

# SYSTEMS FOR **WASTE MANAGEMENT**



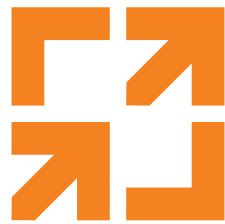
2022



# TABLE OF CONTENTS

Systems from the pros	4
About ELTE GROUP	6
Partnership	8
Capabilities of our systems	10
<b>ET GPS</b> - Vehicles positioning system	12
<b>ET Auto RFID</b> - Automatic RFID system	14
<b>ET Manual RFID</b> - Manual RFID system	20
<b>ET Barcode</b> - Barcode identification system	22
<b>ET Mark</b> - Wastebin stocktaking system	24
<b>ET Container</b> - Waste container positioning system	26
<b>ET Bin</b> - Waste bin fill-level monitoring system	27
<b>ET Dynamic</b> - Dynamic waste weighing system	28
<b>ET Static</b> - Static waste weighing system	31
<b>ET Connect</b> - System for communication with the driver	34
<b>ET Pics</b> - Image recording system	37
<b>ET Optimal</b> - Route optimization system	40
<b>ET Plan</b> - Route planning and scheduling system	41
<b>ET Control</b> - System for implementation and control of routes and schedules	43
<b>ET Register</b> - Vehicle and employee register system	45
<b>ET Integrator</b> - Integration system	46
<b>ET Roads</b> - Summer and winter road maintenance system	47
<b>ET Fuel</b> - Fuel management system	49
<b>ET CAN</b> - System for measuring vehicle performance parameters	52
<b>ET ID</b> - Driver identification system	53
Mobile applications	54
<b>SMOK</b> Mobile	54
<b>SMOK</b> Komunal	55
<b>SMOK</b> iPGO	56
Tacho Box - Tachograph module	58

*ELTE has a vast experience in developing and implementing ICT systems for companies from various industries and local government units.*





# SYSTEMS FROM THE PROS

We offer complex systems which combine state-of-the-art technology and computer science, support and monitor the processes of service provision, optimize the use of resources, and enhance the logistics of transport and communication. All this leads to lower costs, higher quality and increase in satisfaction of your customers.

As the manufacturer of both software and hardware system components, we can guarantee flexible and customized solutions that meet your individual needs, and allow for further expansion

and continuous upgrade. The top level of our services, high quality components and professional warranty and post-warranty service have been appreciated by our numerous customers.

Please take a closer look at what we can offer.



# ELTE GROUP:

**SOLUTIONS  
PROTECTED  
BY LAW**

**PROPRIETARY  
SOFTWARE**

**SUPPORT FOR  
COMPANIES  
OPERATING IN  
10 INDUSTRY  
SECTORS**

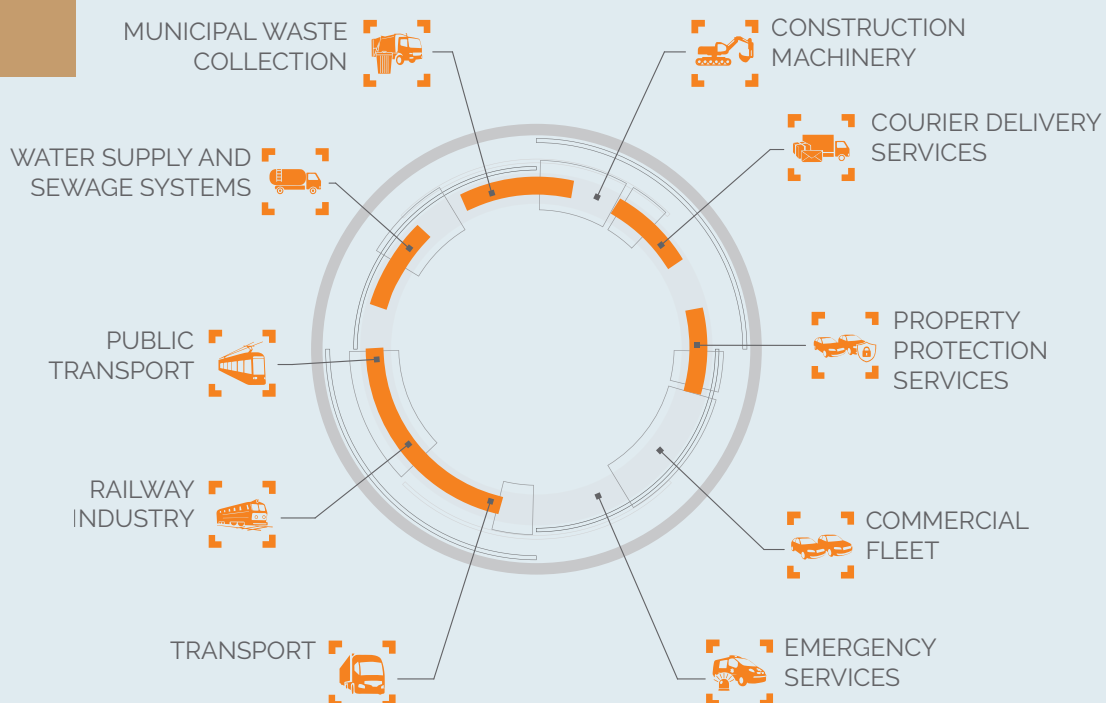
(municipal engineering,  
commercial fleet, railway industry,  
public transport, construction  
machinery, property protection  
services, water and wastewater  
utilities, courier delivery  
services, emergency services)

**EQUIPMENT  
DESIGNED AND  
MANUFACTURED  
BY ELTE GPS**

**OVER 100,000  
DEVICES ALREADY  
INSTALLED**

**MORE THAN  
50,000 VEHICLES  
MONITORED IN  
POLAND AND  
OTHER EUROPEAN  
COUNTRIES**

**OVER 10 YEARS  
OF EXPERIENCE**



# SUPPORT WHEREVER YOU ARE





## Do you manufacture, implement, integrate?

If you implement your own systems, if you cooperate with other providers, then we can also collaborate with you. You can buy single software and device from us. We can meet your needs. You do not have to buy the whole system – you choose the part that you want.

## Do you sell?

Cooperation with Elte Group is a guarantee, that as our business partner you will provide complex systems which combine the latest technological developments and state-of-art IT solutions to your clients. Those solutions have been already implemented with success for several thousands of our clients, especially in following sectors: waste management, transportation, railways, security services. The form of partnership is established individually.



## REBRANDING



Our business success and market position have been achieved in cooperation with our partners. Policy of being opened to partnership contributed to development of our products and our company itself. Challenges raised by our partners,

exchange of experience, mutual assistance and integration led to creation of modern technologies, functional products and lot of implementations in collaboration with Elte Group.

# PARTNERSHIP



INTEGRATED TECHNOLOGY

CAPABILITIES OF OUR SYSTEMS

Our ICT systems for municipal waste collection services provide solutions that meet all expectations of our customers: from the simplest ones, related to monitoring the location of waste collection vehicles to technologically advanced systems which meet high expectations of the client.







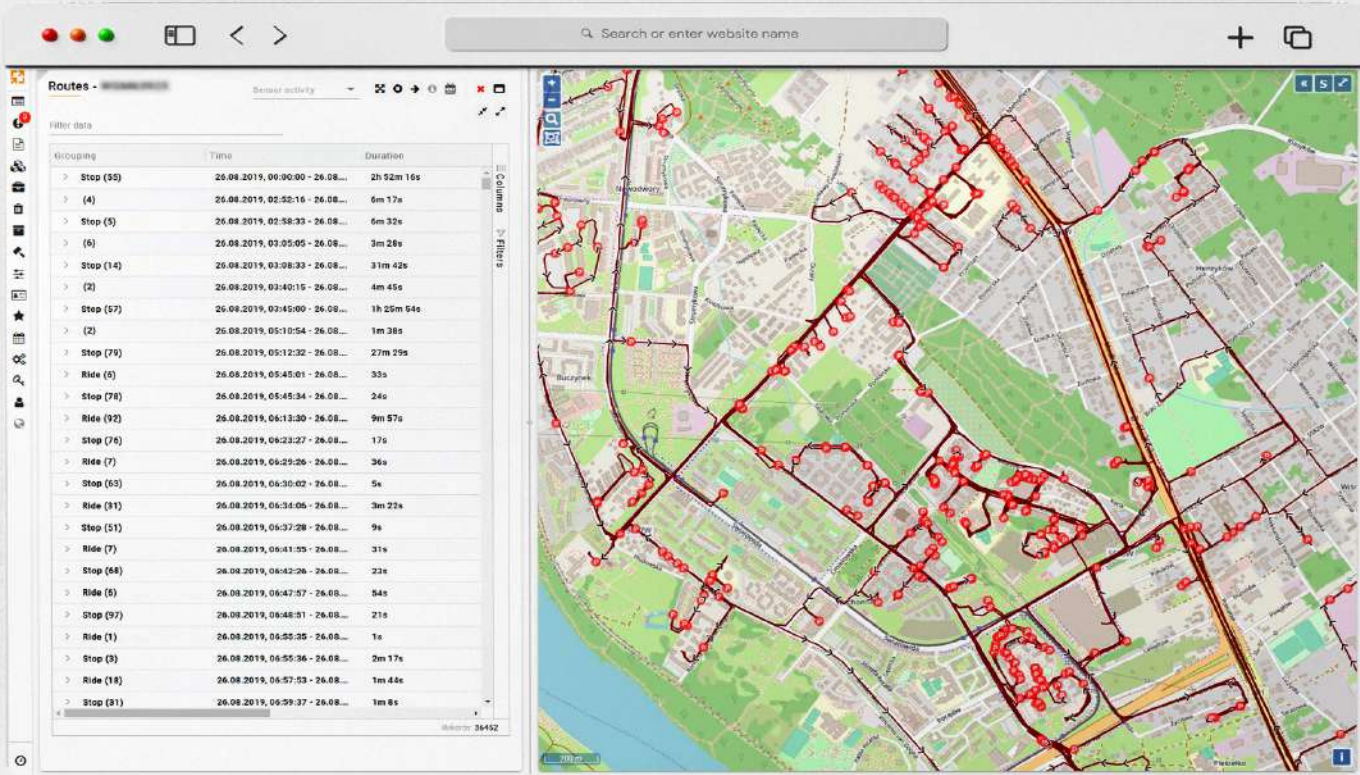
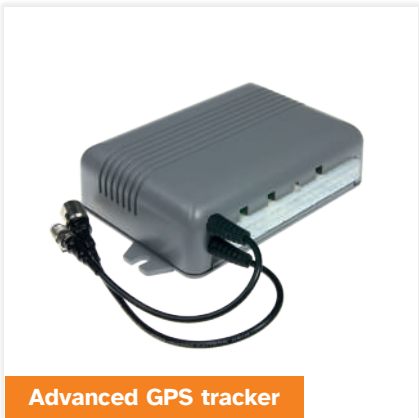
EXPERIENCE PRECISION

POSITIONING SYSTEM

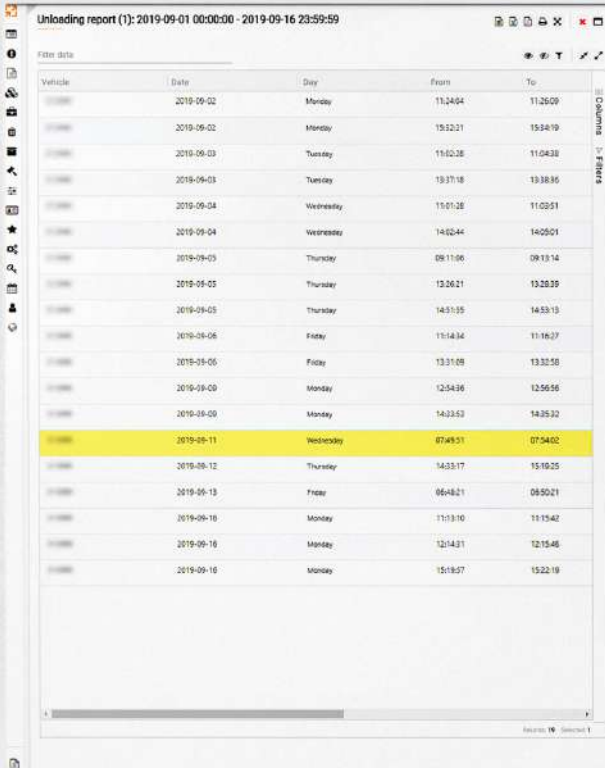
The **ET GPS** system is designed to monitor the position of moving objects. The key element of the system is a GPS tracker, which saves the object location, speed, direction of movement, and information from sensors and interfaces. The data saved in the internal memory of the GPS tracker are transferred to the monitoring system. This information allows for making reports on routes, stops, and reports based on additional sensors and interfaces, e.g. sensors of waste loading and unloading.



Various types tracking units used to monitor vehicles, machines and people are shown below.



Animation and visualization feature of route tracking on a digital map



- 
- An aerial photograph of the MPO Animal Health facility. The map shows several large, light-colored rectangular buildings arranged around a central area. A road labeled "Barnesville Road" runs vertically through the center. To the right, another road is labeled "Alvordinger Straße". Various areas are labeled: "MPO Animal Health" at the bottom left, "Barnesville Road" along the vertical road, "Alvordinger Straße" along the horizontal road at the bottom right, and specific building labels like "Barnesville Center", "Columbus Barnyard/Horsepark", "Barnesville Horse Park", "Lancaster Hall", and "Stables". There are also several circular icons with numbers (1-6) placed near different buildings, likely indicating specific points of interest or sampling locations. A scale bar at the bottom indicates distances up to 100 meters.

In **ET GPS** system, vehicles may be monitored via SEPAN application which runs in any web browser.

# SMOK Mobile

Monitoring of vehicles is also possible via **SMOK Mobile** application which may be installed on mobile devices, such as a smartphone or tablet running with the following operating systems: iOS, Android.



## EFFICIENCY IN YOUR HANDS

# AUTOMATIC IDENTIFICATION SYSTEM WITH RFID TECHNOLOGY

**ET Auto RFID**, an automatic identification system with RFID technology, has been developed in close cooperation with our customers from waste management industry so as to meet their needs, expectations and requirements of the market. The automatic RFID module offered by ELTE GROUP may be installed in any waste collection vehicle. Wastebins are identified thanks to RFID antennas and RFID readers mounted on vehicles, and RFID tags mounted in the bins.



It facilitates wastebin/container database management and enhances the efficiency of operations



In this way it improves management and reduces the company operating costs



It also helps to increase the quality of the services provided

## Automatic RFID LF identification

Equipping garbage trucks with the wastebin identification system enhances the waste collection process by eliminating potential errors.

### KEY SYSTEM FEATURES:

- CAN BE USED IN VARIOUS TYPES OF WASTE COLLECTION VEHICLES (picture below)
- COMPLETE WITH A SET OF PROFESSIONAL SOLUTIONS - wastebins are identified thanks to a set RFID readers and antennas mounted on vehicles, and RFID transponders mounted in bins.
- AUTOMATIC READING OF THE TRANSPONDER WHEN THE WASTEBIN IS BEING COLLECTED
- SUPPORTS VARIOUS TRANSPONDER TYPES
- OPERATES AT VARIOUS FREQUENCIES
- DETECTS AND SIGNALS IRREGULARITIES DURING IMPLEMENTATION OF THE PLANNED ROUTE
- CAN BE COMBINED WITH THE ROUTE PLANNING AND SCHEDULING SYSTEM (**ET Plan**)
- CAN BE COMBINED WITH THE SYSTEM FOR IMPLEMENTATION AND CONTROL OF ROUTES AND SCHEDULES (**ET Control**)
- WORKS WITH THE ON-BOARD COMPUTER (**ET Connect**).



front-loaded  
garbage truck



side-loaded  
garbage truck

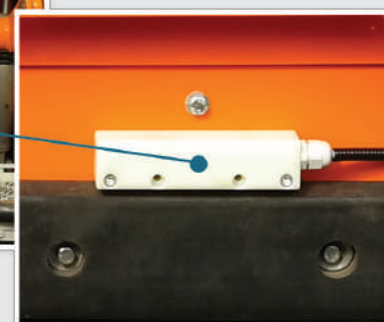
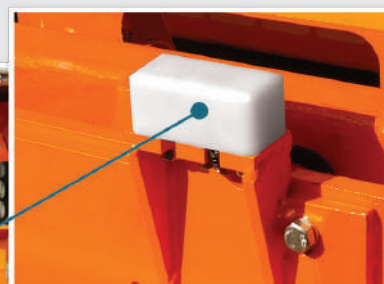


rear-loaded  
garbage truck





■ Example of RFID antenna mounting on a vehicle with rear loading

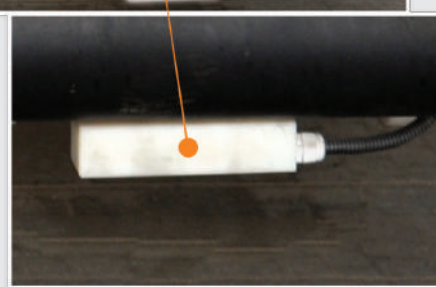


RFID HDX antenna

The wastebin identification system may operate at 125 kHz, 134.2 kHz or in dual mode (125 kHz and 134.2 kHz).



RFID FDX/HDX antenna



RFID HDX antenna

Round ID transponders are fixed in wastebins equipped with a mounting socket. If no sockets are available in wastebins (e.g. metal containers), the ID transponders are fixed on the front or side of the bin so as to ensure they may be read.



Any detected irregularities are signalled to the vehicle crew with visual and acoustic indicators installed on the vehicle. If the vehicle is equipped with a on-board computer, they are also displayed on the screen of the on-board computer.

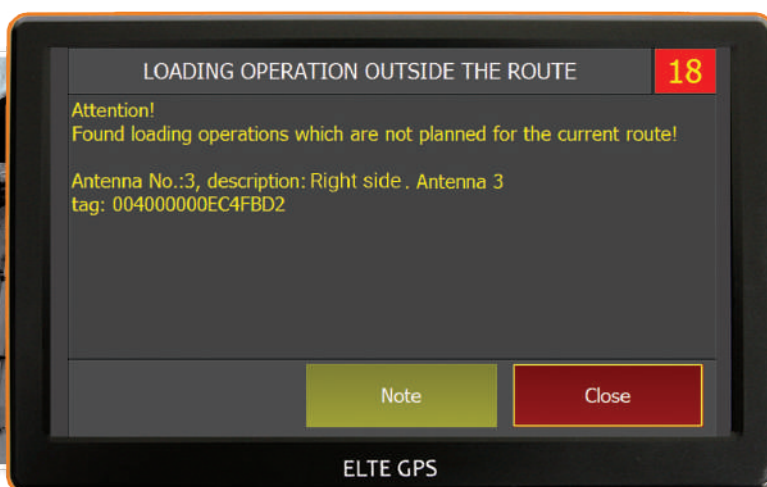
The automated RFID system in the vehicle may be configured to signal irregularities on the planned route, e.g. the emptying of wastebin which was not included in the waste collection schedule.

