

GPS monitoring, telematics

Lesson plan for teachers



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STEP AHEAD II

The support of Professional development of VET teachers and
trainers in following of New trends in Automotive Industry
Automotive Innovation & Teacher training Academy
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GPS monitoring, telematics

The aim of the lesson:

Let students get basic knowledge about what Telematics systems are, how do they work in general, technologies used, advantages of modern Telematics Systems

Activity No.1

Part of the lesson: **EVOICATION**

The aim of the activity: Finding out, what students know about the topic and what they would like to know

Step 1	Brief description of the activity	<p>Activation with K-W-L method. Students work in pairs/individually/groups. On a piece of paper, let them draw a table with 3 columns. Into a first column, ask them to write what they already know about the topic of telematic systems. Those who want to, can read what they wrote. Teacher or students can add their notes also on a board, where all the information written can be summarized. Writing time should be 3 minutes max.</p> <p>After summary, ask them to write into the second column what would they like to know...For now, leave the third column empty.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">I KNOW</td> <td style="text-align: center;">I WANT TO KNOW</td> <td style="text-align: center;">I LEARNT</td> </tr> <tr> <td style="height: 40px;"></td> <td></td> <td></td> </tr> </table>	I KNOW	I WANT TO KNOW	I LEARNT			
	I KNOW	I WANT TO KNOW	I LEARNT					
		<p>Work in pairs. Each pair together please write down everything you know, or want to know about telematics systems. Writing time is 3 minutes. Please use the full time for writing, without going into deep</p>						

	<p>Instruction (what you need to tell the students)</p>	<p>discussions about the topic now. Just write anything you can think about...Write what you know in the first column of the table.</p> <p>After 3 minutes:</p> <p>You've got the list of information written in the first column. Those who want to, can read what they wrote. If you hear any information that is missing in your table, you can add it to yours.</p> <p>Afterwards, please write what you want to know, into the second column.</p> <p>After you are finished, each pair please present what you wrote.</p>
<p>Step 2</p>	<p>Brief description of the activity</p>	<p>Short summary of what students know and come up with in Step 1. Some of student's suggestions can be written on whiteboard by teacher.</p> <p>Teacher then might give an example of goods transportation (for example transporting of fresh fruits or vegetables from Spain to Finland. What of the written suggestions can students assign to the model situation?</p> <p>https://www.theseus.fi/bitstream/handle/10024/44073/Hall%20Hardi.pdf?sequence=1&isAllowed=y or other links stated in "notes"</p>
	<p>Instruction (what you need to tell the students)</p>	<p>Now we will summarize your suggestions on flipchart/blackboard.</p> <p>Afterwards, I will give you a model example of goods transportation and we will try to assign your suggestions to this example.</p>
<p>Tools for the activity (everything you need to take to the classroom)</p>	<p>Pen and paper, blackboard/flip, Annex 1 (K – W – L table)</p>	
<p>Estimated time (max. 40 min.)</p>	<p>15 min</p>	

Notes	<p>Support materials that teacher can use on the topic of fruits transportation (case study), if needed:</p> <p>https://asstra.co.uk/mode-of-transport/road-transport/ https://www.coolcargo.co.uk/refrigerated-transport-to-estonia</p>
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Activity No. 2

Part of the lesson: **APPRECIATION**

The aim of the activity: Deepening the knowledge on the topic of telematics systems

Step 1	Brief description of the activity	<p>Watching 2 videos + working with text in annex 2</p> <p>https://www.youtube.com/watch?v=GW0gDCx-xfA&ab_channel=EmbitelTechnologies https://www.youtube.com/watch?v=gq9O4RSJBnM&ab_channel=EURO-LeasingGmbH</p>
	Instruction (what you need to tell the students)	<p>Now we will watch 2 different videos about how telematics works and real life use of telematics system. After watching, read prepared material (Annex 2) about telematics.</p>
Step 2	Brief description of the activity	<p>After finishing watching videos and reading the annex please let students evaluate what they learnt and let them fill the “I learnt” column of the K – W - L table.</p>
	Instruction (what you need to tell the students)	<p>When you finish watching the videos and reading the annex, please evaluate what you learnt about telematics systems and fill the “I learnt” column in your K – W - L table.</p>
Tools for the activity (everything)		<p>Smart TV / Data projector with notebook & internet access to watch the youtube videos</p>

