00 | 1763.0 | 790.0 | 0.448 | 0.535 | 34 | 570.9 | 1.3839 |
| T | 3 | p | 0.000 | 0.426 | 0.263 | 35.9 | | 2.37 | 1837 | 1.0 | 0.905 | 1.00 | 0.80 | 1.068 | 0.93 | 1324.3 | 78.4 | 0.059 | 0.071 | 22 | 277.5 | 0.2825 |
| B | 3 | P | 1.001 | 0.000 | 0.605 | 278.5 | | 3.00 | 2325 | 1.0 | 0.920 | 1.00 | 0.80 | 1.16 | 1.00 | 1980.5 | 323.8 | 0.163 | 0.195 | 22 | 415 | 0.7803 |

| | | | | | |
|---|---|---|---|---|---|
| Waktu hilang total | | Waktu siklus pra penyesuaian $c_{ua}$ (det) | 169.8 | IFR = | Total g = 90 |
| LTI ( det ) | 15 | Waktu siklus disesuaian c (det) | 105 | $\sum FR_{CRIT}$ 0.838 | |

## Formulir SIG - V

| | | |
|---|---|---|
| **SIMPANG BERSINYAL** | Tanggal : 9Januari 2010 | Ditangani oleh : Thomas R. Iristha |
| Formulir SIG-V : PANJANG ANTRIAN | Kota : Secang, Magelang | Kondisi Eksiting |
| JUMLAH KENDARAAN TERHENTI | Simpang : Secang | Periode : jam puncak sabtu sore, 9 januari 2010 pukul 17.00 - 18.00 wib |
| TUNDAAN | Waktu siklus : | |

| Kode Pendekat | Arus Lalu Lintas smp/jam **Q** | Kapasitas smp / jam **C** | Derajat Kejenuhan **DS= Q/C** | Rasio Hijau **GR = g/c** | Jumlah kendaraan antri (smp) $NQ_1$ | $NQ_2$ | **Total** $NQ=NQ_1+NQ_2$ | $NQ_{MAX}$ liat gbe22 | Panjang Antrian ( m ) **QL** | Angka Henti stop/smp **NS** | Jumlah Kendaraan Terhenti smp/jam $N_{SV}$ | Tundaan lalu lintas rata-rata det/smp **DT** | Tundaan geometrik rata-rata det/smp **DG** | Tundaan rata-rata det/smp **D = DT+DG** | Tundaan total smp.det **D x Q** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) |
| U | 605.4 | 1172.3 | 0.5164 | 0.324 | 0.0 | 14.3 | 14.4 | 22.2 | 74 | 0.733 | 443 | 28.9 | 3.3 | 32.2 | 19486 |
| S | 790.0 | 570.9 | 1.3839 | 0.324 | 111.8 | 28.2 | 140.1 | 187.3 | 1249 | 5.471 | 4322 | 748.7 | 12.3 | 761.0 | 601212 |
| T | 78.4 | 277.5 | 0.2825 | 0.210 | 0.0 | 1.9 | 1.9 | 5.8 | 49 | 0.756 | 59 | 34.9 | 3.4 | 38.3 | 3001 |
| B | 323.8 | 415.0 | 0.7803 | 0.210 | 1.2 | 8.9 | 10.2 | 16.7 | 111 | 0.969 | 314 | 50.0 | 4.2 | 54.2 | 17540 |
| | | | | | | | | | | | | | | | |
| LTOR(semua) | 533 | | | | | | | | | | | 0.0 | 6.0 | 6.0 | 3199.2 |
| Arus total. Q tot. | | | | | | | | | | Total : | 5138 | | | Total : | 644439 |
| Arus kor. Q kor. | 2331 | | | | | | | | | Kendaraan terhenti rata-rata stop/smp : | 2.20 | | | Tundaan simpang rata-rata(det/smp) : | 276.49 |

# Lampiran 5

(Fomulir MKJI 1997 pada Hari Minggu 10 Januari 2010)

## Formulir SIG - I

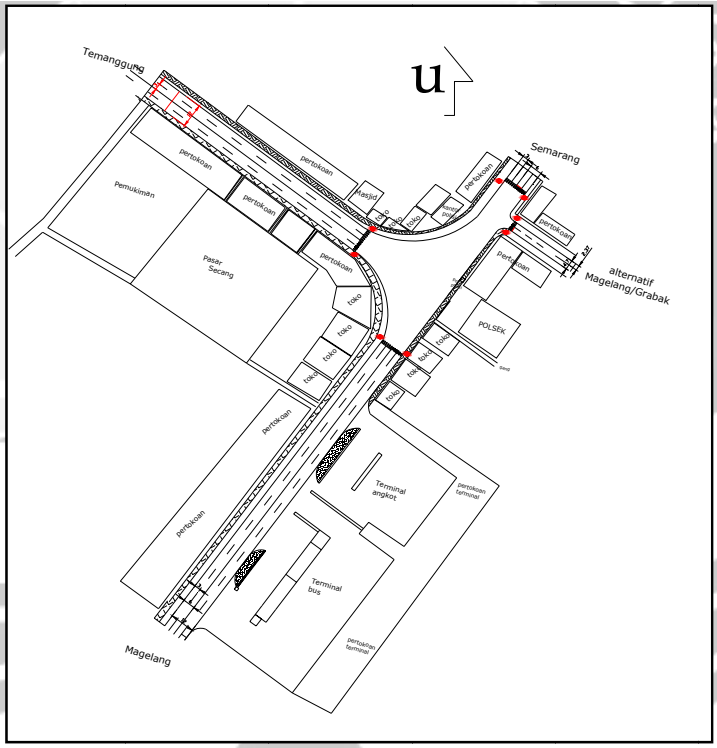
**SIMPANG BERSINYAL**
FORMULIR SIG-I :
- GEOMETRI
- PENGATURAN LALULINTAS
- LINGKUNGAN

Tanggal : 10Januari 2010
Kota : Secang, Magelang
Ditangani oleh : Thomas R. Iristha
Simpang : Secang
Ukuran Kota/jumlah penduduk (isi dalam jutaan) : 1.200
Perihal : 3 fase
Periode : jam puncak minggu pagi, 10 januari 2010 pukul 08.00-09.00 wib

**FASE SINYAL YANG ADA (Gambarkan Sket Fase)**

| | | | | |
|---|---|---|---|---|
| **g = 34** | **g = 34** | **g = 22** | **g =** | Waktu siklus : c |
| | | | | **105** |
| | | | | Waktu hilang total : |
| | | | | **LTI = ∑ IG =** |
| **IG= 5** | **IG= 5** | **IG= 5** | **IG =** | **15** |

**SKETSA SIMPANG**




**KONDISI LAPANGAN**

| Kode Pendekat | Tipe lingkungan jalan (com/res/ra) | Hambatan Samping (Tinggi/Rendah) | Median Ya/Tidak | kelandaian +/- % | Belok kiri langsung Ya/Tidak | Jarak ke kendaraan parkir (m) | Lebar Pendekat ( m ) Pendekat $W_A$ | Masuk $W_{ENTRY}$ | Belok kiri lgs. $W_{LTOR}$ | Keluar $W_{EXIT}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
| U | com | R | T | 0 | T | | 6.0 | 6.0 | 0.0 | 6.0 |
| S | com | T | T | 0 | Y | | 6.0 | 3.0 | 3.0 | 6.0 |
| T | com | R | T | 0 | T | | 2.4 | 2.4 | 0.0 | 2.4 |
| B | com | T | T | 0 | Y | | 6 | 3 | 3.0 | 6.0 |

| **SIMPANG BERSINYAL**<br>Formulir SIG-II :<br>ARUS LALULINTAS | Tanggal : 10Januari 2010<br>Kota : Secang, Magelang<br>Simpang : Secang<br>Perihal : 3 fase | Ditangani oleh : Thomas R. Iristha<br>Periode : jam puncak minggu pagi, 10 januari 2010 pukul 08.00-09.00 wib |
|---|---|---|

| Kode Pendekat | Arah | Arus LaluLintas Kendaraan Bermotor ( MV ) | | | | | | | | | | | | Rasio Berbelok | | Kend.tak bermotor | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Kendaraan Ringan(LV)<br>emp terlindung = 1,0<br>emp terlawan = 1,0 | | | Kendaraan Berat(HV)<br>emp terlindung = 1,3<br>emp terlawan = 1,3 | | | Sepeda Motor(MC)<br>emp terlindung = 0,2<br>emp terlawan = 0,4 | | | Kendaraan Bermotor Total<br>MV | | | | | Arus UM | Rasio $P_{UM}$ = UM/ MV |
| | | kend/ jam | smp/jam | | kend/ jam | smp/jam | | kend/ jam | smp/jam | | kend/ jam | smp/jam | | Kiri | Kanan | kend/ jam | |
| | | | Terlindung | Terlawan | | Terlindung | Terlawan | | Terlindung | Terlawan | | Terlindung | Terlawan | | | | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | $P_{LT}$ (15) | $P_{RT}$ (16) | (17) | (18) |
| U | LT(tanpa LTOR) | 24 | 24 | 24 | 8 | 10.4 | 10.4 | 66 | 13.2 | 26.4 | 98 | 47.6 | 60.8 | 0.062 | | 4 | |
| | ST | 292 | 292 | 292 | 149 | 193.7 | 193.7 | 512 | 102.4 | 204.8 | 953 | 588.1 | 690.5 | | | 4 | |
| | RT | 60 | 60 | 60 | 31 | 40.3 | 40.3 | 132 | 26.4 | 52.8 | 223 | 126.7 | 153.1 | | 0.166 | 4 | |
| | **Total** | 376 | 376 | 376 | 188 | 244.4 | 244.4 | 710 | 142.0 | 284.0 | 1274 | 762.4 | 904.4 | | | 12 | 0.0094 |
| S | LTOR | 86.00 | 86 | 86 | 63 | 81.9 | 81.9 | 216 | 43.2 | 86.4 | 365 | 211.1 | 254.3 | 0.340 | | 2 | |
| | ST | 191.00 | 191 | 191 | 70 | 91.0 | 91.0 | 407 | 81.4 | 162.8 | 668 | 363.4 | 444.8 | | | 4 | |
| | RT | 27.00 | 27 | 27 | 5 | 6.5 | 6.5 | 67 | 13.4 | 26.8 | 99 | 46.9 | 60.3 | | 0.075 | 3 | |
| | **Total** | 304 | 304 | 304 | 138 | 179.4 | 179.4 | 690 | 138.0 | 276.0 | 1132 | 621.4 | 759.4 | | | 9 | 0.0080 |
| T | LT(tanpa LTOR) | 39.00 | 39 | 39 | 3 | 3.9 | 3.9 | 74 | 14.8 | 29.6 | 116 | 57.7 | 72.5 | 0.463 | | 4 | |
| | ST | 14.00 | 14 | 14 | 1 | 1.3 | 1.3 | 98 | 19.6 | 39.2 | 113 | 34.9 | 54.5 | | | 3 | |
| | RT | 13.00 | 13 | 13 | 3 | 3.9 | 3.9 | 76 | 15.2 | 30.4 | 92 | 32.1 | 47.3 | | 0.257 | 1 | |
| | **Total** | 66 | 66 | 66 | 7 | 9.1 | 9.1 | 248 | 49.6 | 99.2 | 321 | 124.7 | 174.3 | | | 8 | 0.0249 |
| B | LTOR | 44.00 | 44 | 44 | 29.00 | 37.7 | 37.7 | 153 | 30.6 | 61.2 | 226 | 112.3 | 142.9 | 0.901 | | 3 | |
| | ST | 17.00 | 17 | 17 | 8.00 | 10.4 | 10.4 | 80 | 16.0 | 32.0 | 105 | 43.4 | 59.4 | | | 7 | |
| | RT | 122.00 | 122 | 122 | 81.00 | 105.3 | 105.3 | 292 | 58.4 | 116.8 | 495 | 285.7 | 344.1 | | 0.647 | 5 | |
| | **Total** | 183 | 183 | 183 | 118 | 153.4 | 153.4 | 525 | 105.0 | 210.0 | 826 | 441.4 | 546.4 | | | 15 | 0.0182 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **SIMPANG BERSINYAL**<br>Formulir SIG - III :<br>-WAKTU ANTAR HIJAU<br>-WAKTU HILANG | | | | | | Tanggal : 10Januari 2010<br>Ditangani oleh : Thomas R. Iristha<br>Kota : Secang, Magelang<br>Simpang : Secang<br>Perihal : 3 fase | |
| LALULINTAS<br>BERANGKAT | | LALU LINTAS DATANG | | | | | Waktu merah semua (dtk) |
| Pendekat | Kecepatan $V_{EV}$ (m/dtk) | Pendekat | Utara | Timur | Selatan | Barat | |
| | | Kecepatan $V_{AV}$ (m/dtk) | 10 | 10 | 10 | 10 | |
| Utara | 10 | Jarak berangkat-datang (m) | | | | | |
| | | Waktu berangkat-datang (dtk)*) | | | | | |
| Timur | 10 | Jarak berangkat-datang (m) | | | | | |
| | | Waktu berangkat-datang (dtk)*) | | | | | |
| Selatan | 10 | Jarak berangkat-datang (m) | | | | | |
| | | Waktu berangkat-datang (dtk)*) | | | | | |
| Barat | 10 | Jarak berangkat-datang (m) | | | | | |
| | | Waktu berangkat-datang (dtk)*) | | | | | |
| | | Penentuan waktu all red didasarkan pada aturan fase | Penentuan waktu merah semua : (data ini dapat dirubah sendiri sesuai fase) | | | | |
| | | | Fase 1 --> Fase 2 | | | | 2 |
| | | | Fase 2 --> Fase 3 | | | | 2 |
| | | | Fase 3 --> Fase 1 | | | | 2 |
| | | | Jumlah fase | 3 | kuning/fase | 3 | 9 |
| | | | Waktu hilang total (LTI)= Merah semua total+waktu kuning (dtk / siklus ) | | | | 15 |

Dari gambar 5.1.

*) Waktu untuk berangkat = ( $L_{EV}$ + $I_{EV}$ ) / $V_{EV}$, dimana $I_{EV}$ = 2 m

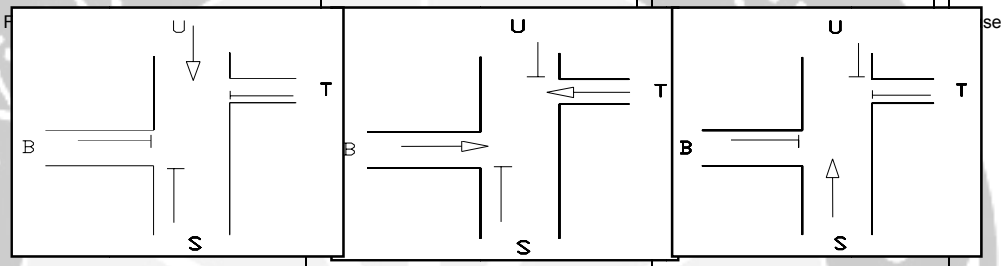
Waktu untuk datang = $L_{AV}$ / $V_{AV}$

Tabel Formulir SIG - IV

| | | |
|---|---|---|
| **SIMPANG BERSINYAL**<br>Formulir SIG-IV : PENENTUAN WAKTU SINYAL<br>KAPASITAS | Tanggal : 10Januari 2010<br>Kota : Secang, Magelang<br>Simpang : Secang | Ditangani oleh : Thomas R. Iristha<br>Perihal : 3 fase<br>Periode : jam puncak minggu pagi, 10 januari 2010 pukul 08.00-09.00 wib |

Distribusi arus lalu lintas(smp/jam)

126.7 47.6 U
112.3 32.1
B 43.4 34.9 T
285.7 57.7
254.3 444.8 60.3
S




se 4

| Kode Pen-dekat (1) | Hijau dalam fase no. (2) | Tipe Pen-dekat (P / O) (3) | Rasio kendaraan berbelok $P_{LTOR}$ (4) | Rasio kendaraan berbelok $P_{LT}$ (5) | Rasio kendaraan berbelok $P_{RT}$ (6) | Arus RT smp/j Arah dari $Q_{RT}$ (7) | Arus RT smp/j Arah lawan $Q_{RTo}$ (8) | Lebar efektif (m) $W_E$ (9) | Arus jenuh smp/jam Hijau: Nilai dasar smp/j hijau So (10) | Faktor Penyesuaian: Semua tipe pendekat: Ukuran kota $F_{CS}$ (11) | Hambatan Samping $F_{SF}$ (12) | kelandaian $F_G$ (13) | Parkir $F_P$ (14) | Hanya tipe P: Belok Kanan $F_{RT}$ (15) | Belok Kiri $F_{LT}$ (16) | Nilai disesuaikan smp/jam hijau S (17) | Arus lalu lintas smp/j Q (18) | Rasio Arus FR = Q/S (19) | Rasio fase PR = $FR_{CRIT}$/IFR (20) | Waktu hijau det g (21) | Kapasitas smp/j C = Sxg/c (22) | Derajat jenuh DS= Q / C (23) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| U | 1 | p | 0.000 | 0.062 | 0.166 | 126.7 | | 6.00 | 4650 | 1.0 | 0.934 | 1.00 | 0.80 | 1.043 | 0.99 | 3589.7 | 714.8 | 0.199 | 0.309 | 34 | 1162.4 | 0.6149 |
| S | 2 | P | 0.340 | 0.000 | 0.075 | 46.9 | | 3.00 | 2325 | 1.0 | 0.935 | 1.00 | 0.80 | 1.020 | 1.00 | 1773.7 | 410.3 | 0.231 | 0.359 | 34 | 574.3 | 0.7144 |
| T | 3 | p | 0.000 | 0.463 | 0.257 | 32.1 | | 2.37 | 1837 | 1.0 | 0.925 | 1.00 | 0.80 | 1.067 | 0.93 | 1342.9 | 67.0 | 0.050 | 0.077 | 22 | 281.4 | 0.2381 |
| B | 3 | P | 0.901 | 0.000 | 0.647 | 285.7 | | 3.00 | 2325 | 1.0 | 0.923 | 1.00 | 0.80 | 1.17 | 1.00 | 2005.1 | 329.1 | 0.164 | 0.255 | 22 | 420 | 0.7833 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Waktu hilang total | | Waktu siklus pra penyesuaian $c_{ua}$ (det) | 77.4 | | IFR = | | Total g = | 90 | |
| LTI ( det ) | 15 | Waktu siklus disesuaian c (det) | 105 | | $\sum FR_{CRIT}$ | 0.644 | | | |

## Formulir SIG - V

| | | | |
|---|---|---|---|
| **SIMPANG BERSINYAL** | Tanggal : 10Januari 2010 | Ditangani oleh : Thomas R. Iristha | |
| Formulir SIG-V : PANJANG ANTRIAN | Kota : Secang, Magelang | Kondisi Eksiting | |
| JUMLAH KENDARAAN TERHENTI | Simpang : Secang | Periode : jam puncak minggu pagi, 10 januari 2010 pukul 08.00-09.00 wib | |
| TUNDAAN | Waktu siklus : | | |

| Kode Pendekat | Arus Lalu Lintas smp/jam **Q** | Kapasitas smp / jam **C** | Derajat Kejenuhan **DS= Q/C** | Rasio Hijau **GR = g/c** | Jumlah kendaraan antri (smp) | | | | Panjang Antrian ( m ) **QL** | Angka Henti stop/smp **NS** | Jumlah Kendaraan Terhenti smp/jam **$N_{SV}$** | Tundaan | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | **$N_{Q_1}$** | **$NQ_2$** | **Total $NQ=NQ_1+NQ_2$** | **$NQ_{MAX}$** liat gbe22 | | | | Tundaan lalu lintas rata-rata det/smp **DT** | Tundaan geometrik rata-rata det/smp **DG** | Tundaan rata-rata det/smp **D = DT+DG** | Tundaan total smp.det **D x Q** |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) |
| U | 714.8 | 1162.4 | 0.6149 | 0.324 | 0.3 | 17.6 | 17.9 | 26.8 | 89 | 0.773 | 552 | 30.9 | 3.3 | 34.2 | 24456 |
| S | 410.3 | 574.3 | 0.7144 | 0.324 | 0.7 | 10.5 | 11.3 | 18.1 | 121 | 0.848 | 348 | 35.9 | 3.8 | 39.7 | 16273 |
| T | 67.0 | 281.4 | 0.2381 | 0.210 | 0.0 | 1.6 | 1.6 | 5.4 | 46 | 0.749 | 50 | 34.5 | 3.4 | 37.9 | 2540 |
| B | 329.1 | 420.1 | 0.7833 | 0.210 | 1.3 | 9.1 | 10.3 | 16.9 | 113 | 0.970 | 319 | 50.1 | 4.2 | 54.3 | 17872 |
| | | | | | | | | | | | | | | | |
| LTOR(semua) | 381 | | | | | | | | | | | 0.0 | 6.0 | 6.0 | 2286.6 |
| Arus total. Q tot. | | | | | | | | | | Total : | 1270 | | | Total : | 63428 |
| Arus kor. Q kor. | 1902 | | | | | | | | | Kendaraan terhenti rata-rata stop/smp : | 0.67 | | | Tundaan simpang rata-rata(det/smp) : | 33.34 |

**SIMPANG BERSINYAL**
Formulir SIG-II :
ARUS LALULINTAS

Tanggal : 10Januari 2010
Kota : Secang, Magelang
Simpang : Secang
Perihal : 3 fase

Ditangani oleh : Thomas R. Iristha
Periode : jam puncak minggu siang, 10 januari 2010 pukul 12.00-13.00 wib

