UC-win/Road Ver.17

Operation guidance

FORUM8 Co., Ltd.

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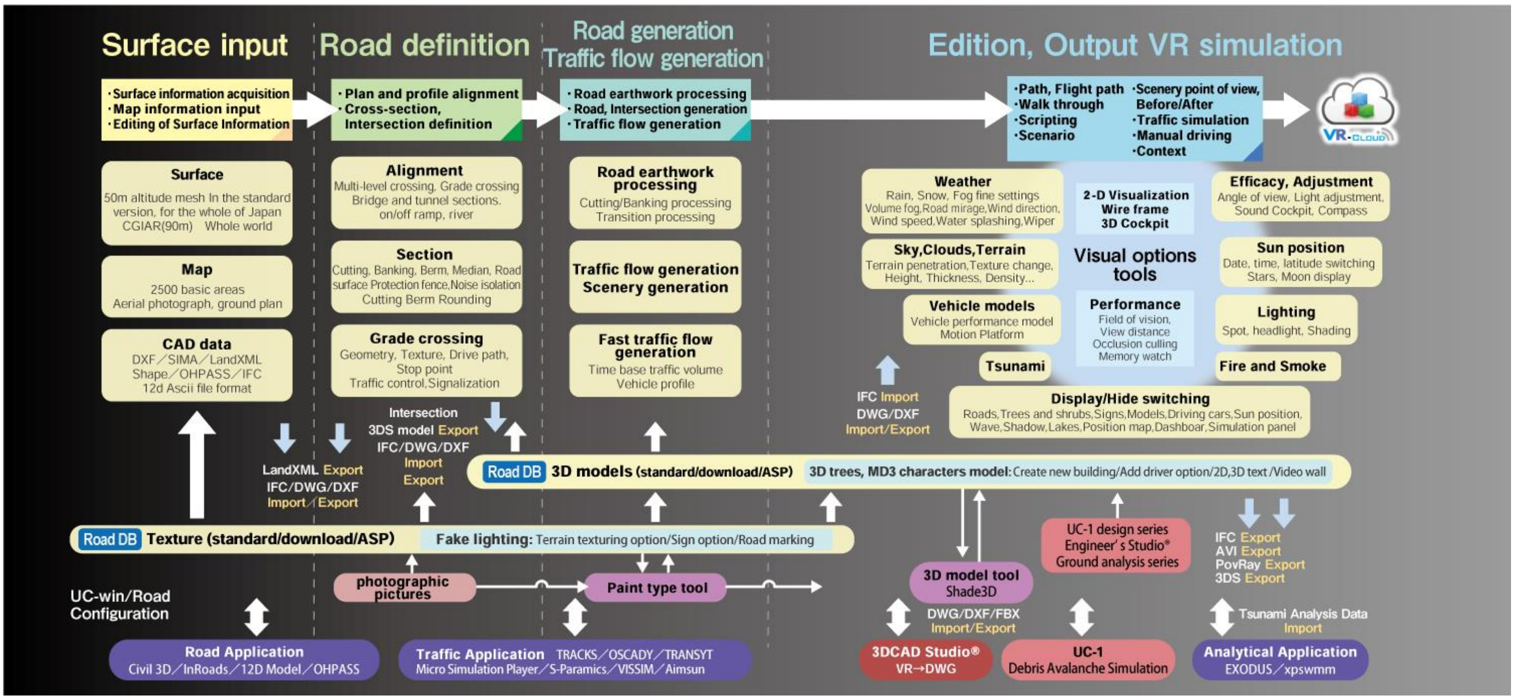
Basic- common

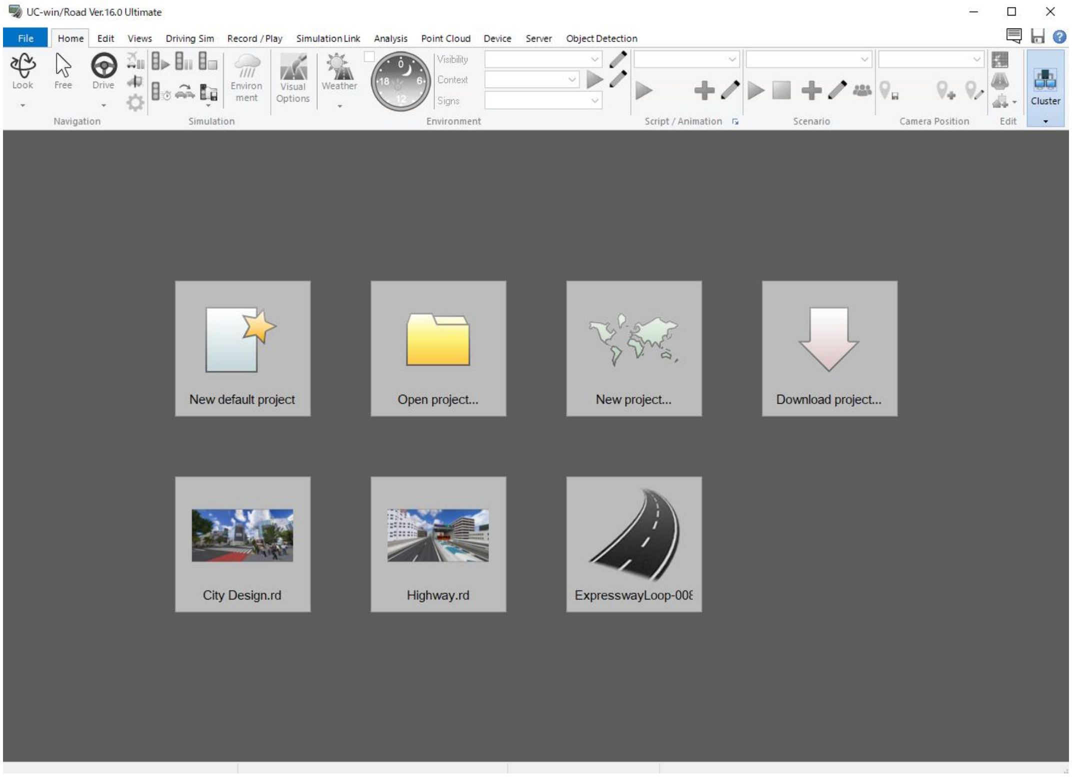
Flow Chart



Surface input
Road definition
Road generation
Traffic flow generation
Edition, Output VR simulation
·Surface information acquisition
·Map information input
·Editing of Surface Information
·Plan and profile alignment
·Cross-section,
Intersection definition
·Road earthwork processing
·Road, Intersection generation
·Traffic flow generation
·Path, Flight path
·Walk through
·Scripting
·Scenario
·Scenery point of view,
Before/After
·Traffic simulation
·Manual driving
·Context
VR-CLOUD
Surface
50m altitude mesh In the standard version, for the whole of Japan
CGIAR(90m) Whole world
Map
2500 basic areas
Aerial photograph, ground plan
CAD data
DXF／SIMA／LandXML
Shape／OHPASS／IFC
12d Ascii file format
Alignment
Multi-level crossing, Grade crossing
Bridge and tunnel sections.
on/off ramp, river
Section
Cutting, Banking, Berm, Median, Road surface Protection fence,Noise isolation
Cutting Berm Rounding
Grade crossing
Geometry, Texture, Drive path,
Stop point
Traffic control,Signalization
Road earthwork processing
Cutting/Banking processing
Transition processing
Traffic flow generation
Scenery generation
Fast traffic flow generation
Time base traffic volume
Vehicle profile
Weather
Rain, Snow, Fog fine settings
Volume fog,Road mirage,Wind direction,
Wind speed,Water splashing,Wiper
2-D Visualization
Wire frame
3D Cockpit
Efficacy, Adjustment
Angle of view, Light adjustment,
Sound Cockpit, Compass
Sky,Clouds,Terrain
Terrain penetration,Texture change,
Height, Thickness, Density...
Visual options tools
Sun position
Date, time, latitude switching
Stars, Moon display
Vehicle models
Vehicle performance model
Motion Platform
Performance
Field of vision,
View distance
Occlusion culling
Memory watch
Lighting
Spot, headlight, Shading
Tsunami
Fire and Smoke
IFC Import
DWG/DXF
Import/Export
Display/Hide switching
Roads,Trees and shrubs,Signs,Models,Driving cars,Sun position,
Wave,Shadow,Lakes,Position map,Dashboar,Simulation panel
Intersection
3DS model Export
IFC/DWG/DXF
Import
Export
LandXML Export
IFC/DWG/DXF
Import／Export
Road DB 3D models (standard/download/ASP)
3D trees, MD3 characters model: Create new building/Add driver option/2D,3D text /Video wall
Road DB Texture (standard/download/ASP)
Fake lighting: Terrain texturing option/Sign option/Road marking
UC-1 design series
Engineer's Studio®
Ground analysis series
IFC Export
AVI Export
PovRay Export
3DS Export
UC-win/Road
Configuration
photographic pictures
Paint type tool
3D model tool
Shade3D
DWG/DXF/FBX
Import/Export
Tsunami Analysis Data
Import
Road Application
Civil 3D／InRoads／12D Model／OHPASS
Traffic Application TRACKS／OSCADY／TRANSYT
Micro Simulation Player／S-Paramics／VISSIM／Aimsun
3DCAD Studio®
VR→DWG
UC-1
Debris Avalanche Simulation
Analytical Application
EXODUS／xpswmm

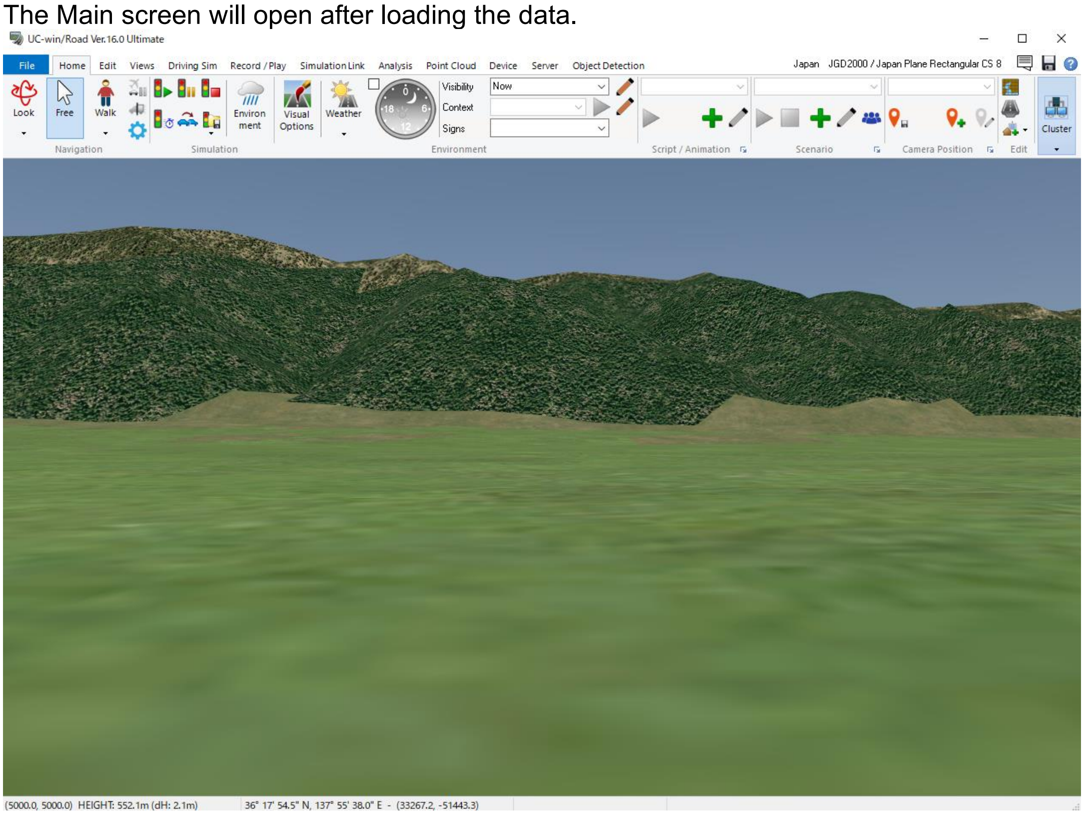
Main Menu

Default Screen



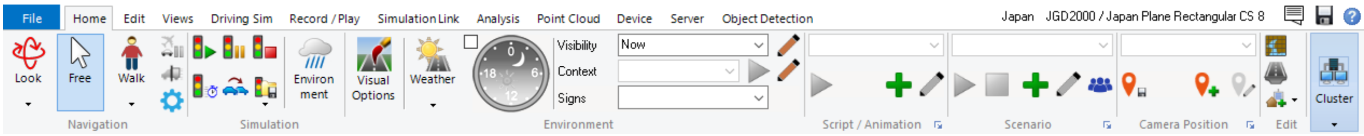
Main Screen

The Main screen will open after loading the data.



The main screen consists of the followings:

●Ribbon Menu
On the top of the screen, there are ribbon menus, which help to find commands instantaneously.
Refer to “Ribbon Menus” for details.



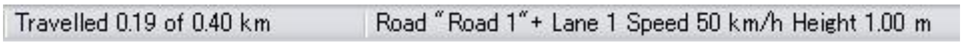
●Terrain and Coordinate System
This shows the terrain and coordinate system in use.

●Event console / Save / Help 
On the top right, there are buttons of Event console, Save and Help.

●Status Bar
Status bar shows the conditions during editing or simulation.

1)Normal 

Frame Rate (fps), current viewpoint in local coordinate, viewpoint in latitude and longitude - (the global geographic coordinate system)

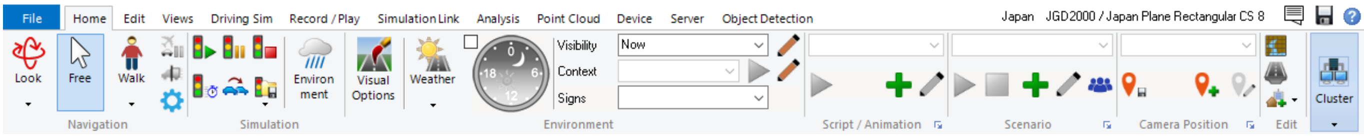
2) During driving simulation 

Position on the road, "road being driven “+lane-speed-height of point of view

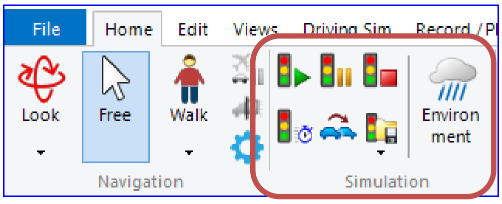
3) During flight simulation 

Position on the flight path, the flight path, speed

Ribbon Menu

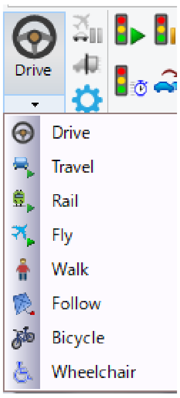


・Ribbon Group



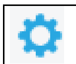
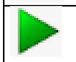
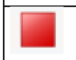
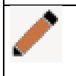
Items are grouped by the features in each ribbon, which is called a ribbon group.
Ex. In the "Home" ribbon, a group surrounded by red is called a "Simulation" group.

Pull down menus



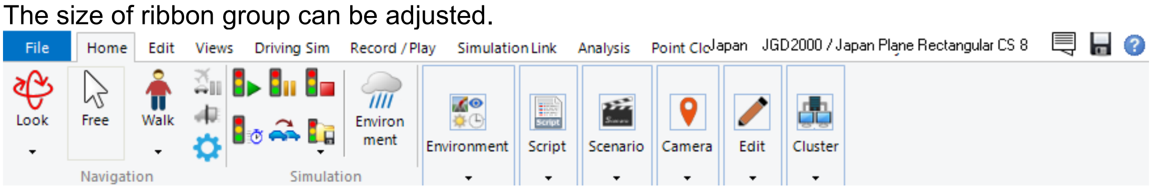
Click ▼ to show pull down menus.

Common icons

	Open a setting form.
	Execute.
	Stop a running function.
	Edit parameters.
	Add information.
	Open an overall function edit from.

Reduced display

The size of ribbon group can be adjusted.



・File Ribbon

Click a file ribbon to open the following pull down menus.

Overview

Command	Description
New Project	［**Default Terrain**］ This option loads a new project using pre-defined terrain. Application default settings will be applied automatically. It is possible to change location settings via an option window. ［**Japan**］ Create a new project using the actual Japanese terrain data. ［**New Zealand**］ Create a new project using the actual New Zealand terrain data. ［**Other Country**］ Create a new project using an actual terrain relevant to a specific location in the supported countries. ［**User Defined**］ Create a new project for locations other than Japan and New Zealand. ［**Load From File**］ Create terrain data supported by GDAL RASTER FORMAT. ［**Download**］ Download the UC-win/Road data from RoadDB. It is downloaded and unzipped in the specified folder <user data path>¥Save or any folder. ［**Import GSI tiles**］ Import GIS tiles.
Open	Open an existing file. It is possible to open a file of the following types. *.rd： Non-compressed UC-win/Road data file *.rdc：Compressed UC-win/Road data file *.rdf：UC-win/Road data file output for Free Viewer version
Reopen	Open an existing UC-win/Road project from a list of the four most recently used.
Merge	Combine two or more existing UC-win/Road projects into one project. *It is possible to use "Merge" only when the data being added has the same area and size as the data currently being edited.
Import	**[Import global positioned models]** Models with the same coordinate system as UC-win/Road can be loaded and placed at once. **[Load RailRoad CSV Curve]** Load Railroad CSV curves. **[Import LandXML]** Import LandXML data. **[Import Shapefile]** Import Shapefile data. **[Import Universal UI Data]** Load data of Universal UI plug-in. **[Import CityGML files]**

	Import CityGML files created by 3D city model project PLATEAU. **[Civil 3D data exchange]**[1] Exchange data during using Civil3D at the same time. **[Import DWG]**[2] Import DWG file data. DWG files of 2D/3D can be imported. *This menu is displayed if "UC-win/Road DWG tool option" (non-free plug-in) is available. *In case of 3D, DWG file, which became blocked by 3DFACE and exported by wblock, can be imported. 3D files are imported as standard models. *In case of 2D, data must be written by a single stroke line because data is imported as cross section. Polyline is not supported. **[Import EXODUS Data]**[3] Import simulation results of building EXODUS by EXODUS plug-in. Refer to "EXODUS plug-in". **[Import GIS View Data]**[4] Open GIS Viewer. **[Import IFC file]**[5] Import IFC data. UC-win/Road imports the terrain defined by IfcSite within IFC. **[Import InRoads]**[6] Import InRoads data. **[OHPASS Convert]**[7] Convert OHPASS data into LandXML data, and then load it in UC-win/Road. **[Import OpenDRIVE]**[8] Import OpenDRIVE data. **[Load OpenStreetMap Data]**[9] Load OpenStreetMap data. **[Load Parking Lot]** Load data output by the parking drawing system of UC-1 product into UC-win/Road. **[Load Tsunami]**[10] Load tsunami data.

1 Available only if Civil Plugin is enabled.
2 Available only if DWG tool Plugin is enabled.
3 Available only if EXODUS Plugin is enabled.
4 Available only if GIS Plugin is enabled.
5 Available only if IFC Plugin is enabled.
6 Available only if inRoads Plugin is enabled.
7 Available only if OHPASS Plugin is enabled.
8 Available only if OpenDRIVE Plugin is enabled.
9 Available only if OSM Plugin is enabled.
10 Available only if Tsunami Plugin is enabled.

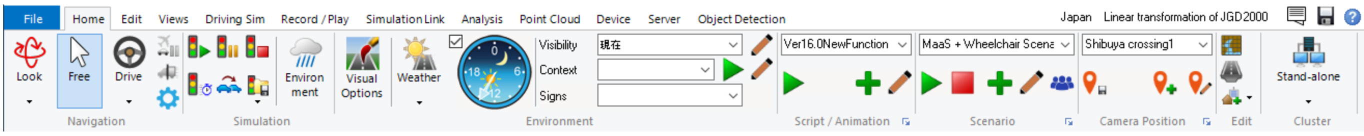
	[Import 12d model data][11] Import 12d Model data. **[Import xpswmm data]**[12] Import xpswmm data. **[Import FLT Model]**[13] Import FLT format data.
Export	**[Export for Free viewer version]**[14] Save a copy of the UC-win/Road project for Free Viewer Version. The file is saved as *.rdf file. Free Viewer can open only the data file output by this format. **[Export LandXML]** Export current data as LandXML (extension: xml). **[Report]**[15] Output information of the current project in HTML format. **[Export Universal UI Data]** Output contents data used in Universal UI plug-in. XML file is created where to be output. **[Civil3D data exchange]**[16] Exchange the data with Civil3D. **[Export DS Courses]**[17] Export data of roads. **[Export FBX]** Export scene information as FBX file. **[Export 3DS]**[18] Export objects as 3D models. **[Export DWG]**[19] Export the current project in DWG file. **[Export FLT file]**[20] Export FLT(OpenFlight) file. **[Export IFC file]**[21] Export IFC file. **[Export InRoads]**[22] Export current data as a LandXML file of InRoads (extension: xml). **[Save to Munsell Color File]**[23] Save a landscape as Munsell Color file (extension: *.mcs).

11 Available only if 12d Model Plugin is enabled.
12 Available only if xpswmm Plugin is enabled.
13 Available only if Export Scene Plugin and OpenFlight Plugin are enabled.
14 Available only if Export For Free Viewer Plugin is enabled.
15 Available only if Road data viewer Plugin is enabled.
16 Available only if Civil3D Plugin is enabled.
17 Available only if DS Course Conversion Plugin is enabled.
18 Available only if 3D Model output Plugin is enabled.
19 Available only if DWG tool Plugin is enabled.
20 Available only if 3Dmodel output Plugin and OpenFlight Plugin are enabled.
21 Available only if IFC Plugin is enabled.
22 Available only if InRoads is enabled.
23 Available only if Munsell Color Space output Plugin is enabled.

	[Export 12d model data][24] Export in 12d Ascii file format.
Save[25]	Save a current UC-win/Road project under the same name.
Save As…	Save a copy of the UC-win/Road project under a new name.
Memory Watch	Watch the memory usage for UC-win/Road.
Project Options	Change the settings such as a logo addition, default basic traffic flow based on the local setting, and the size of intersections.
License Manager	Add or delete plug-ins and set up types of protect keys.
Save Current Image	**Save To File]** Output an image of the current scene. **[Copy To Clipboard]** Copy a current scene to clipboard.
Print...	Print a scene displayed in the main window.
Application Options	**[Default Settings]** Configure basic UC-win/Road system **[Audio Settings]** Configure audio settings. **[Colour Options]** Configure display colors for parts without textures... **[Game Controller Options]**[26] Configure game controller for UC-win/Road. **[Location Settings]** Configure location setting files. **[Proxy Server Settings]** Configure HTTP Proxy Server to download models or textures. **[Civil 3D options]**[27] Configure Civil3D settings.
Information	**[Inquiry]**[28] Sends an e-mail to FORUM8's product development department. **[FORUM8 Home Page]** Open FORUM8 home page (http://www.forum8.co.jp/). **[About...]** Displays UC-win/Road version information of logo, plug-ins, DLL version, OpenGL version and Credits.

24 Available only if 12d Model Plugin is enabled.
25 Saved as *rd.
26 Available only if a game controller is connected before activationg UC-win/Road.
27 Available only if Civil3D Plugin is enabled and Autodest Civil 3D 2006 or newer version of Autodest Civil 3D is installed.
28 Available only if Inquiry Support tool is enabled.

・Home Ribbon



Overview

Command	Button	Explanation
Navigation Change camera mode and navigation mode. It is possible to set up camera mode such as driving and flying.		
Camera mode	Look	**Look** Pivot around current camera position **Zoom** Move back or forward. **Move** Move up, down, left or right **Fly** Change to "Fly". **Spin (model)** Pivot around a model. **Satellite** Change to "Satellite".
Free	Free	Change a navigation mode to “Free”.
Navigation mode	Walk	Change a navigation mode. Click▼mark and select a navigation mode. **Drive** Start driving a car. **Travel** Start simulation driving on road. **Rail** Start running on rail. **Fly** Change to "Fly" mode. **Walk** Change to "pedestrian" mode. **Follow** Change to "Follow" mode. Select a vehicle to ride in the passenger's seat. It is possible to follow a car from the view of outside the vehicle by using a mouse wheel or from any angles by drag. **Bicycle** Start driving a bicycle. **Wheelchair**[29] Start driving a wheelchair.
Pause/Resume		Pause/Resume a simulation.
Change Vehicle		Change driving vehicle.

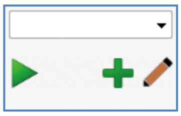
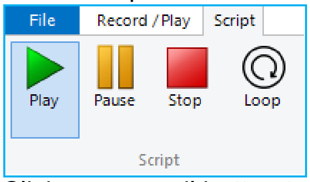
[29] Available only if Wheelchair Plugin Option.

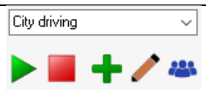
Navigation Options		Open Navigation option to set up moving speed or various effects.

Simulation Use to simulate traffic flow and environments.		
Start Traffic		Start/Finish displaying traffic movement on 3D screen.
Pause Traffic		Pause traffic movement in the window. Click this again to resume.
Stop Traffics		Reset traffic movement.
Run Traffic		Create traffic movement at high speed.
Traffic Step		Display traffic step.
Traffic Status		Save and load traffic movement. **Save traffic status** A traffic simulation on the whole project at the time is exported to a file. **Restore traffic status** The traffic simulation preserved beforehand is loaded. **Register traffic status** Register traffic status file saved by [Save Traffic Status].
Environment	Environ ment	Display movements of environment, character on movable models, and weather, and water huddle, movement of background and flight path.

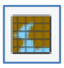
Environment Set up environment.		
Visual Options	Visual Options	Configure visual settings of main window.
Weather setting	Weather	Select a weather from Fine, Rain or Snow. Weather Rain Snow
Time setting		Change the time. Check the checkbox to make the sun potision change depending on the time.
Visibility		Visibility 現在 Select a model group to display on current environment. Click on a pencil mark and open Visible Models display.
Context		Context daytime Select a context to apply to the current scene. Click on a pencil mark to create or edit contents on Context editor.

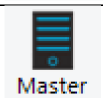
Sign settings		 Switch signs which are created and arranged by parametric model.

Script / Animation Use to edit and execute scripts.		
Script / Animation		Start a script animation. Select an animation and click Play.  Click on a pencil button to open Script editor to create and edit scripts.

Scenario Use this function to edit and start scenario.		
Scenario		Start and edit a selected scenario.[30]

Camera Position Use to save and change camera position.		
Save Camera Position		Save a scene on current main display as camera position.
Add Camera Position		Create a new camera position on displayed editor.
Edit Camera Position		Edit a current camera position.
Camera Position		Open a list window of saved scenes. Set up the keyboard shortcut keys or each view setting.

Edit Use to Edit a plan view, sections or models.		
Open Plan View		Create and edit roads and rails.
Edit Section		Open a registration window to create and edit road sections.
Open Library		Models can be edited and located.

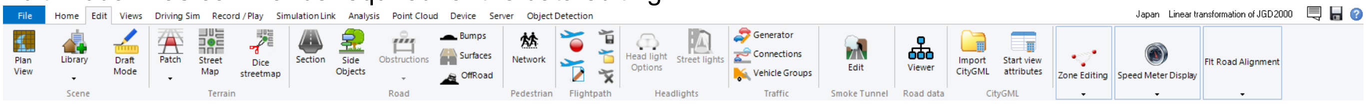
Cluster Use to switch to Mastar mode or Client mode.		
Stand-alone		Stop the cluster mode and back to standard single display.
Master		Switch to Master mode.
Client display		Switch to Cluster client (display mode).

[30] Editing scenario is available only when Scenario Plugin is enabled.

Client free	Client free	Switch to Cluster client (free operation mode).

· Edit Ribbon

Edit Ribbon has commands required for the data editing.



Overview

Command	Button	Explanation
Scene Use to create road, register and arrange models and setup draft mode.		
Plan View	Plan View	Create roads / flight paths / rivers / backgrounds / lakes / cross sections on the current terrain.
Library	Library	Manage all models in the project by using the model panel. Register, edit, and arrange models.
Draft Mode	Draft Mode	Switch to Normal mode or Draft mode. Click to open the draft mode options window. Using Draft mode, it is possible to reduce the time of road creation and check the road shape easily.

Terrain		
Patch	Patch	Load terrain patch data for detail settings of the terrain. **[LEM file]**[31] Apply [Numerical map 5m mesh (height)] data (extension: lem) to the terrain being edited. **[XML file]** Apply terrain patch data (extension: .xml) to the terrain.
Street Map	Street Map	Paste a street map on the terrain.
Dice streetmap	Dice streetmap	Split a large sized picture like a satellite image.

Road Settings for roads. It is possible to add obstructions, edit road surfaces, add side objects or edit sections.		
Section	Section	Edit road sections used for roads and railways.
Side Objects	Side Objects	Arrange signs, 3D models, and trees on the side of roads or markings on the lane
Obstructions	Obstructions	Edit or modify obstructions.
Bumps	Bumps	Edit road bumps.

[31] It is possible to load directly [5m mesh of numerical value map (Elevation)] data provided by Geospatial Information Authority of Japan as 5m mesh data. To load [Base map information] from website of Geospatial Information Authority of Japan, convert it to Shape file.

Surfaces		Edit road surfaces.
OffRoad		Create and edit starting point of off road.

Pedestrian		
Network		Configure network settings of crowd movement.

Flightpath		
Record Flightpath		Set a flight.
Edit Flightpath		Open Flightpath List Editor to edit, delete, display and hide a flightpath.
Export Flightpath		Export the selected flight path on the main to the formatted text file.
Import Flightpath		Import a formatted flight path text file.
Delete Flightpath		Delete a selected flight path.

