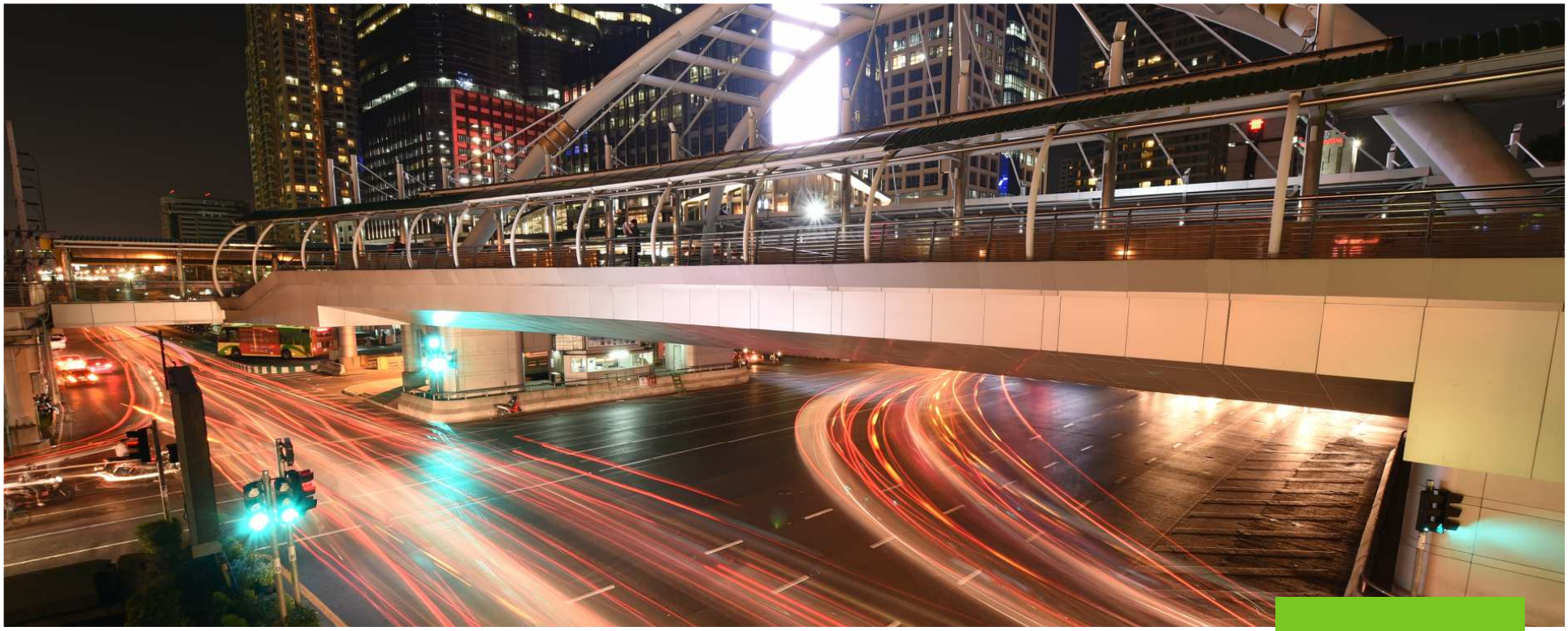

Complex IT solutions in public transport

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2016.02.10.

Introduction of HC Linear IT Development Ltd

General data

- Established in 1990 – 25 years of experience
- Employees number 45 person
- Average age 42
- 78% has university/college degree
- Average years of service 8

Company profile

- Hardware development
- Software development
- Data analytics
- System Support

Industries

- Public transport
- Energetic
- Communication
- Pharmaceutical
- Security

Main solutions developed

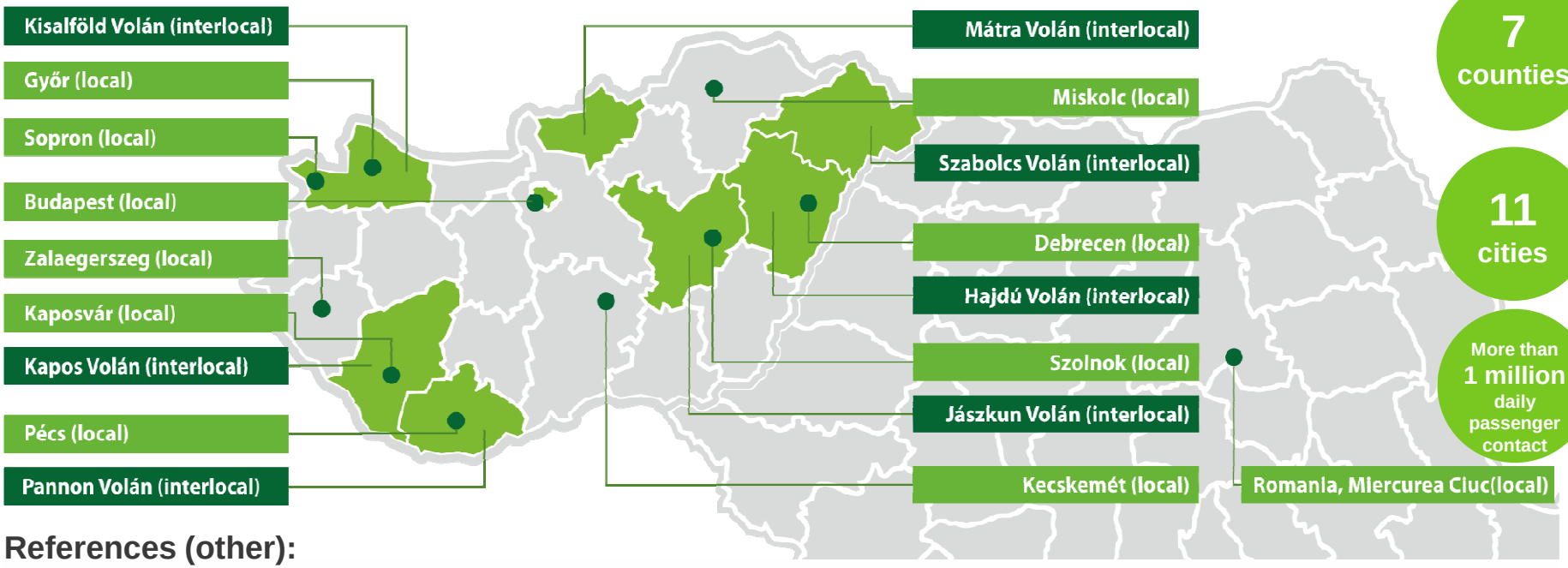
- Complex solution for public transport
- Seismometer for nuclear power station
- Mobile voting and conferencing system
- Measuring chemical substances
- Access control system
- Intelligent key storing system
- … many other developments….

