Floating Car Data

Report

Document Information

FCD Workshop, Frankfurt 17th September 2019

01-00-00

Authors

NAME	ORGANISATION
Reiner Dölger	MWVLW, Rheinland-Pfalz
Stephanie Kleine	MWVLW, Rheinland-Pfalz
Josef Kaltwasser	AlbrechtConsult GmbH
Ulrich Haspel	Zentralstelle Verkehrsmanagement
Stephanie Cheung	Hessen Mobil
Jens Ansorge	StraßenNRW
Fabio Pressi	Autovie Venete
Enrico Ferrante	Autovie Venete
Marco Schreuder	Rijkswaterstaat
Timo Hoffmann	Bundesanstalt für Straßenwesen
Peter Gusia	Bundesanstalt für Straßenwesen

Distribution

DATE	VERSION	DISSEMINATION
28.11.2019	00-01-00	
13.12.2019	01-00-00	

Preface

This report provides insights gained from the FCD Workshop held at the House of Logistics and Mobility (HOLM) in Frankfurt on the 17th September 2019 to share content and results in the frame of cross corridor cooperation with European experts. Herewith we aim to contribute to the international discussion in this issue. You will find beside more a summary of all presentations held.

The workshop was divided into 5 thematic sections:

- ★ Introduction
- ★ Application of historic FCD
- ★ Current usage of real-time FCD
- ★ Future application of real-time FCD in traffic management – Part I
- ★ Future application of real-time FCD in traffic management – Part II.

The introductory presentation described the common understanding of FCD and gave a brief overview of possible use cases as well as options for the integration in existing traffic management infrastructure. The following sections each contained two presentations with an individual focus on specific applications, experiences from current usage and future use cases in the field of FCD. This report presents the contents of the presentations individually and gives a summary of the substantive findings at the end.

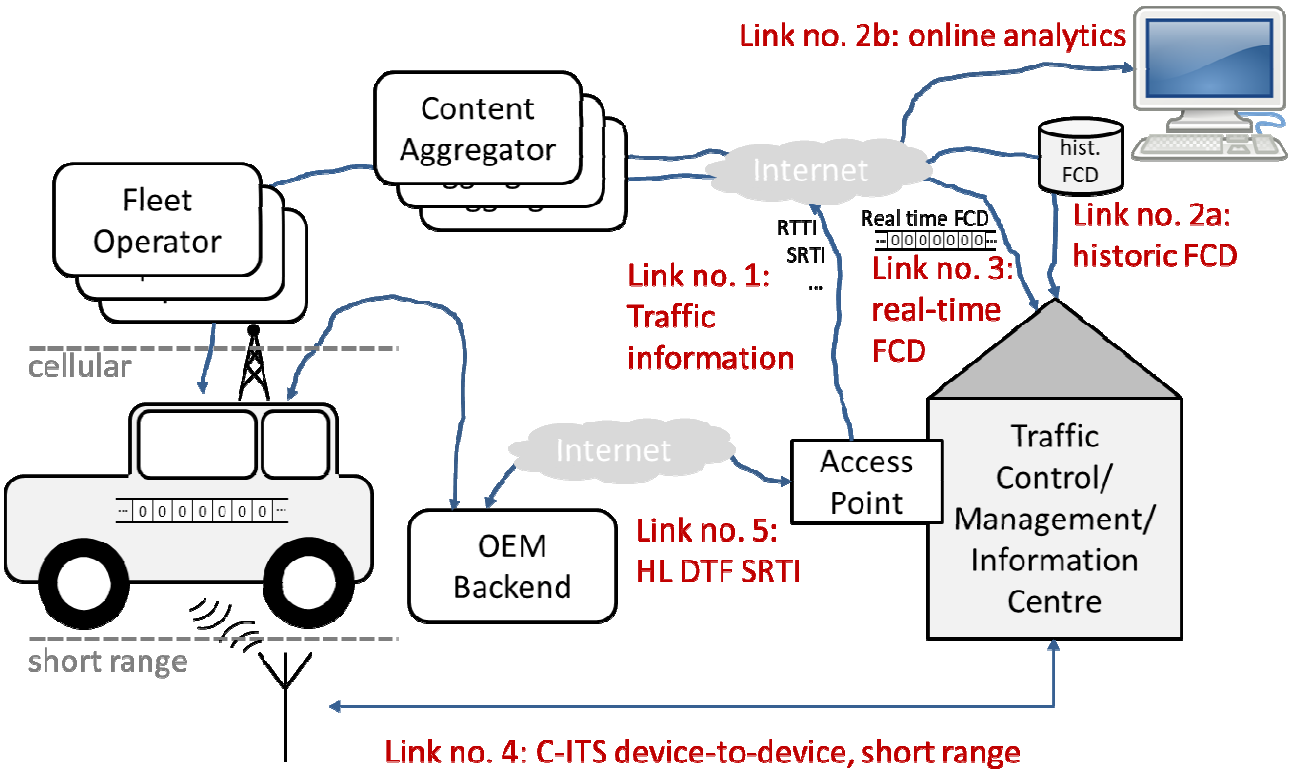
1 What do we mean by “Floating Car Data”?

Traffic and Infrastructure Management has traditionally been based on ‘observations’ of vehicles by using sensors, cameras, etc. If the traffic monitored this way showed undesirable aspects, traffic management actions have been activated in response. This ‘activation’ has traditionally been focussed on informing human drivers, via VMS, spoken radio, etc. Since the ‘observation infrastructure’ (loops, radar, image processing) and the ‘activation infrastructure’ (VMS, matrix signs) are expensive, the observation is fragmented, and the activation is limited.

But meanwhile, vehicles have become a powerful data source themselves, as well as providing intelligent machine assistance to the driver (→ automation). Hence, the vehicle has a huge amount of sensor measurements and observation data from cameras available now, which could be very valuable for supporting traffic management as well. The challenge now is to find agreements between relevant actors on how this data source/intelligence can cooperate with traffic management (→ Traffic Management 2.0).

So, in essence, the term FCD simply summarises all forms of direct access to in-vehicle data by traffic managers and infrastructure operators. The traditional interpretation simply describes fleet operators selling access to data captured in their fleet’s vehicles. Such data sets are offered commercially for quite a while now, and there is already a good base of experience on what you can do with it and what is not possible.

But nowadays, many different links between traffic/infrastructure management and vehicles exist or are being established, as depicted in the diagram below. The traditional use cases are depicted as link 2a (procuring a set of historic FCD data) or link 3 (procuring real-time FCD).



An alternative scenario is link 2b, where the road operator uses an analytics web application provided by the owner of the FCD dataset to analyse the data rather than having to process the (substantial) amount of raw data himself.