It is possible for the RFID system to be configured so as to block the waste container lifter in the case of any attempt to empty a wastebin without an RFID tag or one with a damaged tag, or to empty a wastebin which has not been planned in the route.



Visual and acoustic indicators





Indication of blocking the waste container lifter due to an attempt to empty wrong wastebin.

The on-board computer is an important part of RFID system. It enables the driver to communicate with the operator, to check if all the system components operate correctly, to monitor the status of the planned route, to report any irregularities by using predefined notes or own notes with attached photos.



■ On-board computer - list of waste collection points



■ This device may be paired with RFID reader and barcode reader to support the route service with a feature of adding notes about any irregularities and attaching photos.

## Automatic UHF RFID identification

Combination of vehicle positioning system (**ET GPS**) with RFID transponders operating in UHF standard has resulted in a simple and reliable tool for management and monitoring of waste containers.

### KEY SYSTEM FEATURES:

- CAN BE USED IN VARIOUS TYPES OF WASTE COLLECTION VEHICLES (picture below)
- COMPLETE WITH A SET OF PROFESSIONAL SOLUTIONS - The main components are the RFID/UHF reader and antenna, and a container sensor which allows you to detect a container without an RFID/UHF tag.
- READING CAN BE MADE FROM A LONG DISTANCE
- AUTOMATIC READING OF THE TRANSPONDER WHEN the container is being COLLECTED
- CAN BE COMBINED WITH THE ROUTE PLANNING AND SCHEDULING SYSTEM (**ET Plan**)
- CAN BE COMBINED WITH THE SYSTEM FOR IMPLEMENTATION AND CONTROL OF ROUTES AND SCHEDULES (**ET Control**)
- WORKS WITH THE ON-BOARD COMPUTER (**ET Connect**).



hookloader



skip loader



truck with a hydraulic crane system

RFID/UHF antenna ■



■ RFID/UHF transponder

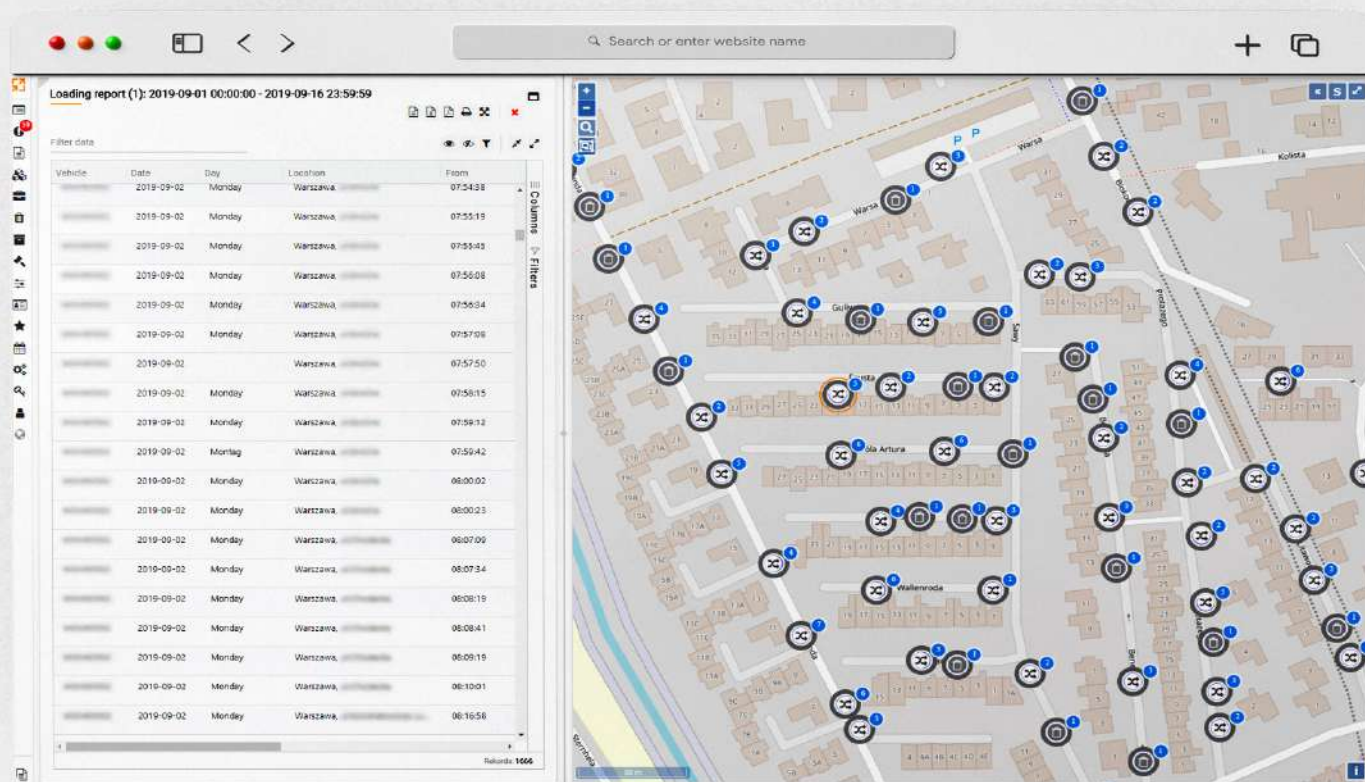


The main components of the automatic identification system for waste containers or bell-type receptacles are the antenna and RFID/UHF reader. The container sensor allows you to detect a container without an RFID/UHF transponder. The advantage of RFID/UHF technology is the ability to read out RFID/UHF transponders from containers located even a dozen meters away.





Regardless of the identification method, gathered data allows for preparing the clearing documentation with a list of emptied wastebins and collected containers.



Example of RFID antenna mounting on a vehicle with rear loading

ELIMINATES DOUBTS AND SUPPORTS CONTROL

## ■ MANUAL IDENTIFICATION SYSTEM WITH RFID TECHNOLOGY

Identification of wastebins and/or containers can be carried out manually with a wireless RFID reader, which reads information from an RFID transponder mounted on any type of wastebin/ container. Such a manual identification is supported by the **ET Manual RFID** system.

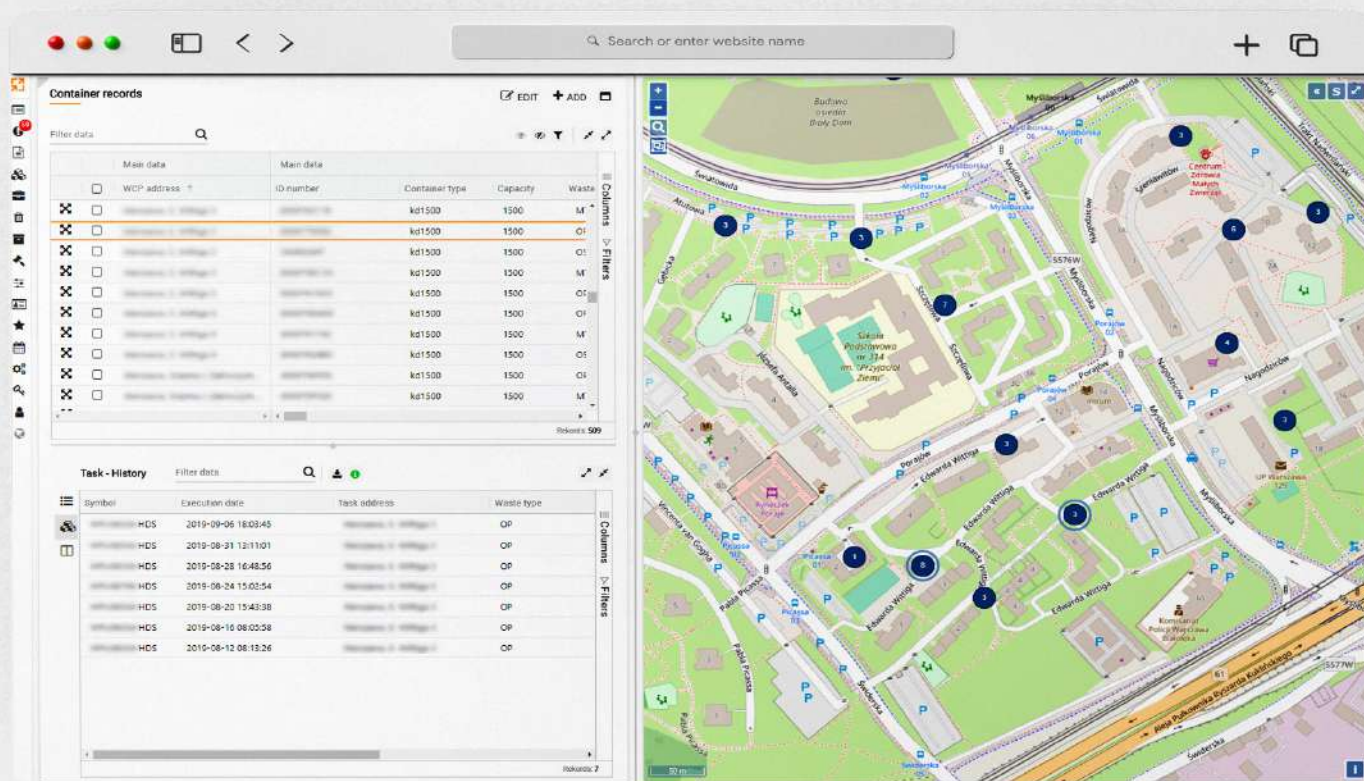
### KEY SYSTEM FEATURES:

- CAN BE USED IN VARIOUS TYPES OF WASTEBINS AND CONTAINERS
- EQUIPPED WITH A SET OF PROFESSIONAL DEVICES - wastebin identification is carried out with a manual RFID reader, which comes with a docking station mounted in the vehicle, and with RFID transponders affixed to wastebins.
- MANUAL READING OF THE TRANSPONDER WHEN THE WASTEBIN IS BEING COLLECTED
- SUPPORTS VARIOUS TRANSPONDER TYPES
- OPERATES AT VARIOUS FREQUENCIES
- DETECTS AND SIGNALS IRREGULARITIES DURING IMPLEMENTATION OF THE PLANNED ROUTE
- CAN BE COMBINED WITH THE ROUTE PLANNING AND SCHEDULING SYSTEM (**ET Plan**)
- CAN BE COMBINED WITH THE ROUTE AND SCHEDULE CONTROL SYSTEM (**ET Control**)
- WORKS WITH THE ON-BOARD COMPUTER (**ET Connect**).



- Manual RFID, barcode, QR-code reader

Data registered by the readers are transmitted to the system software, which allows for preparing the clearing documentation with a list of emptied wastebins and collected containers.



■ Report on the locations where containers were loaded with a view of these locations on a map



## ■ BARCODE IDENTIFICATION SYSTEM

Identification of waste collection, its quantity and type is possible thanks to the barcode technology. The **ET Barcode** system is a solution for monitoring the selective collection of municipal waste using the barcode technology.

### KEY SYSTEM FEATURES:

- CAN BE USED IN VARIOUS TYPES OF WASTEBINS, CONTAINERS AND BAGS
- EQUIPPED WITH A SET OF PROFESSIONAL DEVICES – identification is made with a manual barcode reader, which comes with a docking station mounted in the vehicle, and with barcode tags affixed to the various types of wastebins, containers and bags.
- IT IS POSSIBLE TO MANUALLY READ BARCODE TAGS
- TAGS MAY BE PRINTED OUT VIA A DEDICATED APPLICATION
- USE OF VARIOUS TYPES OF BARCODE TAGS
- DETECTS AND SIGNALS IRREGULARITIES DURING IMPLEMENTATION OF THE PLANNED ROUTE
- CAN BE COMBINED WITH THE ROUTE PLANNING AND SCHEDULING SYSTEM (**ET Plan**)
- CAN BE COMBINED WITH THE ROUTE AND SCHEDULE CONTROL SYSTEM (**ET Control**)
- WORKS WITH THE ON-BOARD COMPUTER (**ET Connect**).

The system includes software for label printing (SMOK Label application). The application works with printers which make barcode labels resistant to adverse weather conditions and minor mechanical damage.

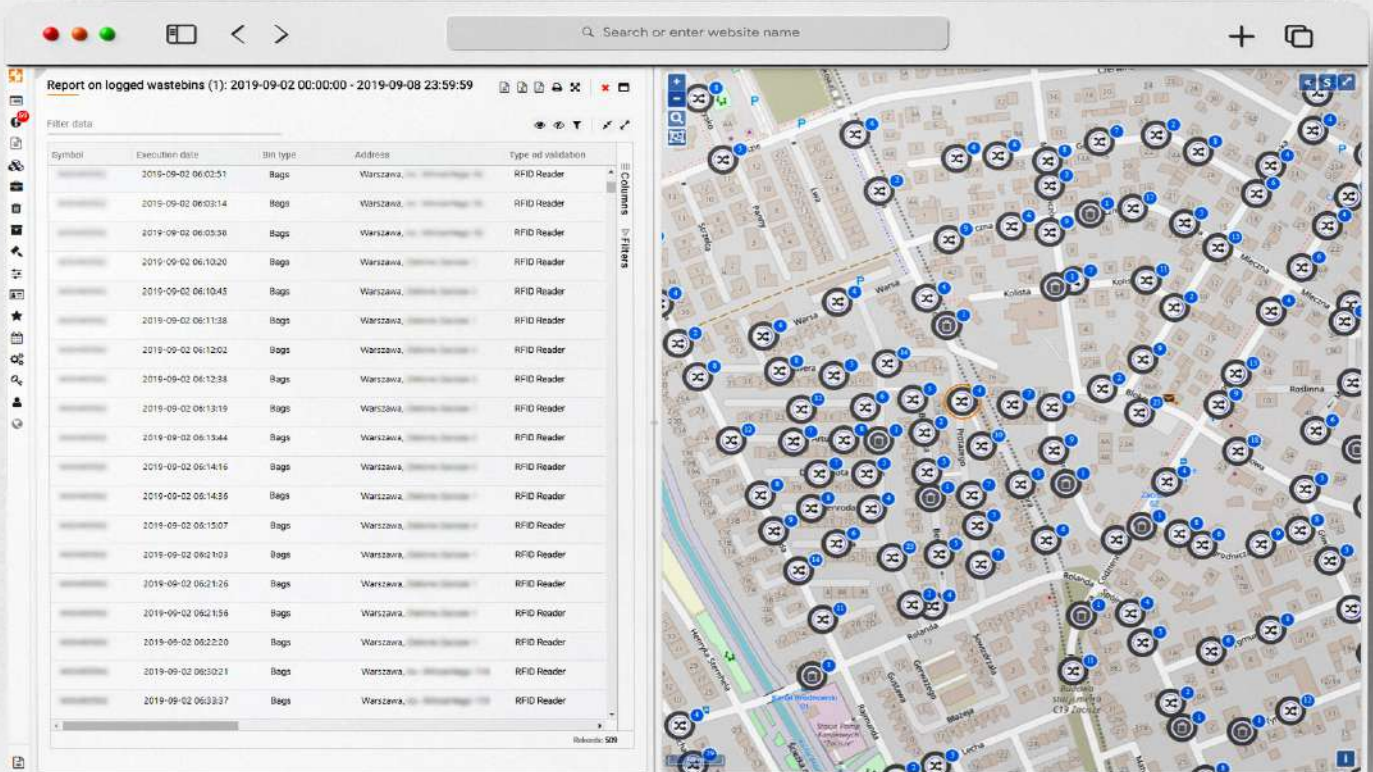


All sorts of wastebins, containers and bags marked with barcodes may be identified with a manual barcode reader. The reader was designed for outdoor operation in difficult weather conditions and in a wide range of temperatures. It is shock-proof and allows for reading partially damaged and soiled labels.

The barcode data read by the manual reader are sent online to the SEPAN application via the GPS controller using GSM/GPRS technology. The data recorded by **ET Barcode** system may be used to make various summaries and reports and to view waste collection points on a digital map.



- Barcode reader



Report from the collection of waste bags tagged with barcodes

## WASTEBIN STOCKTAKING SYSTEM

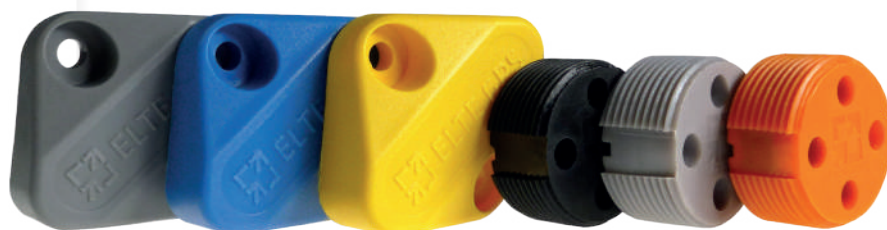
The **ET Mark** system supports the wastebin stocktaking process by assigning a unique RFID transponder or a barcode label to a wastebin and specifying the wastebin location, type and intended use.

### RFID TRANSPONDER

Wastebins are most often equipped with RFID transponders. Different kinds of transponders are used depending on the applicable RFID technology and type of wastebins.

#### KEY FEATURES OF RFID TRANSPONDERS:

- simple installation;
- supporting **ET Auto RFID** - Automatic RFID identification system;
- supporting **ET Manual RFID** - Manual RFID identification system;
- resistance to weather conditions;
- reliability;
- long service life;
- possible multiple use.



### BARCODE LABELS

Barcode labels can be used to identify wastebins as an alternative to RFID transponders. The most commonly used solution are plastic labels with thermal transfer printing.



