

INTISARI

Pada daerah urban, terdapat beberapa permasalahan yang dihadapi dalam implementasi sistem *vehicle tracking* menggunakan metode RTK-GNSS. Obstruksi yang beragam dan kompleks pada daerah urban dapat memantulkan dan membelokkan sinyal GNSS. Hal ini dapat mengakibatkan ketidakstabilan dalam penerimaan sinyal satelit sehingga akan berdampak pada hasil solusi posisi pengukuran *vehicle tracking*. Penelitian ini dilakukan untuk membandingkan kombinasi konstelasi satelit dan resolusi ambiguitas fase yang dapat menghasilkan persentase solusi posisi terbaik pada daerah urban.

Penelitian ini dilakukan di area Stadion Gelora Bung Karno, Senayan, Jakarta. Pengukuran *vehicle tracking* dilakukan secara *real-time* dengan rover Leica GR50 yang secara langsung terhubung pada software RTKLIB, serta CORS SUID sebagai base pengukuran yang memberikan koreksi dalam format RTCM3. Pengukuran dilakukan secara bergantian dengan 6 kombinasi yaitu GPS (*Continuous*), GPS (*Fix and Hold*), GPS (*Instant*), GPS-Glonass (*Continuous*), GPS-Glonass (*Fix and Hold*), GPS-Glonass (*Instant*). Analisis dilakukan dengan menghitung persentase solusi posisi masing-masing kombinasi secara keseluruhan di jalur pengukuran dan persentase solusi posisi setiap segmenutupan obstruksi. Pembagian segmen obstruksi dilakukan dengan pembobotan kuantitatif berdasarkan sebaran obstruksi yang tersebar di sepanjang jalur pengukuran.

Hasil penelitian menunjukkan pada obstruksi terbuka (tutupan obstruksi 10-30%) kombinasi GPS-Glonass (*Instant*) memiliki solusi posisi yang lebih baik dibandingkan kombinasi lainnya dengan 82,40% titik *float*. Pada obstruksi tertutup (tutupan obstruksi 30-60%) kombinasi GPS-Glonass (*Fix and Hold*) memiliki solusi posisi lebih baik dengan 78,90% titik *float*. Serta pada obstruksi sangat tertutup (tutupan obstruksi 60-95%) kombinasi GPS (*Fix and Hold*) lebih baik dibandingkan kombinasi lainnya dengan 38,30% titik *float*. Secara keseluruhan data *vehicle tracking* di jalur pengukuran tanpa membagi jalur menjadi segmen berdasarkan tutupan obstruksi, kombinasi GPS-Glonass (*Fix and Hold*) mendapatkan persentase solusi posisi *float* tertinggi yaitu sebesar 67,20%, lebih baik dibandingkan dengan kombinasi lainnya.

Kata kunci: *vehicle tracking*, solusi posisi, obstruksi, urban, RTKLIB.

ABSTRACT

In urban areas, there are several problems faced in the implementation of vehicle tracking systems using the RTK-GNSS method. Various and complex obstructions in urban areas can reflect and deflect GPS signals. This can lead to instability in the reception of satellite signals, which will have an impact on the results of the vehicle tracking measurement position solution. This study was conducted to compare the combination of satellite constellation and phase ambiguity resolution that can produce the best position solution percentage in urban areas.

This research was conducted in the Gelora Bung Karno Stadium area, Senayan, Jakarta. Vehicle tracking measurements are carried out in real-time with the Leica GR50 rover, which is directly connected to the RTKLIB software, and CORS SUID as a measurement base that provides corrections in RTCM3 format. Measurements were carried out alternately with 6 combinations, namely GPS (Continuous), GPS (Fix and Hold), GPS (Instant), GPS-Glonass (Continuous), GPS-Glonass (Fix and Hold), and GPS-Glonass (Instant). The analysis was conducted by calculating the percentage of position solutions of each combination in the overall measurement path and the percentage of position solutions of each obstruction cover segment. The division of obstruction segments is done by quantitative weighting based on the distribution of obstructions scattered along the measurement path.

The research results showed that in open obstruction (10-30% obstruction cover), the GPS-Glonass (Instant) combination has a better position solution than the other combinations with 82.40% float points. In closed obstruction (obstruction cover 30-60%), the GPS-Glonass (Fix and Hold) combination has a better position solution with 78.90% float points. And in very closed obstruction (60-95% obstruction cover), the GPS (Fix and Hold) combination is better than other combinations with 38.30% float points. Overall vehicle tracking data on the measurement path without dividing the path into segments based on obstruction cover, the GPS-Glonass (Fix and Hold) combination gets the highest percentage of float position solutions of 67.20%, better than other combinations.

Keywords: vehicle tracking, position solution, obstruction, urban, RTKLIB.