A recent addition to his set of option has been created by the starting deployment of C-ITS. Roadside ITS stations can collect vehicle data via the C-ITS messages broadcasted by passing vehicles. A bit similar to this approach is the currently launched proof-of-concept, where OEMs provide access to in-vehicle data via their OEM backend.

As we can see, the FCD options on the market are currently changing dynamically. The workshop shows various options and allows to reflect on the different opportunities, but also limitations and challenges in this dynamic environment.

2 Deficiency analysis for highways and traffic lights, as well as other analysis tools

There are various use cases for historic FCD travel times. One of the measures is the comparison of probe data with sensor data. With a **detector health tool**, the correct function of the sensors can be checked.

Historic raw data can be used to create extensive **congestion statistics** and by combining several statistical analyses, performance checks for road segments are possible. An FCD tool creates congestion statistics for time periods and segments and calculates congestion hours per segment. This can help transport planners to find out exact road stretches with a need for improvement by traffic management or constructional measures.

FCD is also used in the context of **road works** in different ways. FCD is used for ex-ante-analysis of suitable times for road works based on historic FCD and loop data. The road works

management system can give a timing recommendation. Also after the road works are finished, FCD can be used for ex-post-analyses of the traffic flow during road works. This is especially valuable, as sensors are often offline in construction areas. These analyses can serve as an indicator for effectiveness of road works management.

One use case on the subordinate network is the performance checks of **traffic lights**. The Bavarian Road Administration is instructed by ministerial decree to establish a quality management system for its traffic signals including periodical re-views of relevant performance indicators at the signals. Proposed practice is to interview the participating 19 State Building Offices. However, such an approach would be expensive, time-consuming and not sufficiently consistent. The new procedure is based on probe data and works in the following way: a special fine-granular digital map together with the locations of the traffic signals work as starting points. Then, in a generic geo-fencing step, the areas of influence around the signalized junctions are determined and the probe data is map-matched onto that qualified network. From this map-matched data paths are identified that represent the different maneuvers of the probe vehicles through the intersection area. Finally, delay times and other indicators of all the travelled paths at a junction are calculated by comparing all individually measured path travel times with reference travel times on the paths. These reference travel times have also been calculated from FCD analyzing path-speed distributions.

(Held by Ulrich Haspel, ZVM)

3 FCD for cost-benefit analysis of new ITS implementations

Floating Car Data can support ITS evaluation in various ways, mainly as a data source covering events on motorway networks over a wide geographical range in a homogeneous structure. This property is unique since most other approaches rely heavily on national or company-owned databases.

During UMneo FCD has been acquired for most of the UM network. The data has been analysed not only by adding up congestion or time loss, the usual method applied by data providers themselves, but instead the focus was directed to congestion events which can be managed through ITS measures like VMSs, lane control systems, traffic management plans etc. These events can be described and categorized in terms of length, duration, time loss or other criteria pertinent to ITS.

As a first step congestion patterns can be visualized in order to better compare the national situations which supersede discrete local constellations. Dutch motorways show different patterns from Italian ones in time and space, even if the overall dimension of congestion might be comparable.

A method to identify single events out of continuous data landscape had been developed during UM1 and UM2. Only by looking into these events the frequency of major disruptions and severe congestion or road blockages can be estimated. Such it was found that up to 50% of time loss can be attributed to events that might be influenced by measures more than 50 kilometres away, typical cases for long distance traffic management. Thus, the compilation of cost-benefit ratios can be performed more comprehensively and more exact. When distant down-streams events can be taken into account, VMS can be put to extra uses and traffic management can be redesigned to cover relatively rare but significant events.

Beyond this approach lies the idea to produce a section based but TERN-wide European Congestion Report. The TERN has been analysed according to Operating Environment and a

breakdown of larger sections onto smaller stretches has been completed in earlier phases of ITS corridor projects.

Having access to such a large database of several hundreds of sections, a part of which equipped with classified ITS systems statistical methods can be applied: by comparison of a set of sections according to their absolute or relative frequency of overall congestion or severe congestion events, the effects of ITS can be made evident and white noise coming from singular or temporary influences, like roadworks, weather events, temporary extra demand, changes in land use etc. can be silenced. Such an analysis could provide entirely new insights on a large scale and contribute to a project-wide evaluation effort, always prone to local bias, local influences, lack of data and the like.

We can see the following steps to take and risks to assess:

- ★ Mark sections where systems have been installed and attribute information about their operation (start, events etc.). This data is largely available from corridor projects
- ★ Attribute sections with traffic load and operating environment. Also, this data is in principle available.
- ★ Compare FCD data (e.g. time loss, congestion frequency) by group of sections
- ★ Identify general developments, dependence on systems operation and outliers
- ★ Repeat the exercise for several years
- ★ Contribute to corridor evaluation reports and to future ITS proposals
- ★ Prepare a TERN performance report valuable for a solid base in designing transportation policy and efficient investments
- ★ Risk in this approach is considered to be low, since all data can be used for other (local) purposes /comparisons/analysis as well

The results of the performance report can well go beyond an add-up of national reports and insights which are in the first place hardly comparable. Data can be purchased from different providers and contracted for several years. Cost is estimated to be around 5 € per kilometre and year, giving an excellent cost-benefit ratio in itself, compared to data collection through dedicated infrastructure.