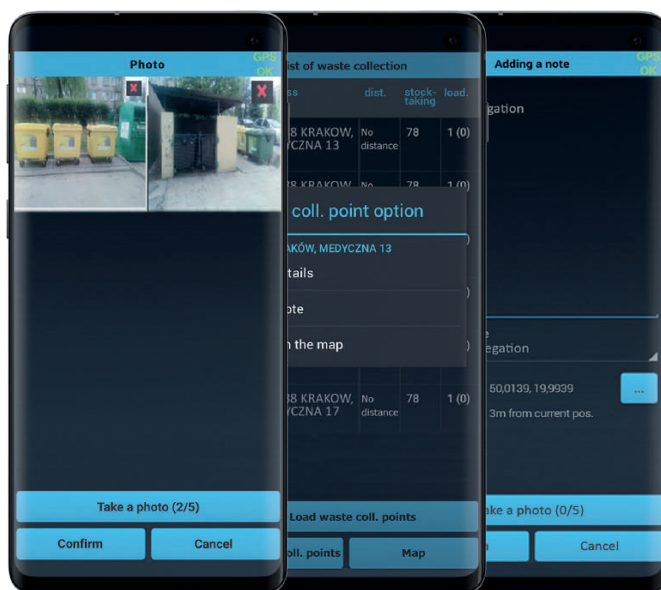
#### FEATURES OF BARCODE LABELS:

- simple installation;
- customizable label pattern;
- supporting the manual RFID identification system - **ET Manual RFID**.



## SMOK IPGO APPLICATION

The **SMOK iPGO** mobile application supports the wastebin stocktaking process. It can assign a unique RFID transponder or a barcode label to a wastebin or a container, specifying the wastebin location, type and intended use. The app may run on an RFID data collector or a mobile device.



## RFID DATA COLLECTOR

The RFID data collector is a specialized device that works with our **SMOK iPGO** app. It has built-in GPS and GSM modules, an RFID reader and barcode reader.

RFID data collector

## RFID READERS FOR MOBILE DEVICES

Our RFID readers known as Check USB and Check MiniUSB work with mobile devices such as tablets via the USB port. They support the mobile app **SMOK iPGO**.

RFID readers for mobile devices





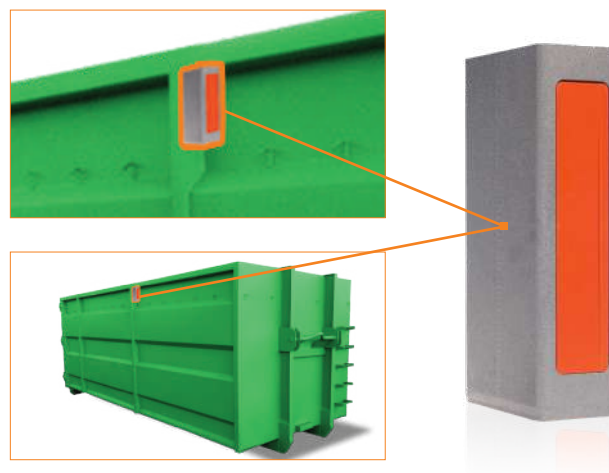
## LOCATION MATTERS

# WASTE CONTAINER POSITIONING SYSTEM

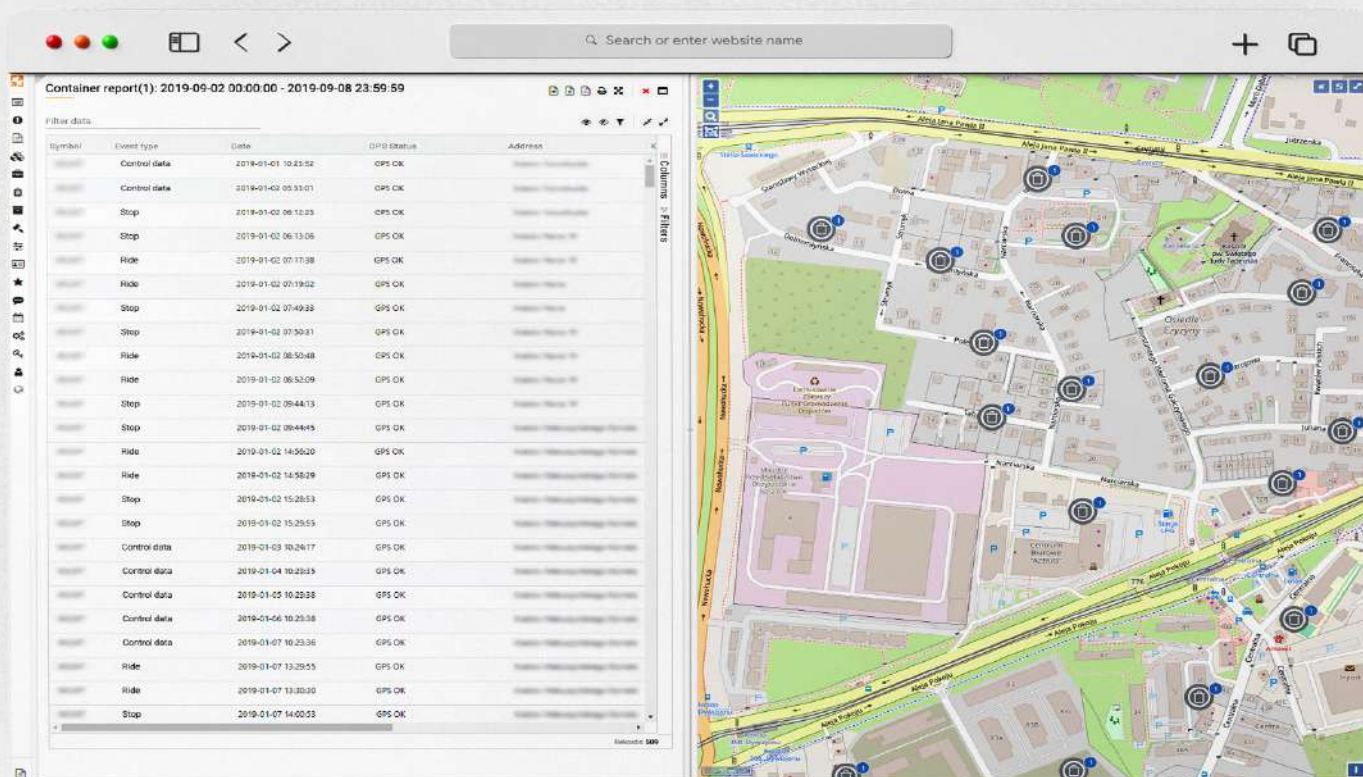
The key component of **ET Container** system is the waste container tracker, a modern device with built-in batteries designed to monitor the container location. In addition to the power supply module and GSM and GPS modules, the tracker is equipped with a sensor which detects the container loading and unloading operations. It is also possible to configure the data transmission frequency individually.

## BASIC FEATURES OF THE TRACKER:

- TRANSMISSION OF THE CONTAINER LOCATION DATA - once a day and following every loading and unloading operation (standard configuration);
- INNOVATIVE POWER SUPPLY - enables device operating for at least 18 months (with standard configuration), battery replacement availability;
- HOUSING DESIGN - allows you to fix the tracker on the container and to replace the battery without damaging the tracker.



■ Example of installation of the waste container tracker



■ Report on the locations where containers were loaded with a view of the container location on a map

## WASTE BIN FILL-LEVEL MONITORING SYSTEM

**ET Bins** system is our solution for monitoring the current status of waste bin fill-level. The dedicated sensor placed inside the bin measures the level of its filling with waste. These data, combined with information about the bin location, are sent to the system. The waste bin fill-level and bin location are shown on the digital map, so you know immediately which waste bins need to be emptied. The system automatically warns the user of problems such as waste bin overflow, tipping, fire inside the bin, or its unauthorized emptying (waste theft).



Waste bin fill-level sensor

Installation example of waste bin fill-level sensor



BECAUSE EVERY KILOGRAM COUNTS

## ■ DYNAMIC WASTE WEIGHING SYSTEM

**ET Dynamic** is a fully automated dynamic waste weighing system. The weight is determined without stopping the waste container lifter – the waste is weighed when wastebins are being emptied.

### KEY SYSTEM FEATURES:

- MAY WORK IN VARIOUS TYPES OF WASTE COLLECTION VEHICLES (picture below)
- EQUIPPED WITH A SET OF PROFESSIONAL EQUIPMENT, including a weighing computer, accelerometer and a set of loadcells
- AUTOMATICALLY WEIGHS WASTE WHEN THE WASTEBIN IS BEING EMPTIED, WITHOUT THE NEED TO INTERRUPT THE EMPTYING PROCESS
- WORKS WITH LOADCELLS OF VARIOUS SIZES
- MAY BE OFFICIALLY APPROVED BY COMPETENT AUTHORITY
- CAN BE COMBINED WITH THE ROUTE PLANNING AND SCHEDULING SYSTEM (**ET Plan**)
- CAN BE COMBINED WITH THE ROUTE AND SCHEDULE CONTROL SYSTEM (**ET Control**)
- WORKS WITH THE ON-BOARD COMPUTER (**ET Connect**).



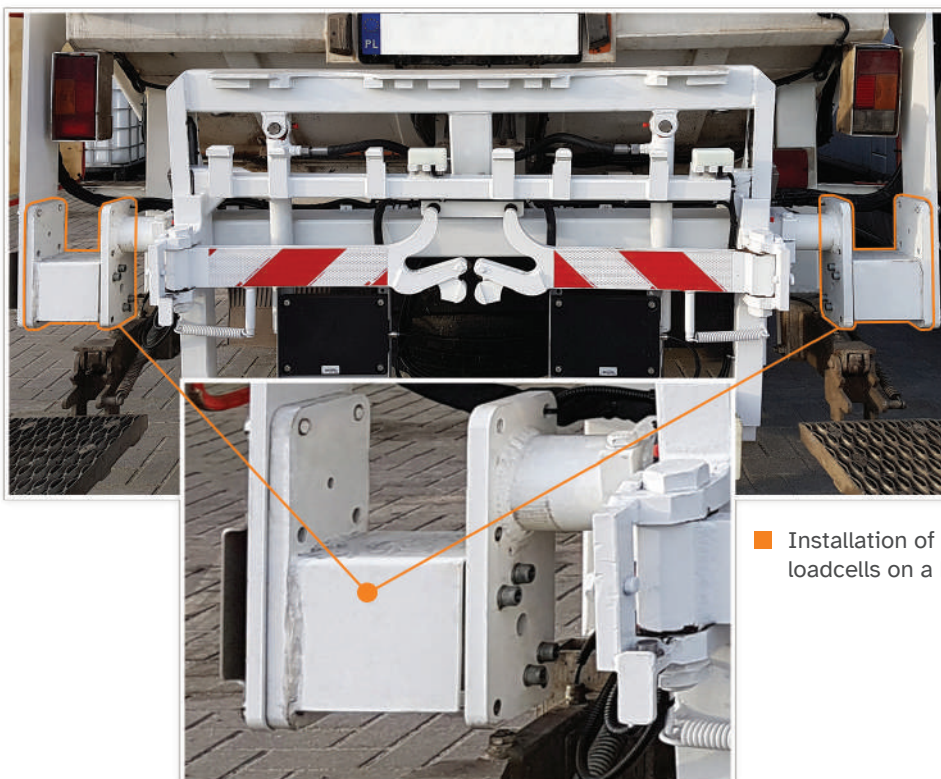
front-loaded  
garbage truck



side-loaded  
garbage truck



rear-loaded garbage  
truck

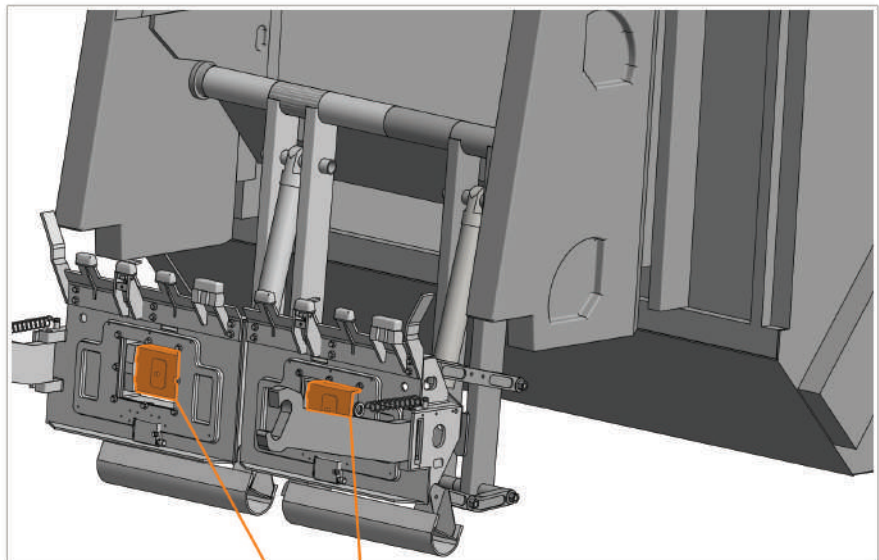


- Installation of dynamic weighing system on a single waste container lifter

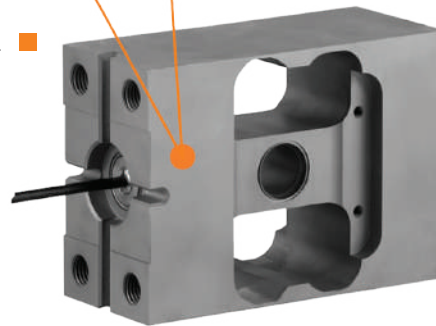
- Installation of loadcells on a bin lifter



Installation of dynamic weighing  
system on a single waste container  
lifter



Loadcell



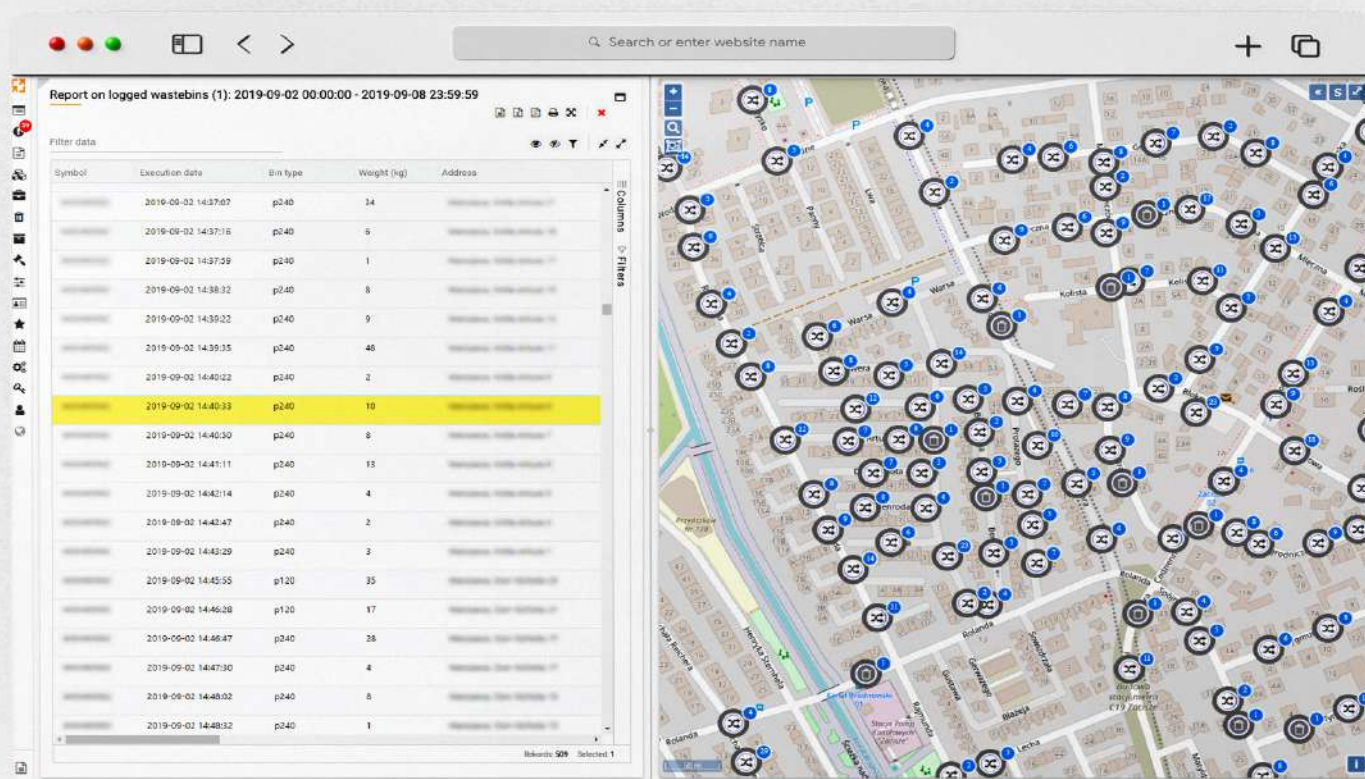
List of weighing results			
L.P.	Weighing time	Loader side	Weight [kg]
1	07:37:58	1	86.0
2	07:38:03	2	45.0
3	07:39:41	1	101.0
4	07:40:32	1	72.0
5	07:41:00	2	97.0
<div> <div>Erase weighing memory</div> <div>Assign weight</div> <div>Cancel</div> </div>			

ELTE GPS

A list of weighing results

The on-board computer installed in the vehicle shows the mass of individual weighing operation. This enables the staff to monitor if the task is carried out correctly.

The information saved during the process of dynamic weighing is sent to a database. This allows for remote reading of the data and for generating reports, e.g. on the amount of waste collected from individual residents (waste collection points).



■ A weighting report showing the location of wastebins on a map

## THE COMPANIES WHICH CARRY OUT OR SUPERVISE WASTE COLLECTION CAN USE THE DYNAMIC WASTE WEIGHING SYSTEM FOR:

- precise settlement of the weight of waste collected from residents;
- monitoring the extent to which waste is sorted by residents and businesses;
- comparing the weight of waste collected by the vehicle with the weight of waste dumped in a landfill.

## ■ STATIC WASTE WEIGHING SYSTEM

The **ET Static** has been designed as a solution for static weighing of municipal waste. Static weighing can be automated, but it is necessary to temporarily stop the emptying of wastebins and/or waste containers.