Awards

- Hungarian Association for Innovation: Special Award – On Board Unit

- South-Transdanubium Regional Innovation Agency: Regional Innovation Award – Traffic management system

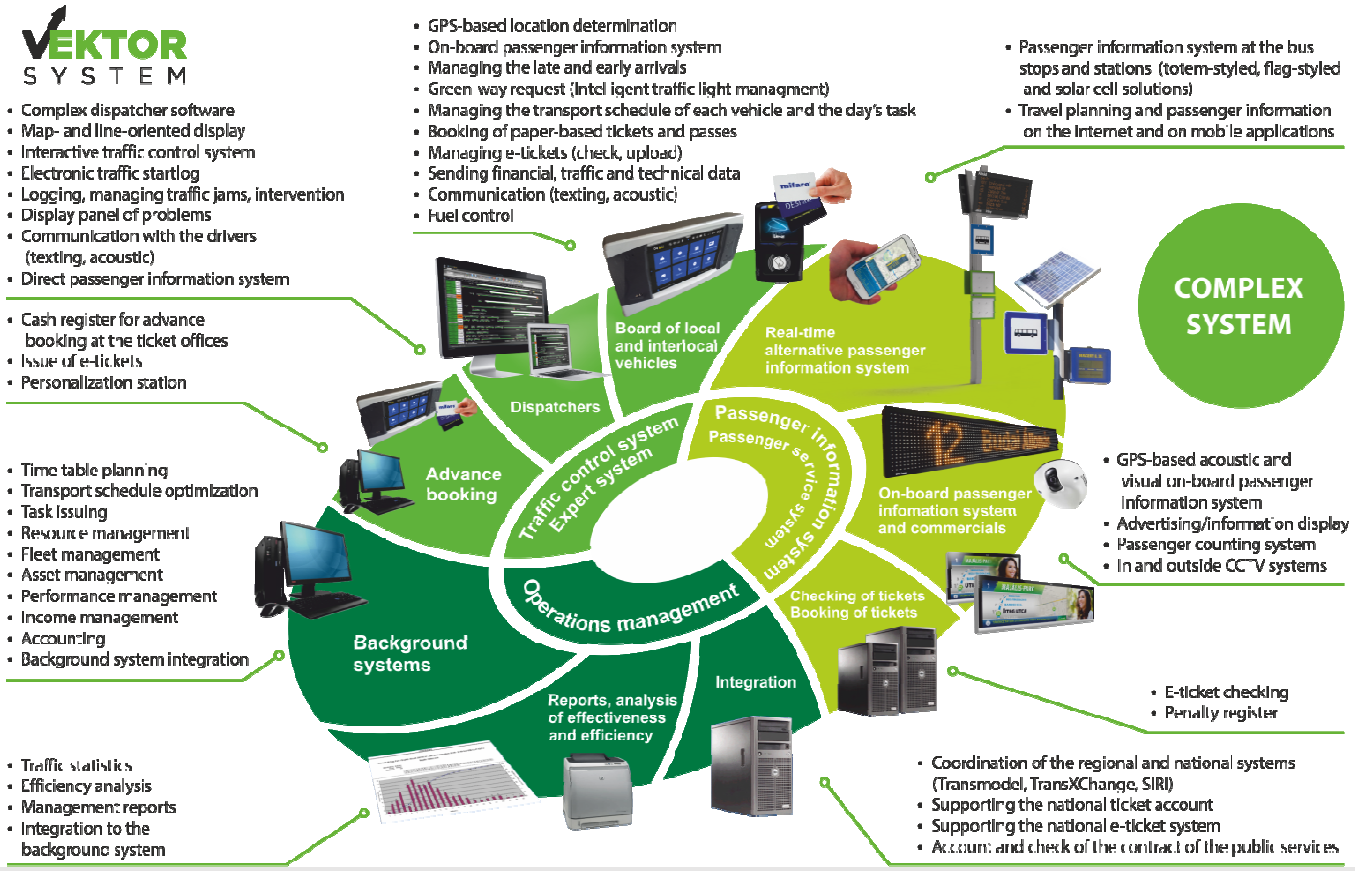
References - HC Linear systems
14 years of experience in public transport