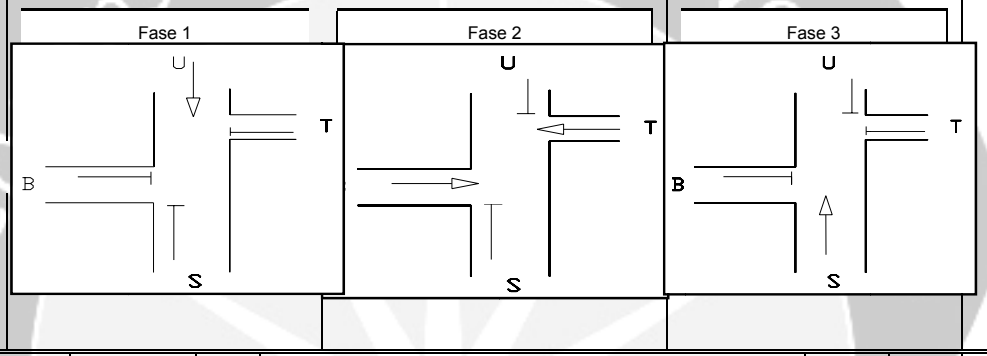
| Kode Pendekat | Arah | Arus LaluLintas Kendaraan Bermotor ( MV ) | | | | | | | | | | | | Rasio Berbelok | | Kend.tak bermotor | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Kendaraan Ringan(LV) emp terlindung = 1,0 emp terlawan = 1,0 | | | Kendaraan Berat(HV) emp terlindung = 1,3 emp terlawan = 1,3 | | | Sepeda Motor(MC) emp terlindung = 0,2 emp terlawan = 0,4 | | | Kendaraan Bermotor Total MV | | | | | Arus UM | Rasio $P_{UM}$ = UM/ MV |
| | | kend/ jam | smp/jam | | kend / jam | smp/jam | | kend/ jam | smp/jam | | kend/ jam | smp/jam | | Kiri $P_{LT}$ | Kanan $P_{RT}$ | kend/ jam | |
| | | | Terlindung | Terlawan | | Terlindung | Terlawan | | Terlindung | Terlawan | | Terlindung | Terlawan | | | | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) |
| U | LT(tanpa LTOR) | 9 | 9 | 9 | 0 | 0.0 | 0.0 | 48 | 9.6 | 19.2 | 57 | 18.6 | 28.2 | 0.031 | | 3 | |
| | ST | 330 | 330 | 330 | 100 | 130.0 | 130.0 | 332 | 66.4 | 132.8 | 762 | 526.4 | 592.8 | | | 2 | |
| | RT | 12 | 12 | 12 | 12 | 15.6 | 15.6 | 97 | 19.4 | 38.8 | 121 | 47.0 | 66.4 | | 0.079 | 2 | |
| | **Total** | 351 | 351 | 351 | 112 | 145.6 | 145.6 | 477 | 95.4 | 190.8 | 940 | 592.0 | 687.4 | | | 7 | 0.0074 |
| S | LTOR | 124.00 | 124 | 124 | 54 | 70.2 | 70.2 | 232 | 46.4 | 92.8 | 410 | 240.6 | 287.0 | 0.329 | | 2 | |
| | ST | 284.00 | 284 | 284 | 89 | 115.7 | 115.7 | 344 | 68.8 | 137.6 | 717 | 468.5 | 537.3 | | | 0 | |
| | RT | 14.00 | 14 | 14 | 0 | 0.0 | 0.0 | 46 | 9.2 | 18.4 | 60 | 23.2 | 32.4 | | 0.032 | 1 | |
| | **Total** | 422 | 422 | 422 | 143 | 185.9 | 185.9 | 622 | 124.4 | 248.8 | 1187 | 732.3 | 856.7 | | | 3 | 0.0025 |
| T | LT(tanpa LTOR) | 14.00 | 14 | 14 | 1 | 1.3 | 1.3 | 52 | 10.4 | 20.8 | 67 | 25.7 | 36.1 | 0.353 | | 2 | |
| | ST | 17.00 | 17 | 17 | 6 | 7.8 | 7.8 | 36 | 7.2 | 14.4 | 59 | 32.0 | 39.2 | | | 2 | |
| | RT | 9.00 | 9 | 9 | 1 | 1.3 | 1.3 | 24 | 4.8 | 9.6 | 34 | 15.1 | 19.9 | | 0.207 | 2 | |
| | **Total** | 40 | 40 | 40 | 8 | 10.4 | 10.4 | 112 | 22.4 | 44.8 | 160 | 72.8 | 95.2 | | | 6 | 0.0375 |
| B | LTOR | 35.00 | 35 | 35 | 8.00 | 10.4 | 10.4 | 77 | 15.4 | 30.8 | 120 | 60.8 | 76.2 | 0.835 | | 2 | |
| | ST | 14.00 | 14 | 14 | 2.00 | 2.6 | 2.6 | 56 | 11.2 | 22.4 | 72 | 27.8 | 39.0 | | | 4 | |
| | RT | 160.00 | 160 | 160 | 51.00 | 66.3 | 66.3 | 183 | 36.6 | 73.2 | 394 | 262.9 | 299.5 | | 0.748 | 2 | |
| | **Total** | 209 | 209 | 209 | 61 | 79.3 | 79.3 | 316 | 63.2 | 126.4 | 586 | 351.5 | 414.7 | | | 8 | 0.0137 |

Tabel Formulir SIG - IV

| | | |
|---|---|---|
| **SIMPANG BERSINYAL**<br>Formulir SIG-IV : PENENTUAN WAKTU SINYAL<br>KAPASITAS | Tanggal : 10Januari 2010<br>Kota : Secang, Magelang<br>Simpang : Secang | Ditangani oleh : Thomas R. Iristha<br>Perihal : 3 fase<br>Periode : jam puncak minggu siang, 10 januari 2010 pukul 12.00-13.00 wib |

Distribusi arus lalu lintas(smp/jam)

| | | | | |
|---|---|---|---|---|
| | 47.0 | 526.4 | 18.6 | U |
| | 60.8 | | 15.1 | |
| B | 27.8 | | 32.0 | T |
| | 262.9 | | 25.7 | |
| | 287.0 | 537.3 | 32.4 | |
| | | S | | |




| Kode Pen-dekat | Hijau dalam fase no. | Tipe Pen-dekat (P / O) | Rasio kendaraan berbelok | | | Arus RT smp/j | | Lebar efektif (m) | Arus jenuh smp/jam Hijau | | | | | | | | Arus lalu lintas smp/j | Rasio Arus **FR =** | Rasio fase **PR =** | Waktu hijau det | Kapa-sitas smp/j **C =** | Derajat jenuh **DS=** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Arah dari | Arah lawan | | Nilai dasar | Faktor Penyesuaian | | | | | | Nilai disesu-aikan | | | | | | | |
| | | | | | | | | | | Semua tipe pendekat | | | | Hanya tipe P | | | | | | | | |
| | | | $P_{LTOR}$ | $P_{LT}$ | $P_{RT}$ | $Q_{RT}$ | $Q_{RTo}$ | $W_E$ | So | Ukuran kota $F_{CS}$ | Hambatan Samping $F_{SF}$ | kelan-daian $F_G$ | Parkir $F_P$ | Belok Kanan $F_{RT}$ | Belok Kiri $F_{LT}$ | smp/jam hijau **S** | **Q** | **Q/S** | $\underline{FR_{CRIT}}$ **IFR** | **g** | **Sxg/c** | **Q / C** |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) | (19) | (20) | (21) | (22) | (23) |
| U | 1 | p | 0.000 | 0.031 | 0.079 | 47.0 | | 6.00 | 4650 | 1.0 | 0.936 | 1.00 | 0.80 | 1.021 | 0.99 | 3534.2 | 573.4 | 0.162 | 0.262 | 34 | 1144.4 | 0.5011 |
| S | 2 | P | 0.329 | 0.000 | 0.032 | 23.2 | | 3.00 | 2325 | 1.0 | 0.938 | 1.00 | 0.80 | 1.008 | 1.00 | 1760.0 | 491.7 | 0.279 | 0.452 | 34 | 569.9 | 0.8628 |
| T | 3 | p | 0.000 | 0.353 | 0.207 | 15.1 | | 2.37 | 1837 | 1.0 | 0.918 | 1.00 | 0.80 | 1.054 | 0.94 | 1340.6 | 47.1 | 0.035 | 0.057 | 22 | 280.9 | 0.1677 |
| B | 3 | P | 0.835 | 0.000 | 0.748 | 262.9 | | 3.00 | 2325 | 1.0 | 0.925 | 1.00 | 0.80 | 1.19 | 1.00 | 2054.1 | 290.7 | 0.142 | 0.229 | 22 | 430 | 0.6755 |
| Waktu hilang total LTI ( det ) | | | 15 | Waktu siklus pra penyesuaian $c_{ua}$ (det) | | | | | | | 72.0 | | | | | | IFR = $\Sigma FR_{CRIT}$ | 0.618 | Total g = | 90 | | |
| | | | | Waktu siklus disesuaian c (det) | | | | | | | 105 | | | | | | | | | | | |

## Formulir SIG - V

| | | | |
|---|---|---|---|
| **SIMPANG BERSINYAL** | Tanggal : 10Januari 2010 | Ditangani oleh : Thomas R. Iristha |
| Formulir SIG-V : PANJANG ANTRIAN | Kota : Secang, Magelang | Kondisi Eksiting |
| JUMLAH KENDARAAN TERHENTI | Simpang : Secang | Periode : jam puncak minggu siang, 10 januari 2010 pukul 12.00-13.00 wib |
| TUNDAAN | Waktu siklus : | |

| Kode Pendekat | Arus Lalu Lintas smp/jam **Q** | Kapasitas smp / jam **C** | Derajat Kejenuhan **DS= Q/C** | Rasio Hijau **GR = g/c** | Jumlah kendaraan antri (smp) | | | | Panjang Antrian ( m ) **QL** | Angka Henti stop/smp **NS** | Jumlah Kendaraan Terhenti smp/jam $N_{SV}$ | Tundaan | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | **$N_{Q_1}$** | **$NQ_2$** | **Total NQ= $NQ_1+NQ_2$** | **$NQ_{MAX}$** liat gbe22 | | | | Tundaan lalu lintas rata-rata det/smp **DT** | Tundaan geometrik rata-rata det/smp **DG** | Tundaan rata-rata det/smp **D = DT+DG** | Tundaan total smp.det **D x Q** |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) |
| U | 573.4 | 1144.4 | 0.5011 | 0.324 | 0.0 | 13.5 | 13.5 | 21.0 | 70 | 0.727 | 417 | 28.7 | 3.0 | 31.7 | 18175 |
| S | 491.7 | 569.9 | 0.8628 | 0.324 | 2.5 | 13.5 | 15.9 | 24.2 | 162 | 1.001 | 492 | 49.0 | 4.0 | 53.0 | 26069 |
| T | 47.1 | 280.9 | 0.1677 | 0.210 | 0.0 | 1.1 | 1.1 | 4.8 | 40 | 0.737 | 35 | 34.0 | 3.3 | 37.3 | 1756 |
| B | 290.7 | 430.4 | 0.6755 | 0.210 | 0.5 | 7.8 | 8.3 | 14.3 | 95 | 0.886 | 257 | 42.7 | 4.6 | 47.3 | 13759 |
| | | | | | | | | | | | | | | | |
| LTOR(semua) | 327 | | | | | | | | | | | 0.0 | 6.0 | 6.0 | 1962.6 |
| Arus total. Q tot. | | | | | | | | | | | Total : 1201 | | | Total : | 61720 |
| Arus kor. Q kor. | 1730 | | | | | | | | | | Kendaraan terhenti rata-rata stop/smp : 0.69 | | | Tundaan simpang rata-rata(det/smp) : | 35.68 |

**SIMPANG BERSINYAL**
Formulir SIG-II :
ARUS LALULINTAS

Tanggal : 10Januari 2010
Kota : Secang, Magelang
Simpang : Secang
Perihal : 3 fase

Ditangani oleh : Thomas R. Iristha
Periode : jam puncak minggu sore, 10 januari 2010 pukul 17.00-18.00 wib

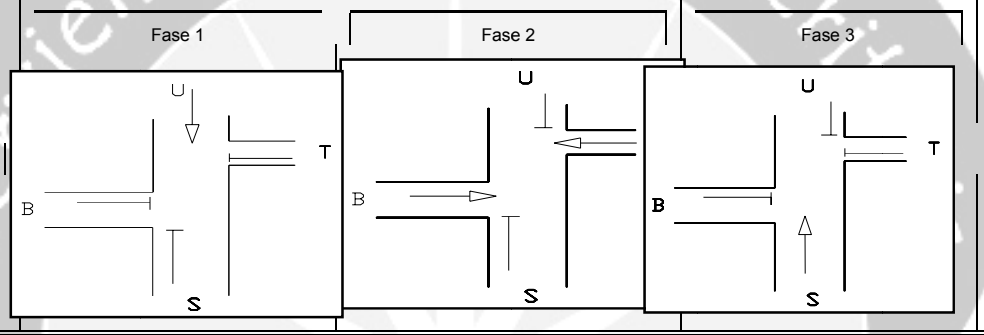
| Kode Pendekat | Arah | Arus LaluLintas Kendaraan Bermotor ( MV ) | | | | | | | | | | | | Kend.tak bermotor | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Kendaraan Ringan(LV) emp terlindung = 1,0 emp terlawan = 1,0 | | | Kendaraan Berat(HV) emp terlindung = 1,3 emp terlawan = 1,3 | | | Sepeda Motor(MC) emp terlindung = 0,2 emp terlawan = 0,4 | | | Kendaraan Bermotor Total MV | | | Rasio Berbelok | | Arus UM | Rasio $P_{UM}$ = UM/ MV |
| | | kend/ jam | smp/jam | | kend/ jam | smp/jam | | kend/ jam | smp/jam | | kend/ jam | smp/jam | | Kiri $P_{LT}$ | Kanan $P_{RT}$ | kend/ jam | |
| | | | Terlindung | Terlawan | | Terlindung | Terlawan | | Terlindung | Terlawan | | Terlindung | Terlawan | | | | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) |
| U | LT(tanpa LTOR) | 5 | 5 | 5 | 1 | 1.3 | 1.3 | 11 | 2.2 | 4.4 | 17 | 8.5 | 10.7 | 0.018 | | 4 | |
| | ST | 258 | 258 | 258 | 53 | 68.9 | 68.9 | 323 | 64.6 | 129.2 | 634 | 391.5 | 456.1 | | | 3 | |
| | RT | 43 | 43 | 43 | 9 | 11.7 | 11.7 | 80 | 16.0 | 32.0 | 132 | 70.7 | 86.7 | | 0.150 | 1 | |
| | **Total** | 306 | 306 | 306 | 63 | 81.9 | 81.9 | 414 | 82.8 | 165.6 | 783 | 470.7 | 553.5 | | | 8 | 0.0102 |
| S | LTOR | 165.00 | 165 | 165 | 53 | 68.9 | 68.9 | 219 | 43.8 | 87.6 | 437 | 277.7 | 321.5 | 0.288 | | 2 | |
| | ST | 397.00 | 397 | 397 | 118 | 153.4 | 153.4 | 461 | 92.2 | 184.4 | 976 | 642.6 | 734.8 | | | 3 | |
| | RT | 29.00 | 29 | 29 | 7 | 9.1 | 9.1 | 26 | 5.2 | 10.4 | 62 | 43.3 | 48.5 | | 0.045 | 5 | |
| | **Total** | 591 | 591 | 591 | 178 | 231.4 | 231.4 | 706 | 141.2 | 282.4 | 1475 | 963.6 | 1104.8 | | | 10 | 0.0068 |
| T | LT(tanpa LTOR) | 20.00 | 20 | 20 | 1 | 1.3 | 1.3 | 53 | 10.6 | 21.2 | 74 | 31.9 | 42.5 | 0.411 | | 4 | |
| | ST | 13.00 | 13 | 13 | 1 | 1.3 | 1.3 | 64 | 12.8 | 25.6 | 78 | 27.1 | 39.9 | | | 1 | |
| | RT | 7.00 | 7 | 7 | 2 | 2.6 | 2.6 | 45 | 9.0 | 18.0 | 54 | 18.6 | 27.6 | | 0.240 | 7 | |
| | **Total** | 40 | 40 | 40 | 4 | 5.2 | 5.2 | 162 | 32.4 | 64.8 | 206 | 77.6 | 110.0 | | | 12 | 0.0583 |
| B | LTOR | 47.00 | 47 | 47 | 17.00 | 22.1 | 22.1 | 131 | 26.2 | 52.4 | 195 | 95.3 | 121.5 | 1.228 | | 1 | |
| | ST | 16.00 | 16 | 16 | 3.00 | 3.9 | 3.9 | 56 | 11.2 | 22.4 | 75 | 31.1 | 42.3 | | | 2 | |
| | RT | 169.00 | 169 | 169 | 27.00 | 35.1 | 35.1 | 167 | 33.4 | 66.8 | 363 | 237.5 | 270.9 | | 0.653 | 5 | |
| | **Total** | 232 | 232 | 232 | 47 | 61.1 | 61.1 | 354 | 70.8 | 141.6 | 633 | 363.9 | 434.7 | | | 8 | 0.0126 |

Tabel Formulir SIG - IV

| | | |
|---|---|---|
| **SIMPANG BERSINYAL**<br>Formulir SIG-IV : PENENTUAN WAKTU SINYAL<br>KAPASITAS | Tanggal : 10Januari 2010<br>Kota : Secang, Magelang<br>Simpang : Secang | Ditangani oleh : Thomas R. Iristha<br>Perihal : 3 fase<br>Periode : jam puncak minggu sore, 10 januari 2010 pukul 17.00-18.00 wib |

Distribusi arus lalu lintas(smp/jam)

| | | | | |
|---|---|---|---|---|
| | 70.7 | 391.5 | 8.5 | U |
| | 95.3 | | 18.6 | |
| B | 31.1 | | 27.1 | T |
| | 237.5 | | 31.9 | |
| | 321.5 | 734.8 | 48.5 | |
| | | S | | |




| Kode Pen-dekat | Hijau dalam fase no. | Tipe Pen-dekat (P / O) | Rasio kendaraan berbelok | | | Arus RT smp/j | | Lebar efektif | Arus jenuh smp/jam Hijau | | | | | | | Arus lalu lintas | Rasio Arus | Rasio fase | Waktu hijau | Kapa-sitas | Derajat jenuh |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Arah dari | Arah lawan | | Nilai dasar | Faktor Penyesuaian | | | | | | Nilai disesu-aikan | | | | | |
| | | | | | | | | | | Semua tipe pendekat | | | | Hanya tipe P | | | | | | | | |
| | | | | | | | | | smp/j hijau | Ukuran kota | Hambatan Samping | kelan-daian | Parkir | Belok Kanan | Belok Kiri | smp/jam hijau | smp/j | | | | | |
| | | | $P_{LTOR}$ | $P_{LT}$ | $P_{RT}$ | $Q_{RT}$ | $Q_{RTo}$ | $W_E$ | **So** | $F_{CS}$ | $F_{SF}$ | $F_G$ | $F_P$ | $F_{RT}$ | $F_{LT}$ | **S** | **Q** | **Q/S** | $\underline{FR_{CRIT}}$ **IFR** | **g** | **C =** | **DS=** |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) | (19) | (20) | (21) | (22) | (23) |
| U | 1 | p | 0.000 | 0.018 | 0.150 | 70.7 | | 6.00 | 4650 | 1.0 | 0.934 | 1.00 | 0.80 | 1.039 | 1.00 | 3599.2 | 462.2 | 0.128 | 0.187 | 34 | 1165.5 | 0.3966 |
| S | 2 | P | 0.288 | 0.000 | 0.045 | 43.3 | | 3.00 | 2325 | 1.0 | 0.936 | 1.00 | 0.80 | 1.012 | 1.00 | 1761.2 | 685.9 | 0.389 | 0.568 | 34 | 570.3 | 1.2027 |
| T | 3 | p | 0.000 | 0.411 | 0.240 | 18.6 | | 2.37 | 1837 | 1.0 | 0.905 | 1.00 | 0.80 | 1.062 | 0.93 | 1319.8 | 45.7 | 0.035 | 0.050 | 22 | 276.5 | 0.1653 |
| B | 3 | P | 1.228 | 0.000 | 0.653 | 237.5 | | 3.00 | 2325 | 1.0 | 0.925 | 1.00 | 0.80 | 1.17 | 1.00 | 2012.3 | 268.6 | 0.133 | 0.195 | 22 | 422 | 0.6370 |

| | | | | | |
|---|---|---|---|---|---|
| Waktu hilang total LTI ( det ) | 15 | Waktu siklus pra penyesuaian $c_{ua}$ (det) | 87.6 | IFR = $\Sigma FR_{CRIT}$ | 0.686 |
| | | Waktu siklus disesuaian c (det) | 105 | Total g = | 90 |

## Formulir SIG - V

| | | |
|---|---|---|
| **SIMPANG BERSINYAL** | Tanggal : 10Januari 2010 | Ditangani oleh : Thomas R. Iristha |
| Formulir SIG-V : PANJANG ANTRIAN | Kota : Secang, Magelang | Kondisi Eksiting |
| JUMLAH KENDARAAN TERHENTI | Simpang : Secang | Periode : jam puncak minggu sore, 10 januari 2010 pukul 17.00-18.00 wib |
| TUNDAAN | Waktu siklus : | |

| Kode | Arus | Kapasitas | Derajat | Rasio | Jumlah kendaraan antri (smp) | | | | Panjang | Angka | Jumlah | Tundaan | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pendekat | Lalu Lintas | smp / jam | Kejenuhan | Hijau | $NQ_1$ | $NQ_2$ | Total | $NQ_{MAX}$ | Antrian | Henti | Kendaraan Terhenti | Tundaan lalu lintas rata-rata | Tundaan geometrik rata-rata | Tundaan rata-rata | Tundaan total |
| | smp/jam | | **DS=** | **GR=** | | | **NQ=** $NQ_1+NQ_2$ | liat gbe22 | ( m ) | stop/smp | smp/jam | det/smp | det/smp | det/smp | smp.det |
| | **Q** | **C** | **Q/C** | **g/c** | | | | | **QL** | **NS** | $N_{SV}$ | **DT** | **DG** | **D = DT+DG** | **D x Q** |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) |
| U | 462.2 | 1165.5 | 0.3966 | 0.324 | 0.0 | 10.5 | 10.5 | 17.0 | 57 | 0.698 | 323 | 27.5 | 3.1 | 30.6 | 14146 |
| S | 685.9 | 570.3 | 1.2027 | 0.324 | 61.1 | 22.2 | 83.2 | 112.7 | 751 | 3.745 | 2569 | 424.9 | 9.5 | 434.4 | 297980 |
| T | 45.7 | 276.5 | 0.1653 | 0.210 | 0.0 | 1.1 | 1.1 | 4.7 | 40 | 0.737 | 34 | 34.0 | 3.3 | 37.3 | 1705 |
| B | 268.6 | 421.6 | 0.6370 | 0.210 | 0.4 | 7.1 | 7.5 | 13.2 | 88 | 0.864 | 232 | 41.1 | 5.0 | 46.1 | 12371 |
| | | | | | | | | | | | | | | | |
| LTOR(semua) | 405 | | | | | | | | | | | 0.0 | 6.0 | 6.0 | 2429.4 |
| Arus total. Q tot. | | | | | | | | | | | Total : | 3157 | | Total : | 328631 |
| Arus kor. Q kor. | 1867 | | | | | | | | | | Kendaraan terhenti rata-rata stop/smp : | 1.69 | | Tundaan simpang rata-rata(det/smp) : | 175.99 |

# Lampiran 6

(Fomulir MKJI 1997 pada Hari Senin
11 Januari 2010)