you need to take to the classroom)	Printed annex 2 for each student
Estimated time (max. 40 min.)	20 min
Notes	<p>Videos to watch:</p> <p>https://www.youtube.com/watch?v=GW0gDCx-xfA&ab_channel=EmbitelTechnologies</p> <p>https://www.youtube.com/watch?v=gq9O4RSJBnM&ab_channel=EURO-LeasingGmbH</p>

Activity No. 3

Part of the lesson: **REFLECTION**

The aim of the activity: Reflection on the information gained in the previous parts of the lesson and practical use of it

Step 1	Brief description of the activity	Reflection on the new information gained in the previous steps. Practical use of this information through explanation of basic principles of how telematics systems works, ant it's gains. Work in pairs.
	Instruction (what you need to tell the students)	You are going to work in pairs. Imagine you are a Fleet manager at Truck transport company. Your task is to explain to your fellows the basic principle of how telematics systems works in general, and its advantages to managing operations as a Fleet manager.
Step 2	Brief description of the activity	Lift pitch. Let students continue working in pairs. One student in the pair is a fleet manager from other company which is not working with any telematics system. The other wants to persuade him/her in 30 seconds to purchase and start using some telematics system, explaining all the benefits. Preparation of arguments is limited to 1 minute. After a while

		the roles in the pair change. Some pairs can present their arguments in front of the class.
	Instruction (what you need to tell the students)	Work in pairs. One of you is a Fleet manager who is common with telematic system, the other is fleet manager you know, who is not using any telematics system yet. Prepare the arguments supporting the purchase of telematics system. Preparation time is 1 minute, presentation time/argumentation is 30 seconds. After a while change your roles in the pair. Volunteers can present their argumentation in front of the class.
	Tools for the activity (everything you need to take to the classroom)	-
	Estimated time (max. 40 min.)	10 min
	Notes	Other sources: https://en.wikipedia.org/wiki/Telematics https://www.webdispecink.cz/

ANNEX 1

K – W – L table (I KNOW, I WANT TO KNOW, I LEARNT)

