Road Control

Road Control Enterprise, version 1.7

SOFTWARE USER MANUAL

www.roadcontrol.eu

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1 ROAD CONTROL PRODUCTS AND SERVICES

Road Control Technology is a set of map, routing and optimisation technology, software and services working with quality road network data and map data.

Road Control Technology is available in a variety of products with different features. The available Road Control products are listed in Chapter 1.1.

1.1 Road Control Products and Services

Road Control

Characteristics: Road Control is a software for planning linked to the full use of Position cloud services. Road Control works only with remote calculation. Map and other data necessary for the calculation are provided by Position data centres.

Road Control Enterprise

Characteristics: Road Control Enterprise is a software allowing the user to benefit from the use of NaviGate Enterprise platform. This product makes it possible to install data locally or to make a full use of Position cloud services. Multi-user licence programme is available within this product. Local installation option provides the user with a number of functions, such as Routing with Truck Routing Support and Isochrones. It also provides an easy way of integration with databases and the IS.

Web Service Road Control

Characteristics: Web Service Road Control is a web service for planning designed to be integrated with the Information System or with the applications of the client or with those of a third party. The documentation of the Web Service is not included in this manual.

1.2 How to Read This Manual

This manual provides information about the products **Road Control** and **Road Control Enterprise.** The functions marked with an *E symbol are only available in the product Road Control Enterprise.*E.

1.3 Customer Support

Our team of experienced professionals is ready to provide customer support to all Position s.r.o. clients.

Any client with **a valid Road Control Software Licence** is entitled to customer support as defined by the Software License Agreement. Customer support is available through email support request or by filling in the Customer Support Form. Support is provided FREE of charge.

We are ready to assist you via e-mail. We will answer your questions within 72 hours on working days once the request is received. Position s. r. o. working hours are: Monday – Friday 8:00-17:00 pm (GTM+1) except for the public holidays in the Czech Republic.

Feel free to contact us on:
E-mail: support@roadcontrol.cz

Contacts: You may find our contacts, up-to-date information and Contact Forms on **http://www.roadcontrol.cz**

1.4 Road Control Technology

Road Control includes the following options for **transport planning** – optimisation (cost minimisation), delivery/collection route calculation, and service intervention calculation according to defined criteria.

Road Control also permits the user **to search routes** (routing), a service designed for a large variety of road vehicle types taking account of physical and legal restrictions. *E

Road Control Technology includes:

- Desktop applications
- The NaviGate map subsystem or NaviGate Enterprise *E
- Planning (scheduling)
- Function for working with addresses, search, geocoding and reverse geocoding („What's here?" function)
- Truck Routing Support including vehicle parameters
- Route searching (routing) taking account of the vehicle type and cargo features *E
- Displaying arrival times – Isochrones *E
- Distance matrix calculation for the road network according to vehicle types
- Cloud calculation option
- Web service for an easy integration of the planning with the IS
- Planning for the whole of Europe or for a selected country

1.5 Necessary Data and Data Range

In order to run, Road Control requires road and spatial map data. Data for the territory of Europe (including the European part of Russia and Turkey) are prepared by default. It is, nevertheless, possible to choose a limited set of data (such as the CZ+SK bundle, for ex.) or data for a selected country *E.

Road Control Technology allows for a possible data extension to cover other areas if these are covered by HERE data (formerly Navteq). Please, contact our Sales Department to inquire about a specific country. Please, visit our website http://www.roadcontrol.eu/contacts.html.

2 INSTALLATION

The first step to install **Road Control** is to download the product installation package from http://www.roadcontrol.eu. The download is available for both the trial version and the purchased subscription for a product. The installation wizard will take you through the installation process. It will prompt you to enter your Licence Information data that you receive via email.

Road Control Enterprise installation runs simultaneously with NaviGate Enterprise (NGE) installation by default. It will be installed from a CD-ROM or a DVD supplied to you. It will be installed as NGE modules. The installation wizard will guide you through the installation process which is also described in the NaviGate System and User Manual. You will receive the Licence information data together with the supplied medium.

3 FUNCTIONALITY – GENERAL OVERVIEW

3.1 Road Control – Scheduling

Road Control – Scheduling offers a powerful solution to calculate the most cost-effective way to serve your customers and to reach the selected places from your centre or multiple centres (depots, service centres) with your fleet.

Service planning is intended primarily to plan delivery and collection schedules from one or multiple depots to a number of destinations to be served within one day (24 hours). **Road Control – Scheduling** takes account of the **vehicle features** (vehicle types, fixed costs and costs per km, **vehicle capacity**, required break times for drivers and other criteria). It also considers **place features**, the required delivery capacity, **time windows** set for service, real service times (such as the time of unloading, the **time of a service intervention**), assignment of specific vehicles and places and many other aspects.

The **result** of the planning is a schedule that arranges the places into individual delivery/collection routes and assigns the routes to the vehicles. Every calculated route features the basic information related to the cost of the route, the distance and the time of the route, the planned itinerary including the information about arrival and departure times, possible waiting times at individual places, and the scheduled break times for drivers. The routes are displayed on the map either in a simplified way or by way of a detailed geometry showing the individual delivery/collection routes and the itinerary.

Road Control – Scheduling Options

- Minimized costs to serve the delivery places
- Single depot or multiple depot option
- Place (destination) settings
- Vehicle settings
- Multiselect – batch feature change of selected places and vehicles
- Vehicle profile selection: when calculating, **Road Control – Scheduling** takes account of the vehicle features and the restrictions that apply in the road network (considering its characteristics)
  Note: depends on the purchased product version with Truck Routing Support.
- If there are not enough vehicles to serve all the places, Road Control – Scheduling assigns the places that are not covered to a so-called virtual vehicle
- Assigning the places to individual routes and defining the itinerary of the service
- Assigning the routes to individual vehicles
- The result of the scheduling displays: total costs, total distance, total delivered quantity

- Displayed details of the route include: the itinerary of the service at individual places, arrival and departure times, scheduled break times for drivers, waiting times
- Dispatch Advisor function *E
- Saving tasks for scheduling to Favorite Tasks
- Importing tasks with place and vehicle settings from *.csv format
- Saving (and opening) the Schedule (depot/depots settings, place and vehicle settings, or/and the result of the calculation) as a *.rml file
- Exporting results of the calculation (the Schedule) to a HTML form or as a *.csv format
- Exporting the individual scheduled routes for a detailed display and a detailed calculation *E of the itinerary in the Routing panel
- Integration with databases, importing data from the IS supported *E

Place Features

- Place type (customer/depot)
- Number of time windows (max. 2 per place)
- Time window/s position and time window/s width
- Service time at the place
- Place demand
- Place location
- User place features linked to vehicles features

Vehicle Features

- Restricting the capacity
- The number of vehicles with identical settings
- Fixed costs associated with vehicle use
- Variable costs (per 1 km)
- Departure place
- Arrival place (may not be identical with the departure place)
- Compulsory break time during daytime driving
- Restricting the total working time (the same as depot, fixed from-to, floating working time)
- Repetitive load option
- User vehicle features linked to place features

3.2 Routing *E

Routing, available in **Road Control Enterprise**, provides a powerful service to allow the user to calculate routes between the starting point and the target point and to select the waypoints. Truck Routing Support is included. The result of the calculation features the basic data related to the distance and the time of the route, the itinerary that may be shown either in a basic or a detailed view, and with the geometry shown in the map window.

Routing Options

- Calculation type options:
  - » Fastest route
  - » Shortest route
- Vehicle profile options:
  - » Basic pre-defined profiles – Auto, Van, Truck, Bus, Pedestrian
  - » Pre-defined truck profiles – up to 7.5 tonnes, up to 12.5 tonnes and up to 12.5 tonnes
  - » User profiles
- Route plan options:
  - » Unlimited number of waypoints
  - » Selecting from the map
  - » Selecting from Search on map
  - » Add place and Delete place option and Reverse the Places of the Route option
  - » Saving tasks to Favorite Routes
  - » Departure time selection
- Route calculation result:
  - » Basic route plan or a detailed itinerary
  - » Itinerary features detailed route description (towns, streets, road numbers, distance, time)
  - » Itinerary details – distance and time summaries according to the countries crossed on the route or according to waypoints
  - » Exporting the itinerary to a *.csv file or to the Clipboard

Vehicle Profiles

A vehicle profile is a set of vehicle features and cargo features taking account of the characteristics of the road network and the legislative restrictions. Every profile has the so-called Basic Settings that define the behaviour of the vehicle in a number of cases, such as if toll roads or one-way streets are encountered etc.; Basic Settings also define speed settings for a given profile.