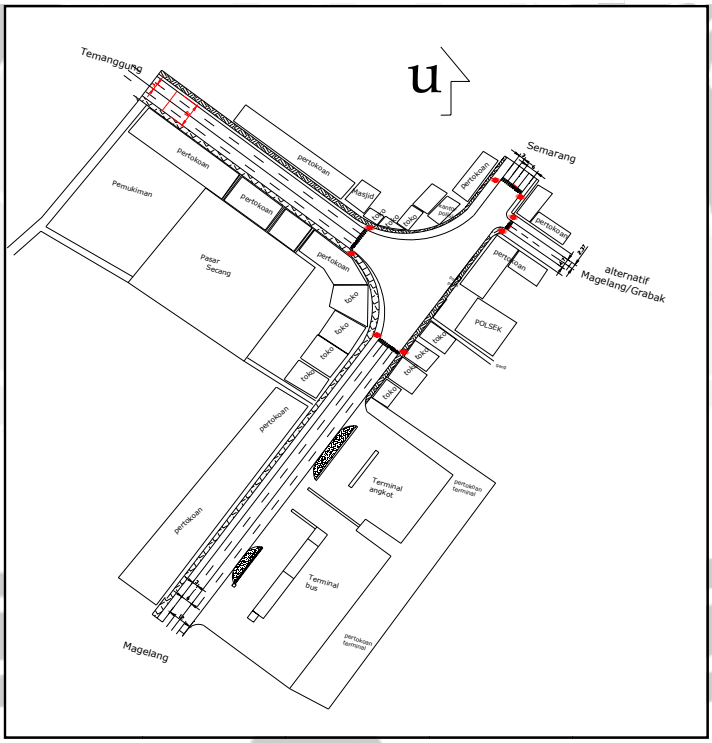
Formulir SIG - I

| | | |
|---|---|---|
| **SIMPANG BERSINYAL**<br>FORMULIR SIG-I :<br>- GEOMETRI<br><br>- PENGATURAN LALULINTAS<br>- LINGKUNGAN | Tanggal : 11 Januari 2010 | Ditangani oleh : Thomas R. Iristha |
| | Kota : Secang, Magelang | |
| | Simpang : Secang | |
| | Ukuran Kota/jumlah penduduk (isi dalam jutaan) : 1.200 | |
| | Perihal : 3 fase | |
| | Periode : jam puncak senin pagi, 11 januari 2010 pukul 08.00-09.00 wib | |

**FASE SINYAL YANG ADA (Gambarkan Sket Fase)**

| | | | | |
|---|---|---|---|---|
| **g = 34** | **g = 34** | **g = 22** | **g =** | Waktu siklus : c<br>**105** |
| **IG= 5** | **IG= 5** | **IG= 5** | **IG =** | Waktu hilang total :<br>**LTI = ∑ IG = 15** |

**SKETSA SIMPANG**




**KONDISI LAPANGAN**

| Kode Pendekat (1) | Tipe lingkungan jalan (com/res/ra) (2) | Hambatan Samping (Tinggi/Rendah) (3) | Median Ya/Tidak (4) | kelandaian +/- % (5) | Belok kiri langsung Ya/Tidak (6) | Jarak ke kendaraan parkir (m) (7) | Lebar Pendekat ( m ) Pendekat $W_A$ (8) | Masuk $W_{ENTRY}$ (9) | Belok kiri lgs. $W_{LTOR}$ (10) | Keluar $W_{EXIT}$ (11) |
|---|---|---|---|---|---|---|---|---|---|---|
| U | com | R | T | 0 | T | | 6.0 | 6.0 | 0.0 | 6.0 |
| S | com | T | T | 0 | Y | | 6.0 | 3.0 | 3.0 | 6.0 |
| T | com | R | T | 0 | T | | 2.4 | 2.4 | 0.0 | 2.4 |
| B | com | T | T | 0 | Y | | 6 | 3 | 3.0 | 6.0 |

**SIMPANG BERSINYAL**
Formulir SIG-II :
ARUS LALULINTAS

Tanggal : 11 Januari 2010
Kota : Secang, Magelang
Simpang : Secang
Perihal : 3 fase

Ditangani oleh : Thomas R. Iristha
Periode : jam puncak senin pagi, 11 januari 2010 pukul 08.00-09.00 wib

| Kode Pendekat | Arah | Arus LaluLintas Kendaraan Bermotor ( MV ) | | | | | | | | | | | | | | Kend.tak bermotor | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Kendaraan Ringan(LV) emp terlindung = 1,0 emp terlawan = 1,0 | | | Kendaraan Berat(HV) emp terlindung = 1,3 emp terlawan = 1,3 | | | Sepeda Motor(MC) emp terlindung = 0,2 emp terlawan = 0,4 | | | Kendaraan Bermotor Total MV | | | Rasio Berbelok | | Arus UM | Rasio $P_{UM}$ = UM/ MV |
| | | kend/ jam | smp/jam | | kend/ jam | smp/jam | | kend/ jam | smp/jam | | kend/ jam | smp/jam | | Kiri | Kanan | kend/ jam | |
| | | | Terlindung | Terlawan | | Terlindung | Terlawan | | Terlindung | Terlawan | | Terlindung | Terlawan | $P_{LT}$ | $P_{RT}$ | | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) |
| U | LT(tanpa LTOR) | 19 | 19 | 19 | 7 | 9.1 | 9.1 | 66 | 13.2 | 26.4 | 92 | 41.3 | 54.5 | 0.062 | | 1 | |
| | ST | 265 | 265 | 265 | 123 | 159.9 | 159.9 | 487 | 97.4 | 194.8 | 875 | 522.3 | 619.7 | | | 4 | |
| | RT | 49 | 49 | 49 | 23 | 29.9 | 29.9 | 119 | 23.8 | 47.6 | 191 | 102.7 | 126.5 | | 0.154 | 4 | |
| | **Total** | 333 | 333 | 333 | 153 | 198.9 | 198.9 | 672 | 134.4 | 268.8 | 1158 | 666.3 | 800.7 | | | 9 | 0.0078 |
| S | LTOR | 95.00 | 95 | 95 | 68 | 88.4 | 88.4 | 232 | 46.4 | 92.8 | 395 | 229.8 | 276.2 | 0.351 | | 5 | |
| | ST | 205.00 | 205 | 205 | 73 | 94.9 | 94.9 | 421 | 84.2 | 168.4 | 699 | 384.1 | 468.3 | | | 2 | |
| | RT | 24.00 | 24 | 24 | 3 | 3.9 | 3.9 | 66 | 13.2 | 26.4 | 93 | 41.1 | 54.3 | | 0.063 | 1 | |
| | **Total** | 324 | 324 | 324 | 144 | 187.2 | 187.2 | 719 | 143.8 | 287.6 | 1187 | 655.0 | 798.8 | | | 8 | 0.0067 |
| T | LT(tanpa LTOR) | 30.00 | 30 | 30 | 6 | 7.8 | 7.8 | 72 | 14.4 | 28.8 | 108 | 52.2 | 66.6 | 0.437 | | 4 | |
| | ST | 13.00 | 13 | 13 | 1 | 1.3 | 1.3 | 97 | 19.4 | 38.8 | 111 | 33.7 | 53.1 | | | 5 | |
| | RT | 17.00 | 17 | 17 | 2 | 2.6 | 2.6 | 70 | 14.0 | 28.0 | 89 | 33.6 | 47.6 | | 0.281 | 4 | |
| | **Total** | 60 | 60 | 60 | 9 | 11.7 | 11.7 | 239 | 47.8 | 95.6 | 308 | 119.5 | 167.3 | | | 13 | 0.0422 |
| B | LTOR | 34.00 | 34 | 34 | 14.00 | 18.2 | 18.2 | 139 | 27.8 | 55.6 | 187 | 80.0 | 107.8 | 0.669 | | 2 | |
| | ST | 14.00 | 14 | 14 | 2.00 | 2.6 | 2.6 | 68 | 13.6 | 27.2 | 84 | 30.2 | 43.8 | | | 6 | |
| | RT | 102.00 | 102 | 102 | 74.00 | 96.2 | 96.2 | 288 | 57.6 | 115.2 | 464 | 255.8 | 313.4 | | 0.699 | 2 | |
| | **Total** | 150 | 150 | 150 | 90 | 117.0 | 117.0 | 495 | 99.0 | 198.0 | 735 | 366.0 | 465.0 | | | 10 | 0.0136 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **SIMPANG BERSINYAL**<br>Formulir SIG - III :<br>-WAKTU ANTAR HIJAU<br>-WAKTU HILANG | | | | | Tanggal : 11 Januari 2010<br>Ditangani oleh : Thomas R. Iristha<br>Kota : Secang, Magelang<br>Simpang : Secang<br>Perihal : 3 fase | | |
| LALULINTAS BERANGKAT | | LALU LINTAS DATANG | | | | | Waktu merah semua (dtk) |
| Pendekat | Kecepatan $V_{EV}$ (m/dtk) | Pendekat | Utara | Timur | Selatan | Barat | |
| | | Kecepatan $V_{AV}$ (m/dtk) | 10 | 10 | 10 | 10 | |
| Utara | 10 | Jarak berangkat-datang (m) | | | | | |
| | | Waktu berangkat-datang (dtk)*) | | | | | |
| Timur | 10 | Jarak berangkat-datang (m) | | | | | |
| | | Waktu berangkat-datang (dtk)*) | | | | | |
| Selatan | 10 | Jarak berangkat-datang (m) | | | | | |
| | | Waktu berangkat-datang (dtk)*) | | | | | |
| Barat | 10 | Jarak berangkat-datang (m) | | | | | |
| | | Waktu berangkat-datang (dtk)*) | | | | | |
| | | Penentuan waktu all red didasarkan pada aturan fase | Penentuan waktu merah semua : (data ini dapat dirubah sendiri sesuai fase) | | | | |
| | | | Fase 1 --> Fase 2 | | | | 2 |
| | | | Fase 2 --> Fase 3 | | | | 2 |
| | | | Fase 3 --> Fase 1 | | | | 2 |
| | | | Jumlah fase | 3 | kuning/fase | 3 | 9 |
| | | | Waktu hilang total (LTI)= Merah semua total+waktu kuning (dtk / siklus ) | | | | 15 |

Dari gambar 5.1.

*) Waktu untuk berangkat = ( $L_{EV}$ + $I_{EV}$ ) / $V_{EV}$, dimana $I_{EV}$ = 2 m

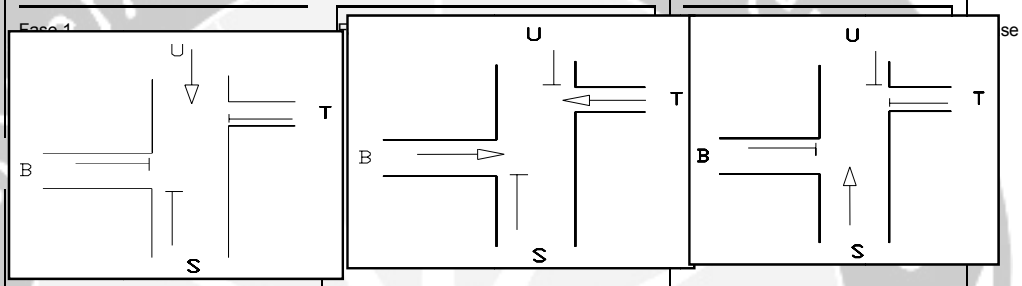
Waktu untuk datang = $L_{AV}$ / $V_{AV}$

Tabel Formulir SIG - IV

| | | |
|---|---|---|
| **SIMPANG BERSINYAL**<br>Formulir SIG-IV : PENENTUAN WAKTU SINYAL<br>KAPASITAS | Tanggal : 11 Januari 2010<br>Kota : Secang, Magelang<br>Simpang : Secang | Ditangani oleh : Thomas R. Iristha<br>Perihal : 3 fase<br>Periode : jam puncak senin pagi, 11 januari 2010 pukul 08.00-09.00 wib |

Distribusi arus lalu lintas(smp/jam)

| | | | |
|---|---|---|---|
| | 102.7 | 522.3 | 41.3 U |
| | 80.0 | | 33.6 |
| B | 30.2 | | 33.7 T |
| | 255.8 | | 52.2 |
| | 276.2 | 468.3 S | 54.3 |




| Kode Pen-dekat | Hijau dalam fase no. | Tipe Pen-dekat (P / O) | Rasio kendaraan berbelok | | | Arus RT smp/j Arah dari | Arah lawan | Lebar efektif (m) | Arus jenuh smp/jam Hijau: Nilai dasar smp/j hijau | Faktor Penyesuaian: Semua tipe pendekat: Ukuran kota | Hambatan Samping | kelandaian | Parkir | Hanya tipe P: Belok Kanan | Belok Kiri | Nilai disesuaikan smp/jam hijau | Arus lalu lintas smp/j | Rasio Arus | Rasio fase | Waktu hijau det | Kapasitas smp/j | Derajat jenuh |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | $P_{LTOR}$ | $P_{LT}$ | $P_{RT}$ | $Q_{RT}$ | $Q_{RTO}$ | $W_E$ | So | $F_{CS}$ | $F_{SF}$ | $F_G$ | $F_P$ | $F_{RT}$ | $F_{LT}$ | S | Q | Q/S | $\frac{FR_{CRIT}}{IFR}$ | g | Sxg/c | Q / C |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) | (19) | (20) | (21) | C = (22) | DS= (23) |
| U | 1 | p | 0.000 | 0.062 | 0.154 | 102.7 | | 6.00 | 4650 | 1.0 | 0.935 | 1.00 | 0.80 | 1.040 | 0.99 | 3583.0 | 625.0 | 0.174 | 0.288 | 34 | 1160.2 | 0.5387 |
| S | 2 | P | 0.351 | 0.000 | 0.063 | 41.1 | | 3.00 | 2325 | 1.0 | 0.936 | 1.00 | 0.80 | 1.016 | 1.00 | 1769.3 | 425.2 | 0.240 | 0.397 | 34 | 572.9 | 0.7422 |
| T | 3 | p | 0.000 | 0.437 | 0.281 | 33.6 | | 2.37 | 1837 | 1.0 | 0.915 | 1.00 | 0.80 | 1.073 | 0.93 | 1341.5 | 67.3 | 0.050 | 0.083 | 22 | 281.1 | 0.2394 |
| B | 3 | P | 0.669 | 0.000 | 0.699 | 255.8 | | 3.00 | 2325 | 1.0 | 0.925 | 1.00 | 0.80 | 1.18 | 1.00 | 2032.2 | 286.0 | 0.141 | 0.232 | 22 | 426 | 0.6717 |

| | | | | | |
|---|---|---|---|---|---|
| Waktu hilang total | | Waktu siklus pra penyesuaian $c_{ua}$ (det) | 69.7 | IFR = | Total g = 90 |
| LTI ( det ) | 15 | Waktu siklus disesuaian c (det) | 105 | $\Sigma FR_{CRIT}$ 0.606 | |

## Formulir SIG - V

| | | |
|---|---|---|
| **SIMPANG BERSINYAL** | Tanggal : 11 Januari 2010 | Ditangani oleh : Thomas R. Iristha |
| Formulir SIG-V : PANJANG ANTRIAN | Kota : Secang, Magelang | Kondisi Eksiting |
| JUMLAH KENDARAAN TERHENTI | Simpang : Secang | Periode : jam puncak senin pagi, 11 januari 2010 pukul 08.00-09.00 wib |
| TUNDAAN | Waktu siklus : | |

| Kode Pendekat | Arus Lalu Lintas smp/jam **Q** | Kapasitas smp / jam **C** | Derajat Kejenuhan **DS= Q/C** | Rasio Hijau **GR = g/c** | Jumlah kendaraan antri (smp) **$NQ_1$** | **$NQ_2$** | **Total NQ= $NQ_1$+$NQ_2$** | **$NQ_{MAX}$** liat gbe22 | Panjang Antrian ( m ) **QL** | Angka Henti stop/smp **NS** | Jumlah Kendaraan Terhenti smp/jam **$N_{SV}$** | Tundaan lalu lintas rata-rata det/smp **DT** | Tundaan geo-metrik rata-rata det/smp **DG** | Tundaan rata-rata det/smp **D = DT+DG** | Tundaan total smp.det **D x Q** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) |
| U | 625.0 | 1160.2 | 0.5387 | 0.324 | 0.1 | 14.9 | 15.0 | 23.0 | 77 | 0.741 | 463 | 29.3 | 3.2 | 32.5 | 20338 |
| S | 425.2 | 572.9 | 0.7422 | 0.324 | 0.9 | 11.0 | 12.0 | 19.0 | 127 | 0.868 | 369 | 37.4 | 3.8 | 41.2 | 17530 |
| T | 67.3 | 281.1 | 0.2394 | 0.210 | 0.0 | 1.6 | 1.6 | 5.4 | 46 | 0.749 | 50 | 34.5 | 3.4 | 38.0 | 2555 |
| B | 286.0 | 425.8 | 0.6717 | 0.210 | 0.5 | 7.7 | 8.2 | 14.1 | 94 | 0.884 | 253 | 42.6 | 4.5 | 47.1 | 13458 |
| | | | | | | | | | | | | | | | |
| LTOR(semua) | 362 | | | | | | | | | | | 0.0 | 6.0 | 6.0 | 2172 |
| Arus total. Q tot. | | | | | | | | | | Total : | 1136 | | | Total : | 56053 |
| Arus kor. Q kor. | 1766 | | | | | | | | | Kendaraan terhenti rata-rata stop/smp : | 0.64 | | | Tundaan simpang rata-rata(det/smp) : | 31.75 |

**SIMPANG BERSINYAL**
Formulir SIG-II :
ARUS LALULINTAS

Tanggal : 11Januari 2010
Kota : Secang, Magelang
Simpang : Secang
Perihal : 3 fase

Ditangani oleh : Thomas R. Iristha
Periode : jam puncak senin siang, 11 januari 2010 pukul 12.00-13.00 wib

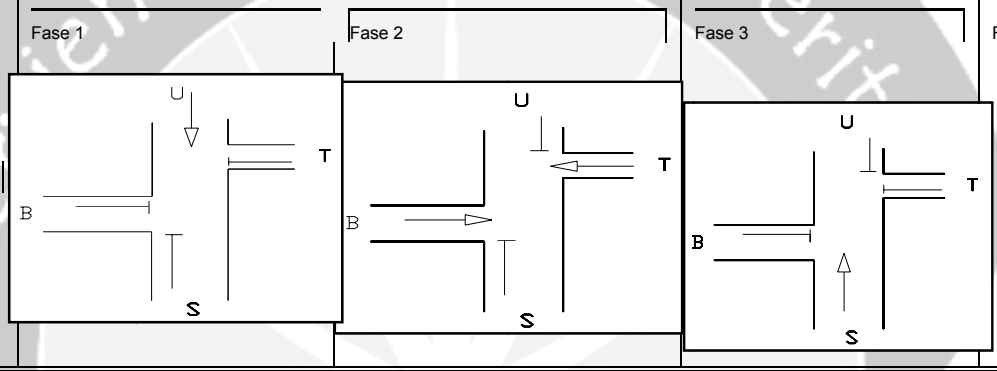
| Kode Pendekat | Arah | Arus LaluLintas Kendaraan Bermotor ( MV ) | | | | | | | | | | | | | | Kend.tak bermotor | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Kendaraan Ringan(LV) emp terlindung = 1,0 emp terlawan = 1,0 | | | Kendaraan Berat(HV) emp terlindung = 1,3 emp terlawan = 1,3 | | | Sepeda Motor(MC) emp terlindung = 0,2 emp terlawan = 0,4 | | | Kendaraan Bermotor Total MV | | | Rasio Berbelok | | Arus UM | Rasio $P_{UM}$ = UM/ MV |
| | | kend/ jam | smp/jam | | kend / jam | smp/jam | | kend / jam | smp/jam | | kend / jam | smp/jam | | Kiri | Kanan | kend / jam | |
| | | | Terlindung | Terlawan | | Terlindung | Terlawan | | Terlindung | Terlawan | | Terlindung | Terlawan | $P_{LT}$ | $P_{RT}$ | | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) |
| U | LT(tanpa LTOR) | 8 | 8 | 8 | 1 | 1.3 | 1.3 | 42 | 8.4 | 16.8 | 51 | 17.7 | 26.1 | 0.028 | | 3 | |
| | ST | 338 | 338 | 338 | 104 | 135.2 | 135.2 | 345 | 69.0 | 138.0 | 787 | 542.2 | 611.2 | | | 4 | |
| | RT | 29 | 29 | 29 | 12 | 15.6 | 15.6 | 91 | 18.2 | 36.4 | 132 | 62.8 | 81.0 | | 0.101 | 4 | |
| | **Total** | 375 | 375 | 375 | 117 | 152.1 | 152.1 | 478 | 95.6 | 191.2 | 970 | 622.7 | 718.3 | | | 11 | 0.0113 |
| S | LTOR | 128.00 | 128 | 128 | 62 | 80.6 | 80.6 | 211 | 42.2 | 84.4 | 401 | 250.8 | 293.0 | 0.333 | | 1 | |
| | ST | 300.00 | 300 | 300 | 83 | 107.9 | 107.9 | 352 | 70.4 | 140.8 | 735 | 478.3 | 548.7 | | | 6 | |
| | RT | 13.00 | 13 | 13 | 2 | 2.6 | 2.6 | 45 | 9.0 | 18.0 | 60 | 24.6 | 33.6 | | 0.033 | 4 | |
| | **Total** | 441 | 441 | 441 | 147 | 191.1 | 191.1 | 608 | 121.6 | 243.2 | 1196 | 753.7 | 875.3 | | | 11 | 0.0092 |
| T | LT(tanpa LTOR) | 14.00 | 14 | 14 | 1 | 1.3 | 1.3 | 62 | 12.4 | 24.8 | 77 | 27.7 | 40.1 | 0.299 | | 4 | |
| | ST | 25.00 | 25 | 25 | 4 | 5.2 | 5.2 | 41 | 8.2 | 16.4 | 70 | 38.4 | 46.6 | | | 3 | |
| | RT | 16.00 | 16 | 16 | 4 | 5.2 | 5.2 | 27 | 5.4 | 10.8 | 47 | 26.6 | 32.0 | | 0.287 | 4 | |
| | **Total** | 55 | 55 | 55 | 9 | 11.7 | 11.7 | 130 | 26.0 | 52.0 | 194 | 92.7 | 118.7 | | | 11 | 0.0567 |
| B | LTOR | 40.00 | 40 | 40 | 26.00 | 33.8 | 33.8 | 144 | 28.8 | 57.6 | 210 | 102.6 | 131.4 | 1.107 | | 6 | |
| | ST | 19.00 | 19 | 19 | 8.00 | 10.4 | 10.4 | 75 | 15.0 | 30.0 | 102 | 44.4 | 59.4 | | | 5 | |
| | RT | 117.00 | 117 | 117 | 73.00 | 94.9 | 94.9 | 277 | 55.4 | 110.8 | 467 | 267.3 | 322.7 | | 0.645 | 2 | |
| | **Total** | 176 | 176 | 176 | 107 | 139.1 | 139.1 | 496 | 99.2 | 198.4 | 779 | 414.3 | 513.5 | | | 13 | 0.0167 |

Tabel Formulir SIG - IV

| | | |
|---|---|---|
| **SIMPANG BERSINYAL**<br>Formulir SIG-IV : PENENTUAN WAKTU SINYAL<br>KAPASITAS | Tanggal : 11Januari 2010<br>Kota : Secang, Magelang<br>Simpang : Secang | Ditangani oleh : Thomas R. Iristha<br>Perihal : 3 fase<br>Periode : jam puncak senin siang, 11 januari 2010 pukul 12.00-13.00 wib |

