

## Aspek eksternalitas pengiriman melalui urban consolidation center = Externalities aspects of freight distribution through the urban consolidation center

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### Abstrak

Dalam alur pergerakan barang, mulai dari produsen hingga barang sampai ke tangan konsumen, segmen distribusi memiliki beberapa masalah seperti banyaknya emisi CO<sub>2</sub> yang dihasilkan, dan tidak maksimalnya penggunaan kapasitas truk. Kedua hal tersebut saling berkaitan dan dinilai sebagai pemborosan kapasitas transportasi. Menjawab permasalahan tersebut, muncullah sebuah metode dimana banyak variasi barang bervolume kecil disatukan ke dalam truk sehingga muatan yang lebih besar dan lebih ekonomis dapat dikirim dengan menggunakan kendaraan yang sama, dan metode tersebut dinamakan konsolidasi. Penerapan selanjutnya dari sistem konsolidasi ialah dengan membuat fasilitas logistik yang digunakan untuk menggabungkan muatan berbagai operator dan untuk menghasilkan rencana pengiriman yang lebih ekonomis ataupun memberikan pelayanan lebih. Fasilitas tersebut disebut sebagai Urban Consolidation Center (UCC). Penelitian ini ingin melihat seberapa besar eksternalitas emisi CO<sub>2</sub> yang dihasilkan oleh sistem ini beserta dengan biaya eksternalnya. Selain itu, penelitian ini ingin melihat bagaimana aspek kemacetan dipertimbangkan dalam pengiriman melalui Urban Consolidation Center. Dari hasil perhitungan, diperoleh rata-rata eksternalitas emisi CO<sub>2</sub> untuk pengiriman melalui UCC sebesar 0,0196 kg CO<sub>2</sub>/item. Dengan mengangkut rata-rata jumlah item sebanyak 2139,70 masing-masing truk dalam satu kali perjalanan, bertanggung jawab terhadap biaya eksternal emisi CO<sub>2</sub> sebesar Rp16.614,1 berdasarkan standar Internasional dan Rp4.131,29 berdasarkan standar Indonesia. Setelah dibandingkan dengan data pembanding dari perusahaan sejenis, dapat dikatakan bahwa Urban Consolidation Center dari PT. X cukup produktif. Untuk karakteristik perjalanan dari pengiriman melalui UCC, sebagian besar perjalanan masuk ke dalam kelas II, dimana UCC melayani toko retail dengan cakupan area yang cukup luas, namun memiliki titik pemberhentian yang tidak terlalu banyak. Dari segi efisiensi, perjalanan distribusi melalui UCC dapat dikatakan cukup efisien walaupun masih dapat dioptimalkan lagi dengan meningkatkan kecepatan rata-rata kendaraan, mengurangi kilometer tempuh antar titik pengiriman, atau mengurangi service time tanpa mengurangi kualitas pelayanan.

.....Freight transportation from the producers to the end consumers faces several problems, including the inefficient use of truck capacity and the amount of CO<sub>2</sub> emissions produced by freight vehicles. These issues are interrelated and are seen as a waste of transportation capacity. In response to those problems, consolidation system is emerged where many small shipments are combined so that a larger and more economical loads can be dispatched on the same vehicle. One of the application of the consolidation system is the logistics facilities that are used to combine various goods from different suppliers and create shipping plans to the end consumers to find the more efficient distribution system. This facility referred to the Urban Consolidation Center (UCC). The objective of this study is to analyse the CO<sub>2</sub> emissions of UCC distribution system and its external costs. In addition, this study is also intended to analyse how the traffic parameter is taken into account in the determination of distribution routes and schedules. The analysis is based on the data produced by one of UCC operator in the form of travel diary of their freight vehicles.

Travel diary mainly presents the data regarding the vehicle kilometer travelled of the vehicle from the UCC to the entire retail stores as delivery points, trip time, amount of goods item loaded, and type of vehicle. The results show that the average CO<sub>2</sub> emissions produced by the delivery activity through the UCC is 0.0196 kg CO<sub>2</sub>/item. By dispatching an average number of items of 2139.70 within one trip, each truck is responsible for the external costs of CO<sub>2</sub> emissions as Rp16,614,- (based on International standards of external costs of CO<sub>2</sub> emissions) or Rp4,131,- (based on Indonesian standard). Regarding the traffic consideration on the distribution trips, most of the trips go into class II, i.e. UCC serves retail stores with a fairly wide area of coverage but has not too many stops. In terms of tour efficiency, distribution trips through UCC is considered to be quite efficient. However, they can still be more optimized by increasing the average travel speed of vehicles per stop, reducing mileage between delivery points, or reducing service time in each delivery point without reducing service quality.<i/>