Headlights		
Headlight Options		Edit headlights of vehicle.
Streetlights		Add streetlights or edit added streetlights.

Traffic Functions to generate and connect traffic flows and manage vehicle groups in this group.		
Traffic Generator		Set traffic flows on the road.
Connections		Edit traffic connection of road network.
Vehicle Groups		Manage vehicle groups.

Smoke Tunnel		
Edit		Edit smoke tunnels for smoke simulation.

Road data[32] Functions to obtain object information of current project.		
Viewer		Open main window of Road data viewer. List of objects arranged on current project are displayed by a tree format.

32 This menu is shown if "Road Data Viewer Plugin" is installed and authenticated.

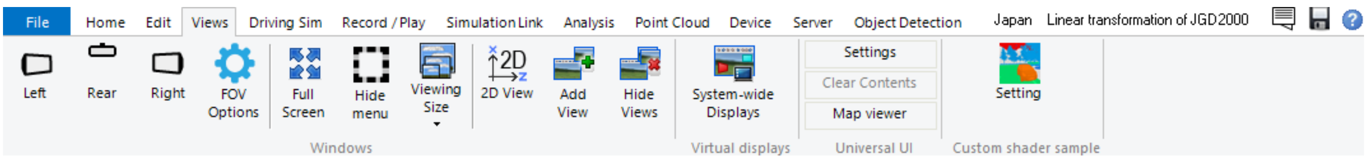
CityGML		
Import CityGML	Import CityGML	Open "Import CityGML" window to import a CityGML file.
Start view attributes	Start view attributes	Display attributes of a building model imported from CityGML file.

Zone Editing Use to create zones or add building models and forests.		
Create Zone	Create Zone	Switch to zone creating mode. Add an arbitrary shape of zone model.
Create Building	Create Building	Switch to shape creating mode. Add an arbitrary shape of building model.
Create Forest	Create Forest	Switch to area creating mode. Add an arbitrary shape of forest model.
Download Object	Download Features	Switch to object download mode. Download building models and forest models from the specified data source and add them to a zone.

Speed meter display[33] Use to control a speed mater of driving vehicle.		
Show	Show Panel	Open a speed meter panel.
Settings	Settings	Open a setting form.

FLT Road alignment[34] Use to generate transparent roads on imported OpenFlight models.		
Input RoadAlignment	Input Road Alignment	Open the setting form.

· Views Ribbon



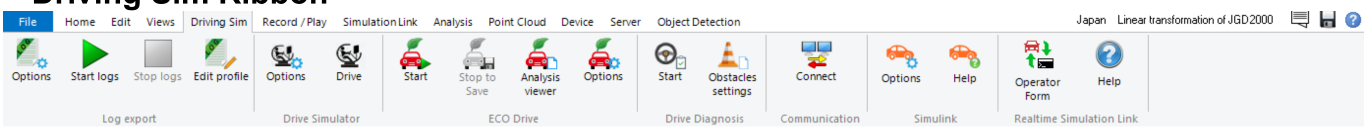
Overview

Command	Button	Description
Windows Show each direction of eviews of current view.		
Left	Left	Display leftward view relative to the current display
Rear	Rear	Display rear view relative to the current display

33 Available only if Speed Meter Plugin is enabled.
34 Available only if OpenFlight Plugin is enabled.

Right	Right	Display the rightward view relative to the current display
FOV Options	FOV Options	Open a setting form.
Full Screen	Full Screen	Switch to full screen mode.
Hide menu	Hide menu	Hide menus.
Viewing Size	Viewing Size	Change the display size.
2D View	2D View	Toggle the Orthographic View on / off.
Add View	Add View	Show a view of saved landscape position.
Hide Views	Hide Views	Hide the view.
Virtual Displays	System-wide Displays	Open System-wide Virtual Display editor.
Universal UI	Settings Clear Contents Map viewer	Start Universal UI. Go to File – Import – Import Universal UI.
Custom shader sample	Setting	Open Custom Shader Sample properties.

· Driving Sim Ribbon



Overview

Command	Button	Explanation
Log export[35] Use to start recording logs and export it.		
Options	Options	Configure options.
Start logs[36]	Start logs	Start recording logs of current simulation.
Stop logs[37]		Stop recording.
Edit profile		Edit profile for log export file name. Setting is optional.

35 Available only if Log export Plugin is enabled.
36 It is also possible to start logging by starting an event which has a Start Logs command.
37 It is also possible to start logging by starting an event which has a Stop Logs command.

Drive Simulator[38] This group has functions used for driving simulation.		
Options	Options	Configure driving simulator options. Refer to "Drive Simulator Options" for details.
Drive	Drive	Start driving simulator.

ECO Drive[39] ECO drive group has functions used for the ECO drive diagnosis.		
Start		Start ECO drive.
Stop to Save		Stop ECO drive and save result.
Analysis Viewer		Display the result of ECO driving.
Options		Configure ECO Drive options.

Drive Diagnosis[40] Used to diagnose and visualize the driver's skill in multiple items.		
Start		A main menu of drive diagnosis is opened. This is for administrator and for training.
Obstacles settings		Open the Obstacle Helper Tool.

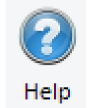
Communication[41] Used to connect with the other UC-win/Road.		
Connect		Open Client display and connect the other UC-win/Road.

Steering Wheel[42] It is used to control a handle on a front passenger seat.		
Control Demo	AUTO	Ride a vehicle during driving. Switch to passenger seat mode by [Enter] key...

Simulink[43] Use Simulink group to operate "Simulink connection plug-in".		
Options		Displays Options form for the "Simulink connection plug-in".
Help		Displays the help for "Simulink connection plug-in".

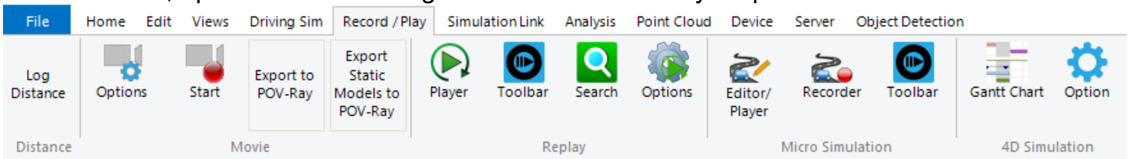
Realtime Simulation Link		
Operator Form	Operator Form	Open the operation form.

[38] Available only if Drive Simulation plugin is enabled.
[39] Available only if Eco Drive plugin is enabled.
[40] Available only if Drive Diagnosis plugin is enabled.
[41] Available only if Communication plugin is enabled.
[42] Available only if Demo function is enabled.
[43] Available only if Simlink connection plugin is enabled.

Help		Open the help page.

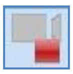
・Record / Play Ribbon

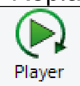
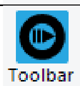
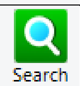
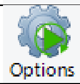
In this Ribbon, operate AVI recording function and POV-Ray output.



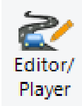
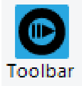
Overview

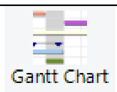
Command	Button	Explanation
Distance Choose either "Two objects" or "Two points" from "Distance between" in the right click menu on the main screen, and click two objects or two points in 3D space. 3D or 2D distance between two objects will be exported to log file. Click the button again to stop exporting.		

Movie Functions to generate a video like AVI output.		
Options		Settings of AVI files and ray tracing files for POV-ray.
Start		Start AVI file creation. It is possible to record movements. Hint: At the time of AVI recording, size of main window is adjusted automatically to the set size.
Stop		Stop creating AVI files.
Export to POV-Ray		Create folders like the following and export to ray tracing files for POV-Ray according to the "POV-Ray Options".
Export Static Models to POV-Ray		Export models on current project. This menu is used when creating flames for movie or before start recording.

Replay[44] Functions to operate Replay plugin.		
Player		Open the replay option window to save movements of vehicles and characters in UC-win/Road and then replay them.
Toolbar		A toolbar is displayed in the bottom of the main window.
Search		Open the Search form that searches for the recorded file once quickly.
Options		Open the Options form.

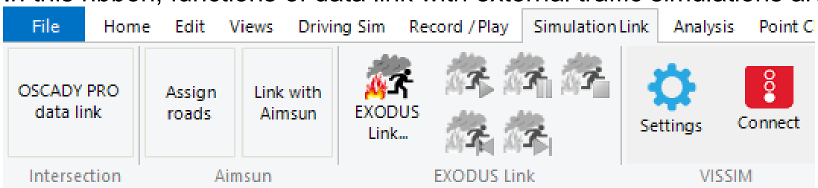
[44] Available only if Replay option plugin is enabled.

Micro Simulation[45] In this group, functions for the micro simulation are available.		
Editor/Player		Open main window of the micro simulation player. It is possible to play not only the data recorded in UC-win/Road, but also the results simulated by other applications like VICS.
Recorder		Record movements of models in Open Micro Simulation format by displaying the traffic flow. The recorded files can be reflected as simulation.
Toolbar		A toolbar is displayed in the bottom of main screen.

4D Simulation		
Gantt Chart		Open a gantt chart for 4D simulation.
Option		Configure the 4D simulation options.

・Simlation Link Ribbon

In this ribbon, functions of data link with external traffic simulations are available.



Overview

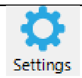
Command	Button	Explanation
Intersection[46] This group has functions to import and visualize the data from intersection simulation OSCADY PRO in UC-win/Road.		
OSCADY PRO data link		Start to import OSCADY PRO data.

Aimsun[47] It is possible to link vehicle movements and signal indications between a traffic simulator Aimsun and a driving simulator UC-win/Road.2023/10/17		
Assign roads	Assign roads	Open Aimsun Section List Editor window. Configure the settings.
Link with Aimsun	Link with Aimsun	The panel for linkage between UC-win/Road and Aimsun is opened.

EXODUS Link[48] Use this group to visualize the analysis result of evacuation analysis simulation software EXODUS.

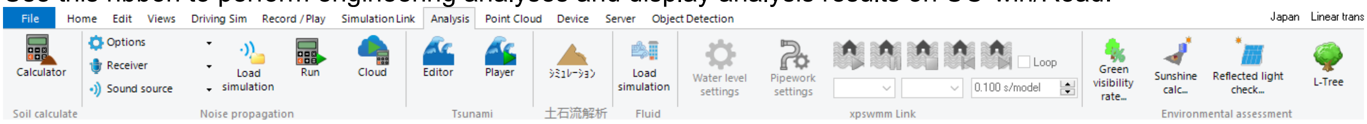
[45] Available only if Micro Simulation Player plugin is enabled.
[46] Available only if OSCADY PRO Plugin is enabled.
[47] imsun is a simulator developed by TSS (http://www.aimsun.com/) and it can simulate traffics by setting roads, intersections, signal switching, and traffic volume. In "Information-using interactive simulation system between human – vehicle - traffic".
Available only if Aimsum Link plugin is enabled.
[48] Available only if EXODUS Plugin is enabled.

Exodus Link		Open the main window of Exodus Link.
Pause		Pause the animation.
Play		Play the animation.
Previous		Back to the previous step.
Next		Skip to the next step.

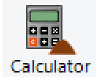
VISSIM[49] Use this to connect with PTV VISSIM.		
Settings		Open the setting form.
Connect		Start connecting with VISSIM.

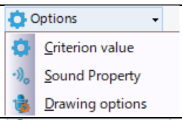
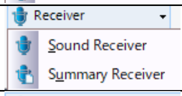
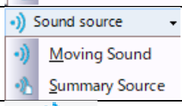
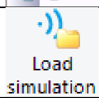
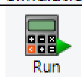
・Analysis Ribbon

Use this ribbon to perform engineering analyses and display analysis results on UC-win/Road.



Overview

Command	Button	Explanation
Soil calculation Using soil calculation group, it is possible to define the case of soil calculation, calculate the cutting and the banking, and output /visualize the result.		
Calculator		Open "Soil Calculator" form.

Noise propagation[50] This group has functions related to noise simulation.		
Options		Open the setting form for criterion, sound property and drawing options.
Receiver		Open the sound receiver setting form or the list of receivers.
Sound source		Open the moving sound setting form or the list of moving sound.
Load simulation		Load simulation data.
Run		Start the simulation data.

[49] Available only if VISSIM plugin is enabled.
[50] Available only if Noise plugin is enabled.

Cloud	Cloud	High-performance computing on cloud services: Create a data file for noise analysis supercomputing service. (*.nad: noise analysis file format)

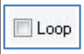
Tsunami[51] Visualize results of external tsunami analysis program.		
Editor	Editor	Configure the visual options for tsunami data.
Player	Player	Open Tsunami Player.

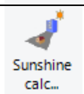
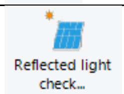
Debris[52] Create input data for FORUM8 debris flow simulation		
Simulation	シミュレーション	Start debris simulation. Configure the options.

Fluid[53] Visualize flood analysis result of xpswmm.		
Load simulation	Load simulation	Open VTK (fluid analysis linkage) Plugin window. Load analysis results and visualize them.

xpswmm Link[54] Use this group to load CFD analysis result of fluid analysis tool "OpenFOAM" and display the flow lines on UC-win/Road.		
Water level settings	Water level settings	Configure Water level settings.
Pipework settings	Pipework settings	Configure Pipework drawing settings.
Pause		Pause the simulation.
Run		Run the simulation.
Stop		Stop the simulation.
Skip previous		Skip to the previous step.
Skip next		Skip to the next.
Start/End time setting	0. 900001. The analysis results are time series data. It is possible to change starting time and ending time of animation. The starting time is left and the ending time is right. Unit is in seconds(s).	
Simulation speed and mode	0.100 s/model Simulation is output as the time interval.	

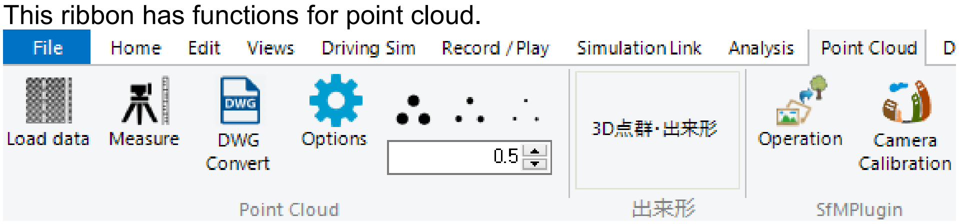
[51] Available only if Tsunami plugin is enabled.
[52] Available only if Debris plugin is enabled. This plugin is in Japanse only.
[53] Available only if VTK(fluid analysis linkage) plugin is enabled.
[54] Available only if xpswmm plugin is enabled.

Loop	 Check to repeat the simulation.	

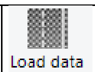
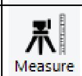
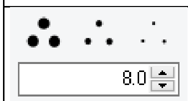
Environment assessment[55] This plug-in enables an assessment on UC-win/Road VR.		
Green Visilbility rate		Calculate the percentage of green visibility on the scene.
Sunshine calc		Calculate the sunshine coverage.
Reflected light check		Calculate the solar panel reflection light.
L-Tree		Create the 3D trees using L-System algorithm.

・Point Cloud Ribbon

This ribbon has functions for point cloud.



Overview

Command	Button	Explanation
Point Cloud[56] This group has functions using point cloud data.		
Load data		Load point cloud data.
Measure		Mesure the distance between clicked 2 points.
DWG Convert		Convert point cloud data to DWG file.
Options		Configure the point cloud settings.
		Change the drawing size of point cloud.

Dekigata[57] Use this group to control work progress.

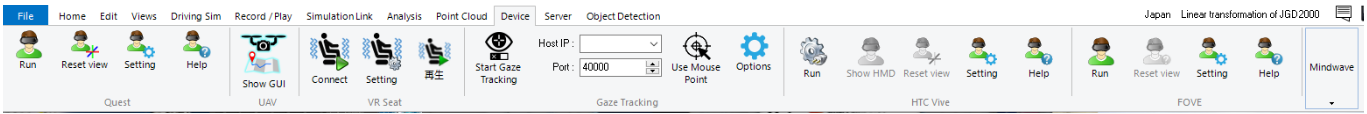
55 Available only if Assessment plugin is enabled. And this plugin cannot be used together with SfM plugin.
56 Available only if Point Cloud Modeling plugin is enabled.
57 Available only if Dekigata plugin is enabled. This plugin is in Japanese only.

3D点群・出来形 出来形	Create a Dekigata maintenance form by calculating difference by design data and point cloud data.

SfM Plugin[58] Use this group to create 3D point clouds based on photo information.		
Operation	Operation	Import analyzed SfM analysis case.
Camera Calibration	Camera Calibration	Generate the camera calibration fille.

・Device Ribbon

This ribbon has functions to connect hardware with UC-win/Road.



Overview

Command	Button	Explanation
Quest[59] This group has functions to connect Quest Rift with UC-win/Road.		
Run	Run	Run or Stop Quest Rift.
Reset view	Reset view	Set default coordination to current direction of Quest Rift.
Setting	Setting	Configure the settings.
Help	Help	Open Quest Rift help menu.

UAV UAV group has a function to connect UAV with UC-win/Road.		
Show GUI	Show GUI	Opens UAV plug-in window.

VR Seat[60] Used to connect VR seat with UC-win/Road.		
Connect	Connect	Connect a VR seat to UC-win/Road.
Setting	Setting	Configure the settings.

58 Available only if SfM(Structuire from Motion) plugin is enabled.
59 Available only if Quest Rift plugin is enabled.
60 Available only if VR seat plugin is enabled.

Play	再生	Start playing a video and shaking a VR seat.

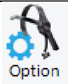
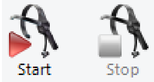
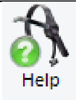
Gaze Tracking[61] Gaze Tracking has a function to connect an eye tracking device with UC-win/Road (Ver14.0 or later).		
Start Gaze Tracking	Start Gaze Tracking	Start Gaze tracking. Once clicking it, the icon changes to Stop Gaze Tracking.
Host IP, Port	Host IP : 192.168.1.80 Port : 3000	Set up IP and Port of the host receiving gaze tracking information.
Use Mouse Point	Use Mouse Point	Use mouse point to adj10/17/2023ust the eye tracking data.
Option	Options	Configure the settings.

Wheelchair[62] Used to connect a wheelchair and UC-win/Road.		
Connection	Connection	Start connection with a wheelchair.
Settings	Settings	Configure the settings.

HTC VIVE Used to connect HTC Vive and UC-win/Road.		
Run	Run	Start connection with HTC Vive.
Show HMD	Show HMD	Show or hide HMD display.
Reset view		The coordinate system of the HMD can be initialized.
Setting	Setting	Configure the settings.
Help	Help	Open the help.

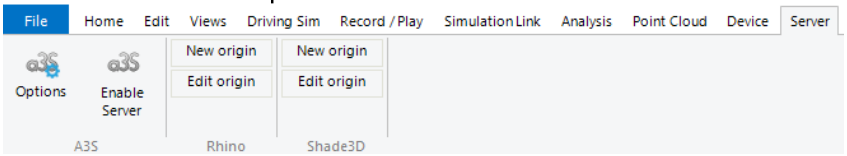
FOVE Used to connect FOVE with UC-win/Road.		
Run	Run	Run FOVE.
Reset view		Reset the view of HMD.
Setting	Setting	Configure the settings.
Help	Help	Open thehHelp.

[61] Available only if Gaze Tracking plugin is enabled.
[62] Available only if Wheelchair plugin is enabled.

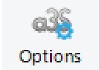
Mindwave[63] Used to connect Mindwave with UC-win/Road.		
Option		Configure the settings.
Start / Stop		Start / Stop driving.
Help		Open the help.

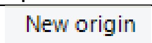
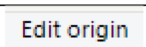
・Server Ribbon

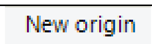
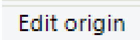
Use Server ribbon to operate about sever functions such as VR-Cloud.



Overview

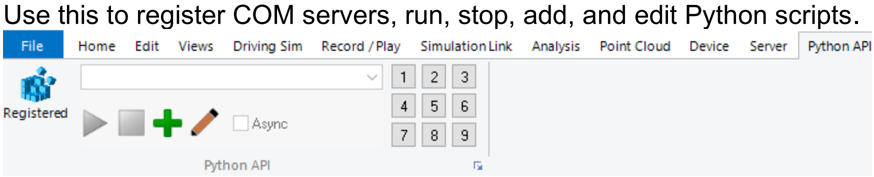
Command	Button	Explanation
A3S Use UC-win/Road as A3S server.		
Options		Configure the settings.
Enable/Disable		Enable/Disable A3S server.

Rhino[64] With Rhino plug-in, it is possible to access to UC-win/Road in real time.		
New origin		Define a new origin.
Edit origin		Edit the origin linked with Rhinoceros.

Shade3D		
New origin		Define a new origin.
Edit origin		Edit the origin linked with Shade3D.

・Python API[65]

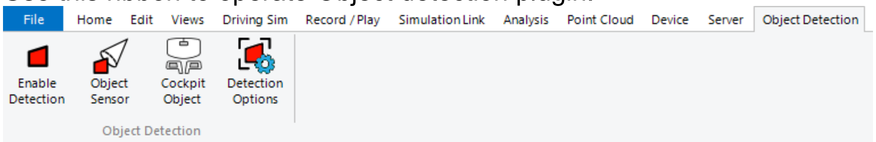
Use this to register COM servers, run, stop, add, and edit Python scripts.



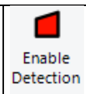
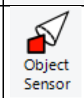
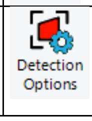
[63] Available only if Mindwave plugin is enabled.
[64] Available only if Rhino plugin is enabled.
[65] Available only with UC-win/Road SDK license.

▪ Object Detection Ribbon

Use this ribbon to operate Object detection plugin.



Overview

Command	Button	Explanation
Object Detection[66]		
Enable Detection		Enable object detection mode.
Object Sensor		Configure the settings of object sensor.
Cockpit Object		Configure the settings of cockpit object.
Detection Options		Configure the detection options.

[66] Available only if Object detection plugin is enabled.

Pop-up Menu

Right click on the screen to open the following pop-up menus.
The menu items will vary depending on the currently selected object and on the situation.

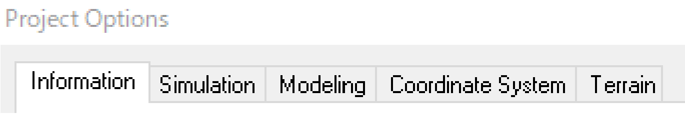
Pop-up menus on the main menu

Pop-up Menu	Operation
Adjust Terrain Height	Opens the Vertices Height form.
Select Objects On Selected Terrain	Selects all objects within the selected terrain area.
Generate forests	Open the display of forest editing
Delete Selected Objects	Deletes the applicable selected objects within the selected terrain area.
Duplicate Objects	Duplicates those 3D models selected within the selected terrain area.
Deselect Terrain	Unselects the terrain. Note: Any selected objects within the terrain area remain selected.
Create Terrain Patch	When 50m mesh has been selected, opens the Patch Size Editor form.
Edit Terrain Patch	When the terrain patch data has been selected, opens the Terrain Patch Editor form.
Delete Terrain Patch	Deletes the selected terrain patch data.
Edit Intersection	Opens the Intersection Editor form. Note: Some tabs are not available as editing these can require roads to be rebuilt or can affect moving traffic. To edit these tabs, open the Intersection Editor from the 2D Plan View.
Replace Intersection with 3DS	Opens "Intersection Replacement" screen.
Distance Between Models	Measures the horizontal distance between two models.
Jump To	Jumps to the position clicked. "J" key on the keyboard has the same function.
Input Coordinates	Specify the position by the value of local coordinate or world coordinate system.
Save Camera Position	Saves the currently displayed scene as a camera position.
Edit Camera Positions	Opens the Camera Positions form.
Move Camera To	Moves the camera position to another saved position.
Hide Camera Views	Hides or re-displays any added camera views.
Full Screen	Maximizes the view and shows as much display area as possible while hiding the title, menu, tool and status bars.
Show / Hide menu	Retains the original viewing size while hiding the borders, title, menu, tool and status bars.
Start/Stop AVI Recording	Start and Stop AVI file recording.
Show Simulation Tool	Hide / show the Micro Simulation Tool.
Show sound receiving plane	Hide / show the sound receiving plane of noise simulation. Micro Simulation Tool.
Show replay tool	Hide / show the replay tool.
Renderer setting	Select the rendering method of the main screen.

Default Settings

■ Project Options

Go to File – Project Options. Here configure the settings of projects: Information, Simulation, Modeling, Coordinate System and Terrain.



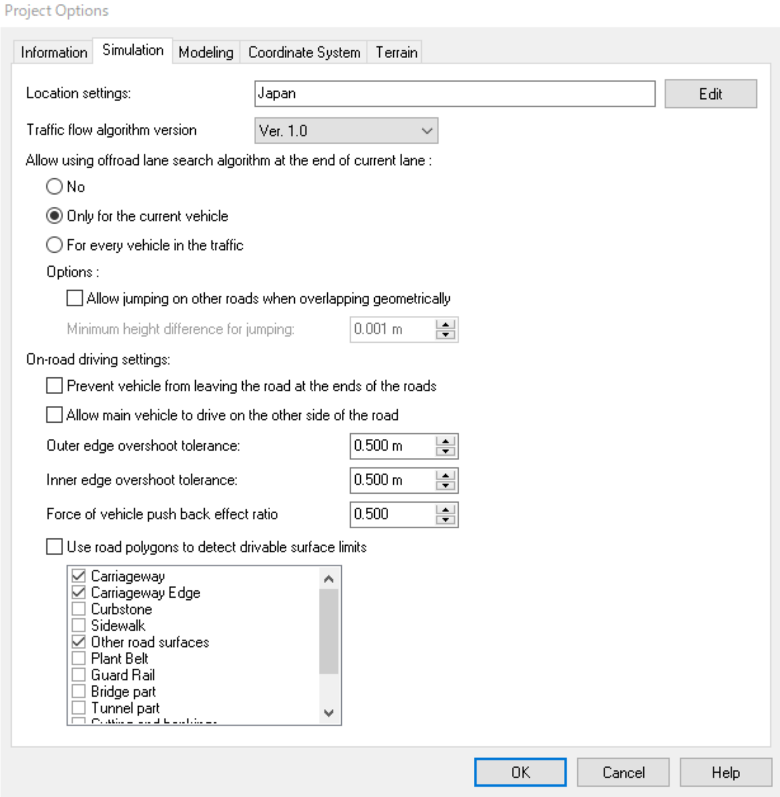
●Information

Edit the information of the project. It is possible to add a title, a description, a thumnail image and a copyright.

Left: Copyright, Right: Logo file

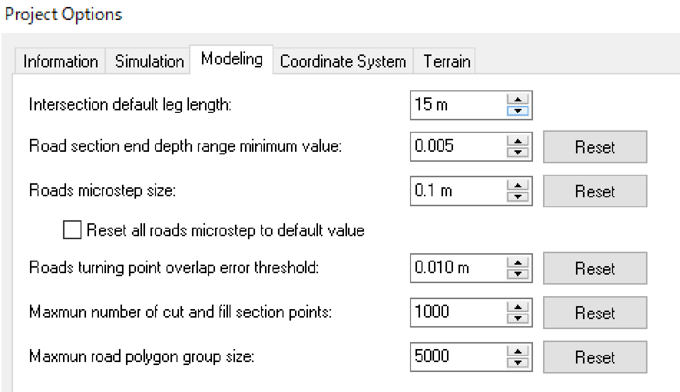
●Simulation

Here, set the project's simulation settings: Locations settings, Traffic flow algorithm version, On-road diving settings. For the details of the settings, please refer to the help.



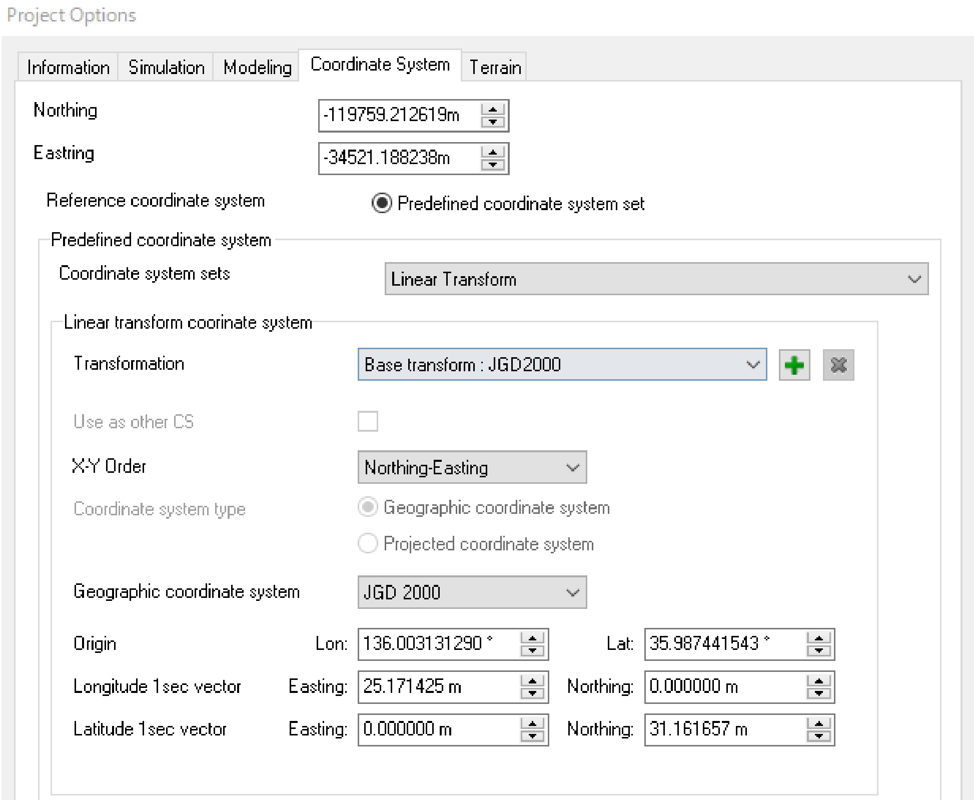
●Modeling

Here, set the project’s road modeling: Intersection default leg length, Road section end depth range minimum value, Roads microstep size, Roads turning point overlap error threshold, Maxmum number of cut and fill section points and Maxmum road polygon group size. For the details of the settings, please refer to the help.



