

is added to k . Because the transportation time is larger, and there are more incoming passengers than in cases a) and b), the system is more affected by changes in these parameters. Thus, planning should consider these potential problems when estimating transportation schedules.

However, if $k = k_0 + \theta$, and $A = A_0 + \beta$, where θ and β are fixed variability values based on historical data from the real system for k and A respectively, the transportation scheme provided by (4) can be more reliable. Thus, for the case c): $k_0 = 4.0$ hrs, $\theta = 0.40$ hrs; and $A_0 = 400$, $\beta = 60$. The new transportation scheme according to (4) would be: $H_R = 1.6 \approx 2.0$ transportation services per hour, $V_R = \{4, 5\}$ runs per vehicle through M , and $N = 7.5 \approx 8$ vehicles. As presented in Table II, if no additional variability is added, the simulation model with these parameters has a reliable performance.

IV. CONCLUSIONS AND FUTURE WORK

As discussed in Section III the transportation scheme presented by (4) can be a reliable tool if the parameters of the real system such as A , k and M include variability which can be integrated by traffic delays, failures and maintenance. Future work is focused on extending the mathematical model to integrate external variability and linear programming to consider variable H_R , V_R and B for the service schedule.

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