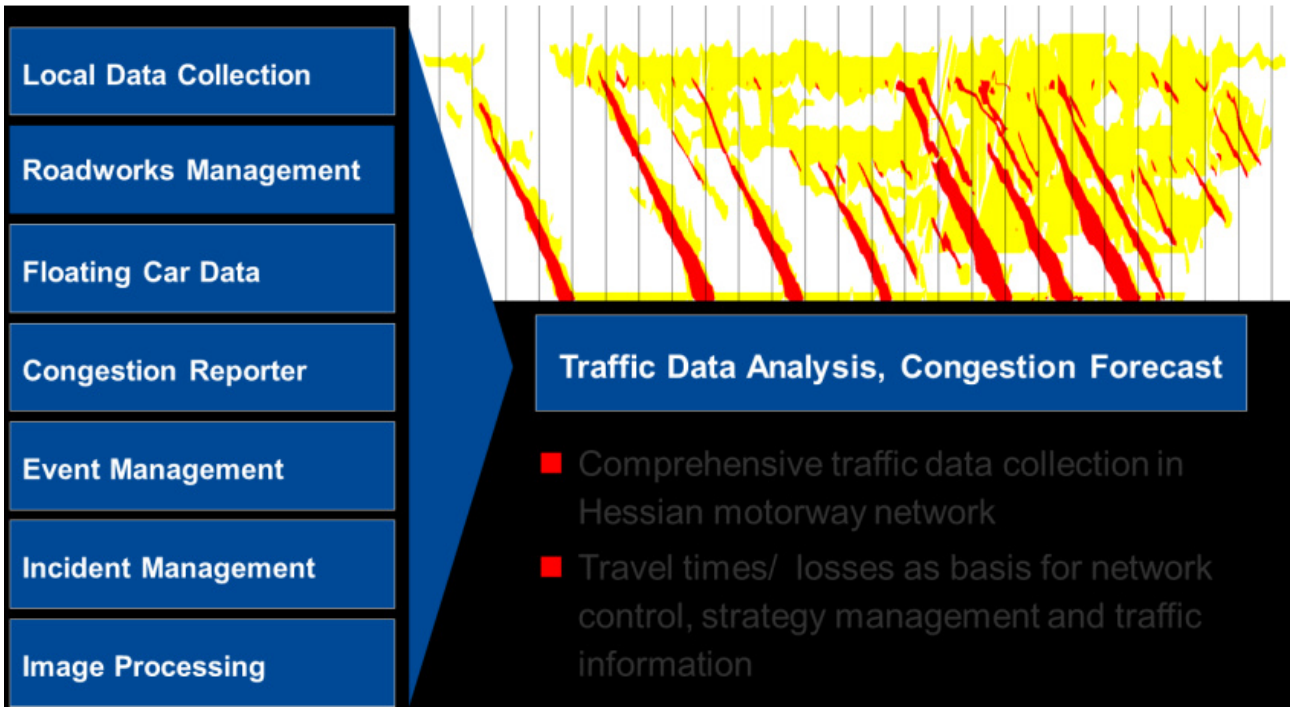
(Held by Stephanie Kleine, MWVLW)

4 FCD to determine travel times and its further usage in C-ITS

Use of FCD in Hessen

Hessen is widely equipped with stationary sensors for traffic detection used for traffic management. There are over 3,000 stationary sensors and 200 cameras in the motorway network. However, there are areas in which no traffic data detection is in operation, e.g. due to long-term road works on motorways or the fact that no detection is available, especially in the secondary network. Nevertheless, the knowledge of the traffic situation in these sections are also important if e.g. rerouting of traffic is necessary. In this case, Floating Car Data (FCD) can help to provide sufficient information about traffic flow. For a better fusion of the travel time and losses of different sources, DIVA (Dynamisch Integrierte Verkehrslageanalyse - dynamic integrated traffic situation analysis) was implemented in the TCC Hessen (Figure 1). ASDA/FOTO (Automatische Staudynamikanalyse

- automatic tracking of moving jams/Forecasting of traffic objects) serves as a basis for this implementation, using stationary cross section data to monitor current traffic conditions and predict congestion and therefore travel time, which is used for automatic network control as well as information of road users.



The first integrated FCD in DIVA was via installing Bluetooth sensors in areas, where no stationary traffic detection is available.

Bluetooth sensors recognise Bluetooth-capable end devices for example in navigation devices, hands-free kits or mobile phones. Both travel directions and several lanes can be monitored simultaneously. An advantage of this system is also the simple installation of sensors e.g. in existing infrastructure on the road. Operation works as follows:

1. Detection of the unique Bluetooth IDs of devices which are located within the perception range of the sensor and are set to “visible”
2. Anonymization of the unique Bluetooth IDs directly at the sensor
3. Assignment of a time stamp and transmission to a server system
4. Travel times and traffic disruptions can be already calculated in real-time from the information from just two sensors
5. Travel times are calculated out of the data of the previous 15 minutes and released once a minute

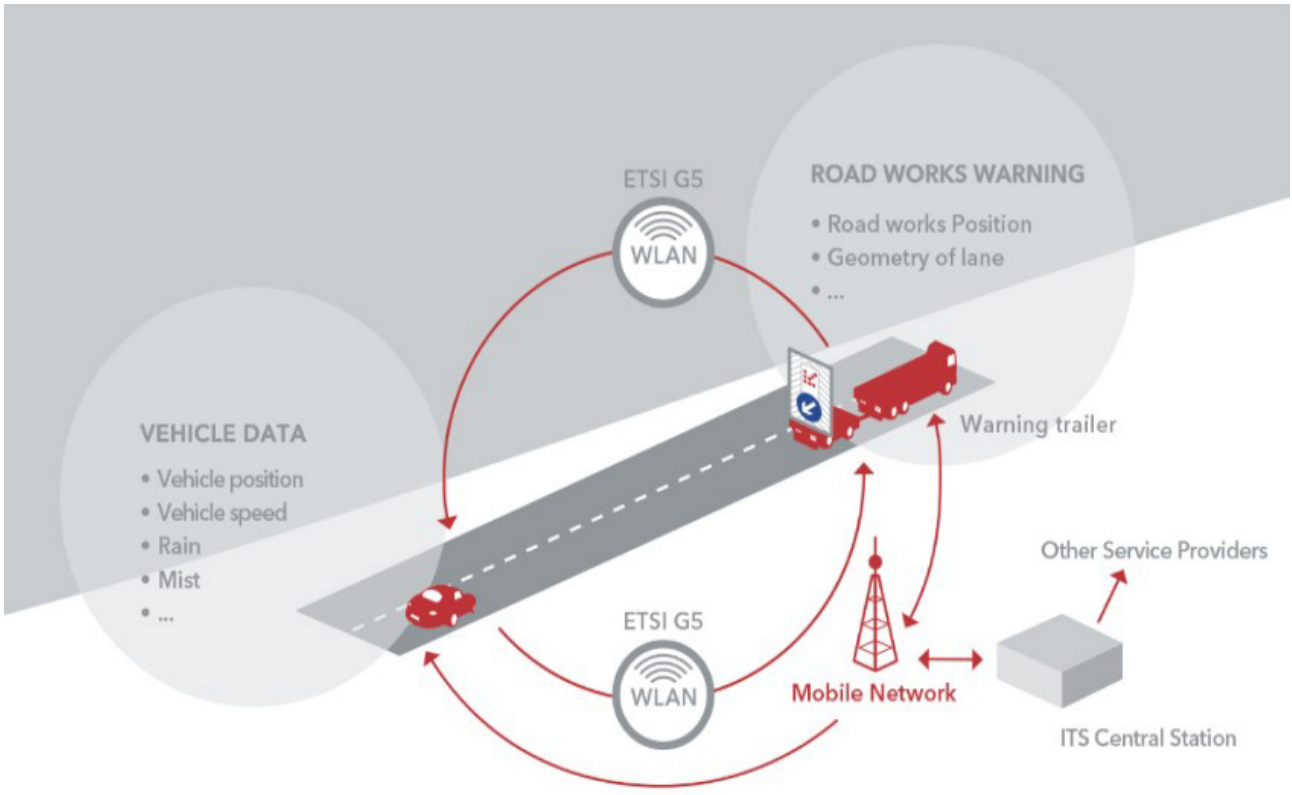
Another kind of FCD is Probe Vehicle Data (PVD), which is a C-ITS-service (Cooperative Intelligent Transportation System). The service PVD has been and is being implemented in various Hessian C-ITS projects, for example

Sichere Intelligente Mobilität Testfeld Deutschland (simTD),

Cooperative ITS Corridor (C-ITS Corridor) and

Connecting Roads Germany (C-ROADS).

