

## 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, metros 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.