Basic Settings

- Accept/ignore direction of one-way streets
- Bypass toll roads option
- Enhanced U-turnability option
- Restrictions defined by local legislation (at the level of individual countries)
- Special vehicle types: Taxi, Emergency vehicle, Delivery vehicle
- Suppress „No through traffic“ option
- Suppress local roads option
- Speed setting according to road type

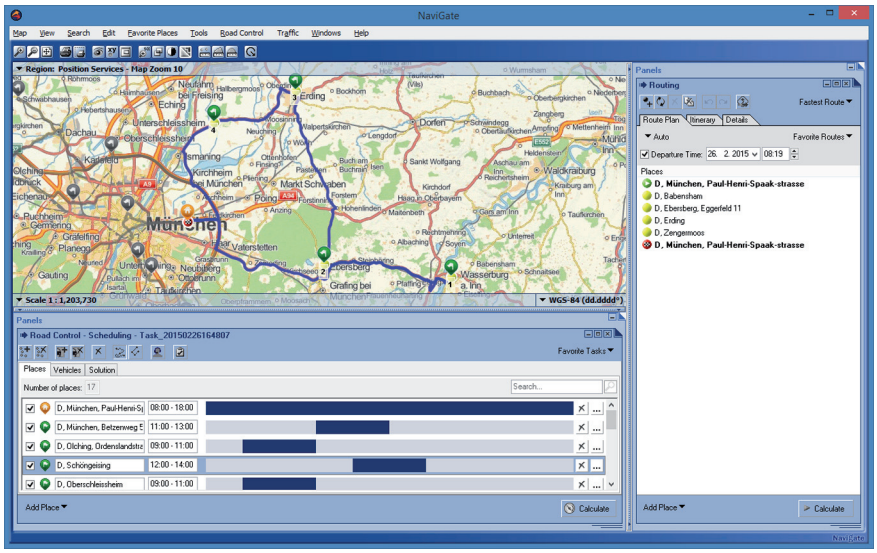
Vehicle Features and Cargo Features Specification

Selected vehicle profiles (typically trucks, vans etc.) include extended functionality of routing that implements specific parameters and restrictions

for freight transport that apply if specific type of cargo is carried (hazardous materials and special cargo). It also considers the physical features of the vehicle (weight, height, length, number of axles …).

- Vehicle Features:
  - » Weight, Height, Width, Length, KPRA Length (Kingpin-to-rear-axle distance), Weight per one axle, Number of trailers, Number of axles, Weight per one axle.
- Cargo Features:
  - » Hazardous materials: Explosives, Gas, Flammables, Organic matters, Poison, Radioactive matters, Corrosives, Goods harmful to water sources,
  - » Special cargo: vehicles transporting Refrigerated cargo, Car transport, Quick-degrading goods (perishables).
  - » Hazardous materials permitions (licenses).

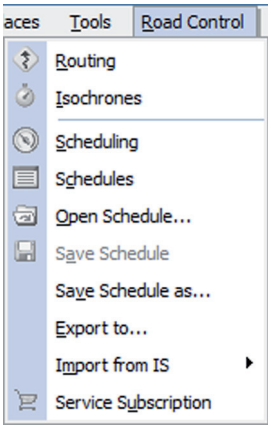
4 SOFTWARE - USER INTERFACE



Once you have launched Road Control, the map window of the program will open. You may access the panel **Road Control - Scheduling** directly from the main menu by selecting the "Road Control" item.

The **Road Control** menu contains the following items:

- Routing *E
- Isochrones *E
- Scheduling
- Schedules
- Open schedule
- Save schedule
- Save schedule as
- Export to
- Import from IS *E
- Service Subscription



Routing *E

Opens the Routing panel. For more details see Chapter 6.

Scheduling

Opens the Road Control - Scheduling panel. For more details see Chapter 5.

Schedules

Opens the Road Control - Schedules panel with the list of all the schedules calculated by remote calculation in the cloud. The list includes the following information: an indication of the calculation success, the name of the schedule, the date and time of the schedule (calculation). If a task is still active, it also shows the status of the calculation. You may open or delete any selected schedule.

Open Schedule

- Allows you to import a task with the vehicles and places from *.csv format or *.xls format while keeping the defined structure.
- Allows you to open a locally stored schedule saved as *.rml. The schedule includes the task definition (depot, places with all the place features and vehicles with all the vehicle features). It may also include the results of the calculation and the itinerary of the routes. It accelerates your work making it much easier. The schedule in *.rml format is stored in a data structure based on xml format.

Save

Allows you to save the changes made in the active task or in the result to the same *.rml file.

Save as

Allows you to save the active task to a new *.rml file.

Export to …

Allows you to export the schedule to html or txt format. The result file may be viewed directly in the browser or in the editor.

Import from IS *E

Allows you to import the Places with the parameters from an external table of *.xls or *.csv defined format.

There are two example import files prepared for importing a .csv or .xls file from the IS (inputExampleExcel.xls and inputExampleISO.csv) and there is an initialisation file named Schema.ini. You need the Schema.ini file in order to initiate a database table from *.csv file.

It must contain the following information:

[<soubor.csv>]	File name
ColNameHeader=True(False)	Indicates if the file contains column headers
Format=Delimited(;)	Defines item delimitor

The example import files can be given any names. Nevertheless, the *.csv file must be included in the Schema.ini file.

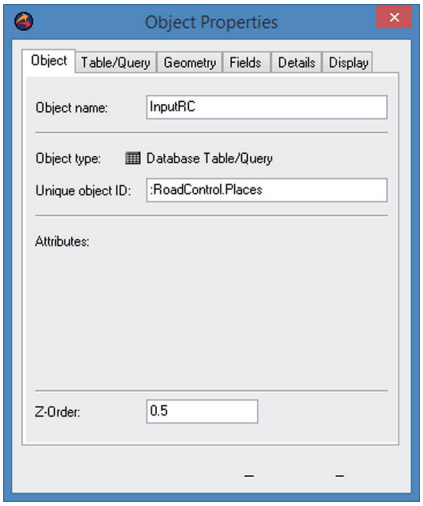
To connect an import file* *E**:**

Click the “Map“ item in the main menu and then, click the “Data Manager“ item. The window Data Manager will open. Right-click anywhere in this window – a menu will appear. In this menu, click the “New object“ item and then, click the “Database Table/Query“ item. The window “Object Properties“ will appear. Now, open the tab “Table/query“, click the open folder icon in the database, and connect the import file.

When importing a database object, you will first need to set the right projection in the „Geometry“ tab (WGS-84 most commonly) and indentify the columns with longitude and latitude in the “Fields“ tab. Then, add the detail type „Add to Road Control Schedule“ in the “Details“ tab.

The ID of the database object that you created for the given NaviGate entry must be in the following form „XXX:RoadControl. Places“, such as „myEntry:RoadControl.Places“ (without quotation marks).

In addition to csv a xls formats, the standard database formats are also supported (tested in MySQL).

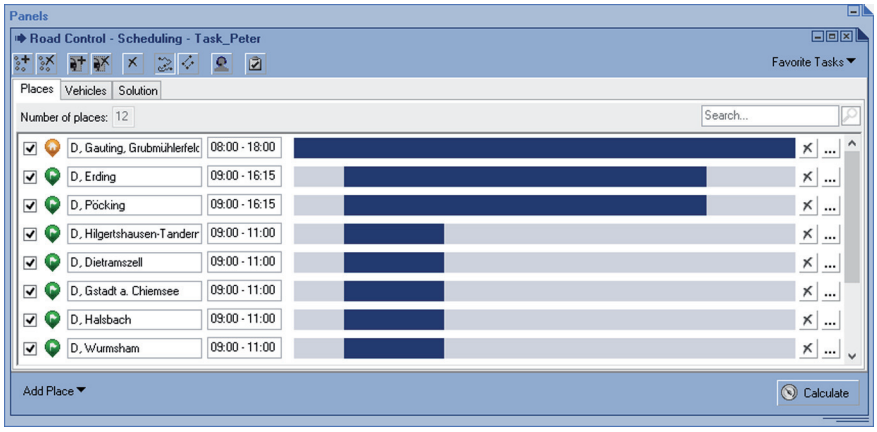


Service Subscription

Shows information about your account and your current Road Control cloud service subscription; includes the link to Road Control shop.

