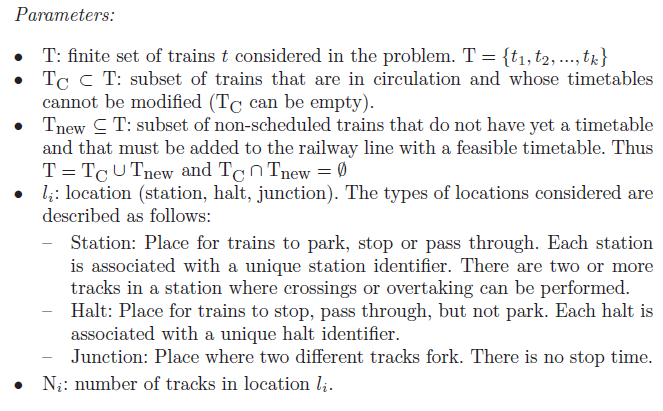
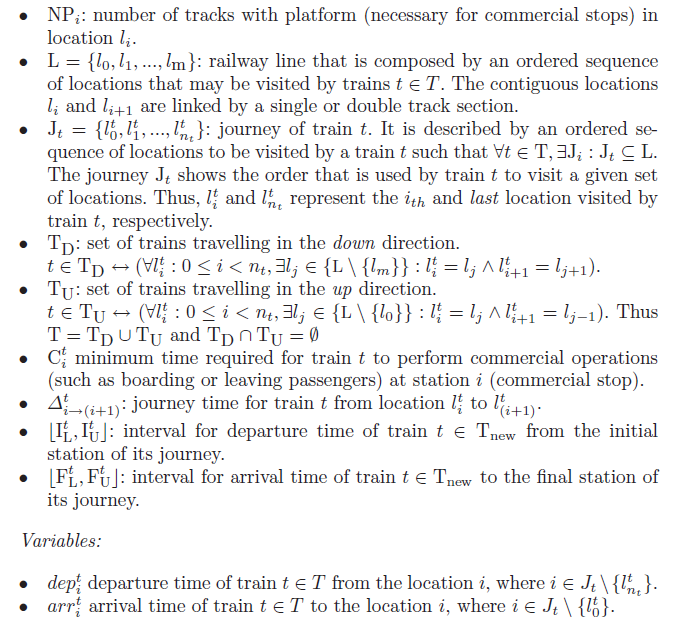
**Model**

**Notation**

Train = desired arrival time, earliest departure time, departure station, arrival station, total delay seen so far

Track segment = track state (busy, or free), eta for train clearing the track, time required to travel entire segment