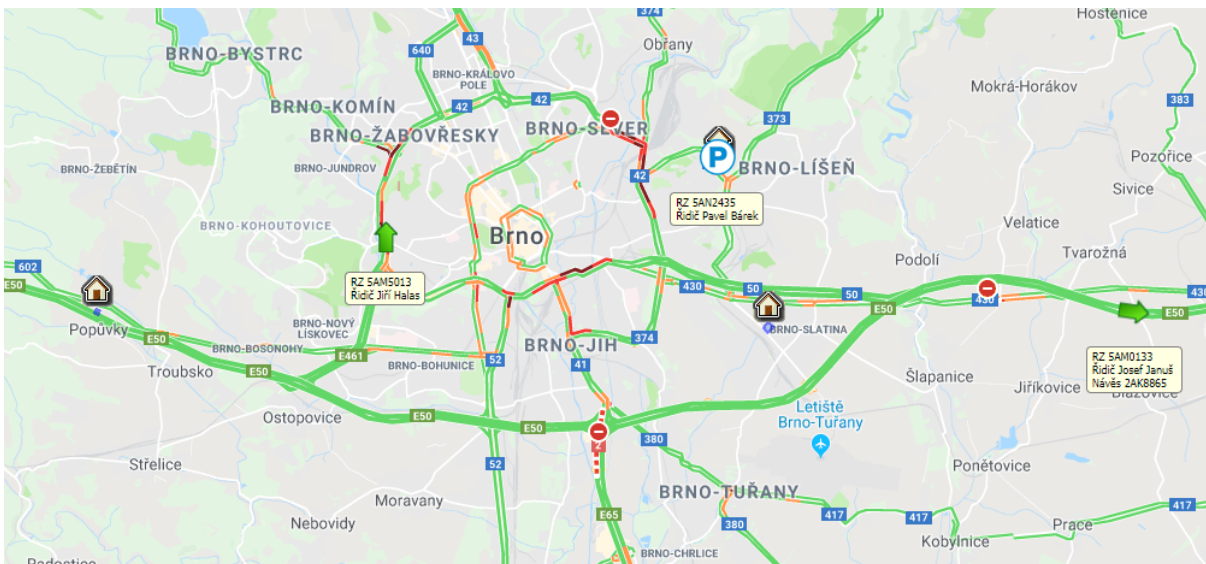
I KNOW	I WANT TO KNOW	I LEARNT

ANNEX 2

Distribution, work planning

Fleet telematics offers several tools to improve company's distribution and make it more efficient. If we took closer look to specific tools at the layer of dispatcher work environment, we are for example talking about:

- Possibility to find nearest vehicle to concrete GPS coordinates while being able to choose vehicle which is currently not contained with other work
- Setting automatically generated notifications about (not) reaching defined area (including possibility of setting up conditions of weekday, concrete day time), and to send these notifications automatically based on on-line GPS positioning to end customer (this functionality is often used in case of „in time“ transports)
- Google maps „Traffic“ – which is feature showing real time traffic condition based on automatic location data collection by Google. Based on these informations dispatcher is able to react to it in advance, and change route plan – or inform end customer there will probably be some delay.



Traffic situation on-line, user defined areas, distinction of vehicles parked/in ride.

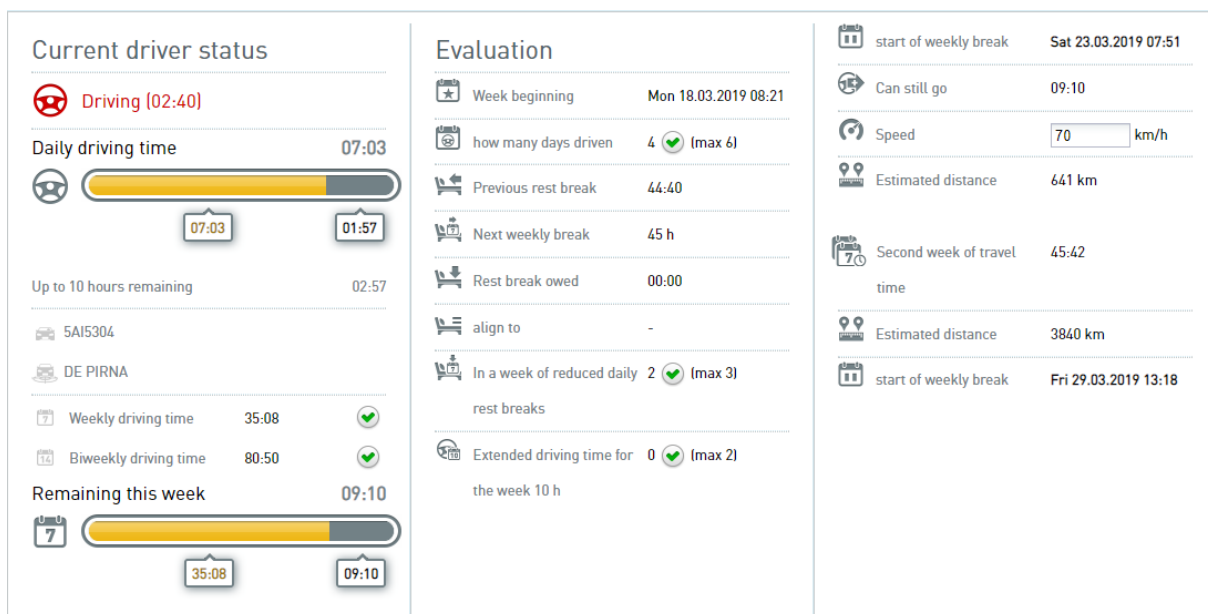
- Having awareness about driver's performance's by tachograph (regulation (EC) 561/2006) which leads to efficient transport planning
- Ability to do detailed planning of transportation – defining loading and unloading places, including exact instructions for driver like time windows, amounts of goods, goods codes, detailed route planning etc. Within this in detail planned transportation it's possible to be automatically notified about leaving defined corridors (route plan), notifying not fulfilling time windows etc..
- Connecting GPS monitoring with optimization software which (based on vehicles real movements and details filled at customers – load/unload points) can suggest routing optimizations
- Controlling of fulfilling cold chain conditions