5 ROAD CONTROL - SCHEDULING

5.1 Using Road Control - Scheduling



The “Road Control - Scheduling“ panel contains the button toolbar and three tabs:

- Places
- Vehicles
- Solution

The button toolbar contains the following options:

- Add Place from Map
- Clear Places
- Add Vehicle
- Clear Vehicles
- Clear All
- View Routes
- View Lines
- Dispatch Advisor *E
- Settings (Default Settings)

At version 1.6 and higher, there is also the “Counter“ field in the upper left corner of the “Places“ tab and the “Vehicles“ tab showing you the number of selected places and vehicles.

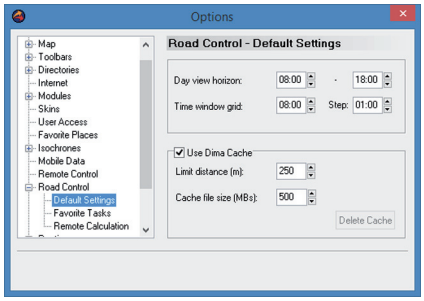
At version 1.6 and higher, there is the “Quick Search“ field located in the upper right corner of the “Places“ tab and the “Vehicles“ tab that enables you to search specific information. “Quick Search“ is available for “Places“ and “Vehicles“.

5.1.1 Settings

Settings may be accessed from the main menu by selecting Map/Options/Road Control. The extended list contains three items.

5.1.1.1 Default Settings

Default settings may be accessed from the main menu by selecting Map/Options/ Road Control or from the button Toolbar of the “Road Control – Scheduling“ panel.



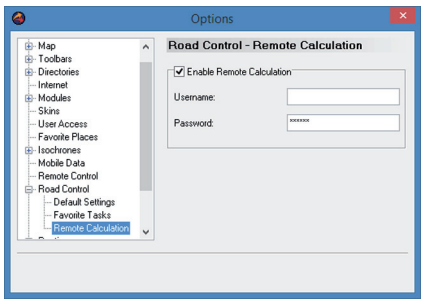
- Day view horizon – defines the time interval displayed in the time window component in the Road Control – Scheduling panel (in the Places tab). This time interval shows the time windows you set.
- Time window grid – determines the start limit of the time window and the step to move the time window by dragging-and-dropping.
- DIMA Cache setting – sets the size of the calculation cache to accelerate the repeated calculations in local calculation *E

5.1.1.2 Favorite Tasks

The Favorite Tasks window shows all the files and folders of your favorite tasks. Change the order in which the tasks are listed by dragging-and-dropping them with the mouse. Use “Rename“, “New Folder “ and “Delete“ on the right in order to make any changes.

5.1.1.3 Web Service Settings *E

Setting Web service for remote calculation:



- Web Service Calculation
  You may select either the remote or local calculation option.
- Login Information
  - » User Name
  - » Password

5.1.2 Creating a Task

5.1.2.1 Depot and Place Location

A Depot is the starting point of the delivery. A Customer is the target point to which an item is to be delivered, (the final delivery point). You may select multiple depots for one task.

The following settings are available for each place:

- Place type – either a **depot** or a **customer**
- Name – places can be given any names
- Number of time windows – two time windows at maximum

  Note: at versions earlier than 1.7, only one time window for a depot is possible.
- Time window position – you may define the point at which the window starts
- Time window width – you may set the width of the time window (**Road Control - Scheduling** operates with the maximum time window width of 24 hours).
- Service time – you may set the time the vehicle will spend at the place (such as the time of a service intervention, time to visit a client, time of uploading and unloading...).

  Note: For the depot, the service time may be defined at version 1.7 and higher.

Features specific to a place defined as **customer**:

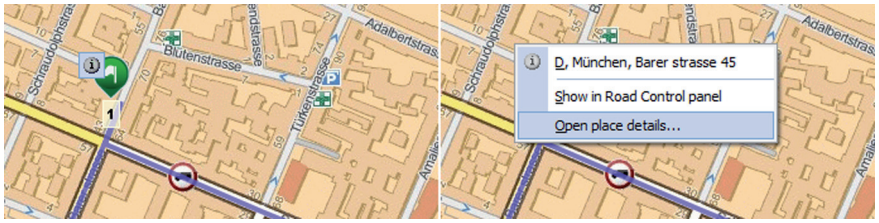
- Place demand – you may set the volume required by the customer/place (litres, pieces, volume, weight).

Note: all these parameters are optional. If it is not, for instance, necessary to reach a place within a given time window, it is recommended to set the time windows at maximum. It will make the algorithm calculate the most cost-effective route in terms of the distance the vehicle travels (travelling salesman problem).

At version 1.6 and higher, it is also possible to change the time window parameter in the “Places“ tab without the need to open the “Place Details“ window.

At version 1.6 and higher, the “Place Details“ window can be accessed directly in the map window. Place the cursor on the green icon of the place you want to change. An information icon and an arrow symbol (view menu icon) will appear. Left-click the arrow and a menu will appear offering you the following options:

- Show in Road Control Panel
- Open Place Details ...



Left-click the “Open Place Details ...“ item and the “ Place Details “ window will open.

You may change any Place Feature by editing the value in a corresponding input box. You may also change the time window settings in the tab “Places“.

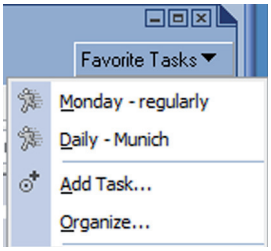
Multiselect: to change a parameter of multiple places or to batch change multiple parameters of multiple places, select the places by holding down CTRL key when clicking the lines and use the “Details“ button to perform the batch change.

Places can be added to the schedule in the following ways:

- One by one by using the “Add Place from Map” button
- By opening a favorite task in the “Favorite Tasks” menu
- By opening a schedule selecting the “Open Schedule” in the “Road Control” menu (in the main menu)
- By adding a place from a database table
- By adding a place using the WSING Search service (depending on the WSING service availability).

Add Place from Map

Add Place from Map is a function to add delivery places. In the “Road Control - Scheduling” panel, click the “Add Place from Map” button. Move the cursor to the “Map window”, find the place to be added on the map and mark that place by left-clicking the mouse. If there are no places in the current task, the first place you select is automatically marked as the **depot**. You may add other depots by holding down CTRL key when adding places from the map.

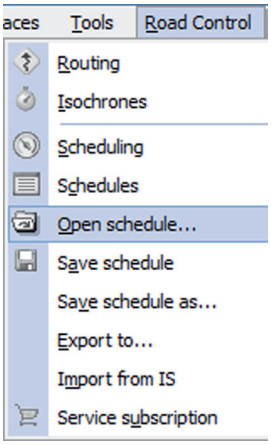


Favorite Tasks

If the delivery places are saved as a favorite task, you may simply open this task repeatedly by selecting it in the “Favorite Tasks” list - see chapter 5.6.1 for further information.

Schedule

A Schedule is a compact set of data that contains at least the following: the task (places and the fleet) the result (optional) and detailed information related to the calculated routes. This set is stored as a common xml format with *.rml file name extension. The list of places may only be imported in a pre-defined format from a *.xls or *.csv file.



Go to the main menu and select the “Road Control” item. Click the “Open Schedule...“ item to open a schedule. Find the external file you want to open, open it and **Road Control - Scheduling** will open the selected file - see chapter 5.6.2 to learn more. The following formats are supported: *.rml, *.xls a *.csv.

Adding a place using the Search function

Go to the main menu, open the Search item and select the “Search on Map“ item. The “Search on Map“ panel will open in the right section of the screen. The web service Search on Map will be launched in this panel. Enter the address of the place in the search box (for ex.: Unter den Linden 12, Berlin or Unter den Linden 12 Berlin).

Place the cursor on the result of the search and left-click it to confirm it. Click the “Actions“ button and select the “Add to Road Control Schedule...“ option.

ATTENTION! The first selected place of the route is always marked as the DEPOT. The other places you add are, by default, marked as delivery places (destinations). You may change the place to depot (and vice versa) in the “Place Details” window.

In the “Places“ tab and in the Map panel, the place selected as a **depot** is marked with an orange icon. The places selected as **customers** are marked with a green icon.

