ANALYSE AND DETERMINATION OF THE RECURRING CONGESTION FROM MEASUREMENTS OF TRAFFIC

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ABSTRACT

Traffic fluctuations are complex phenomena, difficult to apprehend and to anticipate. It is said that the road network is congestioned when the number of vehicles exceeds the physical capacity of the road. Then the flux of vehicles does not run out any more at normal speed. A traffic jam can be recurring at the peak hours or, exceptional, after an exceptional event occurred (incident on the road, accident, etc).

The problems of the recurring traffic jam are raised in all the metropolises of the world and raise the following questions:

- What is the tendency of the traffic on the road network ?
- Can we know where and when the traffic fluid or is saturated ?
- How to know the recurring traffic jam when we does not have an automatic system of traffic ?

This paper presents an original method for the treatment of the road traffic jam thanks to measurements get from vehicle detector.

This method is illustrated by concrete cases. It allows to isolate the recurring traffic jam from the exceptional traffic jam. It provides to the road manager an abacus with the hours of the beginning and the end of the recurring congestion.

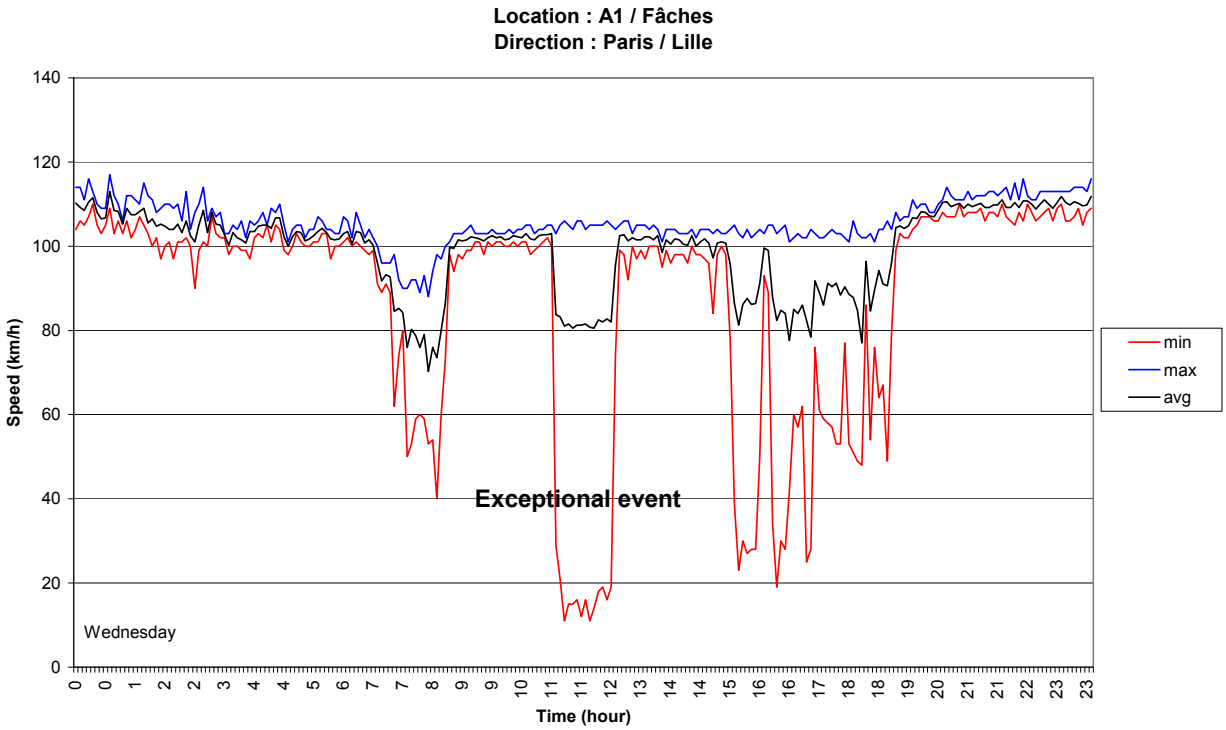
1. PRESENTATION

The presentation contains:

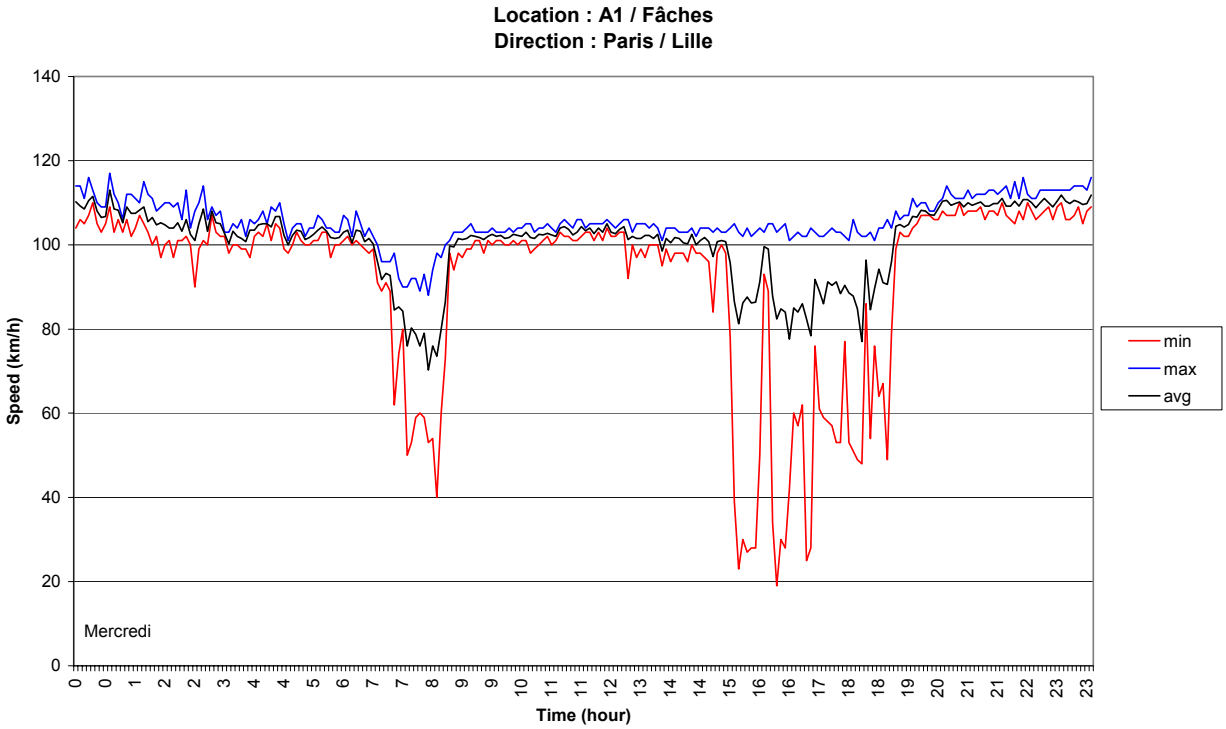
- Principle
- Generalities about road traffic and congestion
- Periods and methods of traffic measurements
- Method of traffic jam determination
- Results
- Tendency of the traffic

2. GRAPHICAL RESULTS

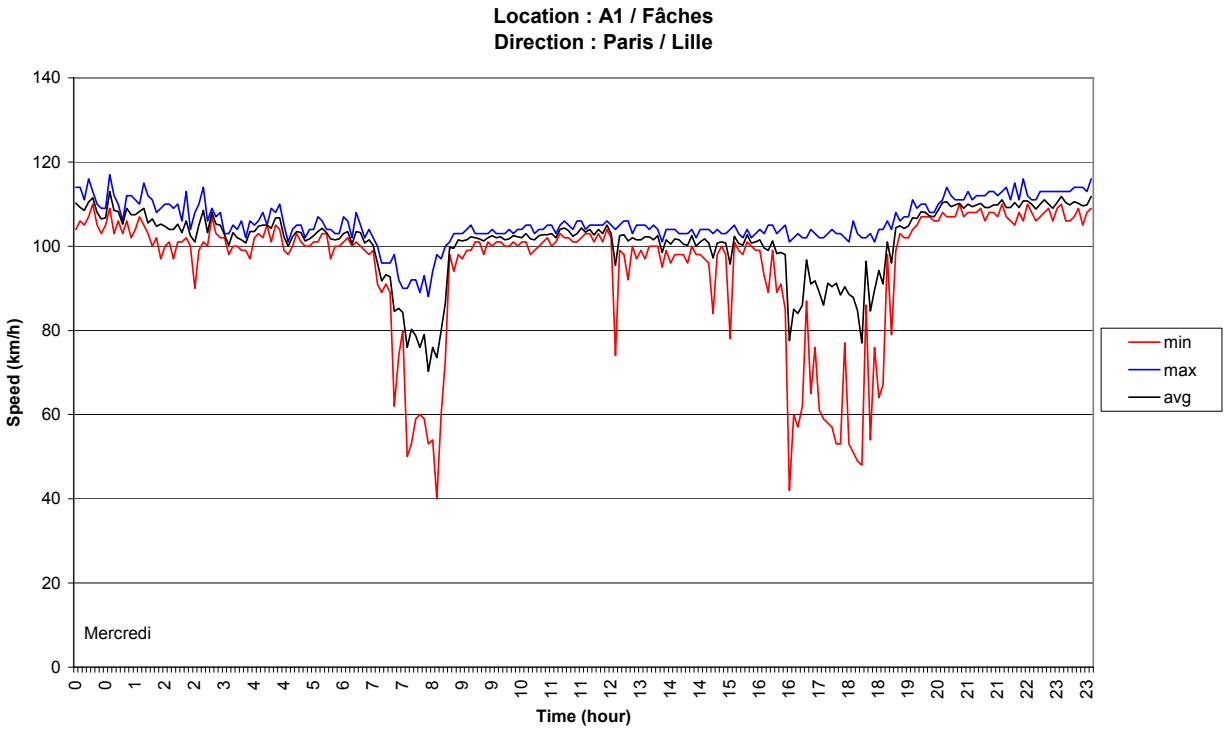
For the following graphics, we grouped all measures by week day and by 6 minutes and calculated the minimum, the maximum and the average speed (by 6 minutes steps).