Tachograph

A digital tachograph is a device fitted to a vehicle that digitally records its speed and distance, together with the driver's activity selected from a choice of modes.

In Europe, drivers are legally required to accurately record their activities, retain the records, and produce them on demand to transport authorities who are charged with enforcing regulations governing driver's working hours. Regulation (EC) 561/2006 of the European Parliament and of the Council defines driver's hours.

Thanks to reading that data from digital tachograph, telematics allows dispatchers not only to see exactly who is driving (has its tachograph card in tachograph slot) and therefore know drivers name, but also to view and control fulfilment of driver's working hours on-line during transportations, and this functionality also gives them overview of driver's working hours across the company which helps to make work planning more efficient.



UP - On-line status of driver's working hours regarding do (EC) 561/2006

RIGHT - Regulation (EC) 561/2006 - Short list of rules

Also the employer must control driver's compliance with the directive (EC) 561/2006 by downloading and evaluating raw data's from digital tachograph, which is demanded by law. It usually requires technician worker to get physically into each vehicle with Company card (company card are used by operators to retrieve data regarding their employees from the tachograph memory) and initiate data download manually.

Daily driving time	max. 9 hours (possible increase 2x weekly to 10 hour) between two rests
Weekly driving time	max. 56
Total driving time for two consecutive weeks	max. 90 hour
Break in the proceedings	no greater than 4,5 length of rest at least 45 minutes. Can only be divided into 2 sections: first 15 min and second 30 mins
Normal daily rest	at least 11 hours within 24 hours from the end of the previous rest period
The division of the normal daily rest period	during an extension of at least 12 hours can only be divided into 2 segments : the first stretch of 3 hours > 9 hours .
Reduced daily rest period	Max. 3x can be shortened to 9 hours . between two weekly rest periods, without compensation
Normal weekly rest	at least 45 hours .
Short weekly rest period	at least 24 hours . with equalization by the end of the 3rd week following. (condition: previous weekly rest period must be normal = min.45 hrs)
Start of weekly rest	At the latest after the lapse of six 24-hour periods from the end of the previous weekly rest.

Telematics allows companies to do this automatically and remotely. While using this solution from telematics systems like Webdispecink, company card is put in card reader connected to server which is initiating downloads continuously based on timer which is set up in vehicle units.

This function saves a lot of time for technician employees which had to physically visit each vehicle time to time.

API – Application programming interface

Is a set of various functions (web services) which makes telematics system able to communicate with other programs and systems.

One way of use is that it allows transportation company to provide information about vehicle position during transportation on-line to logistics companies or transport customer. This data sharing is more and more required by transport customers across the Europe. Today it is often a must-have-feature while making transportations for Europe's leading logistics companies like DHL, Gefco, Gatehouse etc. Those companies usually have their own monitoring platform where they merge positioning information from various GPS monitoring providers)

With this type of connection, all transport stakeholders have the necessary information without having to get the information directly from the person (dispatcher)

Reference guide

Search results for term **getcar**:

Functions

_getCar4way	The function returns data for car4way.
_getCarAtribut	The function returns a list of vehicles including settings.
_getCarAtribut2	The function returns a list of vehicles including settings. This feature allows you to filter by...
_getCarChargeStatus	The function returns the state of charge of the electric car.
_getCarConsumption	The function returns vehicle consumption.
_getCarConsumption2	The function returns vehicle consumption.
_getCarCosts API version 1.0	Function returns list of costs of specific time period for the vehicle.
_getCarCosts API version 2.0	Function returns list of costs of specific time period for the vehicle.
_getCarCosumption	The function returns vehicle consumption.