Change the settings of a place

It is possible to change the settings of any of the places. Select the line containing the place you want to change with the cursor.

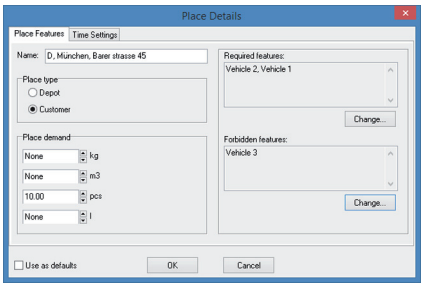
At the right end of the selected line, click the more icon and the “Place Details” window will open. Change the features of the place and click the OK button to confirm. Check the “Use as Defaults“ checkbox to save the changed feature settings as defaults. When adding a place from the map with the WSING Search function, every place will automatically have the default settings you defined.

Note: You may set the features of depots and those of customers separately. See, if you have selected the right place type (depot, vs. customer) when saving the default settings in the “Place Details” panel.

If you want to remove a place, select it and click the “Remove“ button at the right end of the line containing the place. The selected place will be removed.

If you want to remove all the places, just click the “Clear Places“ button in the button Toolbar of the “Road Control - Scheduling“ panel. It is the second button from the left.

Quick changes can be made directly in the “Places“ tab without the need to open the “Place Details“ window. These changes include:



- Place name change - the place added from the map is automatically named according to its location (according to the data included in NaviGate Enterprise*E even at the level of addresses, or - in case of special data - at the level of the internal user‘s identification). If you want to rename the place (giving it the name of the client for instance), select the place by clicking the box containing the name of the place, and rename it.

- Time window position – drag and drop the highlighted time window on the timeline. If you want to change the “Time Window Position“, click the time window, hold down and drag the highlighted time window to the right or to the left to change the time window position.

Required Features and Forbidden Features of a place

This functionality enables you to assign vehicle/vehicles to a specific place. These vehicles will always be assigned to it. You may also forbid a vehicle/ vehicles to serve a particular place. These will never be assigned to serve the place. To define these settings, go to the “Place Details“ window (the button to the right), click the “Change“ button, select the vehicle in the left “Unused Features“ window and click the arrow pointing to the right. You will move the vehicle to the “Used Features“ window.

5.1.2.2 Vehicles

You may change the vehicle settings or add a vehicle using the Toolbar buttons in the “Scheduling“ panel. Click the “Add Vehicle“ button – the third icon from the left – to add a vehicle.

The following settings are available for each vehicle (vehicle type):

- Name
- Departure place and arrival place – if you work with multiple depots, you may define that a vehicle belongs to a specific depot (the depot from which the vehicle departs and to which it arrives need not be identical. The depot for arrival may not be defined at all).
- Limited vehicle fleet size – you may set the number of vehicles (fleet size) for a specific vehicle type or specific vehicle features.
- Return to depot – you may define the vehicle will obligatorily return to the depot (at version 1.5 and higher, this option is replaced by the depot as departure place and depot as arrival place definition).
- Capacity – cargo space capacity of the vehicle. There are four volume units you may set (weight - kg, m3, pieces, volume l).
- Costs per km - you may set the cost associated with the vehicle power per 1 km.
- Fixed costs – you may set the invariable costs independent of the vehicle power.
- Break time – you may set the obligatory break time for the driver.
- Allow break at service time – it is possible to set that the time of unloading will be included in break time.
- Break time interval – you may set the maximum time the driver will drive between two breaks.
- Break time length – you may set how long a break will take.

- Initial driving time – you may set the time the driver has already spent driving before the start of the delivery.
- At version 1.4 and higher, vehicle working time and vehicle capacity.
- At version 1.7 and higher, Allow repetitive loads option is included – you may allow or forbid the vehicle to be used more times during one delivery day. If allowed, the vehicle may return to the depot and perform another delivery.

Note – Limited vehicle fleet size: It is possible to select only one vehicle or you may define that there are more such vehicles, or that there is an unlimited number of such vehicles.

In the “Vehicles“ tab, set the vehicle profile for the calculation by clicking the “Vehicle Profile“ button. The current Road Control version supports to select a profile that is common to all vehicles of the fleet defined. The arrival time and distance calculation (DIMA) (an integral part of the calculation) depends on this kind of limitation. For more details, see 6.2.1.2 Vehicle Profile.

Change vehicle settings

Detailed settings may be set for each vehicle, or (more precisely) for each group of vehicles. Select the line containing the vehicle. By clicking the “Details“ button to right of the line, you will open the “Vehicle Details” panel. Change the parameters and click the OK button to save the changes. Check the “Use as Defaults“ option and the vehicle features you set will be saved as defaults. Every vehicle added to the task by the “Add Vehicle“ icon will automatically have the default settings.

If you want to remove a vehicle, select the vehicle and click the “Remove“ button. The selected vehicle will be removed.

It is also possible to use the Multiselect function (by holding down the CTRL key when clicking the lines). It permits you to select a number of vehicles and change the parameters of all the vehicles selected simultaneously.

If you want to remove all the vehicles, click the “Clear Vehicles“ button located in the “Road Control – Scheduling“ panel toolbar.

In the “Vehicles“ tab, it is also possible to change the parameters without the need to open the “Vehicle Details“ panel. In this way, it is possible to change the following features:

- Name, Capacity, Costs per km, Fixed costs

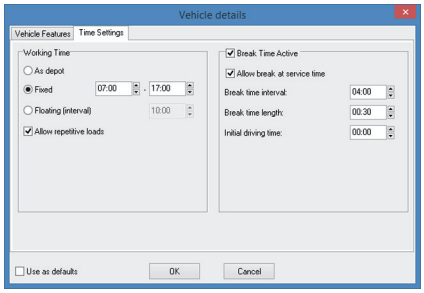
If you want to change the vehicle features mentioned above, select the vehicle and click the box you want to change. Enter the changes and click the OK button to save the changes.

- Vehicle working time and vehicle capacity setting

At version 1.4 and higher, it is possible to set the parameters pertaining to vehicle working time and vehicle capacity in the Vehicle Details menu.

Vehicle Working Time

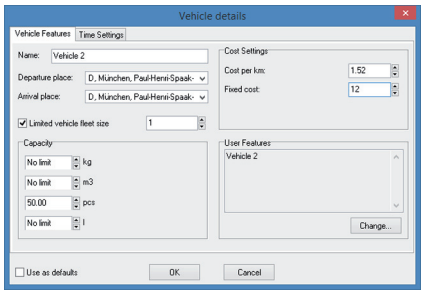
The Road Control system enables you to select three types of working time:



- **As depot** – vehicle working time is determined by the working time of the depot. The working time starts when the depot opens. If the depot to which the vehicle will return is defined, the working time ends at the same time the depot closes. If not, the working time is not limited.
- **Fixed** – vehicle working time is defined by a From/To time span. This working time may be different from that of the depot.
- **Floating (Interval)** – vehicle working time is only determined by the working hours. There is not any specific point at which the working time starts (such as 5 o'clock).

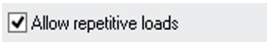
Vehicle capacity

Vehicle capacity may be set in the following volume units: kg, m3, pieces, l



Allow repetitive loads

You may allow or forbid a vehicle to perform multiple deliveries during one delivery day.



5.2 Task Calculation

In order to run the calculation, you need to set the following parameters:

- Depot location (or location of multiple depots) and the location of places – see chapter 5.1.2.1 Depot / Place Location
- Vehicles – see 5.1.2.2 Vehicles

Once the depot, place, and vehicle settings are complete, you may run the calculation by clicking the "Calculate" button. Road Control – Scheduling will perform the calculation (cost optimisation) according to the parameters you defined.

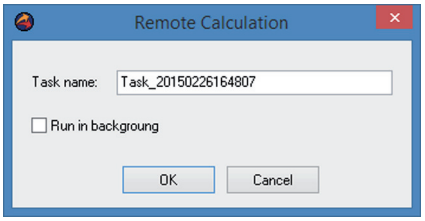
Note: The product Road Control operates with data from and runs the calculation in Position data centres.

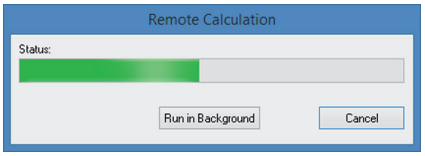
By contrast, the Road Control Enterprise product works with local data or uses the remote calculation option depending on a specific configuration.