### KEY SYSTEM FEATURES:

- CAN BE USED IN VARIOUS TYPES OF WASTE COLLECTION VEHICLES (picture below)
- EQUIPPED WITH A SET OF PROFESSIONAL DEVICES, including a weighing computer and a set of loadcells
- ALLOWS A WIDE RANGE OF MEASUREMENTS
- MAY BE OFFICIALLY APPROVED BY COMPETENT AUTHORITY
- CAN BE COMBINED WITH THE ROUTE PLANNING AND SCHEDULING SYSTEM (**ET Plan**)
- CAN BE COMBINED WITH THE ROUTE AND SCHEDULE CONTROL SYSTEM (**ET Control**)
- WORKS WITH THE ON-BOARD COMPUTER (**ET Connect**).



truck with a hydraulic crane system



hookloader

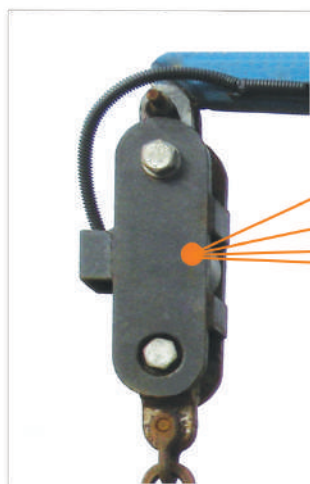


skip loader



garbage truck

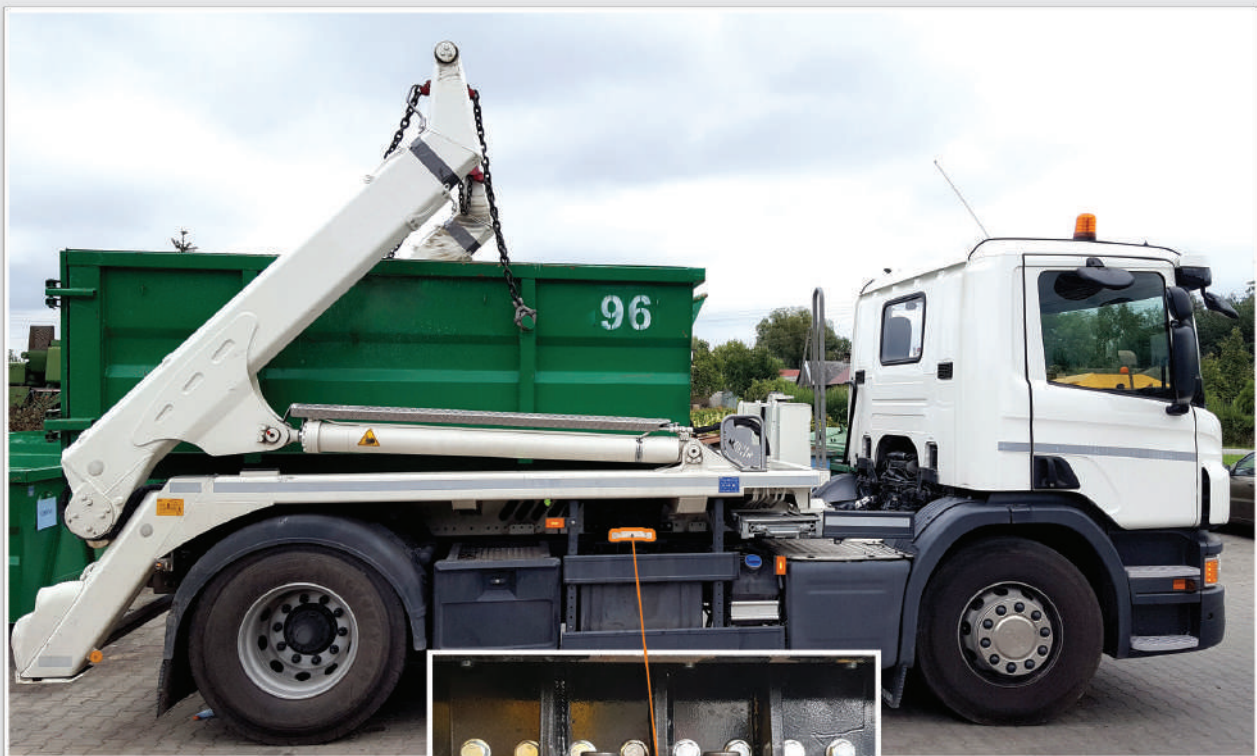
Installation of loadcells in the weighing system for a truck designed to empty KP7 type waste containers



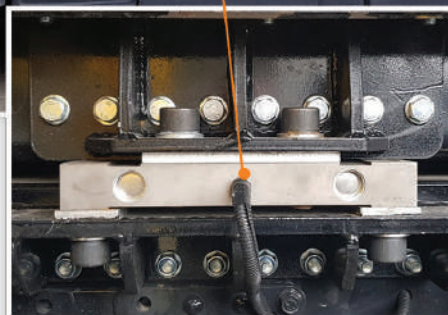




■ Installation of loadcells in the weighing system for a truck with a hydraulic crane system



Example of loadcell ■



■ Location of loadcells in the weighing system for a garbage truck

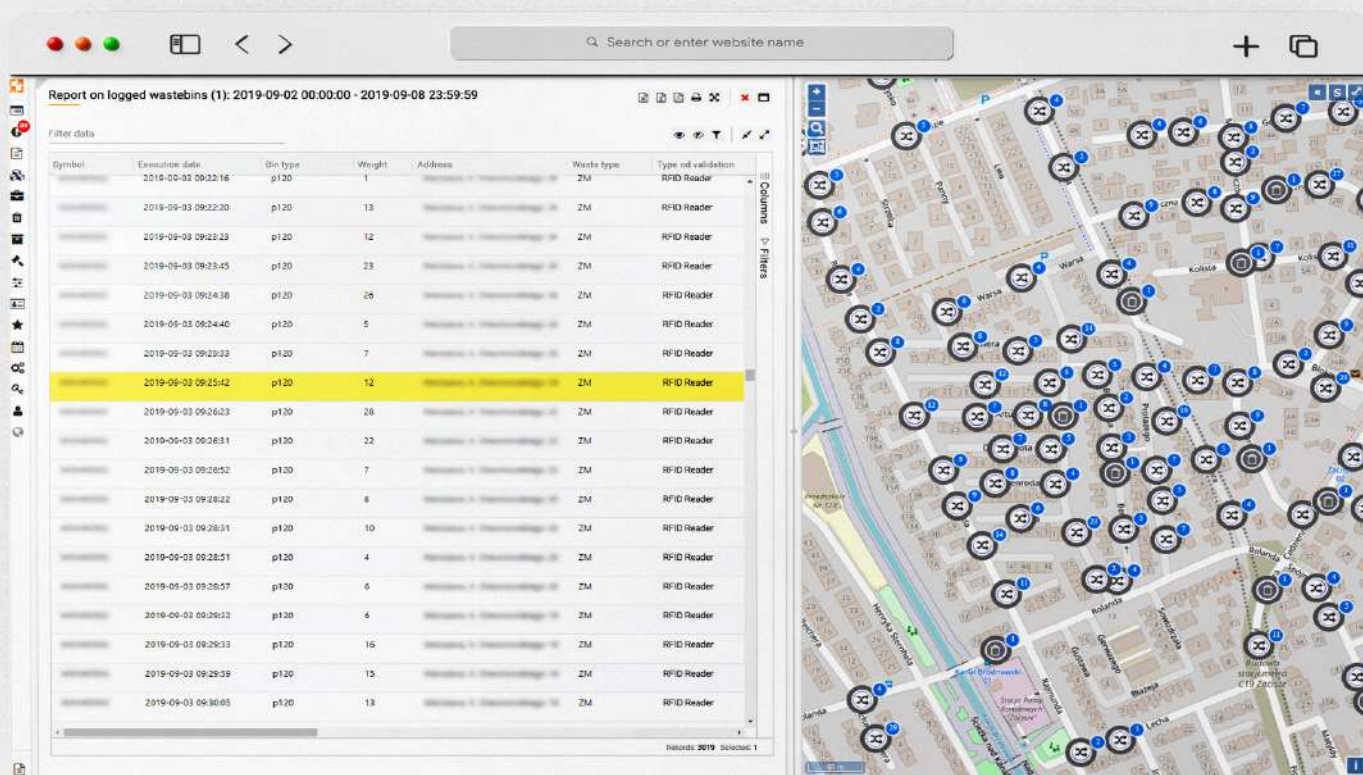


The on-board computer installed in the vehicle shows the mass of individual weighing operation. This enables the staff to monitor if the task is carried out correctly.



On-board computer with a list of weighing results

The information saved during the process of static waste weighing is sent to a database. This allows for remote reading of the data and for generating reports, e.g. on the amount of waste collected from individual residents (waste collection points).



A weighing report showing the location of wastebins and/or containers on a map

GOOD COMMUNICATION IS KEY TO EFFECTIVE WORK

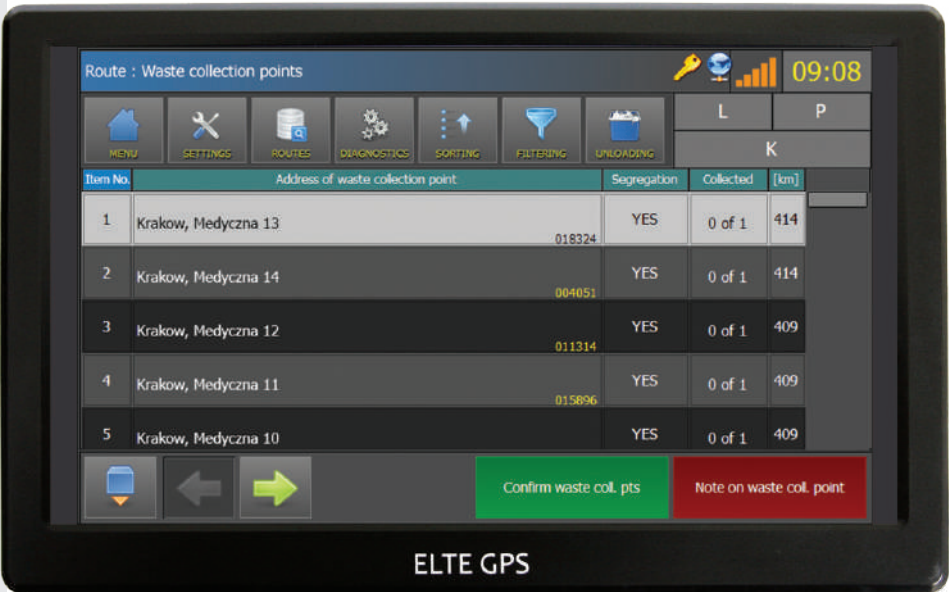
DRIVER COMMUNICATION SYSTEM

The **ET Connect** system supports and facilitates the execution of tasks. Among other things, it offers communication with the driver, GPS navigation, and diagnostics of GPS/RFID system components installed in the vehicle. You can also view a route plan as a list of task points. Any irregularities can be reported by the vehicle crew with predefined notes or personal notes, to which photos may be attached.

The Diagnostics feature in the on-board computer allows you to check the operation of each device of ELTE GPS systems installed in the vehicle.



The on-board computer also permits viewing the planned route as a list of task points.



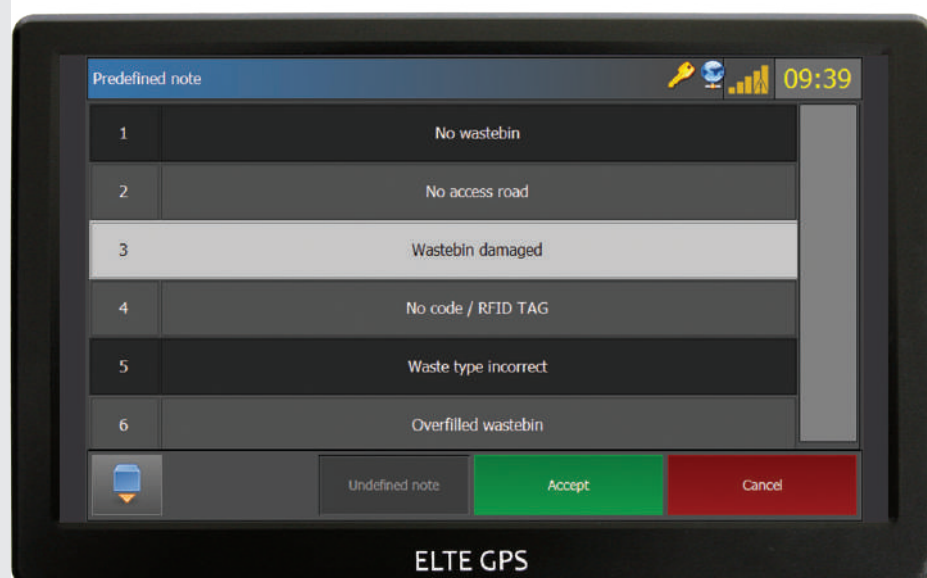
The Navigate function allows for automatic guidance to the selected waste collection point without the need to enter its address in the application installed in the on-board computer.



The on-board computer can also show a list of wastebins (with details of their type, volume and purpose) which are to be emptied on the planned route.



Any irregularities may be reported by the vehicle crew by their own notes or predefined notes. A note can be linked with a waste collection point or to a specific wastebin or bag.

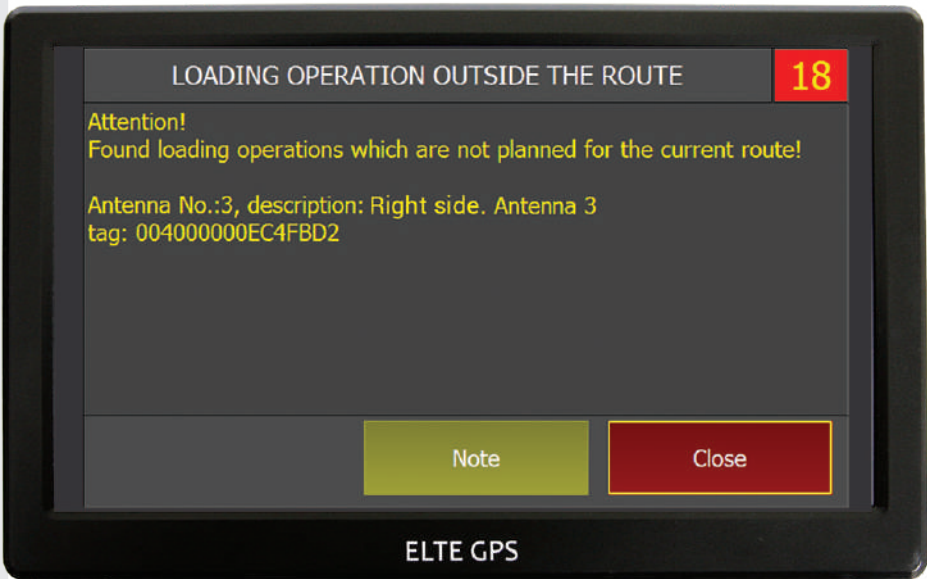




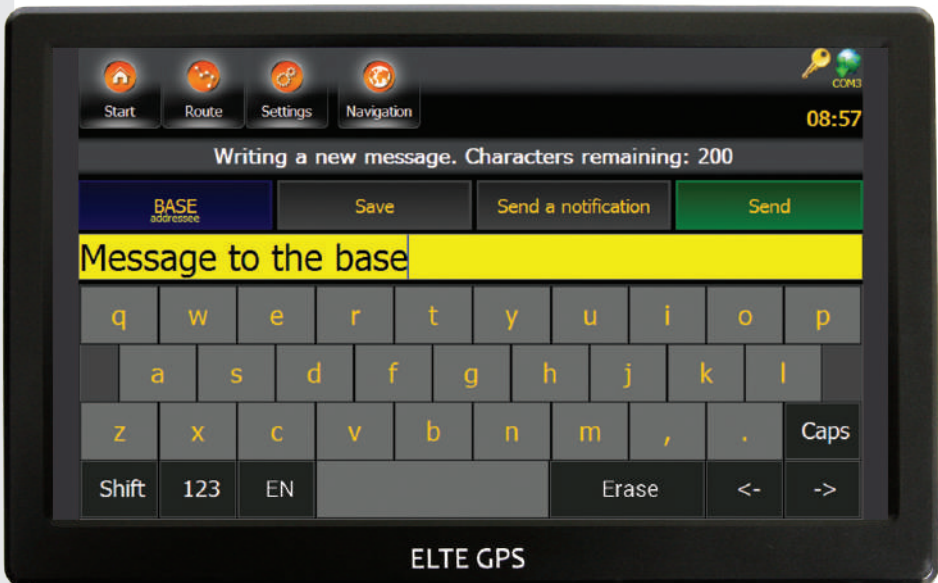
You can use a mobile device with a built-in camera to upload photos to the on-board computer using WIFI network. The sent photo is attached to a note of any irregularity found at a waste collection point.



On-board computer software signals irregularities during the route, e.g. collection of container that was not included in the route plan.



The on-board computer permits two-way communication with the operator.



## RECORDING AND MONITORING

# IMAGE RECORDING SYSTEM

The **ET Pics** system allows for using photos or videos to document any irregularities or the completion of tasks. The advantage of the system is the capability of geotagging photos and videos. This function adds the geographical location to a registered image, which allows you to search quickly for images captured while providing the service at the location shown on the map, e.g. a street or a specific address. This system proves useful in verifying the completion of tasks and investigating any complaints. **ET Pics** offers various solutions depending on whether you want to record the image as photos or videos.

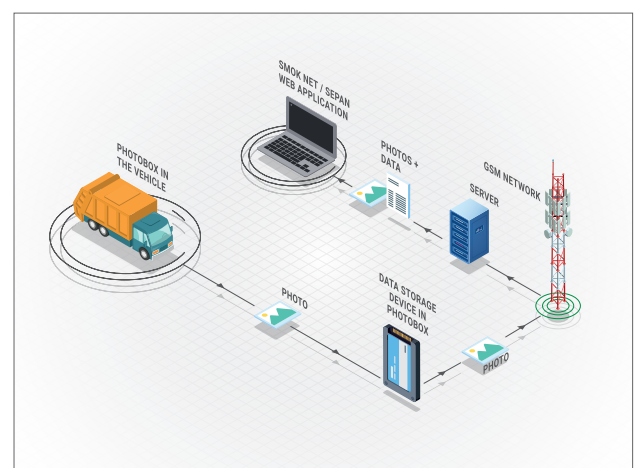
### VIDEO RECORDER:

- captures the image in the form of videos;
- allows you to record the image from multiple cameras;
- offers customizable image recording, e.g. activation by the ignition key, starting the PTO, etc.;
- is customizable in terms of the quality of the recorded image;
- allows you to send recorded images on-line and/or to save them on an SD card or HDD disk drive.



### PHOTO RECORDER - PHOTOBX:

- captures the image in the form of photos;
- allows you to record the image from multiple cameras;
- is configurable in terms of the frequency of taking photos;
- is customizable in terms of the quality of the recorded image;
- allows you to send recorded images on-line and/or to save them on an SD card.

