

## Route planning in a condominium company using mathematical optimization

This work focuses on planning daily routes for a group of employees from a condominium company.

Given a set of employees and a set of customers with pre-scheduled visits, we want to build double-open routes to guarantee visits to all customers, ensuring that each customer is visited by an employee with the appropriate skills to carry out the required activity. The travel times between customers and the service time at each customer are known. The problem includes time windows for visiting customers, each employee has a maximum working time and the daily working period is between 9 AM and 6:30 PM. The routes respect the lunch period if they extend from morning to afternoon. The aim is to minimize the distance covered by all routes.

The distances and times between customers are collected via an API to Microsoft Azure; and the solutions are then displayed on Bing Maps.

The results obtained show the operational advantages of an efficient and effective vehicle route planning in a specific condominium management company. The model can be extended to other service provider companies.

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