The result of the calculation will be displayed in the "Solution" tab, see chapter 5.3 RESULT.

Remote Calculation

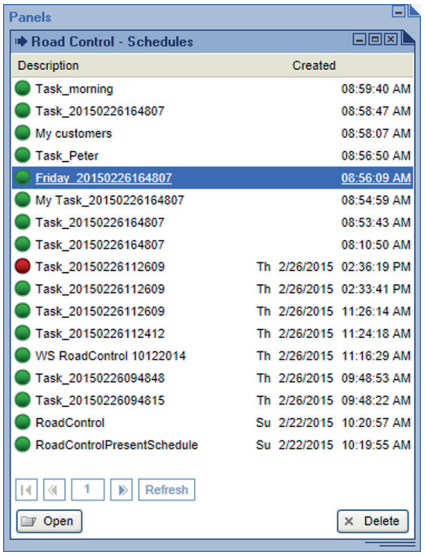
Once you click the “Calculate“ button, the task will be sent to the remote calculation service server. In the remote calculation dialog, you may enter the task name and select the option “Run in Background“. If selected, the calculation runs in background and you may start preparing another task in the **Road Control - Scheduling** panel.





The **Road Control - Schedules** panel featuring the list of all the schedules calculated by remote calculation in the cloud will automatically appear. The list includes the calculation success indication, the name of the schedule and time and place of the schedule (at which the schedule was created).

If task is still active, the status of the calculation is also displayed. You may select or delete a selected schedule.
If the remote calculation service server is unable to verify your registration information, a dialog will prompt you to enter it.



If the remote calculation fails to run from another reason, the calculation is interrupted and an error message box will appear indicating the error that occurred.

If the calculation is successful, the results of the calculation are displayed in the **Road Control - Scheduling** panel once the schedule is opened.

Local calculation *E

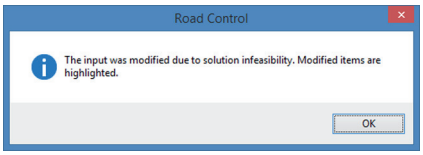
Click the “Calculate“ button and the calculation will run on your PC. While the calculation is in progress, it is not possible to work in the Road Control - Scheduling panel. When running, there is a window displayed indicating the status of the calculation (progress bar). In this window, there is also the “Cancel“ button you may use to cancel the calculation. If the calculation is successful, the result will automatically be displayed once the calculation is complete. Now, you may change the task, save it locally or delete it. If the calculation is not successful, an error message box will appear indicating the error that occurred.

5.3 Solution

The Solution overview provides the basic information about the solution as a whole. It also shows the list of all the routes of the schedule. The header of the solution indicates the estimated cost of the route, total number of km travelled, the number of scheduled routes, and also the places that were not assigned.

The individual scheduled routes provide further details of the solution, such as the estimated cost, the number of places served, the total time the route will take, and the amount of material transported.

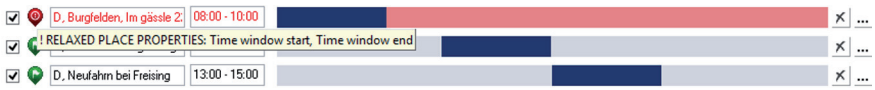
The task may not have a solution that would meet all the parameters you defined. Nevertheless, the algorithms implemented in Road Control are able to detect such situations automatically and may alter the parameters in such a way to make it possible to display them. These situations may arise in the following cases:



- It is not possible to reach the selected place from the depot within the required time or none of the vehicles has sufficient capacity to deliver the quantity required at that particular place.
- There are not enough vehicles to serve all the places selected or they do not have features sufficient to perform the delivery.

In such cases, Road Control analyses the situation, alerts you about it and adjusts the task:

- Either by adjusting the time window of the place or that of the depot, or by reducing the quantity of material required at the place. In the “Places“ tab, this place will be marked with a red icon and a „clock“ symbol. Red will indicate the whole line. The same icon will also be displayed in the map window marking the uncovered place.

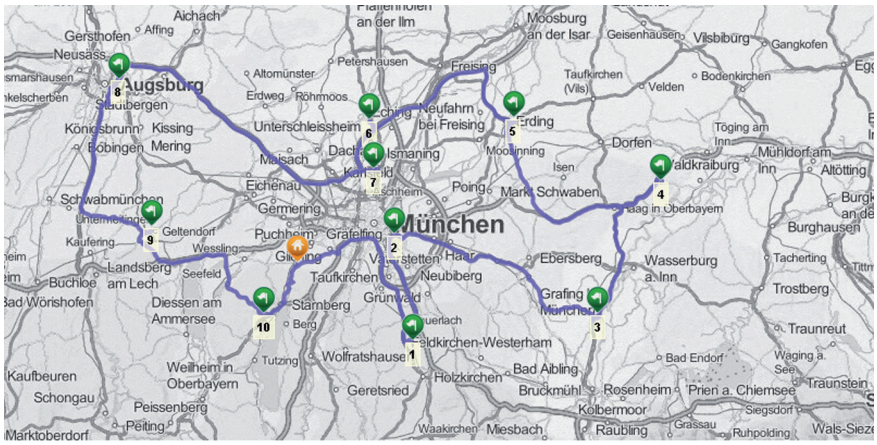


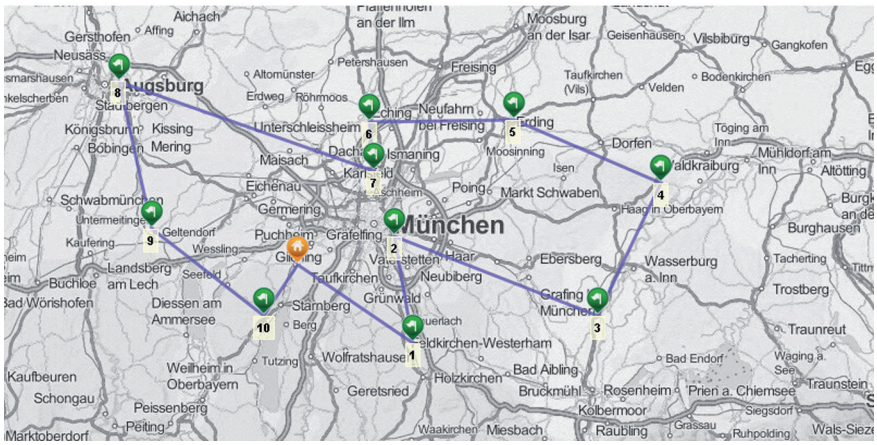
- Road Control compensates the lack of vehicles by using **virtual vehicles.** A virtual vehicle will be added to the “Solution“ tab. The routes that could not be assigned vehicles from the fleet you defined are indicated by red colour. Such routes are assigned a virtual vehicle. In the “Places“ tab, the places assigned to virtual vehicles will also be indicated. They will be marked with a red icon and a „clock“ symbol; the respective lines will turn red. The same icon will also mark these places in the map window.

The map window will display all the calculated routes highlighting the current route you selected. This route will include the location on the map as well as the information about the sequence in which the places will be reached (the itinerary).

There are two ways Road Control may display the scheduled routes:

- **Detailed route view** - shows the route the vehicle will travel on the road network
- **Schematic route view** - shows the route by way of a polyline chain.





5.4 Dispatch Advisor Function

You have already calculated a schedule and you need to include another place defined as costumer to the schedule. In this case, you may use the Dispatch Advisor function*E. The function enables you to re-calculate the schedule instantly after the place is added. **Road Control - Schedule** suggests the optimal time window of that place and includes the new place to the selected route.

To activate the “Dispatch Advisor“ function, click the icon <Obrazek40_A>, located in the “Scheduling“ panel toolbar.

5.5 Itinerary

The right section of the “Solution“ tab displays the itinerary of the selected route. Select a route in the left section of the tab, and the itinerary with a detailed schedule of service at individual places will be displayed.

