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INFORMATION TECHNOLOGY DESIGNATED TO MONITOR TRANSPORT AND VEHICLES IN ROAD TRANSPORT

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Introduction

Information technology for monitoring of transport and vehicles are mainly designated to track vehicle movement, driver monitoring, vehicle condition recording and monitoring. Information technology to monitor transport and vehicles are used by transportation carriers mainly to reduce internal costs which are directly related to their performance. These costs are especially fuel costs, labor costs, travel expenses, vehicle repairs and maintenance etc. There are existing many different Information technologies designed for transport and vehicle monitoring which are able to provide these features:

- Vehicle tracking
- Estimation of start and end date of expedition
- Determination of exact time of loading and unloading
- Vehicle and driver identification
- Estimation of covered distance
- Accurate vehicle speed monitoring (average, actual, speeding)
- Time of running on idle
- Refueling
- Fuel consumption
- Tank fuel quantity changes
- Rest brake control
- Vehicle position indication on digital map (track)
- Generation of clear itinerary

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- Route planning control
- Comparison of real and measured refueling
- Alarms for suspicious tank fuel quantity decrease
- Making lists of records of drivers, vehicles, contracts etc
- Costs evidence (fuel, maintenance, oil, wages, tires,…)
- statistics - daily, weekly, monthly, yearly totals endpoints and their subsequent comparison with the specified standard
- Between other features of these information technology belong:
- Engine temperature monitoring
- Temperature characteristics monitoring in cargo space (for instance vehicles transporting goods based on ATP agreement)
- Engine RPM monitoring
- Engine load monitoring
- Vehicle load monitoring
- Voice communication between driver and dispatching

Transport carriers can use systems for transport and vehicle operation properties monitoring of different companies in Slovakia. For instance systems as Commander, DeMoTech, GENETECH, INFOCAR, TAMEX, EMTEST etc.

1. Commander information system

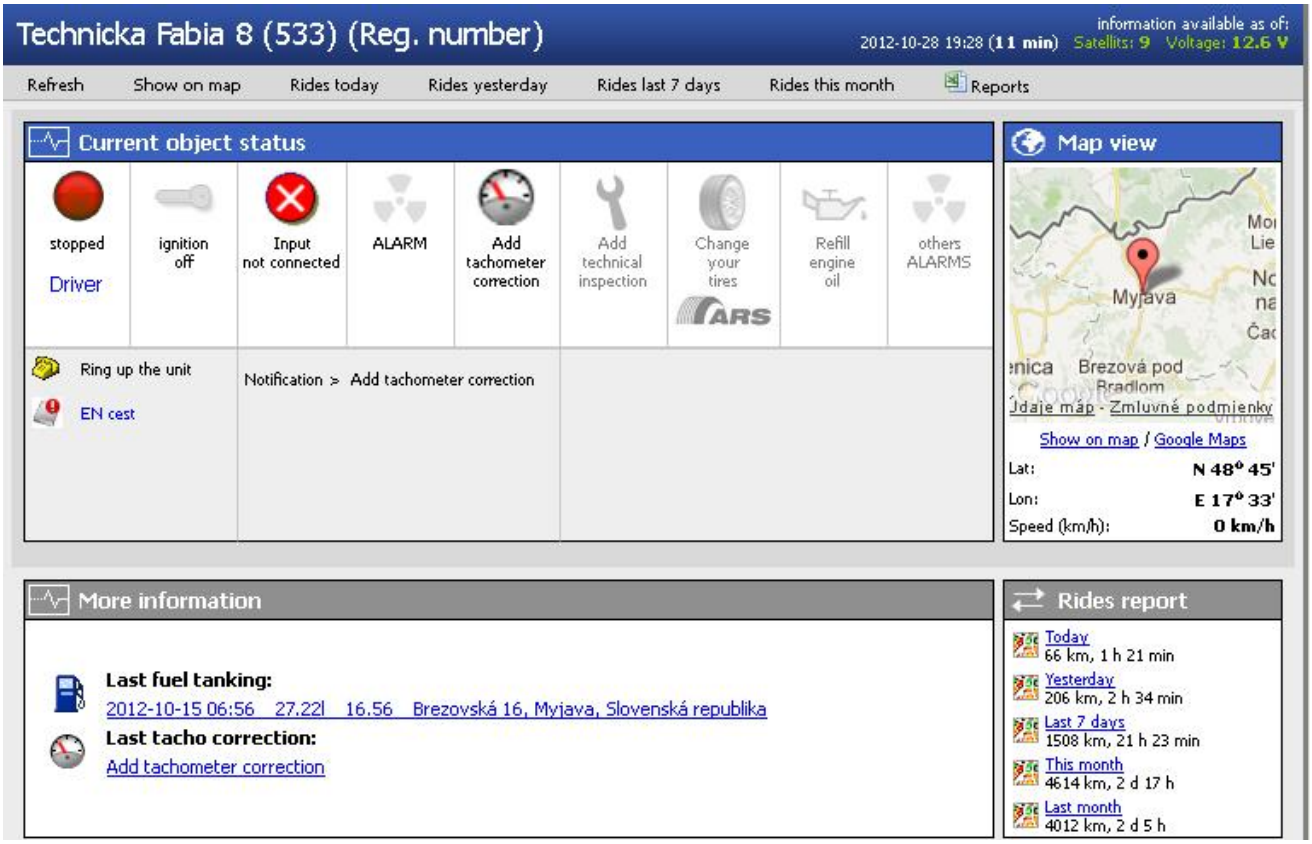
Commander system provides to carrier these services:

- Vehicle monitoring
- Active satellite security monitoring
- Passive satellite security monitoring
- Person and animal monitoring
- WiFi to vehicle

Vehicle monitoring

Vehicle monitoring from Commander system (pic. 1.) belongs to most used service in road cargo transport. This service provides:

- Got a rid of unauthorized drives
- Increase of work efficiency
- Work time monitoring
- Possibility to account fuel costs to costs
- Easy and accurate management of vehicles maintenance
- Fast cost assemblies for economical evaluation of vehicle operation
- Securing property against theft and unauthorized use



Pic. 1. Vehicle monitoring

Active satellite security monitoring

This service is providing to customer 24/7 security vehicle monitoring while service activated. Vehicles are equipped with vibration sensor, pitch sensor and others to allow the system to recognize whether the vehicle was opened, attacked or towed. In few seconds after

vehicle was opened the first alarm comes, in other few seconds the Commander operators identify whether there is authorized person in or not. If there is unauthorized person, the operator of Commander notifies the owner of vehicle and then can contact police department.

The price of hardware, installation and activating, what is necessary to be able to use service of active satellite security monitoring is 550 €. warranty for hardware is 10 years. The service monthly price is 22 €.

Passive satellite security monitoring

This service passively protect vehicle, where this service is activated only in case of need. This service is cheaper compare to service Active satellite security monitoring, what is its advantage. There is hardware installed into the car, which allows to use this service. Price of this hardware is 313 € and with warranty of 10 years. The operator of Commander provides immediate help in case of need, accident, road accident, thievery or breakdown. There is information about position send to customer or help in case of notification fire department, ambulance, tow service or supply of spare part necessary for vehicle repair. The service monthly price is 7,44 €.

Wifi to vehicle

This service is mainly used for international and national long-distance bus transport, to keep the passengers connected to internet.

Price of hardware is 267 € without tax, where installation is included. Monthly cost for no limit internet connection is 12 €.

2. Infocar

Satellite information system Infocar provides these products:

- Vehicle monitoring
- Fuel consumption measurement
- Person monitoring
- EcoDrive driving style
- Mobileye

Vehicle monitoring

This product is designated to vehicle movement monitoring and followed processing, evaluating and analyzing data of their operation. Product is for any kind of vehicle where log book is part of this product. Beside of movement monitoring there is fuel consumption and other parameters of vehicle monitored. Other services which can vehicle monitoring provide are these:

- Online localization - customer can any time check instant position of vehicle on internet
- Log book – this service is processed automatically, what saves time increase lucidity and efectivity
- Monthly reports - customers vehicle reports are processed automatically ant sent monthly in summary spread sheet
- EkoDrive
- E-call – when an accident happen, automatic message with information about position is sent to customer tel. No.
- Tow and theft signalization
- Fuel consumption and fuel quantity decrease monitoring – after floating probe sensor installed to trucks tank to measure fuel volume, the system is able to recognize any unauthorized fuel manipulation (fuel volume decrease while not moving) or with recites from fuel stations. Customer is given strong tool to have clear view over accurate vehicles fuel consumption.
- Import of fuel tank – provides to carrier monthly consumption report for each vehicle, refuelling and place of refuelling, exact time of refuelling and full overview of fuel costs
- Sites – dispatcher can create its own site on Google maps and set notifications for entries and outputs of vehicles in certain regions
- Driver identification – it is possible to recognize driver of each drive via cell phone or noncontact card

- Business or private drive – vehicle switch to private drive with simple push of a button in vehicle, because the system is always set to business mode
- Route planning – possibility to plan route, loading point, unloading point or stop for each vehicle. The system sends to dispatcher every vehicle diversion, time of unloading or every event that is not corresponding with plan.
- Sensing of external outputs – work of hydraulic arm, monitoring of independent heating, sensing position of blade of snow shovelling, sensing direction o rotation of concrete drum, measuring temperature of semi-trailers cargo space, sensing the door opening etc...
- Internet connection in vehicle – it is possible to access internet via DELUXE unit and touch sensitive screen, to be able to reach necessary information as navigation, emails etc...
- Resistance to GPS jamming devices

