

## Route planner

A route planner **is** a software service that **allows** people to **plan** their journeys with (typically) public transport. Such systems are widely available in cities worldwide.

A route planner **covers** some geographical area where passengers can **travel** with different vehicles, in our case with buses, trams, metro lines or trains. The whole transport system **includes** fixed vehicle lines, i.e., bus lines, tram lines, metro lines and train lines. Each vehicle line (hereafter **called** just “line”) **has** a fixed timetable, how vehicles on that line **depart** from their starting point and **proceed** till their terminus and vice versa. The timetable is different on workdays, Saturdays and Sundays. There are exceptional timetables for certain public holidays.

Each line has a pre-defined route in the city map and many stops, on which the vehicle **driving** on the line **stops**. A route is typically from one place to another, but some routes can be circular where the starting point and the terminus are the same stop.

For each stop, a timetable of **estimated** stopping times for each **passing** line has been **calculated**. The time is an estimate based on history data, and how it is calculated is not relevant here.

The passenger can **change** from a vehicle to another freely on those stops where the vehicles stop. This may include a short walk from one stop to another.

The whole area of the transport system is **split** into different zones. The price of the trip **depends** on in which zones the passenger **enters** and **exits** the vehicle. The price also depends on the type of passenger. There are reductions for children, retired people and other special groups. Some reductions depend on time of day, e.g., travelling is cheaper for retired people outside the rush hours. Tickets can be **bought** as singles tickets which are valid for a fixed time, day tickets, or period tickets which **are valid** for a certain longer period such as a month.

Passengers can **ask** the route planning system to **show** alternative routes, which vehicles and lines to **use to be able** to travel from one address to another, and on which exchange stops one should change from a vehicle to another. The system **gives** an estimate when the passenger should be in the starting stop and when the journey should be at the end stop.

Walking times within the city street network are not included in this version of route planner.