Itinerary:

Place	Arrival	Waiting	Departue	Latest dept.	Km
D, Gauting, Grubmühle...		**00:04**	**08:04**	**08:11**	**0.0**
1. D, Hilgertshausen-Tandern	09:00		09:15	09:23	58.1
2. D, Markt Indersdorf	09:30		09:45	09:53	71.1
3. D, Reichling	10:52		11:07	15:34	152.0
4. D, Pöcking	11:47		12:02	16:57	189.3
D, Gauting, Grubmühle...	**13:04**				**204.6**

The itinerary includes the following information:

- Place
- Arrival time at the place
- Waiting time (when the vehicle has to wait due to the time window)
- Departure time
- Latest departure time – to comply with the time window of the next place
- The number of km the vehicle travels

The itinerary may also contain the scheduled break times. **Road Control - Scheduling** enables you to set the length of the break time as well as the maximimum possible driving time during daytime driving. By checking the “Allow Break at Service Time” checkbox you may select that service time will be included in break time. This is, however, possible only if the service time is at least as long as (or longer than) the break time.

Itinerary:

Place	Arrival	Waiting	Departue	Latest dept.	Km
D, Gauting, Grubmühle...		**00:27**	**08:27**	**08:39**	**0.0**
1. D, Dietramszell	09:00		09:15	09:27	40.7
2. D, Sauerlach	09:35		09:50	10:02	61.7
3. D, Gstadt a. Chiemsee	10:47		11:02	13:51	141.7
4. D, Rott a. Inn	11:38		11:53	14:42	175.1
Break time 45 min starting at 11:53					
5. D, München, Kuenstrasse 6	13:26		13:41	17:37	224.3
D, Gauting, Grubmühle...	**14:03**				**247.6**

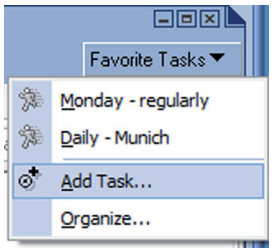
There are two possible ways to display break times in driving:

- Break time inserted between two places – break time is shown in a special line in the itinerary.
- Break time as part of service time – break time is indicated by an icon at the place it will take place.

This itinerary features an overview of the routes scheduled.

If you need a detailed itinerary of the route, Road Control enables you to export the itinerary. To export the itinerary, click the “Export Itinerary“ button you find in the right window of the “Solution“ tab. It is in the upper right corner. The Export function will open the “Routing“ control panel to which the itinerary will be exported. Road Control Enterprises*E enables you to export the itinerary and make a full use of the Routing functionality. Then, you may work the same way as described below, see chapter 6.3.1- Itinerary.

5.6 Saving / Exporting Tasks and Results

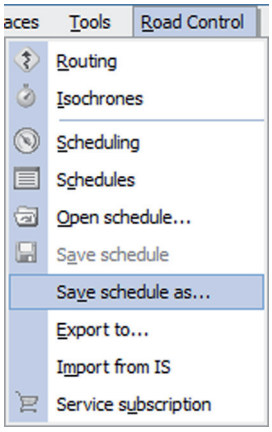


5.6.1 Favorite Tasks

Click the “Favorite Task“ button in the “Scheduling“ panel. A drop down menu will open. Click the “Add Task ...“ item and you will save the task you set. You may find this button in the upper right corner of the “Road Control - Scheduling” panel.

You may organize the Favorite Tasks (change the order in which they are listed) in the Options - Favorite Tasks window (go to Map/Options/Road Control/Favorite Tasks), see 5.1.1.2 Favorite Tasks.

5.6.2 Schedule



Except for saving tasks to Favorite Tasks, it is also possible to save the **result** of the scheduling together with the schedule (including the itinerary displayed on the map).

The “Save Schedule“ item and the “Save Schedule as...“ item are unavailable by default. They will be accessible in the following cases: if a task is defined (depot and places), if a calculation is complete, and if you open another task that has already been saved.

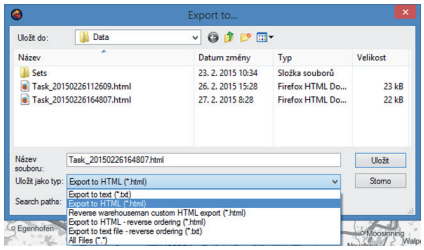
To save a new task for scheduling: go to main menu, click the “Road Control“ item and a drop down menu will appear. In this menu, click the “Save Schedule as...“ item and you will save the task as a new schedule.

5.6.3 Exporting

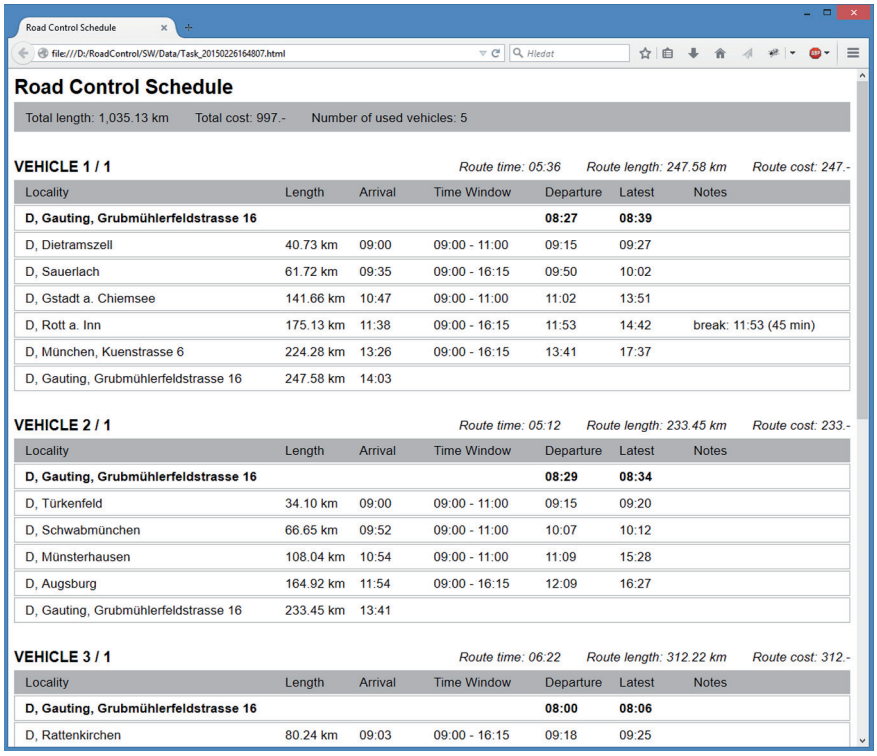
The result of the scheduling may be exported to *.txt and *.HTML formats. There are several ways to export the result of the scheduling, such as Export to text file, Export to text file for the warehouseman (shows the places of the route in a reversed order) and customer export.

To export the result, go to Road Control menu, left-click the “Export to...“ item. Then, select the destination location, enter the name of the file and select one of following export types:

- Export to text (*.txt) file with the pre-defined default UTF-8 Encoding.
- Export to HTML (*.html) – the exported file may be opened in any Internet browser.
- Export to HTML – reverse ordering (*.html) – the itinerary will be exported in a reversed order. This type of export may be particularly useful for cargo loading.
- Export to text file – reverse ordering (*.txt).



To display the exported schedule:
When exporting, you may also display the exported schedule. For *.txt format, a default text editor is used to display the schedule. For *.html format, the schedule is displayed in a default browser.



Road Control Schedule

file:///D:/RoadControl/SW/Data/Task_20150226164807.html

Road Control Schedule

Total length: 1,035.13 km Total cost: 997.- Number of used vehicles: 5

VEHICLE 1 / 1 *Route time: 05:36* *Route length: 247.58 km* *Route cost: 247.-*

Locality	Length	Arrival	Time Window	Departure	Latest	Notes
D, Gauting, Grubmühlerfeldstrasse 16				**08:27**	**08:39**	
D, Dietramszell	40.73 km	09:00	09:00 - 11:00	09:15	09:27	
D, Sauerlach	61.72 km	09:35	09:00 - 16:15	09:50	10:02	
D, Gstadt a. Chiemsee	141.66 km	10:47	09:00 - 11:00	11:02	13:51	
D, Rott a. Inn	175.13 km	11:38	09:00 - 16:15	11:53	14:42	break: 11:53 (45 min)
D, München, Kuenstrasse 6	224.28 km	13:26	09:00 - 16:15	13:41	17:37	
D, Gauting, Grubmühlerfeldstrasse 16	247.58 km	14:03				

