Demand-based scheduling refers to the set of transportation problems that explicitly take into account individual behaviour. In particular, performance indicators of operational decisions combine the actual cost of the operations with an explicit measure of passenger satisfaction. Moreover, it is necessary to account for the uncertainty related to behavioral aspects. In this presentation, we present the structure of these problems and distinguish them from other demand-based problems. We also demonstrate some of its applications in railway industries. Also, we discuss about passengers itinerary choice and how it could be affected by train schedule.