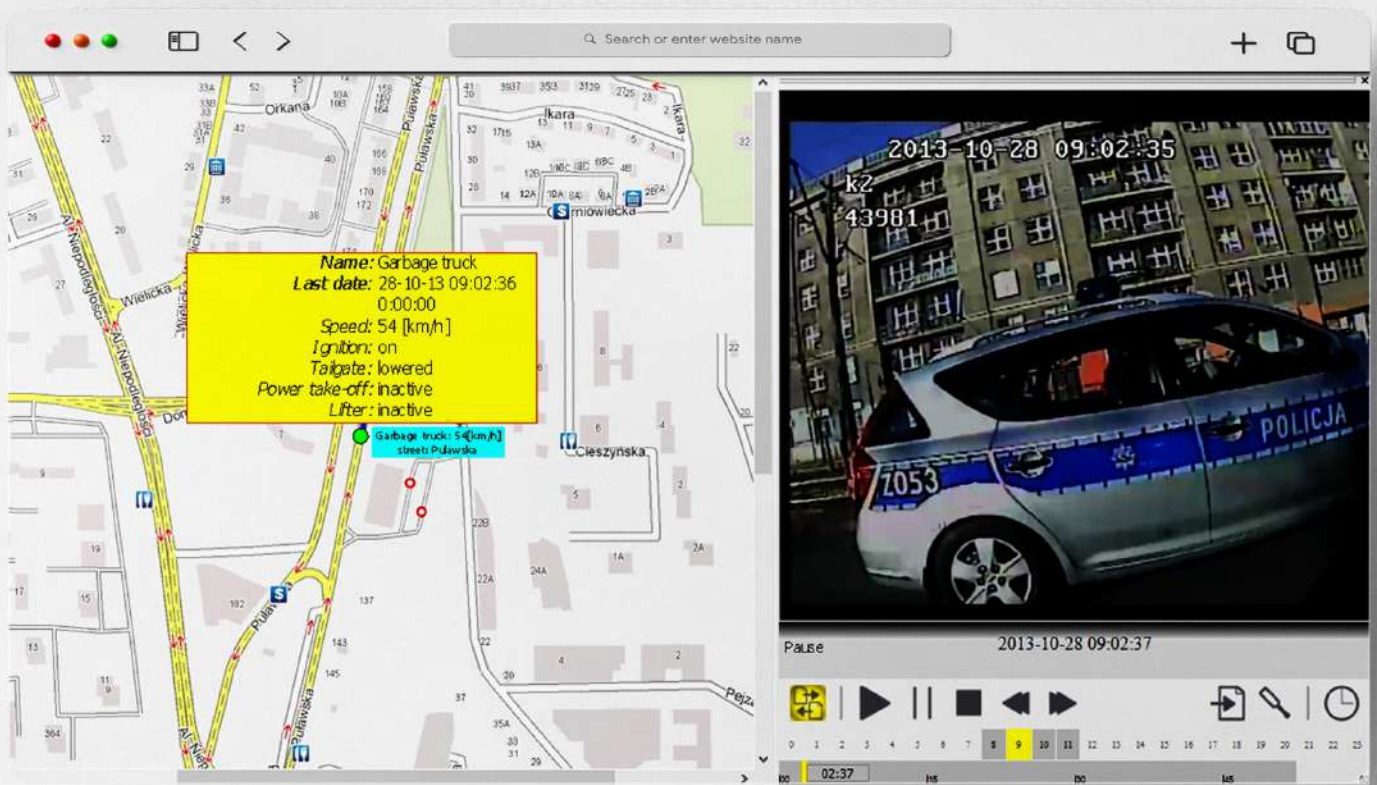


The image recording system enables you to view an object on a digital map synchronized with the photos or videos captured at a given location.



View of the system with the photo display feature





View of the system with the video display feature

You can use a mobile device with a built-in camera to upload photos to the on-board computer using WIFI network. The sent photo is attached to a note of any irregularity found at a waste collection point.



On-board computer - a photo may be attached to a note

## SYSTEM FOR DEMANDING TASKS

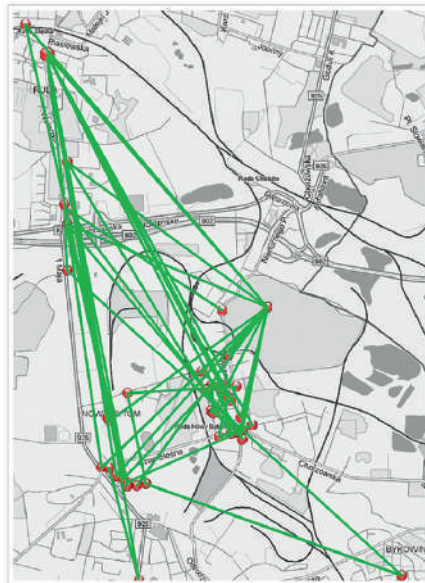
## ROUTE OPTIMIZATION SYSTEM

The main challenge for the staff in charge of route planning is the optimal use of the fleet, and planning the routes so that vehicles travel the shortest distance, completing all task as quickly as possible.

Our **ET Optimal** system resolves these issues and ensures efficient use of your fleet. The system takes into account a number of variables and parameters required for the effective planning of routes. It takes into account the capacity of vehicles and wastebins, the frequency of their emptying and their locations. The route is planned so as to maximally reduce the time between waste collection and waste unloading while keeping the mileage as low as possible.

Once the right parameters and variables are entered, the system will plan the routes according to the set criteria.

Route before optimization



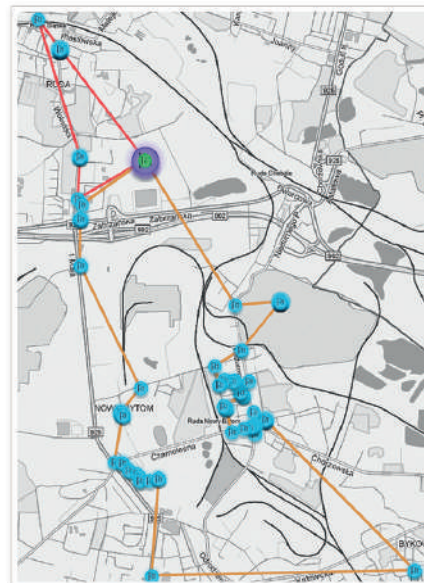
● Task location

● Place of reloading

— cycle 1

— cycle 2

Route after optimization



### BENEFITS OF ET OPTIMAL SYSTEM:

- boosting the efficiency of planners and staff carrying out tasks;
- reduction of mileage and time of order completion;
- optimal allocation of tasks and use of vehicles;
- reduced costs of transport;
- efficient implementation of tasks and improvement of service quality;
- enhanced competitiveness of your company;
- monitoring the correctness of task completion.



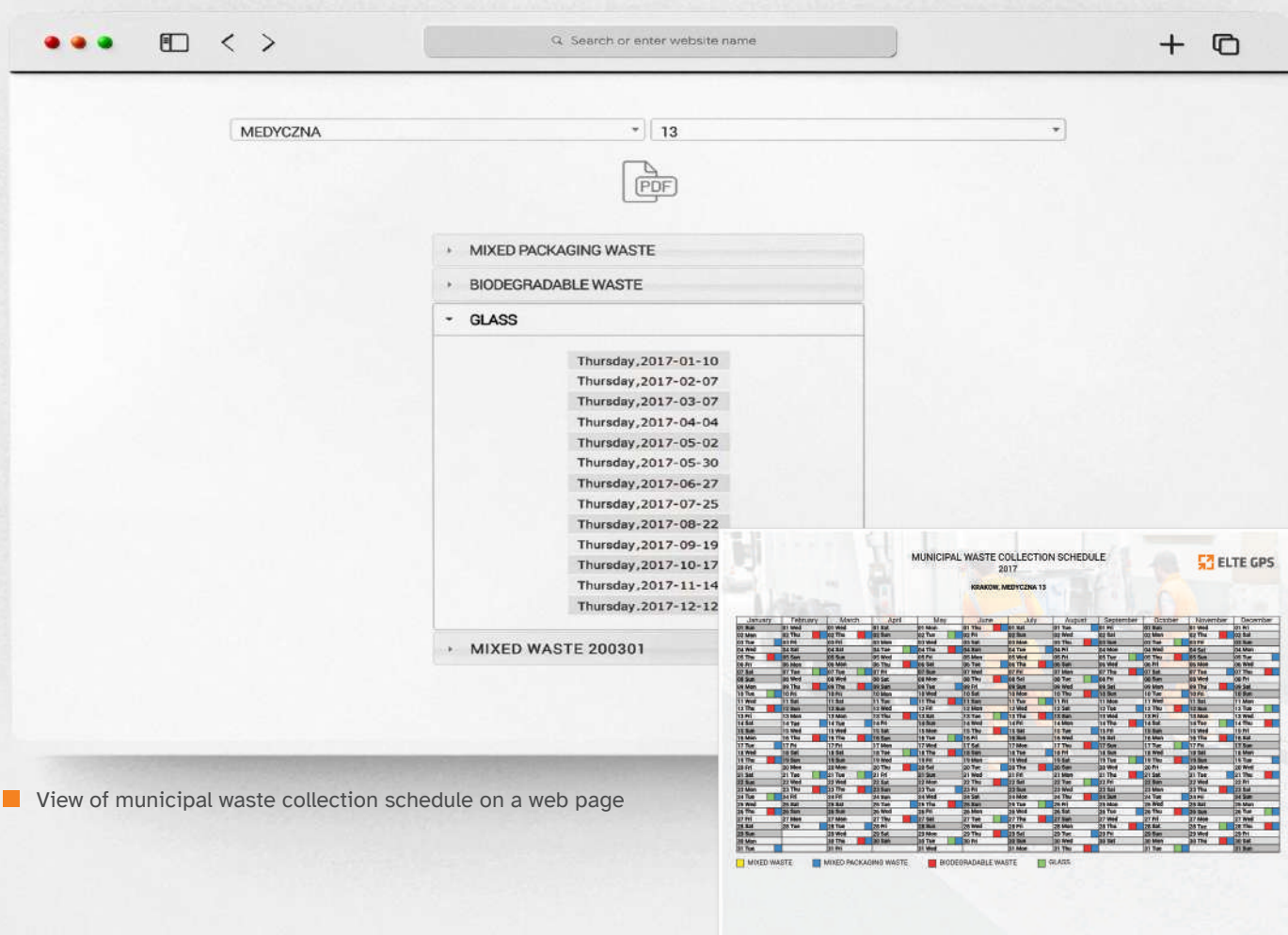
# ROUTE PLANNING AND SCHEDULING SYSTEM

The system permits planning of waste collection based on the declared frequency, type of waste and number of wastebins. In this way schedules can be created for a number of days without having to plan each day individually.

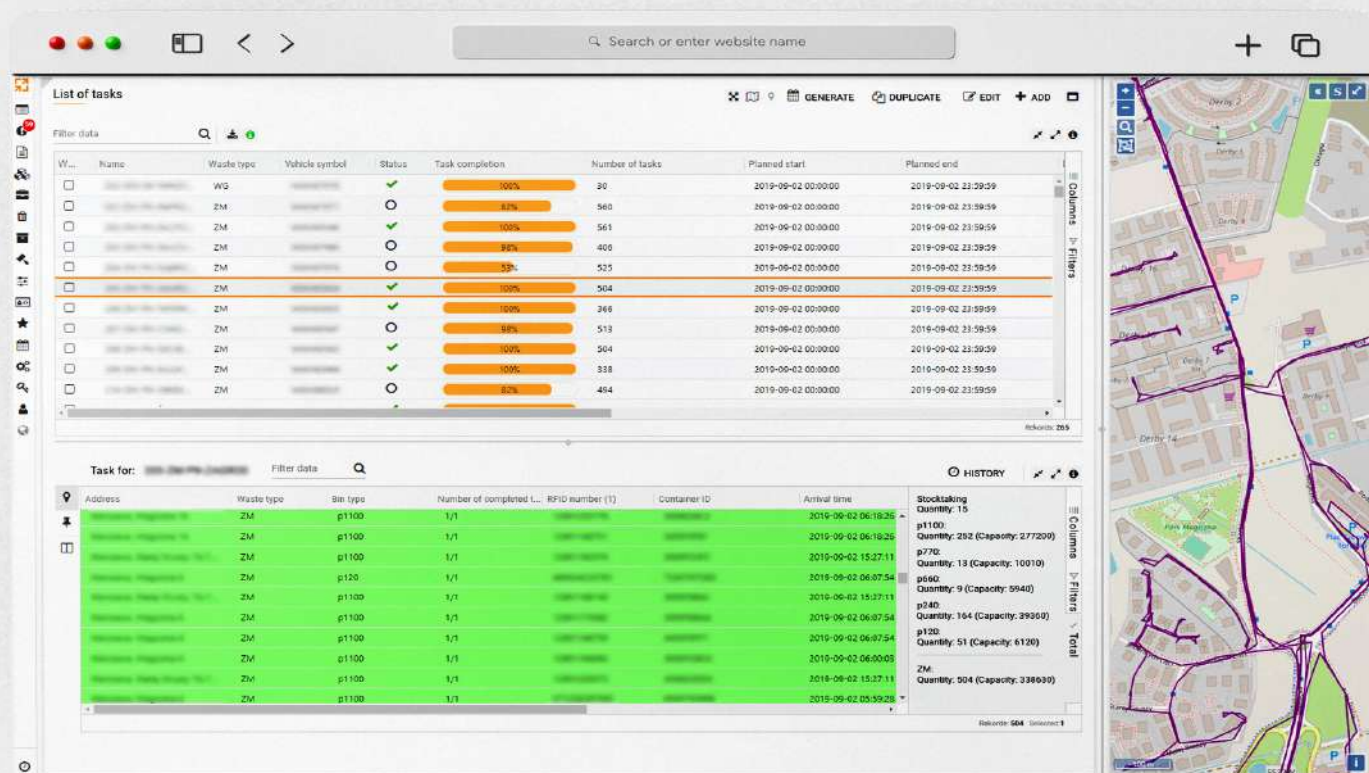
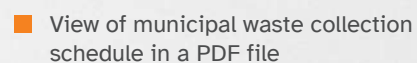


The main calendar view with the waste collection schedule and locations of loading operations displayed on the map





- View of municipal waste collection schedule on a web page



View of the task window with its completion status

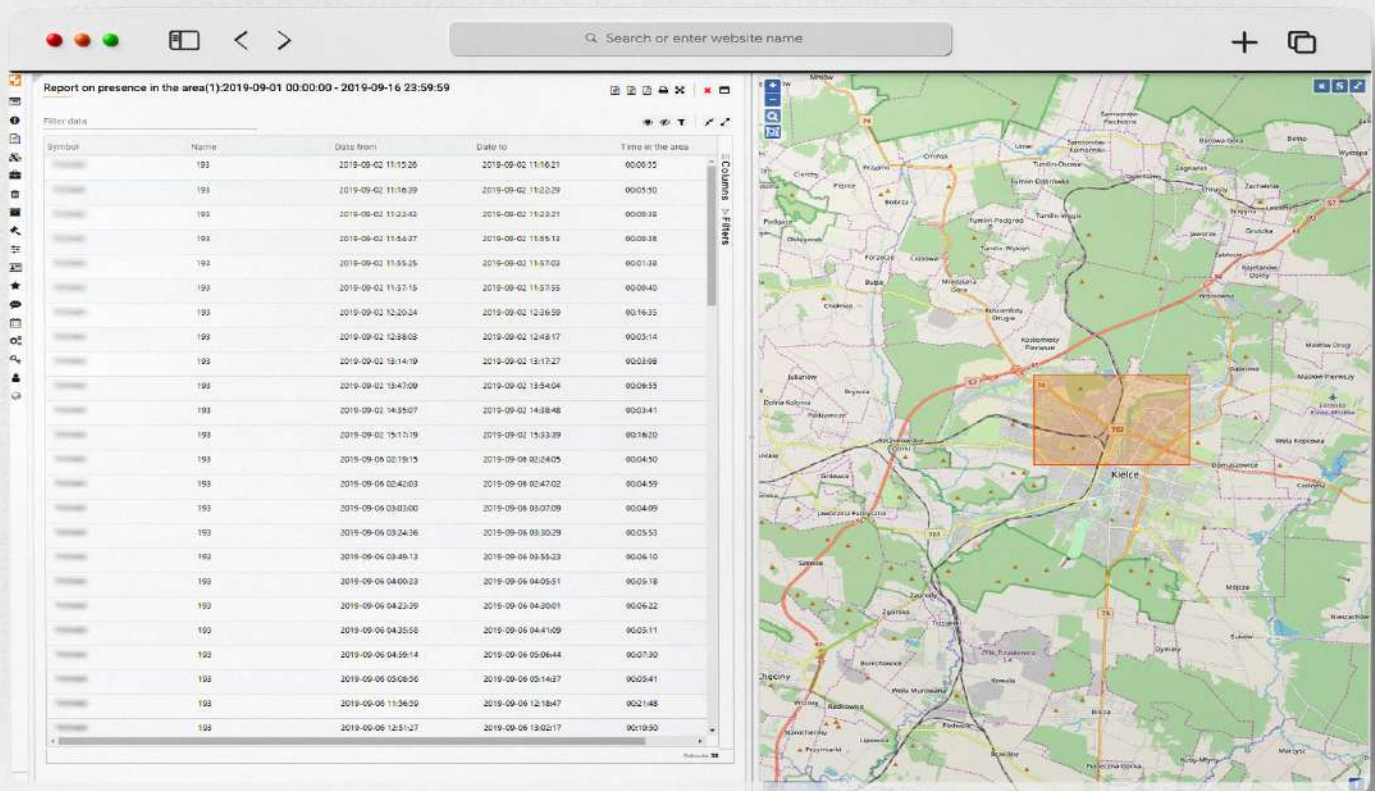
## SYSTEM FOR IMPLEMENTATION AND CONTROL OF ROUTES AND SCHEDULES

This system is the perfect tool to assess the quality of waste collection services. Not only does it enable you to check the work of vehicle crews, but it also offers the feature of reporting and searching for information about completed and unfinished tasks for any address (point), area, vehicle or date.