Distribusi arus lalu lintas(smp/jam)

| | | | |
|---|---|---|---|
| | 62.8 | 542.2 | 17.7 U |
| | 102.6 | | 26.6 |
| B | 44.4 | | 38.4 T |
| | 267.3 | | 27.7 |
| | 293.0 | 548.7 S | 33.6 |




| Kode Pen-dekat (1) | Hijau dalam fase no. (2) | Tipe Pen-dekat (P / O) (3) | Rasio kendaraan berbelok $P_{LTOR}$ (4) | Rasio kendaraan berbelok $P_{LT}$ (5) | Rasio kendaraan berbelok $P_{RT}$ (6) | Arus RT smp/j Arah dari $Q_{RT}$ (7) | Arus RT smp/j Arah lawan $Q_{RTo}$ (8) | Lebar efektif (m) $W_E$ (9) | Arus jenuh smp/jam Hijau: Nilai dasar smp/j hijau So (10) | Faktor Penyesuaian: Semua tipe pendekat: Ukuran kota $F_{CS}$ (11) | Hambatan Samping $F_{SF}$ (12) | kelandaian $F_G$ (13) | Parkir $F_P$ (14) | Faktor Penyesuaian: Hanya tipe P: Belok Kanan $F_{RT}$ (15) | Belok Kiri $F_{LT}$ (16) | Nilai disesuaikan smp/jam hijau S (17) | Arus lalu lintas smp/j Q (18) | Rasio Arus FR = Q/S (19) | Rasio fase PR = $\frac{FR_{CRIT}}{IFR}$ (20) | Waktu hijau det g (21) | Kapasitas smp/j C = Sxg/c (22) | Derajat jenuh DS= Q / C (23) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| U | 1 | p | 0.000 | 0.028 | 0.101 | 62.8 | | 6.00 | 4650 | 1.0 | 0.933 | 1.00 | 0.80 | 1.026 | 1.00 | 3546.3 | 605.0 | 0.171 | 0.258 | 34 | 1148.3 | 0.5269 |
| S | 2 | P | 0.333 | 0.000 | 0.033 | 24.6 | | 3.00 | 2325 | 1.0 | 0.934 | 1.00 | 0.80 | 1.008 | 1.00 | 1752.9 | 502.9 | 0.287 | 0.434 | 34 | 567.6 | 0.8860 |
| T | 3 | p | 0.000 | 0.299 | 0.287 | 26.6 | | 2.37 | 1837 | 1.0 | 0.906 | 1.00 | 0.80 | 1.075 | 0.95 | 1362.2 | 65.0 | 0.048 | 0.072 | 22 | 285.4 | 0.2277 |
| B | 3 | P | 1.107 | 0.000 | 0.645 | 267.3 | | 3.00 | 2325 | 1.0 | 0.923 | 1.00 | 0.80 | 1.17 | 1.00 | 2005.5 | 311.7 | 0.155 | 0.235 | 22 | 420 | 0.7418 |
| Waktu hilang total<br>LTI ( det ) | | | | 15 | | Waktu siklus pra penyesuaian $c_{ua}$ (det)<br>Waktu siklus disesuaian c (det) | | | | | 81.0<br>105 | | | | | | | IFR =<br>$\Sigma FR_{CRIT}$ | 0.661 | Total g = | 90 | | |

## Formulir SIG - V

| | | | |
|---|---|---|---|
| **SIMPANG BERSINYAL** | Tanggal : 11Januari 2010 | Ditangani oleh : Thomas R. Iristha |
| Formulir SIG-V : PANJANG ANTRIAN | Kota : Secang, Magelang | Kondisi Eksiting |
| JUMLAH KENDARAAN TERHENTI | Simpang : Secang | Periode : jam puncak senin siang, 11 januari 2010 pukul 12.00-13.00 wib |
| TUNDAAN | Waktu siklus : | |

| Kode Pendekat | Arus Lalu Lintas smp/jam **Q** | Kapasitas smp / jam **C** | Derajat Kejenuhan **DS= Q/C** | Rasio Hijau **GR = g/c** | Jumlah kendaraan antri (smp) **$NQ_1$** | **$NQ_2$** | **Total NQ= $NQ_1$+$NQ_2$** | **$NQ_{MAX}$** liat gbe22 | Panjang Antrian ( m ) **QL** | Angka Henti stop/smp **NS** | Jumlah Kendaraan Terhenti smp/jam **$N_{SV}$** | Tundaan lalu lintas rata-rata det/smp **DT** | Tundaan geometrik rata-rata det/smp **DG** | Tundaan rata-rata det/smp **D = DT+DG** | Tundaan total smp.det **D x Q** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) |
| U | 605.0 | 1148.3 | 0.5269 | 0.324 | 0.1 | 14.4 | 14.4 | 22.3 | 74 | 0.737 | 446 | 29.1 | 3.1 | 32.2 | 19497 |
| S | 502.9 | 567.6 | 0.8860 | 0.324 | 3.1 | 13.9 | 17.0 | 25.6 | 171 | 1.043 | 525 | 53.3 | 4.1 | 57.3 | 28839 |
| T | 65.0 | 285.4 | 0.2277 | 0.210 | 0.0 | 1.6 | 1.6 | 5.4 | 45 | 0.747 | 49 | 34.4 | 3.4 | 37.9 | 2462 |
| B | 311.7 | 420.2 | 0.7418 | 0.210 | 0.9 | 8.5 | 9.4 | 15.7 | 105 | 0.934 | 291 | 46.7 | 4.4 | 51.2 | 15948 |
| | | | | | | | | | | | | | | | |
| LTOR(semua) | 381 | | | | | | | | | | | 0.0 | 6.0 | 6.0 | 2286.6 |
| Arus total. Q tot. | | | | | | | | | | Total : | 1310 | | | Total : | 69032 |
| Arus kor. Q kor. | 1866 | | | | | | | | | Kendaraan terhenti rata-rata stop/smp : | 0.70 | | | Tundaan simpang rata-rata(det/smp) : | 37.00 |

**SIMPANG BERSINYAL**
Formulir SIG-II :
ARUS LALULINTAS

Tanggal : 11Januari 2010
Kota : Secang, Magelang
Simpang : Secang
Perihal : 3 fase

Ditangani oleh : Thomas R. Iristha
Periode : jam puncak senin sore, 11 januari 2010 pukul 17.00-18.00 wib

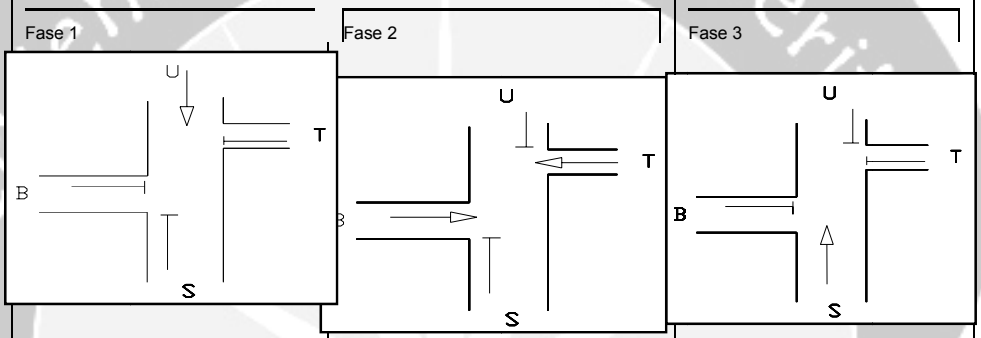
| Kode Pendekat | Arah | Arus LaluLintas Kendaraan Bermotor ( MV ) | | | | | | | | | | | | Rasio Berbelok | | Kend.tak bermotor | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Kendaraan Ringan(LV) emp terlindung = 1,0 emp terlawan = 1,0 | | | Kendaraan Berat(HV) emp terlindung = 1,3 emp terlawan = 1,3 | | | Sepeda Motor(MC) emp terlindung = 0,2 emp terlawan = 0,4 | | | Kendaraan Bermotor Total MV | | | | | Arus UM | Rasio $P_{UM}$ = UM/ MV |
| | | kend/ jam | smp/jam | | kend / jam | smp/jam | | kend / jam | smp/jam | | kend / jam | smp/jam | | Kiri $P_{LT}$ | Kanan $P_{RT}$ | kend / jam | |
| | | | Terlindung | Terlawan | | Terlindung | Terlawan | | Terlindung | Terlawan | | Terlindung | Terlawan | | | | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) |
| U | LT(tanpa LTOR) | 12 | 12 | 12 | 3 | 3.9 | 3.9 | 28 | 5.6 | 11.2 | 43 | 21.5 | 27.1 | 0.036 | | 3 | |
| | ST | 322 | 322 | 322 | 50 | 65.0 | 65.0 | 409 | 81.8 | 163.6 | 781 | 468.8 | 550.6 | | | 4 | |
| | RT | 58 | 58 | 58 | 20 | 26.0 | 26.0 | 76 | 15.2 | 30.4 | 154 | 99.2 | 114.4 | | 0.168 | 11 | |
| | **Total** | 392 | 392 | 392 | 73 | 94.9 | 94.9 | 513 | 102.6 | 205.2 | 978 | 589.5 | 692.1 | | | 18 | 0.0184 |
| S | LTOR | 183.00 | 183 | 183 | 74 | 96.2 | 96.2 | 213 | 42.6 | 85.2 | 470 | 321.8 | 364.4 | 0.326 | | 3 | |
| | ST | 393.00 | 393 | 393 | 100 | 130.0 | 130.0 | 461 | 92.2 | 184.4 | 954 | 615.2 | 707.4 | | | 3 | |
| | RT | 36.00 | 36 | 36 | 6 | 7.8 | 7.8 | 25 | 5.0 | 10.0 | 67 | 48.8 | 53.8 | | 0.050 | 4 | |
| | **Total** | 612 | 612 | 612 | 180 | 234.0 | 234.0 | 699 | 139.8 | 279.6 | 1491 | 985.8 | 1125.6 | | | 10 | 0.0067 |
| T | LT(tanpa LTOR) | 27.00 | 27 | 27 | 2 | 2.6 | 2.6 | 64 | 12.8 | 25.6 | 93 | 42.4 | 55.2 | 0.351 | | 5 | |
| | ST | 27.00 | 27 | 27 | 5 | 6.5 | 6.5 | 59 | 11.8 | 23.6 | 91 | 45.3 | 57.1 | | | 5 | |
| | RT | 18.00 | 18 | 18 | 5 | 6.5 | 6.5 | 43 | 8.6 | 17.2 | 66 | 33.1 | 41.7 | | 0.274 | 3 | |
| | **Total** | 72 | 72 | 72 | 12 | 15.6 | 15.6 | 166 | 33.2 | 66.4 | 250 | 120.8 | 154.0 | | | 13 | 0.0520 |
| B | LTOR | 65.00 | 65 | 65 | 33.00 | 42.9 | 42.9 | 133 | 26.6 | 53.2 | 231 | 134.5 | 161.1 | 1.113 | | 3 | |
| | ST | 18.00 | 18 | 18 | 4.00 | 5.2 | 5.2 | 52 | 10.4 | 20.8 | 74 | 33.6 | 44.0 | | | 3 | |
| | RT | 185.00 | 185 | 185 | 40.00 | 52.0 | 52.0 | 209 | 41.8 | 83.6 | 434 | 278.8 | 320.6 | | 0.624 | 6 | |
| | **Total** | 268 | 268 | 268 | 77 | 100.1 | 100.1 | 394 | 78.8 | 157.6 | 739 | 446.9 | 525.7 | | | 12 | 0.0162 |

Tabel Formulir SIG - IV

| | | |
|---|---|---|
| **SIMPANG BERSINYAL**<br>Formulir SIG-IV : PENENTUAN WAKTU SINYAL<br>KAPASITAS | Tanggal : 11Januari 2010<br>Kota : Secang, Magelang<br>Simpang : Secang | Ditangani oleh : Thomas R. Iristha<br>Perihal : 3 fase<br>Periode : jam puncak senin sore, 11 januari 2010 pukul 17.00-18.00 wib |

Distribusi arus lalu lintas(smp/jam)

| | | | | |
|---|---|---|---|---|
| | 99.2 | 468.8 | 21.5 | U |
| | 134.5 | | 33.1 | |
| B | 33.6 | | 45.3 | T |
| | 278.8 | | 42.4 | |
| | 364.4 | 707.4 | 53.8 | |
| | | S | | |




| Kode Pen-dekat | Hijau dalam fase no. | Tipe Pen-dekat (P / O) | Rasio kendaraan berbelok | | | Arus RT smp/j Arah dari | Arah lawan | Lebar efektif (m) | Arus jenuh smp/jam Hijau: Nilai dasar smp/j hijau | Faktor Penyesuaian: Semua tipe pendekat: Ukuran kota | Hambatan Samping | kelandaian | Parkir | Hanya tipe P: Belok Kanan | Belok Kiri | Nilai disesuaikan smp/jam hijau | Arus lalu lintas smp/j | Rasio Arus | Rasio fase | Waktu hijau det | Kapasitas smp/j | Derajat jenuh |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | $P_{LTOR}$ | $P_{LT}$ | $P_{RT}$ | $Q_{RT}$ | $Q_{RTO}$ | $W_E$ | So | $F_{CS}$ | $F_{SF}$ | $F_G$ | $F_P$ | $F_{RT}$ | $F_{LT}$ | S | Q | Q/S | $\frac{FR_{CRIT}}{IFR}$ | g | Sxg/c | Q / C |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) | (19) | (20) | (21) | (22) | (23) |
| U | 1 | p | 0.000 | 0.036 | 0.168 | 99.2 | | 6.00 | 4650 | 1.0 | 0.929 | 1.00 | 0.80 | 1.044 | 0.99 | 3585.9 | 568.0 | 0.158 | 0.211 | 34 | 1161.1 | 0.4892 |
| S | 2 | P | 0.326 | 0.000 | 0.050 | 48.8 | | 3.00 | 2325 | 1.0 | 0.936 | 1.00 | 0.80 | 1.013 | 1.00 | 1763.3 | 664.0 | 0.377 | 0.502 | 34 | 571.0 | 1.1629 |
| T | 3 | p | 0.000 | 0.351 | 0.274 | 33.1 | | 2.37 | 1837 | 1.0 | 0.909 | 1.00 | 0.80 | 1.071 | 0.94 | 1350.2 | 78.4 | 0.058 | 0.077 | 22 | 282.9 | 0.2771 |
| B | 3 | P | 1.113 | 0.000 | 0.624 | 278.8 | | 3.00 | 2325 | 1.0 | 0.924 | 1.00 | 0.80 | 1.16 | 1.00 | 1996.3 | 312.4 | 0.156 | 0.209 | 22 | 418 | 0.7469 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Waktu hilang total | | Waktu siklus pra penyesuaian $c_{ua}$ (det) | 109.8 | IFR = | | Total g = | 90 |
| LTI ( det ) | 15 | Waktu siklus disesuaian c (det) | 105 | $\sum FR_{CRIT}$ | 0.750 | | |

## Formulir SIG - V

| | | |
|---|---|---|
| **SIMPANG BERSINYAL** | Tanggal : 11Januari 2010 | Ditangani oleh : Thomas R. Iristha |
| Formulir SIG-V : PANJANG ANTRIAN | Kota : Secang, Magelang | Kondisi Eksiting |
| JUMLAH KENDARAAN TERHENTI | Simpang : Secang | Periode : jam puncak senin sore, 11 januari 2010 pukul 17.00-18.00 wib |
| TUNDAAN | Waktu siklus : | |

| Kode Pendekat | Arus Lalu Lintas smp/jam **Q** | Kapasitas smp / jam **C** | Derajat Kejenuhan **DS= Q/C** | Rasio Hijau **GR = g/c** | Jumlah kendaraan antri (smp) **$NQ_1$** | **$NQ_2$** | **Total NQ= $NQ_1$+$NQ_2$** | **$NQ_{MAX}$** liat gbe22 | Panjang Antrian ( m ) **QL** | Angka Henti stop/smp **NS** | Jumlah Kendaraan Terhenti smp/jam **$N_{SV}$** | Tundaan lalu lintas rata-rata det/smp **DT** | Tundaan geo-metrik rata-rata det/smp **DG** | Tundaan rata-rata det/smp **D = DT+DG** | Tundaan total smp.det **D x Q** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) |
| U | 568.0 | 1161.1 | 0.4892 | 0.324 | 0.0 | 13.3 | 13.3 | 20.8 | 69 | 0.723 | 411 | 28.5 | 3.2 | 31.7 | 18003 |
| S | 664.0 | 571.0 | 1.1629 | 0.324 | 50.3 | 21.0 | 71.3 | 97.0 | 646 | 3.312 | 2199 | 355.5 | 8.0 | 363.5 | 241373 |
| T | 78.4 | 282.9 | 0.2771 | 0.210 | 0.0 | 1.9 | 1.9 | 5.8 | 49 | 0.755 | 59 | 34.8 | 3.4 | 38.3 | 2999 |
| B | 312.4 | 418.3 | 0.7469 | 0.210 | 1.0 | 8.5 | 9.5 | 15.8 | 105 | 0.938 | 293 | 47.1 | 4.4 | 51.5 | 16099 |
| | | | | | | | | | | | | | | | |
| LTOR(semua) | 499 | | | | | | | | | | | 0.0 | 6.0 | 6.0 | 2992.2 |
| Arus total. Q tot. | | | | | | | | | | Total : | 2962 | | | Total : | 281466 |
| Arus kor. Q kor. | 2122 | | | | | | | | | Kendaraan terhenti rata-rata stop/smp : | 1.40 | | | Tundaan simpang rata-rata(det/smp) : | 132.67 |

# Lampiran 7

(Fomulir Pembahasan Alternatif I)

# Formulir SIG - I

**SIMPANG BERSINYAL**
FORMULIR SIG-I :
- GEOMETRI
- PENGATURAN LALULINTAS
- LINGKUNGAN

Tanggal : 9Januari 2010
Kota : Secang, Magelang
Ditangani oleh : Thomas R. Iristha
Simpang : Secang
Ukuran Kota/jumlah penduduk (isi dalam jutaan) : 1.200
Perihal : 3 fase
Periode : jam puncak sabtu sore, 9 januari 2010 pukul 17.00 - 18.00 wib

**FASE SINYAL YANG ADA (Gambarkan Sket Fase)**

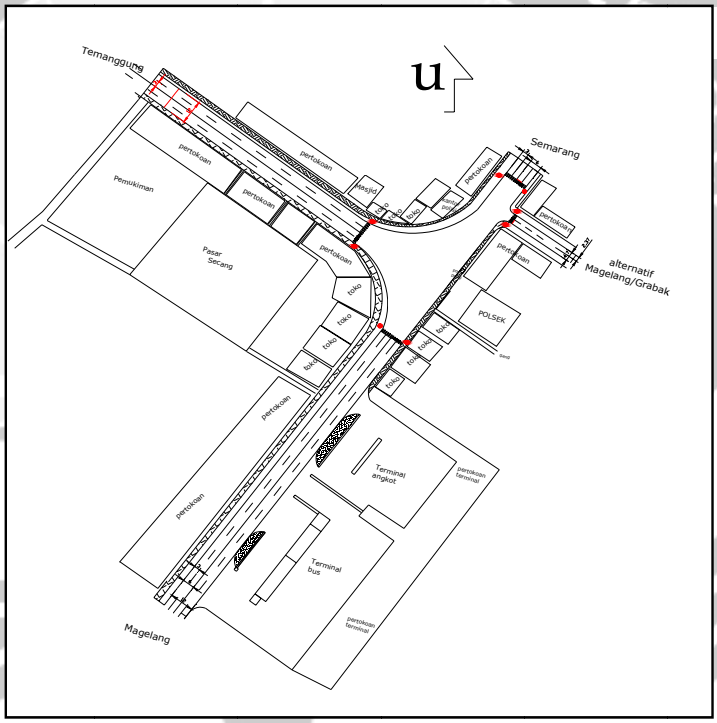
| | | | |
|---|---|---|---|
| **g = 34** | **g = 34** | **g = 22** | **g =** |
| **IG= 5** | **IG= 5** | **IG= 5** | **IG =** |

Waktu siklus : c

**105**

Waktu hilang total :
**LTI = ∑ IG =**
**15**

**SKETSA SIMPANG**




**KONDISI LAPANGAN**

| Kode Pendekat (1) | Tipe lingkungan jalan (com/res/ra) (2) | Hambatan Samping (Tinggi/Rendah) (3) | Median Ya/Tidak (4) | kelandaian +/- % (5) | Belok kiri langsung Ya/Tidak (6) | Jarak ke kendaraan parkir (m) (7) | Lebar Pendekat ( m ) Pendekat $W_A$ (8) | Masuk $W_{ENTRY}$ (9) | Belok kiri lgs. $W_{LTOR}$ (10) | Keluar $W_{EXIT}$ (11) |
|---|---|---|---|---|---|---|---|---|---|---|
| U | com | R | T | 0 | T | | 6.0 | 6.0 | 0.0 | 6.0 |
| S | com | T | T | 0 | Y | | 6.0 | 3.0 | 3.0 | 6.0 |
| T | com | R | T | 0 | T | | 2.4 | 2.4 | 0.0 | 2.4 |
| B | com | T | T | 0 | Y | | 6 | 3 | 3.0 | 6.0 |

**SIMPANG BERSINYAL**
Formulir SIG-II :
ARUS LALULINTAS

Tanggal : 9Januari 2010
Kota : Secang, Magelang
Simpang : Secang
Perihal : 3 fase