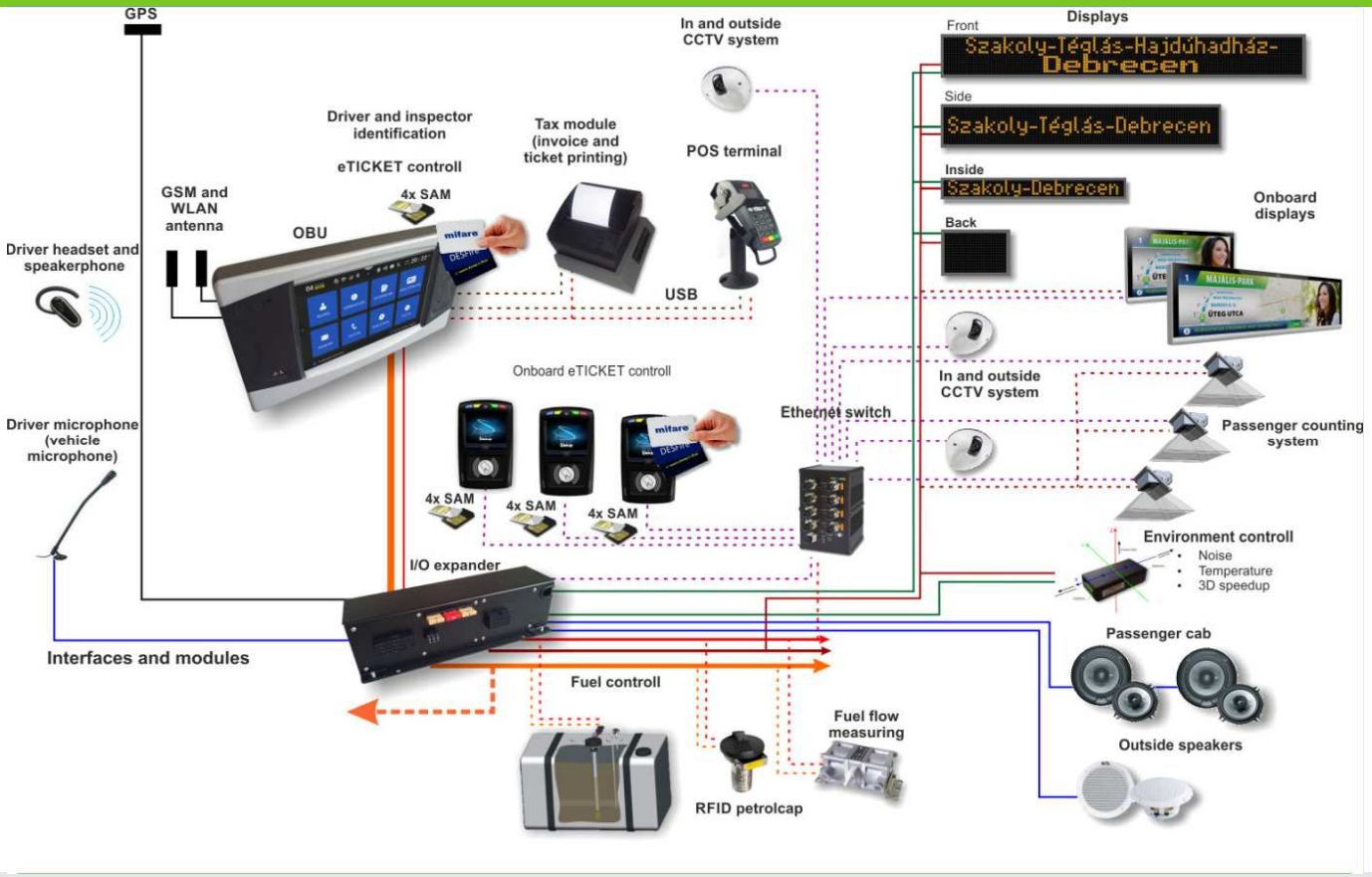
References (other):

CAF, SIEMENS, ŠKODA TRANSPORTATION, RG, MOL, T-Systems, keler, NEXON, RICHTER GEDEON, Magyar Posta, Nemzeti Adó- és Vámhivatal, ANNO 1790 ZWACK & C

The complex IT-solution for public transport
Real time traffic management and passenger information



On-board modules for public transport



Advantages of the complex, real time Traffic Management and Passenger Information System

Real Time Traffic Management

- On-line GPS based vehicle tracking
- On-line daily task/schedule/change management
- On-line voice and text communication between driver and dispatcher, alarm/warnings
- On-line dispatcher software
- Late / early arrival prediction and handling
- Automatic administration
- Paper and e-ticket sales and handling
- Security - integrated CCTV system
- Passenger counting system
- Fuel control
- Intelligent traffic light management
- Measuring and collecting environment data (temperature, noise, speed, door status…)
- Data collection in every seconds
- Data analyses and reports for efficiency improvement
- Cost and operation optimization

Real Time Passenger Information System

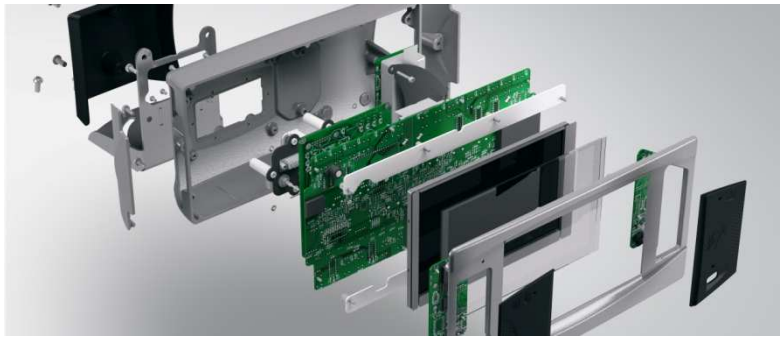
- Visual and acoustic systems
- Real time travel related information for passengers
- Real time messaging to passengers
- On-board advertising system (location and time based)
- Displaying tourism and public information
- Passenger information displays at bust stops/stations
- Real time applications for smart phones
- Journey planner
- Web based passenger information system
- Social media connections
- Collecting and handling passenger feedbacks

On-Board Unit (OBU)

The product developed by HC Linear, which earned an innovation recognition by the Hungarian Association for Innovation

Functions of OBU

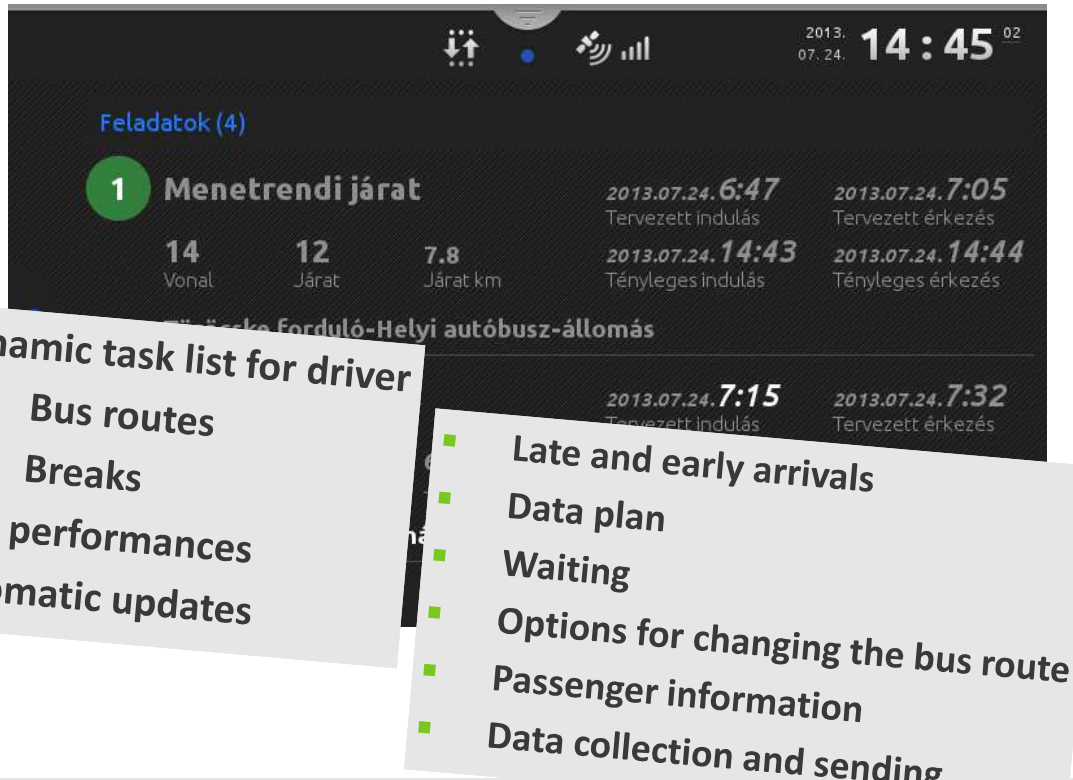
Modular and scalable product with development potentials