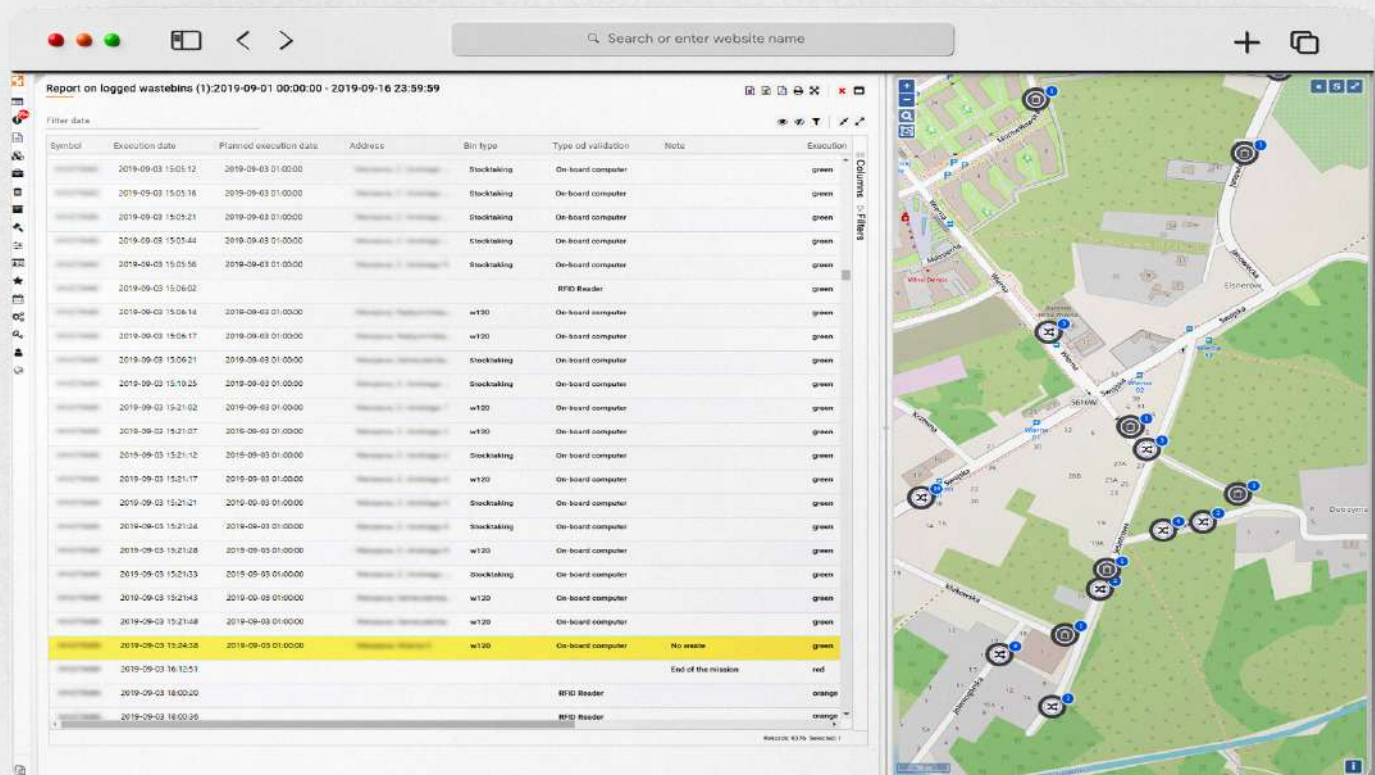
The screenshot shows a web application interface for task management. The main area is a table titled 'List of tasks' with the following columns: Name, Waste type, Vehicle symbol, Status, Task completion, Planned start, Planned end, and Startdatum. The table contains multiple rows of task data. The 'Task completion' column uses orange progress bars to indicate the status of each task. The 'Status' column uses icons to represent different task states. The 'Planned start' and 'Planned end' columns show dates and times. The 'Startdatum' column shows the actual start date. On the right side, there is a 'Task clipboard' section with a list of tasks and their details. At the bottom left, there is a 'Task for' section with a search bar and a list of tasks. The interface is clean and professional, with a light gray background and clear typography.

View of search orders window





■ Searching objects in a designated area



■ Report on logged wastebins with information about completed and unfinished tasks with a note attached



ALL INFORMATION IN ONE PLACE

## VEHICLE AND EMPLOYEE REGISTER SYSTEM

**ET Register** is a vehicle and employee register system, which stores the databases of vehicles used in the company and the data of employees.

### THIS SOLUTION OFFERS A QUICK ACCESS TO:

- vehicle data (such as the registration number, VIN, year of manufacture, color, etc.);
- operating costs, including the history of repairs, refuelling, insurance policies and accidents;
- information about the cost of maintaining the fleet;
- an active schedule which reminds of upcoming events such as vehicle checkups, technical inspections, official inspections, tachograph authentication etc.

Workshop evidence

Filter data

Vehicle	Type of task	Notification date	Executed	Task description	Additional description	Planned service date	Service execution date	Reporting person	Cost	Mileage
...	service	2019-09-26 10:42:14	✗	service		2019-09-26 10:42:14		administrator		24580 km
...	service	2019-08-30 15:03:20	✓	service		2019-08-30 15:03:20	2019-08-30 11:25:00	administrator	2.345 EUR	120456 km
...	Periodical vehicle m...	2018-03-03 09:22:01	✓	Periodical vehicle inspection		2018-03-03 09:22:01	2018-03-03 10:40:25	administrator	525 EUR	54178 km
...	service	2018-03-02 16:40:46	✓	service		2018-03-02 16:40:46	2018-03-10 09:02:30	administrator	788 EUR	33413 km
...	Vehicle inspection	2018-01-20 11:34:29	✓	Vehicle inspection		2018-01-20 11:34:29	2018-01-20 18:00:00	administrator	100 EUR	10000 km
...	service	2017-11-05 12:27:54	✓	service		2017-11-05 12:27:54	2017-11-13 09:58:51	administrator	1.234 EUR	65520 km
...	service	2017-10-17 15:00:05	✓	service		2017-10-17 15:00:05	2017-10-23 11:50:42	administrator	3.100 EUR	58952 km

Records: 1

Execution details

Filter data

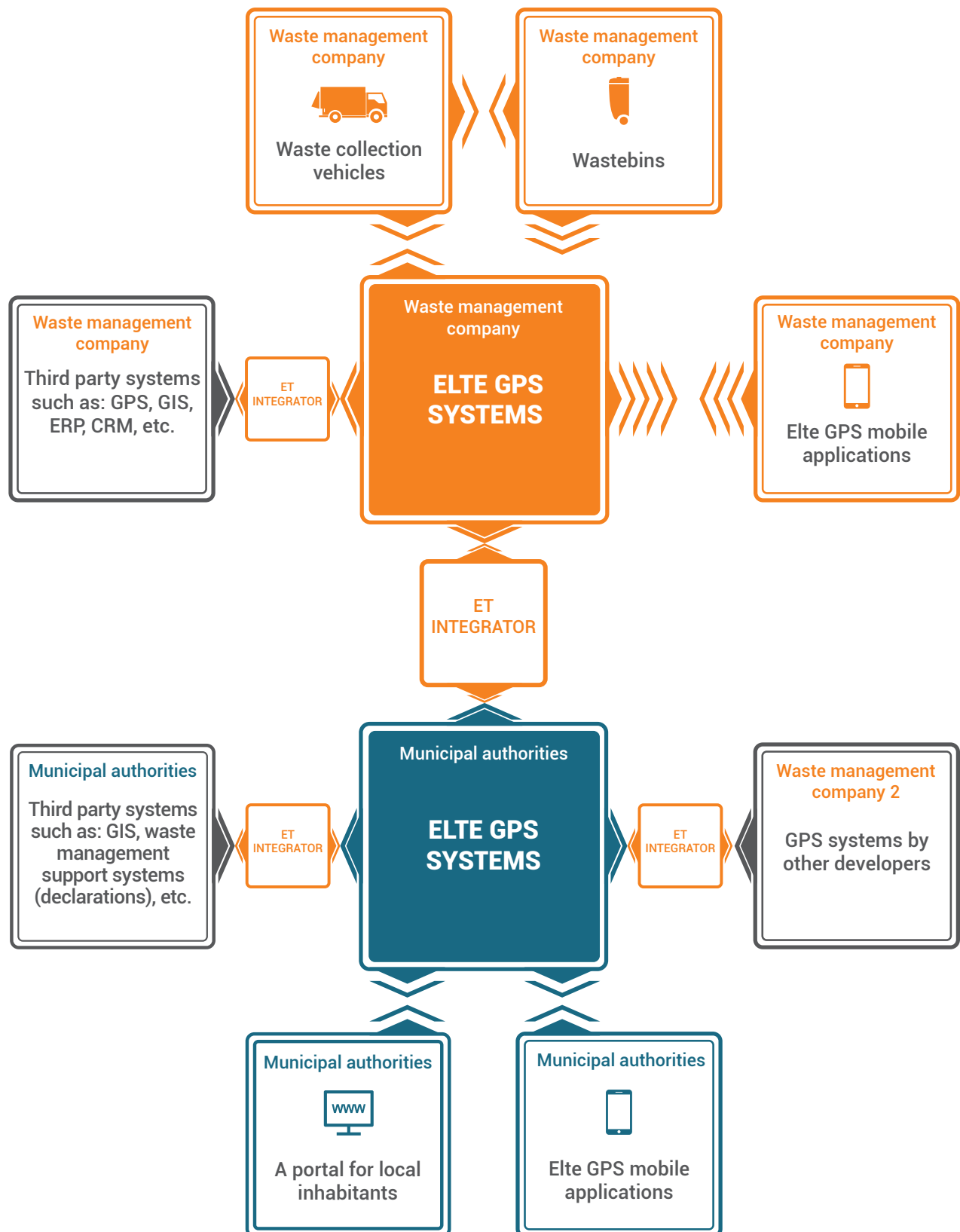
Activity	Status of service	Description	Mileage	Planned execution date	Execution date	Kosten	Personne responsible for execution	Date of creation
Repair	new	Alternator repair	24580 km	2019-09-28 10:43:47		480	...	2019-09-25 10:46:49
Replacement	new	Tires	24580 km			890	...	2019-09-25 10:46:49
Replacement	new	Light replacement	24580 km			95	...	2019-09-25 10:46:49
Replacement	new	Spark plug replacement	24580 km				...	2019-09-25 10:46:49
Deletion	new	Hood damage	24580 km	2019-09-30 10:43:49		1430	...	2019-09-25 10:46:49
Other	Completed	Diagnostic	24580 km	2019-09-24 10:43:14		250	...	2019-09-25 10:46:49

Records: 6

- The active schedule may be set up in the time interval mode (e.g. every year) or the distance interval mode (e.g. every 20,000 km). The schedule takes into account dynamically changing data about vehicles, e.g. mileage

## INTEGRATION SYSTEM

The **ET Integrator** system enables the integration of our ICT solutions with other systems, including the systems for clearing the provided services, monitoring of working time, invoicing, scheduling, etc. The data can be exchanged via files or Webservice.



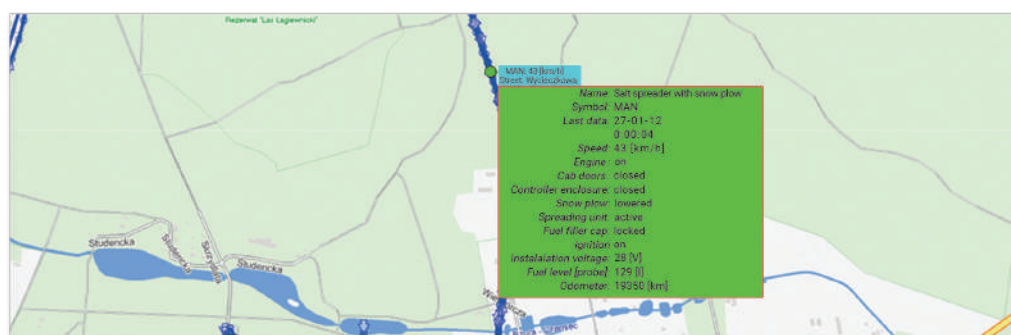
■ Diagram of **ET Integrator** system for waste management companies and municipal authorities

## KEEPING WINTER AND SUMMER UNDER CONTROL

# SUMMER AND WINTER ROAD MAINTENANCE SYSTEM

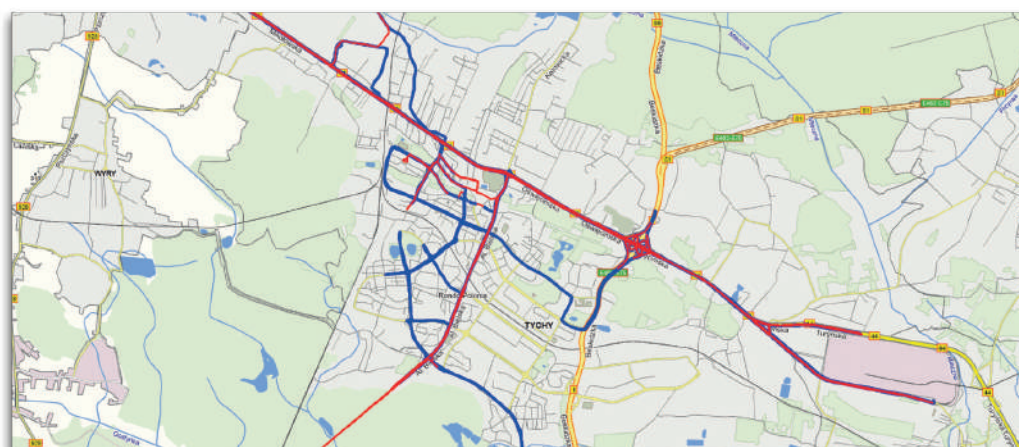
**ET Roads** is a system that monitors municipal specialized vehicles such as salt spreaders with snow plows or sweepers. The system supports and controls processes related to summer and winter road maintenance.

Salt spreaders with snow plows are equipped with sensors of plow position and sensors of salt spreading, which allows for monitoring their operation. Information about the operation of these sensors is transmitted to the SEPAN system software with other basic data such as simultaneously registered location and time. In the case of sweepers, the activation signal for brushes and the sprinkler may be monitored. Modern sweepers and salt spreaders also make it possible to read these and other data (such as the amount and width of salt spreading) via the CAN-BUS.



■ A map view with the location of vehicle and its parameters

The data recorded by the devices mounted on vehicles for snow removal and road cleaning are displayed in the SEPAN application.



— serviced route

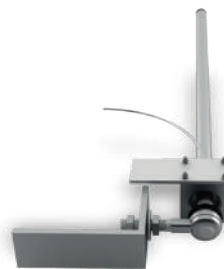
— covered route



The SMOK system allows you to generate a variety of reports on summer and winter road maintenance services.



■ Salt spreading sensor



Plow position sensor ■

Search or enter website name

Report - Summary report on winter road maintenance - details (1)

Vehicle	Date	Location	Travel time	Distance	Ploughing without spreading - time	Ploughing without spreading - distance	Spreading without ploughing - time	Spreading without ploughing - distance	Ploughing and spreading - time	Ploughing and spreading - distance
2017-01-01 00:00:00					0.0		0.0			
2017-01-01 16:22:01			01:25:33	16.9	0.0		0.0		0.0	
2017-01-01 04:17:09			00:00:27	1.3	0.0		0.0		0.0	
2017-01-01 04:18:08			00:16:04	4.2	0.0		0.0		0.0	
2017-01-01 04:19:48			00:02:15	1.9	0.0		0.0		0.0	
2017-01-01 04:22:04			00:01:51	1.6	0.0		0.0		0.0	
2017-01-01 04:23:55			00:03:08	1.0	0.0		0.0		0.0	
2017-01-01 04:24:22			00:02:15	1.2	0.0		0.0		0.0	
2017-01-01 04:25:19			00:00:57	0.6	0.0		0.0		0.0	
2017-01-01 04:26:16			00:03:06	1.3	0.0		0.0		0.0	
2017-01-01 04:27:42			00:04:44	6.5	0.0		0.0		0.0	
2017-01-01 04:40:34			00:02:28	0.9	0.0		0.0		0.0	
2017-01-01 04:51:59			00:01:05	0.6	0.0		0.0		0.0	
2017-01-01 05:06:09			00:01:13	0.6	0.0		0.0		0.0	
2017-01-01 07:01:04			00:05:28	3.1	0.0		0.0		0.0	
2017-01-01 07:01:44			00:00:36	0.4	0.0		0.0		0.0	
2017-01-01 07:03:13			00:08:57	7.1	0.0		0.0		0.0	
2017-01-01 07:07:34			00:06:01	3.6	0.0		0.0		0.0	
2017-01-01 07:08:45			00:01:05	0.5	0.0		0.0		0.0	
2017-01-01 07:18:30			00:07:20	3.4	0.0		0.0		0.0	
2017-01-01 07:19:39			00:15:39	4.5	0.0		0.0		0.0	
2017-01-01 08:39:46			00:03:29	1.7	0.0		0.0		0.0	
2017-01-01 08:40:07			00:01:50	1.0	0.0		0.0		0.0	
2017-01-01 08:40:36			00:04:34	1.4	0.0		0.0		0.0	
2017-01-01 09:12:42			00:02:23	1.1	0.0		0.0		0.0	
2017-01-01 09:43:51			00:05:51	0.6	0.0		0.0		0.0	
2017-01-01 09:49:42			00:16:35	6.2	0.0		0.0		0.0	
2017-01-01 06:07:09			00:23:57	5.4	0.0		0.0		0.0	
2017-01-01 06:07:42			00:09:40	0.4	0.0		0.0		0.0	
2017-01-01 06:14:52			00:01:36	0.9	0.0		0.0		0.0	
2017-01-01 06:15:43			00:02:13	0.9	0.0		0.0		0.0	

Download complete 34MB / 276MB 184° 2' 3" 53° 7' 51"

## THE ET ROADS SYSTEM ALLOWS THE USER:

- to obtain current information about the location of tasks;
- to create reports on completed tasks;
- to check if the tasks were completed correctly.

