

## INTISARI

Tundaan dan panjang antrian yang tinggi berimbas kepada pelanggaran marka jalan, yaitu pelanggaran marka jalan untuk mengambil waktu awal hijau sinyal lalu lintas tanpa menghiraukan peraturan garis marka di simpang. Dalam penelitian ini diambil 2 (dua) tipe simpang bersinyal yang berbeda yaitu simpang tidak bermediasi di tiap lengannya pada Simpang Gayam dan Simpang Wirobrajan yang tiap lengannya memiliki median jalan. Oleh karena pengaruh pelanggaran marka jalan menarik untuk diteliti tentang bagaimana pengaruhnya terhadap kinerja Simpang Gayam dan Simpang Wirobrajan tersebut sehingga nantinya dapat diberikan alternatif pemecahan masalah.

Dalam penelitian ini, digunakan mikrosimulasi lalu lintas dengan *VISSIM* untuk melakukan analisis tundaan dan panjang antrian akibat pelanggaran marka jalan di simpang bersinyal. Data primer dikumpulkan dengan melakukan survei langsung di lapangan, untuk mendapatkan volume kondisi eksisting periode jam puncak yang akan menjadi acuan dalam merencanakan waktu siklus baru untuk alternatif pemecahan masalah.

Dari kedua alternatif didapatkan alternatif terbaik untuk Simpang Gayam adalah alternatif 2 yaitu optimalisasi simpang. Dengan waktu siklus baru sebesar 134 detik dapat mengurangi nilai tundaan di lengan selatan sebesar 8,20 detik, lengan barat 63,06 detik, lengan utara 26,90 detik, lengan timur 103,33 detik, dan rata-rata penurunan tundaan tersebut sebesar 50,37 detik. Sedangkan untuk penurunan nilai panjang antrian di lengan selatan sebesar 50,78 meter, lengan barat 48,13 meter, lengan utara 35,05 meter, lengan timur 2 meter, dan rata-rata penurunan panjang antrian tersebut sebesar 33,99 meter. Alternatif terbaik untuk Simpang Wirobrajan adalah Alternatif 1 yaitu penerapan NLTOR (belok kiri ikuti lampu) dan bagi kendaraan yang akan lurus dapat ikut antrian di dalam lajur belok kiri. Hasil alternatif tersebut dapat menurunkan tundaan di lengan barat sebesar 84,16 detik, lengan utara 104,14 detik, lengan timur 193,52 detik, lengan selatan 114,75 detik, dan rata-rata penurunan tundaan sebesar 124,14 detik. Begitupun penurunan nilai panjang antrian di lengan barat sebesar 74,87 meter, lengan utara 28,73 meter, lengan timur 76,07 meter, lengan selatan 25,53 meter, dan rata-rata penurunan panjang antrian tersebut sebesar 51,30 meter.

**Kata Kunci :** Pelanggaran marka jalan, Kinerja simpang bersinyal, *VISSIM*, Mikrosimulasi

## **ABSTRACT**

*Delay and long queue may influence the road markings violations, which are violations of road markings at the intersection on pre-green phase. This research focus on two type of signalized intersections which are different, firstly Simpang Gayam which has no divided median (strip median only) and secondly an intersection with divided median strip at Wibrorajan. The road marking violations at the intersection is practically interesting to be examine. Thus, the study aims to analyze the influence of the behavior of drivers to the performance of Gayam and Wirobrajan intersection. Therefore, several alternatives can be discovered to solve the problem.*

*This research is using traffic microsimulation VISSIM software in order to create the delay and length of the queue due to road markings violations at the signal intersection. Primary data are compiled according to direct observations in Gayam and Wirobrajan Intersections, to obtain condition volume of existing period in peak hour in which will refer in the planning of new cycle time for alternative problem solving.*

*From the both of the alternatives, the former one can be applied optimally at Gayam Intersection by resetting the cycle time of the traffic light. With 134 seconds of the new traffic light cycle time, the delay is reduced by 8.20 seconds at the south leg, 63.06 seconds at the west leg, 26.90 and 103.33 seconds at the north and east leg, respectively, of the intersection. In addition, the average decrease of the delay is 50.37 seconds. Additionally, the queue length is declined by 50.78 meters at the south leg, 48.13 meters at the west leg, 35.05 at the north leg and 2 meters at the east leg of the intersection. However, in case of Wirobrajan Intersection, the application of "No Left Turn on Red" is the most optimal alternative. Using this scenario, the delay at this intersection is decreased by 84.16 seconds at the west leg, 104.14 seconds at the north leg, 193.52 and 114.75 seconds at the east and south leg, respectively, of Wirobrajan intersection. Thus, the average decline of delay at Wirobrajan intersection is 124.14 seconds. With the similar trend, the queue length is also reduced by 74.87 meters at the west leg, 28.73 meters at the north leg, 76.07 and 25.53 meters at the east and south leg, respectively, which the average of decrease is 51.30 meters.*

**Case Study :** *Road markings violations, Signalized intersection performance, VISSIM, Microsimulation*