

## **New Insights on Fundamental Diagram Calibration from Loop Detectors Data**

Nicolas CHIABAUT, Christine BUISSON, Ludovic LECLERCQ,

Laboratoire Ingénierie Circulation Transport LICIT – ENTPE / INRETS – Université de Lyon  
Rue Maurice Audin  
F-69518 Vaulx-en-Velin  
Tel: +33 4 72 04 77 13  
Fax: +33 4 72 04 77 12  
Email: [cbuisson@entpe.fr](mailto:cbuisson@entpe.fr)

This paper aims to provide best practices for fundamental diagram (FD) calibration.

First, existing methods based on punctual observations from loop detector data are summarized. Their main drawbacks are related to equilibrium states definition and to errors made when translating occupancy into density. These lacks can be circumvented by choosing an adequate aggregation period and by leading a frequency analysis. However these solutions are not completely convincing to estimate the congested part of the FD.

To fulfill this shortage, we will present methods based on wave identification from several successive detectors. Indeed, a careful determination of the FD's congested part parameters requires a spatial analysis of the traffic behaviour's. Cross correlation techniques or ingenious use of congested wave properties will help to calibrate both the wave speed and the jam density.

Finally it appears that each part of the FD (free-flow and congested) should be calibrated by different methods to achieve the best possible fit from available loop detector data.