Report - Daily GPS Report

Id	Maintenance service	Name of the street	km to maintain	equipment operation	% of maintained km
3	1	Arm Krajowej	0.795	0.000	0%
4	1	Banadilla	0.136	0.000	0%
5	1	Warszewice	1.057	0.000	0%
6	1	Celników	0.280	0.000	0%
7	1	Chopina	0.898	0.000	0%
8	1	Chropaczówka	1.948	0.000	0%
9	1	Dąb	1.580	0.000	0%
10	1	Dąbrowska	1.852	0.000	0%
11	1	Dąbrowskiego	1.458	0.000	0%
12	1	Olguszyńska	2.068	0.000	0%
13	1	Smoli Piater	0.828	0.000	0%
14	1	Fabryczna	0.825	0.000	0%
15	1	Górników z Danuty	0.727	0.000	0%
16	1	Grunwaldzka	2.934	0.000	0%
17	1	Henryka Patryki	0.393	0.000	0%
18	1	Korczyńskiego	0.700	0.000	0%
19	1	Hetmańska	1.210	0.000	0%
20	1	Inwestycyjna	0.583	0.000	0%
21	1	Jana Kantego Steczkowskiego	0.135	0.000	0%
22	1	Kaczeńców	1.439	0.000	0%
23	1	Katowicka	2.800	0.000	0%
24	1	Ks. Maksymiliana Kolbego+ parki...	0.309	0.000	0%
25	1	Letnia	1.132	0.000	0%
26	1	Karczana	0.661	0.000	0%
27	1	Łącznik Grunwaldzkiej z Al. Tysię...	0.540	0.000	0%
28	1	Martyniaków	4.046	0.000	0%
29	1	Matęgi	0.734	0.000	0%
30	1	Młynarska	0.853	0.000	0%
31	1	Meniszki	1.335	0.000	0%
32	1	Mostowa	0.416	0.000	0%
33	1	Obrońców Władzina 1939	3.052	0.000	0%

DESIGNED TO SAVE YOUR MONEY

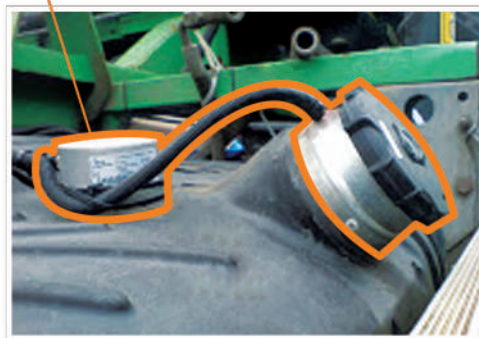
## FUEL MANAGEMENT SYSTEM

The **ET Fuel** system has been designed to facilitate fuel management. It enables fast and efficient compilation of data about fuel tanking and fuel consumption with regard to a particular vehicle or a group of vehicles.

Fuel consumption may be monitored thanks to a range of gauges and signalling devices such as the CAN interface, digital microprocessor fuel probe and fuel filler cap sensor with an anti-theft strainer.



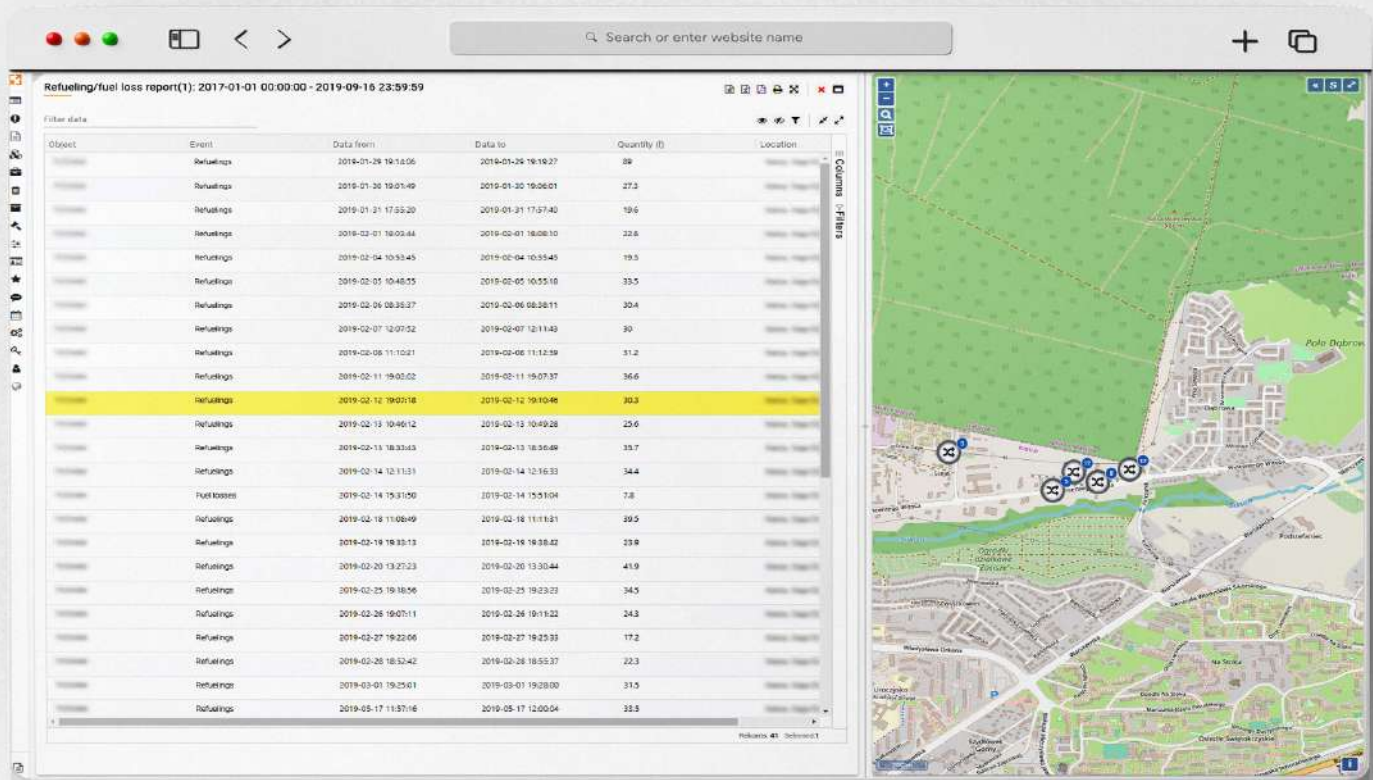
The fuel tank cross section showing the installation of a digital microprocessor fuel probe and a fuel filler cap sensor with an anti-theft strainer.



■ Installation of digital microprocessor fuel probe with an RFID fuel filler cap sensor and an anti-theft strainer



CAN interface



A system window with the report on refueling/fuel losses, graph of fuel consumption over time and a map of refueling locations

Object	Event	Data from	Data to	Quantity (l)	Location
	Refuelings	2018-01-29 18:14:06	2018-01-29 18:19:27	89	Kielce
	Refuelings	2019-01-30 19:01:49	2019-01-30 19:06:01	27.3	Kielce
	Refuelings	2019-01-31 17:55:20	2019-01-31 17:57:40	19.6	Kielce
	Refuelings	2019-02-01 18:03:44	2019-02-01 18:08:10	22.6	Kielce
	Refuelings	2019-02-04 10:53:45	2019-02-04 10:55:45	19.3	Kielce
	Refuelings	2019-02-05 10:48:55	2019-02-05 10:55:18	33.5	Kielce
	Refuelings	2019-02-06 08:35:37	2019-02-06 08:38:11	30.4	Kielce
	Refuelings	2019-02-07 12:07:52	2019-02-07 12:11:43	30	Kielce
	Refuelings	2019-02-08 11:10:21	2019-02-08 11:12:59	31.2	Kielce
	Refuelings	2019-02-11 19:02:02	2019-02-11 19:07:37	36.6	Kielce
	Refuelings	2019-02-12 19:07:18	2019-02-12 19:10:46	30.3	Kielce
	Refuelings	2019-02-13 10:46:12	2019-02-13 10:49:28	25.6	Kielce
	Refuelings	2019-02-13 18:33:43	2019-02-13 18:36:49	35.7	Kielce
	Refuelings	2019-02-14 12:11:31	2019-02-14 12:16:33	34.4	Kielce
	Fuel losses	2019-02-14 15:31:50	2019-02-14 15:51:04	7.8	Kielce
	Refuelings	2019-02-18 11:08:49	2019-02-18 11:11:21	38.5	Kielce
	Refuelings	2019-02-19 19:33:15	2019-02-19 19:38:42	23.9	Kielce
	Refuelings	2019-02-20 13:27:23	2019-02-20 13:39:44	41.9	Kielce
	Refuelings	2019-02-25 19:18:56	2019-02-25 19:23:23	34.5	Kielce
	Refuelings	2019-02-26 19:07:11	2019-02-26 19:11:22	24.3	Kielce
	Refuelings	2019-02-27 19:22:06	2019-02-27 19:25:33	17.2	Kielce
	Refuelings	2019-02-28 18:52:42	2019-02-28 18:55:37	22.3	Kielce
	Refuelings	2019-03-01 19:25:01	2019-03-01 19:28:09	31.5	Kielce
	Refuelings	2019-05-17 11:57:16	2019-05-17 12:00:04	33.5	Kielce

An example of fuel management reports - Fuel loss and refueling report



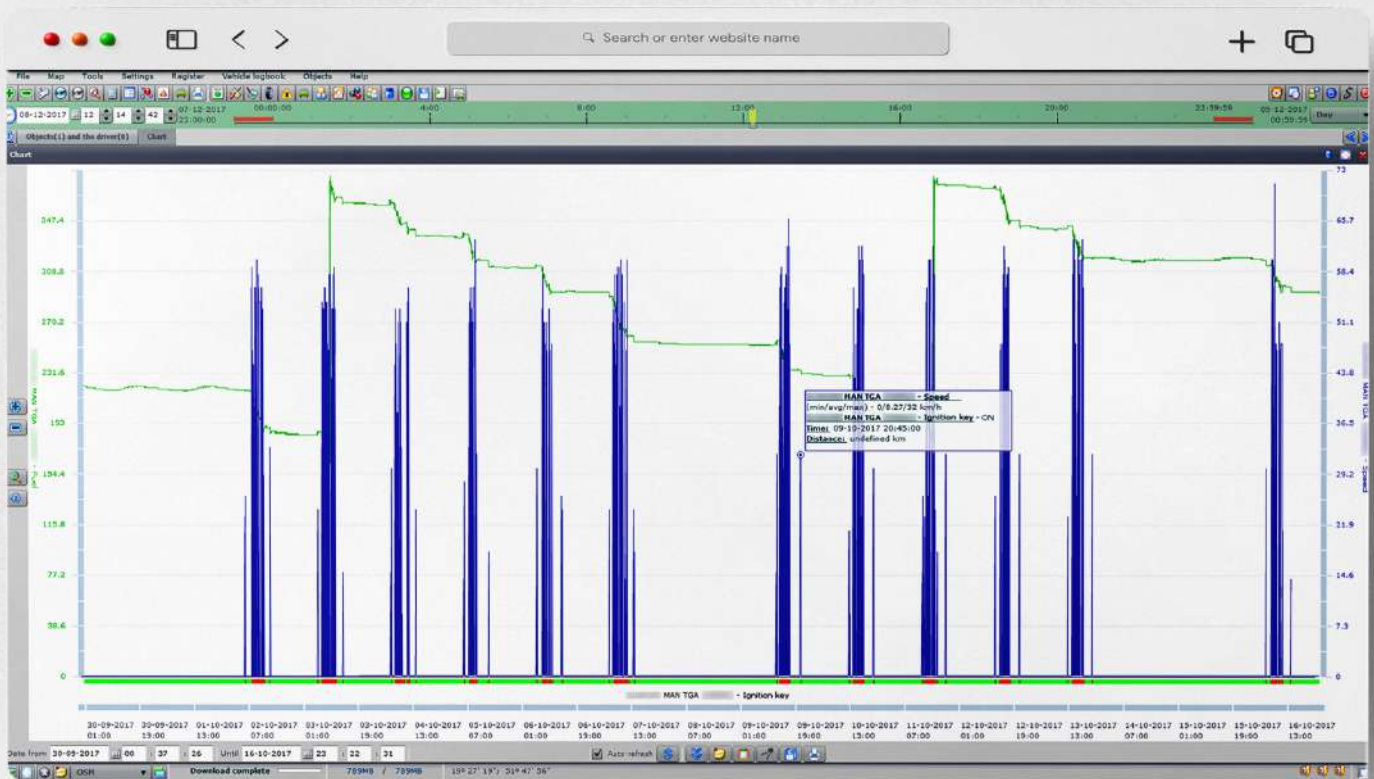
Route report (1): 2019-01-01 00:00:00 - 2019-09-31 23:59:59

Filter data

Vehicle	Date	Distance (km)	Refuellings (l)	Fuel losses (l)	Initial fuel level (l)	Final fuel level (l)	Fuel consumption (l)	Average fuel consumption (l/100km)
	2019-02-01 Friday	89.42	23	-	187	186	23	25.95
	2019-02-02 Saturday	3.19	-	-	186	186	0	-
	2019-02-03 Sunday	2.97	-	-	186	186	0	-
	2019-02-04 Monday	81.31	19	-	186	184	22	26.95
	2019-02-05 Tuesday	114.30	33	-	184	187	39	26.55
	2019-02-06 Wednesday	126.68	30	-	187	187	30	23.70
	2019-02-07 Thursday	119.97	30	-	187	187	30	24.82
	2019-02-08 Friday	130.71	31	-	187	188	31	23.58
	2019-02-09 Saturday	2.73	-	-	188	188	0	-
	2019-02-10 Sunday	3.41	-	-	188	188	0	-
	2019-02-11 Monday	147.03	37	-	188	187	38	25.51
	2019-02-12 Tuesday	122.42	30	-	187	188	29	23.74
	2019-02-13 Wednesday	235.48	61	-	188	184	63	25.07
	2019-02-14 Thursday	130.33	34	8	186	179	42	31.09
	2019-02-15 Friday	0.60	-	-	179	178	0	-
	2019-02-16 Saturday	1.30	-	-	178	178	0	-
	2019-02-17 Sunday	1.02	-	-	178	178	0	-
	2019-02-18 Monday	139.63	40	-	178	187	31	22.09
	2019-02-19 Tuesday	117.45	24	-	187	189	21	18.27
	2019-02-20 Wednesday	178.53	42	-	189	186	45	25.06
	2019-02-21 Thursday	1.37	-	-	186	185	1	-
	2019-02-22 Friday	30.56	-	-	185	180	5	16.55
	2019-02-23 Saturday	2.42	-	-	180	180	0	-
	2019-02-24 Sunday	1.74	-	-	180	180	0	-

Records: 45

■ An example of fuel management reports – General vehicle logbook



■ Graph view of the amount of fuel relative to time and an additional parameter - vehicle speed

## BOUNDLESS INFORMATION

## SYSTEM FOR MONITORING VEHICLE OPERATING PARAMETERS

These days, the vast majority of newly produced vehicles, machines and superstructures are fitted with the CAN Bus, which provides access to various operational data that may be read out and recorded in the **ET CAN** system.

The **ET CAN** system allows for monitoring and saving various parameters associated with the current operation of the vehicle without the need to install many additional sensors.

### THE LIST OF PARAMETERS THAT MAY BE READ USING THE ET CAN SYSTEM INCLUDES:

- fuel level,
- odometer,
- pressure in the brake circuit,
- fuel consumption,
- current engine speed (rpm),
- coolant temperature,
- parameters of superstructure installation.

Symbol: Plow and spreader  
 Speed: 45 [km/h]  
 Last data: 01-02-14 10:54:01  
 0:00:05  
 Ignition: enabled  
 Spreading operation: spreading  
 Plow: lowered  
 10 g/m2: no spreading  
 30 g/m2: spreading  
 The cab: closed  
 Conveyor belt: in operation  
 Disk: in operation



Name: Garbage truck  
 Latest data: 02-05-14 02-05-14  
 0:00:00  
 Speed: 0 [km/h]  
 Ignition: enabled  
 PTO: in operation  
 Lifter: in operation  
 Tailgate: closed  
 Fuel: 386 [l]  
 Speed (Can): [0 km/h]  
 Coolant temp.: 79 [°C]  
 Engine speed (rpm): 1050 [rpm]  
 Total fuel consumption: 28356 [l]  
 Engine operating time: 3862 [h]  
 Odometer: 195082 [km]



Name: JCB JS 160W  
 Speed: 0 [km/h]  
 Ignition: enabled  
 Power supply type: main  
 Battery voltage: 28 [V]  
 Engine speed setting (rpm): 53 [%]  
 Fuel level: 111 [l]  
 Coolant temp.: 86[°C]  
 Engine speed (rpm): 1649 [rpm]  
 Operation of crane system arm: active  
 Gear 1: active  
 Gear 2: inactive  
 Gear 3: inactive



# EMPLOYEE IDENTIFICATION SYSTEM

The **ET ID** system is a solution for employee identification which allows for keeping track of each employee's working time on individual vehicles and/or machines. It offers information about mileage and speed, fuel consumption, activation of pumps, power take-off, etc. in company vehicles.

Depending on the applied solutions, the employee/driver can be identified with a personal RFID card and reader, RFID keychain or Dallas chip.