●Coordinate System

Here set the project’s coordinate system: Offset settings and Reference coordinate system.



Offset values in North-South and East-West are used to convert between global coordinate and local coordinate.
(Global coordinate) = (Local coordinate) + (Offset)

As a coordinate system, there are 5 options.

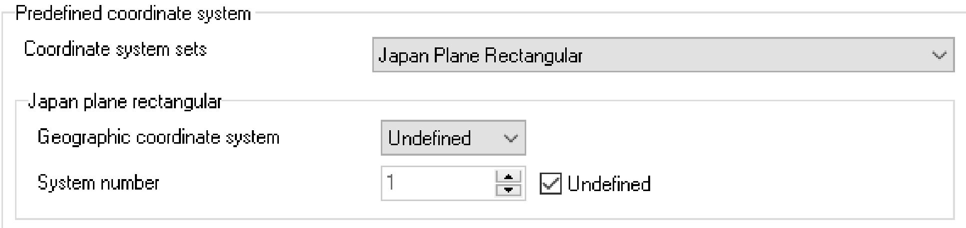
1. Undefined

It is not possible to convert to the longitude and latitude.X is for the east direction and Y is for the north direction on the global coordinate.

2. New Zealand Transverse Mercator

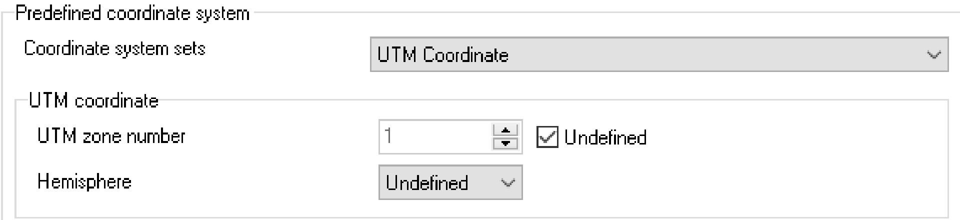
It is possible to convert to the longitude and latitude.X is for the east direction and Y is for the north direction on the global coordinate.

3. Japan Plane Rectangular



Set a geographic coordiante sytem and the system number.
Selecting 'Undefined' as Geographic coordiante sytem, or check Undefined as System number, the coordinate system may be incomplete or the latitude/ longitude conversion is impossible.
The X is North; Y coordiante is East.

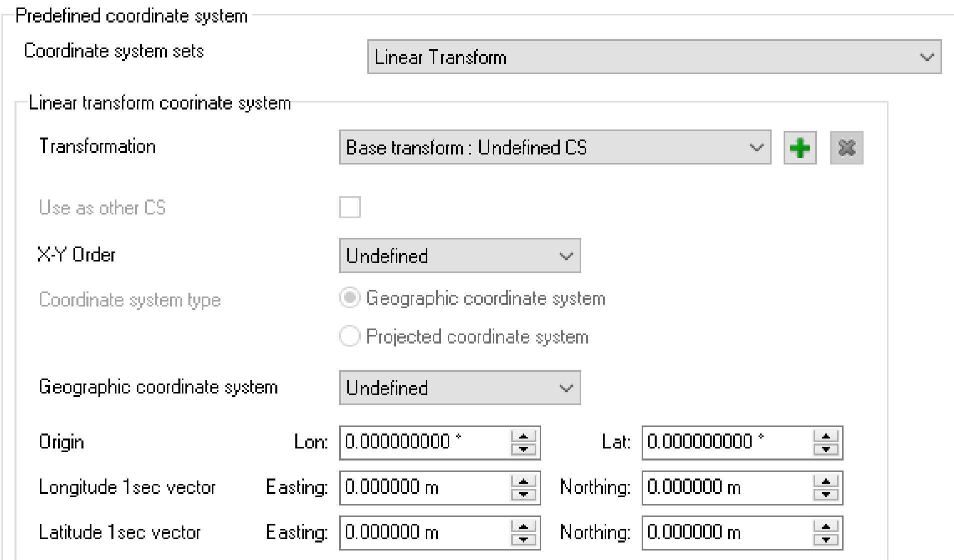
4. UTM Grid coordinate system



Set a zone number and the Northern/Southern hemisphere.
Selecting Undefined as number or hemisphere, the coordinate may be incomplete.
X is East; Y is North.

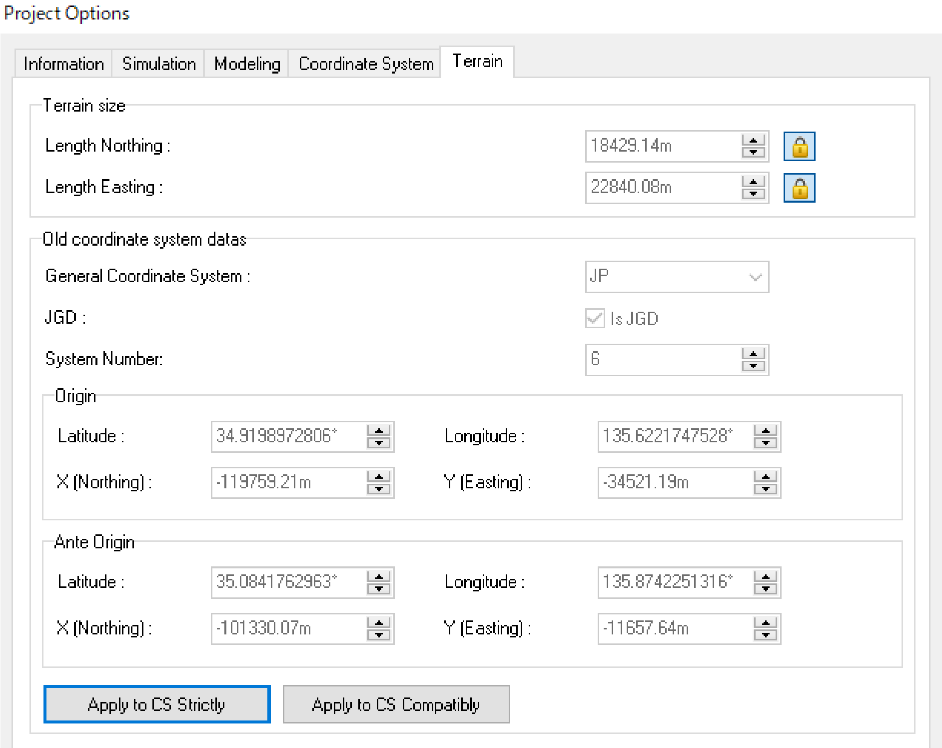
5. Linear Transform

Define the origin and the movement par 1 degree of latitude/longitude in east and north direction. Without defining geodetic reference system, entering 0 as movements or entering same movement direction of longitude/latitude, the coordinate may be incomplete.
The direction of X and Y in global coordinate system changes depending on the settings.



●Terrain

Here all terrain information are listed.



■ Application Options

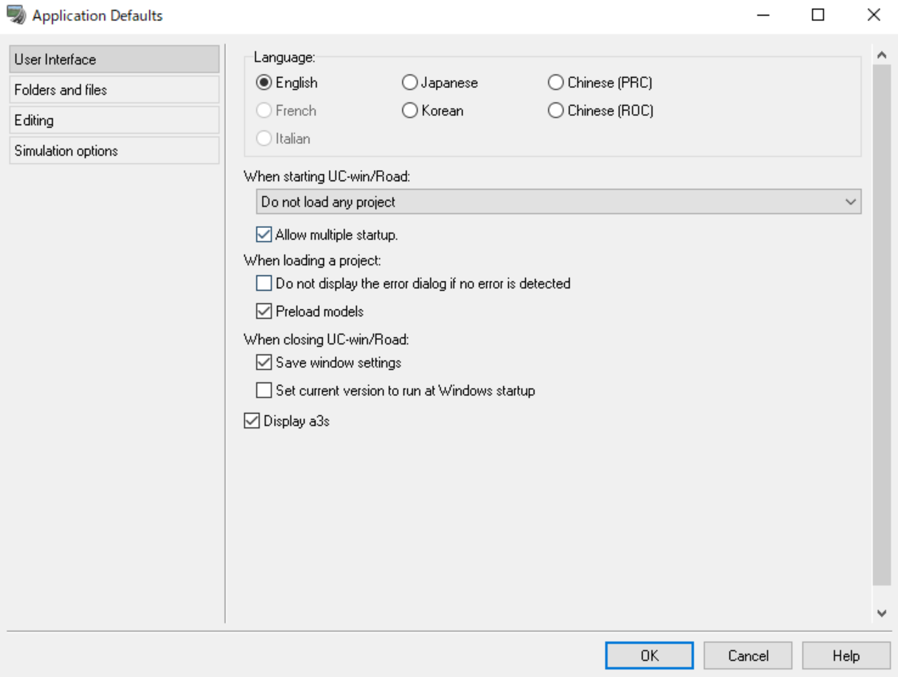
Go to File – Application Options. Set up the General settigns on UC-win/Road : Default settings, Audio settings, Colour Options, Game Controller Options, Location Settings, Proxy Server Settings and Civil 3D Options.

Default settings

This window contains the settings for UC-win/Road's operational environment.
Go to File Ribbon - [Application Options] - [Default settings]. For the details of the settings, please refer to the help.

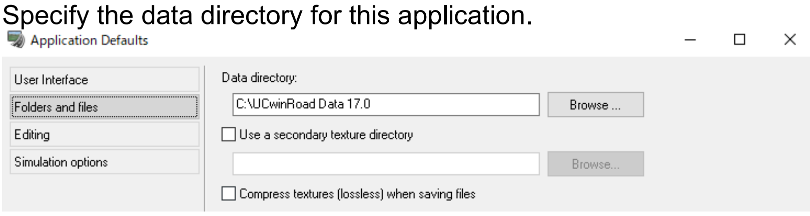
●User interface

Set up the settings related to the user interface.



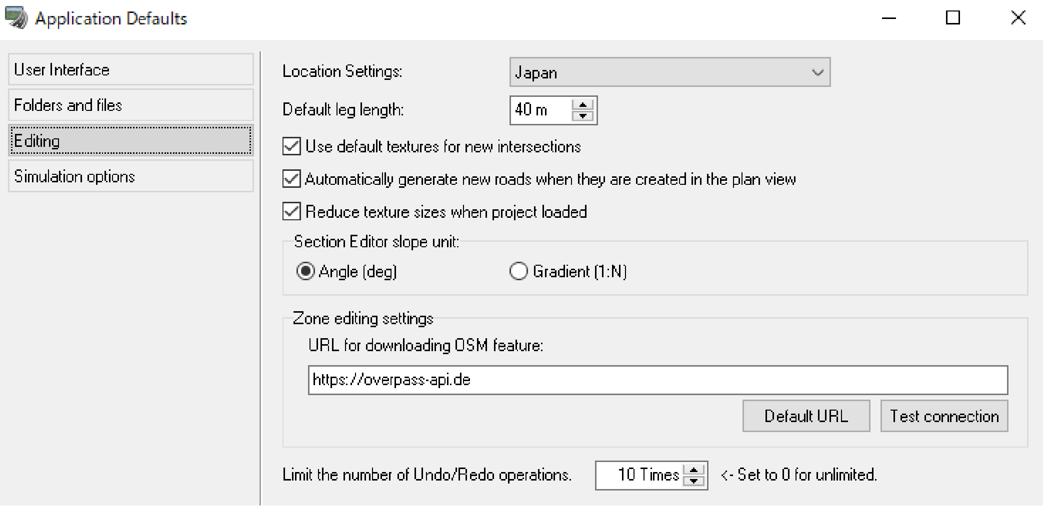
●Folders and files

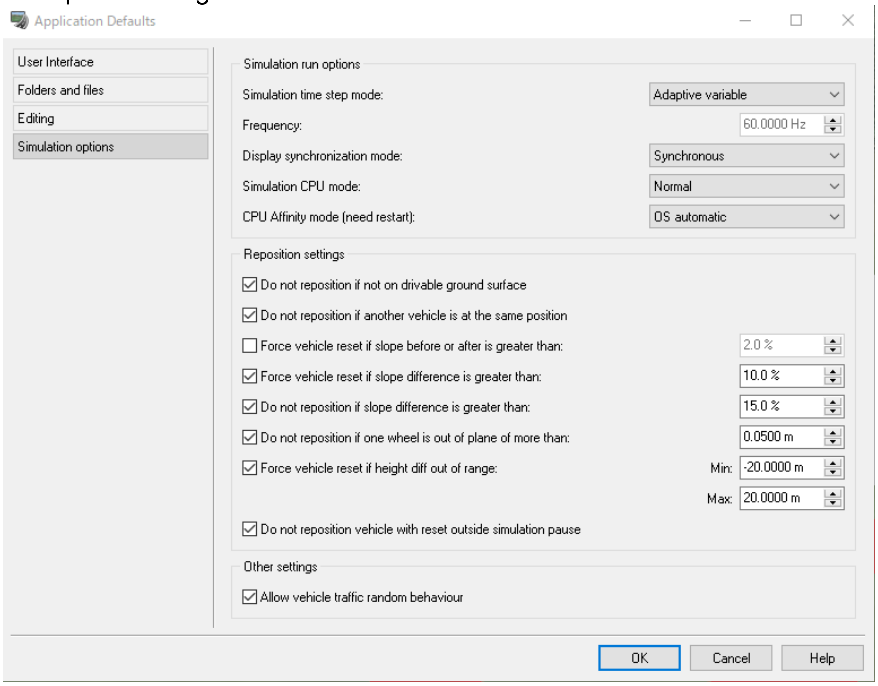
Specify the data directory for this application.



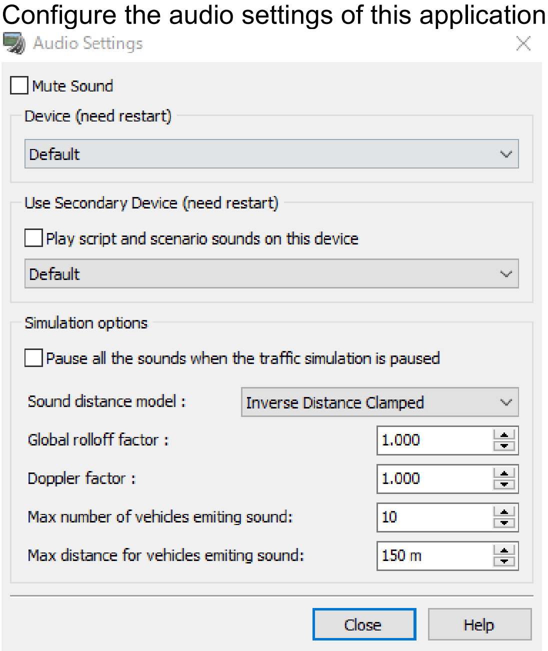
●Editing

Set up the location, the default leg length and other editing settings.



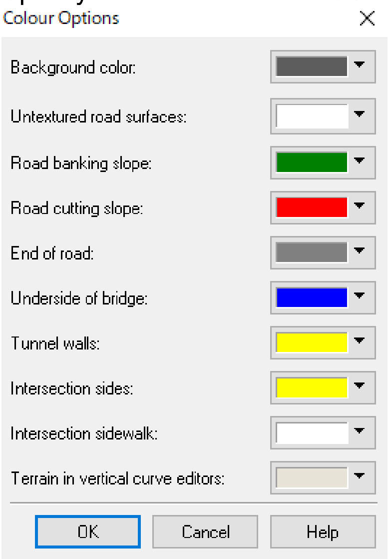
●Simulation Options
Set up the settings for simulation.


Audio settings

Configure the audio settings of this application. For the details of the settings, please refer to the help.


Colour Options

Specify the colours used in UC-win/Road.

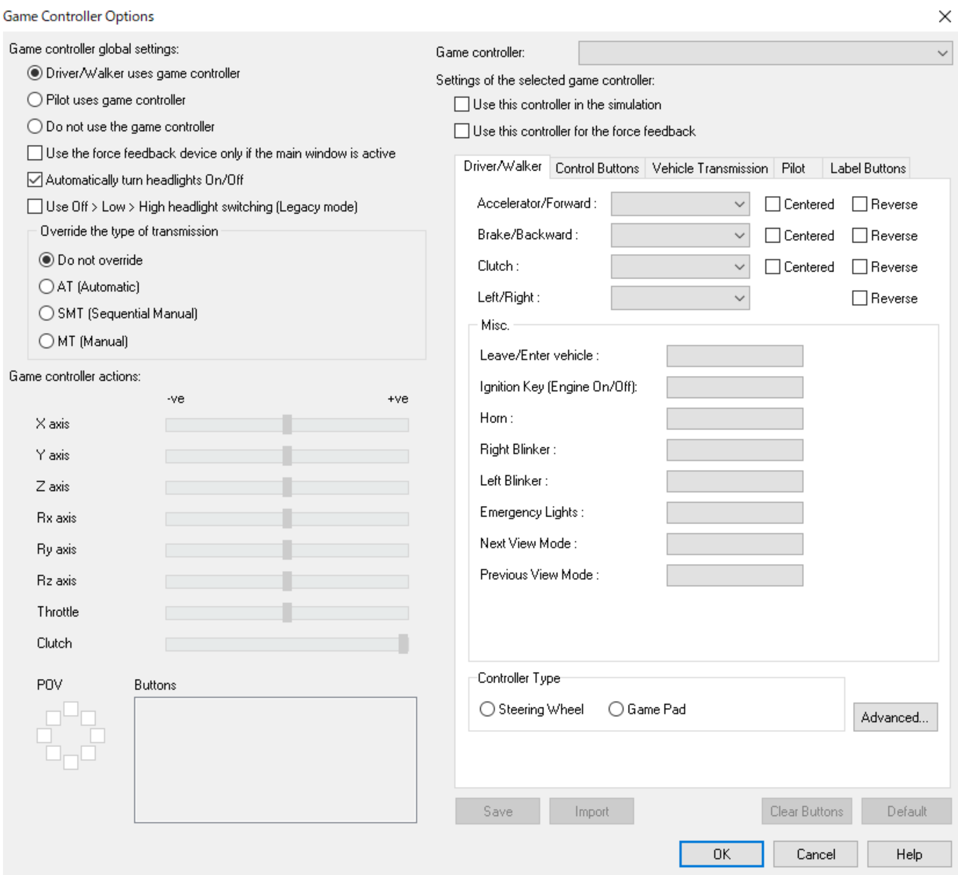


Game Controller Options

On the Game Controller Options form, set the game controller to be used with this application.
To use the controller, select "Driver/Waker uses game controller" or "Pilot uses game controller "; to not use the game controller, select "Do not use the game controller".

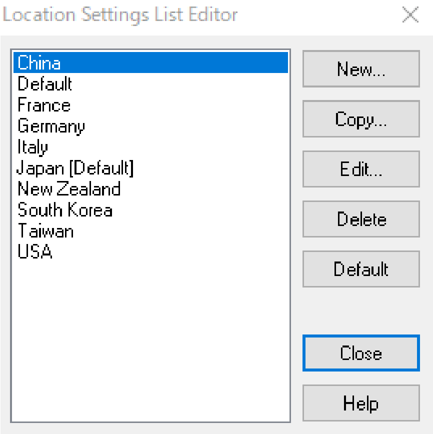
On the right side, there are 4 tubs: Diver/Waker settings, Control Buttons, Vehicle Transmission and Pilot Settings.

Click Advanced… to set up the reaction speed of steering wheel, accelerator, and brake operation when driving a vehicle, and adjusting force feedback. For the details of the settings, please refer to the help.

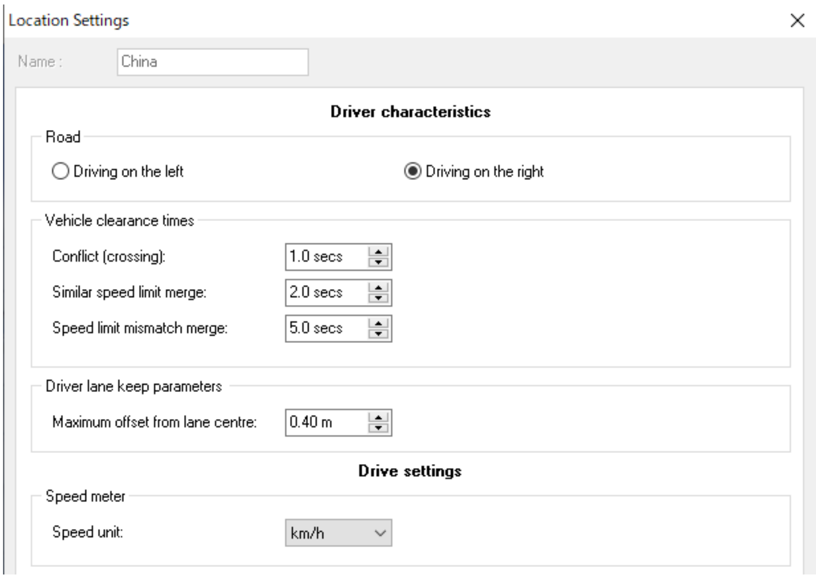


Location Settings

This editor lists all available location files. And it is possible to add a new location file and edit it.

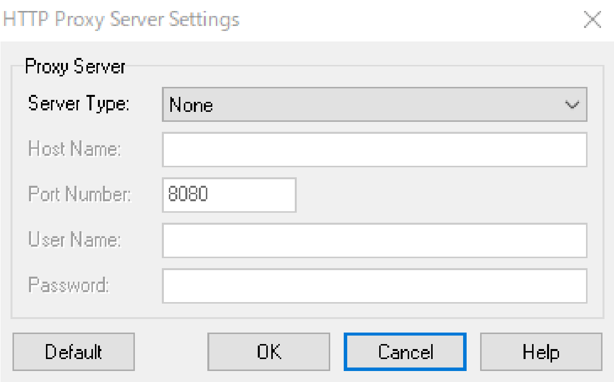


Select a country and click Edit to configure the driving lane, the general traffic rules and the traffic lights.



Proxy Server Settings

Configure settings for downloading models and textures over the Internet via a proxy server.



Program folder structure

Program folder

UC-win/Road Installed Folder¥

Folder	Description
Data	: Data that does not need to be changed is stored here.
DefaultPlugins	: Default plug-in modules are stored here.
GISView	: GISViewer
Help(CHS)	: Help document data (Chinese)
Help(CHT)	: Help document data (Taiwanese)
Help(ENZ)	: Help document data (English)
Help(JPN)	: Help document data (Japanese)
Help(KOR)	: Help document data (Korean)
IFCSvr	: Setup file of IFC server used for IFC plug-in is stored.
MDS Steering Wheel	: Driver setup file of old MDS Steering Wheel is stored.
Plugins	: Plug-ins are stored here.
SetupDrivers	: Setup files of each driver used for DS are stored here.
Shaders	: Shaders used in UC-win/Road are stored.
SupportTool	: A setup file of the inquiry support tool
TeighaX	: A setup file of TeighaX used in DWG plug-in
ThirdParty Licenses	: Information such as license agreement when using third party source code is store
Uninstaller	: Information of uninstaller created at the installation is stored.

Data folder

C: ¥UCwinRoad Data x.x¥

Folder			Description
Characters			: Character model files
Data			: Japan.map, Tokyo/Osaka.map etc…
	5m		: 5m mesh data
Effects			: Game controller feedback effects files
Locations			: The Location Settings information
Log			: Logs
Models			: 3D model samples
	…		: 3D model samples with texture
Movie			: AVI, frames, POV-Ray data
Plugins			: Plugins and files for system plugin
Save			: Sample data
	FBX scene		: FBX data
	GISSampleData		: GIS sample data
	InRoads		: InRoads sample data
	Intersection		: Intersection textures
		MarkingsLib	: Intersection texture editing markings library
	LandXML		: LandXML data
	MicroSimSample		: Micro Simulation sample data
	Model		: Samples of animated models
	NoiseSimulation		: Sample data of noise simulation
		Highway	
		Kyoto	
		Nihondaira	
	Section		: Road sections
	SfMPlugin		: SfM plug-in sample data
	Shapefile		: Shapefile sample data
	Shoreline		: Several lake preset files
	TRACKSSamples		: TRACKS samples

```
|          ├───      TrafficSaveSamples          : Traffic snapshot sample data (.trs)
|          ├───      Tree                        : 3D trees
|          ├───      TRLVehicleModelsLibrary     : Vehicle model data
|          └───      xpswmm_Sample               : xpswmm samples
├───  Scripts                                    : VRCloud script samples
├───  Sounds                                     : Sound files
|          ├───      AirFriction                 : Air friction sound files
|          ├───      Engine                      : Engine sound files

|          ├───      Hone                        : Horn sound files
|          ├───      Signals                     : Turn signal sound files
|          └───      Tires                       : Tire sound files
├───  Textures                                   : Textures
|          ├───      BackDrop                    : Background
|          ├───      Clouds                      : Clouds
|          ├───      Cockpit                     : Cockpit
|          ├───      Event                       : Event
|          ├───      Fire                        : Flame, Smoke
|          ├───      Flag                        : Flags
|          ├───      Model
|              |          ├───     3DS           : 3DS models
|              |          ├───     Building      : Buildings (walls)
|              |          └───     Lighting      : Artificial lightings (at night)
|          ├───      ParametricEscalator         : Escalator textures in the parametric model
|          ├───      ParametricStairs            : Stairs textures in the parametric model
|          ├───      Parkinglot                  : Ground textures for the parking lot model
|          ├───      RainOnRoad                  : Water puddle on the road surface
|          ├───      RainOnWindshield            : Rainwater on the windshield
|          ├───      River                       : Rivers (used in previous version)
|          ├───      Road
|          |                ├───     Bridge          : Undersides of bridge
|          |                ├───     Carriageway     : Carriageway surfaces
|          |                ├───     CuttingBanking  : Cuttings and bankings
|          |                ├───     Intersection    : Grade intersections
|          |                ├───     Marking         : Road markings
|          |                ├───     Obstruction     : Obstacles
|          |                ├───     Surface         : Road surface other than carriageways
|          |                └───     Tunnel          : Tunnel walls
|          ├───      Sign                        : Signs
|          ├───      Sky                         : Sky
|          ├───      SkyDome                     : Sky dome
|          ├───      Snow                        : Snow
|          ├───      Terrain                     : Terrains
|              |          ├───     Ground        : Ground surfaces
|              |          ├───     Satellite     : Satellite photographs, high precision aerial photographs
|              |          └───     Streetmap     : Spatial Data Framework maps
|          ├───      Tree                        : Trees
|          |                ├───     Bark          : Trunks of 3D trees
|          |                ├───     Blossom       : Flowers of 3D trees
|          |                └───     Leaves        : Leaves of 3D trees
|          ├───      Water                       : Rivers
|          └───      Waves                       : Water surfaces
└───  Video                                      : Video file data used in scripts and video wall
```

Operation method

Operation with keyboard

・ [↑] key: Advancement ・ [↓] key: Retreat ・ [←] key: Move left ・ [→] key: Move right	・ [Alt] + [↑] key: Move up ・ [Alt] + [↓] key: Move down ・ [Alt] + [Q] key: Speed up (+1km/h) ・ [Alt] + [A] key: Speed down (-1km/h) ・ [Alt] + [Z] key: Reset speed (3km/h)

*Moving speed: 1 to 45 km/h
*If [Shift] key is pushed while moving, the passing speed becomes 3.3 times.

・ [Ctrl] + [↑] key: Face up ・ [Ctrl] + [↓] key: Face down ・ [Ctrl] + [←] key: Turn to left. ・ [Ctrl] + [→] key: Turn to right.	・ [Alt] + [W] key: Increase the rotation degree (+1 deg./s) ・ [Alt] + [S] key: Decrease the rotation degree (-1 deg./s) ・ [Alt] + [X] key: Reset the rotation degree (2 deg./s)

-Movement angle: Two degrees per second - Setting range-turning angle degree: 2 to 30 deg./s.

With 10 keys.

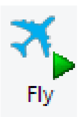
・ [7]: Left front	・ [8]: Forward	・ [9]: Right front
・ [4]: Left	・ [5]: Right under	・ [6]: Right
・ [1]: Left rear	・ [2]: Rear side	・ [3]: Right rear

・[↑] key: Accelerate ・[↓] key: Decelerate	・[Shift] key: Double Speed (during flight)

・Ascend: [PageUp] key or scroll the wheel forward ・Descend: [PageDown] key or scroll the wheel backward	・Move to north, south, east, west: Click and drag a mouse

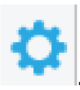
・ [↑] key: accelerate (+5km/h) ・ [↓] key: decelerate (-5km/h)	・ [←] key: move to left lane ・ [→] key: move to right lane

*Range: speed0 ～ 1000 km/h. the viewpoint height0.2 ～ 10 m.
*It is possible to ride in the front passenger seat of other vehicles, including vehicles generated by the traffic flow. It is also possible to drive with a steering controller on the passenger seat.



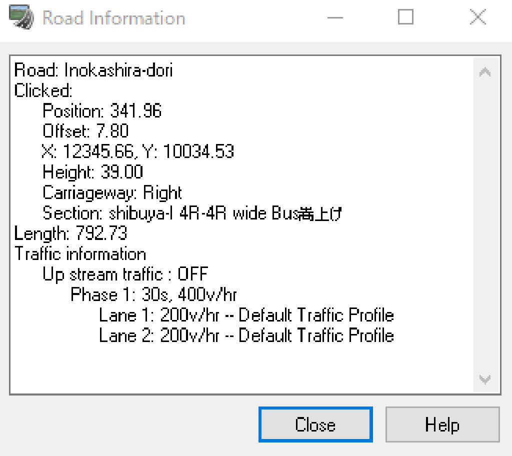
・ [↑] key: accelerate(+5km/h)	・[↓] key: decelerate(-5km/h)

—How to change operation keys

Go to Home – Navigation option . Refer to "Navigation Option" for more details.
*To simulate with keyboard, uncheck "Do not use the game controller" from File Ribbon - Application Options - Game Controller Options

—Show road/model information

[Alt]+Clicking on a road or a model on the main screen, it shows road/model information.