Hidden microphone	Cast aluminium box
Loudspeaker	Light meter
Bluetooth & WLAN	Card Reader
Green way request	Touch display &LCD
Full color LED	Stand by button

The functions of the On-Board Software

MANAGING THE DAY'S TASK (with the On-Board Computer)

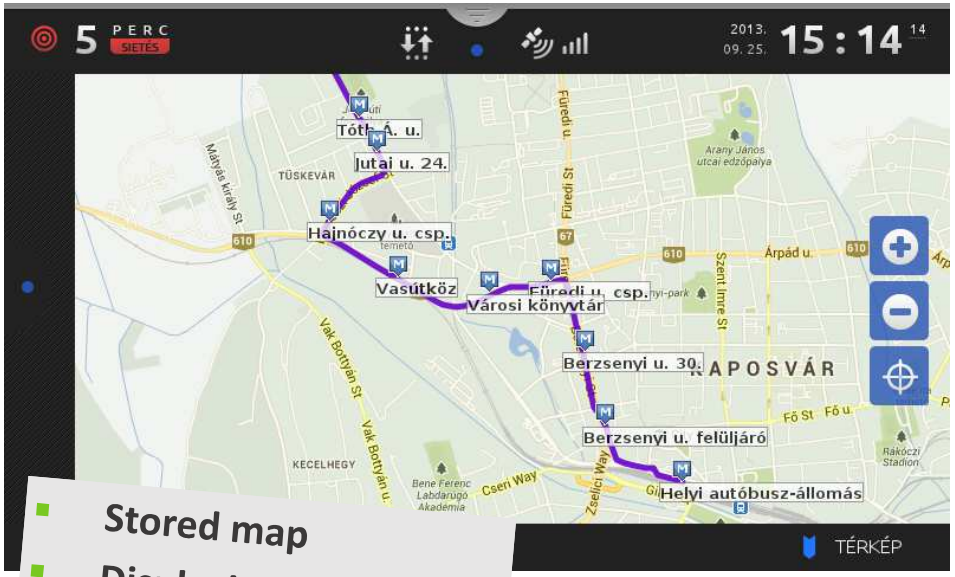


- Dynamic task list for driver
  - Bus routes
  - Breaks
- Real performances
- Automatic updates

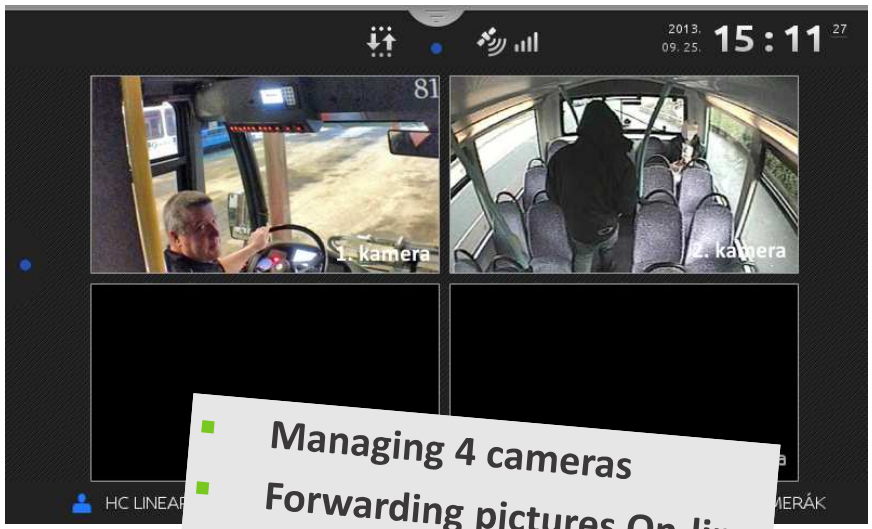
- Late and early arrivals
- Data plan
- Waiting
- Options for changing the bus route
- Passenger information
- Data collection and sending

