

The Periodic Vehicle Routing Problem with Driver Consistency

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Each **customer** has an associated set of **allowable visit schedules**. For example, suppose we are making a plan for Monday to Friday and a customer needs to be visited twice with at least one day and at most two days between consecutive visits.

Then, the **possible visit schedules** for this customer are:

Monday & Wednesday , Monday & Thursday , Tuesday & Thursday ,
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The problem is to simultaneously decide on the **schedules** and the **routes** to minimize the total transportation cost.

The **Consistent VRP**, introduced by Groér et al. (2009), each customer has a unique visit schedule (e.g., Monday & Wednesday), and the aim is to design the **routes** such that all visits to each customer are performed by the same driver at about the same time. (i.e. *driver consistency* and *time consistency*).

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The **motivation** to ask for *driver consistency* is that customers appreciate to be serviced by the same driver, and drivers became more familiar with their tasks when they visit the same customers repeatedly.

We introduce the **Periodic VRP with Driver Consistency (PVRP-DC)**, which is a variant of the **Periodic VRP** where we impose **driver consistency**. That is, we are given:

- A depot and a set of **homogeneous vehicles** that can visit a limited number of customers each day.
- A set of customers that need to be visited over a **time horizon** of several days, always by the same driver/vehicle.
- Each customer has a given number of **allowable visit schedules** over the time horizon.

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The aim of the PVRP-DC is to find a set of minimum cost routes for each period of the time horizon, so that each customer is visited according to one of its allowable visit schedules, and it is visited always by the same vehicle/driver.