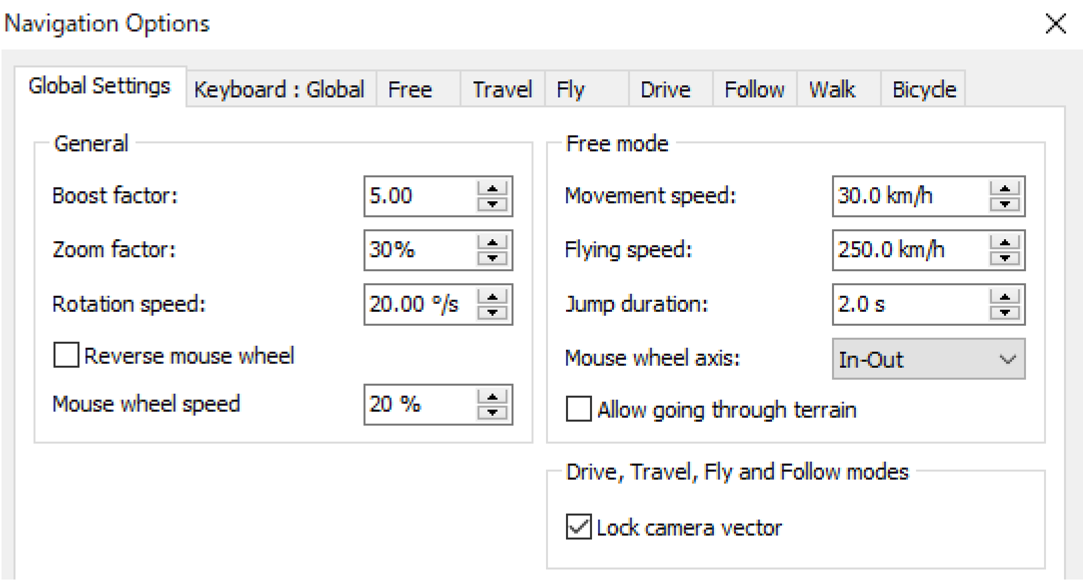


Navigation Options

Go to Home – Navigation – .
On Navigation option, set up movements, speed, effects etc... on the several tabs: Global Setteings, Keyboard:Global, Free, Travel, Fly, Drive, Follow, Walk and bicycle.

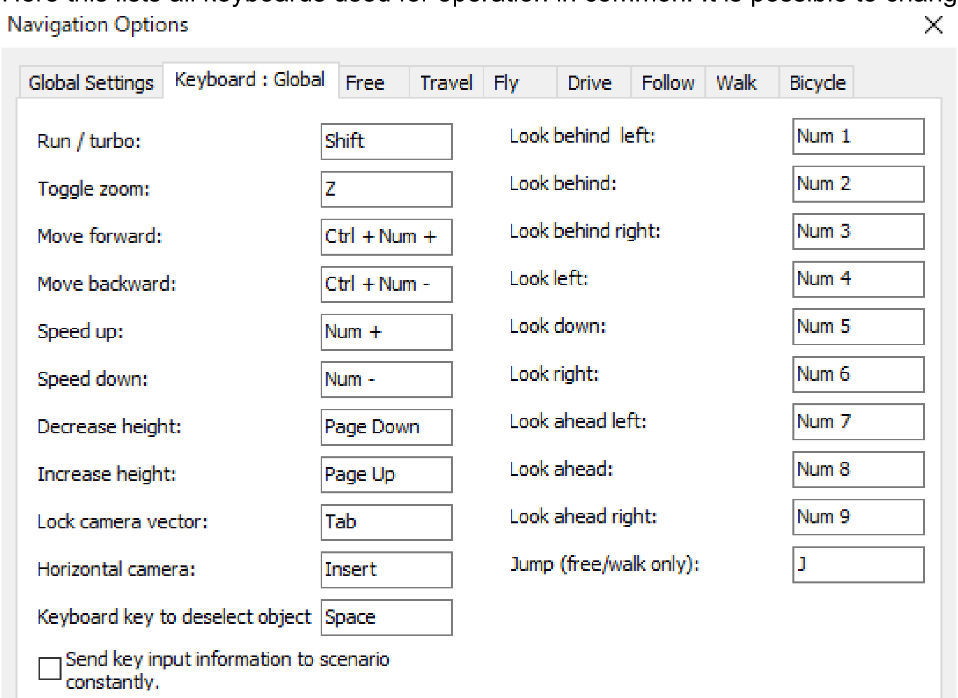
Global Settings

Specify speeds for General, Free mode and Drive,Travel, Fly and Follow modes.



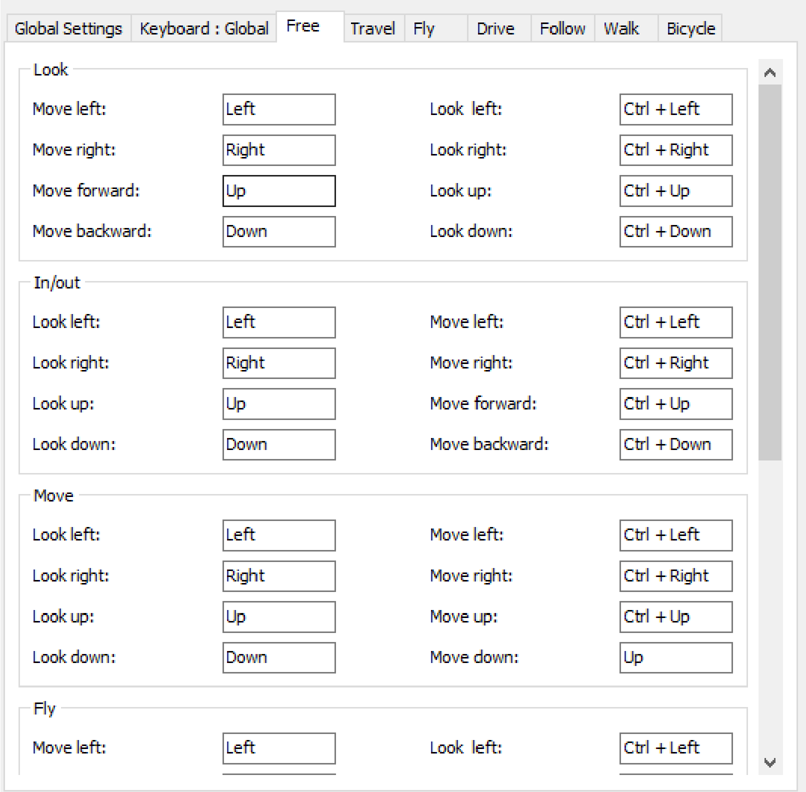
Keyboard: Global

Here this lists all keyboards used for operation in common. It is possible to change them.



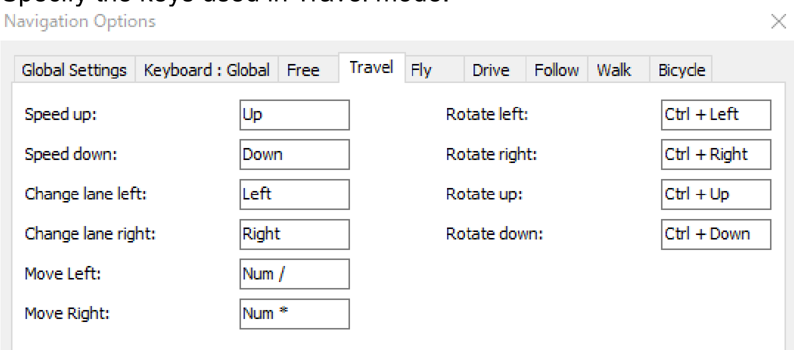
Free

Specify the keys used in Free mode.



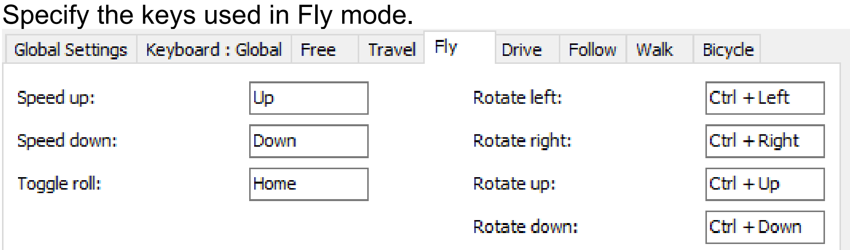
Travel

Specify the keys used in Travel mode.



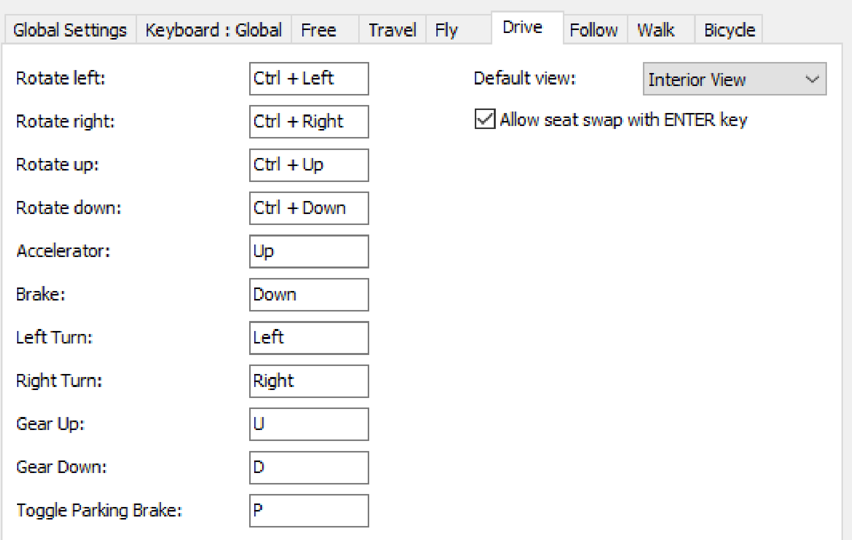
Fly

Specify the keys used in Fly mode.

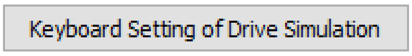


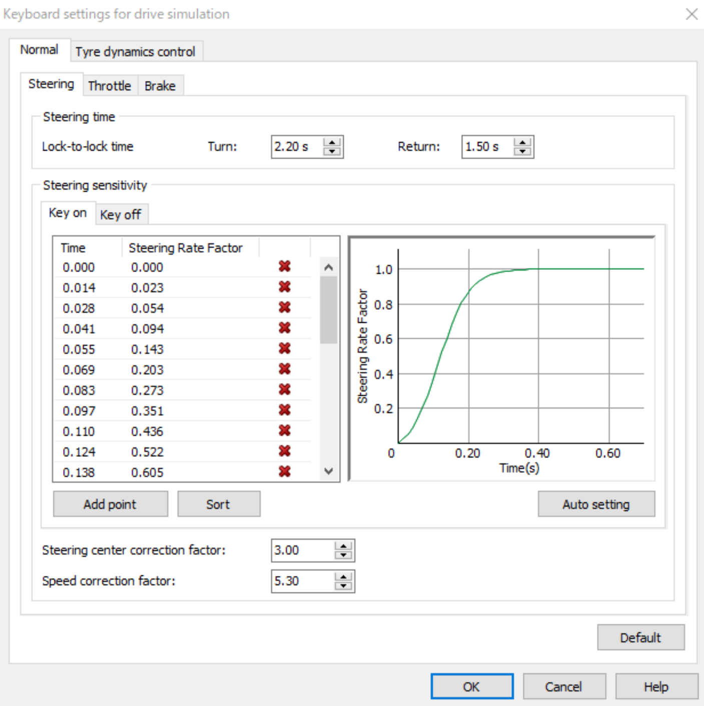
Drive

Specify the keys used in Drive mode.



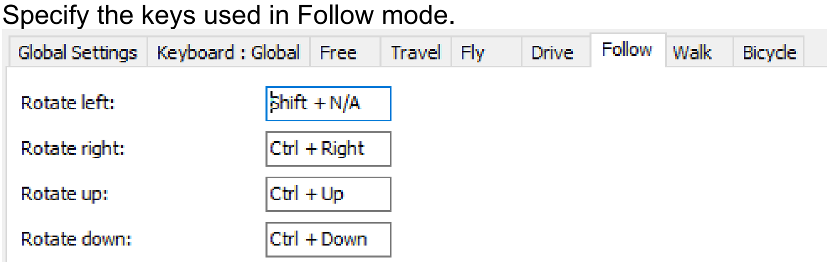
Click Keyboard Setting of Drive Simulation to set up the details for drive simulation.





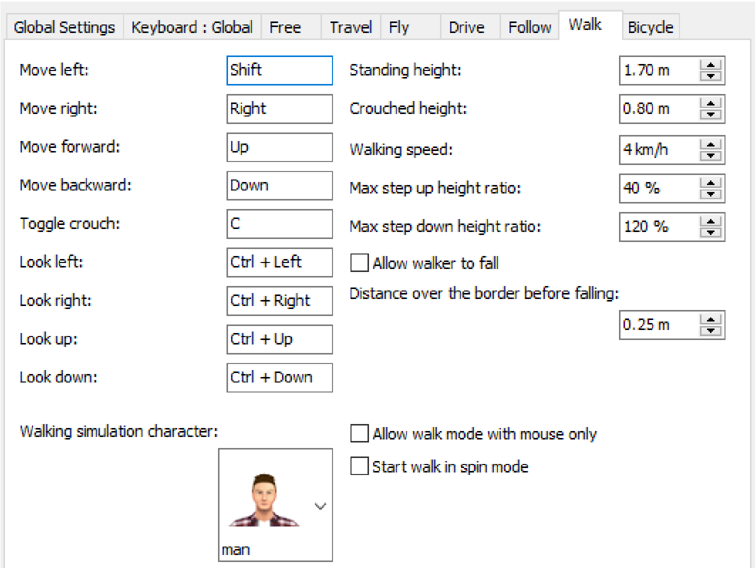
Follow

Specify the keys used in Follow mode.



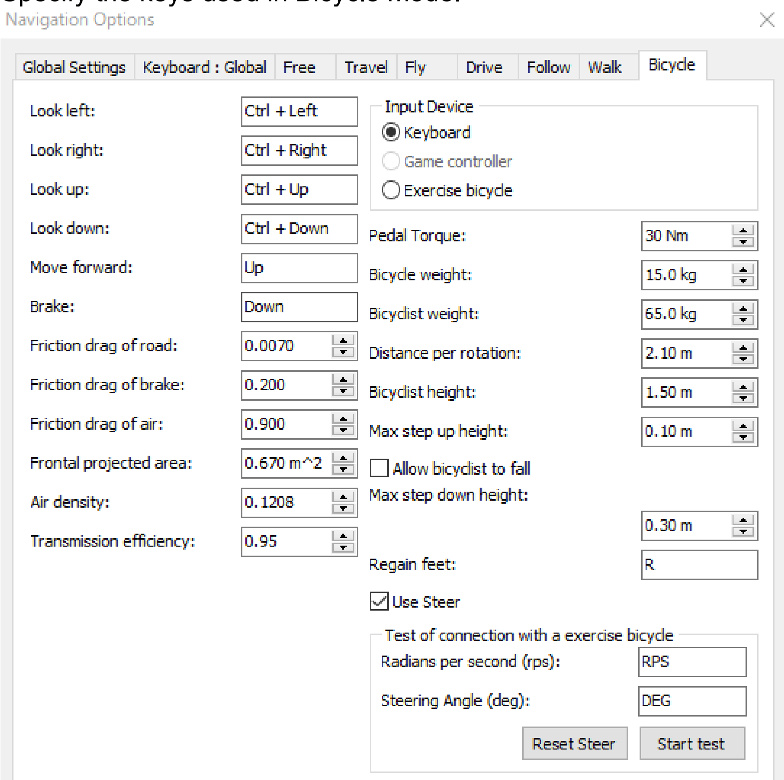
Walk

Specify the keys used in Walk mode.



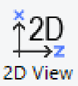
Bicycle

Specify the keys used in Bicycle mode.

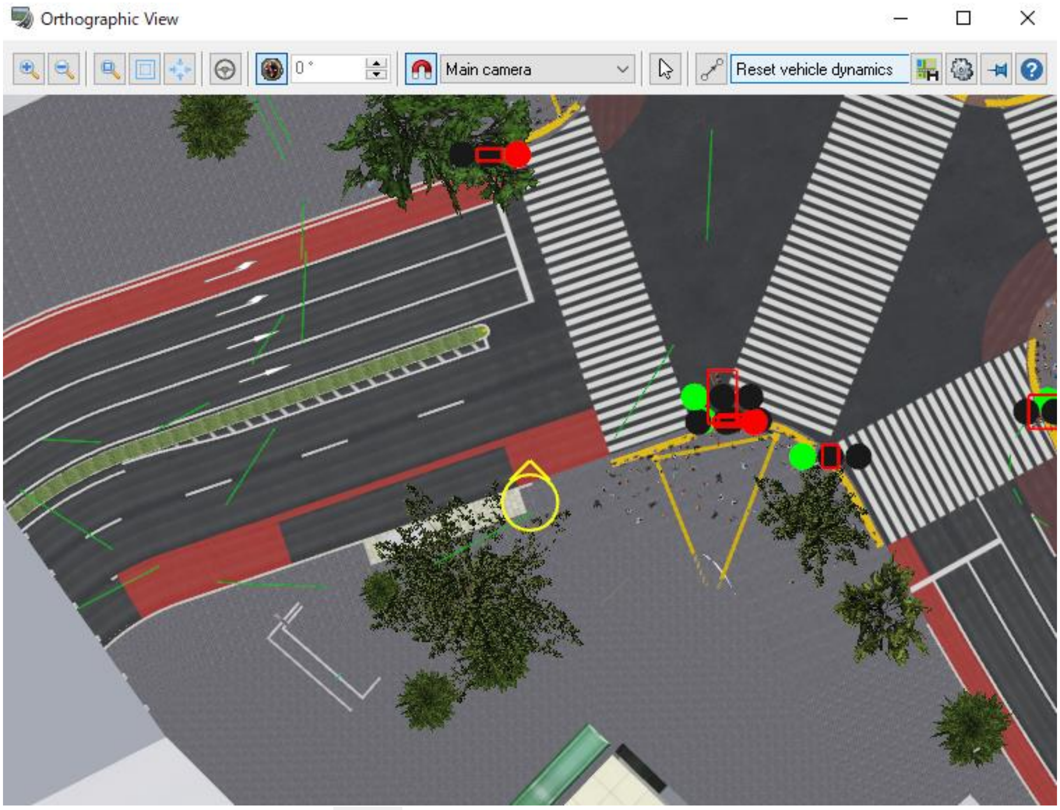


2D View

It is possible to show a 2D view of the project in a separate view from the 3D main view.

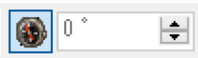
Go to View ribbon – 2D View. 

On this form, it is possible to select information to be shown and the camera mode, and reposition vehicles, too.



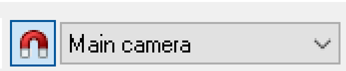
Use as Car Interior Zoom 

Apply the current zoom level to a 2D view of the car interior.

Direction of camera 

When this is disabled, 2D view is shown at the angle specified. If 0°, upward is north.

When this and Follow mode  are enabled, the vehicle's direction of travel is always displayed facing up,

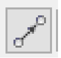
Follow mode 

Click the button to activate Follow mode.
Select one from Main camera, Target model or Client (only available as a multi user client)
It follows the camera or model selected in the combo box next to the right.

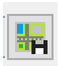
Display View Options 

On the options, select information or models to shown in 2D view.

Reposition traffic vehicle 

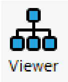
Click  to reposition a selected model or vehicle.

Always on Top 
Click to show 2D view at the top of other windows.

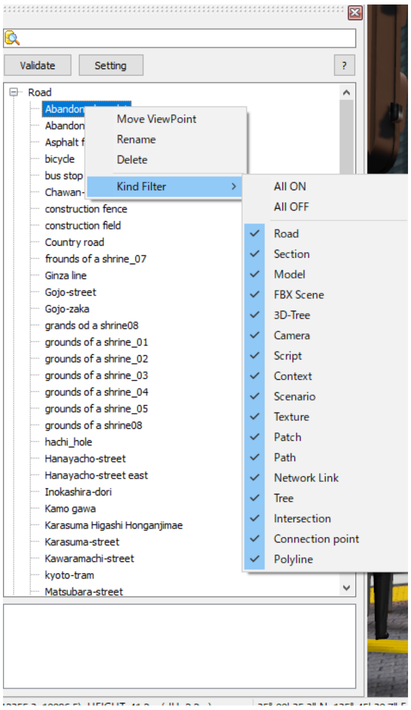
Export ortho images 
Click to ecport the view as ortho images.

RoadDataViewer Plug-in

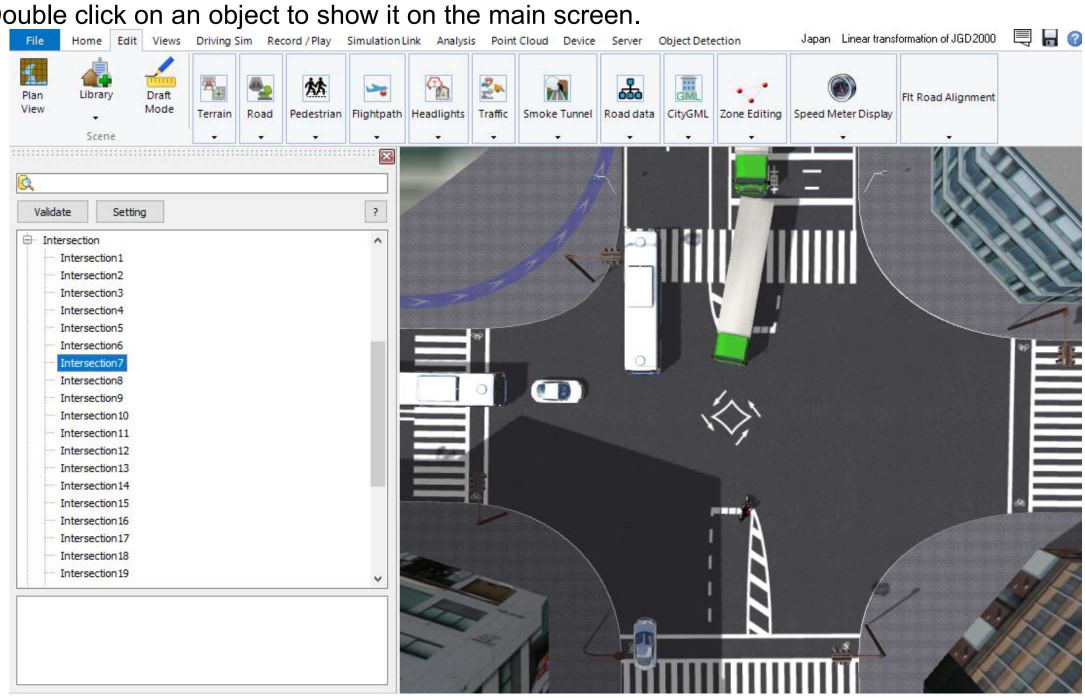
RoadDataViewer plug-in lists information of all objects, textures and intersections etc. in UC-win/Road project. It is possible to verify buried placements, overlapping placements, and textures with large capacity, and to search for unconnected road connection points.

Go to Edit - Road data - Viewer. 

This lists all elements in the project. Right click an element to move viewpoint, rename, delete.

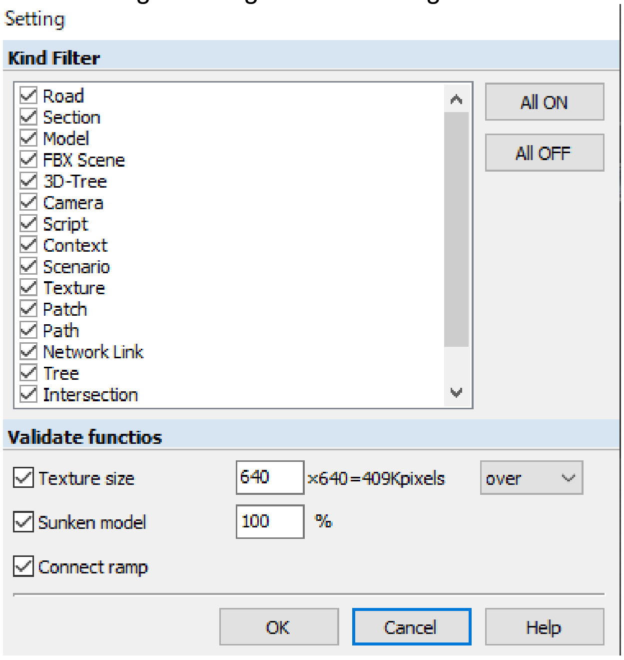


Double click on an object to show it on the main screen.

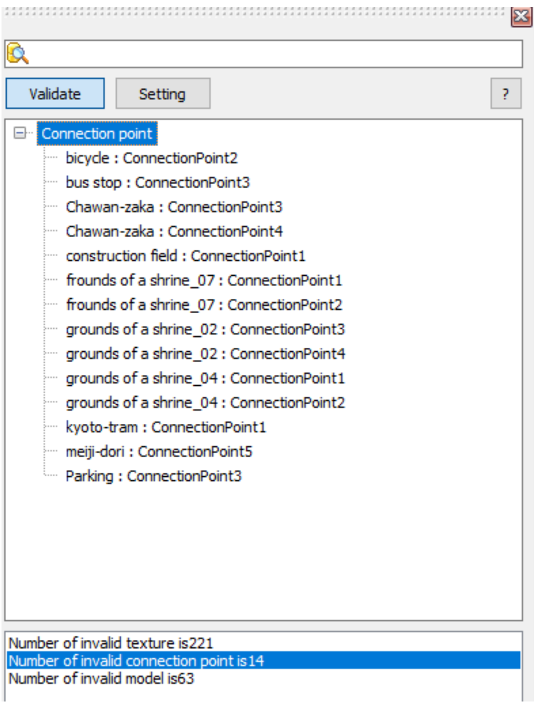


Setting

Click Setting to configure the filterling and verlification.



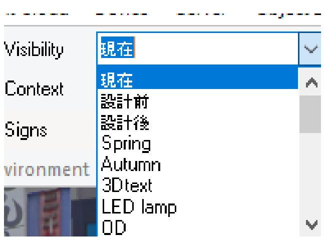
During Validate button hold on, the results of verifivation are shown at the buttom.
It displays the number of objects which meet the specified filter conditions. Click the messege to list them on the upper part.



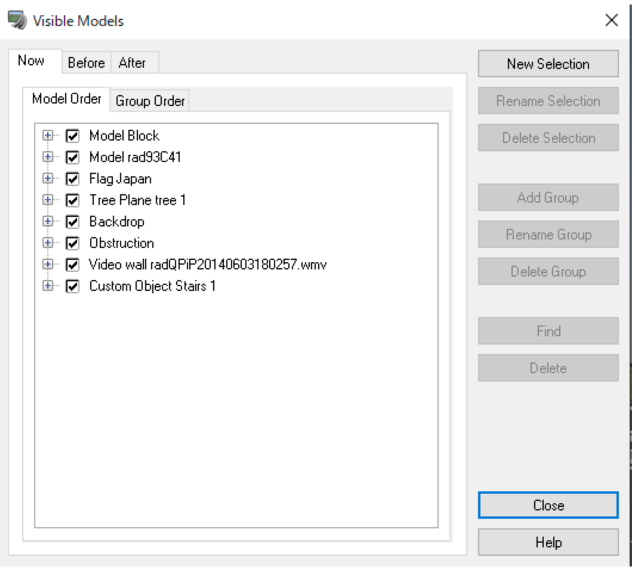
Model display switching – Before After design

It is possible to switch the display by models, and compare landscapes by showing and hiding models. It is possible to place models only in certain landscapes and compare them with and without models.

Go to Home Ribbon – Environment – Visibility to switch Visibilities.



Or click  to open Visible Models form. On this form, check model to display, check off to hide for each visibility. Click New Selection to add a new visibility.



Example
Left: Before. The cherry trees, the yellow benches and green street lights.
Right: After. Display the greeneries, the green benches and the white street lights.

POV-Ray Options

Exporting for ray tracing is supported. Ray-tracing is a rendering technology which can generate a real 2D image by chasing a track in light from the viewpoint to the light source during simulation.
Rendering the exported file with the freeware "POV-Ray (Persistence of Vision Ray-Tracer)" by POV- Team to increase the realism of 2D image

Each setting for ray-tracing
Model Editor - POV-Ray tab
It is possible to set the Texture of the model for POV-Ray, as well as the light.
Texture Setting

Check "Override texture" option after selecting model parts under "POV-Ray" tab of the "Model editor" to generate the default texture.
If the texture for POV-Ray is set for the fake light, blinker or brake light, it cannot be output.
Check "ignore the fake light" option to output it, however, it is effective with the Blend mode only.

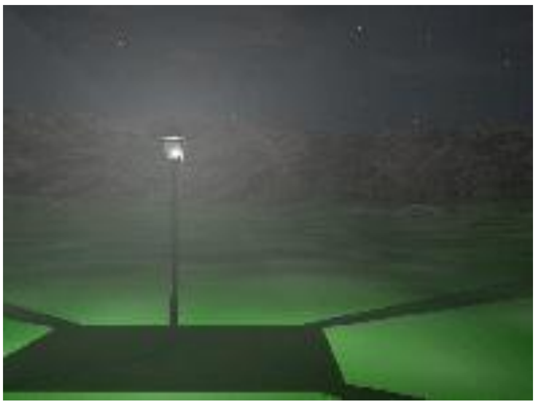
Light Source Setting
Check "Is Light Source (only at night)".
The default is "Spot light of Fade distance 8m".
The light source is situated at the gravitational center of the model parts; hence, depending on the model parts, light source is sometimes absent. In this case, check "Cast No Shadow" option or check “Override Light Source” to edit the language of scene description.