The functions of the On-Board Software

MAP AND OPTIONAL CAMERA

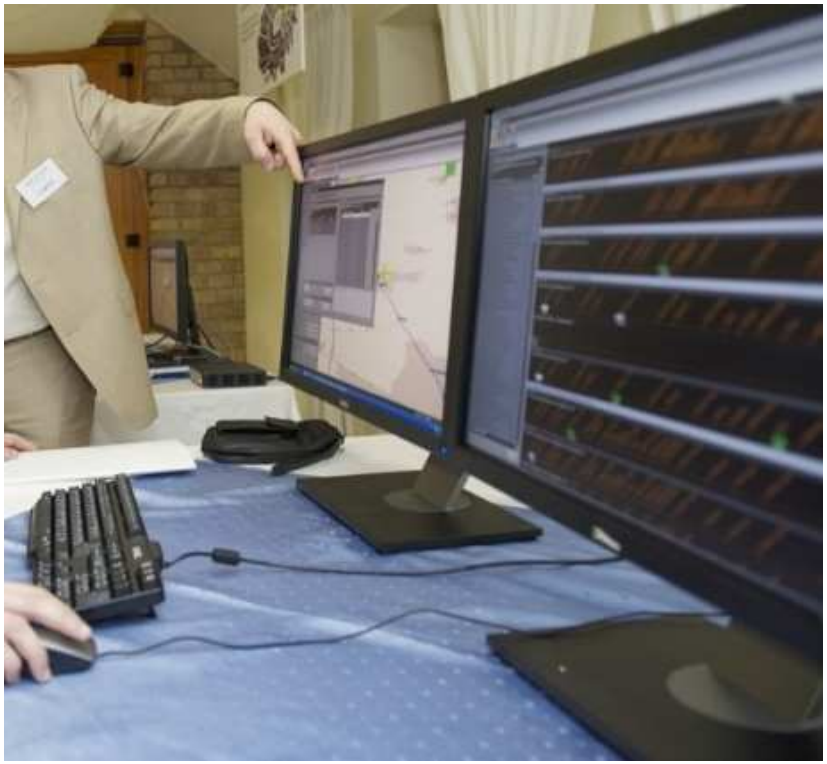


- Stored map
- Displaying the bus line
- List of bus stops
- Own position



- Managing 4 cameras
- Forwarding pictures On-line
- On-Board display

Dispatcher software



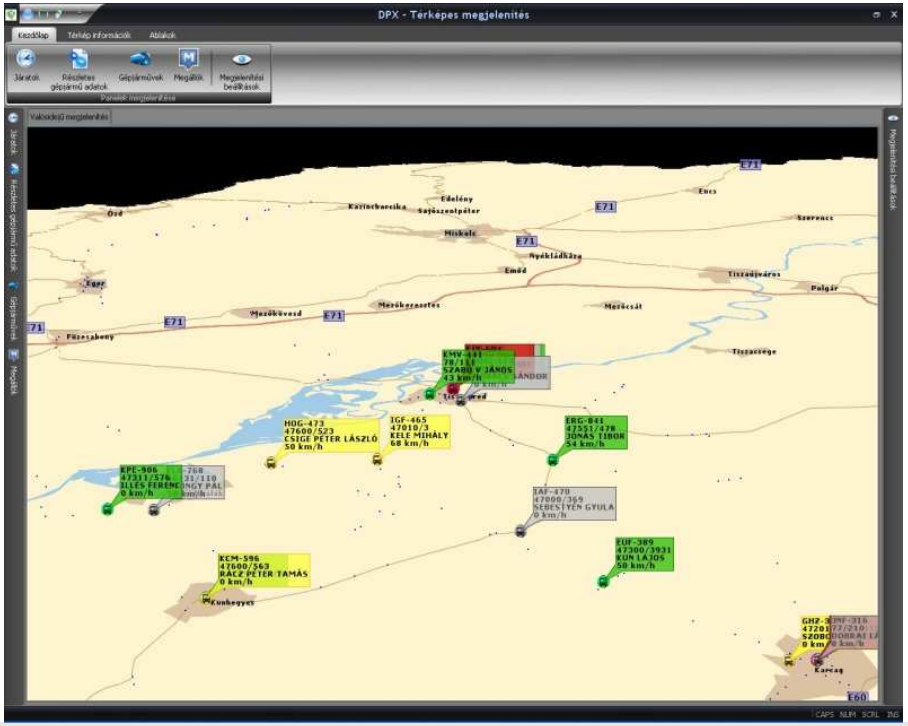
DPX – COMPLEX SOFTWARE

- Line-oriented display panel
- Map-oriented display panel
- Start log panel
- Display panel of problems
- Display panel of warnings
- Communication panel
- Technical panel

Dispatcher software

- 3D digital map on a street level for many countries
- Real time vehicle position with many data
- Route and stops display
- Delay / early information and alert
- Customized views
- Quick search

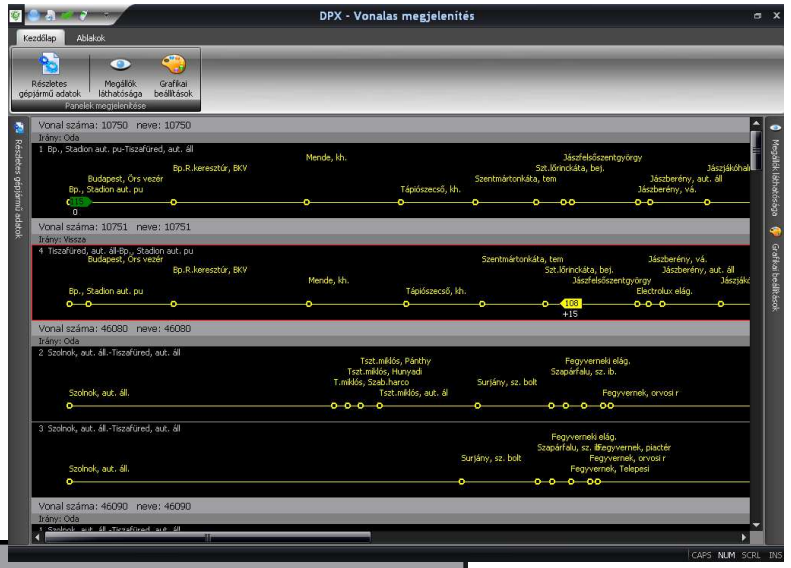
MAP-ORIENTED DISPLAY PANEL

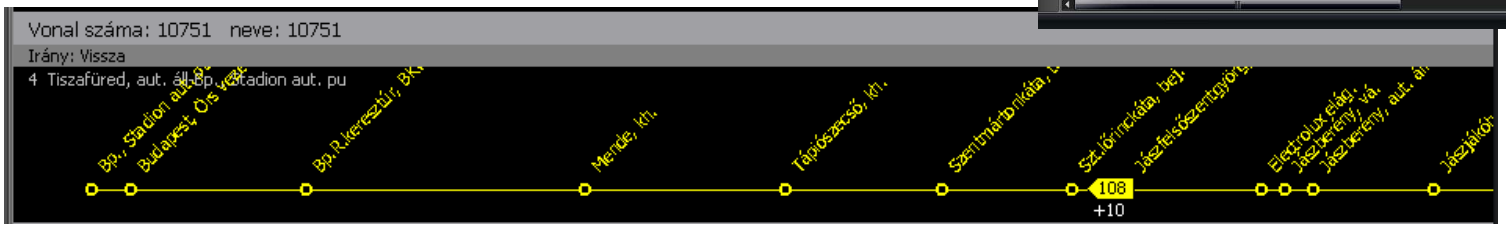


Dispatcher software

- Displaying vehicles running on the same line
- Proportional line display
- Displaying the late and early arrivals with different colors
- Line number display
- Schedule row identification
- Displaying detailed data
- Various dispatcher modes
- Custom-designed views
- Distinction of problematic vehicles