Example from Webdispecink API reference guide

Another and not less important use of API is to link it up with ERP – company information software.

Based on this connection it is possible to

- Generate traffic records, driver’s working time report
- Border crossings to calculate travel compensations
- Record of fuel – cost of fuel, consumption
- Dispatcher communication with vehicle crew
- Sources for navigaiton, informations about i.e. loading/unloading

Main benefits are:

- Reduciton of data duplication
- Considerable time savings when processing the information
- Incerased accuracy of information
- Incerased efficiency of SW utilization

Vehicle management – Tasks





Tasks – a very helpful tool which allows telematics users to define tasks for vehicles, drivers or trailers. Based on time or odometer state conditions set, systems - like Webdispecink - are able to automatically generate notifications for upcoming service tasks.




Vehicle / Driver / Semi-trailer	expected date	Name	Check Date	Check km	Check mh	Window	Email	State	last fulfilled
2E7 2206 vehicle	19.12.2018 (93 days)	Technická Kontrola	19.12.2018 (93 days)	-	-	✓	✗	Repeated actions	19.12.2016
2E7 2206 vehicle	19.12.2018 (93 days)	EMISE	19.12.2018 (93 days)	-	-	✓	✗	Repeated actions	19.12.2016
3E5 6683 vehicle	27.12.2018 (85 days)	Servisní prohlídka + olej	27.12.2018 (85 days)	352235 (2517)	-	✓	✗	Repeated actions	27.12.2017
5E7 9474 vehicle	13.03.2019 (9 days)	Servisní prohlídka + olej	09.08.2019 (-140 days)	124537 (2042)	-	✓	✗	Repeated actions	09.08.2018
5E8 7163 vehicle	20.03.2019 (2 days)	Servisní prohlídka + olej	09.08.2019 (-140 days)	112875 (180)	-	✓	✓	Repeated actions	09.08.2018
5E5 3761 vehicle	25.03.2019 (-3 days)	STK + EMISE	25.03.2019 (-3 days)	-	-	✓	✗	Repeated actions	
5E5 3748 vehicle	29.03.2019 (-7 days)	Servisní prohlídka + olej	22.06.2019 (-92 days)	151830 (-868)	-	✓	✗	Repeated actions	22.06.2018
5E7 9464 vehicle	06.04.2019 (-15 days)	Servisní prohlídka + olej	31.08.2019 (-162 days)	118421 (-3162)	-	✓	✗	Repeated actions	31.08.2018
6E2 4257 vehicle	08.04.2019 (-17 days)	Servisní prohlídka + olej	30.08.2019 (-161 days)	25000 (-3196)	-	✓	✓	Repeated actions	


Example of Tasks set.


Information about upcoming tasks is visible for all Webdispecink users, which helps to efficiently plan service schedule across the company – dispatchers are able to account with an upcoming task while planning work (transportations) for vehicles/drivers.


Information about vehicle


 RM:  3176
 Ford
 Transit Custom 9 míst
 OP00000301  
 Lelystadt


 Driver: Nicolae  


 Location: OP301_Stavba

 km: 28513,00

 Fuel: 57,40 l

 Parking 172 min







 Time: 10:07:38

 Tasks:
 Servisní prohlídka + olej: -21days
 -1487km

Basis for diets - travel expenses compensations

Employees (Drivers) traveling more than 5 hours away from place of work are entitled to get travel expenses compensations in form of diets.

The calculation is set on defined rates for each country (in various currencies) and time spent. These rates are being actualized each year.

Duration of business trip	Code	Country	Amount	Currency	Pocket money	Valid from	inserted	inserted by
...	DE	DE - Germany				01.01.2019	Show	
  1,00 - 12,00	DE	Germany	15,00	EUR	6,00	01.01.2019	07.02.2019	admin
  12,00 - 18,00	DE	Germany	30,00	EUR	12,00	01.01.2019	07.02.2019	admin
  18,00 - 24,00	DE	Germany	45,00	EUR	18,00	01.01.2019	07.02.2019	admin

Compensation allowance rates

Without Webdispecink travel expenses compensations are made out of traffic record's which are mostly handwritten by drivers. Processing this handwritten record takes quite big amount of time and may contain inaccurate data – for example sometimes the driver may intentionally write the wrong time of border crossing to obtain higher compensation allowance.