Report on driver's working time (1): 2019-09-01 00:00:00 - 2019-09-16 23:59:59

Date	Driver	Vehicle	Start of ride	End of ride	Total time	Real ride time	Working time	Time of stops below 10 min	Number of stops below 10 min	Time of stops above 10 min	Number of stops above 10 min	Effective working time
2019-09-02			05:44:13	13:11:51	05:27:38	05:23:00	05:06:10	01:32:49	30	02:31:49	3	04:26:41
2019-09-02			13:30:36	13:11:51	00:21:15	00:33:37	05:06:10	06:05:38	3	00:00:00	0	00:49:56
2019-09-03			05:54:16	08:39:44	02:36:28	01:28:21	04:35:47	00:40:36	16	00:27:31	1	02:16:42
2019-09-03			08:43:44	15:46:42	02:03:05	01:43:26	04:35:47	00:39:43	23	00:39:43	1	02:35:31
2019-09-04			05:41:28	13:09:32	07:27:53	05:26:09	05:10:34	01:25:24	33	02:06:20	2	05:24:28
2019-09-05			05:49:28	10:08:23	04:18:55	02:30:38	05:40:25	01:05:53	28	00:42:34	1	03:39:04
2019-09-05			10:38:52	13:02:31	02:13:39	01:17:08	05:40:25	00:36:54	13	00:21:36	1	02:01:24
2019-09-06			05:41:10	12:25:56	06:44:46	05:11:11	04:34:26	01:14:01	35	02:19:36	3	04:13:05
2019-09-06			11:52:30	12:25:56	00:33:26	00:27:17	04:34:26	00:05:11	3	00:00:00	0	00:14:07
2019-09-09			05:42:35	05:41:20	03:58:45	01:57:37	05:05:57	01:20:17	32	00:48:51	1	03:18:26
2019-09-09			10:02:59	12:48:57	02:45:58	01:13:24	05:05:57	00:22:40	12	01:11:54	2	01:44:01
2019-09-10			05:49:43	10:54:09	05:04:26	03:00:18	04:25:14	01:06:05	43	00:38:20	1	04:29:32
2019-09-11			05:45:38	10:29:15	04:43:37	02:33:37	05:41:04	01:21:08	34	00:49:08	1	03:39:15
2019-09-11			08:48:32	13:10:00	04:21:57	02:46:57	05:41:04	00:31:49	17	01:02:51	2	01:58:51
2019-09-12			05:42:34	10:50:10	04:47:45	02:33:31	06:09:15	01:36:56	45	00:57:19	1	04:22:51
2019-09-12			10:50:17	12:53:14	02:02:57	01:23:48	06:09:15	00:19:09	15	00:00:00	0	02:05:15
2019-09-13			05:44:59	12:29:17	06:54:58	03:07:05	04:48:44	01:16:08	41	02:31:47	4	04:21:05
2019-09-14			10:59:57	20:57:44	09:57:47	00:41:20	00:57:36	00:16:27	7	00:00:00	0	01:12:05
2019-09-16			05:37:00	13:22:02	07:45:02	03:34:23	05:02:30	01:34:32	27	02:19:06	4	05:29:30

Report - Vehicle logbook - Driver's login

Driver	Vehicle	Day	Start of work	End of work	Working time (Engine hours)	Distance [km]	Total amount of fuel [l]	Final amount of fuel [l]	Fuel consumption [l/h]	Average consumption [l/h]	Average consumption [l/100km]
181	2017-09-07 Thursday	2017-09-07 07:17:12	2017-09-07 13:32:24	06:15:12	95:40:29	87	87	0	1.33	1.33	1.33
SUBTOTAL					06:15:12	95:40:29	87	0	1.33	1.33	1.33
83	2017-09-05 Monday	2017-09-05 07:12:12	2017-09-05 13:34:33	06:14:08	31:35:35	34	34	0	2.77	2.77	14.44
92	2017-09-08 Wednesday	2017-09-08 06:38:08	2017-09-08 13:13:21	06:37:13	32:05:36	49	39	0	2.89	2.89	12.20
82	2017-09-07 Thursday	2017-09-07 06:46:02	2017-09-07 12:46:53	05:58:56	32:36:14	51	44	0	2.30	2.30	14.77
83	2017-09-08 Wednesday	2017-09-08 05:59:26	2017-09-08 12:36:44	06:37:18	32:15:37	34	34	0	1.77	1.77	14.75
SUBTOTAL					23:10:57	99:04:11	140	0	2.37	2.37	13.79
66	2017-09-04 Monday	2017-09-04 09:44:41	2017-09-04 10:42:17	00:57:36	00:44:37	12	82	82	1.33	1.33	0.42
88	2017-09-03 Tuesday	2017-09-03 07:37:17	2017-09-03 12:49:34	05:12:17	00:57:30	6	53	53	2.19	2.19	12.91
SUBTOTAL					06:05:53	01:42:37	138	0	1.76	1.76	16.72
27	2017-09-07 Thursday	2017-09-07 07:28:37	2017-09-07 13:20:29	05:51:48	03:16:34	34	75	0	2.44	2.44	8.95
27	2017-09-08 Friday	2017-09-08 07:45:13	2017-09-08 13:23:37	05:38:22	00:32:31	83	55	0	3.12	3.12	9.67
27	2017-09-09 Saturday	2017-09-09 14:03:19	2017-09-09 21:01:03	06:57:44	01:06:10	41	39	0	2.74	2.74	8.84
27	2017-09-10 Sunday	2017-09-10 21:37:21	2017-09-10 21:37:31	00:00:10	00:00:00	0	78	0	0	0	0
SUBTOTAL					08:28:13	07:17:47	236	0	4.33	4.33	13.87
Total					54:05:34	23:48:34	607	0	2.75	2.75	13.89



## INFORMATION AT YOUR FINGERTIPS

## MOBILE APPLICATION - SMOK MOBILE

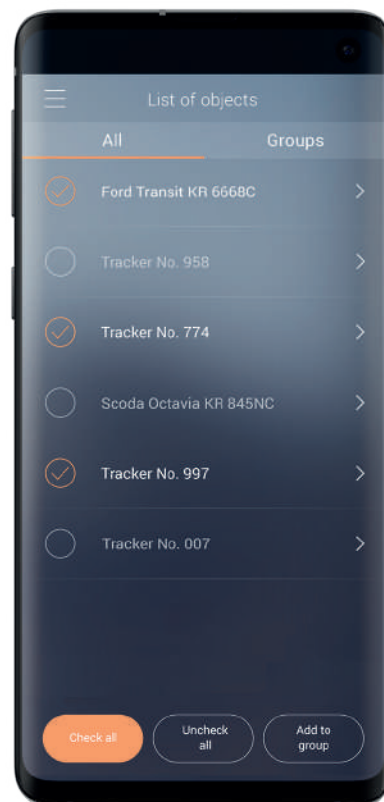
**SMOK Mobile** is a mobile device application which displays the location of vehicles, their parameters and statuses of sensors installed on objects equipped with Elte GPS devices. **SMOK Mobile** runs on the following operating systems: iOS, Android.



Map - view



Map - details - view

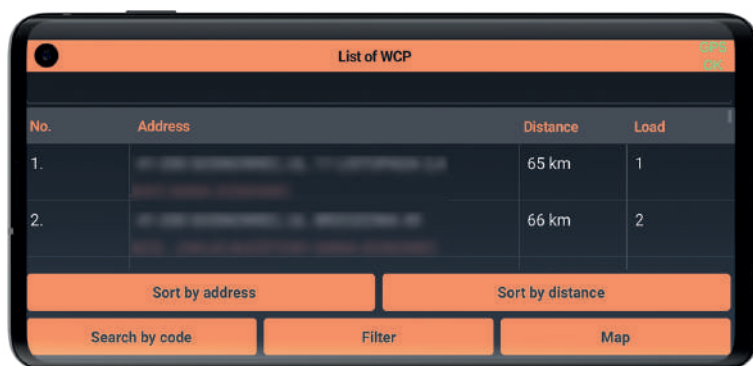


List - view

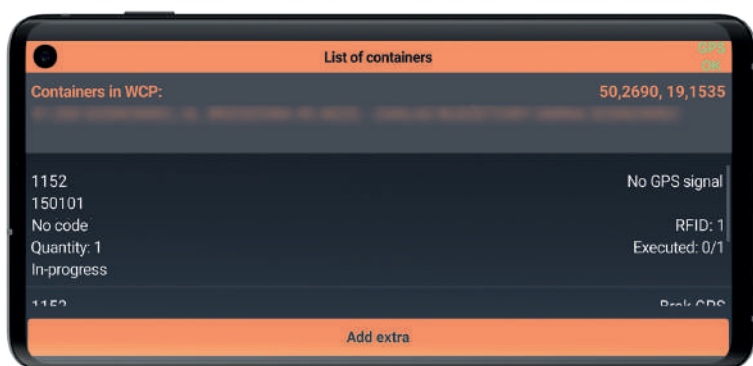
## MONITORING IN YOUR MOBILE PHONE

### MOBILE APPLICATION - SMOK KOMUNAL

Mobile devices with installed **SMOK Komunal** application can be used to support the process of order implementation. The application allows for reporting any irregularities with predefined or own notes, to which photos from a digital camera may be attached.



List of various waste collection points



Details of task implementation

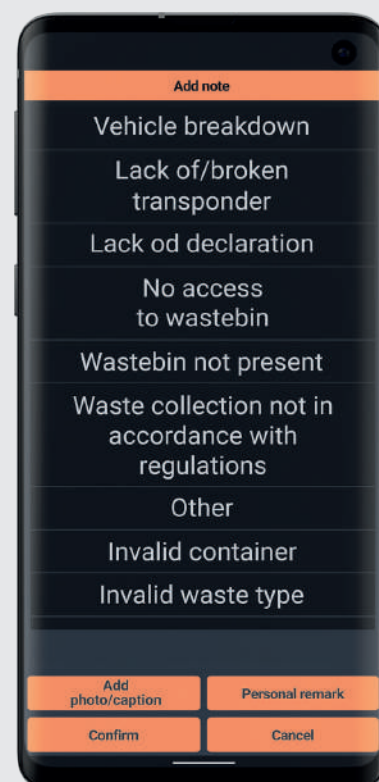
**SMOK Komunal** application can also be used to report irregularities, using predefined messages or your own notes. A note may be associated with a waste collection point or with a specific wastebin or bag.



Adding a geotagged photograph

Planned route may be displayed as a list of waste collection points.

The application can also show a list of wastebins (with details of their type, volume and purpose) which are to be emptied on the planned route.



Adding a note about a loading operation

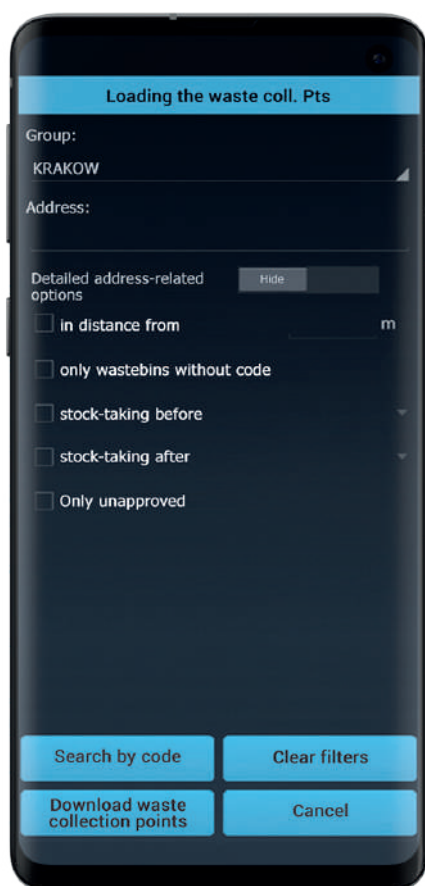
## STOCKTAKING IN YOUR MOBILE PHONE

## MOBILE APPLICATION - SMOK iPGO

The mobile device app **SMOK iPGO** is a tool which supports stocktaking of containers. It also enables audit checks to find out if waste is collected properly and whether residents sort and discard waste in accordance with their declarations.

### THE MOBILE DEVICE APP SMOK IPGO FEATURES:

- quick and easy validation of container stocktaking;
- independent control tools, e.g. in the event of lack of similar solutions in the company that collects waste;
- quick and easy reporting of irregularities in the form of notes and photos;
- verification of declarations made for a given waste collection point; it also provides an additional source of documentation in the case of complaints or disputes;
- checking inspectors' work - after opening the app the inspector's location is visible in the system.

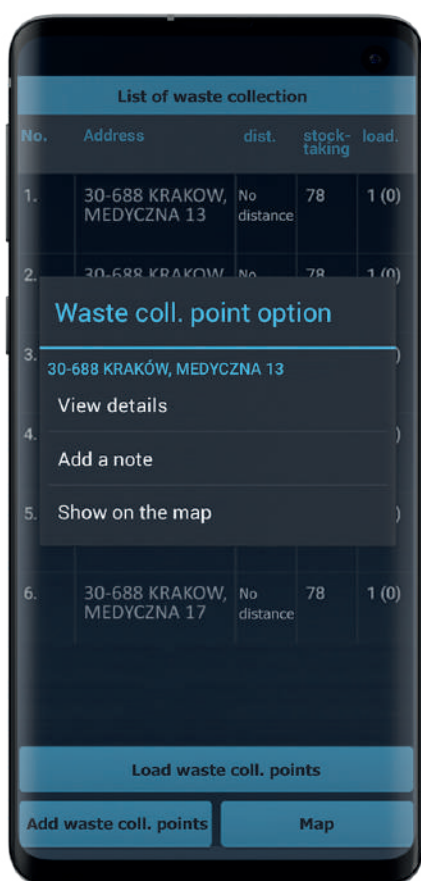


- Searching for waste collection point where irregularity was found

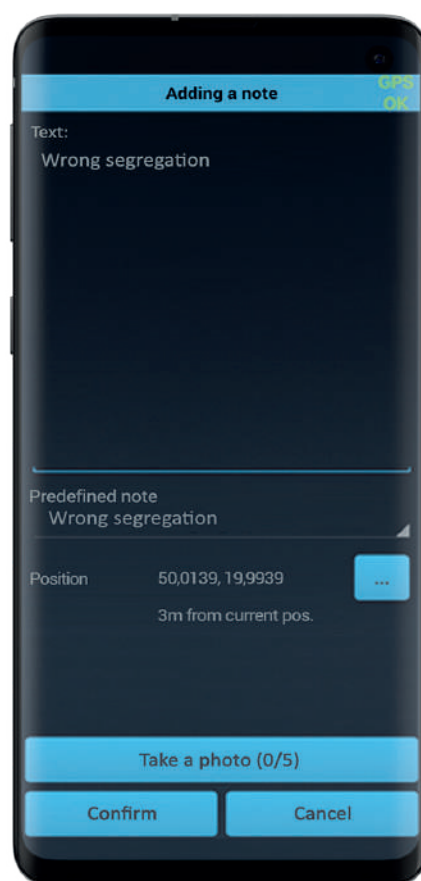


- Search results

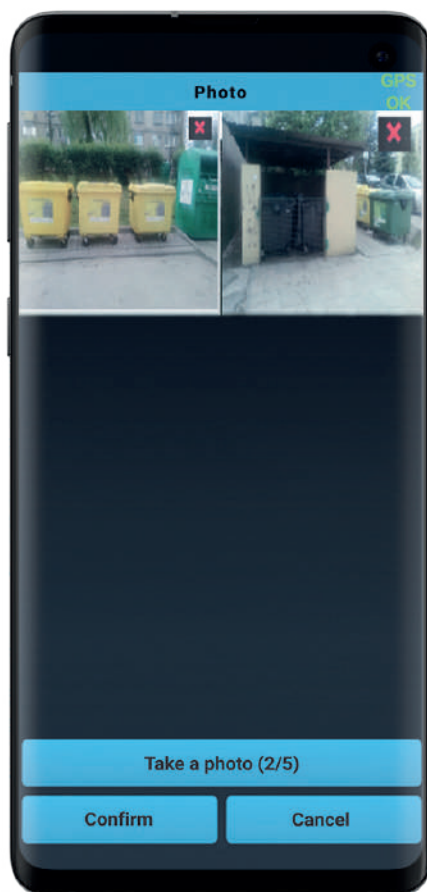




■ Selection of waste collection point where irregularity was found



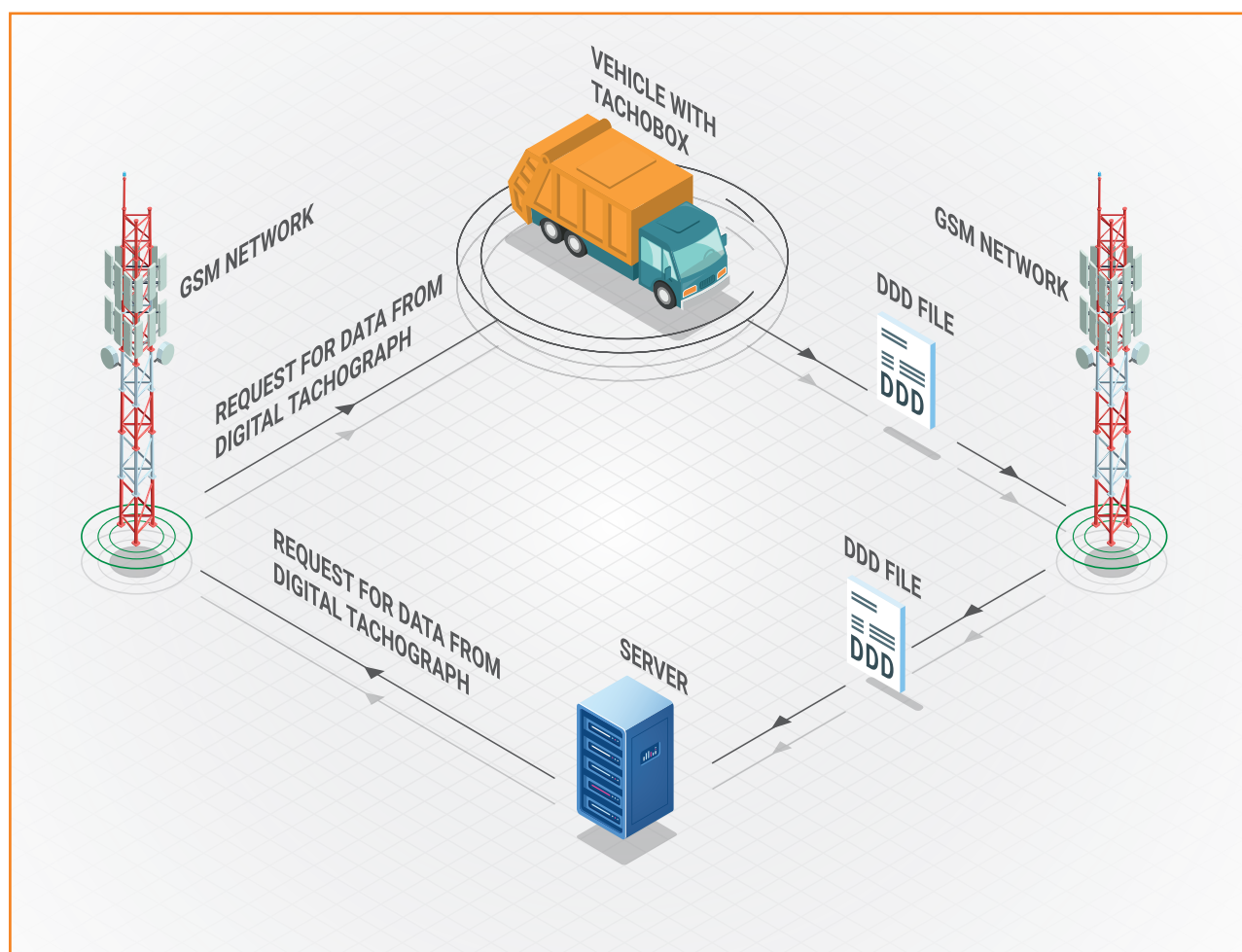
■ Adding a note



■ Attaching a photo

## TACHOGRAPH MODULE

Tacho Box is a perfect solution dedicated for vehicles equipped with digital tachograph. It enables remote download and import of DDD files from tachograph.



### MODULE CHARACTERISTICS:

- Mutual cooperation with different types of digital tachographs;
- Easy mounting on the vehicle due to small size of the device;
- Remote download and import of DDD files.





**THANK  
YOU**

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