

Impact of Operating Program Heterogeneity on Operation Quality in Railway Systems

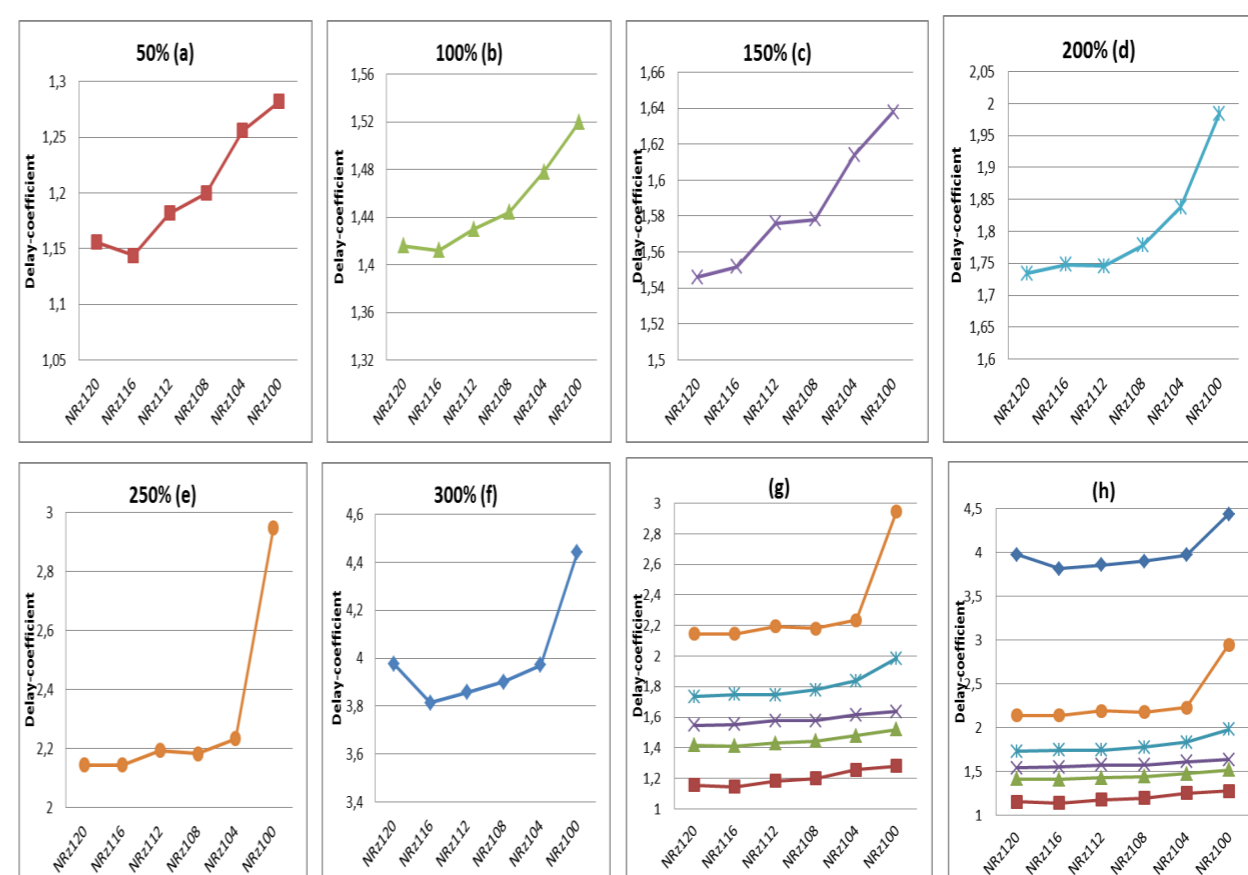
● Railway traffic faces the challenge of increasing traffic demand along with increasing economic development. Optimizing railway operating program turns out to be more cost-efficient and quick-implemented solution to manage the capacity constraints. Therefore operation quality of railway system must be improved. A key factor influencing railway operation quality is the heterogeneity in train characteristic. In this thesis, train characteristics of speed, braking performance, acceleration and dispatching priority are chosen as four key factors of heterogeneity.

● The impact of operating program heterogeneity on operation quality in railway system has been analyzed. With the assistance of simulation software RailSys and PULEIV, a series sensitivity analyses have been conducted in two cases. The analyses on institute example find out that the higher train speed would lead to a better operation quality. Braking performance of passenger trains hardly affects delay-coefficient, however there is an obvious improvement of operation quality if increase the deceleration of local freight trains. Both of braking performance and speed influence more when traffic in high density. Moreover, the result of acceleration and dispatching priority shows that the optimizing result of individual operational parameter is limited, sensitivity analysis on multi-parameter are expected. The results of case study on Hannover network also suggest that method on real-life investigated area will be developed in the future.