EcoDrive driving style

This system provide to rate driving style of drivers. Installed hardware is rating drivers driving style in these parameters:

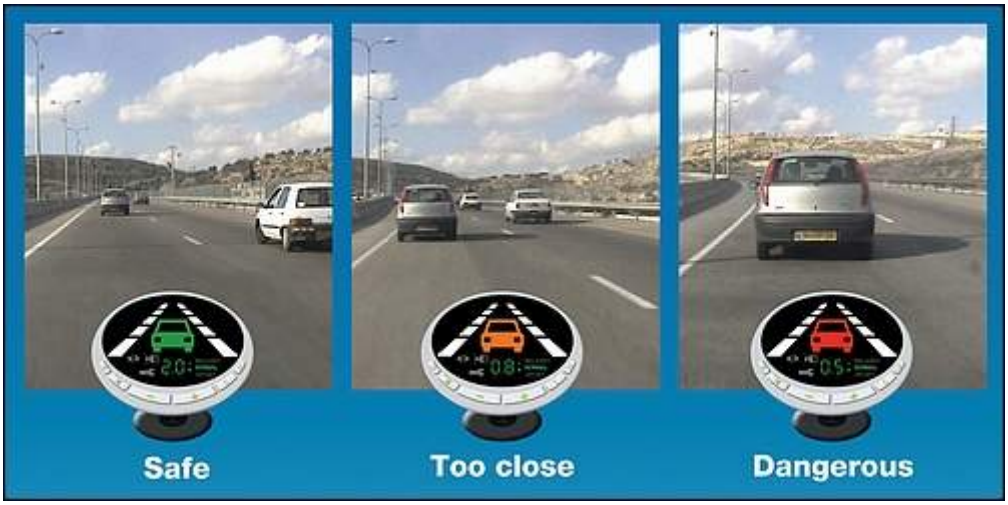
- Speeding
- Acceleration rating
- Braking rating
- Comfort rating (drive through curves – circumferential acceleration)

Based on values sensed by very accurate and sensitive inertial sensors the unit calculates how the driver works with brake and accelerator, whether the driver is driving economically or not. The system evaluates the style of driving: acceleration or braking, speeding, the system describe accident risks, mistakes in drivers behaviour and style of drive. The system shows to carrier economical recalculation, how much increased the costs of fuel, excessive tire wearing and other vehicle components when the driver is not following the economical driving style.

Mobileye

This device helps the driver to keep safe distance (Pic. 2.). Signalization is showed to the driver when the distance is to small and accident may occur. The system is warning driver that there is a biker in vicinity of vehicle ol an accident with pedestrian or biker may occur. The device acoustically an visually warn driver when the vehicle moves out of the lane. Other possible advantages of Mobileye service:

- Prevent accidents
- Improve driving habits
- Improve vehicle driving safety
- Can save lives and injuries
- Featuring price is 699 € tax included

