

ANALISIS KOORDINASI DAN OPTIMASI ANTAR SIMPANG BERSINYAL PADA AREA TRAFFIC CONTROL SYSTEM DENGAN APLIKASI SYNCHRO 7.0

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ABSTRAK

Laporan Tugas Akhir ini bertujuan untuk mengevaluasi kinerja di persimpangan bersinyal pada Kota Salatiga yaitu Simpang Bersinyal Isep-Isep, Simpang Bersinyal Tingkir, dan Simpang Bersinyal Cebongan. Ketiga simpang bersinyal tersebut terdapat pada jalan arteri primer yang menjadi penghubung Kota Salatiga menuju Kota Surakarta. Metodologi yang digunakan perhitungan menggunakan *HCM(Highway Capacity Manual)* pada program *synchro 7.0* dan MKJI, dan memberikan solusi alternatif berupa perubahan geometrik untuk mengoptimalkan kinerja simpang. Langkah-langkah kerja meliputi survai lapangan, identifikasi masalah, pengumpulan data, analisis data,. Saat ini kinerja simpang-simpang yang dalam keadaan eksisting masih dikendalikan secara *Pretimed* sehingga belum ada koordinasi antar simpang. Sehingga perlu dilakukan optimasi simpang bersinyal baik secara *Pretimed* ataupun *full coordinated*. Optimasi yang dilakukan meliputi optimasi waktu siklus yang ada pada simpang-simpang tersebut. Pada analisis kondisi eksisting ketiga simpang tersebut terdapat perbedaan hasil perhitungan derajat jenuh berdasarkan tipe koordinasi lalu lintas. Dengan menggunakan program *synchro 7.0* tipe *Pretimed* derajat jenuh Simpang Bersinyal Isep-Isep sebesar 0,76; Simpang Bersinyal Tingkir sebesar 0,74; dan Simpang Bersinyal Cebongan sebesar 0,75. Setelah tipe *pretimed* pada program *synchro .7.0* diganti menjadi tipe *coordinated* derajat jenuh Simpang Bersinyal Isep-Isep sebesar 0,84, Simpang Bersinyal Tingkir sebesar 0,84; dan Simpang Bersinyal Cebongan sebesar 0,82. Perbedaan hasil perhitungan tipe *Pretimed* dan *coordinated* dikarenakan kinerja simpang dengan tipe *coordinated* saling bergantung dengan simpang yang lain. Namun setelah dikoordinasikan, lama tundaan dan panjang antrian pada simpang tersebut berkurang. Ini dikarenakan analisis yang dilakukan hanya mengoptimalkan kinerja jalan mayor, sehingga kinerja jalan minor harus dikorbankan. Pada Tugas Akhir ini, mengoptimalkan kinerja ketiga simpang dengan memberikan solusi seperti perubahan waktu siklus lalu lintas dan perubahan geometrik jalan, belum membahas mengenai solusi alternatif yang lain seperti contoh pengurangan volume lalu lintas dengan memaksimalkan moda angkutan umum untuk menekan penggunaan kendaraan pribadi dan perubahan fase lalu lintas pada simpang terkait.

Kata kunci : *Full Coordinated, Area Traffic Control System, Synchro 7.0, MKJI.*

COORDINATION AND OPTIMIZATION ANALYSIS OF AREA TRAFFIC CONTROL SYSTEM-SIGNALIZED INTERSECTION USED BY SYNCHRO 7.0

ABSTRACT

Purpose of this paper is evaluating the performance at signalized intersections in Salatiga that Isep-Isep intersection, Tingkir intersection, and Cebongan intersection contained on primary arterial roads connecting Salatiga heading into the city of Surakarta in peak hours when there is congestion. Methodologies used include field surveys, problem identification, data collection, data analysis, calculations using synchro 7.0 program and Indonesia Highway Capacity Manual (IHCM), and provide alternative solutions in the form of geometric changes to optimize the performance of the intersection. Currently the performance of intersections existing in a state still controlled Pretimed so that there is no coordinated between intersections. So that needs to be optimized both Pretimed intersection or full coordinated. Optimization was conducted on the existing cycle time optimization in intersections. In the analysis of the existing condition of the third intersection there are differences in the degree of saturation calculation results based on the type of traffic coordinated. Using by synchro 7.0 program with the pretimed control type the results for degree of saturation are 0,76 for Isep-Isep Intersection, 0,74 for Tingkir Intersection, and 0,75 for Cebongan Intersection. After that, the pretimed control type was changed to coordinated control type so that there are changes in the degree of saturation like Isep-Isep Intersection changed to 0,84; Tingkir Intersection to 0,84, and Cebongan Intersection to 0,82. There being a different type of calculation results synchro 7.0 pretimed and coordinated because the performance of the intersection with the type coordinated intersection interdependent with others. After the intersections was changed to coordinated, delays and queue of vehicles has been decrease. This happens because just optimizing the performance of major roads, so that why the performance of the minor roads must be sacrificed. In this paper, the authors Optimazed performance of the three intersections with giving so; Warp such as changes in cycle time traffic and road geometric changes, not to talk about other alternative solutions such as sample volume reduction of traffic to maximize public transport modes to reduce the use of private vehicles and changing the phase of the traffic at that signalzed Intersections.

Keywords: Full Coordinated, Area Traffic Control System, optimization between intersections, Indonesian Highway Capacity Manual.