Ditangani oleh : Thomas R. Iristha
Periode : jam puncak sabtu sore, 9 januari 2010 pukul 17.00 - 18.00 wib

| Kode Pendekat | Arah | Arus LaluLintas Kendaraan Bermotor ( MV ) | | | | | | | | | | | | | | Kend.tak bermotor | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Kendaraan Ringan(LV) emp terlindung = 1,0 emp terlawan = 1,0 | | | Kendaraan Berat(HV) emp terlindung = 1,3 emp terlawan = 1,3 | | | Sepeda Motor(MC) emp terlindung = 0,2 emp terlawan = 0,4 | | | Kendaraan Bermotor Total MV | | | Rasio Berbelok | | Arus UM | Rasio $P_{UM}$ = UM/ MV |
| | | kend/ jam | smp/jam | | kend / jam | smp/jam | | kend / jam | smp/jam | | kend / jam | smp/jam | | Kiri | Kanan | kend / jam | |
| | | | Terlindung | Terlawan | | Terlindung | Terlawan | | Terlindung | Terlawan | | Terlindung | Terlawan | $P_{LT}$ | $P_{RT}$ | | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) |
| U | LT(tanpa LTOR) | 11 | 11 | 11 | 8 | 10.4 | 10.4 | 21 | 4.2 | 8.4 | 40 | 25.6 | 29.8 | 0.041 | | 4 | |
| | ST | 310 | 310 | 310 | 63 | 81.9 | 81.9 | 423 | 84.6 | 169.2 | 796 | 476.5 | 561.1 | | | 4 | |
| | RT | 91 | 91 | 91 | 15 | 19.5 | 19.5 | 92 | 18.4 | 36.8 | 198 | 128.9 | 147.3 | | 0.204 | 9 | |
| | **Total** | 412 | 412 | 412 | 86 | 111.8 | 111.8 | 536 | 107.2 | 214.4 | 1034 | 631.0 | 738.2 | | | 17 | 0.0164 |
| S | LTOR | 196.00 | 196 | 196 | 75 | 97.5 | 97.5 | 224 | 44.8 | 89.6 | 495 | 338.3 | 383.1 | 0.300 | | 5 | |
| | ST | 440.00 | 440 | 440 | 144 | 187.2 | 187.2 | 499 | 99.8 | 199.6 | 1083 | 727.0 | 826.8 | | | 8 | |
| | RT | 41.00 | 41 | 41 | 10 | 13.0 | 13.0 | 45 | 9.0 | 18.0 | 96 | 63.0 | 72.0 | | 0.056 | 3 | |
| | **Total** | 677 | 677 | 677 | 229 | 297.7 | 297.7 | 768 | 153.6 | 307.2 | 1674 | 1128.3 | 1281.9 | | | 16 | 0.0096 |
| T | LT(tanpa LTOR) | 37.00 | 37 | 37 | 6 | 7.8 | 7.8 | 67 | 13.4 | 26.8 | 110 | 58.2 | 71.6 | 0.426 | | 5 | |
| | ST | 22.00 | 22 | 22 | 7 | 9.1 | 9.1 | 57 | 11.4 | 22.8 | 86 | 42.5 | 53.9 | | | 4 | |
| | RT | 15.00 | 15 | 15 | 7 | 9.1 | 9.1 | 59 | 11.8 | 23.6 | 81 | 35.9 | 47.7 | | 0.263 | 7 | |
| | **Total** | 74 | 74 | 74 | 20 | 26.0 | 26.0 | 183 | 36.6 | 73.2 | 277 | 136.6 | 173.2 | | | 16 | 0.0578 |
| B | LTOR | 73.00 | 73 | 73 | 27.00 | 35.1 | 35.1 | 143 | 28.6 | 57.2 | 243 | 136.7 | 165.3 | 1.001 | | 7 | |
| | ST | 19.00 | 19 | 19 | 7.00 | 9.1 | 9.1 | 86 | 17.2 | 34.4 | 112 | 45.3 | 62.5 | | | 8 | |
| | RT | 197.00 | 197 | 197 | 35.00 | 45.5 | 45.5 | 180 | 36.0 | 72.0 | 412 | 278.5 | 314.5 | | 0.605 | 4 | |
| | **Total** | 289 | 289 | 289 | 69 | 89.7 | 89.7 | 409 | 81.8 | 163.6 | 767 | 460.5 | 542.3 | | | 19 | 0.0248 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **SIMPANG BERSINYAL**<br>Formulir SIG - III :<br>-WAKTU ANTAR HIJAU<br>-WAKTU HILANG | | | | | | Tanggal : 9Januari 2010<br>Ditangani oleh : Thomas R. Iristha<br>Kota : Secang, Magelang<br>Simpang : Secang<br>Perihal : 3 fase | |
| LALULINTAS<br>BERANGKAT | | LALU LINTAS DATANG | | | | | Waktu merah semua (dtk) |
| Pendekat | Kecepatan $V_{EV}$ (m/dtk) | Pendekat | Utara | Timur | Selatan | Barat | |
| | | Kecepatan $V_{AV}$ (m/dtk) | 10 | 10 | 10 | 10 | |
| Utara | 10 | Jarak berangkat-datang (m) | | | | | |
| | | Waktu berangkat-datang (dtk)*) | | | | | |
| Timur | 10 | Jarak berangkat-datang (m) | | | | | |
| | | Waktu berangkat-datang (dtk)*) | | | | | |
| Selatan | 10 | Jarak berangkat-datang (m) | | | | | |
| | | Waktu berangkat-datang (dtk)*) | | | | | |
| Barat | 10 | Jarak berangkat-datang (m) | | | | | |
| | | Waktu berangkat-datang (dtk)*) | | | | | |
| | | Penentuan waktu all red didasarkan pada aturan fase | Penentuan waktu merah semua : (data ini dapat dirubah sendiri sesuai fase) | | | | |
| | | | Fase 1 --> Fase 2 | | | | 2 |
| | | | Fase 2 --> Fase 3 | | | | 2 |
| | | | Fase 3 --> Fase 1 | | | | 2 |
| | | | Jumlah fase | 3 | kuning/fase | 3 | 9 |
| | | | Waktu hilang total (LTI)= Merah semua total+waktu kuning (dtk / siklus ) | | | | 15 |

Dari gambar 5.1.

*) Waktu untuk berangkat = ( $L_{EV}$ + $I_{EV}$ ) / $V_{EV}$, dimana $I_{EV}$ = 2 m

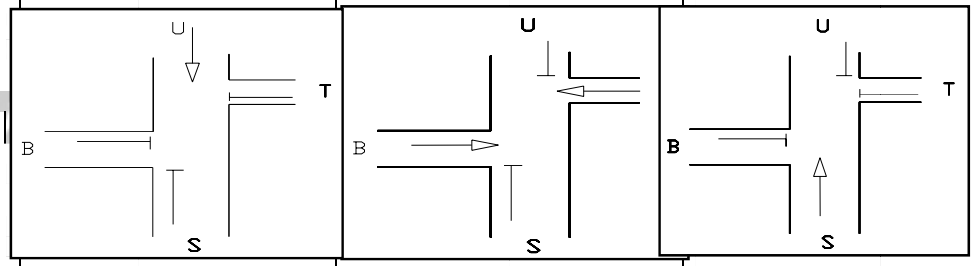
Waktu untuk datang = $L_{AV}$ / $V_{AV}$

Tabel Formulir SIG - IV

| | | |
|---|---|---|
| **SIMPANG BERSINYAL**<br>Formulir SIG-IV : PENENTUAN WAKTU SINYAL<br><br>KAPASITAS | Tanggal : 9Januari 2010<br>Kota : Secang, Magelang<br><br>Simpang : Secang | Ditangani oleh : Thomas R. Iristha<br>Perihal : 3 fase<br>Periode : jam puncak sabtu sore, 9 januari 2010 pukul 17.00 - 18.00 wib |

Distribusi arus lalu lintas(smp/jam)

| | | | |
|---|---|---|---|
| | 128.9 | 476.5 | 25.6 U |
| | 136.7 | | 35.9 |
| B | 45.3 | | 42.5 T |
| | 278.5 | | 58.2 |
| | 383.1 | 826.8 S | 72.0 |




| Kode Pen-dekat | Hijau dalam fase | Tipe Pen-dekat (P / O) | Rasio kendaraan berbelok | | | Arus RT smp/j Arah dari | Arah lawan | Lebar efektif | Arus jenuh smp/jam Hijau: Nilai dasar smp/j hijau | Faktor Penyesuaian: Semua tipe pendekat: Ukuran kota | Hambatan Samping | kelandaian | Parkir | Hanya tipe P: Belok Kanan | Belok Kiri | Nilai disesu-aikan smp/jam hijau | Arus lalu lintas | Rasio Arus | Rasio fase | Waktu hijau | Kapasitas | Derajat jenuh |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | $P_{LTOR}$ | $P_{LT}$ | $P_{RT}$ | $Q_{RT}$ | $Q_{RTo}$ | $W_E$ | So | $F_{CS}$ | $F_{SF}$ | $F_G$ | $F_P$ | $F_{RT}$ | $F_{LT}$ | S | Q | Q/S | $\frac{FR_{CRIT}}{IFR}$ | g | C = Sxg/c | DS= Q / C |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) | (19) | (20) | (21) | (22) | (23) |
| U | 1 | p | 0.000 | 0.041 | 0.204 | 128.9 | | 6.00 | 4650 | 1.0 | 0.930 | 1.00 | 1.00 | 1.053 | 0.99 | 4525.3 | 605.4 | 0.134 | 0.200 | 34 | 1465.3 | 0.4131 |
| S | 2 | P | 0.300 | 0.000 | 0.056 | 63.0 | | 3.00 | 2325 | 1.0 | 0.934 | 1.00 | 1.00 | 1.015 | 1.00 | 2203.7 | 790.0 | 0.358 | 0.535 | 34 | 713.6 | 1.1071 |
| T | 3 | p | 0.000 | 0.426 | 0.263 | 35.9 | | 2.37 | 1837 | 1.0 | 0.905 | 1.00 | 1.00 | 1.068 | 0.93 | 1655.4 | 78.4 | 0.047 | 0.071 | 22 | 346.8 | 0.2260 |
| B | 3 | P | 1.001 | 0.000 | 0.605 | 278.5 | | 3.00 | 2325 | 1.0 | 0.920 | 1.00 | 1.00 | 1.16 | 1.00 | 2475.6 | 323.8 | 0.131 | 0.195 | 22 | 519 | 0.6243 |

| | | | | | |
|---|---|---|---|---|---|
| Waktu hilang total | | Waktu siklus pra penyesuaian $c_{ua}$ (det) | 83.4 | IFR = | Total g = 90 |
| LTI ( det ) | 15 | Waktu siklus disesuaian c (det) | 105 | $\sum FR_{CRIT}$ 0.670 | |

## Formulir SIG - V

| | | |
|---|---|---|
| **SIMPANG BERSINYAL** | Tanggal : 9Januari 2010 | Ditangani oleh : Thomas R. Iristha |
| Formulir SIG-V : PANJANG ANTRIAN | Kota : Secang, Magelang | Kondisi Eksiting |
| JUMLAH KENDARAAN TERHENTI | Simpang : Secang | Periode : jam puncak sabtu sore, 9 januari 2010 pukul 17.00 - 18.00 wib |
| TUNDAAN | Waktu siklus : | |

| Kode Pendekat | Arus Lalu Lintas smp/jam **Q** | Kapasitas smp / jam **C** | Derajat Kejenuhan **DS= Q/C** | Rasio Hijau **GR = g/c** | Jumlah kendaraan antri (smp) | | | | Panjang Antrian ( m ) **QL** | Angka Henti stop/smp **NS** | Jumlah Kendaraan Terhenti smp/jam **$N_{SV}$** | Tundaan | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | **$NQ_1$** | **$NQ_2$** | **Total $NQ=NQ_1+NQ_2$** | **$NQ_{MAX}$** liat gbe22 | | | | Tundaan lalu lintas rata-rata det/smp **DT** | Tundaan geo-metrik rata-rata det/smp **DG** | Tundaan rata-rata det/smp **D = DT+DG** | Tundaan total smp.det **D x Q** |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) |
| U | 605.4 | 1465.3 | 0.4131 | 0.324 | 0.0 | 13.8 | 13.8 | 21.4 | 71 | 0.703 | 425 | 27.7 | 3.2 | 30.9 | 18699 |
| S | 790.0 | 713.6 | 1.1071 | 0.324 | 43.2 | 24.3 | 67.5 | 92.0 | 613 | 2.637 | 2083 | 255.5 | 7.1 | 262.5 | 207396 |
| T | 78.4 | 346.8 | 0.2260 | 0.210 | 0.0 | 1.9 | 1.9 | 5.8 | 49 | 0.747 | 59 | 34.4 | 3.4 | 37.8 | 2965 |
| B | 323.8 | 518.7 | 0.6243 | 0.210 | 0.3 | 8.6 | 8.9 | 15.0 | 100 | 0.850 | 275 | 40.0 | 4.8 | 44.9 | 14530 |
| | | | | | | | | | | | | | | | |
| LTOR(semua) | 533 | | | | | | | | | | | 0.0 | 6.0 | 6.0 | 3199.2 |
| Arus total. Q tot. | | | | | | | | | | Total : | 2842 | | | Total : | 246790 |
| Arus kor. Q kor. | 2331 | | | | | | | | | Kendaraan terhenti rata-rata stop/smp : | 1.22 | | | Tundaan simpang rata-rata(det/smp) : | 105.88 |

# Lampiran 8

(Fomulir Pembahasan Altrnatif II)

# Formulir SIG - I

**SIMPANG BERSINYAL**
FORMULIR SIG-I :
- GEOMETRI
- PENGATURAN LALULINTAS
- LINGKUNGAN

Tanggal : 9Januari 2010
Kota : Secang, Magelang
Ditangani oleh : Thomas R. Iristha
Simpang : Secang
Ukuran Kota/jumlah penduduk (isi dalam jutaan) : 1.200
Perihal : 3 fase
Periode : jam puncak sabtu sore, 9 januari 2010 pukul 17.00 - 18.00 wib

**FASE SINYAL YANG ADA (Gambarkan Sket Fase)**

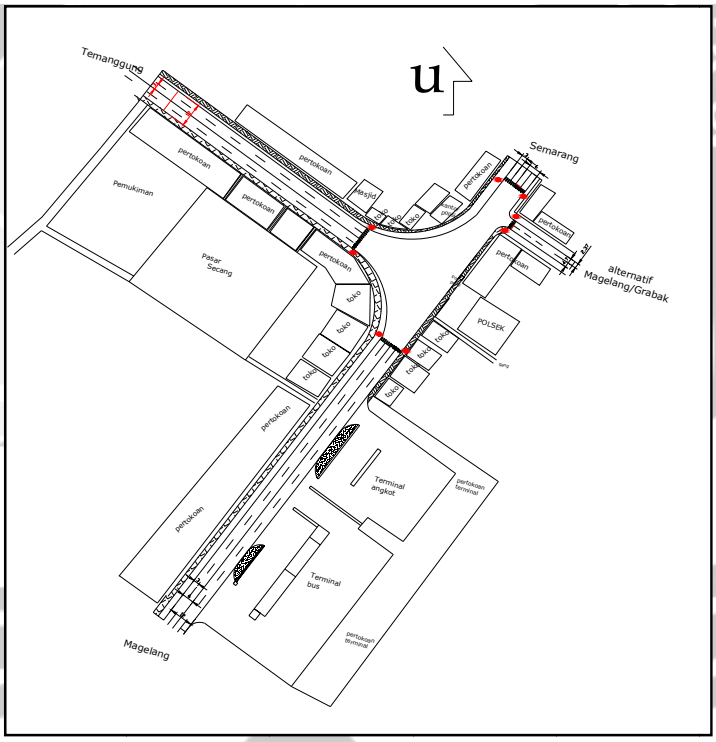
| | | | |
|---|---|---|---|
| **g = 28** | **g = 38** | **g = 24** | **g =** |
| **IG= 5** | **IG= 5** | **IG= 5** | **IG =** |

Waktu siklus : c

**105**

Waktu hilang total :
**LTI = ∑ IG =**
**15**

**SKETSA SIMPANG**




**KONDISI LAPANGAN**

| Kode Pendekat (1) | Tipe lingkungan jalan (com/res/ra) (2) | Hambatan Samping (Tinggi/Rendah) (3) | Median Ya/Tidak (4) | kelandaian +/- % (5) | Belok kiri langsung Ya/Tidak (6) | Jarak ke kendaraan parkir (m) (7) | Lebar Pendekat ( m ) Pendekat $W_A$ (8) | Masuk $W_{ENTRY}$ (9) | Belok kiri lgs. $W_{LTOR}$ (10) | Keluar $W_{EXIT}$ (11) |
|---|---|---|---|---|---|---|---|---|---|---|
| U | com | R | T | 0 | T | | 6.5 | 6.5 | 0.0 | 6.5 |
| S | com | T | T | 0 | Y | | 7.0 | 4.0 | 3.0 | 6.0 |
| T | com | R | T | 0 | T | | 2.4 | 2.4 | 0.0 | 2.4 |
| B | com | T | T | 0 | Y | | 7 | 4 | 3.0 | 6.0 |

**SIMPANG BERSINYAL**
Formulir SIG-II :
ARUS LALULINTAS

Tanggal : 9Januari 2010
Kota : Secang, Magelang
Simpang : Secang
Perihal : 3 fase

Ditangani oleh : Thomas R. Iristha
Periode : jam puncak sabtu sore, 9 januari 2010 pukul 17.00 - 18.00 wib

| Kode Pendekat | Arah | Arus LaluLintas Kendaraan Bermotor ( MV ) | | | | | | | | | | | | | | Kend.tak bermotor | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Kendaraan Ringan(LV) emp terlindung = 1,0 emp terlawan = 1,0 | | | Kendaraan Berat(HV) emp terlindung = 1,3 emp terlawan = 1,3 | | | Sepeda Motor(MC) emp terlindung = 0,2 emp terlawan = 0,4 | | | Kendaraan Bermotor Total MV | | | Rasio Berbelok | | Arus UM | Rasio $P_{UM}$ = UM/ MV |
| | | kend/ jam | smp/jam | | kend / jam | smp/jam | | kend / jam | smp/jam | | kend / jam | smp/jam | | Kiri $P_{LT}$ | Kanan $P_{RT}$ | kend / jam | |
| | | | Terlindung | Terlawan | | Terlindung | Terlawan | | Terlindung | Terlawan | | Terlindung | Terlawan | | | | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) |
| U | LT(tanpa LTOR) | 11 | 11 | 11 | 8 | 10.4 | 10.4 | 21 | 4.2 | 8.4 | 40 | 25.6 | 29.8 | 0.041 | | 4 | |
| | ST | 310 | 310 | 310 | 63 | 81.9 | 81.9 | 423 | 84.6 | 169.2 | 796 | 476.5 | 561.1 | | | 4 | |
| | RT | 91 | 91 | 91 | 15 | 19.5 | 19.5 | 92 | 18.4 | 36.8 | 198 | 128.9 | 147.3 | | 0.204 | 9 | |
| | **Total** | 412 | 412 | 412 | 86 | 111.8 | 111.8 | 536 | 107.2 | 214.4 | 1034 | 631.0 | 738.2 | | | 17 | 0.0164 |
| S | LTOR | 196.00 | 196 | 196 | 75 | 97.5 | 97.5 | 224 | 44.8 | 89.6 | 495 | 338.3 | 383.1 | 0.300 | | 5 | |
| | ST | 440.00 | 440 | 440 | 144 | 187.2 | 187.2 | 499 | 99.8 | 199.6 | 1083 | 727.0 | 826.8 | | | 8 | |
| | RT | 41.00 | 41 | 41 | 10 | 13.0 | 13.0 | 45 | 9.0 | 18.0 | 96 | 63.0 | 72.0 | | 0.056 | 3 | |
| | **Total** | 677 | 677 | 677 | 229 | 297.7 | 297.7 | 768 | 153.6 | 307.2 | 1674 | 1128.3 | 1281.9 | | | 16 | 0.0096 |
| T | LT(tanpa LTOR) | 37.00 | 37 | 37 | 6 | 7.8 | 7.8 | 67 | 13.4 | 26.8 | 110 | 58.2 | 71.6 | 0.426 | | 5 | |
| | ST | 22.00 | 22 | 22 | 7 | 9.1 | 9.1 | 57 | 11.4 | 22.8 | 86 | 42.5 | 53.9 | | | 4 | |
| | RT | 15.00 | 15 | 15 | 7 | 9.1 | 9.1 | 59 | 11.8 | 23.6 | 81 | 35.9 | 47.7 | | 0.263 | 7 | |
| | **Total** | 74 | 74 | 74 | 20 | 26.0 | 26.0 | 183 | 36.6 | 73.2 | 277 | 136.6 | 173.2 | | | 16 | 0.0578 |
| B | LTOR | 73.00 | 73 | 73 | 27.00 | 35.1 | 35.1 | 143 | 28.6 | 57.2 | 243 | 136.7 | 165.3 | 1.001 | | 7 | |
| | ST | 19.00 | 19 | 19 | 7.00 | 9.1 | 9.1 | 86 | 17.2 | 34.4 | 112 | 45.3 | 62.5 | | | 8 | |
| | RT | 197.00 | 197 | 197 | 35.00 | 45.5 | 45.5 | 180 | 36.0 | 72.0 | 412 | 278.5 | 314.5 | | 0.605 | 4 | |
| | **Total** | 289 | 289 | 289 | 69 | 89.7 | 89.7 | 409 | 81.8 | 163.6 | 767 | 460.5 | 542.3 | | | 19 | 0.0248 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **SIMPANG BERSINYAL**<br>Formulir SIG - III :<br>-WAKTU ANTAR HIJAU<br>-WAKTU HILANG | | | Tanggal : 9Januari 2010<br>Ditangani oleh : Thomas R. Iristha<br>Kota : Secang, Magelang<br>Simpang : Secang<br>Perihal : 3 fase | | | | |
| LALULINTAS<br>BERANGKAT | | LALU LINTAS DATANG | | | | | Waktu merah semua (dtk) |
| Pendekat | Kecepatan $V_{EV}$ (m/dtk) | Pendekat | Utara | Timur | Selatan | Barat | |
| | | Kecepatan $V_{AV}$ (m/dtk) | 10 | 10 | 10 | 10 | |
| Utara | 10 | Jarak berangkat-datang (m) | | | | | |
| | | Waktu berangkat-datang (dtk)*) | | | | | |
| Timur | 10 | Jarak berangkat-datang (m) | | | | | |
| | | Waktu berangkat-datang (dtk)*) | | | | | |
| Selatan | 10 | Jarak berangkat-datang (m) | | | | | |
| | | Waktu berangkat-datang (dtk)*) | | | | | |
| Barat | 10 | Jarak berangkat-datang (m) | | | | | |
| | | Waktu berangkat-datang (dtk)*) | | | | | |
| | | Penentuan waktu all red didasarkan pada aturan fase | Penentuan waktu merah semua : (data ini dapat dirubah sendiri sesuai fase) | | | | |
| | | | Fase 1 --> Fase 2 | | | | 2 |
| | | | Fase 2 --> Fase 3 | | | | 2 |
| | | | Fase 3 --> Fase 4 | | | | 2 |
| | | | Jumlah fase | 3 | kuning/fase | 3 | 9 |
| | | | Waktu hilang total (LTI)= Merah semua total+waktu kuning (dtk / siklus ) | | | | 15 |

Dari gambar 5.1.