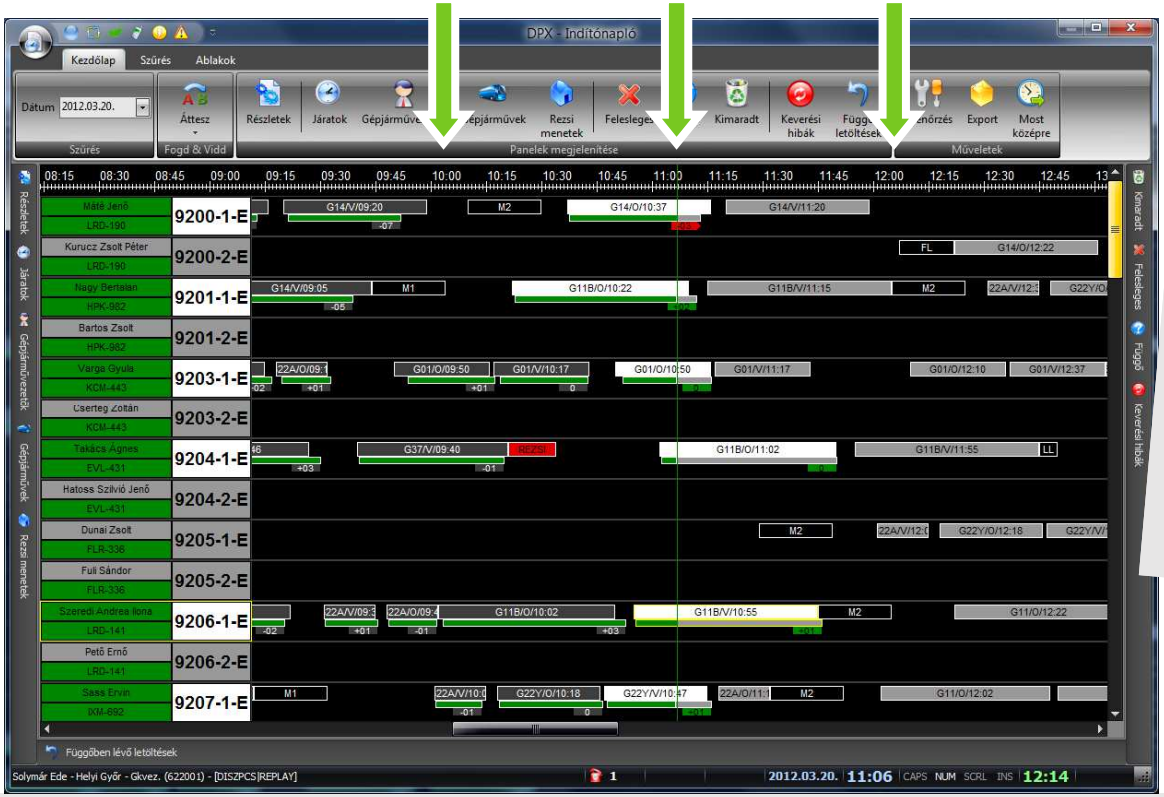
LINE-ORIENTED DISPLAY PANEL





Dispatcher software

Past – Present - Future



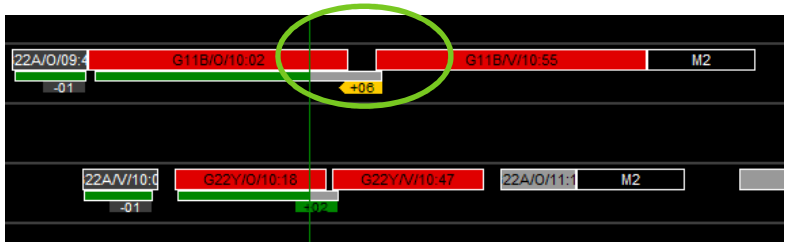
STARTLOG PANEL

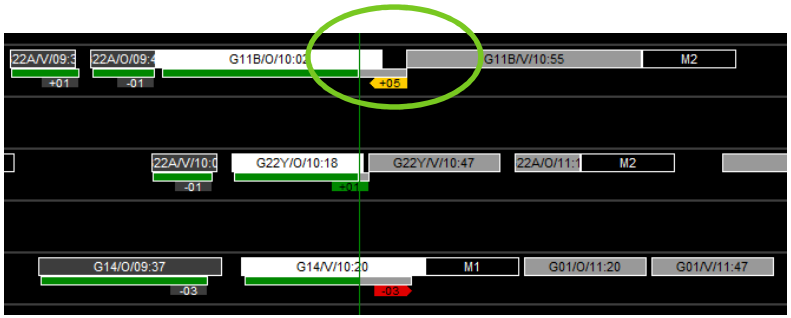
- Human-Tool-Task-Time diagram
- Real time automatic plan vs reality comparison
- Function for real time problem solving opportunity

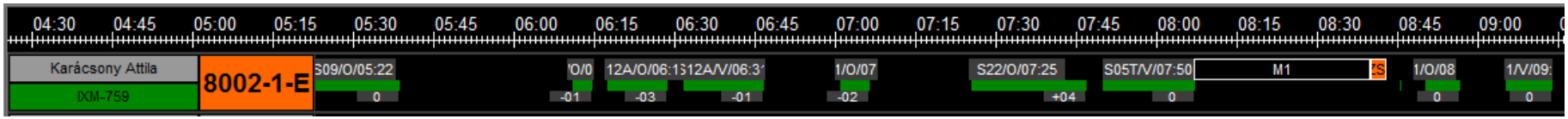
Dispatcher software

- Comparison of planned and real data, displayed in time sheet
- Displaying late and early arrivals
- Displaying and managing problems
- Support and documentation of vehicle, driver and bus route reorganization
- Real-time control and traffic log
- Synchronization of changed plans with the On-Board Units
- Prediction of scheduling conflict
- Havaria management

