**Article focus: A brainstorming exercise**

1) Why is your field important?

*Road traffic is a crucial element in providing mobility to billions of people around the world. To achieve an efficient road traffic system, that is providing mobility while taking into account the costs, smart decisions have to be made related to road design and traffic management. For this purpose we need historical and real-time information related to the traffic conditions (referred to as traffic state estimation), that is speed, density and flow throughout the road network.*

2) What has already been studied in your field?

*Traffic state estimation using traditional sensing data-types, that is flow and speed observations from road-side sensors, and individual speed and location from vehicle-based sensors, has been studied extensively. This research has led to a good understanding what we can and also what we cannot do with these traditional sensing data-types. Furthermore, researchers are now starting to consider new data-types resulting from the vehicle automation trend for traffic state estimation purposes. These researchers only consider readily-available data-types, e.g., headway observations from an Adaptive Cruise Control (ACC) system.*

3) What has not been studied? Why is this gap significant?

*Existing researches limit themselves to the readily-available data-types. However, they do not investigate which data automated vehicles can best collect to estimate the road traffic conditions.*

*In its core, an estimation methodology is designed to extract the desired information which is `hidden’ in the dataset. A methodology is better is if is able to extract more (relevant) information from the dataset, however all methodologies are limited by the dataset. We should not only strive to design the perfect estimation methodology, but also (and maybe even more importantly) to obtain dataset which contain the most (hidden) information. Therefore, we believe it is important to investigate which data automated vehicles can best collect to estimate the road traffic conditions.*

4) How does your research relate to this gap, and what is the goal of the current article?

*The goal of this article is to propose collecting a specific new data-type, that is the flow relative to vehicle trajectories. It is not our goal to design a specific estimation algorithm, but to focus on the data. Despite this focus, it is inevitable to define a general estimation approach to evaluate the potential value of data.*

5) What have you done, or what are you doing, to achieve this goal?

*Based on our understanding of traffic flow theory and data-based estimation, we reasoned that relative flow data may be a highly valuable new data-type (creative step). This reasoning comes hand-in-hand with defining the general estimation approach which is the basis for a future estimation methodology. We exposed the important problems/challenges related to the general estimation approach. For each problem we are designing (partly finished) a tool to evaluate the capability of different, i.e., both traditional as the new, data-types of dealing with the problem. This allows us to compare the importance of different data characteristics, e.g., spatial/temporal characteristics, and data-types. We are currently working towards an extended abstract which is due December 1st, 2017.*

6) What is the working title of your article?

*Macroscopic traffic state estimation: Why automated vehicles should keep track of the flow relative to their trajectories.*