In this case, Webdispecink is a huge time saver for company accountants. The driver is assigned to vehicle by inserting his tachograph card into tachograph (even as a crew if there are 2 drivers in vehicle). Webdispecink knows the exact moment vehicle crossed the state border. Therefore, Webdispecink has accurate information about drivers' movement and time spent in each country. It is also possible to assign defined areas to each driver where the algorithm stops to count the time of travel.

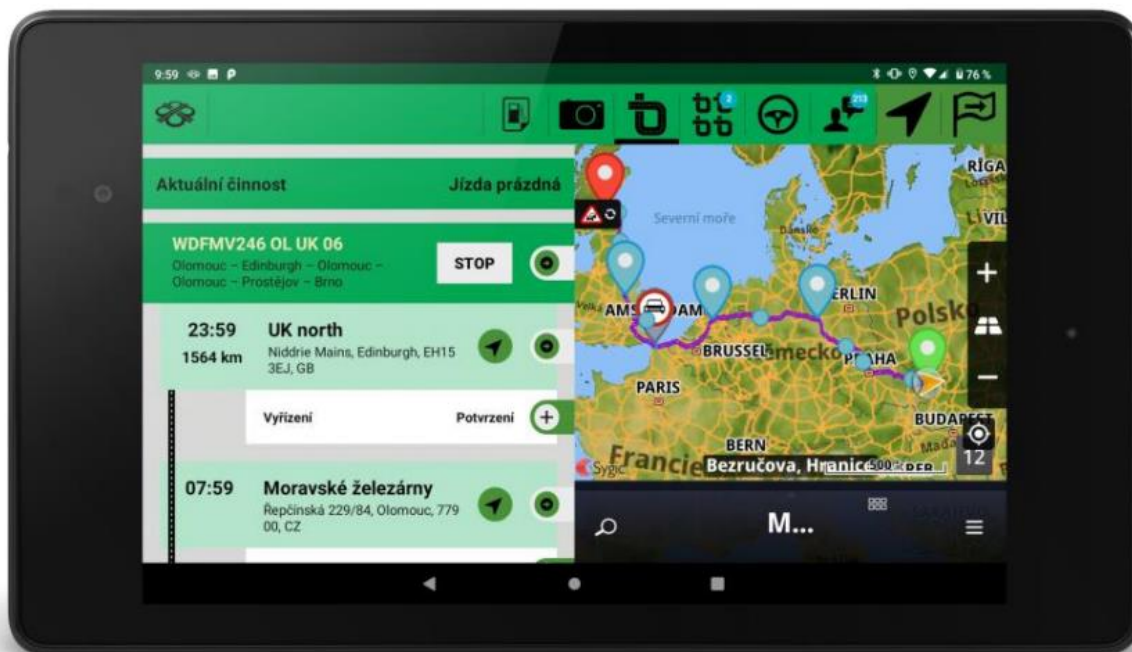
The result is quick and accurate basis for paying off the driver.