STARTLOG PANEL

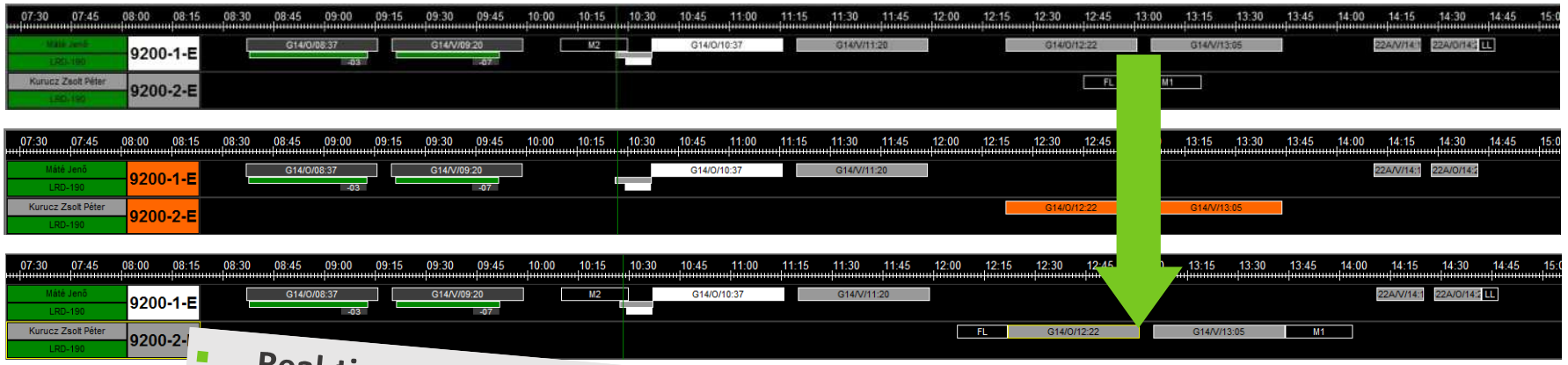






Dispatcher software

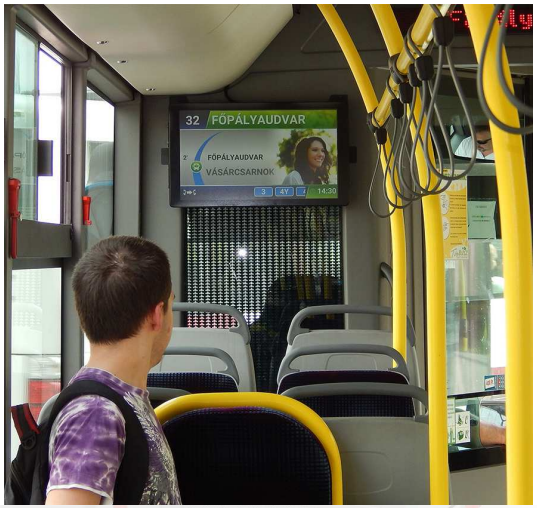
STARTLOG PANEL (modification of the day's task)

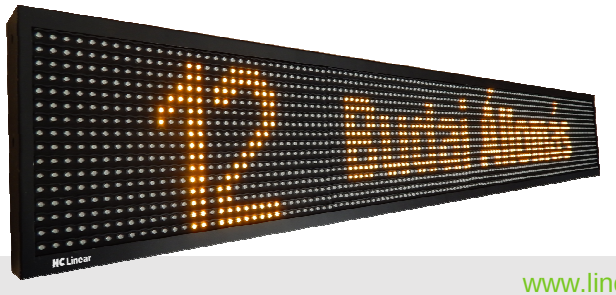


- Real-time control
- Warnings
- Rules of labor law
- Geographical disruptions
- Downloading of the On-line task list

Real time, dynamic passenger information system on-board acoustic and visual solutions

- Real time and dynamic passenger information: arriving time, routes, options for changing the bus route, map view, actual time, dispatcher messages to passengers…
- Acoustic and visual communications
- Industrial solution in various sizes
- LED backlight, metal casing and 5mm thick anti-reflective glass
- Company specific image
- Displaying public, tourism, city, news… related information
- Location and time based advertising options (pictures and video)
- Direct and dynamic communication with citizens, increasing the journey standards

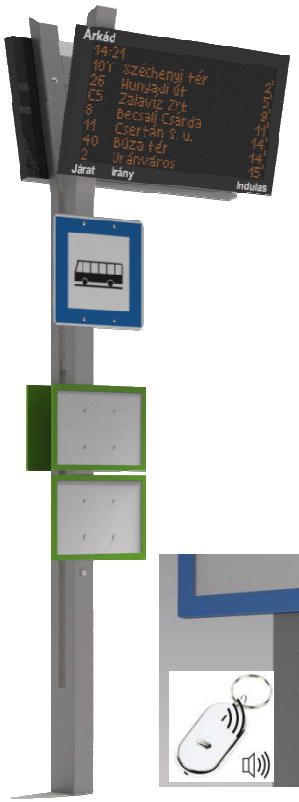




Dynamic passenger information system at the bus stop

End-to-end solution

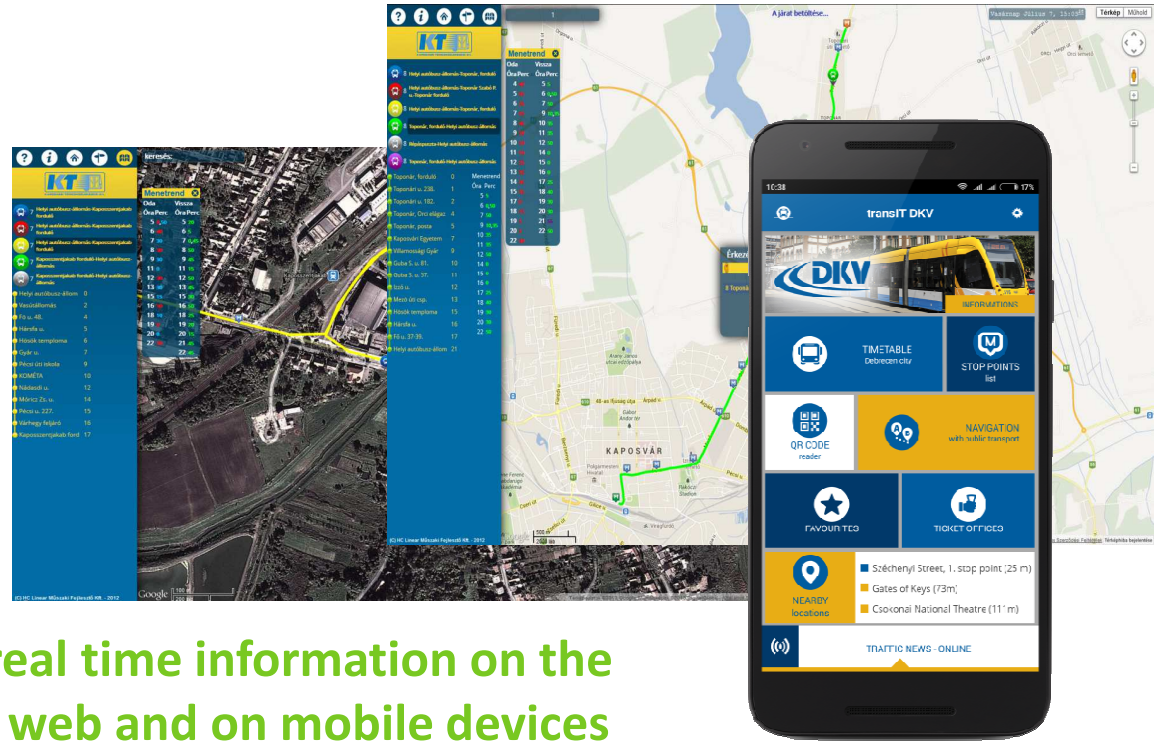
Dynamic and real time passenger information system at the bus stop or stations