With car-to-infrastructure communication, vehicles equipped with this technology send messages with information about vehicle position and speed as well as the events detected by vehicles (e.g. weather conditions, traffic jams etc.). The Roadside ITS station (R-ITS-S), e.g. an equipped warning trailer, can receive these messages and forward the information to the TCC. This data can be used as additional information for enhanced traffic management to reach a harmonised traffic flow.



Since the automotive industry announced that the first vehicles will soon be equipped with C-ITS technology, DIVA will be extended for the regular use of PVD.

(Held by Stephanie Cheung, Hessen Mobil)

5 Travel times, levels of service, and congestion lengths for telematic services

Although probe vehicle data cannot deliver the extensive data of regular sensors, as they deliver mainly current average speed and travel times, their data content is sufficient for various use cases in traffic information, traffic management and traffic planning.

Travel times for traffic information

After the successful pilot phase, a European tendering process for the purchase of probe data on all motorway sections in Bavaria, plus the most important Federal Roads has been launched in 2014, repeated in 2017 (and is planned in 2020). The length of these sections adds up to **55.000 kilometres**.

One important decision was not to ask for single probe data, but to let the provider do the aggregation process. The goal is to get the information in a 3-minute interval. The information transferred is **average speed, travel time, free-flow speed, length of congestion, level-of-service and a quality index** indicating on how many probes the data is based. The data also have to be referenced to the Bavarian map system by the provider to avoid having to do the geo-referencing work.

The following **challenges** have to be faced when integrating probe vehicle data from an external data provider:

- ★ Set-up and operation of the interfaces
- ★ Solution of **geo-referencing** issues (different geo-referencing system in the systems of the data provider and the Bayerninfo system)
- ★ Set-up of the messages generation tool for TMC messages
- ★ Definition of **threshold values** for the generation of traffic messages
  - defined in percentage of the average speed of flee-flow speed
  - distinguished between motorway/interurban roads and urban roads
  - Values used in Bavaria:
    - v < 32% vref = congestion und v < 60% vref = dense traffic on highways
    - v < 32% vref = congestion und v < 50% vref = dense traffic on urban roads

After the integration of the data into the system an extensive **quality control** campaign has been started. It consists of e.g. comparison of online sensor data with probe data, but also field survey campaigns or the installation of ANPR cameras to determine the real travel time on certain road stretches.

The data can be used not only for traffic information portals, but also for mobile applications, for feeding the public TMC channel, for internal evaluations of the road administration and for traffic management systems.

A new use case is the feedback loop from FCD provider on plausibility of road works message, e.g. when there should be a closed road, but still traffic is detected on this segment. This use case is still in discussion with providers.

Travel times for traffic management

Travel time info panels can inform the drivers about the travel times for different route options. They are used e.g. at the border control area between Germany and Austria in the Passau region.

FCD is also used as a trigger for **rerouting decisions**, sometimes combined with loop and Bluetooth sensors. In some cases, existing dynamic message signs at the decision points are used, in other cases mobile signs are installed for special occasions.

For long-distance TMP, there is no own sensor network covering the full distance, so FCD travel times are used as a trigger for rerouting decisions. Also for short-distance rerouting at construction sites they are in use, because the own sensor network is offline during the construction phase. This is e.g. the case for the large-scale reconstruction of the Munich ring road A99.

For most classic traffic control measures FCD cannot be used yet, because some important values are not contained, like number of vehicles (essential information for many traffic control algorithms, often wrong LOS during road works or bad weather), lane specific information (e.g. necessary for lane specific speed limits), vehicle type (e.g. necessary for overtaking ban for trucks, hard shoulder opening).

(Held by Ulrich Haspel, ZVM)

6 Management of the network during major and massive road works on motorways

The use case of A4 Venezia – Trieste

The motorway between Venezia and Trieste on the Mediterranean Corridor is facing a major intervention of road works for the construction of the third lane on both carriageway in a section of approximately 100 km, the works starts in 2013 and will be completed in 2023. The impact on traffic flow is huge and impressive and Traffic management during the construction phase are strongly influenced by road closures, accidents in the road works areas and restrictions for different categories of vehicles (speed limit, overtaking bans, etc.). During the construction phase some of the ITS installations has to be removed temporarily (loops, cameras, traffic sensors). Average daily traffic on the main road measured in 2018 is around 130.000 vehicle per day, with high percentage of trucks and lorries. During the last years the accident rate is increasing due to the massive presence of this kind of vehicle, and consequentially traffic congestion increases.

The workplan and activities carried out to build up the new lanes on the motorway, forces the removal of traffic and other sensors as well as the variable message signs. The area where the road traffic mostly affected the traffic are the section were the traffic managers aren't able to collect data and information. When the road operator is planning road works or construction and building programme for new infrastructures, they need to know exactly what the situation is before and after the activities, what should be the impact on traffic, on environment and take care of economic issue. If the data available is good enough traffic managers and technical team could be able to predict the effect and they can decide and define properly measures to be adopted in order to reduce the impact on mobility. In case of accidents, traffic jam or road closure, traffic management needs to have the most precise, timely and large amount of data about traffic flows, speed and Estimate Travel Time on the area interested by the events and alternative routes. The detour on national and local roads have to be planned and agreed with local authorities.

What data do traffic managers need? What is necessary to plan and design the entire construction phase? How should these data and plans be shared? Different stakeholders need to have the information and data during the event. How it could be possible to give an answer to the above sentences? We know that service providers start to collect data on "people mobility" and process it. Route planner and smartphone works continuously in background, black boxes of car insurance is

a sensor that can detect and provide not only data on mobility but other important parameters like surface conditions, accident rates and driver behaviour.