With enclosed light source

With "Cast No shadow" option

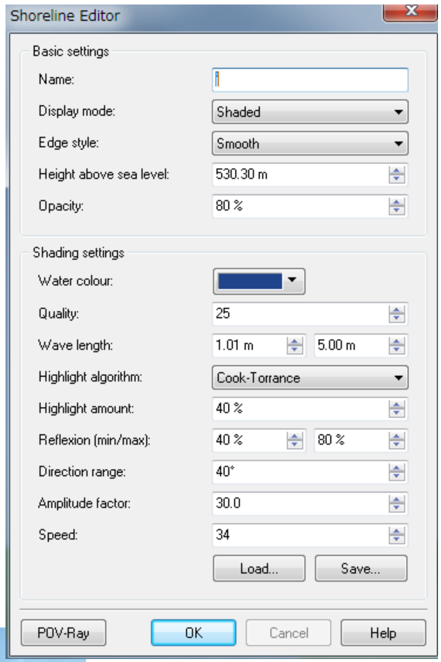
Mist Setting

Mist is caused by diffusion of light with fog.
Check "Light Has Mist Halo (only at night) to generate a halo.
Choose model parts which are set for the light source under "POV-Ray" tab of "Model Editor" form. The default is "Type2", which is a condition of very small drops of water.



Lake Setting

To generate the default texture for POV-Ray, click POV-Ray in "Edit shoreline" form and check "Override Shoreline Texture" option.



Left:Before, Right:After

Sample data (FORUM8 CG Movie Service: Rendering using Super Computer)

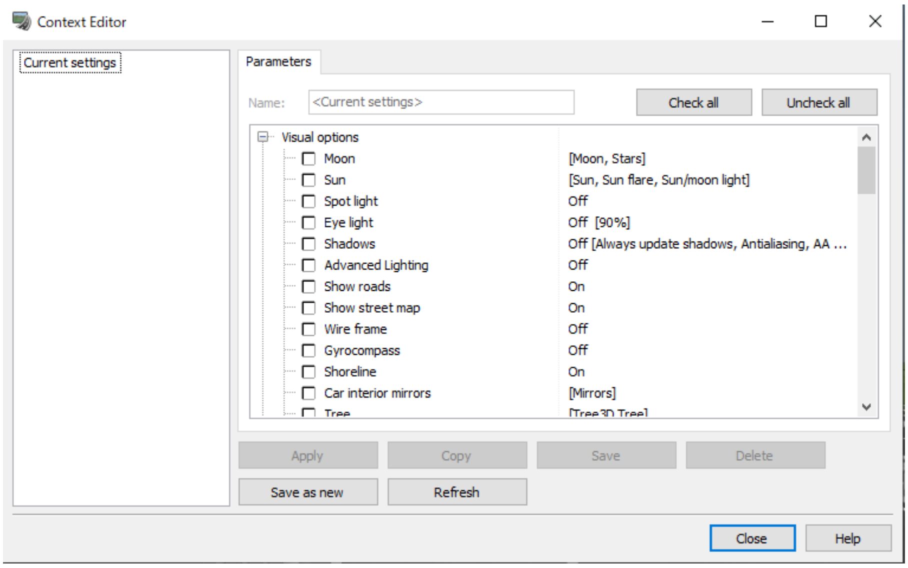
Context

Context is comtained of the several environment settings. Using Context, the environmental setting is reflected and switched at once. Comparisons of situations can be easily done by preparing and switching contexts.

Go to Home – Environment – Context to switch Contexts.

Or click  to open Context Editor. On this form it is possible to:

- Create new contexts
- Show the current settings of the project
- Copy/Rename/ Delete contexts
- Overwrite contexts with the current settings of the project
- Create a shortcut button for a context



Basic –Road and terrain

Load 3D Elevation Data

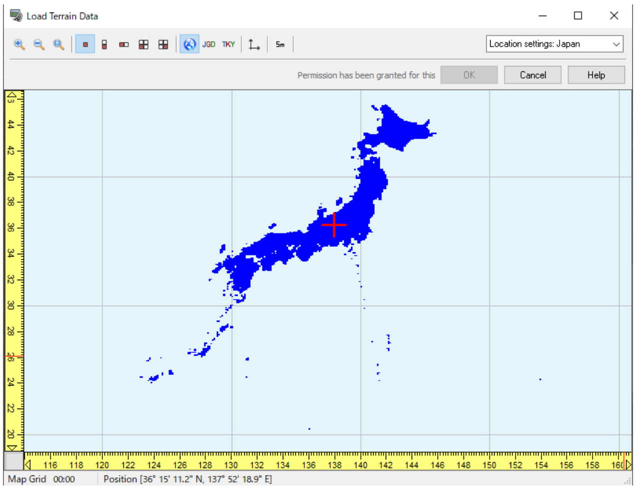
Obtain and load 3D elevation data. File - Select which data to use from the new project.

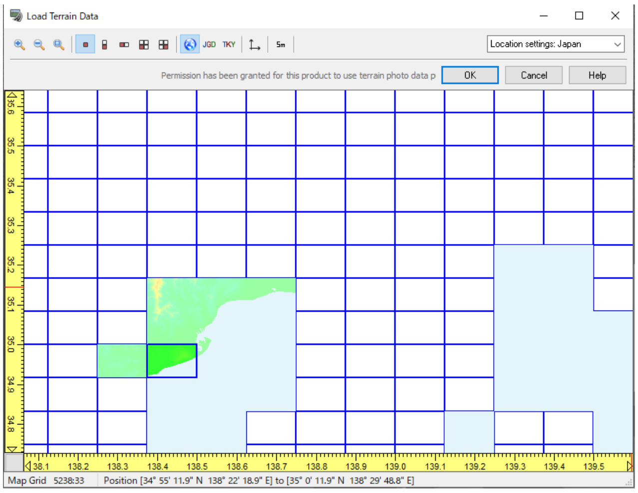
1. Default Terrain

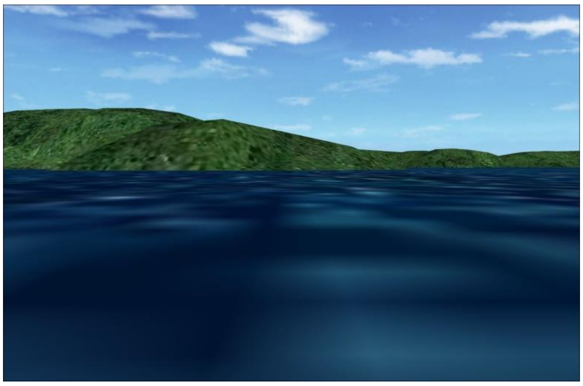
This is a project using a pre-defined terrain. All default settins are applied.

2. Japan

Japan map with 50m meshes is displayed. Zoom in or out the map and click mesh data to use.
Then cllick OK to start loading.







Each side of the division is 10km

 : One division 10x10km

 : Two divisions in length 10x20km

 : Two divisions in side 20x10km

 : Two divisions in length and breadth 20x20km.

 : Latitude longitude

 : The world land surveying system

 : Old geographical coordinate system

 : Edit the coordinate system

 : Load the "Digital Map 5m grid Mesh (Elevation)" created by the Geospatial Information Authority of Japan.

How to use 5m mesh data

There are two methods of loading the digital map in 5m mesh (Elevation) provided by Geospatial Information Authority of Japan into UC-win/Road.
For either loading method, 5m mesh data is converted into the terrain patch data. Once the data is taken as the terrain patch data, street map, road, building etc. can be placed on top of this terrain.

Note: The 5m mesh data that can be imported directly into UC-win/Road is only "Digital Map 5m grid Mesh (Elevation)" published by Geospatial Information Authority of Japan. Users who have CD-ROM or other devices with 5m mesh data can use this function. To import the basic map information that can be downloaded on the Web site of GSI, the data must be converted to the Shape file before doing.

How to import simultaneously when creating a project

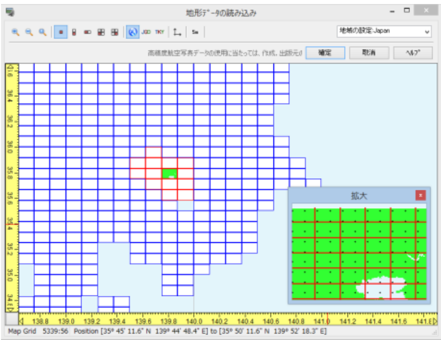
1. Save 5m mesh data into the folder

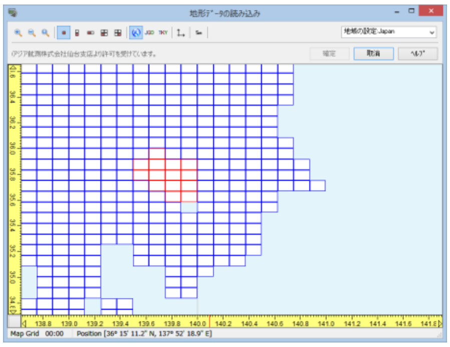
Copy the data of 5m mesh (*.lem, *.csv) into arbitrary folder.
It is convenient to save it in the following folder.
<<User data folder>>¥Data¥5m

1. Select the 5m mesh data to load

Go to File - New project – Japan.On the window, click on 

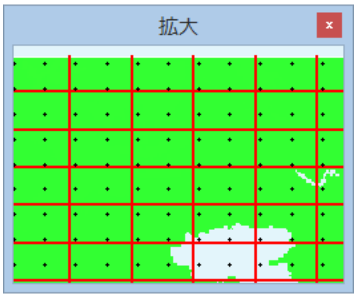
button.
Then select the 5m mesh data (*.lem) to load in the File Open dialog.
Tip: it is possible to select multiple files by holding down the Ctrl key or Shift key while clickin.
The selected mesh data is loaded. The area of 5m mesh data has red diagonal lines.





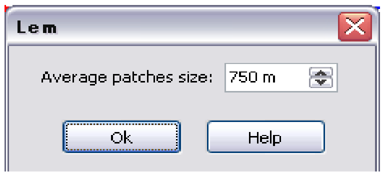
3. Select the loaded 5m mesh data

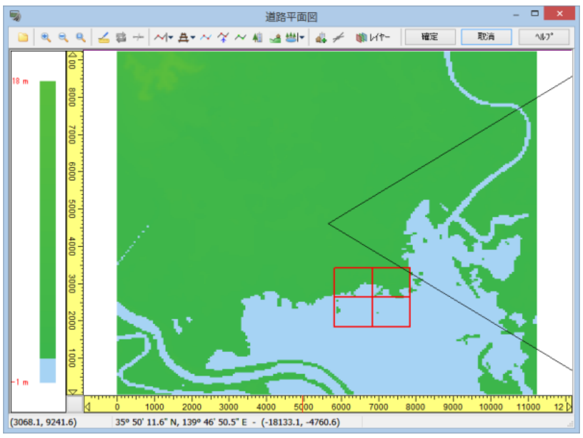
When the terrain of 50m mesh is selected, it is possible to view a zoomed-in image of the selected area on a different window where the mesh (1.5km x 2.0km) of 5m mesh elevation data is displayed.
On this window, click the area of 5m mesh to load.

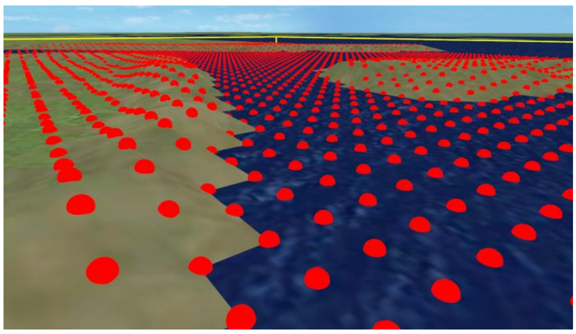


4. Set the terrain patch size and load

Click OK to open the window for inputting the terrain patch size. Click OK after inputting the average terrain patch size. The 5m mesh will be loaded as terrain patch data each having this size.







Importing method after creating a project

Import the 5m mesh altitude data from the state that terrain has been already imported.

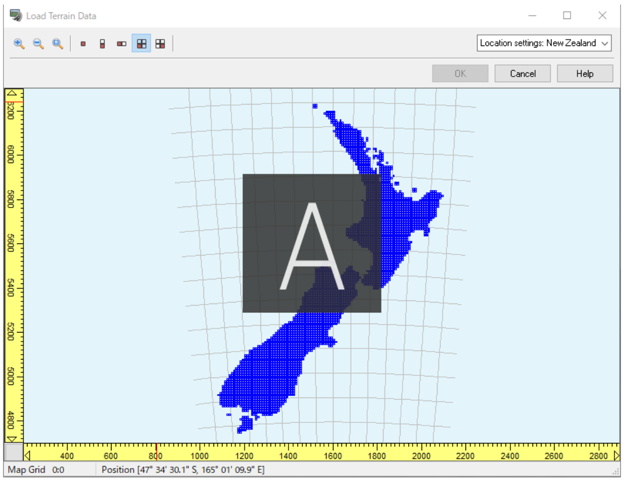
1. Save 5m mesh data into a folder
Copy the data of 5m mesh to the arbitrary folder.   Save it to <<User data folder>>¥Data¥5m.

2. Select 5m mesh data to import
Go to Edit - Terrain – Patch▼ - LEM File.

3. Setting and importing the terrain patch size
When clicking [Open] button, the screen to input the patch size is displayed. When inputting the 1 side of terrain patch data and clicking "OK" button, the 5m mesh is imported as a terrain patch data for each size.

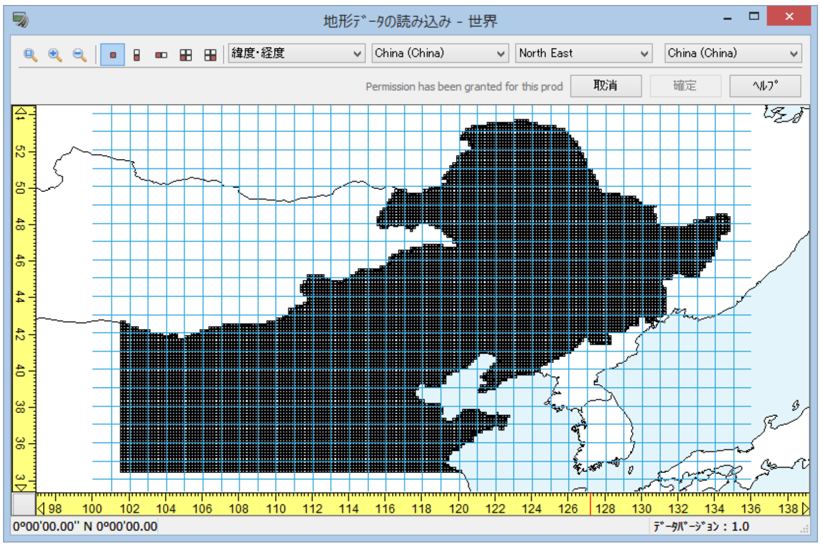
3. New Zealand

Go to "File" - "New Project" - "New Zealand"
Load the terrain of New Zealand provided from GeoGraph.
As there is only one coordinate system for the New Zealand map, there are no functions to change coordinate systems.



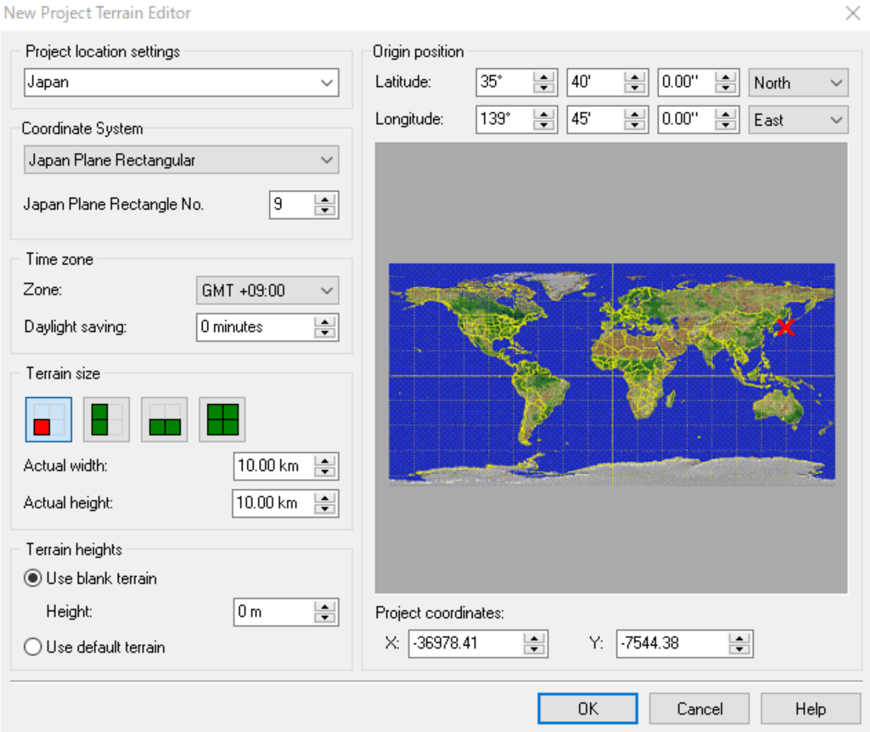
4. Other country

It supports 3-second digital map data (approx. 90m) distributed by CGIAR-CSI. As standard, it is possible to select terrain in the terrain database "CGIAR-CSI SRTM 90m Database".
Terrain grids of the same size as those of Japan and New Zealand can be created, and terrain of up to 36 km square can be read.



5. User defined

From the drop-down menus, go to "File" - "New Project" - "User Defined"
It is possible to user defined terrain for areas other than those listed above or when survey coordinates are unknown.
Set up the coordinate system, time zone, terrain size, terrain heights and origin position.



6. Load From File

Go to File - New Project - Load From File to load assorted files of terrain data for a new project.
The terrain data supported also include seabed data, making the recreation of a containing ocean floor also possible.
This method has the following features.

1. Free terrain size

It is possible to specify freely the terrain area to use in the project. The project created by other method is limited to sizes such as 10km X 10km or 20km X 20km.

2. Freely specifying the area

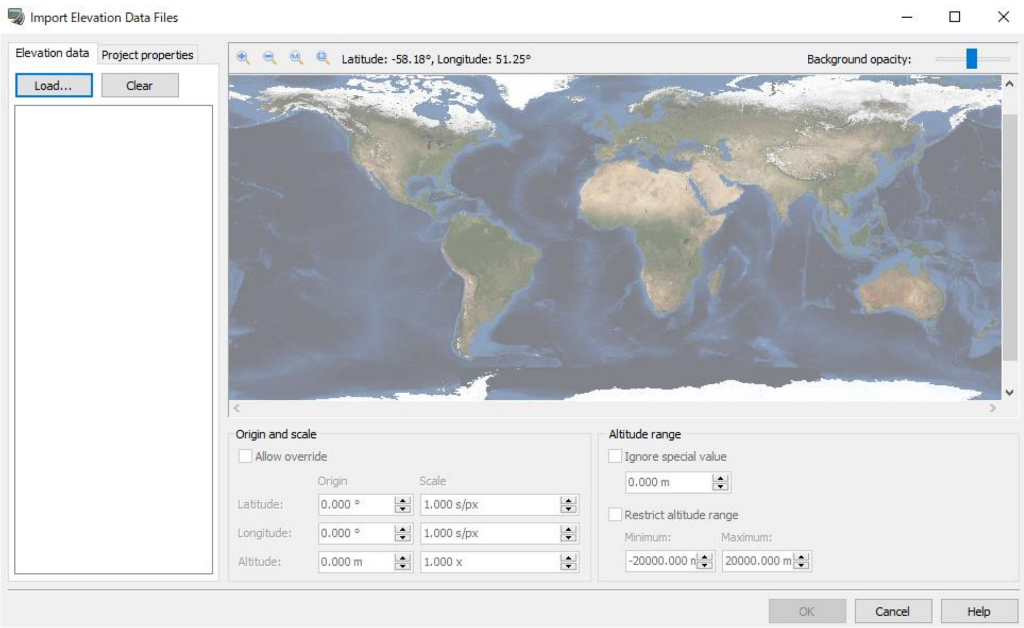
It is possible to specify the area to be generated regardless of aspect ratio or coordinates.

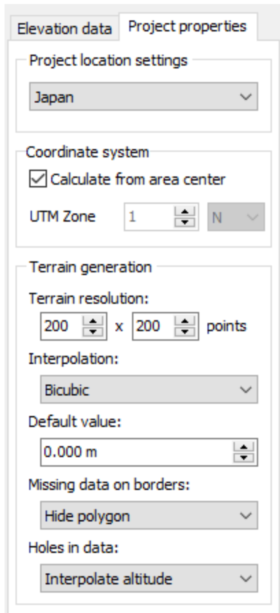
2. Supported data format

It supports SRTM90 (90m mesh), ASTER (30m mesh), image files, etc. It is also possible to integrate different multiple data into one and synthesize a terrain.
Note: Some of the data contained are only free under the circumstances that they are used for research purposes. Please consult their appropriate author before engaging in commercial activities.

4. Terain data filtering

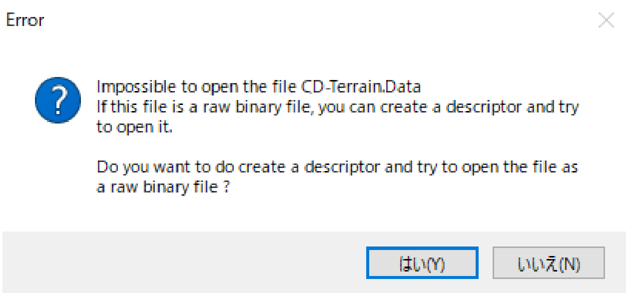
It is possible to specify the polygon size of the generated terrain. The elevation of the polygon vertices are complemented through cubic interpolation to maintain high-detail terrain generation.

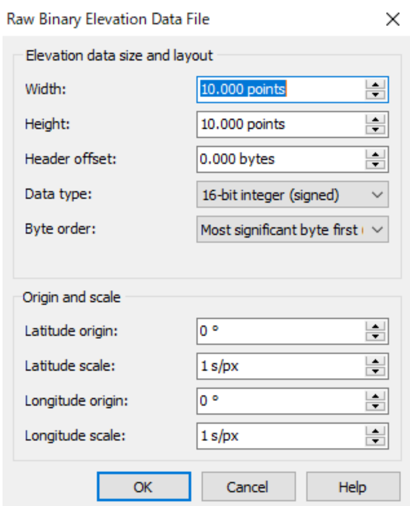




■ Raw Binary Elevation Data File Form

Most of their formats include headers that have information about their contents, but sometimes elevation data is distributed using raw binary files. A raw binary file is a file that only includes elevation data, without any additional information that can be used to know the size, scale or location of the data.
If the file forma canot be recognized, the following message will be displayed to create a file with that description.



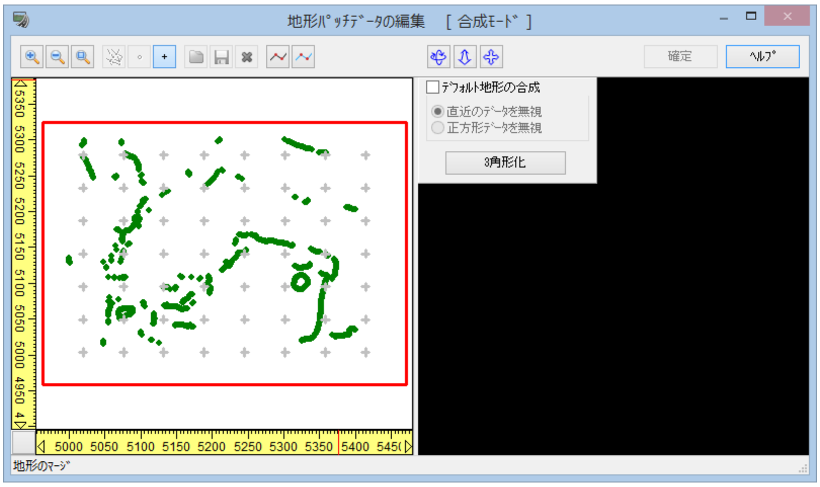


If the data to be read will contain binary elevation data, it is possible to define a descriptive file with all the information required for the elevation data.

7. External 3 dimensional terrain data

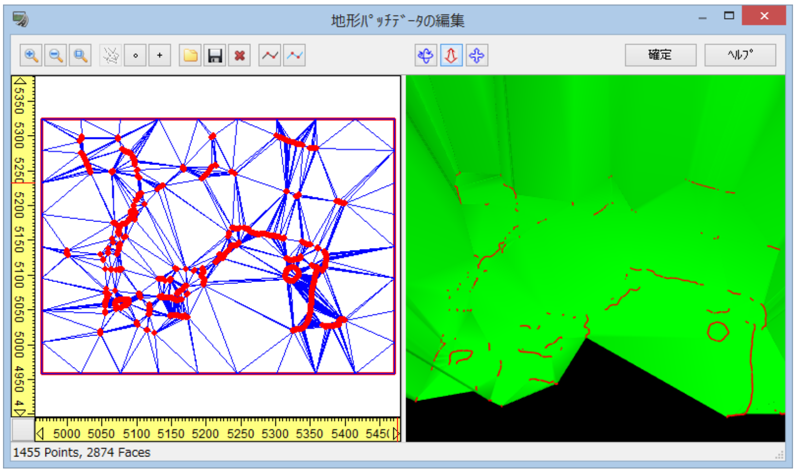
Merge existing terrain data with the selected 50m mesh.

Go to Edit – Patch - Terrain 
Click "Open" and load the terrain file previously created.



Check this box to optimize the original terrain and terrain data. The following options will show data that will be validated in green and data that will be ignored in gray.
Ignore Closest: Ignore data with an altitude similar to the terrain patch data.
Ignore Square: Ignore data inside a square made by the terrain patch data's elevation points.

Click on Triangulate button and the generated terrain data will be displayed on the right side.



*If the data is converted directly from terrain data such as contours, it will be very detailed. Converting a wide area is not recommended, as it takes time to generate the data. We recommend to use the 50m mesh data for points that are quite far from the desired location.

About the terrain patch data format

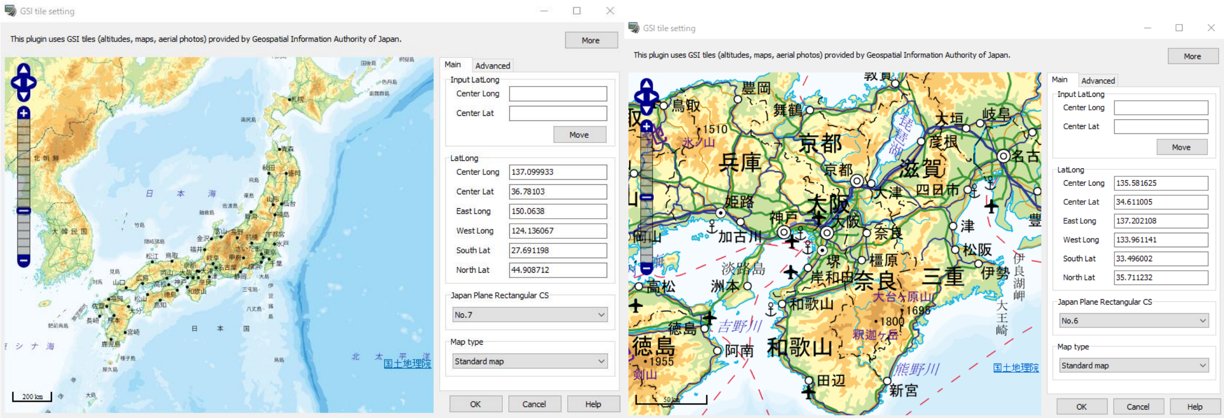
To import terrain data created by an external tool, it is necessary to convert the data to XML format in a specified format.

```
<?xml version="1.0"?>
<!DOCTYPE UCwinRoadTerrain SYSTEM "UCwinRoadTerrain.dtd">

<UCwinRoadTerrain version="0.*" coordinateSystem="0">
<Origin north="*****" east="*****"/>
<Point north="***.**" east="**.**" height="**.**"/>
<Point north="***.**" east="**.**" height="**.**"/>
<Point north="***.**" east="**.**" height="**.**"/>
                          :
                          :
                          :
<Point north="***.**" east="**.**" height="**.**"/>
<Point north="***.**" east="**.**" height="**.**"/>
</UCwinRoadTerrain>
```

8. Import GSI tiles

The terrain is created from survey data and GSI tiles published by the Geospatial Information Authority of Japan as topographic data. The map image is imported as a street map.



1. Go to File – New Project – Importing GSI tiles and [GSI tile setting] window will be opened. It is required to connect to the Internet.

2. Expand the range to create. It is also possible to specify the latitude and longitude.
3. Standard map, Reduced shade map, Photo (After 2007), and Photo (1974-1978) are available.

◦ The "Photo Map (After 2007)" takes advantage of the "electronic national land based map (ortho-image) of the Geographical Survey Institute tiles" that GSI has published to the public.
◦ for the "Photo map (1974 - 1978)", the published article, "National Land Image Information (first phase: 1974 - 1978)", is being used.
◦ "Photo Map (After 2007)" and "Photo Map (1974-1978)" only support a zoom level range of 9 - 17, so in the case of a zoom level of 9 or less cannot be specified.
◦ "E-Land, Infrastructure and basic view (ortho-image)" contains some areas, such as mountainous regions for which images have not been captured, As such, there are areas for which no images will be displayed.

