**ANALISIS PERBANDINGAN BIAYA OPERASIONAL KENDARAAN (BOK) ANGKUTAN UMUM KONVENSIONAL DENGAN ANGKUTAN UMUM LISTRIK**

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# Abstrak

Peralihan kendaraan bermotor berbahan bakar fosil/solar menjadi *EV* di tahun 2025 merupakan salah satu faktor adanya penelitian ini. Penelitian ini bertujuan untuk menghitung dan menganalisis total BOK bus angkutan umum berkonsep *conventional vehicle* dan *EV* menggunakan metode dari Departemen Perhubungan, FSTPT, dan DLLAJ. Berdasarkan perhitungan yang telah dilakukan, metode Departemen Perhubungan menghasilkan total BOK Bus angkutan umum berkonsep *conventional vehicle* sebesar Rp9,953.58, metode FSTPT menghasilkan BOK sebesar Rp9,592.84, dan metode DLLAJ menghasilkan BOK sebesar Rp8,973.94. Selain itu, bus angkutan umum berkonsep *EV* menghasilkan total BOK sebesar Rp12,687.11 dari perhitungan metode Departemen Perhubungan, Rp11,626.09 dari perhitungan metode FSTPT, dan Rp11,707.47 dari perhitungan metode DLLAJ. Berdasarkan hasil perhitungan Biaya Operasional Kendaraan dari ketiga metode, BOK (Rp/km) bus medium EV memiliki nilai lebih besar daripada BOK (Rp/km) bus medium konvensional. Berdasarkan uji normalitas, data BOK bus konvensional dan bus EV berdistribusi normal. Berdasarkan uji anova, terdapat pengaruh yang signifikan antara BOK bus konvensional dan bus EV. Hasil biaya depresiasi kendaraan bus medium EV memiliki nilai yang lebih tinggi daripada bus medium konvensional. Jika dilihat dari sisi biaya *maintenance* dan biaya konsumsi energi kendaraan, bus medium EV menghasilkan biaya yang lebih rendah daripada bus medium konvensional sebesar Rp2,047.94. Ditinjau dari metode Departemen Perhubungan dan FSTPT, PT. XYZ akan mengalami penurunan *maintenance cost* sebesar 37,73% dan dari metode DLLAJ sebesar 46,05% jika mengganti seluruh bus konvensionalnya dengan bus EV serta mengurangi emisi karbon sebesar 1,49 kg/km.

Kata kunci: BOK, biaya, uji anova, uji normalitas, konvensional, EV, Departemen Perhubungan, FSTPT, DLLAJ

# COMPARISON ANALYSIS OF VEHICLE OPERATIONAL COSTS (BOK) OF CONVENTIONAL PUBLIC TRANSPORTATION WITH ELECTRIC PUBLIC TRANSPORTATION

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## *Abstract*

The transition of motorized vehicles from fossil/diesel fuels to EVs in 2025 is one of the factors for this research. This study aims to calculate and analyze the total BOK of conventional vehicle and EV public transport buses using methods from the Department of Transportation, FSTPT, and DLLAJ. Based on the calculations that have been done, the Ministry of Transportation's method yields a total VOC for public transport buses with the conventional vehicle concept of Rp. 9,953.58, the FSTPT method generates a VOC of Rp. 9,592.84, and the DLLAJ method generates a VOC of Rp. 8,973.94. In addition, public transportation buses with the EV concept generate a total VOC of IDR 12,687.11 from the calculation of the Department of Transportation method, IDR 11,626.09 from the calculation of the FSTPT method, and IDR 11,707.47 from the calculation of the DLLAJ method. Based on the results of calculating VOC from the three methods, VOC (Rp/km) for medium EV buses has a greater value than VOC (Rp/km) for conventional medium buses. Based on the normality test, VOC data for conventional buses and EV buses are normally distributed. Based on the ANOVA test, there is a significant influence between the VOC of conventional buses and EV buses. The results of the depreciation cost of medium EV bus vehicles have a higher value than conventional medium buses. When viewed from the side of maintenance costs and vehicle energy consumption costs, medium EV buses generate lower costs than conventional medium buses of IDR 2,047.94. Judging from the method of the Department of Transportation and FSTPT, PT. XYZ will experience a reduction in maintenance costs of 37.73% and from the DLLAJ method of 46.05% if it replaces all of its conventional buses with EV buses and reduces carbon emissions by 1.49 kg/km.

Keywords: TCO, costs, normality test, anova test, conventional, EV, Department of Transportation, FSTPT, DLLAJ