VEHICLE 2 / 1 *Route time: 05:12* *Route length: 233.45 km* *Route cost: 233.-*

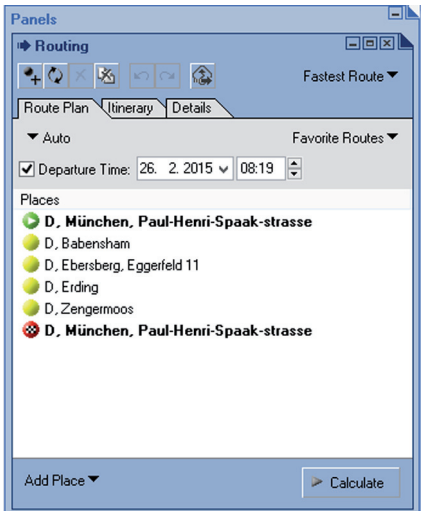
Locality	Length	Arrival	Time Window	Departure	Latest	Notes
D, Gauting, Grubmühlerfeldstrasse 16				**08:29**	**08:34**	
D, Türkenfeld	34.10 km	09:00	09:00 - 11:00	09:15	09:20	
D, Schwabmünchen	66.65 km	09:52	09:00 - 11:00	10:07	10:12	
D, Münsterhausen	108.04 km	10:54	09:00 - 11:00	11:09	15:28	
D, Augsburg	164.92 km	11:54	09:00 - 16:15	12:09	16:27	
D, Gauting, Grubmühlerfeldstrasse 16	233.45 km	13:41				

VEHICLE 3 / 1 *Route time: 06:22* *Route length: 312.22 km* *Route cost: 312.-*

Locality	Length	Arrival	Time Window	Departure	Latest	Notes
D, Gauting, Grubmühlerfeldstrasse 16				**08:00**	**08:06**	
D, Rattenkirchen	80.24 km	09:03	09:00 - 16:15	09:18	09:25	

6 ROUTING *E

Note: Chapter provides information about Routing (route searching) fully available in the product version **Road Control Enterprise** *E



6.1 Using Routing

The “Routing“ panel contains the toolbar and three tabs:

- Route Plan
- Itinerary
- Details

6.2 Route Calculating in Routing

To calculate a route in Routing, you need to set the following parameters for the calculation:

- Place Selection – see chapter 6.2.1.1 Places
- Vehicle Profile Settings – see chapter 6.2.1.2 – Vehicle Profile (optional)
- Route Type Selection – see chapter 6.2.1.3 – Route Type (optional)

Run the calculation by clicking the “Calculate“ button or by clicking directly on the “Itinerary“ tab. Road Control will perform the calculation according to the parameters you defined. The result of the calculation will be shown in the “Itinerary“ tab (see chapter 6.3.1) and in the “Details“ tab (see chapter 6.3.2).

6.2.1 Input Parameters – Task

6.2.1.1 Places

There are two ways to select the places of the route:

- To search and add a place from the map (in the map window).
- To search and add a place using the Search/Search on Map in the main menu...

Search and add a place from the map

Click the “Add Place from Map“ button in the “Routing“ panel toolbar. Find the place you want to add and select it as a place of the route by left-clicking on it. Road Control will mark the place on the map and will list it in the “Route Plan“ tab as the starting point of the route (the green circle with an arrow).

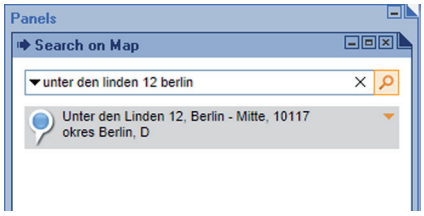
The second place you select this way will be marked as the target point, the destination (a red circle with a target flag). If you add other places of the route, Road Control will always mark the last selected place as the target point.

The waypoints will be marked with a yellow circle icon. Road Control will simultaneously name the places in the Route Plan tab using the reverse geocoding function. The name of the registered office, of the street and the address will be assigned to the places. The quality and details of this process depend on the data the user operates with within his/hers NaviGate installation.

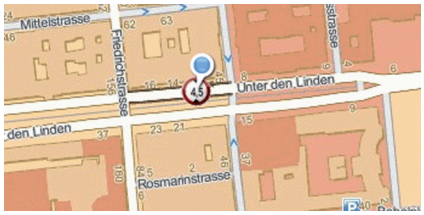
You may change the order in which the places are listed in the Route Plan tab by simply dragging and dropping a selected place in the list of the places (still in the "Route Plan" tab).

Find a Place using the Search on Map... service

This service is used in order to define the registered office, street, address (or postcode/ZIP code) and even the house number („descriptive"/"orientation number"). Select the "Search/ Search on Map ..." item in the main menu. The "Search on Map" panel will open in the upper right section of Road Control.



Enter an address into the Search box. Press the ENTER key or left-click the magnifying glass icon and Road Control will show you the results of the search. The results will be displayed in the map panel. If you search a street, the result will be the middle of the street.



Then, select one of the following options either in the Actions menu or from the drop-down list of the selected result: "Add as Start to Routing, Add as Destination to Routing, Add as Waypoint to Routing" (still in the panel "Search on Map").

Removing the places/Clear all, changing the order of places/export

You may remove the individual places of the route. Select the place you want to remove by left-clicking it in the "Route Plan" tab of the "Routing" panel. Left-click the "Remove Place" button in the toolbar to remove the selected place.

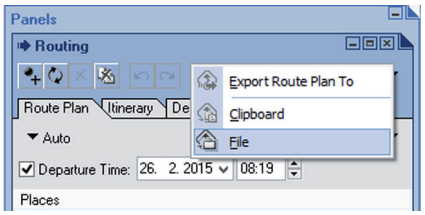
You may remove all the places of the route in a similar way. Left-click the "Clear All" button in the "Routing" panel toolbar and all the places of the route will be removed.

Road Control allows you to change the starting point of the route for the target point (to reverse the route order). Left-click the “Reverse Places“ button in the “Routing“ panel toolbar and the starting and target points will be exchanged.

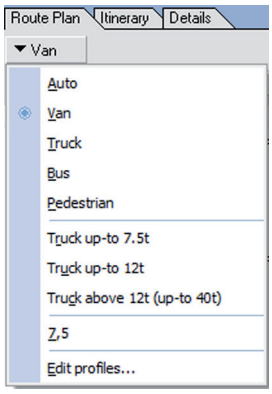
Changing the order of the places: You may easily change the order of the paces in the Route Plan tab by dragging and dropping them with the mouse.

You may save the route plan to the Clipboard or to a .csv file. Both are possible in the “Routing“ panel toolbar (by clicking the “Export“ button).

Click the “Export“ button and the “Export Route Plan To“ menu will appear enabling you to save the route plan to the Clipboard or to a *.csv file.



6.2.1.2 Vehicle Profile

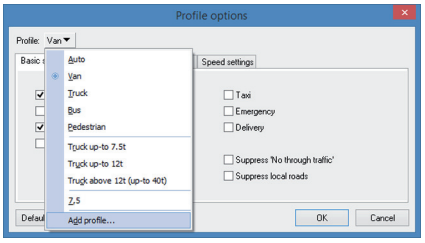


Vehicle Profile (a motor vehicle profile) enables you to set the vehicle features and the features of the cargo it carries. You may access the Vehicle Profile settings in the “Route Plan“ tab by clicking the “Vehicle Profile“ button. A menu will appear in which you may set the profiles.

This menu features a number of predefined vehicle profiles you may select. It is also possible to change the profiles by selecting the “Edit Profiles...“ menu. If you do so, the panel “Profile Options“ will open. You may either save the profile you changed or you may add it to the list of the profiles under a new name by selecting the Add Profile option.

The following basic tabs are common to all vehicle profiles:

- Basic Settings
- Vehicle Features
- Cargo Features
- Speed Settings



There are, however, two profiles (Auto and Pedestrian) that will only feature two tabs – “Basic Settings“ and “Speed Settings“.

Vehicle Profile

Select a “Profile“ in order to set the vehicle profile for which the route will be calculated. You may choose from the following default profiles:

- Auto
- Van
- Truck
- Bus
- Pedestrian

- Truck up-to 7.5t
- Truck up-to 12t
- Truck above 12t (up-to 40 t)

If you have changed any profile parameters, you may save the changes for a predefined profile you wish to change. You may also save it as a new user profile by selecting the “Add profile“ item.

Basic Settings

In the “Basic Settings“ tab, you may define the following vehicle features:

- Accept directions
- Bypass toll roads
- Country legislative restrictions
- Emergency
- Delivery
- Suppress ‚No through traffic‘
- Suppress local roads
- Taxi
- Enhanced U-turnability

Note: There are certain predefined Profiles with fixed Basic Setting items you may not change.