- Real time and dynamic information
- Dispatcher messages to passengers
- One or two side solution in variable size
- LED or LCD
- Monochromatic or colorful displays
- Industrial solution
- Wifi/GSM/Ethernet communication
- Acoustic information with push-button or remote control for disabled passengers
- Line power or solar cells
- Displaying public, tourism, city, news… related information

Alternative passenger information system

- WEB based passenger information
- SMART phone passenger information
  - Timetable
  - Virtual bus stop
  - Real time information
  - Journey planner
  - POI’s
  - Favorites
  - Live traffic news feeds
  - etc…



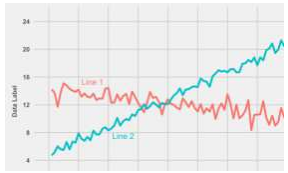
Accurate, dynamic and real time information on the vehicle, at the stops, on web and on mobile devices

Intelligent traffic light management „Green way request”

- Along the set parameters traffic lights and providing preference „green way” to the public transport vehicles
- Based on real time information
- OBU is in connection with traffic light management
- Transport schedule optimization
- Cost savings
- Punctuality

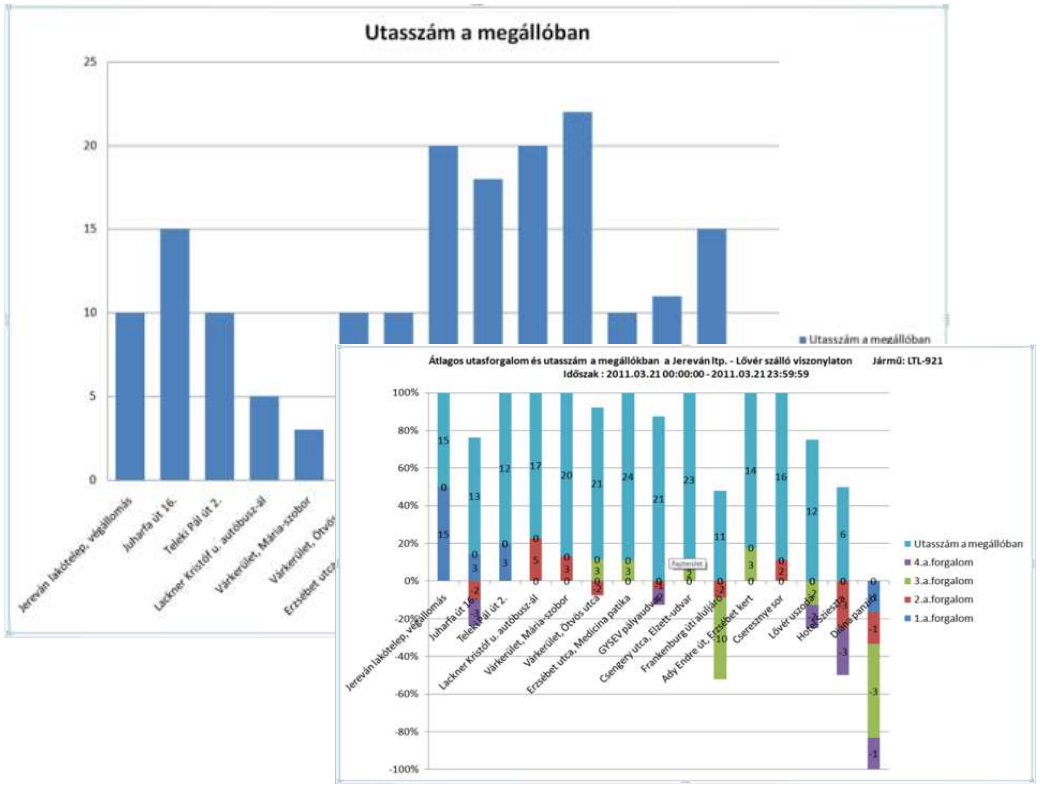
Fuel control system

- Controllable fuel consumption
- Proven efficiency increasing and cost savings
- Motivation for ECO driving style
- System pairs all the other traffic data to the fuel consumption: time, GPS coordinates, driver's name, registration number, number of the route, temperature in the passenger compartment, performed distance, status of the doors, speed, 3D acceleration, state of the fuel cap, running time of heating and air conditioning, etc.

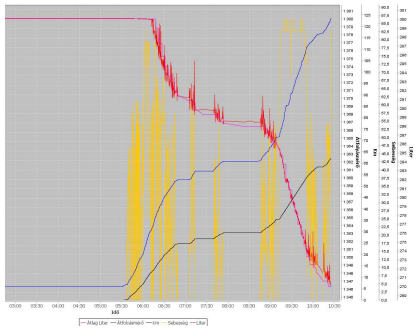


Central system administration software

REPORTS



- Number of passengers
- Fulfilled bus routes
- Comparison of plans and facts
- Account settlement
- Fuel monitoring
- etc…



Solutions for different type of public transport

TROLLEY BUS

TRAM

LOCAL BUS

INTERLOCAL BUS

TRAIN

Cooperation with vehicle manufacturers

E.g. CAF trams (Debrecen)
SKODA trams (Miskolc)

Green Way request
(Intelligent Traffic Light Management)

On-Board passenger information

Passenger information at the bus stop

On-Board-Unit
Traffic control

Thank you for your attention!

If you are interested about any of our solutions, please contact us:
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