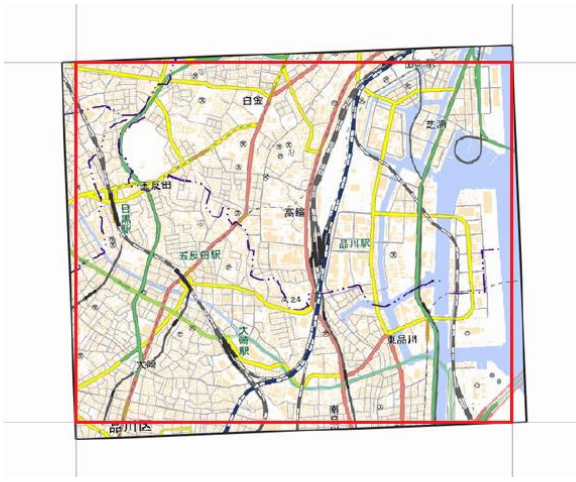

4. The terrain of the area will be generated and the selected map image will be displayed as a street map.

※About GIS import

This function imports terrain elevation information and street maps from GSI Tiles provided by GSI. When using a project created with this function, please comply with the GSI Terms of Use. For details, please refer to the "Terms of Use of GSI Tiles" on the GSI website.

1. Coordinate information

The coordinate information for the created project is based on the longitude and latitude displayed on the settings screen. The displayed map area is projected onto the set rectangular coordinate system, and the rectangular area encompassing that area is used as the project area. Note that when loading a region that is far from the origin of the rectangular coordinate system, the east, west, north, south, and west end points will be cut off. The figure below shows an example where the area around Shinagawa Station is specified as the 6th system (Kansai coordinate system)



In this case, the red rectangular area is the extent of the project, and there will be areas not included in the immediate north-south edge. If the appropriate coordinate system coordinate system (9th system for the Tokyo area) is selected, the area to be cropped will be smaller because the distortion is not as great.
The number of terrain grids will be created as 400 x 400.
The length of each grid is 1/400 of the north-south distance and east-west distance in the project options.

2. Street maps

Automatically generates a street map using images of selected geographic tiles. A georeferenced tile with the value of the zoom level plus the zoom level offset is downloaded. The downloaded image is projected to the configured plane rectangular coordinate system and split according to the split settings in the additional settings.

3. Evelation data

The height of the terrain grid is automatically applied using information from one of the Geographical Survey Institute tiles, the elevation tile.

Load 2D Image Data

The following mappings are supported:

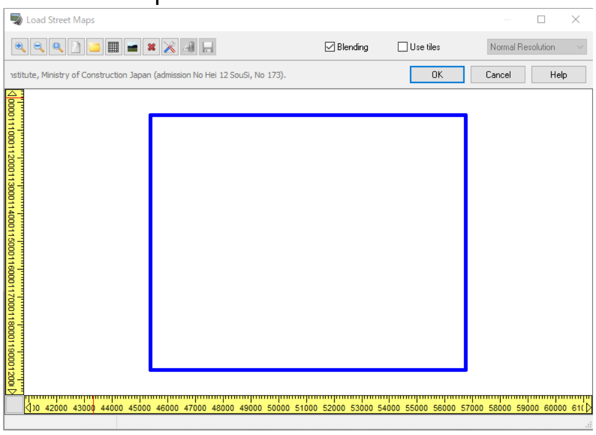
- 2500m spatial infrastructure data value maps from the Geographical Survey Institute
- Detailed data value maps from the Geographical Survey Institute (10m mesh of land use)
- DM file by Ministry of Land, Infrastructure and Transport
- Aerial Photos (BMP image .bmp or JPEG image .jpg)

Aerial photo grids are treated as layers. It is possible to create multiple layers, select them individually, overlap, rearrange, delete, or split them.

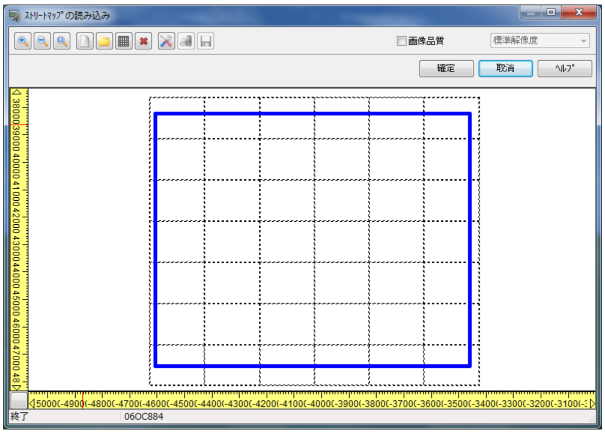
1. 2500m spatial infrastructure data

Go to Edit – Terrain - Street Map. 

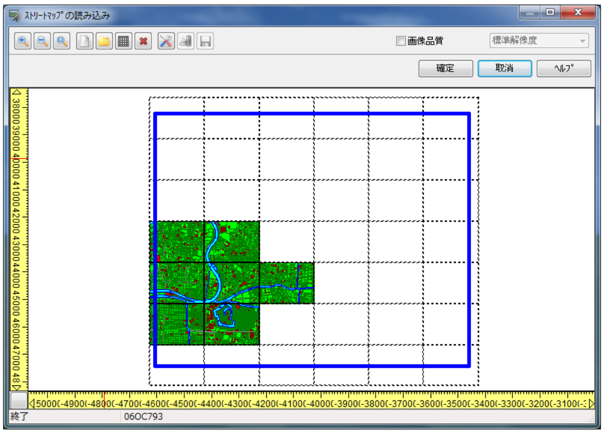
1. Click Open. 



2. The corresponding street map (black mesh box) will be displayed. If an error message appears, a different coordinate system has been selected. Please re-configure the settings.



3. Click on mesh frames to display the street maps. Click "OK" to finish.



The spatial infrastructure data for Tokyo and Osaka is saved to Tokyo.map/Osaka.map, which is Tokyo [MapFile] / Osaka [MapFile]. For other locations, click "Use CD" from map selection drop-down menu.
* If the map files are not installed, Use CD.
* When data belonging to more than one prefecture is included on CD, the files cannot be read. Copy all the folders for necessary prefectures into the Data folder and run UC-win/Road. Select "Directory Name" in the "Maps" column.

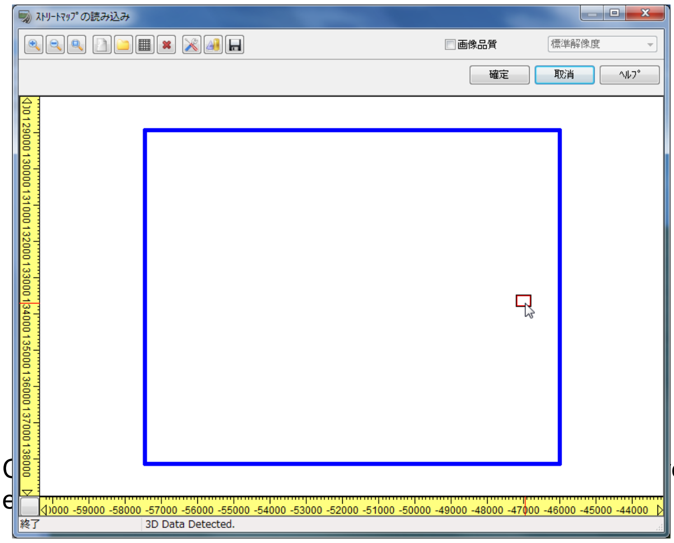
2. DM data

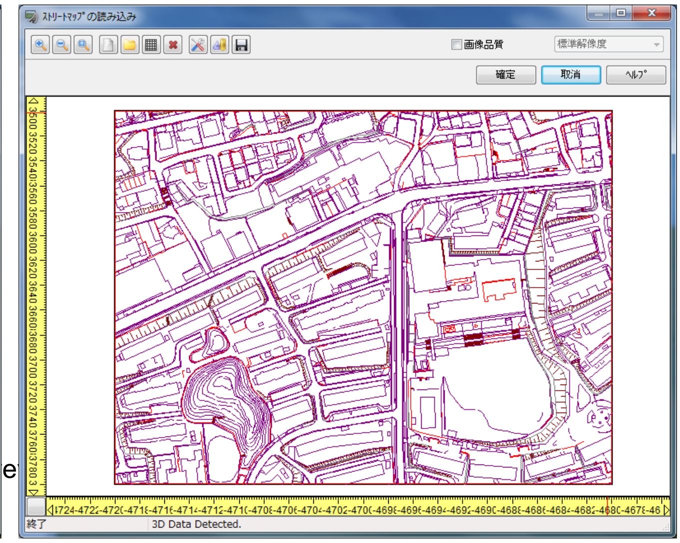
After Ver.6.1, it is possible to load the data from other than the specified folders.
In case of Ver.6.0.2 or earlier, create the following folder directory.
UCwinRoad /Data /DM /new folder (area name, etc.) - dm
Also, *****.dm and INDEX.file have to be in the dm folder.

1. Copy the DM Data from CD to the DM Folder in /Data. (UCwinRoad/Data/DM)
2. A DM file and INDEX file are saved in each folder.

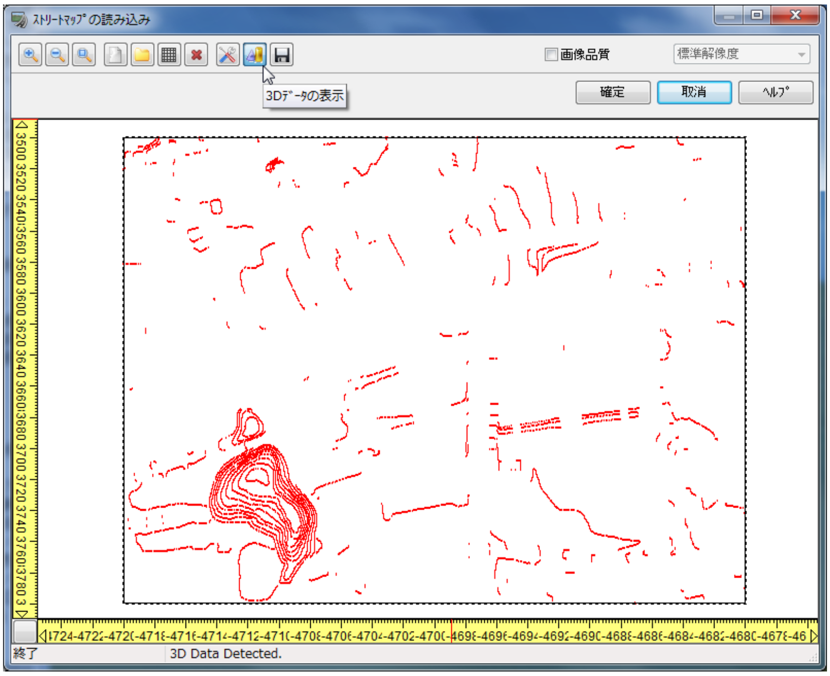
UCwinRoad/Data/DM/00abc123…07nd815.dm
…Index.file
/00abc456…07nd816.dm
…Index.file

3. Select DM from "Load Street Maps" and click on the search button.
4. Clicked on the red outline to load and display the DM information.
5. Save the data in XML.

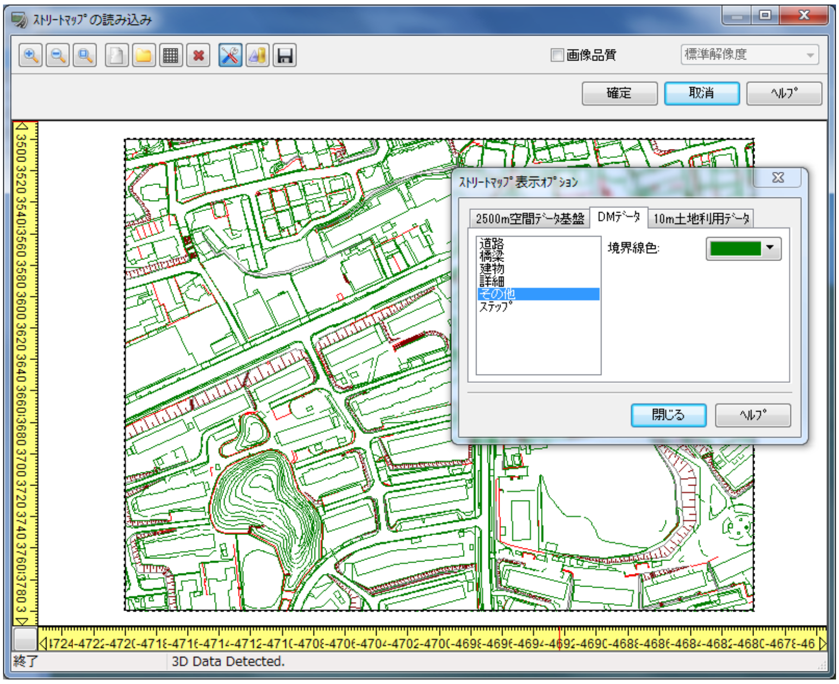




This button  is enabled only if the imported DM data contains three-dimensional terrain information. When the button is pressed, only the three-dimensional terrain information is displayed.



"Display Option'  can change the color of display element.

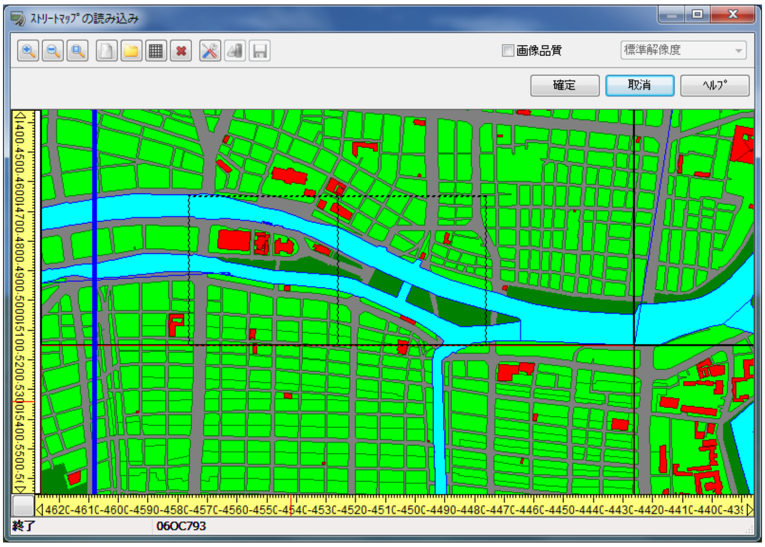


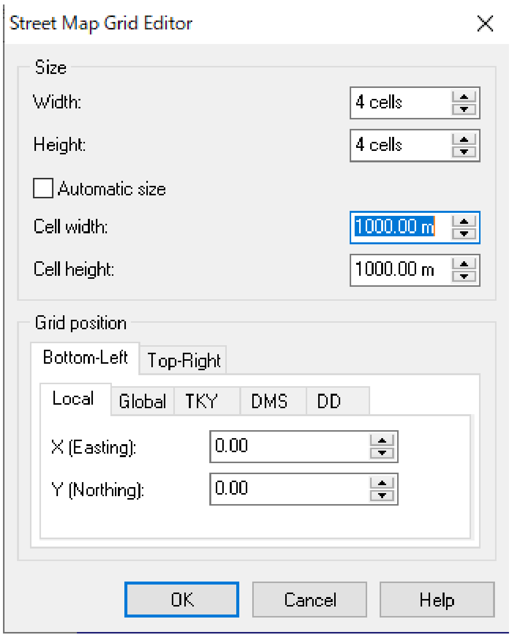
3. Satellite photos

Regardless of whether a street map is pasted or not, or regardless of the mesh size, aerial photos (aerial photographs) can be pasted over the top.There are 2 methods.

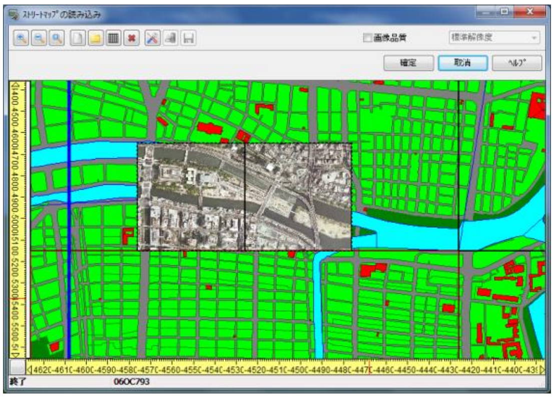
How to add a street map grid

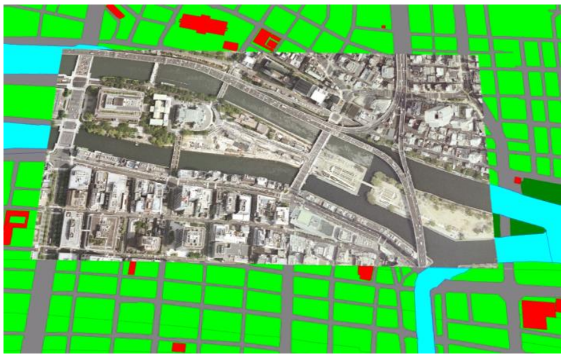
Click "Add a street map grid" button. 



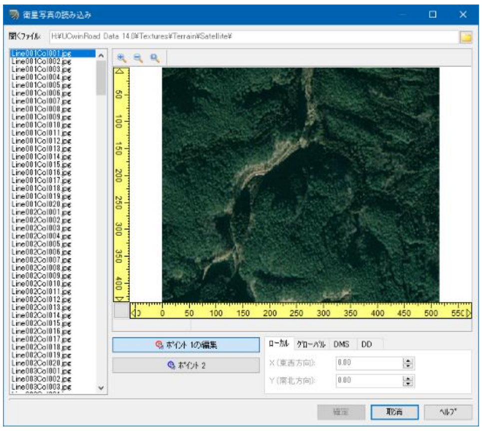


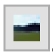
Click on the frame to be placed to display the saved image. Select an image and confirm. To use images in a folder different from the displayed path, click  to specify the path.



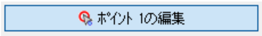


How to paste photos by specifying its coordinates

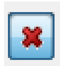


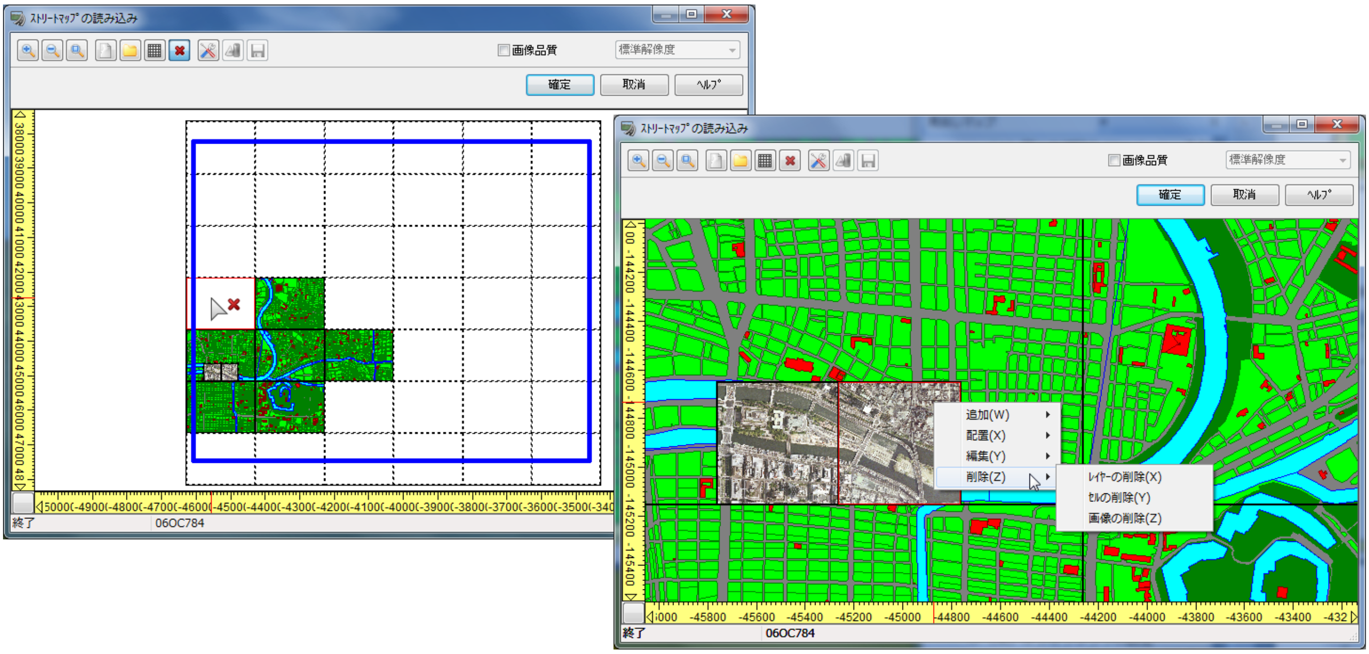
Click Load street map .

Click  to select the folder in which the images reside. Select an image from the list on the left.

Click the "Edit Point 1"  button, drag the mouse over the image  to specify the position and enter the coordinates. Similarly, set the position and coordinates for "Point 2.

After specifying the coordinates of the two points and clicking "Confirm," the image will be positioned so that its location is at the specified coordinates.

Click "Delete" to change the cursor to  .Click cells to delete. Click  and release the delete mode.
Right-click on a cell to open a popup menu.

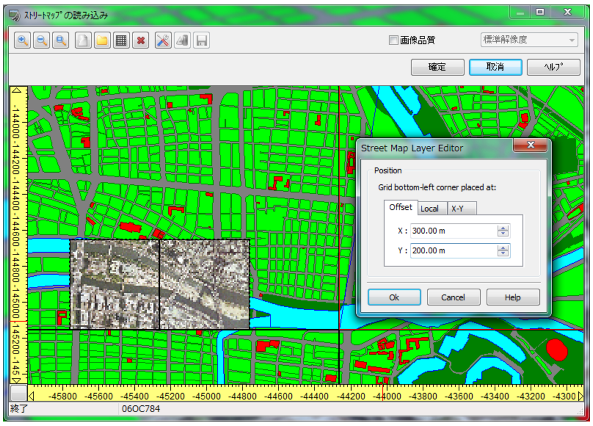
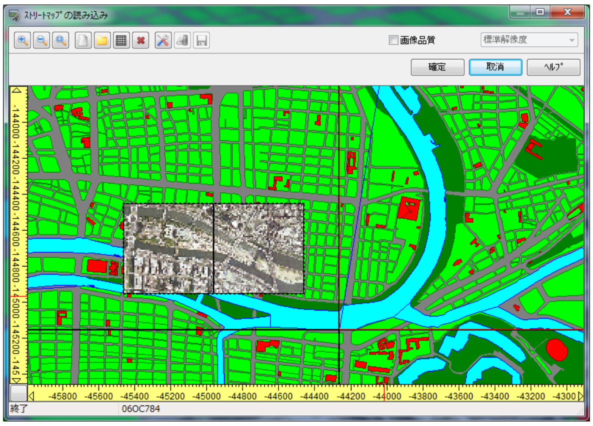


Right-click on a layer and a pop-up menu will appear depending on its status.

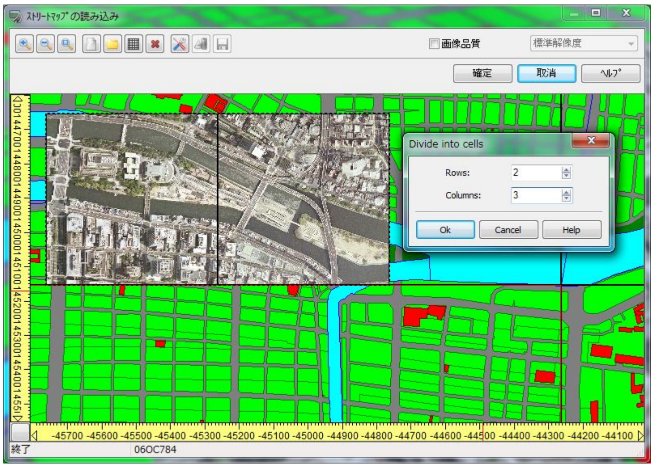
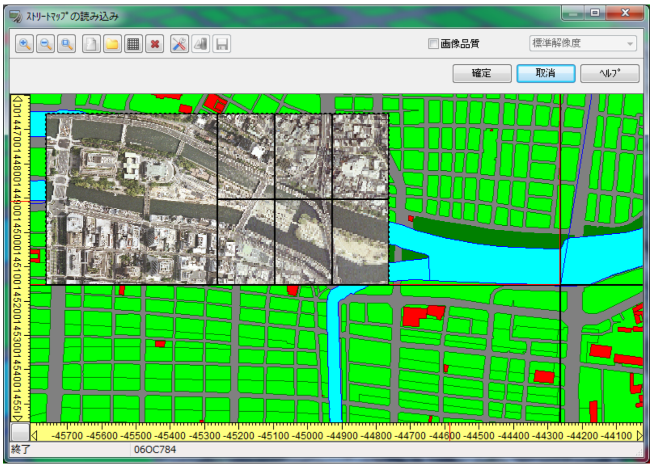
■Add
・Add a geolocalised file in the selected layer.
・Add a street map grid in the selected layer.

■Arrange
・Bring to front: Z value will be the highest.
・Bring to frontward: Z value will be incremented by one.
・Send to backward: Z value will be decremented by one.
・Send to back: Z value will be the lowest.

■Edit
・Edit the layer offset

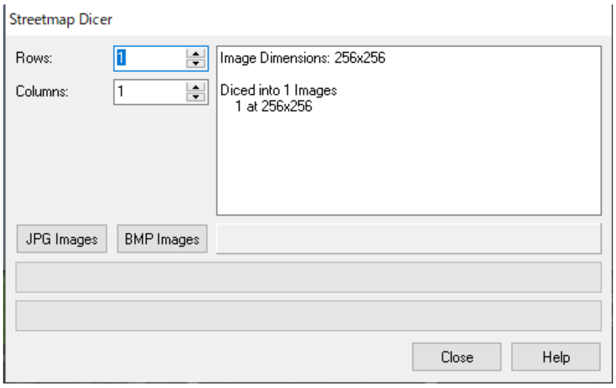



■Divide into cells
The selected cells are further divided. Next, enter the number of divisions for each row and column. This allows you to accurately display only a limited area of an aerial photo, or, conversely, to delete photos in unnecessary areas.

4. Dice streetmap

When the size of one image is too big, divide it and assign only the required sections.



1. Go to the ribbon, "Edit" - "Terrain" - "Dice streetmap"

2. Select the image to be divided
3. Specify the vertical and horizontal distribution value.
4. After division, Select from the street maps.

*Note: The file is named automatically.

5. World file

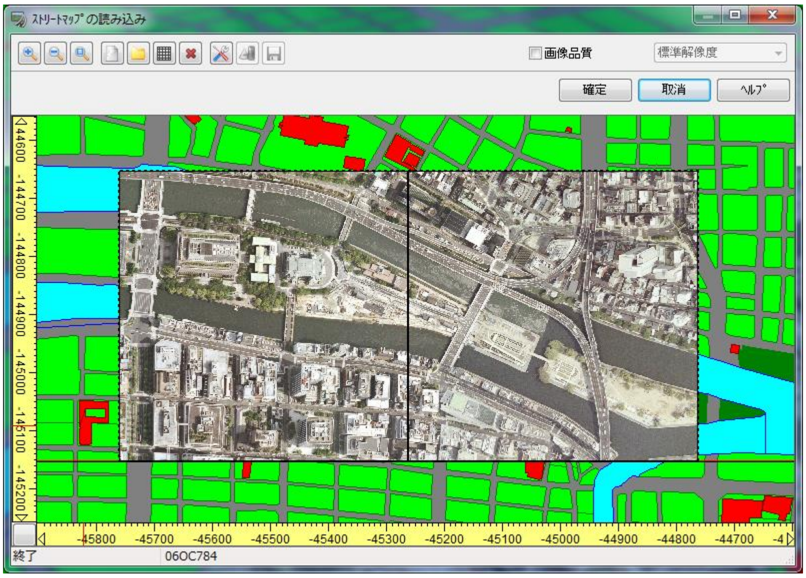
When a world file (bpw or jpgw) that includes coordinate information is selected when loading a street map, it is possible to set the corresponding image attributes. The screen will display UTM information for the current terrain.

Click " Street Map" 

 - Open .

Open the world file prepared with the same name as the image. The world file is in text format, so its contents can be viewed and edited with a text editor. In the example below, the coordinate system is UTM zone: 53, north latitude.

Click OK to paste the image on the position to be specified by world file.



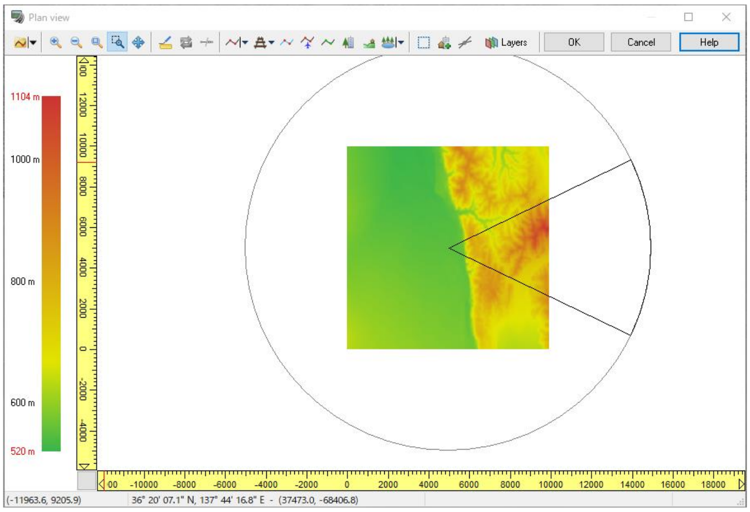
Road definition – Holozontal curve

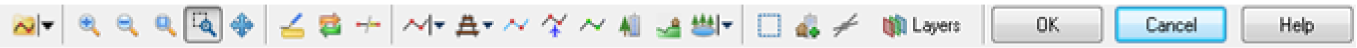
1. Road plain view

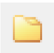
Go to Ribbon - Edit - Open Plan View 

.