Black boxes, in car component connected and IoT is the main sources for data collected and processed for mobility analysis and study. This component improves Big Data process as they are able to offer not only real time but historic vision also. The most important process is to merge it and fuse all this data and use for the “digital twin”: the digital model and representation of the real infrastructure. Cars and vehicles became one of the most advanced and complete intelligent sensors in the field of traffic. They are able to “see” and “talk” to each other and to the infrastructure, telling what happens and what are the environmental conditions. The enhanced V2I solutions will be the enablers of the new services. Infoblu and Telepass are the most active service provider in Italy, they ave 1,5 million of consumer customer using the app, 4 million of cars providing daily data for 90 million of GPS positions with 400.000 km/h of traffic patterns on urban and suburban areas.

With the solutions presented they are able to provide to Autovie Venete different innovative traffic manager services: traffic event evolution analysis, “time to pass” through the queues, and “Travel Time” for alternative routes. The service could provide the data and represent it with distinction between class of vehicles (PCU and HGV), where each line represents the position in time and space of single vehicle, the data are obviously anonymized. Data analysis of driver behaviour and route matching different class of vehicles the traffic conditions can be presented to traffic manager in a very intuitive way providing important information of the events on the road.

Traffic manager can evaluate the severity of the event of road according to the data collected and processed, they need to know how the events change in time and space for ex post analysis and to adapt the plans for future events.

The use of FCD vs. traditional sensors and during major road works: benefits for traffic managers.

During major road works roadside traffic sensors can be less efficient. Traffic management during the road works are more complicated than in normal conditions. Road operators manage only sections or part of the road network. The use of FCD allow the traffic managers to know the conditions in “real-time” and on the whole road network. It should be possible to have ETT on different sections and route with high approximation. Data can be used to know how the measures adopted are influencing the traffic on different kind of roads and different users.

- ★ Where the traffic “moves” if I’ve to close the major roads?
- ★ Who will be affected by the measures?
- ★ How long the effects of traffic management actions can influence the road network?

The FCD should be able to help in get answers to these questions.

(Held by Enrico Ferrante, Autovie Venete)

7 Automated network control based on travel times

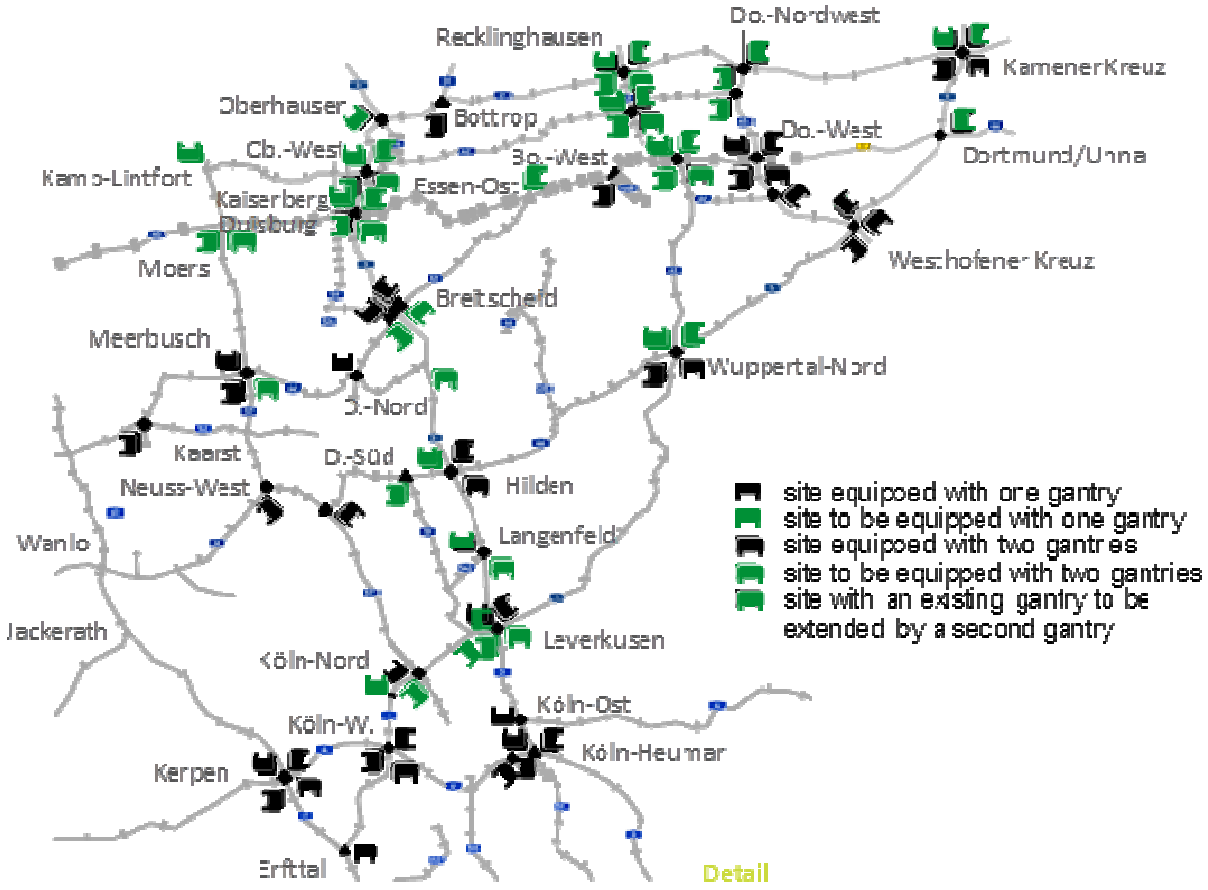
In the past traffic management on the motorway network of North Rhine-Westphalia has relied on own traffic detection only. About 2.500 detection sites are in operation on a total length of 4.400 km directed motorways. However, the availability of precise traffic flow information originated from detection loops is limited caused by different reasons:

- ★ no data during road works,

- ★ incidents in lowly equipped areas not recognised in short term manner,
- ★ length of occurring congestions cannot be exactly determined,
- ★ travel times based on stationary detection require short distances between detectors.

That's why the traffic management centre of North Rhine-Westphalia decided to acquire FCD based travel times not only for information at the traffic information portal Verkehr.NRW but also for traffic management purposes, especially for network control.

