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Bus Simulation Report

The route 3 Bus route is one of the busiest in the Minneapolis/Saint Paul area and serves many customers in this twin cities area. To help the MetroTransit corporation improve the quality of the service given by this route, this project of the “Bus Simulation” was put in place. The following will consist of a report regarding the simulation run and how each aspect, including wait time, travel time, number of people at a single stop, and how full the bus is at any given time relative to capacity. Through the results of the simulation, it seems that there may need to be slightly fewer buses during the off-peak times during the day in which there are not as many travelers. By doing this, the company will maximize Passenger Miles Per Gallon (PMPG). This will be done by increasing how full each bus is on any point of the route. To collect this information, the simulation has produced the average bus fill in percentage. Additionally, there is also another point of data that is returned which is the maximum bus fill in percentage which came out to be 100%. This information shows that the number of buses is not outrageously more than needed but with the given around 50% of average bus fill, it shows that there is a need for slightly fewer buses during the non-peak times in which many passengers are traveling along the route. Further, decreasing the number of buses that operate during the slower times allows for full optimization of the use of the buses and increases the PMPG which profits the company as a whole. The act of decreasing the number of buses during the mid-morning and late-night time periods will impact many aspects of the operation as a whole. The average wait time will decrease and the number of people waiting to board a bus at any given time will also decrease. This, in turn, will allow for customers to be served within reasonable timing and eliminates the

chance of an overfilled bus arriving which forces several passengers to wait until the next arrival of a bus. Increasing customer satisfaction will increase the productivity and quality of service the route 3 buses give.

During the rush hour times, the number of regular and express buses provided to run by the MetroTransit seems to be sufficient based on the simulation results. Given that the downtown stops are more popular than the rest of the stops, the buses will need to accommodate the demand and supply the right number of express buses. Currently, based on the results of the simulation, there is an adequate number of express buses on the route during the rush hour times that help balance the demand and supply. Furthermore, more than half the time the simulations were run, the average fill of the buses remained above 50% which speaks volume to how many buses are needed during this busy time. Continuing to have above 50% fill capacity within all of the buses allows for the PMPG to rise and the company to optimize the savings of sending too many buses on the same route. Overall, the MetroTransit company will benefit by taking into consideration the suggestions given above regarding decreasing the number of buses during off-peak hours and possibly increasing the number of express buses during rush hour if it will not compromise the profit the company makes.