View
The fan symbol represents the current camera position (center) and orientation. The radius of the fan represents the position of the horizontal line.
Double-click on any location on the plan view to move the center to that location.



Toolbar


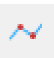
 : Load spline road or polyline road.

 : Zoom In  : Zoom Out  : Full Size  : Area zoom  : Move views

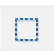
 : Draft mode (The road formation time is reduced as the cutting, banking and intersections are not regenerated.)

 : Re-build Roads  : Road building options (Select roads to build)

 : Make Road (Make New Railroad, Add New Roadway, Add New Track)  : Make Road Spline

 : Make River  : Make flight Path  : Male Polyline

 : Make Backdrop  : Make Cross Section  : Make a lake

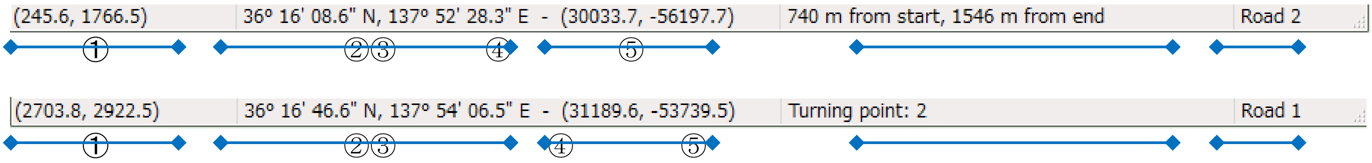
 : Shift Objects  : Place 3D model  : This is available for invalid intersections.

 : Undo / Redo

: Display or hide below layers in the plan view.
Terrain, Street map, Models, 2D/3D Trees, Video walls, Flags,
Fires/Smokes, 3D Texts, Terrain patches, Roads, Railroads, Railroads: Survey Curves, Railroads: Structure Curves, Railroads: Tracks, Road Models, Road Trees, Signs, Flightpaths, Backdrops, Rivers, Shorelines, Cross sections, Waypoints, Traffic connections, Camera position, Polylines, Point Cloud, Presets and Background color etc…

Preset: Display/hide all layers or display only terrain, roads or river etc.

Status bar
The coordinates of the current cursor position is displayed in this format.



①The position starting from the bottom left of the topographical map in meters (X-direction, Z-direction)
②The current longitude and latitude
③The position in the coordinate system according to the world geodetic system in meters
④The position on currently selected road, river, etc.
⑤The name of currently selected road

2. Holizontal road alignments

Defining horizontal road alignments
There are 2 methods.
(1) IP point coordinate entry: Entry of the road alignment by IP method
(2) The central point coordinate entry: Entry by the spline road alignment which passes a specified point

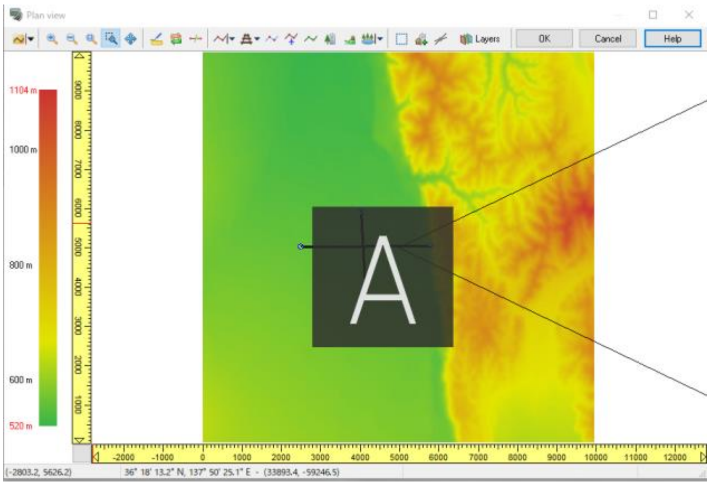
(1) IP point coordinate entry

1. Click on "Make Road" button  , or go to "Start" - "Start Road".

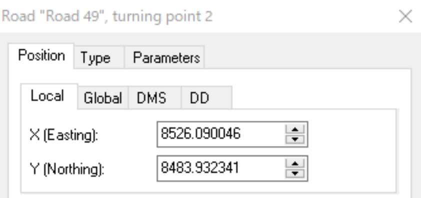
2. Click on the terrain to start road, create bends and end road.

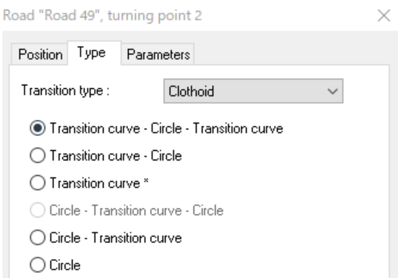
3. Click "Make Road"  once again or right click and select "Finish Road.

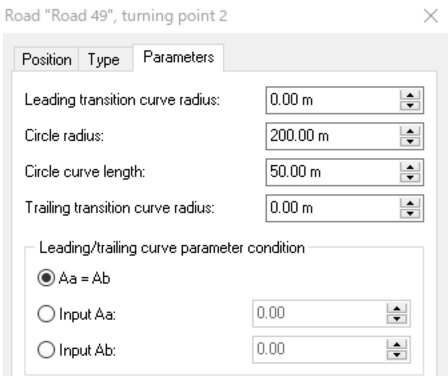
The "Starting Point" is created at the point at the point clicked first and the “End Point” at the point clicked last. The dots in between are “Turning Points”. As it is difficult to place these “points” at the correct coordinates, place them at the approximate locations with the correct number of turning points.



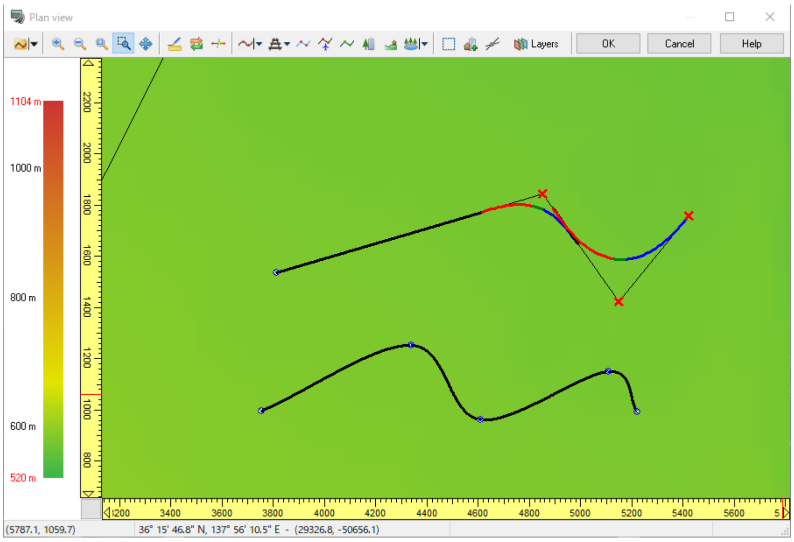
4. By right-clicking on the created road alignment, a menu for editing, deleting, etc. can be displayed.
5. Right mouse-click on the “point” to and go to Edit - turning point to set its position, type and parameters.

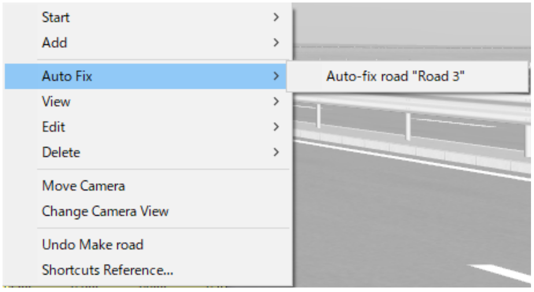




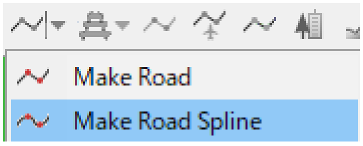


The transition curve on the starting side, the circular section and the transition curve on the ending side is displayed in red, green, and blue.
Red X at the turning point indicates it is invalid. Edit it to remove this X.
If the X remains, reconsider the parameters of the alignment, type of change point and curve."Auto-Fix" is also available in the right-click to correct the invalid turning point automatically.

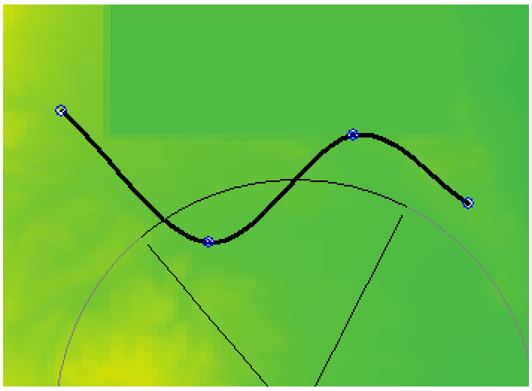


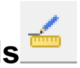


(2) Entry by spline

1. Click "Make road spline"  

or right click and go to "Start" - "Start spline road".
2. Click on plan view. Select the number of starting and turning points as well as the end points.
3. Click "Make road spline" button once more or right click and select "Finish Road".



3. Generation of Roads 

When editing or generating roads, Draft mode is available to prevent erroneous roads and to reduce time.

Draft mode

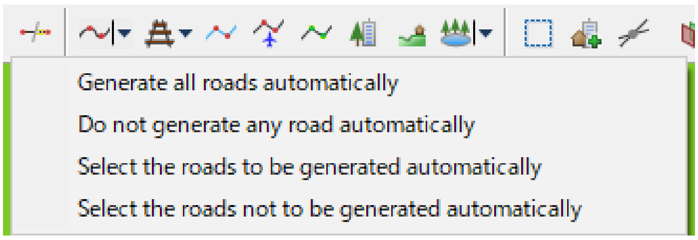
Draft mode roads will only be partially rendered, which can save loading times and is excellent for previews. Draft mode affects both Plan view and Main view.

※Non-selected roads will be hidden on the main screen. Traffic cannot be generated. On the plan view, only lanes are displayed with dot outlines, but cannot be edited. On/Off ramps cannot be added to unselected roads.

Automatic generation

Selecting the roads to be generated prior to road generation can reduce the generation time.

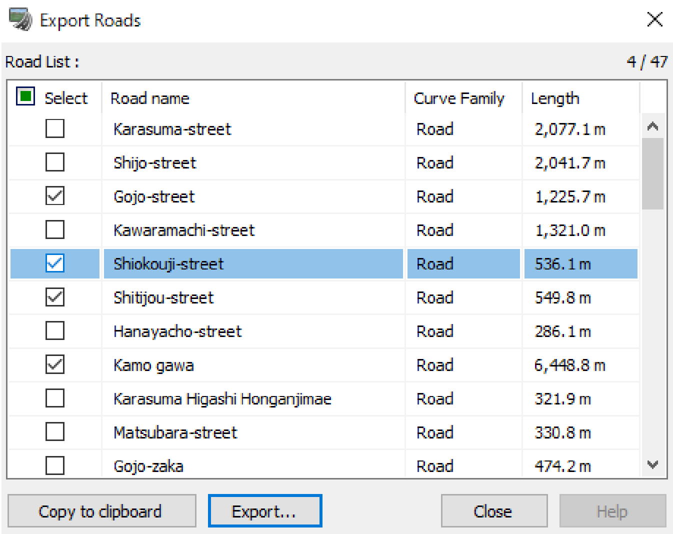
Click  button to display a pop-up menu.



4. Export Roads

Roads can be saved/loaded and copied and pasted.
In addition, cross-section data and road surface textures are also saved.

Click  to select road to be saved and click Export.



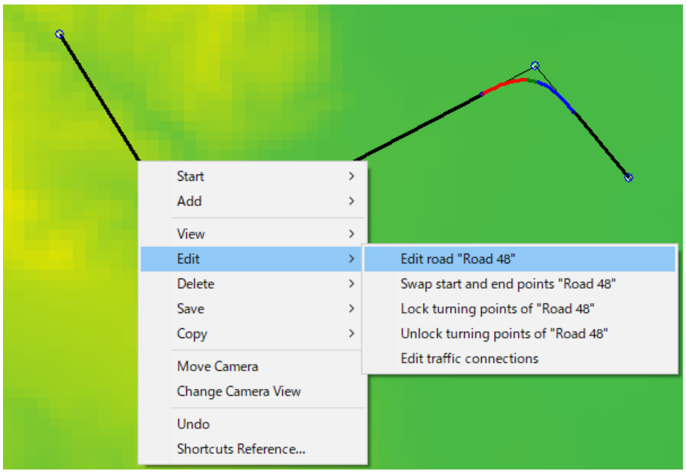
Click  to load roads.
Roads can be copied and pasted from the right-click menu.

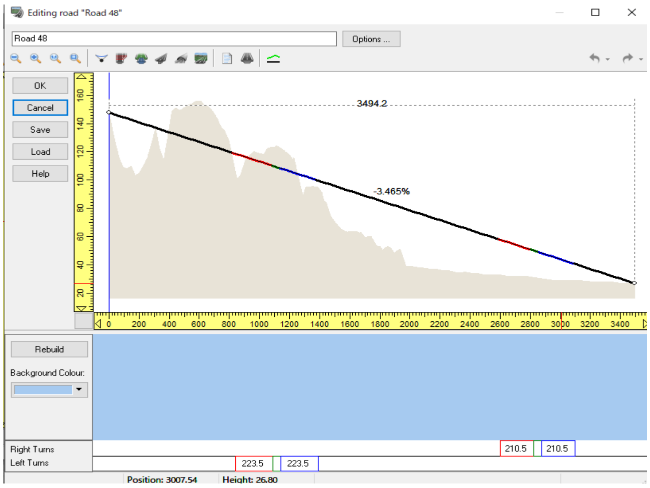
Road definition - Vertical curve

Next, define the vertical curves of the roads before created.
After definition, click OK to start generating them on the main view.

1. Add / edit longitudinal turning point

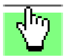
On the Plan view, right-click on the road alignment and go to "Edit - Edit Road". The Vertical curve editor is opened.



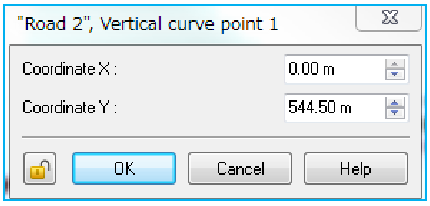


Red indicates the section of the selected road with overlap.
Blue indicates relations in height when the road passes over another road.

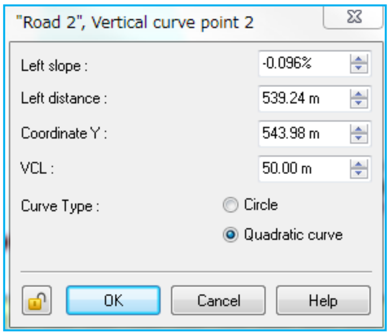
1. Click  or right click and go to "Add turning point"
2. Click at a point to add turning point. Repeat as necessary. Move the white circle added to the clicked point to move the change turning point.

   Turning points cannot be placed at the position where the cursor changes to 
3. Right click on it and select "Edit turning point" to edit it.

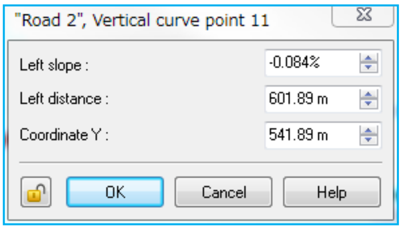
Start (height, starting position)



Turning point (distance, inclination, VCL)

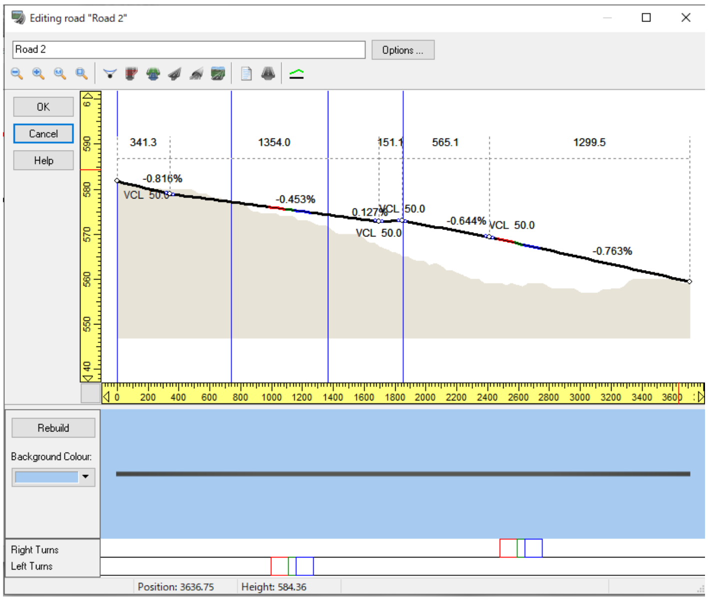


End (distance, inclination)



2. Insert sectional change positions

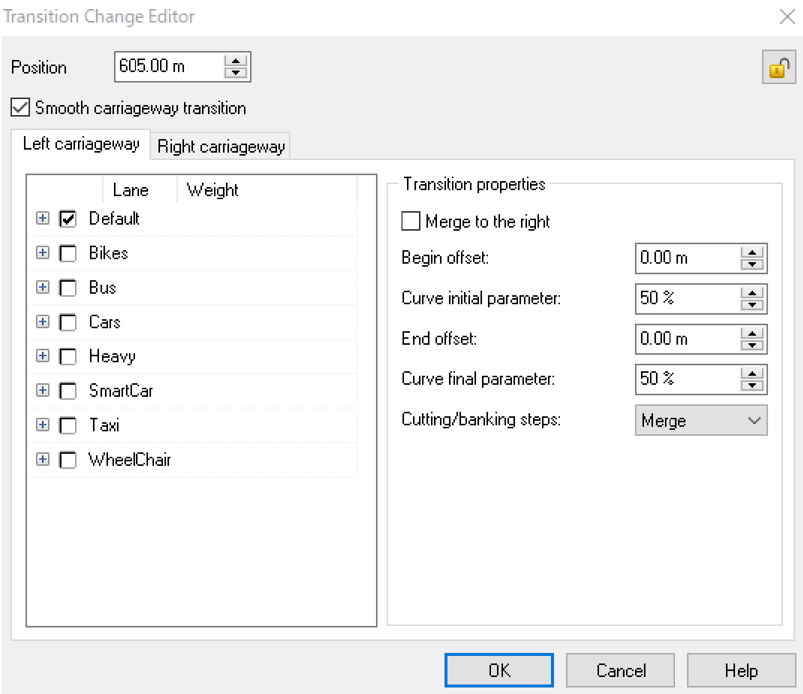
1. Click  or right click and select "Add section change".
2. Left click at the point of section change.
3. Right click on the line and select "Edit section change".
4. Select a section to use.



3. Smooth Sectional Change

Create smooth section change in cross-sectional inclination or in the road that widens.

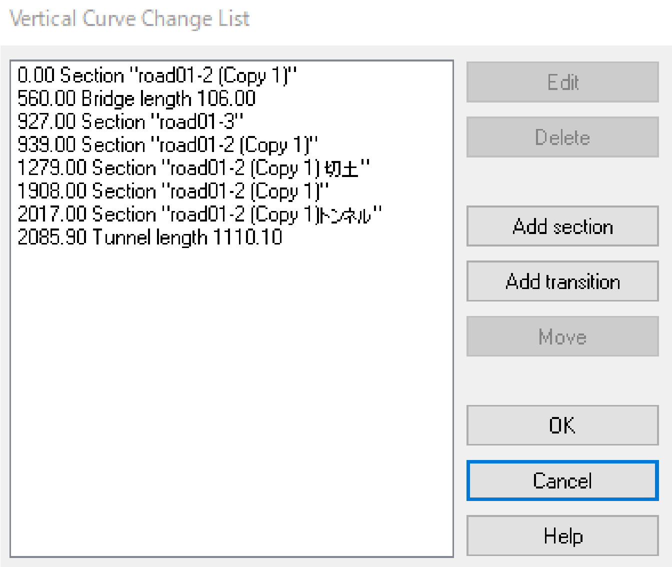
Click  or right click and select “Add transition” Right click and go to “Edit transition…”.
Check on ”Smooth carriageway transition”.



If it does not work, redefine the section or check the following questions.

- Are the number of the nodes the same?
- Is there a large gap between the X and Y coordinates?
- Are the coordinates similar to the road?

Click "Edit by the list"  to confirm the section change. A section is added in this view.

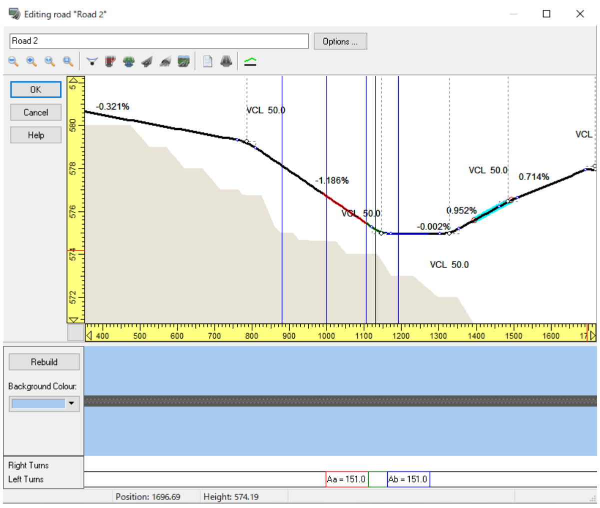


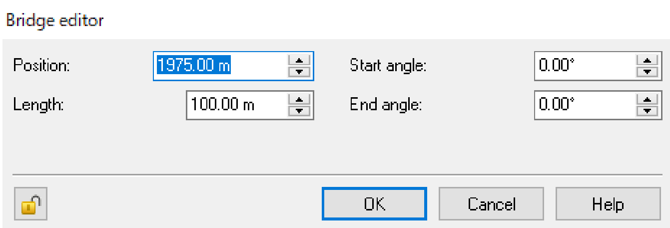
4. Bridge / Tunnel

As needed, it is possible to add (a) bridge(s) or/and (a) tunnel(s)/

Bridge

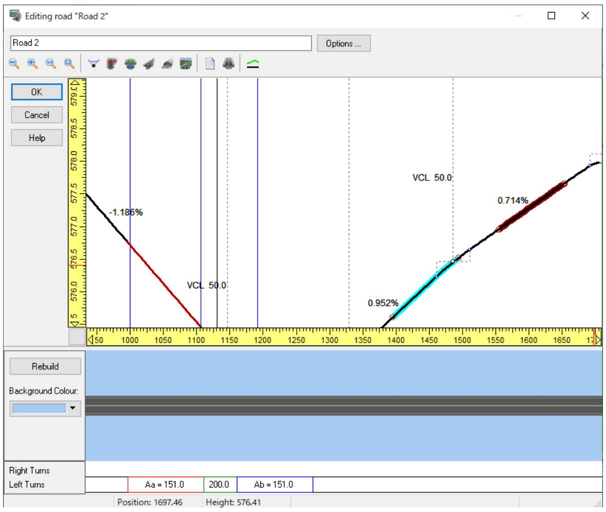
Click "Add Bridge"  and click on the road alignment where a bridge is placed.
Right click on the bridge (light blue), and select "Edit Bridge".
Enter the position and the length of the bridge or the angle if the bridge has a title.

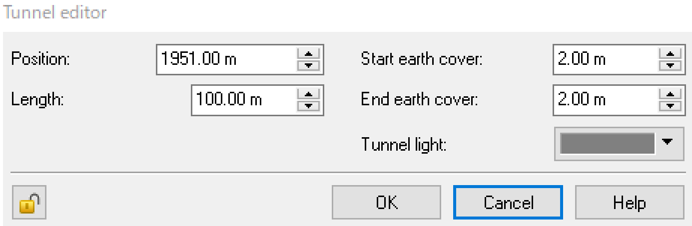




Tunnel

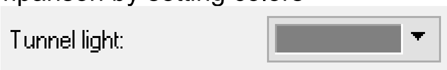
Click "Add Bridge" and click on the road alignment where a tunnel is placed.
Right click on the bridge (light blue), and select "Edit Tunnel".
Enter the position and the length of the bridge or the angle if the bridge has a title.

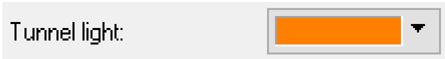


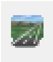


Tunnel lighting

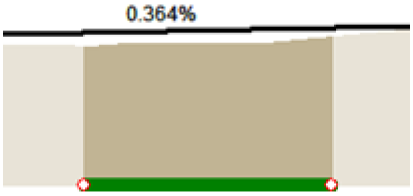
Comparison by setting colors





5. Unmodified terrain section 

Add non-edited terrain section. Click the position to add in longitudinal linear area. Non-edited terrain section is a section in which the cutting section is not generated automatically. It is used when creating the natural river which has non-artificial banks.



After definition, click OK to return to the plan view. Then click OK again to start generating them on the main view.

Road Section

It is possible to edit the road section such as road lane, road surface, cutting, banking, etc..
RS and CSV file input/output functions allow reuse of cross sections created elsewhere.
To load a CSV file, Go to File – Import – Load Railroad CSV curve….