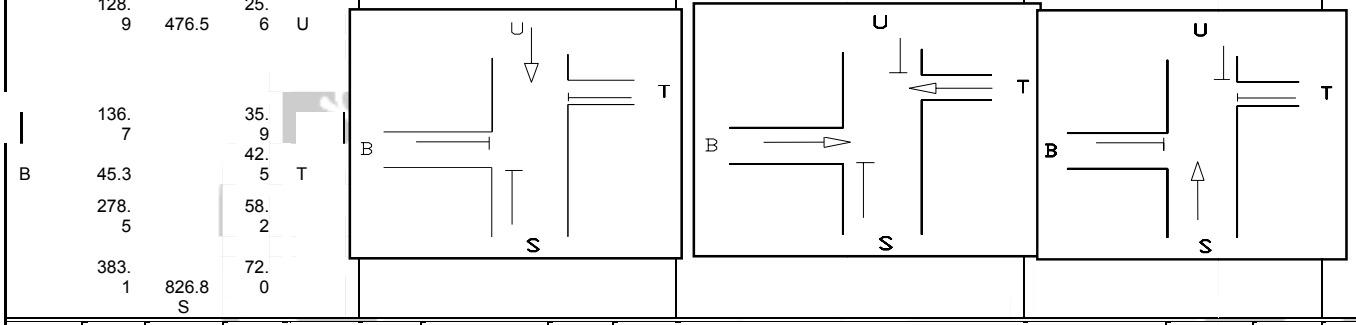
*) Waktu untuk berangkat = ( $L_{EV}$ + $I_{EV}$ ) / $V_{EV}$, dimana $I_{EV}$ = 2 m

Waktu untuk datang = $L_{AV}$ / $V_{AV}$

Tabel Formulir SIG - IV

| | | |
|---|---|---|
| **SIMPANG BERSINYAL**<br>Formulir SIG-IV : PENENTUAN WAKTU SINYAL<br>KAPASITAS | Tanggal : 9Januari 2010<br>Kota : Secang, Magelang<br>Simpang : Secang | Ditangani oleh : Thomas R. Iristha<br>Perihal : 3 fase<br>Periode : jam puncak sabtu sore, 9 januari 2010 pukul 17.00 - 18.00 wib |

Distribusi arus lalu lintas(smp/jam)




| Kode Pen-dekat | Hijau dalam fase no. | Tipe Pen-dekat (P / O) | Rasio kendaraan berbelok $P_{LTOR}$ | Rasio kendaraan berbelok $P_{LT}$ | Rasio kendaraan berbelok $P_{RT}$ | Arus RT smp/j Arah dari $Q_{RT}$ | Arus RT smp/j Arah lawan $Q_{RTo}$ | Lebar efektif (m) $W_E$ | Arus jenuh smp/jam Hijau: Nilai dasar smp/j hijau So | Faktor Penyesuaian: Semua tipe pendekat: Ukuran kota $F_{CS}$ | Hambatan Samping $F_{SF}$ | kelandaian $F_G$ | Parkir $F_P$ | Hanya tipe P: Belok Kanan $F_{RT}$ | Belok Kiri $F_{LT}$ | Nilai disesuaikan smp/jam hijau S | Arus lalu lintas smp/j Q | Rasio Arus FR = Q/S | Rasio fase PR = $\frac{FR_{CRIT}}{IFR}$ | Waktu hijau det g | Kapasitas smp/j C = Sxg/c | Derajat jenuh DS= Q / C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) | (19) | (20) | (21) | (22) | (23) |
| U | 1 | p | 0.000 | 0.041 | 0.204 | 128.9 | | 6.50 | 5038 | 1.0 | 0.930 | 1.00 | 0.80 | 1.053 | 0.99 | 3921.9 | 605.4 | 0.154 | 0.230 | 28 | 1045.8 | 0.5789 |
| S | 2 | P | 0.300 | 0.000 | 0.056 | 63.0 | | 4.00 | 3100 | 1.0 | 0.934 | 1.00 | 0.80 | 1.015 | 1.00 | 2350.6 | 790.0 | 0.336 | 0.500 | 38 | 850.7 | 0.9286 |
| T | 3 | p | 0.000 | 0.426 | 0.263 | 35.9 | | 2.37 | 1837 | 1.0 | 0.905 | 1.00 | 0.80 | 1.068 | 0.93 | 1324.3 | 78.4 | 0.059 | 0.088 | 24 | 302.7 | 0.2590 |
| B | 3 | P | 1.001 | 0.000 | 0.605 | 278.5 | | 4.00 | 3100 | 1.0 | 0.920 | 1.00 | 0.80 | 1.16 | 1.00 | 2640.6 | 323.8 | 0.123 | 0.182 | 24 | 604 | 0.5365 |
| Waktu hilang total LTI ( det ) | | | 15 | Waktu siklus pra penyesuaian $c_{ua}$ (det) | | | | | | | 83.9 | | | | | | IFR = $\Sigma FR_{CRIT}$ | 0.672 | Total g = | 90 | | |
| | | | | Waktu siklus disesuaian c (det) | | | | | | | 105 | | | | | | | | | | | |

## Formulir SIG - V

**SIMPANG BERSINYAL**

Formulir SIG-V : PANJANG ANTRIAN

JUMLAH KENDARAAN TERHENTI

TUNDAAN

Tanggal : 9Januari 2010

Kota : Secang, Magelang

Simpang : Secang

Waktu siklus :

Ditangani oleh : Thomas R. Iristha

Kondisi Eksiting

Periode : jam puncak sabtu sore, 9 januari 2010 pukul 17.00 - 18.00 wib

| Kode Pendekat | Arus Lalu Lintas smp/jam **Q** | Kapasitas smp / jam **C** | Derajat Kejenuhan **DS= Q/C** | Rasio Hijau **GR = g/c** | Jumlah kendaraan antri (smp) | | | | Panjang Antrian ( m ) **QL** | Angka Henti stop/smp **NS** | Jumlah Kendaraan Terhenti smp/jam $N_{SV}$ | Tundaan | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | **$NQ_1$** | **$NQ_2$** | **Total $NQ=NQ_1+NQ_2$** | **$NQ_{MAX}$** liat gbe22 | | | | Tundaan lalu lintas rata-rata det/smp **DT** | Tundaan geo-metrik rata-rata det/smp **DG** | Tundaan rata-rata det/smp **D = DT+DG** | Tundaan total smp.det **D x Q** |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) |
| U | 605.4 | 1045.8 | 0.5789 | 0.267 | 0.2 | 15.3 | 15.5 | 23.7 | 73 | 0.790 | 478 | 34.0 | 3.4 | 37.4 | 22671 |
| S | 790.0 | 850.7 | 0.9286 | 0.362 | 5.1 | 22.1 | 27.3 | 39.1 | 196 | 1.066 | 842 | 53.9 | 4.1 | 58.1 | 45869 |
| T | 78.4 | 302.7 | 0.2590 | 0.229 | 0.0 | 1.9 | 1.9 | 5.8 | 49 | 0.738 | 58 | 33.2 | 3.4 | 36.6 | 2867 |
| B | 323.8 | 603.6 | 0.5365 | 0.229 | 0.1 | 8.3 | 8.4 | 14.3 | 72 | 0.799 | 259 | 36.1 | 5.1 | 41.2 | 13344 |
| | | | | | | | | | | | | | | | |
| LTOR(semua) | 533 | | | | | | | | | | | 0.0 | 6.0 | 6.0 | 3199.2 |
| Arus total. Q tot. | | | | | | | | | | Total : | 1637 | | | Total : | 87951 |
| Arus kor. Q kor. | 2331 | | | | | | | | | Kendaraan terhenti rata-rata stop/smp : | 0.70 | | | Tundaan simpang rata-rata(det/smp) : | 37.73 |

# Lampiran 9

(Fomulir Pembahasan Alternatif III)

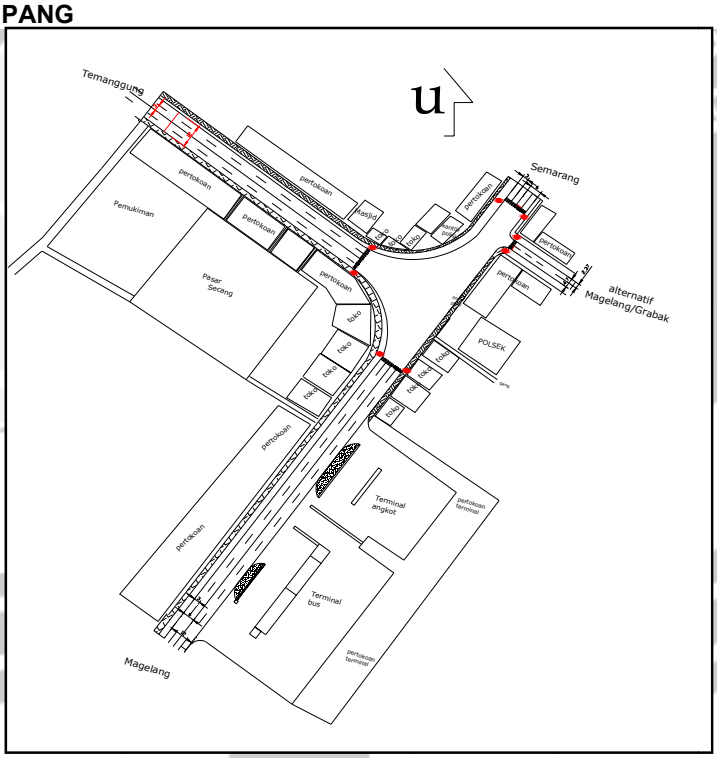
Formulir SIG - I

| | | |
|---|---|---|
| **SIMPANG BERSINYAL**<br>FORMULIR SIG-I :<br>- GEOMETRI<br>- PENGATURAN LALULINTAS<br>- LINGKUNGAN | Tanggal : 9Januari 2010 | Ditangani oleh : Thomas R. Iristha |
| | Kota : Secang, Magelang | |
| | Simpang : Secang | |
| | Ukuran Kota/jumlah penduduk (isi dalam jutaan) : 1.200 | |
| | Perihal : 3 fase | |
| | Periode : jam puncak sabtu sore, 9 januari 2010 pukul 17.00 - 18.00 wib | |

**FASE SINYAL YANG ADA (Gambarkan Sket Fase)**

| | | | | |
|---|---|---|---|---|
| **g = 34**<br>**IG= 5** | **g = 34**<br>**IG= 5** | **g = 22**<br>**IG= 5** | **g =**<br>**IG =** | Waktu siklus : c<br>**105**<br>Waktu hilang total :<br>**LTI = ∑ IG =**<br>**15** |

**SKETSA SIMPANG**




**KONDISI LAPANGAN**

| Kode Pendekat (1) | Tipe lingkungan jalan (com/res/ra) (2) | Hambatan Samping (Tinggi/Rendah) (3) | Median Ya/Tidak (4) | kelandaian +/- % (5) | Belok kiri langsung Ya/Tidak (6) | Jarak ke kendaraan parkir (m) (7) | Lebar Pendekat ( m ) Pendekat $W_A$ (8) | Masuk $W_{ENTRY}$ (9) | Belok kiri lgs. $W_{LTOR}$ (10) | Keluar $W_{EXIT}$ (11) |
|---|---|---|---|---|---|---|---|---|---|---|
| U | com | R | T | 0 | T | | 6.0 | 6.0 | 0.0 | 6.0 |
| S | com | T | T | 0 | Y | | 6.0 | 3.0 | 3.0 | 6.0 |
| T | com | R | T | 0 | T | | 2.4 | 2.4 | 0.0 | 2.4 |
| B | com | T | T | 0 | Y | | 6 | 3 | 3.0 | 6.0 |

**SIMPANG BERSINYAL**
Formulir SIG-II :
ARUS LALULINTAS

Tanggal : 9Januari 2010
Kota : Secang, Magelang
Simpang : Secang
Perihal : 3 fase

Ditangani oleh : Thomas R. Iristha
Periode : jam puncak sabtu sore, 9 januari 2010 pukul 17.00 - 18.00 wib

| Kode Pendekat | Arah | Arus LaluLintas Kendaraan Bermotor ( MV ) | | | | | | | | | | | | Rasio Berbelok | | Kend.tak bermotor | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Kendaraan Ringan(LV) emp terlindung = 1,0 emp terlawan = 1,0 | | | Kendaraan Berat(HV) emp terlindung = 1,3 emp terlawan = 1,3 | | | Sepeda Motor(MC) emp terlindung = 0,2 emp terlawan = 0,4 | | | Kendaraan Bermotor Total MV | | | | | Arus UM | Rasio $P_{UM}$ = UM/ MV |
| | | kend/ jam | smp/jam Terlindung | smp/jam Terlawan | kend/ jam | smp/jam Terlindung | smp/jam Terlawan | kend/ jam | smp/jam Terlindung | smp/jam Terlawan | kend/ jam | smp/jam Terlindung | smp/jam Terlawan | Kiri $P_{LT}$ | Kanan $P_{RT}$ | kend/ jam | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) |
| U | LT(tanpa LTOR) | 11 | 11 | 11 | 8 | 10.4 | 10.4 | 21 | 4.2 | 8.4 | 40 | 25.6 | 29.8 | 0.053 | | 4 | |
| | ST | 233 | 233 | 233 | 63 | 81.9 | 81.9 | 211 | 42.2 | 84.4 | 507 | 356.6 | 398.8 | | | 4 | |
| | RT | 68 | 68 | 68 | 15 | 19.5 | 19.5 | 46 | 9.2 | 18.4 | 129 | 97.0 | 106.2 | | 0.202 | 9 | |
| | **Total** | 312 | 312 | 312 | 86 | 111.8 | 111.8 | 278 | 55.6 | 111.2 | 676 | 479.2 | 534.8 | | | 17 | 0.0252 |
| S | LTOR | 147 | 147 | 147 | 75 | 97.5 | 97.5 | 112 | 22.4 | 44.8 | 334 | 266.9 | 289.3 | 0.298 | | 5 | |
| | ST | 330 | 330 | 330 | 144 | 187.2 | 187.2 | 250 | 50.0 | 100.0 | 724 | 567.2 | 617.2 | | | 8 | |
| | RT | 41 | 41 | 41 | 10 | 13.0 | 13.0 | 45 | 9.0 | 18.0 | 96 | 63.0 | 72.0 | | 0.070 | 3 | |
| | **Total** | 518 | 518 | 518 | 229 | 297.7 | 297.7 | 407 | 81.4 | 162.8 | 1154 | 897.1 | 978.5 | | | 16 | 0.0139 |
| T | LT(tanpa LTOR) | 37 | 37 | 37 | 6 | 7.8 | 7.8 | 67 | 13.4 | 26.8 | 110 | 58.2 | 71.6 | 0.426 | | 5 | |
| | ST | 22 | 22 | 22 | 7 | 9.1 | 9.1 | 57 | 11.4 | 22.8 | 86 | 42.5 | 53.9 | | | 4 | |
| | RT | 15 | 15 | 15 | 7 | 9.1 | 9.1 | 59 | 11.8 | 23.6 | 81 | 35.9 | 47.7 | | 0.263 | 7 | |
| | **Total** | 74 | 74 | 74 | 20 | 26.0 | 26.0 | 183 | 36.6 | 73.2 | 277 | 136.6 | 173.2 | | | 16 | 0.0578 |
| B | LTOR | 55 | 55 | 55 | 27.00 | 35.1 | 35.1 | 72 | 14.4 | 28.8 | 154 | 104.3 | 118.7 | 0.763 | | 7 | |
| | ST | 19 | 19 | 19 | 7.00 | 9.1 | 9.1 | 86 | 17.2 | 34.4 | 112 | 45.3 | 62.5 | | | 8 | |
| | RT | 148 | 148 | 148 | 35.00 | 45.5 | 45.5 | 90 | 18.0 | 36.0 | 273 | 211.3 | 229.3 | | 0.586 | 4 | |
| | **Total** | 222 | 222 | 222 | 69 | 89.7 | 89.7 | 248 | 49.6 | 99.2 | 539 | 360.8 | 410.4 | | | 19 | 0.0353 |

**SIMPANG BERSINYAL**
Tanggal : 9Januari 2010

| | |
|---|---|
| Formulir SIG - III :<br>-WAKTU ANTAR HIJAU<br>-WAKTU HILANG | Ditangani oleh : Thomas R. Iristha<br>Kota : Secang, Magelang<br>Simpang : Secang<br>Perihal : 3 fase |

| LALULINTAS BERANGKAT | | LALU LINTAS DATANG | | | | | Waktu merah semua (dtk) |
|---|---|---|---|---|---|---|---|
| Pendekat | Kecepatan $V_{EV}$ (m/dtk) | Pendekat | Utara | Timur | Selatan | Barat | |
| | | Kecepatan $V_{AV}$ (m/dtk) | 10 | 10 | 10 | 10 | |
| Utara | 10 | Jarak berangkat-datang (m) | | | | | |
| | | Waktu berangkat-datang (dtk)*) | | | | | |
| Timur | 10 | Jarak berangkat-datang (m) | | | | | |
| | | Waktu berangkat-datang (dtk)*) | | | | | |
| Selatan | 10 | Jarak berangkat-datang (m) | | | | | |
| | | Waktu berangkat-datang (dtk)*) | | | | | |
| Barat | 10 | Jarak berangkat-datang (m) | | | | | |
| | | Waktu berangkat-datang (dtk)*) | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Penentuan waktu all red didasarkan pada aturan fase | Penentuan waktu merah semua : (data ini dapat dirubah sendiri sesuai fase) | | | | | | |
| | Fase 1 --> Fase 2 | | | | | | 2 |
| | Fase 2 --> Fase 3 | | | | | | 2 |
| | Fase 3 --> Fase 1 | | | | | | 2 |
| | Jumlah fase | 3 | kuning/fase | 3 | | | 9 |
| | Waktu hilang total (LTI)= Merah semua total+waktu kuning (dtk / siklus ) | | | | | | 15 |

Dari gambar 5.1.

*) Waktu untuk berangkat = ( $L_{EV}$ + $I_{EV}$ ) / $V_{EV}$, dimana $I_{EV}$ = 2 m

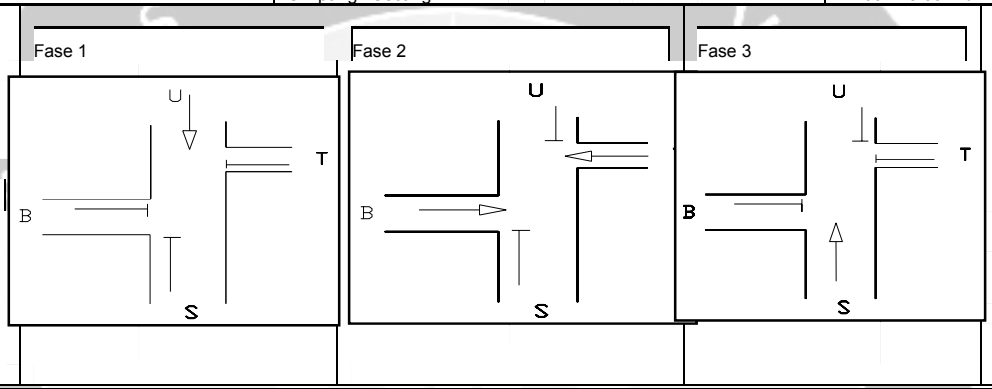
Waktu untuk datang = $L_{AV}$ / $V_{AV}$

Tabel Formulir SIG - IV

| | | |
|---|---|---|
| **SIMPANG BERSINYAL**<br>Formulir SIG-IV : PENENTUAN WAKTU SINYAL<br><br>KAPASITAS | Tanggal : 9Januari 2010<br>Kota : Secang, Magelang<br><br>Simpang : Secang | Ditangani oleh : Thomas R. Iristha<br>Perihal : 3 fase<br>Periode : jam puncak sabtu sore, 9 januari 2010 pukul 17.00 - 18.00 wib |

Distribusi arus lalu lintas(smp/jam)

| | | | | |
|---|---|---|---|---|
| | 97.0 | 356.6 | 25.6 | U |
| | 104.3 | | 35.9 | |
| B | 45.3 | | 42.5 | T |
| | 211.3 | | 58.2 | |
| | 289.3 | 617.2 | 72.0 | |
| | | S | | |




| Kode Pen-dekat | Hijau dalam fase no. | Tipe Pen-dekat (P / O) | Rasio kendaraan berbelok $P_{LTOR}$ | $P_{LT}$ | $P_{RT}$ | Arus RT smp/j Arah dari $Q_{RT}$ | Arah lawan $Q_{RTo}$ | Lebar efektif $W_E$ | Arus jenuh smp/jam Hijau: Nilai dasar smp/j hijau So | Faktor Penyesuaian: Semua tipe pendekat: Ukuran kota $F_{CS}$ | Hambatan Samping $F_{SF}$ | kelan-daian $F_G$ | Parkir $F_P$ | Hanya tipe P: Belok Kanan $F_{RT}$ | Belok Kiri $F_{LT}$ | Nilai disesu-aikan smp/jam hijau S | Arus lalu lintas smp/j Q | Rasio Arus FR = Q/S | Rasio fase PR = $FR_{CRIT}$ / IFR | Waktu hijau det g | Kapa-sitas smp/j C = Sxg/c | Derajat jenuh DS= Q / C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) | (19) | (20) | (21) | (22) | (23) |
| U | 1 | p | 0.000 | 0.053 | 0.202 | 97.0 | | 6.00 | 4650 | 1.0 | 0.925 | 1.00 | 0.80 | 1.053 | 0.99 | 3590.7 | 453.6 | 0.126 | 0.188 | 34 | 1162.7 | 0.3901 |
| S | 2 | P | 0.298 | 0.000 | 0.070 | 63.0 | | 3.00 | 2325 | 1.0 | 0.932 | 1.00 | 0.80 | 1.018 | 1.00 | 1764.6 | 630.2 | 0.357 | 0.530 | 34 | 571.4 | 1.1029 |
| T | 3 | p | 0.000 | 0.426 | 0.263 | 35.9 | | 2.37 | 1837 | 1.0 | 0.905 | 1.00 | 0.80 | 1.068 | 0.93 | 1324.3 | 78.4 | 0.059 | 0.088 | 22 | 277.5 | 0.2825 |
| B | 3 | P | 0.763 | 0.000 | 0.586 | 211.3 | | 3.00 | 2325 | 1.0 | 0.916 | 1.00 | 0.80 | 1.15 | 1.00 | 1962.9 | 256.6 | 0.131 | 0.194 | 22 | 411 | 0.6238 |
| Waktu hilang total | | | | Waktu siklus pra penyesuaian $c_{ua}$ (det) | | | | | | | 84.2 | | | | | | IFR = | | Total g = | 90 | | |
| LTI ( det ) | | | 15 | Waktu siklus disesuaian c (det) | | | | | | | 105 | | | | | | $\Sigma FR_{CRIT}$ | 0.673 | | | | |