Day	Code	Country	Date from	Date to	km	duration	Compensation allowance	Currency	Vehicle	Driver	Meal allowance + pocket money	Currency
01.02.2019	international				439,86	24:00:00		45,00 GBP				63,00 GBP
	GB	Great Britain	01.02.2019 00:00:00	02.02.2019 00:00:00	439,86	24:00:00			527 2203	Petr Dvořan		63,00 GBP
02.02.2019	international				374,96	24:00:00		50,00 EUR				70,00 EUR
	GB	Great Britain	02.02.2019 00:00:00	02.02.2019 09:53:28	209,64	09:53:28			527 2203	Petr Dvořan		70,00 EUR
	FR	France	02.02.2019 09:53:28	02.02.2019 11:33:10	128,08	01:39:42						EUR
	BE	Belgium	02.02.2019 11:33:10	03.02.2019 00:00:00	37,24	12:26:50			527 2203	Petr Dvořan		EUR
03.02.2019	international				0,00	24:00:00		50,00 EUR				70,00 EUR
	BE	Belgium	03.02.2019 00:00:00	04.02.2019 00:00:00	0,00	24:00:00			527 2203	Petr Dvořan		EUR
04.02.2019	international				663,64	24:00:00		50,00 EUR				70,00 EUR
	BE	Belgium	04.02.2019 00:00:00	04.02.2019 12:40:26	255,14	12:40:26			527 2203	Petr Dvořan		EUR
	DE	Germany	04.02.2019 12:40:26	05.02.2019 00:00:00	408,50	11:19:34			527 2203	Petr Dvořan		EUR
05.02.2019	international				205,11	08:05:41		15,00 EUR				21,00 EUR
	DE	Germany	05.02.2019 00:00:00	05.02.2019 08:05:41	205,11	08:05:41						EUR
05.02.2019	inland				453,22	06:39:00		82,00 CZK				82,00 CZK
	CZ	Czech Republic	05.02.2019 08:05:41	05.02.2019 14:44:41	453,22	06:39:00			527 2203	Petr Dvořan		CZK
06.02.2019	inland				548,96	14:42:40		124,00 CZK				124,00 CZK
	CZ	Czech Republic	06.02.2019 04:56:43	06.02.2019 08:59:00	73,46	04:02:17			527 2203	Petr Dvořan		CZK
	CZ	Czech Republic	06.02.2019 09:17:20	07.02.2019 00:00:00	475,50	14:42:40			527 2203	Petr Dvořan		CZK
07.02.2019	international				653,58	13:13:10		30,00 EUR				42,00 EUR
	FR	France	07.02.2019 00:00:00	07.02.2019 13:13:10	653,58	13:13:10						EUR
07.02.2019	inland				7,25	10:46:50		82,00 CZK				82,00 CZK
	CZ	Czech Republic	07.02.2019 10:46:50	07.02.2019 11:53:40	7,25	10:46:50						CZK
27.02.2019	international				537,98	24:00:00		45,00 EUR				63,00 EUR
	FR	France	27.02.2019 00:00:00	28.02.2019 00:00:00	537,98	24:00:00			527 2203	Petr Dvořan		EUR
28.02.2019	international				675,15	13:33:21		30,00 EUR				42,00 EUR
	DE	Germany	28.02.2019 07:45:14	28.02.2019 13:33:21	399,08	05:48:07			527 2203	Petr Dvořan		EUR
28.02.2019	inland				8,88	10:26:38		82,00 CZK				82,00 CZK
	CZ	Czech Republic	28.02.2019 13:33:21	28.02.2019 23:59:59	8,88	10:26:38			527 2203	Petr Dvořan		CZK
Total								45,00 GBP				63,00 GBP
								565,00 EUR				791,00 EUR
								1358,00 CZK				1358,00 CZK
Country summary												
	BE	Belgium			292,38	49:07:16		150,00 EUR				210,00 EUR
	CZ	Czech Republic			4900,88	158:52:33		1358,00 CZK				1358,00 CZK
	DE	Germany			4261,57	128:03:44		210,00 EUR				294,00 EUR
	FR	France			1449,72	54:50:27		120,00 EUR				168,00 EUR
	GB	Great Britain			648,50	33:53:28		45,00 GBP				63,00 GBP
	NL	Netherlands			338,51	25:55:08		50,00 EUR				70,00 EUR
	SK	Slovakia			257,35	19:13:41		35,00 EUR				49,00 EUR

Diet basis for paying off the driver.

Drivers terminal

Is the bridge between driver and dispatcher/fleet manager. It works for both way communication, getting route plans to driver, allows to send photos or document scans both ways.



NOTES:



The opinions presented in this document are the views of the STEP AHEAD II project partnership and do not have to express the opinions of the EU.