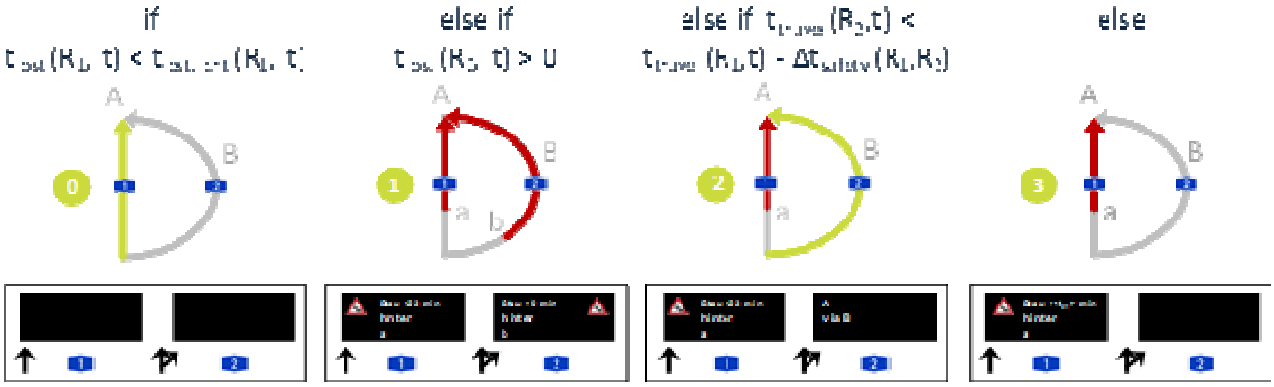
The North Rhine-Westphalian motorway network is highly meshed. 89 existing gantries with variable messages signs for rerouting (German abbreviation: dWiSta) will be expanded by further 83 gantries within the next few months. From 2021 on automated network control will be operated based on VMS at 91 decision points. The follwing map shows the existing VMS gantries for network control and ongoing expansion.



Valid travel times on each road segment have proved one's worth as minimum requirement for network control in the last 15 years. Consequently, a concept for automated network control based on travel times has been in preparation since 2017. Nevertheless, traffic flows have to be known in order to evaluate the success of network control. Therefore, detection of traffic volumes will continue to be necessary in future.

Basic principle of dynamic rerouting is the comparison of travel times on normal route and potential alternative route(s). To avoid inappropriate route recommendations the algorithm will provide such recommendations only, if travelling on alternative route is faster than on normal route with an additional time buffer and, if no time losses are identified on alternative route. Otherwise, VMS will provide only information about occurring incidents and time losses for both, main and alternative

route. The follwing figure illustrates the decision algorithm for dynamic rerouting and adequate presentation on VMS in a single net mesh.



In order to prioritise information displayed on VMS it is necessary to consider interdependences of incidents in the meshed network. Furthermore, strategies of cross border management, planned and unexpected road closures as well as major events do not necessarily correspond with increasing travel times on relevant routes or segments. Therefore, a hierarchical process has to cover all the aspects in order to provide drivers with most relevant information on VMS for rerouting.

The implementation of FCD based travel times into the traffic control centre is almost finalised. Some adjustment of map matching and final acceptance are still pending.

Next step in gaining experience with FCD based will be the realisation of an analytical application that allows defining traffic queues by traditional characteristics. Congestion statistics in the past and in the future will be comparable somehow. Furthermore, this application will provide tools for bottleneck analysis and quality checks. Call for tender will be published in October 2019.

FCD based traffic information has remarkable potentials in the field of traffic management, if it meets the requirements of TMC:

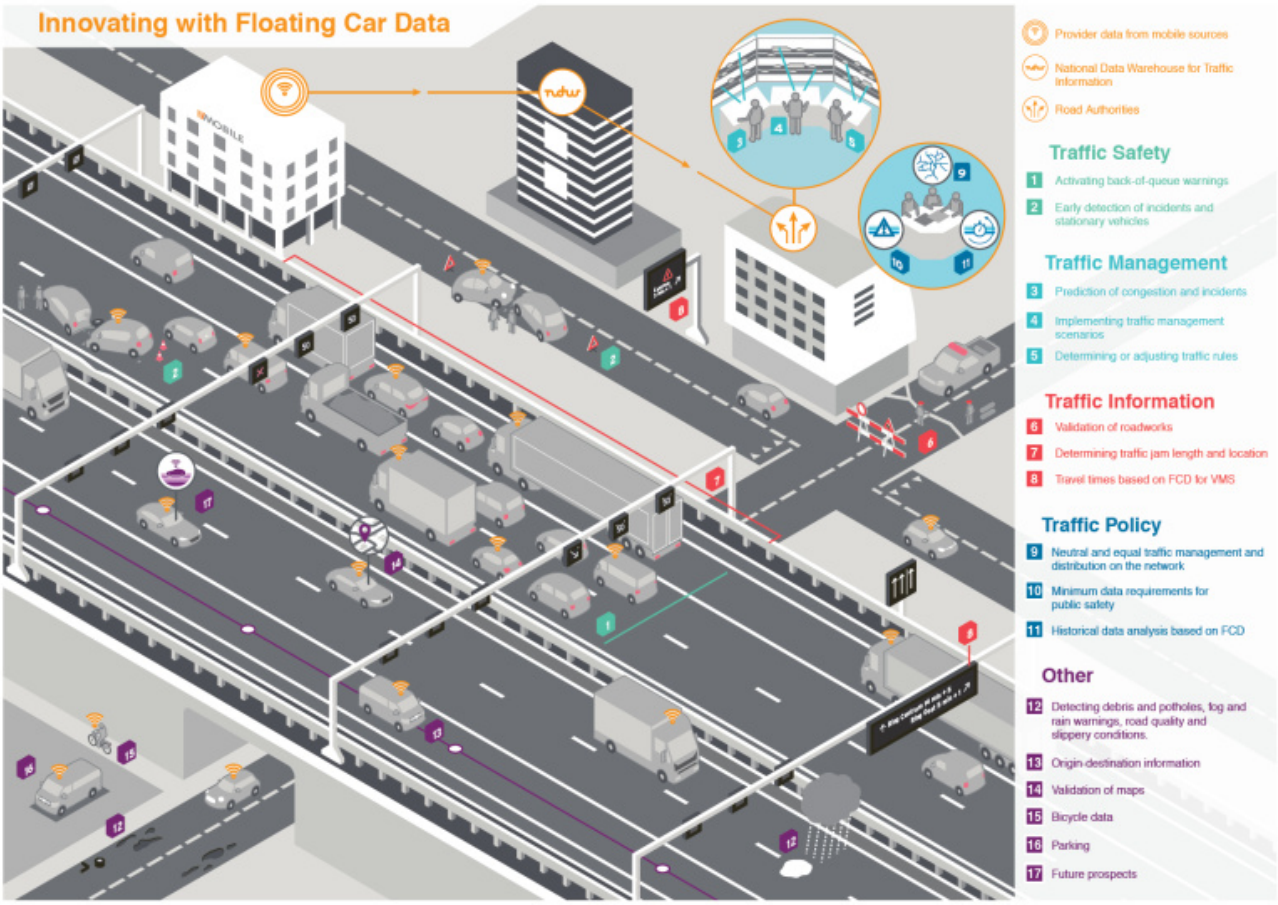
- ★ complete network coverage by average speed, current + free flow travel time,
- ★ low latency between recording in vehicle and availability at TCC,
- ★ exact information about sources,
- ★ availability of providers with affordable licence policy within the next years.

