Dynamic Train Headway Selection and Its Effect on Capacity

Yanbo Zhao Petros Ioannou

Motivation & Introduction

Communication Based Train
Control System

- Communication Based
- Continuous Updating
- Reducing Headway
- Improving Capacity

Proposed Method

Input Factors
- Location
- Velocity
- Brake Characteristics
- Driver Response
- Communication
- Track Curvature
- Track Occupancy Status

Numeric Headway Calculation Algorithm

- Two trains in a straight track line:
  - If an emergency occurs, the Leading Train starts to decelerate and send event report to the Following Train.
  - The Following Train will start to brake when receiving event report from the Leading Train.

Evaluation & Results

Sensitivity Analysis (Case F-E)

- Headways of Different Policies

Headway Policy Switch

- Dynamic Headway Policy to Brick-wall Policy when Communication Network Fails
  - Decelerate Trains to New Operation Velocity
  - Check The Received Signal
  - If Green, Switch Successfully
  - If Not, Continue Deceleration

Examples

Switch to Brick-wall Policy

Switch to Dynamic Policy