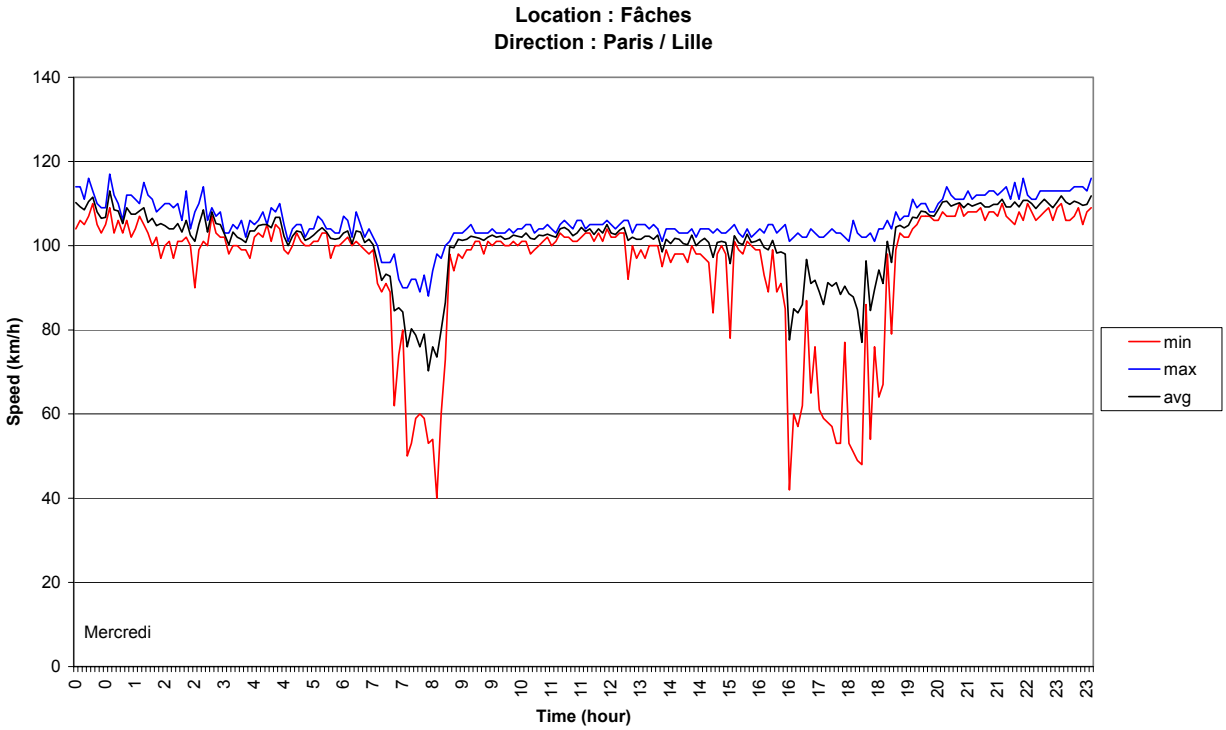
On this first graphic, we can note an exceptional event at around midday.



On this second graphic we applied a algorithm using the log of the events. We can note that the midday peek has vanished.



On this graphic we applied a first mathematical algorithm. So, we can note that the midday peek has vanished. But it doesn't seem perfect.



On this graphic we applied a second mathematical algorithm. So, we can note that the midday peek has vanished. And the result seems better.

3. CONCLUSIONS

The results obtained about the determination of the recurring events are convincing. The comparison of real time measurements with recurring data could help to detect exceptional events on the network and thus to have a way of detecting abnormal situations on the network.
These data stored in a database can be useful for road information as for traffic forecasting. They can also contribute to evaluate the gravity and to take decision in case of crisis.