(Held by Jens Ansorge, StraßenNRW)

8 How can we use FCD for Realtime Traffic Management?

State of the art in the NL

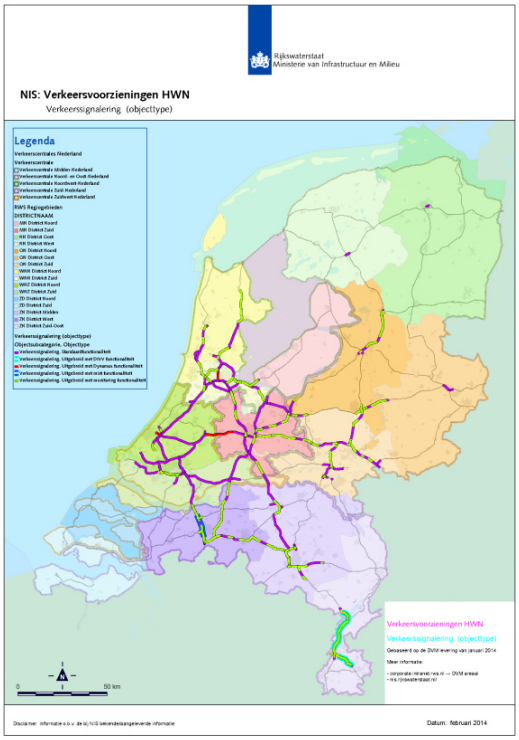
FCD is used in the Netherlands in a very broad way and is for governmental usage widely available via the Nationale Databank Wegverkeergegevens (NDW). For now, its source of FCD is via BE-Mobile, but this can change since every 3-4 years a new tender will be conducted. FCD in this sence is defined by minute by minite data for segments of 50m. The latency in this case is thus at least 60 seconds.



The figure above shows an overview of the topics in which FCD is used.

Realtime vs offline usage of FCD

A big distinction can be made in realtime and offline usage of FCD. In this presentation/memo the focus is on realtime usage of FCD, for the use case of Jam Tail Warning.



Signaling in The Netherlands

In the most crowded area of the Netherlands (see figure) the so-called Signalling Function is implemented, which has 3 main functions

- ★ Reducing Maximum speed (dangerous situations)
- ★ Lane Management (rush hour lanes, incidents, roadworks)
- ★ Jam Tail Warning (queues)

Benefits of this system:

- ★ 2-5% improved traffic flow (higher capacity)
- ★ Reduction of 19% primary incidents, reduction up to 35% of secondary incidents

To estimate the traffic conditions, double loop detectors are installed at each lane, approximately every 500m. Which

results in an enormous amount of installed loop detectors with ditto maintenance and cost.

Therefor a study is conducted with the main research questions:

- ★ Are we able to use FCD as an alternative for loop detectors?

Some Sub questions are

- ★ Is FCD fast enough (latency <15 sec)
- ★ Is FCD reliable? What is the uptime of this data?
- ★ How to receive this new data in our (RWS) installed base?
- ★ For what “road arche types” is carriageway based FCD good enough?

Pilot A9

A lot of questions, and the only way to get the answers is to set up a pilot and try to make use of this FCD. From 2016 and further we first conducted theoretical analyses, and after positive conclusions, we started from 2018 working on realtime implementation of FCD, for the Use case Jam tail warning.

This pilot is combined with the implementation of the new, futureproof, roadside station (i-RSU). Which has the possibility to add new functionality on a remote basis, so new functionality can be added in a very efficient way (If questions about the i-RSU, please contact Gerard Avontuur, RWS-CIV)

FCD in 3 different types of data

Since we want to learn more about the quality of FCD in general we are working with several types of FCD (however still form one supplies Be-Mobile/Flitsmeister), for the use-case Jam Tail warning:

1. AID-triggers direct from Service Providerss ..... (latency max 15 seconds)
2. Aggregated speeds, per segment..... (50m, 15 seconds)
3. Raw FCD, create our own AID Triggers ..... (see online tool)

In this way we get:

- ★ better insight of the quality of FCD
- ★ Open possibilities for Data Fusion
- ★ Fill in Future procurements

Level 1 and 2 have already been implemented, and the third is planned for the end of this year. Overall conclusion is that level 1, work perfectly well. Level 2 is working less than level 1, since the standard product of the service provider (which is being used in this case) “suffers” from to much smoothing and aggregation. The detection of the Queue is therefor in most of the times too late.

Datafusion

Since we do not want to rely on the data of only one service provider, we think it is necessary to combine multiple data sources.

Some alternative sources might be:

- ★ Optical Fibre as a sensor

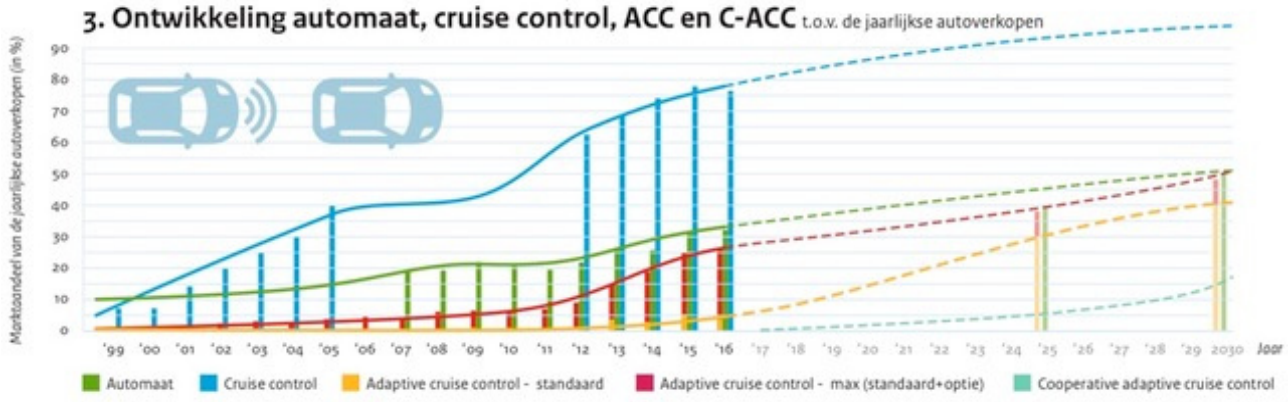
- ★ FCD from other Service Providers (ie TOMTOM etc)
- ★ PVD from OEMs (data task force)
- ★ Future data sources we do not know yet

We already started on working on data fusion techniques, in which loop data (Individual Vehicle passages) and FCD-trajectories are available. In the near future we also would like to add the sources which are mentioned in the list above.

