



# GreenFlow for Trucks

Fuel savings, time savings and better flow

Increasingly congested cities are leading to a strong need for solutions that contribute both to economic interests and quality of life. GreenFlow is a solution that helps lower CO<sub>2</sub> emissions, reduce noise levels, achieve better traffic flow and improve safety by getting freight vehicles out of the city faster. Because the trucks start and stop less often, this creates a smooth flow that results in reduced fuel consumption and less stress on the vehicles, while drivers are able to drive more comfortably. The municipality saves on road maintenance due to reduced stress and wear on the asphalt.

## Smarter logistics



GreenFlow is a C-ITS application that provides smart support to truck drivers when navigating a route through the city. C-ITS stands for Cooperative Intelligent Transport Systems. GreenFlow ensures that traffic signals detect an approaching truck. The traffic control at the intersection will then attempt to give the truck an earlier or longer green light. 'Time to green' and 'Time to red' information from the relevant traffic signals also allows the driver to adjust his speed to the expected green light. This limits stopping and idling to a minimum.

## Collaboration

In collaboration with road authorities, it is possible to provide soft priority, thereby achieving more fuel and time savings while also reducing emissions and noise levels. GreenFlow offers an intelligent and sustainable solution for logistics service providers and road authorities alike.

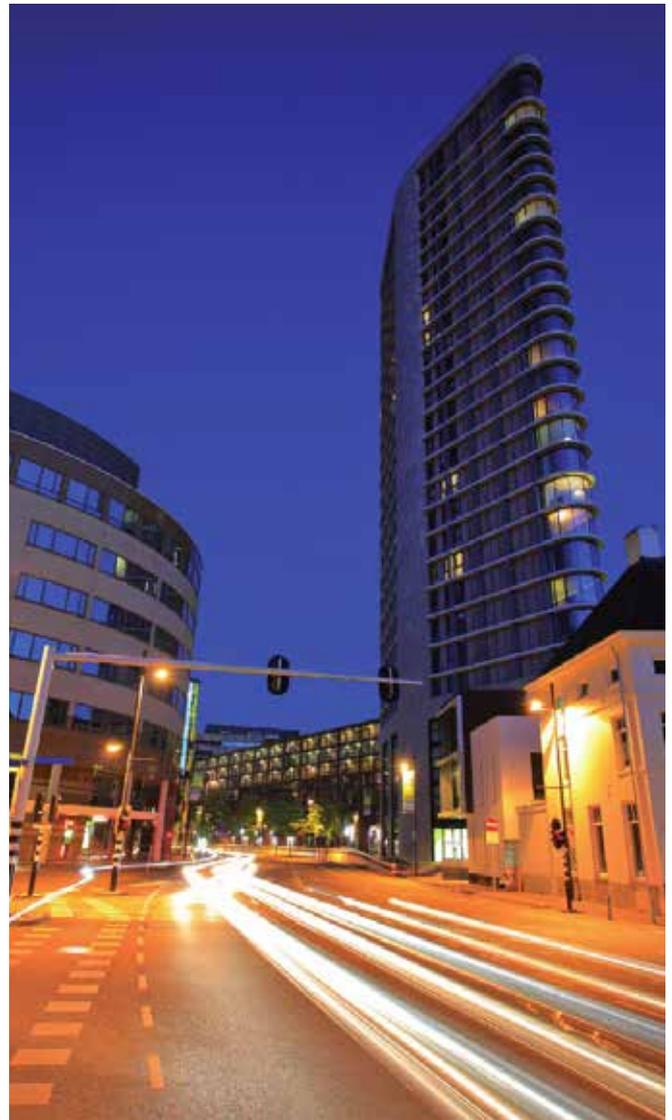
## GreenFlow components

A compact V2X-M200 on-board computer running the GreenFlow application is installed in the truck. The application handles the priority requests at traffic signals and in turn receives the expected red and green times from these signals. The on-board computer also provides a speed recommendation. For connected scenarios, the GreenFlow application is available for smart devices (smartphone, tablet or fleet management system) and displays information to the driver. There are two ways in which the truck can communicate with the intersection:



- **Cooperative**

In this case the vehicle communicates with the local traffic control device by means of so-called Wifi 802.11p communication. This communication method has a highly reliable network with dedicated communication bands for C-ITS, resulting in low latency. Trucks do not depend on the availability of the mobile (4G or LTE) network.



- **Connected**

With this option the exchange of information takes place via the mobile network (3G, 4G or LTE). The mobile communication method does not require any installation of local infrastructure by the municipality. The traffic control device must however be connected to a 4G server that supports the flow of messages between road authorities and trucks.

To make GreenFlow for Trucks effective, the local traffic control applications at the intersections are customised. This is similar to the conditional priority requests that have been used in public transport for years. GreenFlow does not use privacy-sensitive information.

## Dynniq's role

Dynniq coordinates with municipalities, road authorities and fleet owners to establish agreements on priority for trucks and ensure that technical provisions are implemented in traffic control applications. We make sure that data communication with traffic control equipment goes smoothly. To do so, in the case of the cooperative solution we deliver the necessary Wifi-11p router and handle its maintenance. The connected solution only requires the customisation of the traffic control application, and then we manage the full service in the Cloud. In addition, we also help suppliers of fleet management systems to integrate GreenFlow into their systems.

## Proven implementation

In combination with ImFlow, GreenFlow has been successfully implemented in the European projects Freilot and Compass4D. Since 2010, Dynniq and its partners have set up cooperative services in a number of European cities including Copenhagen, Bordeaux, Tampere and Helmond. In all cases of implementation, the benefits of cooperative driving are clearly visible: cleaner and safer driving in busy city centres.

## Combination with ImFlow



GreenFlow and ImFlow are solutions that offer outstanding results both separately and when paired together. GreenFlow provides information on the presence and movement of vehicles. ImFlow is an advanced control application in which the information on the presence and movement of vehicles is used to optimise the flow of traffic at intersections. ImFlow works based on predictive algorithms that make it easy for road authorities to turn policy goals into operational technology.



## Technical specifications

Depending on the fleet manager's wishes, there are many options for the V2X-M200 on-board computer. The most important choice to make is between cooperative (Wifi-11p) or connected (4G/LTE) communication. Also a factor is the decision between using the GreenFlow app and/or integrating the on-board computer into an existing user interface (Ethernet, BlueTooth or Wifi-11n).



Image: On Board Unit

### Vehicle router V2X-M200

- Radio: IEEE 802.11p (range 500-700 m) and/or 4G/LTE (optional), IEEE, BlueTooth, 802.11n (optional)
- Supply voltage: 10-28 VDC
- Dimensions, weight: 180 x 190 x 50 mm, 235 g
- Connections: m-USB, Ethernet, IO
- ETSI TS standards: 102 636-4-1, 102 636-5-1, 102 637-2, 102 637-3

**Dynniq designs, develops and maintains innovative solutions that enhance everyday life for people all over the world. We aim to be a reliable partner who listens and engages pro-actively. If you would like to find out more or receive more detailed information, we would be happy to assist you.**

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