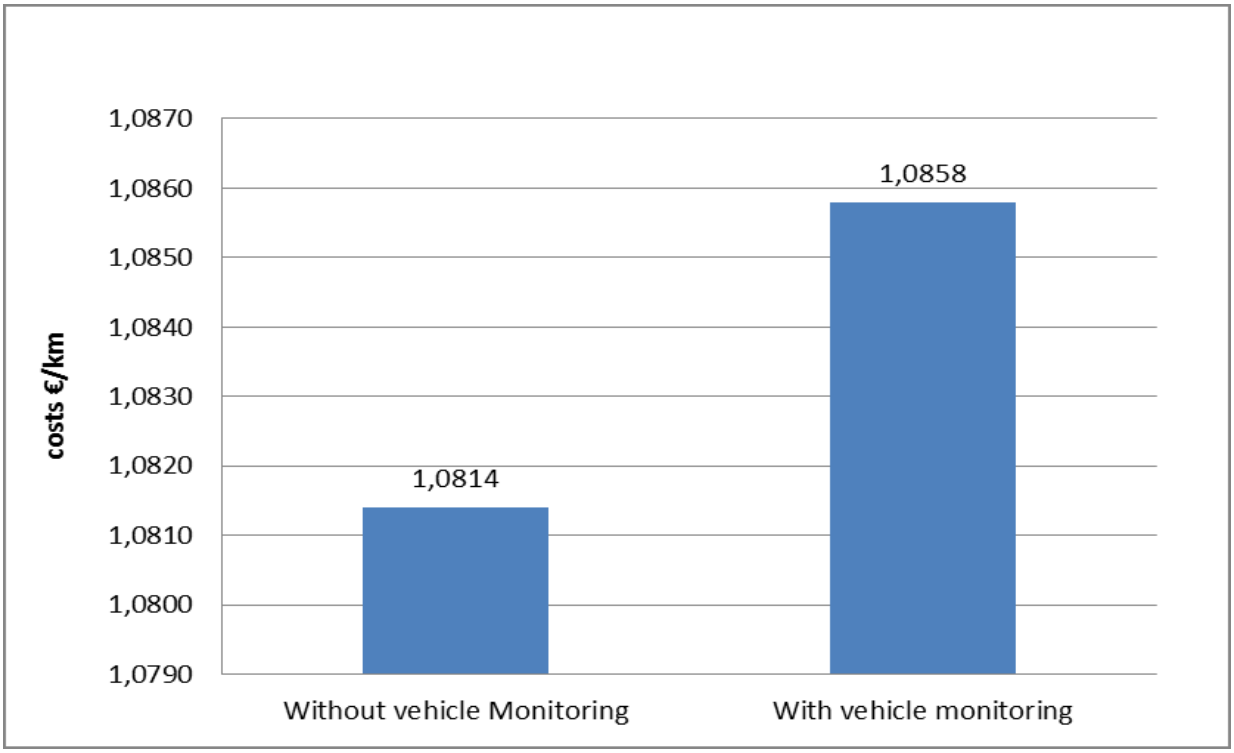


Pic. 2. Mobileye system

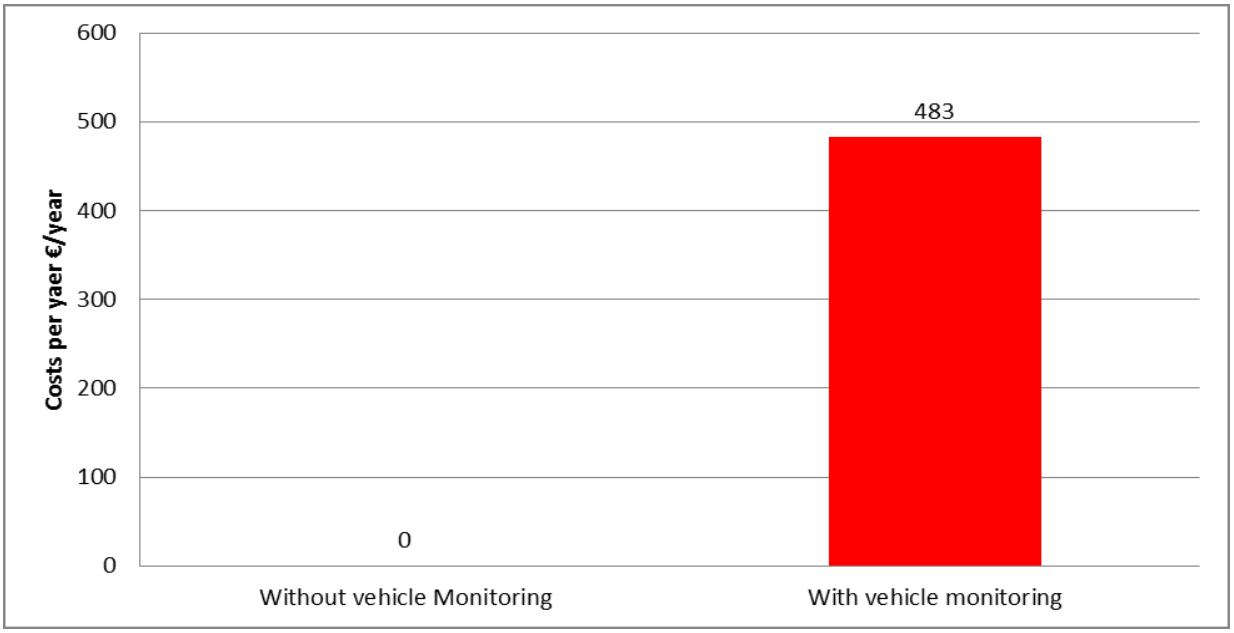
Conclusion

Information technologies designated to monitor transport and vehicles in road haulage are not only for cargo road haulage, but for personal road haulage up to 3,5t as well. It is more useful for the carriers to get information systems, which are provided by vehicle producers, because these systems provide much more features and are focused more for carrier needs in cargo transport. From the point of view of carrier there is no need to have all functions of information technology for monitoring of transport and vehicles, carrier needs mainly functions – Vehicle monitoring and EcoDrive driving style or Fuel consumption measurement, which are designed for road transport.

The carrier needs a hardware for using of all functions of vehicle monitoring which costs 130 € and he also must pay mounthly fee 46,90 €. Costs €/km and annual costs are depicted in pictures (Pic. 3 and Pic 4.).



Pic. 3. Costs €/km with vehicle monitoring and without vehicle monitoring



Pic. 4. Costs per year with vehicle monitoring and without vehicle monitoring

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[2] http://www.infocar.sk/

[3] http://www.commander.sk/

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