## Formulir SIG - V

| | | |
|---|---|---|
| **SIMPANG BERSINYAL** | Tanggal : 9Januari 2010 | Ditangani oleh : Thomas R. Iristha |
| Formulir SIG-V : PANJANG ANTRIAN | Kota : Secang, Magelang | Kondisi Eksiting |
| JUMLAH KENDARAAN TERHENTI | Simpang : Secang | Periode : jam puncak sabtu sore, 9 januari 2010 pukul 17.00 - 18.00 wib |
| TUNDAAN | Waktu siklus : | |

| Kode Pendekat | Arus Lalu Lintas smp/jam **Q** | Kapasitas smp / jam **C** | Derajat Kejenuhan **DS= Q/C** | Rasio Hijau **GR = g/c** | Jumlah kendaraan antri (smp) | | | | Panjang Antrian ( m ) **QL** | Angka Henti stop/smp **NS** | Jumlah Kendaraan Terhenti smp/jam $N_{SV}$ | Tundaan | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | **$NQ_1$** | **$NQ_2$** | **Total $NQ=NQ_1+NQ_2$** | **$NQ_{MAX}$** liat gbe22 | | | | Tundaan lalu lintas rata-rata det/smp **DT** | Tundaan geometrik rata-rata det/smp **DG** | Tundaan rata-rata det/smp **D = DT+DG** | Tundaan total smp.det **D x Q** |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) |
| U | 453.6 | 1162.7 | 0.3901 | 0.324 | 0.0 | 10.2 | 10.2 | 16.8 | 56 | 0.697 | 316 | 27.5 | 3.2 | 30.6 | 13892 |
| S | 630.2 | 571.4 | 1.1029 | 0.324 | 34.4 | 19.3 | 53.7 | 73.9 | 493 | 2.632 | 1658 | 254.2 | 6.9 | 261.1 | 164538 |
| T | 78.4 | 277.5 | 0.2825 | 0.210 | 0.0 | 1.9 | 1.9 | 5.8 | 49 | 0.756 | 59 | 34.9 | 3.4 | 38.3 | 3001 |
| B | 256.6 | 411.3 | 0.6238 | 0.210 | 0.3 | 6.8 | 7.1 | 12.7 | 84 | 0.858 | 220 | 40.6 | 4.6 | 45.2 | 11593 |
| | | | | | | | | | | | | | | | |
| LTOR(semua) | 429 | | | | | | | | | | | 0.0 | 6.0 | 6.0 | 2576.1 |
| Arus total. Q tot. | | | | | | | | | | | Total : 2254 | | | Total : | 195600 |
| Arus kor. Q kor. | 1848 | | | | | | | | | | Kendaraan terhenti rata-rata stop/smp : 1.22 | | | Tundaan simpang rata-rata(det/smp) : | 105.84 |

# Lampiran 10

(Fomulir Pembahasan Alternatif IV)

Formulir SIG - I

**SIMPANG BERSINYAL**
FORMULIR SIG-I :
- GEOMETRI
- PENGATURAN LALULINTAS
- LINGKUNGAN

Tanggal : 9Januari 2010 | Ditangani oleh : Thomas R. Iristha
Kota : Secang, Magelang
Simpang : Secang
Ukuran Kota/jumlah penduduk (isi dalam jutaan) : 1.200
Perihal : 3 fase
Periode : jam puncak sabtu sore, 9 januari 2010 pukul 17.00 - 18.00 wib

**FASE SINYAL YANG ADA (Gambarkan Sket Fase)**

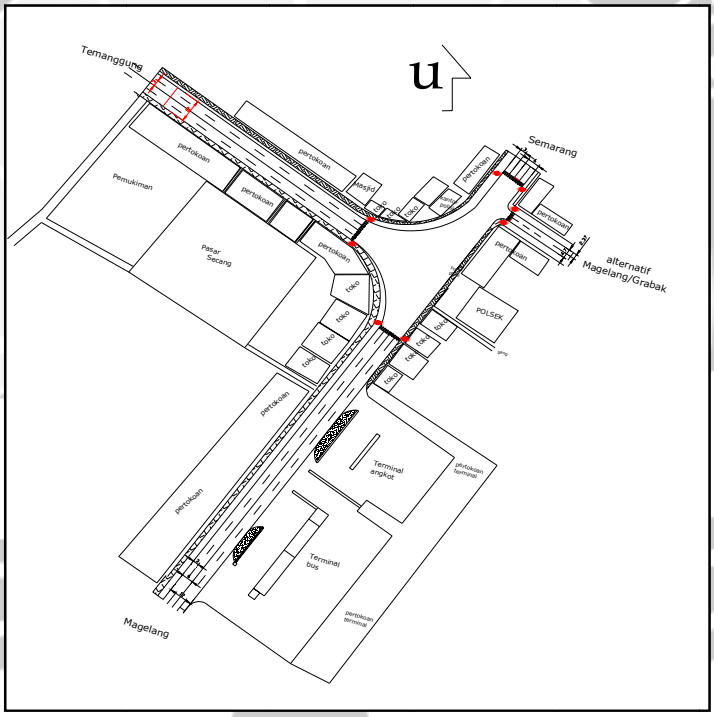
| | | | |
|---|---|---|---|
| **g = 28** | **g = 38** | **g = 24** | **g =** |
| **IG= 5** | **IG= 5** | **IG= 5** | **IG =** |

Waktu siklus : c

**105**

Waktu hilang total :
**LTI = ∑ IG =**
**15**

**SKETSA SIMPANG**




**KONDISI LAPANGAN**

| Kode Pendekat | Tipe lingkungan jalan (com/res/ra) | Hambatan Samping (Tinggi/Rendah) | Median Ya/Tidak | kelandaian +/- % | Belok kiri langsung Ya/Tidak | Jarak ke kendaraan parkir (m) | Lebar Pendekat ( m ) Pendekat $W_A$ | Masuk $W_{ENTRY}$ | Belok kiri lgs. $W_{LTOR}$ | Keluar $W_{EXIT}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
| U | com | R | T | 0 | T | | 6.5 | 6.5 | 0.0 | 6.5 |
| S | com | T | T | 0 | Y | | 7.0 | 4.0 | 3.0 | 6.0 |
| T | com | R | T | 0 | T | | 2.4 | 2.4 | 0.0 | 2.4 |
| B | com | T | T | 0 | Y | | 7 | 4 | 3.0 | 6.0 |

**SIMPANG BERSINYAL**
Formulir SIG-II :
ARUS LALULINTAS

Tanggal : 9Januari 2010
Kota : Secang, Magelang
Simpang : Secang
Perihal : 3 fase

Ditangani oleh : Thomas R. Iristha
Periode : jam puncak sabtu sore, 9 januari 2010 pukul 17.00 - 18.00 wib

| Kode Pendekat | Arah | Arus LaluLintas Kendaraan Bermotor ( MV ) | | | | | | | | | | | | | | Kend.tak bermotor | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Kendaraan Ringan(LV) emp terlindung = 1,0 emp terlawan = 1,0 | | | Kendaraan Berat(HV) emp terlindung = 1,3 emp terlawan = 1,3 | | | Sepeda Motor(MC) emp terlindung = 0,2 emp terlawan = 0,4 | | | Kendaraan Bermotor Total MV | | | Rasio Berbelok | | Arus UM | Rasio $P_{UM}$ = UM/ MV |
| | | kend/ jam | smp/jam | | kend/ jam | smp/jam | | kend/ jam | smp/jam | | kend/ jam | smp/jam | | Kiri | Kanan | kend/ jam | |
| | | | Terlindung | Terlawan | | Terlindung | Terlawan | | Terlindung | Terlawan | | Terlindung | Terlawan | $P_{LT}$ | $P_{RT}$ | | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) |
| U | LT(tanpa LTOR) | 11 | 11 | 11 | 8 | 10.4 | 10.4 | 21 | 4.2 | 8.4 | 40 | 25.6 | 29.8 | 0.041 | | 4 | |
| | ST | 310 | 310 | 310 | 63 | 81.9 | 81.9 | 423 | 84.6 | 169.2 | 796 | 476.5 | 561.1 | | | 4 | |
| | RT | 91 | 91 | 91 | 15 | 19.5 | 19.5 | 92 | 18.4 | 36.8 | 198 | 128.9 | 147.3 | | 0.204 | 9 | |
| | **Total** | 412 | 412 | 412 | 86 | 111.8 | 111.8 | 536 | 107.2 | 214.4 | 1034 | 631.0 | 738.2 | | | 17 | 0.0164 |
| S | LTOR | 196.00 | 196 | 196 | 75 | 97.5 | 97.5 | 224 | 44.8 | 89.6 | 495 | 338.3 | 383.1 | 0.300 | | 5 | |
| | ST | 440.00 | 440 | 440 | 144 | 187.2 | 187.2 | 499 | 99.8 | 199.6 | 1083 | 727.0 | 826.8 | | | 8 | |
| | RT | 41.00 | 41 | 41 | 10 | 13.0 | 13.0 | 45 | 9.0 | 18.0 | 96 | 63.0 | 72.0 | | 0.056 | 3 | |
| | **Total** | 677 | 677 | 677 | 229 | 297.7 | 297.7 | 768 | 153.6 | 307.2 | 1674 | 1128.3 | 1281.9 | | | 16 | 0.0096 |
| T | LT(tanpa LTOR) | 37.00 | 37 | 37 | 6 | 7.8 | 7.8 | 67 | 13.4 | 26.8 | 110 | 58.2 | 71.6 | 0.426 | | 5 | |
| | ST | 22.00 | 22 | 22 | 7 | 9.1 | 9.1 | 57 | 11.4 | 22.8 | 86 | 42.5 | 53.9 | | | 4 | |
| | RT | 15.00 | 15 | 15 | 7 | 9.1 | 9.1 | 59 | 11.8 | 23.6 | 81 | 35.9 | 47.7 | | 0.263 | 7 | |
| | **Total** | 74 | 74 | 74 | 20 | 26.0 | 26.0 | 183 | 36.6 | 73.2 | 277 | 136.6 | 173.2 | | | 16 | 0.0578 |
| B | LTOR | 73.00 | 73 | 73 | 27.00 | 35.1 | 35.1 | 143 | 28.6 | 57.2 | 243 | 136.7 | 165.3 | 1.001 | | 7 | |
| | ST | 19.00 | 19 | 19 | 7.00 | 9.1 | 9.1 | 86 | 17.2 | 34.4 | 112 | 45.3 | 62.5 | | | 8 | |
| | RT | 197.00 | 197 | 197 | 35.00 | 45.5 | 45.5 | 180 | 36.0 | 72.0 | 412 | 278.5 | 314.5 | | 0.605 | 4 | |
| | **Total** | 289 | 289 | 289 | 69 | 89.7 | 89.7 | 409 | 81.8 | 163.6 | 767 | 460.5 | 542.3 | | | 19 | 0.0248 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **SIMPANG BERSINYAL**<br>Formulir SIG - III :<br>-WAKTU ANTAR HIJAU<br>-WAKTU HILANG | | | | | | Tanggal : 9Januari 2010<br>Ditangani oleh : Thomas R. Iristha<br>Kota : Secang, Magelang<br>Simpang : Secang<br>Perihal : 3 fase | |
| LALULINTAS<br>BERANGKAT | | LALU LINTAS DATANG | | | | | Waktu merah semua (dtk) |
| Pendekat | Kecepatan $V_{EV}$ (m/dtk) | Pendekat | Utara | Timur | Selatan | Barat | |
| | | Kecepatan $V_{AV}$ (m/dtk) | 10 | 10 | 10 | 10 | |
| Utara | 10 | Jarak berangkat-datang (m) | | | | | |
| | | Waktu berangkat-datang (dtk)*) | | | | | |
| Timur | 10 | Jarak berangkat-datang (m) | | | | | |
| | | Waktu berangkat-datang (dtk)*) | | | | | |
| Selatan | 10 | Jarak berangkat-datang (m) | | | | | |
| | | Waktu berangkat-datang (dtk)*) | | | | | |
| Barat | 10 | Jarak berangkat-datang (m) | | | | | |
| | | Waktu berangkat-datang (dtk)*) | | | | | |
| | | Penentuan waktu all red didasarkan pada aturan fase | Penentuan waktu merah semua : (data ini dapat dirubah sendiri sesuai fase) | | | | |
| | | | Fase 1 --> Fase 2 | | | | 2 |
| | | | Fase 2 --> Fase 3 | | | | 2 |
| | | | Fase 3 --> Fase 4 | | | | 2 |
| | | | Jumlah fase | 3 | kuning/fase | 3 | 9 |
| | | | Waktu hilang total (LTI)= Merah semua total+waktu kuning (dtk / siklus ) | | | | 15 |

Dari gambar 5.1.

*) Waktu untuk berangkat = ( $L_{EV}$ + $I_{EV}$ ) / $V_{EV}$, dimana $I_{EV}$ = 2 m

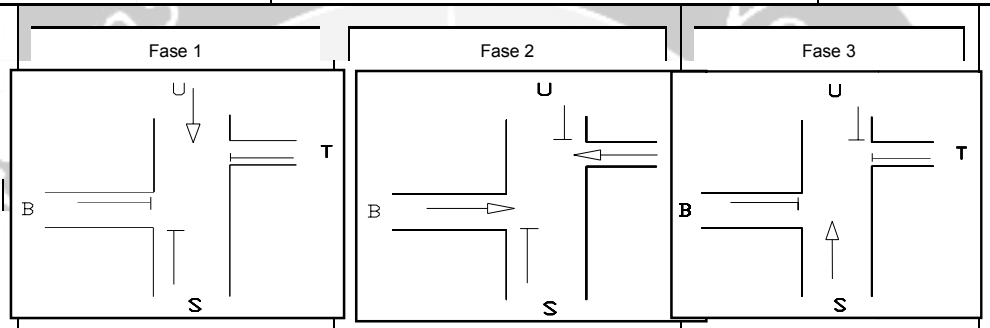
Waktu untuk datang = $L_{AV}$ / $V_{AV}$

Tabel Formulir SIG - IV

| | | |
|---|---|---|
| **SIMPANG BERSINYAL**<br>Formulir SIG-IV : PENENTUAN WAKTU SINYAL<br>KAPASITAS | Tanggal : 9Januari 2010<br>Kota : Secang, Magelang<br>Simpang : Secang | Ditangani oleh : Thomas R. Iristha<br>Perihal : 3 fase<br>Periode : jam puncak sabtu sore, 9 januari 2010 pukul 17.00 - 18.00 wib |

Distribusi arus lalu lintas(smp/jam)

| | | | |
|---|---|---|---|
| 128.9 | 476.5 | 25.6 | U |
| 136.7 | | 35.9 | |
| B 45.3 | | 42.5 | T |
| 278.5 | | 58.2 | |
| 383.1 | 826.8 | 72.0 | |
| | S | | |




| Kode Pen-dekat | Hijau dalam fase no. | Tipe Pen-dekat (P / O) | Rasio kendaraan berbelok $P_{LTOR}$ | $P_{LT}$ | $P_{RT}$ | Arus RT smp/j Arah dari $Q_{RT}$ | Arah lawan $Q_{RTo}$ | Lebar efektif (m) $W_E$ | Arus jenuh smp/jam Hijau: Nilai dasar smp/jam hijau So | Faktor Penyesuaian: Semua tipe pendekat: Ukuran kota $F_{CS}$ | Hambatan Samping $F_{SF}$ | kelandaian $F_G$ | Parkir $F_P$ | Hanya tipe P: Belok Kanan $F_{RT}$ | Belok Kiri $F_{LT}$ | Nilai disesuaikan smp/jam hijau S | Arus lalu lintas smp/j Q | Rasio Arus FR = Q/S | Rasio fase PR = $FR_{CRIT}$ / IFR | Waktu hijau det g | Kapasitas smp/j C = Sxg/c | Derajat jenuh DS= Q / C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) | (19) | (20) | (21) | (22) | (23) |
| U | 1 | p | 0.000 | 0.041 | 0.204 | 128.9 | | 6.50 | 5038 | 1.0 | 0.930 | 1.00 | 1.00 | 1.053 | 0.99 | 4902.4 | 605.4 | 0.123 | 0.230 | 28 | 1307.3 | 0.4631 |
| S | 2 | P | 0.300 | 0.000 | 0.056 | 63.0 | | 4.00 | 3100 | 1.0 | 0.934 | 1.00 | 1.00 | 1.015 | 1.00 | 2938.3 | 790.0 | 0.269 | 0.500 | 38 | 1063.4 | 0.7429 |
| T | 3 | p | 0.000 | 0.426 | 0.263 | 35.9 | | 2.37 | 1837 | 1.0 | 0.905 | 1.00 | 1.00 | 1.068 | 0.93 | 1655.4 | 78.4 | 0.047 | 0.088 | 24 | 378.4 | 0.2072 |
| B | 3 | P | 1.001 | 0.000 | 0.605 | 278.5 | | 4.00 | 3100 | 1.0 | 0.920 | 1.00 | 1.00 | 1.16 | 1.00 | 3300.8 | 323.8 | 0.098 | 0.182 | 24 | 754 | 0.4292 |

| | | | | | |
|---|---|---|---|---|---|
| Waktu hilang total | | Waktu siklus pra penyesuaian $c_{ua}$ (det) | 59.5 | IFR = | Total g = 90 |
| LTI ( det ) | 15 | Waktu siklus disesuaian c (det) | 105 | $\sum FR_{CRIT}$ 0.538 | |

## Formulir SIG - V

| | | |
|---|---|---|
| **SIMPANG BERSINYAL** | Tanggal : 9Januari 2010 | Ditangani oleh : Thomas R. Iristha |
| Formulir SIG-V : PANJANG ANTRIAN | Kota : Secang, Magelang | Kondisi Eksiting |
| JUMLAH KENDARAAN TERHENTI | Simpang : Secang | Periode : jam puncak sabtu sore, 9 januari 2010 pukul 17.00 - 18.00 wib |
| TUNDAAN | Waktu siklus : | |

| Kode Pendekat | Arus Lalu Lintas smp/jam **Q** | Kapasitas smp / jam **C** | Derajat Kejenuhan **DS= Q/C** | Rasio Hijau **GR = g/c** | Jumlah kendaraan antri (smp) | | | | Panjang Antrian ( m ) **QL** | Angka Henti stop/smp **NS** | Jumlah Kendaraan Terhenti smp/jam **$N_{SV}$** | Tundaan | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | **$NQ_1$** | **$NQ_2$** | **Total NQ= $NQ_1$+$NQ_2$** | **$NQ_{MAX}$** liat gbe22 | | | | Tundaan lalu lintas rata-rata det/smp **DT** | Tundaan geo-metrik rata-rata det/smp **DG** | Tundaan rata-rata det/smp **D = DT+DG** | Tundaan total smp.det **D x Q** |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) |
| U | 605.4 | 1307.3 | 0.4631 | 0.267 | 0.0 | 14.8 | 14.8 | 22.7 | 70 | 0.753 | 456 | 32.2 | 3.3 | 35.5 | 21507 |
| S | 790.0 | 1063.4 | 0.7429 | 0.362 | 0.9 | 20.1 | 21.0 | 31.0 | 155 | 0.822 | 649 | 32.4 | 3.7 | 36.1 | 28505 |
| T | 78.4 | 378.4 | 0.2072 | 0.229 | 0.0 | 1.9 | 1.9 | 5.7 | 48 | 0.729 | 57 | 32.8 | 3.3 | 36.1 | 2833 |
| B | 323.8 | 754.5 | 0.4292 | 0.229 | 0.0 | 8.1 | 8.1 | 13.9 | 70 | 0.770 | 249 | 34.6 | 5.3 | 39.9 | 12932 |
| | | | | | | | | | | | | | | | |
| LTOR(semua) | 533 | | | | | | | | | | | 0.0 | 6.0 | 6.0 | 3199.2 |
| Arus total. Q tot. | | | | | | | | | | | Total : | 1412 | | Total : | 68977 |
| Arus kor. Q kor. | 2331 | | | | | | | | | | Kendaraan terhenti rata-rata stop/smp : | 0.61 | | Tundaan simpang rata-rata(det/smp) : | 29.59 |

# Lampiran 11

(Fomulir Pembahasan Alternatif V)

Formulir SIG - I

**SIMPANG BERSINYAL**
FORMULIR SIG-I :
- GEOMETRI
- PENGATURAN LALULINTAS
- LINGKUNGAN

Tanggal : 9Januari 2010
Kota : Secang, Magelang
Simpang : Secang
Ukuran Kota/jumlah penduduk (isi dalam jutaan) : 1.200
Perihal : 3 fase
Periode : jam puncak sabtu sore, 9 januari 2010 pukul 17.00 - 18.00 wib

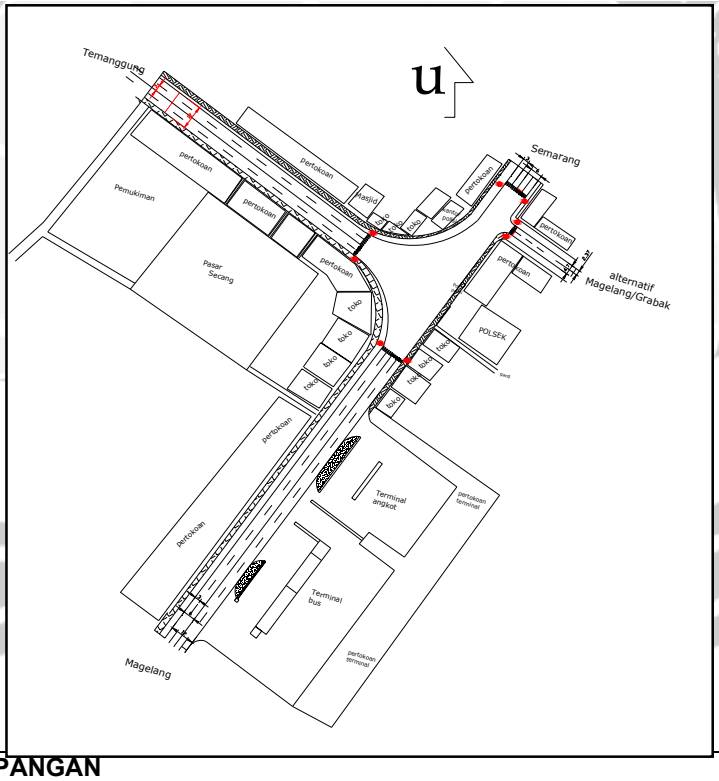
Ditangani oleh : Thomas R. Iristha

**FASE SINYAL YANG ADA (Gambarkan Sket Fase)**

| | | | |
|---|---|---|---|
| **g = 28** | **g = 38** | **g = 24** | **g =** |
| **IG= 5** | **IG= 5** | **IG= 5** | **IG =** |

Waktu siklus : c = **105**
Waktu hilang total : **LTI = Σ IG = 15**

**SKETSA SIMPANG**




**KONDISI LAPANGAN**

| Kode Pendekat | Tipe lingkungan jalan (com/res/ra) | Hambatan Samping (Tinggi/Rendah) | Median Ya/Tidak | kelandaian +/- % | Belok kiri langsung Ya/Tidak | Jarak ke kendaraan parkir (m) | Lebar Pendekat ( m ) Pendekat $W_A$ | Masuk $W_{ENTRY}$ | Belok kiri lgs. $W_{LTOR}$ | Keluar $W_{EXIT}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
| U | com | R | T | 0 | T | | 6.5 | 6.5 | 0.0 | 6.5 |
| S | com | T | T | 0 | Y | | 7.0 | 4.0 | 3.0 | 6.0 |
| T | com | R | T | 0 | T | | 2.4 | 2.4 | 0.0 | 2.4 |
| B | com | T | T | 0 | Y | | 7 | 4 | 3.0 | 6.0 |