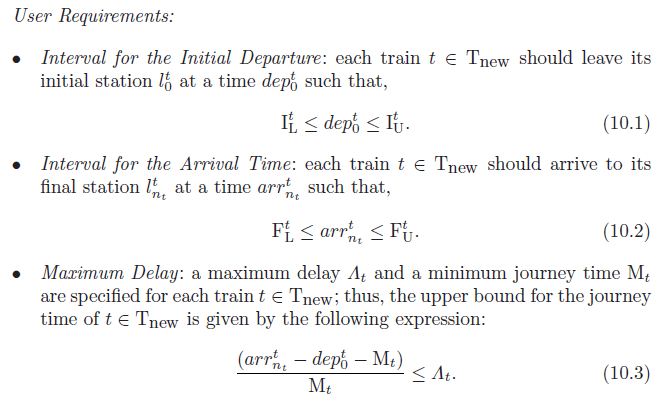


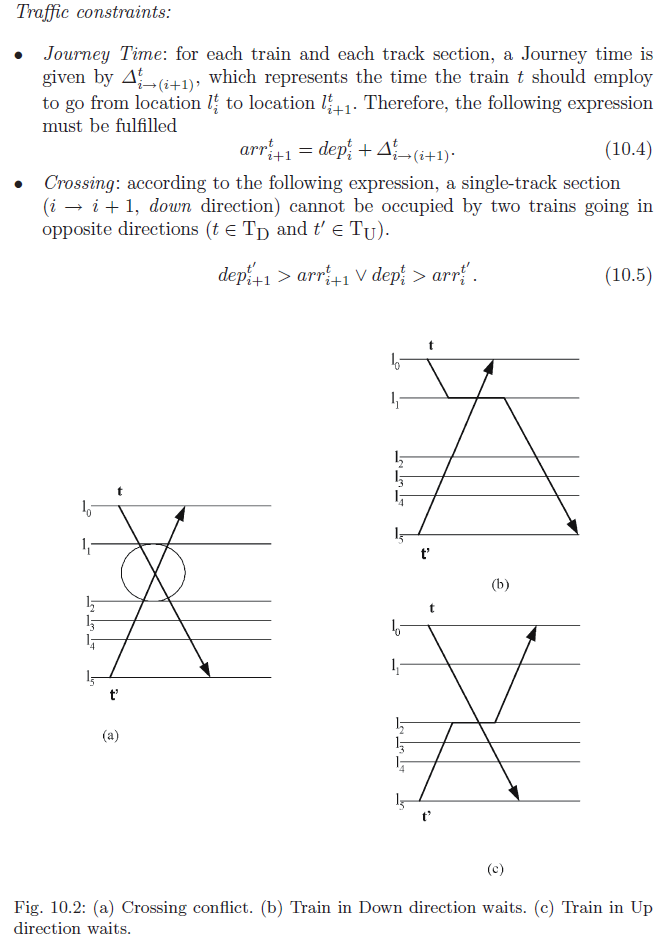
**Constraints**

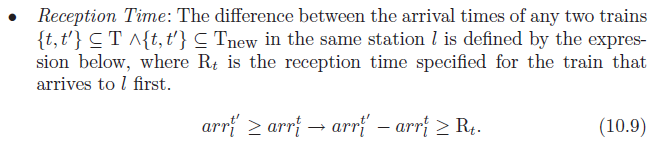
In between two stations, there can be at most n-1 trains traveling at a time where n is the number of track segments. N > 1. Track segment = track in between stations and junctions

Infinite trains at stations and they can pass there

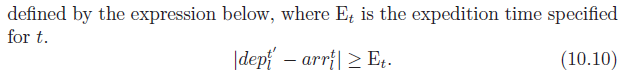
Train speeds are the same.

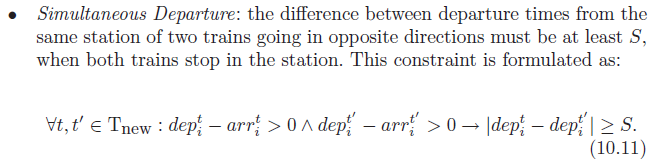
Remove the max delay

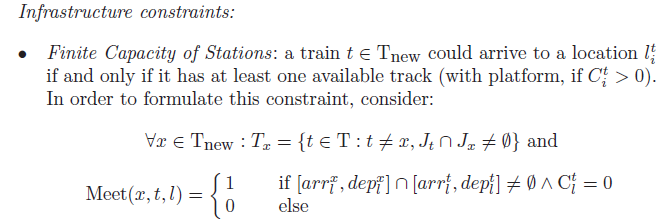


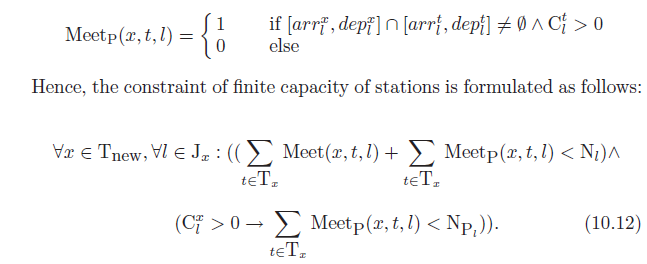


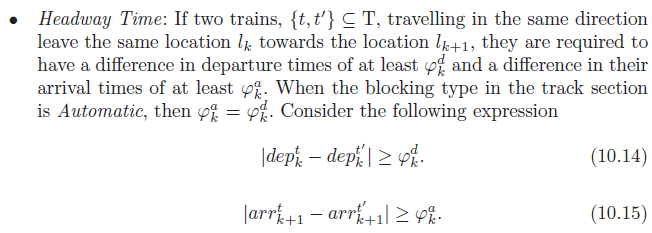










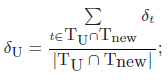


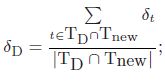
**Optimization Problem**



Average delay of new trains with respect to their optimum 



 -> Average for trains going in the up direction which is the sum of the average delay for each new train going in the up direction over how many new trains are going in the up direction



 -> Total

 -> To optimize = minimum delay for all trains

**Model**

<http://www.eecs.harvard.edu/~parkes/pubs/ch9.pdf> (page 5 drawing)