Modeling the Release and Distribution of Air Pollutants Using Aimsun Traffic Simulator Software

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ABSTRACT

In this study, improvement of the operation of the Hemmat Exp-east, between the Haqhani Exp and Sayad Shirazi Exp, was investigated using the smartization implementation and geometric designing. The traffic volumes of passing vehicles through light and heavy detachment were collected and traffic information involved the PHF and the peak hour, were extracted from them. The speed of the vehicles, the number of transmission lanes and width of the lanes were taken and the improvement of delay indices, speed, travel time and distance traveled, fuel consumption and pollutant emissions, and were investigated by providing solutions in three scenarios. The first scenario was implemented on ramp metering. In the second scenario, two lanes were added to the Hemmat Exp and both of the scenarios were implemented in the third scenario. CO_2 production was decreased by 28% and PM was decreased by 61% in scenario3. Delay index was decreased by 22% in scenario1. In the third scenario, the speed indicator increased by 77%. In comparison to different scenarios, the improvement rate for delay indices, speed, travel time, fuel consumption and pollutant emissions in scenario 3 had more improvement than the other two scenarios. In the case after the software calibration, in which the results are more reliable, scenario 3 showed better results than first and second solutions again.

Keywords: Traffic simulation, Air Pollutants, Travel Time, Traffic Emissions