**SIMPANG BERSINYAL**
Formulir SIG-II :
ARUS LALULINTAS

Tanggal : 9Januari 2010
Kota : Secang, Magelang
Simpang : Secang
Perihal : 3 fase

Ditangani oleh : Thomas R. Iristha
Periode : jam puncak sabtu sore, 9 januari 2010 pukul 17.00 - 18.00 wib

| Kode Pendekat | Arah | Arus LaluLintas Kendaraan Bermotor ( MV ) | | | | | | | | | | | | | | Kend.tak bermotor | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Kendaraan Ringan(LV) emp terlindung = 1,0 emp terlawan = 1,0 | | | Kendaraan Berat(HV) emp terlindung = 1,3 emp terlawan = 1,3 | | | Sepeda Motor(MC) emp terlindung = 0,2 emp terlawan = 0,4 | | | Kendaraan Bermotor Total MV | | | Rasio Berbelok | | Arus UM | Rasio $P_{UM}$ = UM/ MV |
| | | kend / jam | smp/jam | | kend / jam | smp/jam | | kend / jam | smp/jam | | kend / jam | smp/jam | | Kiri | Kanan | kend / jam | |
| | | | Terlindung | Terlawan | | Terlindung | Terlawan | | Terlindung | Terlawan | | Terlindung | Terlawan | $P_{LT}$ | $P_{RT}$ | | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) |
| U | LT(tanpa LTOR) | 11 | 11 | 11 | 8 | 10.4 | 10.4 | 21 | 4.2 | 8.4 | 40 | 25.6 | 29.8 | 0.051 | | 4 | |
| | ST | 233 | 233 | 233 | 63 | 81.9 | 81.9 | 317 | 63.5 | 126.9 | 613 | 377.9 | 441.3 | | | 4 | |
| | RT | 68 | 68 | 68 | 15 | 19.5 | 19.5 | 69 | 13.8 | 27.6 | 152 | 101.6 | 115.4 | | 0.201 | 9 | |
| | **Total** | 312 | 312 | 312 | 86 | 111.8 | 111.8 | 407 | 81.5 | 162.9 | 805 | 505.0 | 586.5 | | | 17 | 0.0211 |
| S | LTOR | 147 | 147 | 147 | 75 | 97.5 | 97.5 | 168 | 33.6 | 67.2 | 390 | 278.1 | 311.7 | 0.298 | | 5 | |
| | ST | 330 | 330 | 330 | 144 | 187.2 | 187.2 | 374 | 74.9 | 149.7 | 848 | 592.1 | 666.9 | | | 8 | |
| | RT | 41 | 41 | 41 | 10 | 13.0 | 13.0 | 45 | 9.0 | 18.0 | 96 | 63.0 | 72.0 | | 0.068 | 3 | |
| | **Total** | 518 | 518 | 518 | 229 | 297.7 | 297.7 | 587 | 117.5 | 234.9 | 1334 | 933.2 | 1050.6 | | | 16 | 0.0120 |
| T | LT(tanpa LTOR) | 37 | 37 | 37 | 6 | 7.8 | 7.8 | 67 | 13.4 | 26.8 | 110 | 58.2 | 71.6 | 0.426 | | 5 | |
| | ST | 22 | 22 | 22 | 7 | 9.1 | 9.1 | 57 | 11.4 | 22.8 | 86 | 42.5 | 53.9 | | | 4 | |
| | RT | 15 | 15 | 15 | 7 | 9.1 | 9.1 | 59 | 11.8 | 23.6 | 81 | 35.9 | 47.7 | | 0.263 | 7 | |
| | **Total** | 74 | 74 | 74 | 20 | 26.0 | 26.0 | 183 | 36.6 | 73.2 | 277 | 136.6 | 173.2 | | | 16 | 0.0578 |
| B | LTOR | 55 | 55 | 55 | 27 | 35.1 | 35.1 | 107 | 21.5 | 42.9 | 189 | 111.3 | 132.8 | 0.815 | | 7 | |
| | ST | 19 | 19 | 19 | 7 | 9.1 | 9.1 | 86 | 17.2 | 34.4 | 112 | 45.3 | 62.5 | | | 8 | |
| | RT | 148 | 148 | 148 | 35 | 45.5 | 45.5 | 135 | 27.0 | 54.0 | 318 | 220.3 | 247.3 | | 0.584 | 4 | |
| | **Total** | 222 | 222 | 222 | 69 | 89.7 | 89.7 | 328 | 65.7 | 131.3 | 619 | 376.9 | 442.5 | | | 19 | 0.0307 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **SIMPANG BERSINYAL**<br>Formulir SIG - III :<br>-WAKTU ANTAR HIJAU<br>-WAKTU HILANG | | | Tanggal : 9Januari 2010<br>Ditangani oleh : Thomas R. Iristha<br>Kota : Secang, Magelang<br>Simpang : Secang<br>Perihal : 3 fase | | | | |
| LALULINTAS<br>BERANGKAT | | LALU LINTAS DATANG | | | | | Waktu merah semua (dtk) |
| Pendekat | Kecepatan $V_{EV}$ (m/dtk) | Pendekat | Utara | Timur | Selatan | Barat | |
| | | Kecepatan $V_{AV}$ (m/dtk) | 10 | 10 | 10 | 10 | |
| Utara | 10 | Jarak berangkat-datang (m) | | | | | |
| | | Waktu berangkat-datang (dtk)*) | | | | | |
| Timur | 10 | Jarak berangkat-datang (m) | | | | | |
| | | Waktu berangkat-datang (dtk)*) | | | | | |
| Selatan | 10 | Jarak berangkat-datang (m) | | | | | |
| | | Waktu berangkat-datang (dtk)*) | | | | | |
| Barat | 10 | Jarak berangkat-datang (m) | | | | | |
| | | Waktu berangkat-datang (dtk)*) | | | | | |
| | | Penentuan waktu all red didasarkan pada aturan fase | Penentuan waktu merah semua : (data ini dapat dirubah sendiri sesuai fase) | | | | |
| | | | Fase 1 --> Fase 2 | | | | 2 |
| | | | Fase 2 --> Fase 3 | | | | 2 |
| | | | Fase 3 --> Fase 4 | | | | 2 |
| | | | Jumlah fase | 3 | kuning/fase | 3 | 9 |
| | | | Waktu hilang total (LTI)= Merah semua total+waktu kuning (dtk / siklus ) | | | | 15 |

Dari gambar 5.1.

*) Waktu untuk berangkat = ( $L_{EV}$ + $I_{EV}$ ) / $V_{EV}$, dimana $I_{EV}$ = 2 m

Waktu untuk datang = $L_{AV}$ / $V_{AV}$

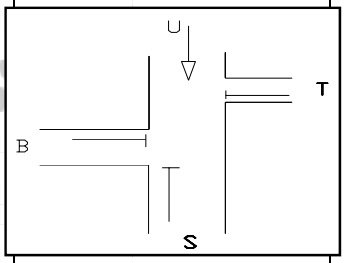
Tabel Formulir SIG - IV

| | | |
|---|---|---|
| **SIMPANG BERSINYAL** | Tanggal : 9Januari 2010 | Ditangani oleh : Thomas R. Iristha |
| Formulir SIG-IV : PENENTUAN WAKTU SINYAL | Kota : Secang, Magelang | Perihal : 3 fase |
| KAPASITAS | Simpang : Secang | Periode : jam puncak sabtu sore, 9 januari 2010 pukul 17.00 - 18.00 wib |

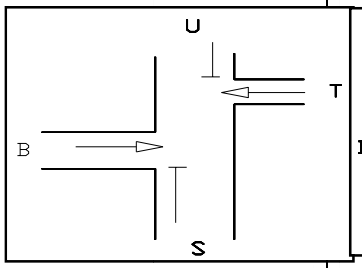
Distribusi arus lalu lintas(smp/jam)

| | | | |
|---|---|---|---|
| | 101.6 | 377.9 | 25.6 U |
| | 111.3 | | 35.9 |
| B | 45.3 | | 42.5 T |
| | 220.3 | | 58.2 |
| | 311.7 | 666.9 S | 72.0 |

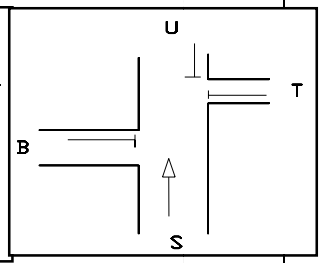
Fase 1




Fase 2




Fase 3




Fase 4

| Kode Pen-dekat | Hijau dalam fase no. | Tipe Pen-dekat (P / O) | Rasio kendaraan berbelok $P_{LTOR}$ | $P_{LT}$ | $P_{RT}$ | Arus RT smp/j Arah dari $Q_{RT}$ | Arah lawan $Q_{RTo}$ | Lebar efektif $W_E$ | Nilai dasar smp/jhijau So | Faktor Penyesuaian: Semua tipe pendekat, Ukuran kota $F_{CS}$ | Hambatan Samping $F_{SF}$ | kelandaian $F_G$ | Parkir $F_P$ | Hanya tipe P, Belok Kanan $F_{RT}$ | Belok Kiri $F_{LT}$ | Nilai disesuaikan smp/jam hijau S | Arus lalu lintas smp/j Q | Rasio Arus FR = Q/S | Rasio fase PR = $\frac{FR_{CRIT}}{IFR}$ | Waktu hijau det g | Kapasitas smp/j C = Sxg/c | Derajat jenuh DS= Q / C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) | (19) | (20) | (21) | (22) | (23) |
| U | 1 | p | 0.000 | 0.051 | 0.201 | 101.6 | | 6.50 | 5038 | 1.0 | 0.927 | 1.00 | 1.00 | 1.052 | 0.99 | 4875.8 | 479.4 | 0.098 | 0.219 | 28 | 1300.2 | 0.3687 |
| S | 2 | P | 0.298 | 0.000 | 0.068 | 63.0 | | 4.00 | 3100 | 1.0 | 0.933 | 1.00 | 1.00 | 1.018 | 1.00 | 2942.5 | 655.1 | 0.223 | 0.495 | 38 | 1064.9 | 0.6151 |
| T | 3 | p | 0.000 | 0.426 | 0.263 | 35.9 | | 2.37 | 1837 | 1.0 | 0.905 | 1.00 | 1.00 | 1.068 | 0.93 | 1655.4 | 78.4 | 0.047 | 0.105 | 24 | 378.4 | 0.2072 |
| B | 3 | P | 0.815 | 0.000 | 0.584 | 220.3 | | 4.00 | 3100 | 1.0 | 0.918 | 1.00 | 1.00 | 1.15 | 1.00 | 3277.2 | 265.6 | 0.081 | 0.180 | 24 | 749 | 0.3545 |
| Waktu hilang total LTI ( det ) | | | 15 | Waktu siklus pra penyesuaian $c_{ua}$ (det) | | 49.9 | | | | | | | | | | | IFR = $\sum FR_{CRIT}$ | 0.449 | Total g = | 90 | | |
| | | | | Waktu siklus disesuaian c (det) | | 105 | | | | | | | | | | | | | | | | |

## Formulir SIG - V

**SIMPANG BERSINYAL**

Formulir SIG-V : PANJANG ANTRIAN

JUMLAH KENDARAAN TERHENTI

TUNDAAN

Tanggal : 9Januari 2010

Kota : Secang, Magelang

Simpang : Secang

Waktu siklus :

Ditangani oleh : Thomas R. Iristha

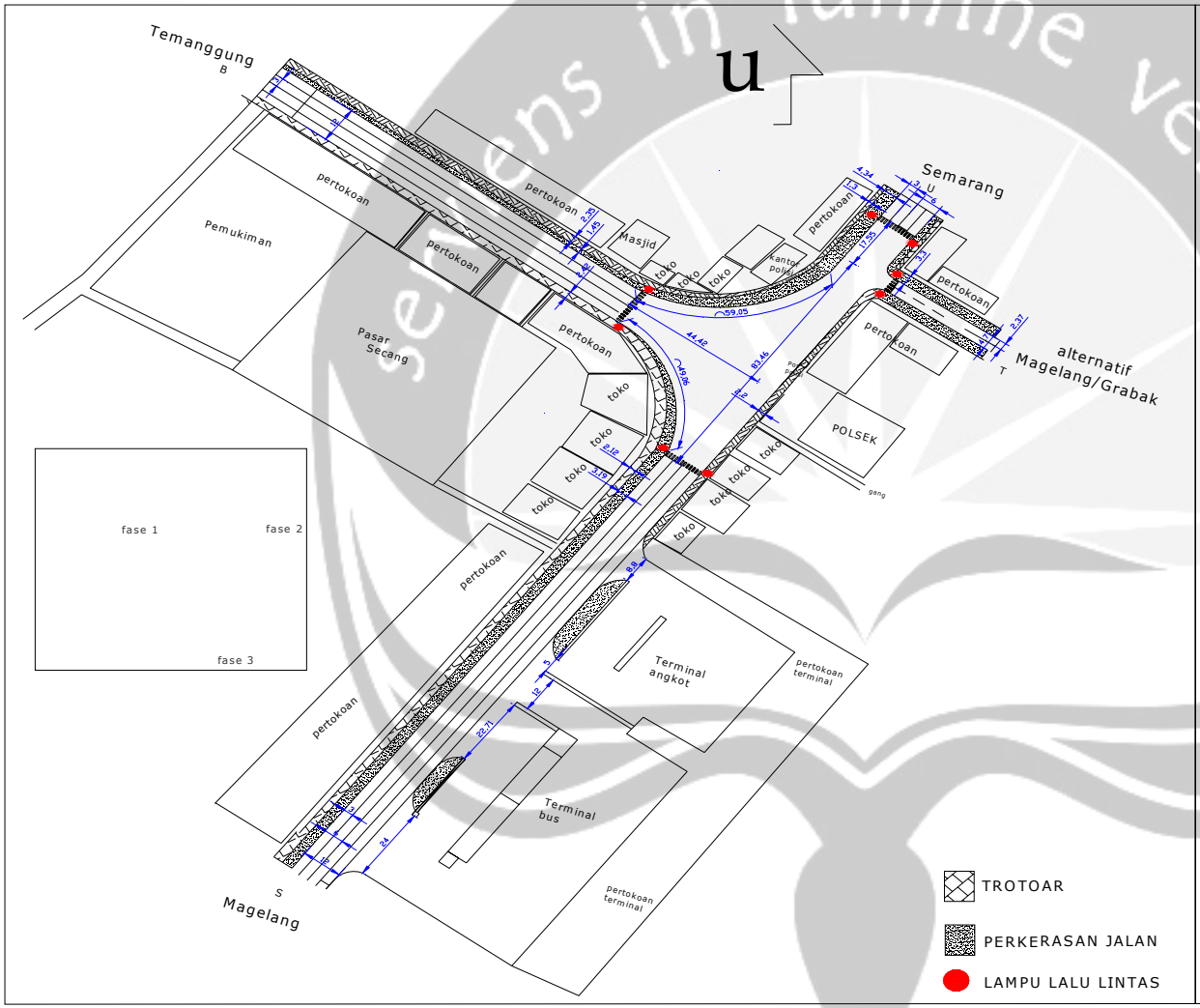
Kondisi Eksiting

Periode : jam puncak sabtu sore, 9 januari 2010 pukul 17.00 - 18.00 wib

| Kode Pendekat | Arus Lalu Lintas smp/jam **Q** | Kapasitas smp / jam **C** | Derajat Kejenuhan **DS= Q/C** | Rasio Hijau **GR= g/c** | Jumlah kendaraan antri (smp) | | | | Panjang Antrian ( m ) **QL** | Angka Henti stop/smp **NS** | Jumlah Kendaraan Terhenti smp/jam $N_{SV}$ | Tundaan | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | **$NQ_1$** | **$NQ_2$** | **Total $NQ=NQ_1+NQ_2$** | **$NQ_{MAX}$** liat gbe22 | | | | Tundaan lalu lintas rata-rata det/smp **DT** | Tundaan geo-metrik rata-rata det/smp **DG** | Tundaan rata-rata det/smp **D = DT+DG** | Tundaan total smp.det **D x Q** |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) |
| U | 479.4 | 1300.2 | 0.3687 | 0.267 | 0.0 | 11.4 | 11.4 | 18.2 | 56 | 0.732 | 351 | 31.3 | 3.3 | 34.6 | 16570 |
| S | 655.1 | 1064.9 | 0.6151 | 0.362 | 0.3 | 15.7 | 16.0 | 24.3 | 121 | 0.753 | 493 | 28.5 | 3.6 | 32.1 | 21002 |
| T | 78.4 | 378.4 | 0.2072 | 0.229 | 0.0 | 1.9 | 1.9 | 5.7 | 48 | 0.729 | 57 | 32.8 | 3.3 | 36.1 | 2833 |
| B | 265.6 | 749.1 | 0.3545 | 0.229 | 0.0 | 6.5 | 6.5 | 11.8 | 59 | 0.756 | 201 | 34.0 | 5.1 | 39.1 | 10376 |
| | | | | | | | | | | | | | | | |
| LTOR(semua) | 448 | | | | | | | | | | | 0.0 | 6.0 | 6.0 | 2685.6 |
| Arus total. Q tot. | | | | | | | | | | Total : | 1102 | | | Total : | 53466 |
| Arus kor. Q kor. | 1926 | | | | | | | | | Kendaraan terhenti rata-rata stop/smp : | 0.57 | | | Tundaan simpang rata-rata(det/smp) : | 27.76 |

# Lampiran 12

(Gambar Situasi Simpang Empat Bersinyal Secang)




PROGRAM STUDI
TEKNIK SIPIL
FAKULTAS TEKNIK
UNIVERSITAS ATMA
JAYA YOGYAKARTA

**PENGARUH AKTIFITAS PASAR DAN TERMINAL TERHADAP KINERJA SIMPANG EMPAT BERSINYAL**
**(Studi Kasus Pasar dan Terminal pada Simpang Empat Bersinyal Secang)**

LAMPIRAN

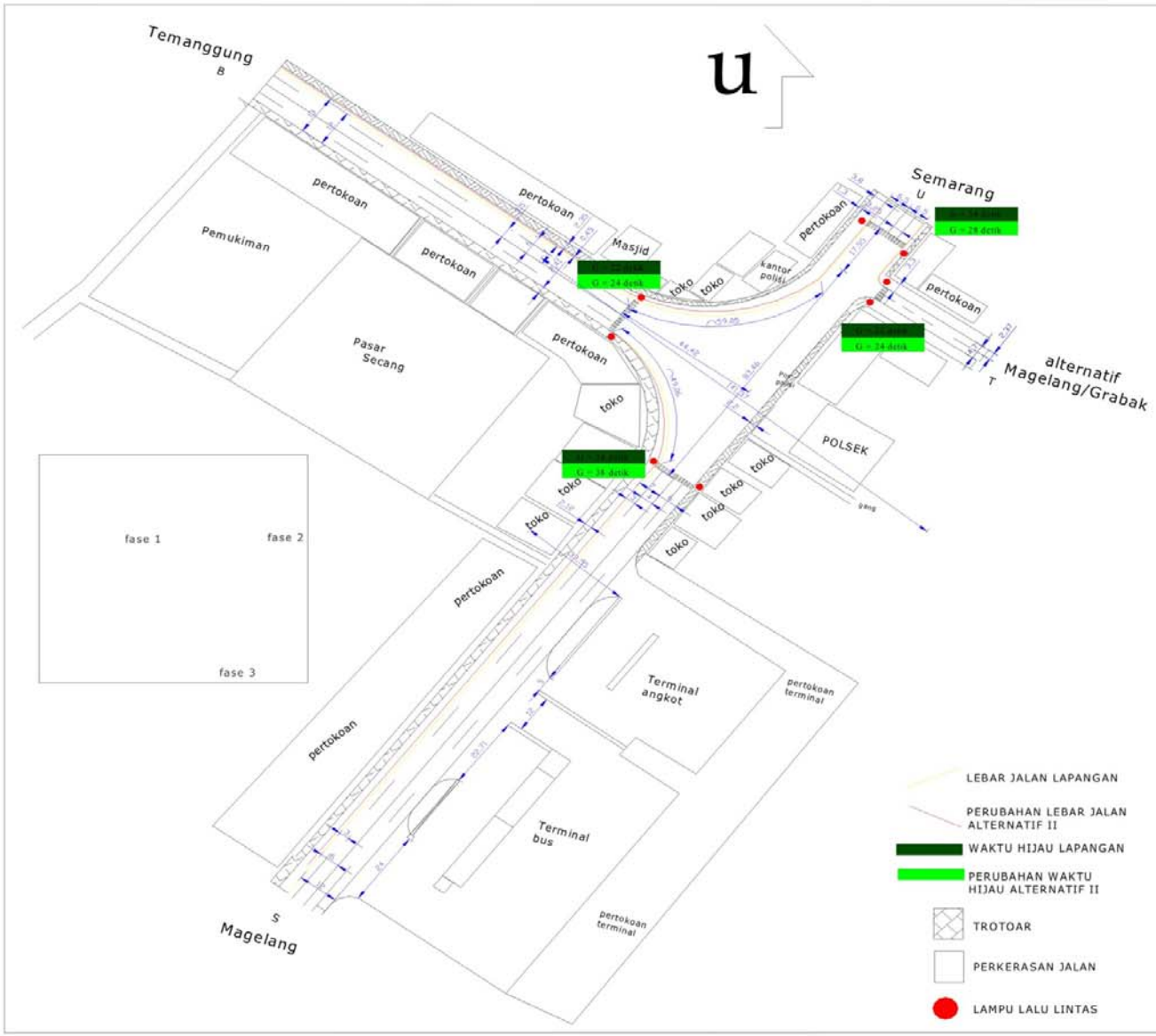
GAMBAR EKISTING
SIMPANG EMPAT
BERSINYAL SECANG

THOMAS RUTH IRISTHA
00 02 10244

| 08-02-2010 | 1 : 100 |
|---|---|

# Lampiran 13

(Gambar Simpang Empat Bersinyal Secang Setelah Dilakukan Perubahan Geometrik dan Waktu *Green*)




PROGRAM STUDI
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**PENGARUH AKTIFITAS PASAR DAN TERMINAL TERHADAP KINERJA SIMPANG EMPAT BERSINYAL (Studi Kasus Pasar dan Terminal pada Simpang Empat Bersinyal Secang)**

LAMPIRAN

GAMBAR EKISTING
SIMPANG EMPAT
BERSINYAL SECANG
SETELAH ADA
PERUBAHAN
GEOMETRIK DAN
LAMPU LALU LINTAS

THOMAS RUTH IRISTHA
00 02 10244

| 08-02-2010 | 1 : 120 |
|---|---|

# Lampiran 14

(Peta Jalur Alternatif Magelang - Temanggung-Semarang)


= kecepatan rata-rata 50 km/jam
= kecepatan rata-rata di bawah 20 km/jam
1,6 km = jarak

# Lampiran 15

(Foto Dokumentasi)


PARIWISATA
KEMPLING


AMINA
RWL 4


PERTAMINA


TOKO TIWI


SECANG - MUNTILAN - PURWOREJO - PP