The pilot side A9 is the test-track where we can combine all these data and implement them in our operational processes. After successful results on the test-track, we foresee an implementation in the rest of the Netherlands.

Footnote:

We know that vehicles are getting smarter and smarter and that INCAR ADAS systems, in the end will make roadside based systems less necessary. We are there monitoring very closely the development, the penetration rates, and the usage of ADAS in the automotive fleet in the Netherlands. We believe that at least for the next 20-30 years the benefits of road-side based Infrastructure will be there. But lets do that in an efficient way, where we make use of the latest techniques and possibilities.



(Held by Marco Schreuder, RWS)

9 Access to in-vehicle data – Proof of concept

Data Task Force

The Data Task Force is the first project in the European Union and the biggest project in the world focusing on improving road safety by means of the large-scale use of vehicle data. It was created by the minister-level (High Level Meeting) on Connected and Automated Driving and is a dedicated public-private task force that will set the first steps to deploy data-sharing for Safety Related Data in real life situations as:

- ★ Local hazard warning,
- ★ Incident management,
- ★ Infrastructure maintenance and
- ★ Tra□c management.

The project members consists of EU member states, vehicle manufacturers and service providers and aim together at improving the safety on European roads, on a reciprocal basis. The European Union has set itself the ambitious target of halving the number of road deaths between 2010 and 2020. This only confirms the necessity of the joined efforts to improve road safety in the European Union, and shows the importance of the involvement in the Data Task Force. The Netherlands, France, Spain and Germany will take the initiative together with the European Commission and the Industry. Past cooperation has been pleasant and discussions have been fruitful: a proof of concept (PoC) is about to start in several European countries, in which vehicle data is to be shared for the purpose of Safety-Related Traffic Information. According to Delegated Regulation 886/2013 the scope of this Information is specified by:

1. Temporary slippery road
2. Animal, people, obstacles, debris on the road
3. Unprotected accident area
4. Short-term road works
5. Reduced visibility
6. Wrong-way driver
7. Unmanaged blockage of a road
8. Exceptional weather conditions.

Proof of Concept

The Proof of Concept started with a Memorandum of Understanding and will focus on the creation of safety Related Traffic Information from vehicle generated data. The signing ceremony took place at ITS Europe Congress in Eindhoven in June 2019 and the duration was set to one year. Coordination is carried out by Chair of Steering Group: **The Netherlands** and Chair of Tech Group: **BASt**.

The trusted partners consists of:

- **Original Equipment Manufacturers (OEMs)** — Daimler, BMW, Ford, Volvo, The European Automobile Manufacturers Association (ACEA) and German Manufacturers Association (VDA)
- **Member States** — Germany, The Netherlands, Finland, Luxembourg and Spain
- **Service Providers** — HERE and TomTom
- Many more interested to join (November 2019).

The Data Task Force classify the necessary data for Safety-Related Traffic Information in defined levels of vehicle data, according to the following table:

Level 1	○ Single sensor reading, raw sensor data ○ This information does not leave the vehicle and is not part of the data distribution
Level 2	○ From one vehicle, one or multiple sensors used to create OEM specific interpretation of basic observations (safety relevant events), e.g. “traction loss” or “heavy rain” (available at OEM backend) ○ Data necessary for providing the road safety related minimum universal traffic information service and collected via any private

	and/or public source ○ Role of partner: **Sources**
Level 2 Prime	○ From multiple data sources in one feed ○ Enriched version of Level 2 Data created by cross referencing the data (L2) across multiple vehicles, vehicles from different brands and/or through data harmonization and cleansing of the Data (L2) ○ Role of partner: **Aggregators**
Level 3	○ Information: Any extracted, aggregated and processed road safety related traffic information, offered by public and/or private road operators and/or service providers to end users through any delivery channels ○ Role of partner: **Data creators (service creators), service distributors**

Within the project, data of different phases will be made available to the partners (within the ecosystem) at data access interfaces, and level 3 data will be made available at the national access points (NAPs). The creation of level 3 data will be done by various actors e.g. service providers or member states. In this context Germany partners with Luxembourg to create Level 3 data for Germany and Luxembourg and a cost-benefit evaluation is planned to determine a long-term Level 3 creation approach.

(Held by Peter Gusia, BASt)

10 Summary

The FCD Workshop showed that almost all UMneo partners use FCD, for various purposes. FCD complements traffic detection by sensors, and it is of high interest to evaluate where it might have the potential to actually replace or at least reduce the expensive detection infrastructure.

Historic FCD is used for analysis, which can benefit traffic planning but also asset management. Different use cases were shown where e.g. the detection of bottlenecks and in general the congestion analysis.

Real-time FCD is used to support traffic management. It is widely used to determine current LoS, travel times and as a basis for re-routing. It is also very valuable to support action that require knowledge about the status of the secondary network, or on the main network in cases where the traffic detection infrastructure does temporarily not work, e.g. road work.

The usability of FCD data for traffic control measures is still unclear, but the Netherlands showed promising results with a FCD data feed with approximately 9 % penetration, single vehicle data and a latency less than 15 seconds. In the light of this result it will be of highest interest to follow the activities of the High Level Data Taskforce, where access to OEM backends may become possible that would provide such data everywhere.

Given the huge potential of FCD and the dynamic developments currently happening in this sector, the participants supported the proposal to set up an expert group that would allow them to meet and share. Whether in this context more concrete tools to guide the deployment of FCD could be created, needs to be analysed and decided at a later stage.

11 List of Attendants

URSA MAJOR neo FCD WS, September 17th 2019, Frankfurt			
No.	Surname	First name	Signature
1	Ansorge	Jens	
2	Arditi	Roberto	
3	Cheung	Stephanie	
4	Ferrante	Enrico	
5	Geißler	Torsten	
6	Gusia	Peter	
7	Haspel	Ulrich	
8	Hedberg	Karolina	
9	Jansma	Henk	
10	Jorna	Ronald	
11	Kaltwasser	Josef	
12	Kleine	Stephanie	
13	Minardi	Andrea	
14	Pressi	Fabio	
15	Rausch	Jessica	S. Rausch
16	Reusswig	Achim	
17	Schlüter	Henri	
18	Schreuder	Marco	
19	Tognoni	Gilberto	
20	RADEK	VOLF	