Accept direction

If you check this option, you enforce the vehicle to accept the direction of one way roads. For motor vehicles, this option should always be checked. This option, however, does not make much sense if the calculation operates with Pedestrians or with an Emergency vehicle, rescue and armed forces.

Bypass toll roads

Check this option to exclude any road designated as toll road from the route calculation.

Country legislative restrictions

Check this option if you want the calculation to consider any area restrictions specific for the countries the calculation works with.

Emergency

Check this option to designate the vehicle as an emergency vehicle.

Delivery

Check this option to designate the vehicle as a delivery vehicle.

Suppress ‚No through traffic‘

Check this option to allow your vehicles to pass through the areas that cannot be entered by vehicles, (the B32 traffic sign, No entry for motor vehicles).

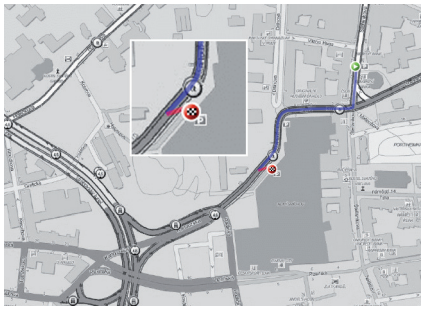
Suppress local roads

Check this option to make your vehicles avoid local roads – roads of the lowest category (for ex. unpaved roads, housing estate roads, etc.). This option will

ensure that your vehicles will avoid such roads even if you search the shortest route.

Taxi
Check this option to designate the vehicle as a taxi.

Enhanced U-turnability
If you check this option, you enable the search algorithm to return to an already passed waypoint. That makes it, for instance, possible to accomplish a manoeuvre that could not be performed earlier (since there was a no turning sing for instance). As a result, Road Control manages to find (or improve) the route even if there are certain unfavourable configurations. It will, however, prolong the time necessary for the route calculation.

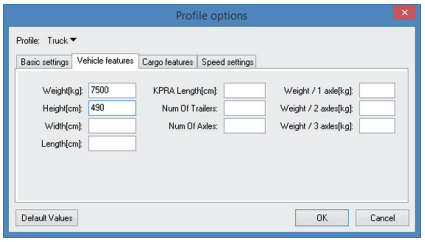


Example: underground parking garage Nový Smíchov – the situation:

- You are driving the Kartouzká Street from the East. It is not possible to legally access the underground garage parking through the southwest entrance. Therefore, it is not possible to follow a direct route between two points. Road Control may, however, use the Enhanced U-turnability option. If you check this option, you allow Road Control to adjust the route; see the second picture.

Vehicle Features
In the tab Vehicle Features (available for truck vehicle profiles), you may specify the physical parameters of the vehicle. These features will determine the calculation as it will consider the restrictions that apply on the road network (maximum load carrying capacity of a bridge, maximum vehicle height to pass underneath etc...).

The physical parameters you may define:

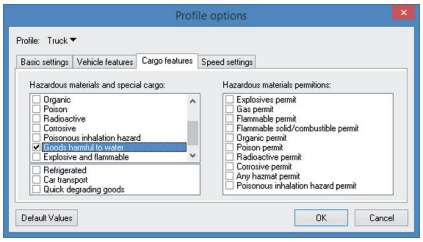


- Weight of the vehicle
- Height of the vehicle
- Width of the vehicle
- Length of the vehicle
- KPRA Length
- Number of trailers
- Number of axles
- Weight per one axle

- Weight per two axles
- Weight per three axles

Cargo Features

In the Cargo Features tab, you may specify the cargo the vehicle carries in case it carries any hazardous material. Other specifications are also available. Route calculation reflects the cargo features you specify and calculates the route accessible for the cargo features you defined.



There are three groups of cargo feature specifications:

- Hazardous material (the cargo content) – options: (Explosives, Gas, Flammable, Flammable-solid/combustible, Organic, Poison, Radioactive material, Corrosive, Poisonous inhalation hazard, Goods harmful to water, Explosive and Flammable, Other).
- Hazardous material permitions (licence to transport hazardous substances) – options: (Explosives permit, Gas permit, Flammable permit, Flammable-solid/combustible, Organic permit, Poison permit, Radioactive permit, Corrosive permit, any hazardous material permit, Poisonous inhalation hazard permit).
- Special cargo – options: (vehicle carrying Refrigerated cargo, Car transport, Quick-degrading goods /perishables/).

Speed settings

In this tab, you may set the average speed limits for specific types of roads for any of the vehicle profiles. Speed limits for the pre-defined vehicle profiles are already set in Road Control. It is not recommended to change the speed limits unless you want to change the weight for a specific type of a road.

6.2.1.3 Route Type

The route type selection is the third basic parameter you need to define for the calculation. There are two available route types:

- Fastest Route (the route that will take the shortest possible time considering the settings and limitations of the selected profile).
- Shortest Route (the shortest possible route considering the settings and limitations of the selected profile).

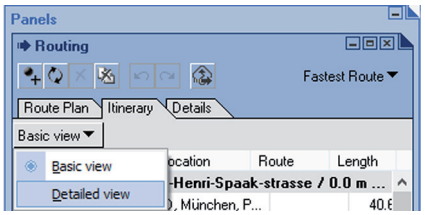
6.3 Result

The result of the routing will be displayed in the “Itinerary“ tab and in the “Details“ tab in the Routing panel.

The route will also be displayed in a detailed way directly in the map window. The itinerary of the route will be shown as a blue line; toll roads will be shown in purple.

6.3.1 Itinerary

You may select one of the available itinerary types in the “Itinerary“ tab. These types are:

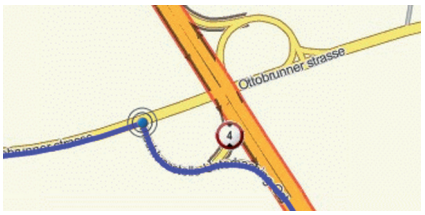


- **Basic** – shows the route information. It displays the itinerary of the route in those places that are marked by a significant change of direction, or by a complicated manoeuvre. It also shows the parameters (distance, time, locality, route, length).
- **Detailed** – shows the information related the all the segments of the route, where road designation or street names change. It also shows the parameters (distance, time, locality, route, length).

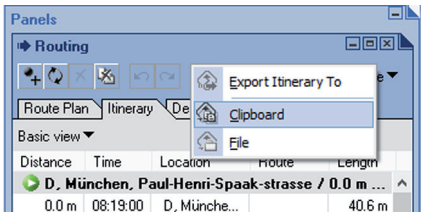
You may set the Itinerary type as default in the main menu by selecting the Map item and then going to Options/Routing/Custom Settings/Default Itinerary Type.

You may display any of the places in the map window by left-clicking any line of the “Itinerary“ tab.

The place is marked with a blue dot symbol with two concentric circles. Double-click any line in the “Itinerary “ tab and the detail of the place will be shown in the “Map“ panel in the most detailed scale.



You may export the itinerary to the Clipboard or as a .csv file. Export the itinerary in the “Routing“ panel toolbar by clicking the “Export“ button. The “Export Itinerary“ menu will open enabling you to save the itinerary to the Clipboard or as a .csv file.



6.3.2 Details

The “Details“ tab features additional information and details related to the route. The tab is divided into two information windows:

The upper window of the Details tab - This window features the result presentation options. You may choose between:

- Result by countries – shows the total distance and time for individual countries.
- Result by route segments – shows the total distance and time between the route points and the total distance and time of the whole planned route.

The lower window of the Details tab – This window features all the information related to the parameters that you defined. These include the information related to the:

- Selected Vehicle Profile
- Profile Option Settings
- Vehicle Feature Settings
- Cargo Feature Settings

6.4 Saving

6.4.1 Favorite Routes

You may save the routes you frequently operate with to the Favorite Tasks folder. You may find it in the upper right corner in the “Route Plan“ tab. The favorite route will be saved together with the profile settings.

The specific activities available for the Favorite Tasks, such as deleting, renaming and saving etc. may be done by going to main menu and selecting /Map/Options/Routing or by selecting the “Organize…“ item. The “Favorite Routes“ item is also accessible in the “Route Plan“ of the “Routing“ panel (go to Routing/Route Plan/Favorite Routes/Organize).