An analysis of short unscheduled absences among regular transit drivers

The data used in this study comes from OC Transpo’s archived human resource, scheduling, and absence databases. The data was mainly derived from Nexus’ work-scheduling software package, and it was collected between April 21st, 2008 and July 31st, 2012. 

The paper unit of analysis is the total driver absence per garage, day of week, and time period. Days of the week have been further distinguished according to the booking week number (week 1 and week 2). All variables were summarized according to the previous criteria.

After this process 14,305 groups of garage-day-period observations were generated with an average group size of 69.1 drivers per observation and standard deviation of 48.9 drivers.

The analysis methodology was based on a multilevel regression model used to capture the total number of drivers’ absences during the time period that need to be covered by the extraboards. Five different time periods and temporal factors have been further distinguished according to the booking week number (week 1 and week 2).

The sensitivity analysis presents the actual absence and estimated absence for the different scenarios in a percentage. The actual total driver absences was 8.8 drivers, while the estimated total number of absences was 10.0 drivers per garage-day-period, with a mean difference of 0.19 drivers.

The Pearson correlation test shows a statistically significant positive correlation of 0.9 between the actual and estimated absences. A t-test revealed that there is no significant difference between them.

Future absences were calculated based on the actual absences and the estimated absences, as well as the overall effectiveness of the extraboard planning process. Absences were compared to the current transit agency practice.

CONCLUSIONS

This article aimed to understand the factors that contribute to the short-duration unscheduled absences of bus transit drivers at the aggregate level, and to anticipate the future total absences that will need to be filled for a large-size transit operator.

The research suggests various levels of service for the extraboard teams that can be applied by the agency in order to cover their regular drivers’ absences.

Finally, comparing the third scenario to the current practice shows a total savings of around $900,000, in favor of the scenario three, while covering 100% of the absences.

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