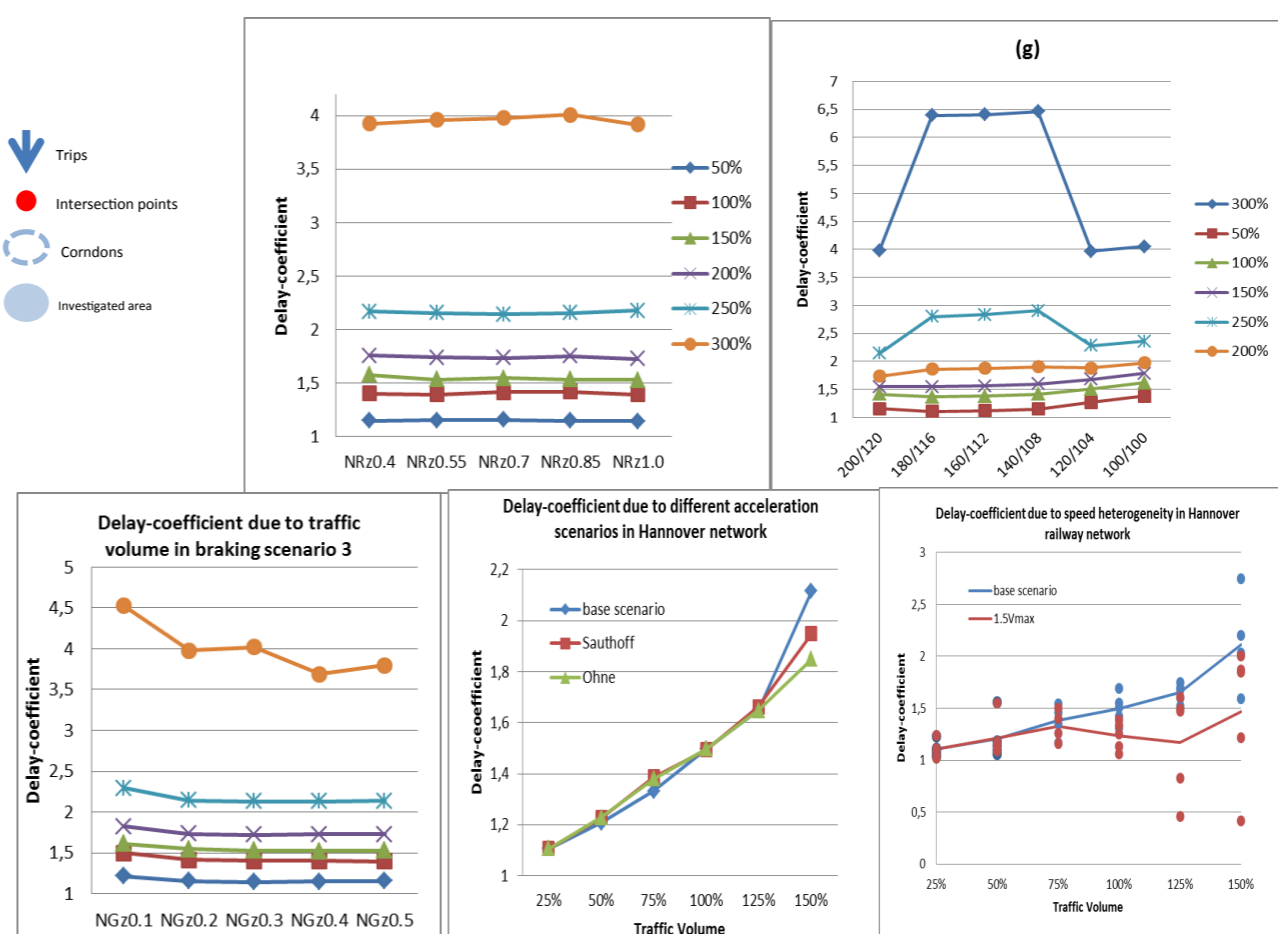
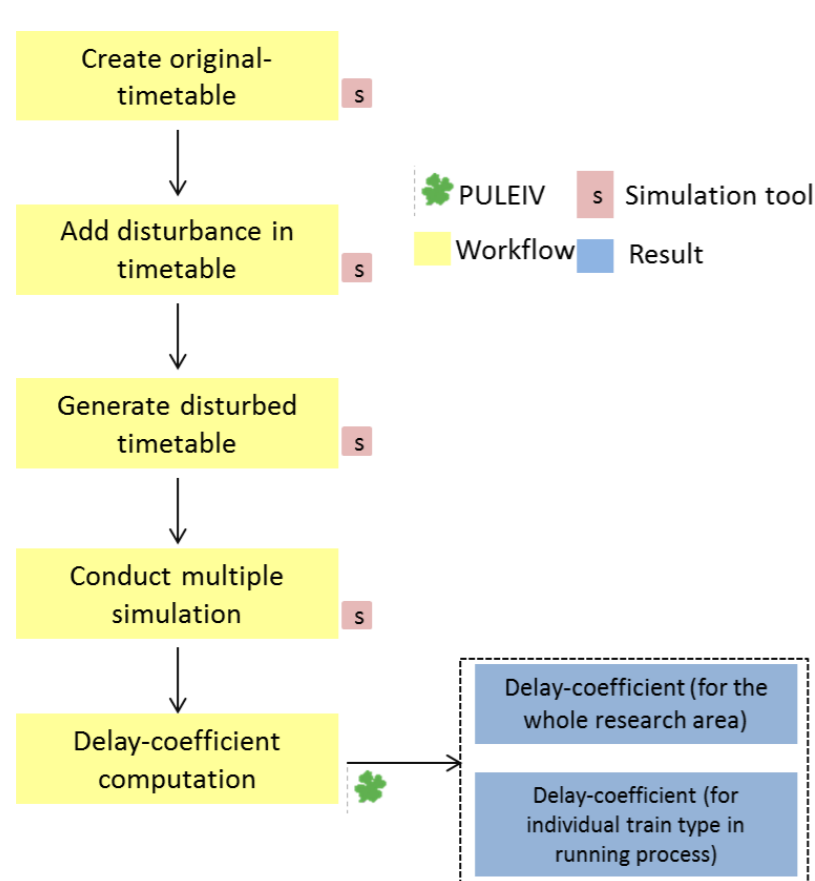
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Result of sensitivity analysis on case 1



X-axis is the speed of NRz, eg NRz108 means speed of NRz at this time is 108km/h
Delay-coefficient under speed scenario 2 in different traffic volumes

Calculation processw of delay-coefficient



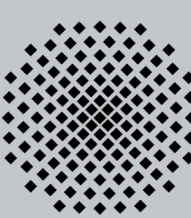
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