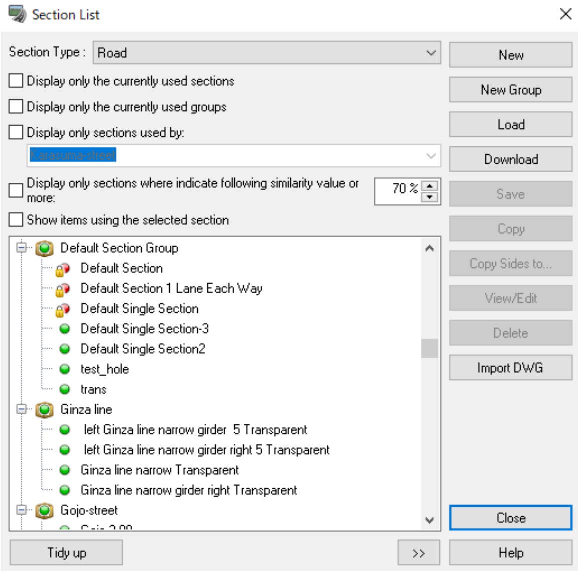
Define sections

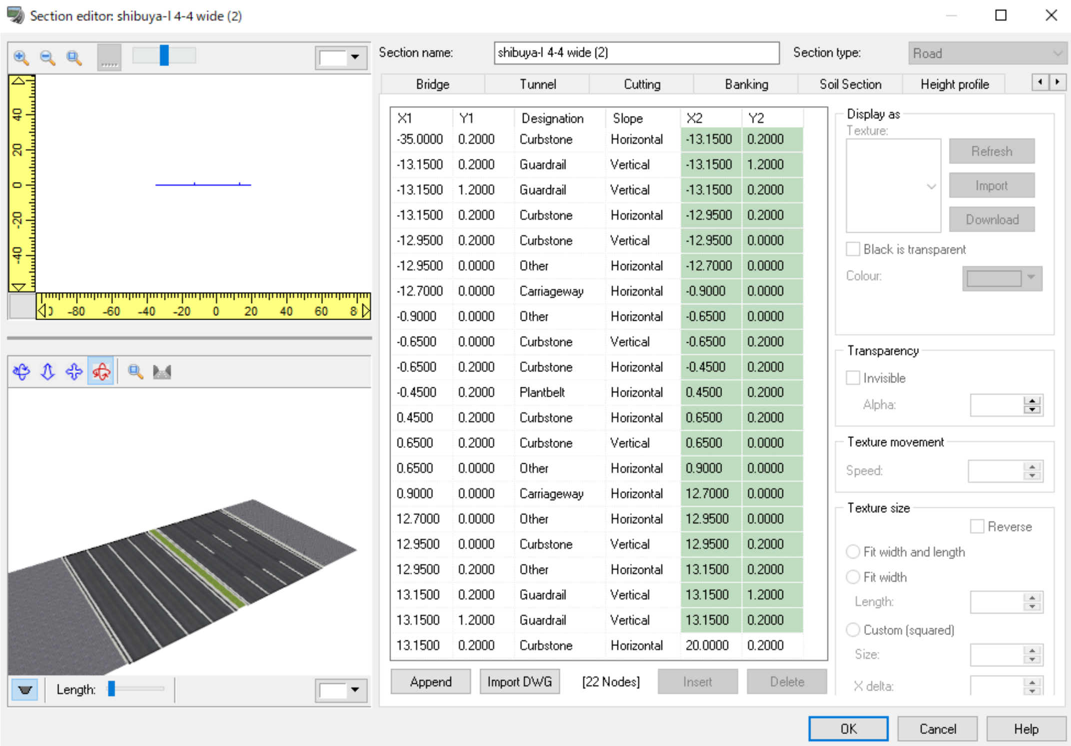
1. Go to Edit – Road - 

on the main menu, or click  on the vertical curve editor.
2. Clcik 

to create a new section or 

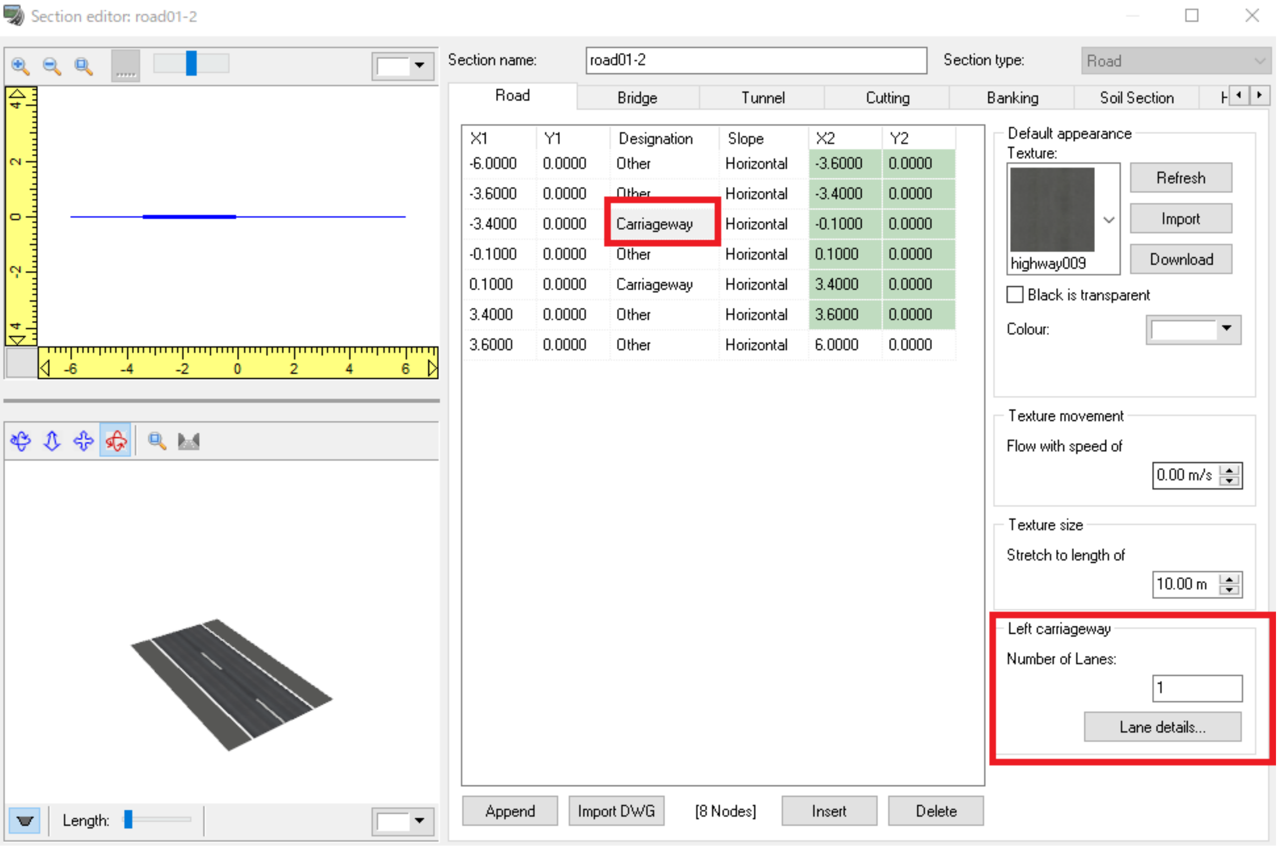
to view or edit the section already created.
3. Set up the parameters on Road, Bridge, Tunnel, Cutting, Banking, Soil Section or Height profile tab/



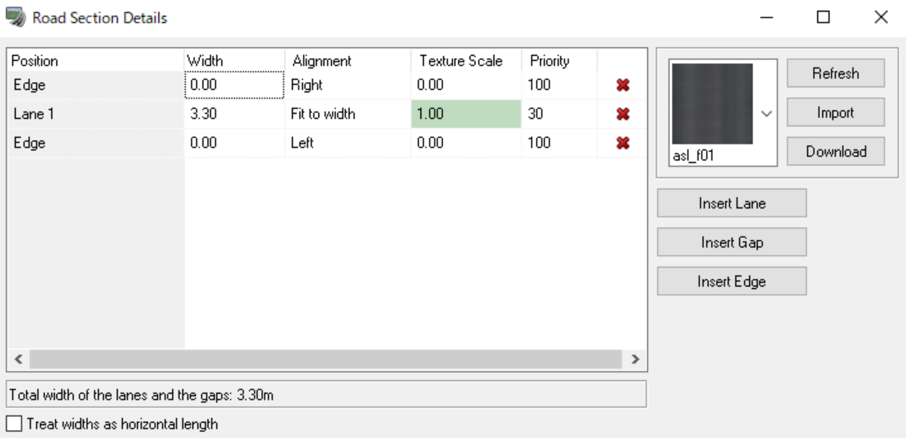


Road tab

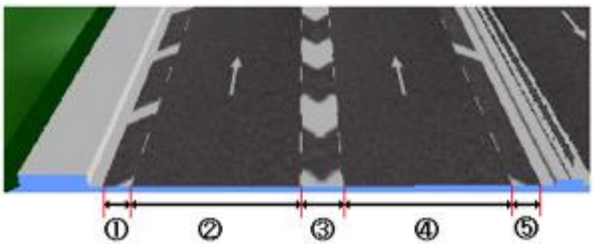
Set up Road appearance, Texture movement, Texture size and Lanes.



Click to Lane details… to define the details of lanes. Here, set the width and texture on the lane. The width of the texture can be matched to the width on the lane.

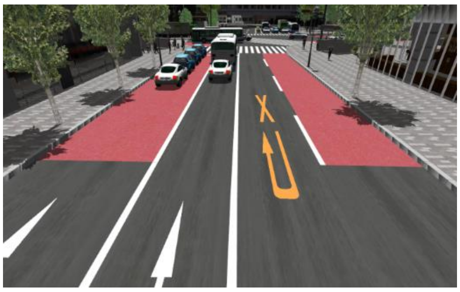


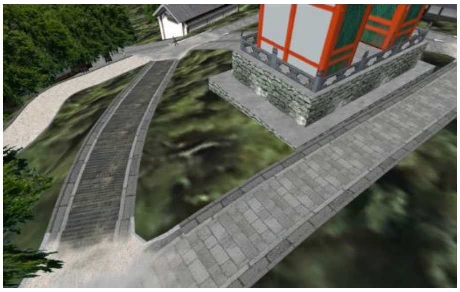
The correspondence between each position and lane is as follows. From the edge of the road to the center: 1, 2, 3, ...



Position	Width	
Edge	0.40	①
Lane 1	2.50	②
Gap 1-2	0.60	③
Lane 2	2.50	④
Edge	0.40	⑤

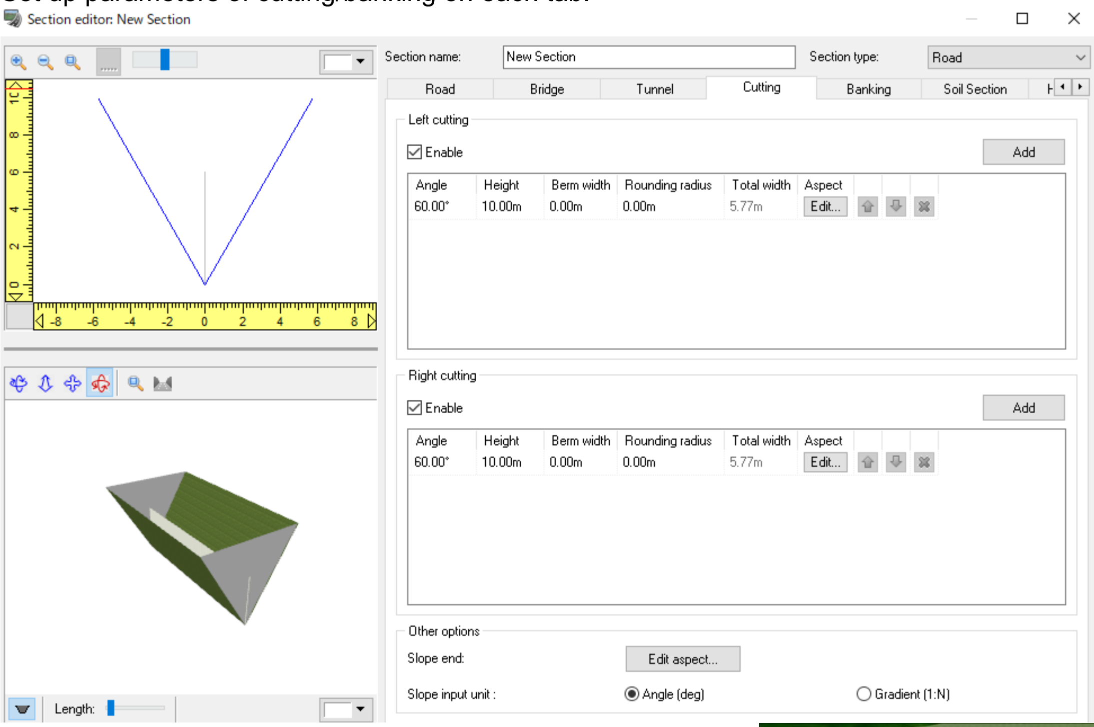
Example of textures

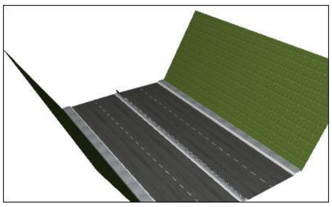


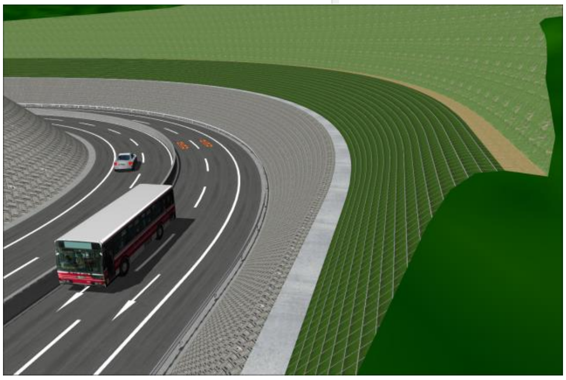


Cutting/Banking tab

Set up parameters of cutting/banking on each tab.



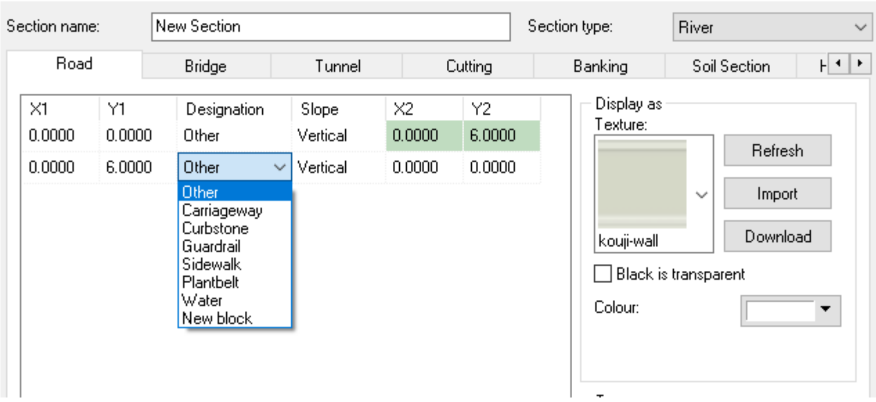


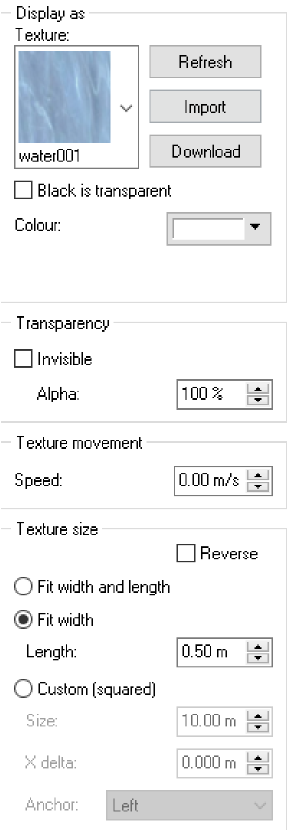


River

It is possible to add a river as a section type.

As designation, others, carriageway, curbstone, guardrail, sidewalk, plantbelt, water and new block are available. To define a river, select Water.





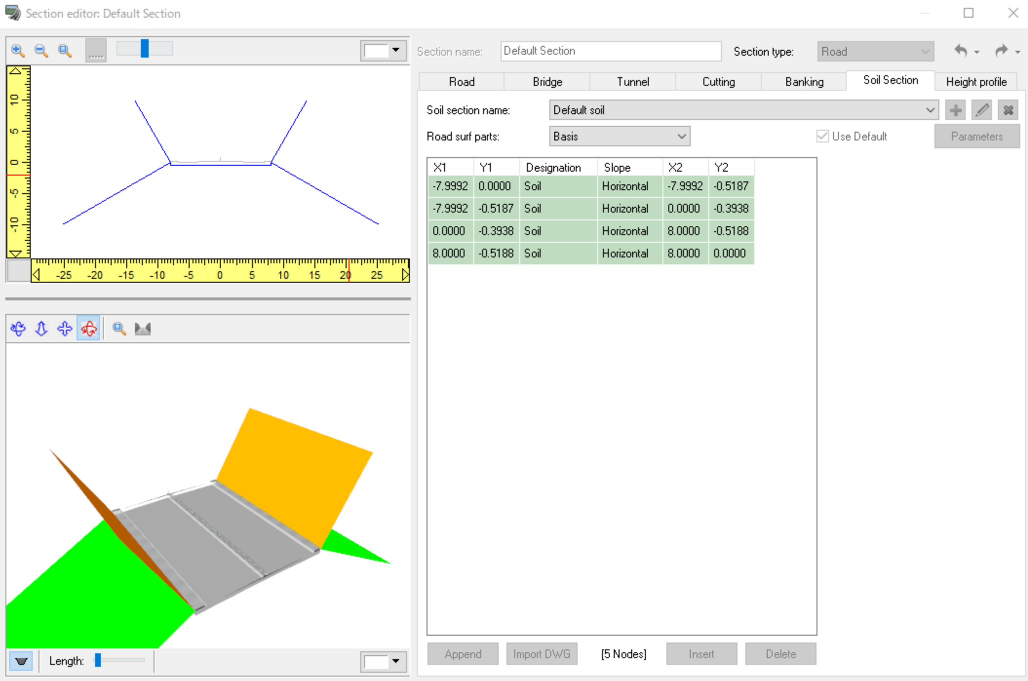
It is possible to enter the speed at which the texture is moving to represent the movement of the texture.

Clicking button on 

the main menu causes the texture to move at a specified speed.

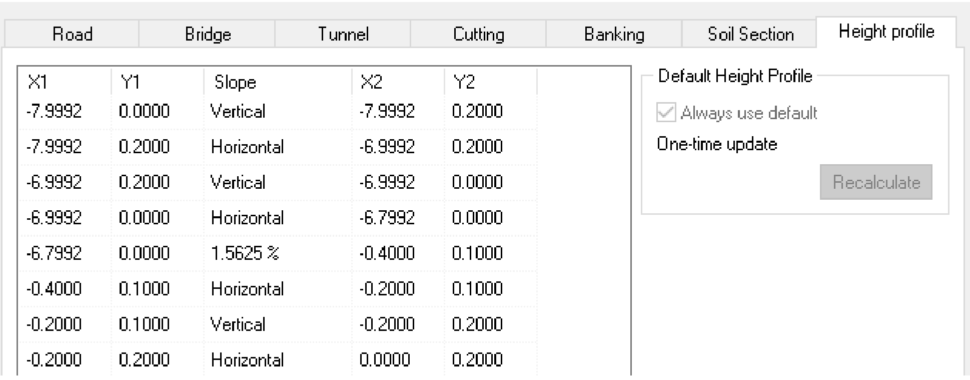
Soil Section

Here, define the soil section for creating a surface for soil volume calculations.



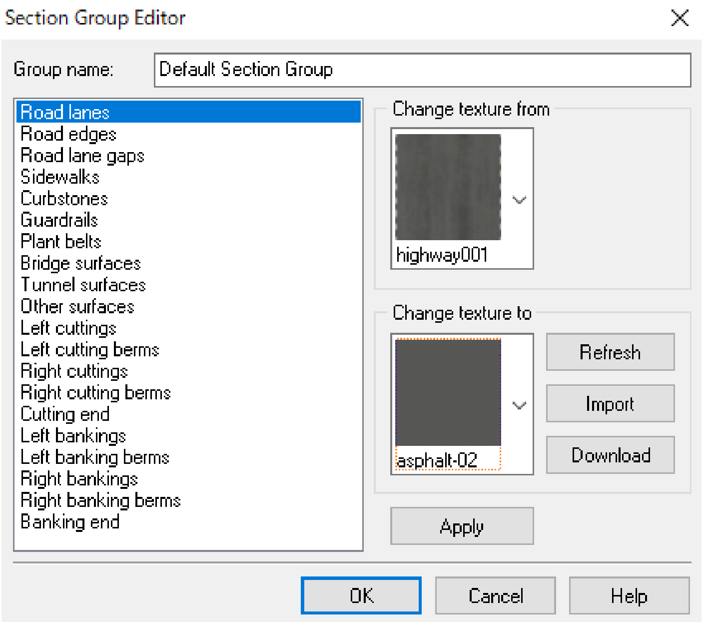
Height profile

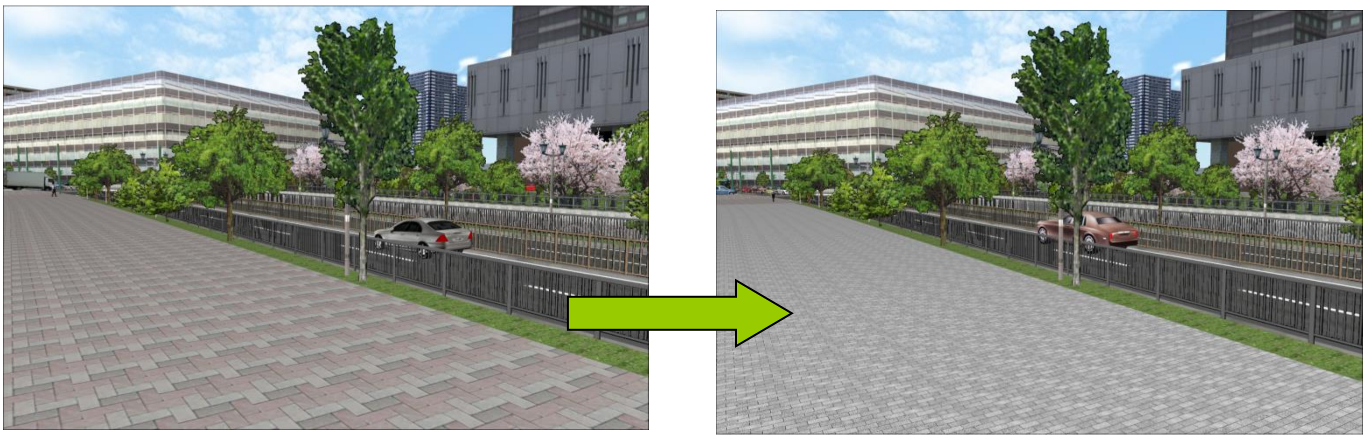
Enter the height at which roadside objects will be placed, as well as the height of the road surface during the walking simulation.



Section Group Editor

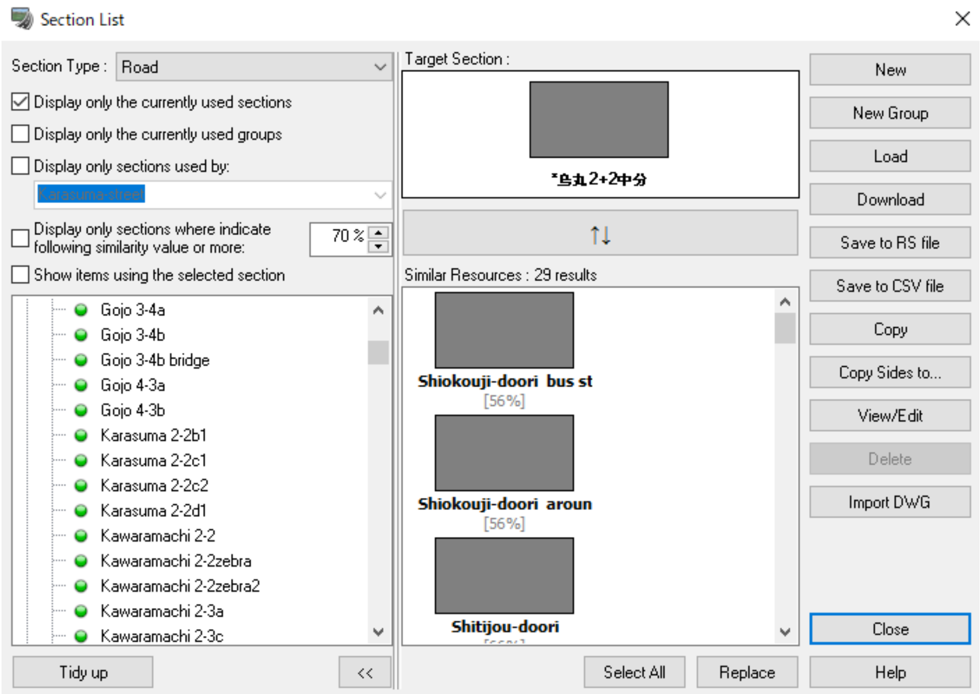
Use the Section Group Editor to automatically change the road section textures for all sections within the group.





Ingrate Section

>>button enables to list the similar sections with Target section. And it is possible to replace target sectionwith the similar section to imtegrate duplicate sections.



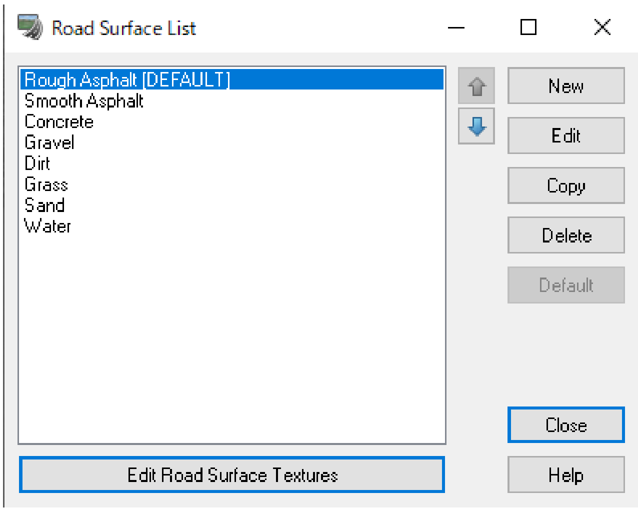
Road Surface / Attribute

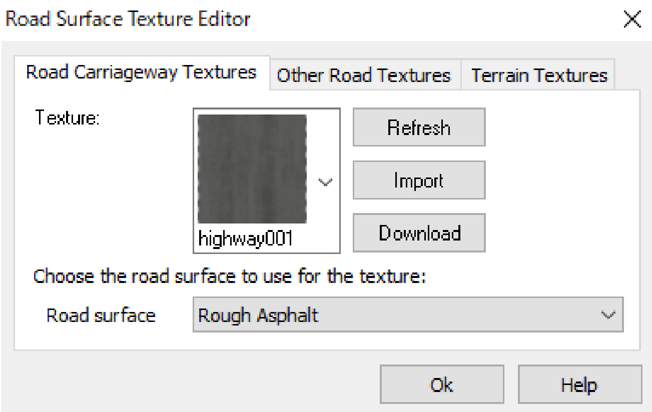
It is possible to set up the properties for road attribute or road surface: Friction, Sound, Force Feedback Effect.

Register road surface

Go to Edit – Road – Surfaces. 

Click New to add a new surface, or select a surface and click Edit.
Click Edit Road Surface Textures to edit the surface texture.

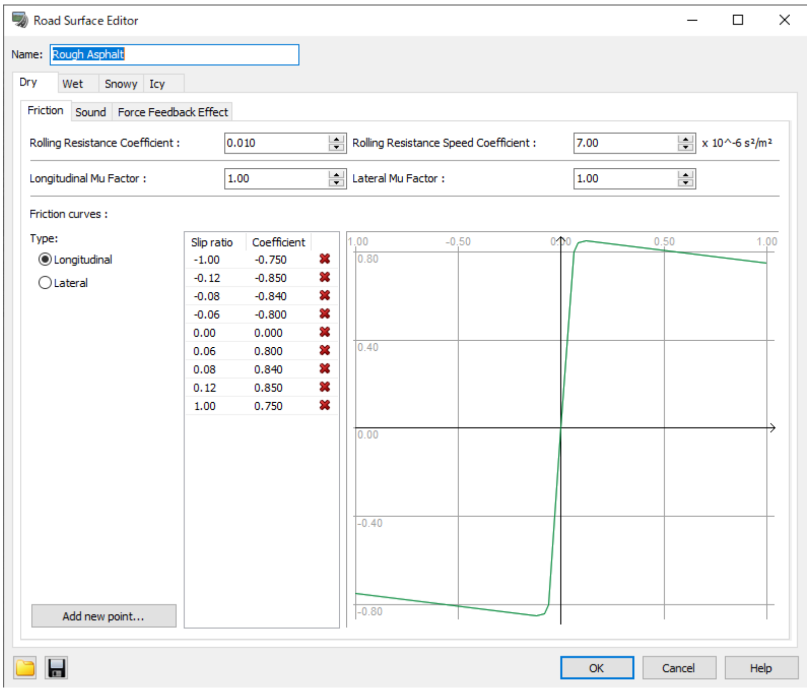




Edit road surface

Edit the properties of the road surface, such as friction, sound and Force Feedback Effect for the tires.
Go to Ribbon Edit - Road - Surfaces and double click on a road surface or click Edit. For each road surface, different values can be set for different road conditions (dry, wet, snowy, frozen).

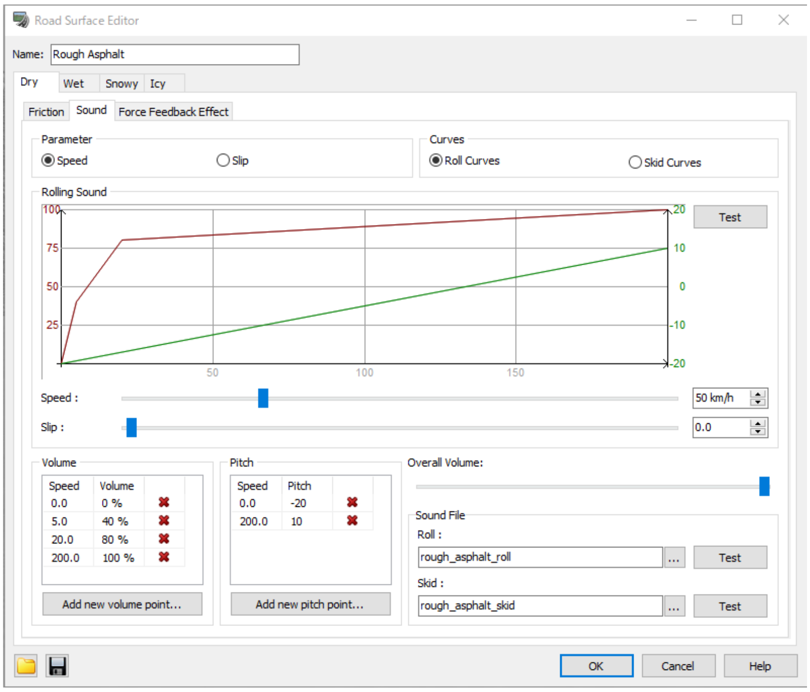
・Friction tab



The friction will determine how the tire behaves on the road, which will in turn affect how the car behaves on the

road.
The curve, called Slip Ratio Curve, determines the friction coefficient of a tire on the road depending of the slip. To define a precise curve, add points by clicking on the add point button. For each point the slip ratio and the friction coefficient are editable by clicking on the corresponding value. Do not change the origin.

・Sound tab



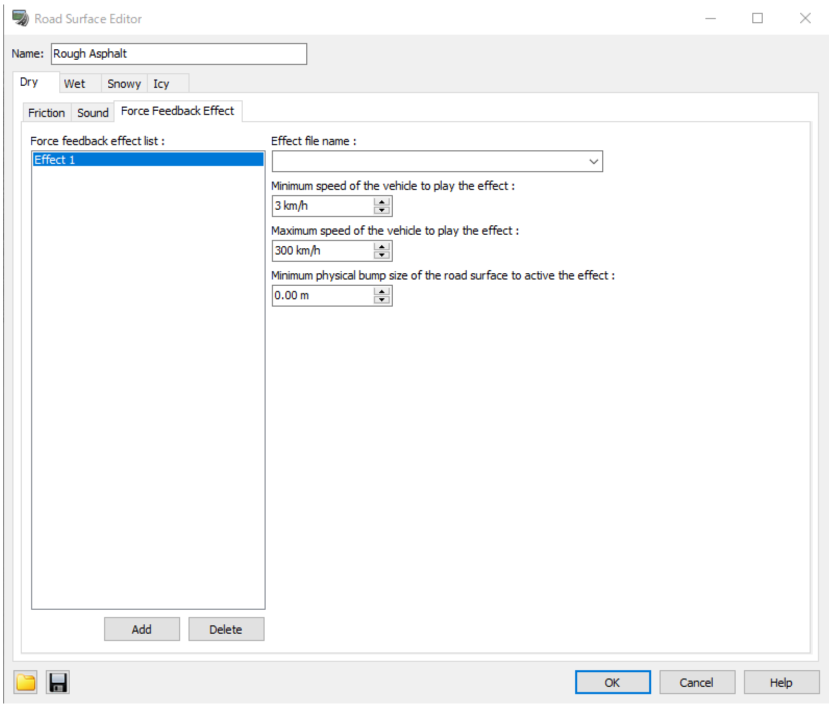
When driving a vehicle, the tires sound represents the sound of the vehicle tires.

Two sounds are played: The rolling sound of wheels turning on the road surface, and the skidding sound when the tire slips. For both sounds there are curves for volume and pitch that depend on the speed and the slip. Each tire has two sound sources, one for the rolling sound and one for the skidding sound. For each sound source the final volume and pitch are a combination of the speed and slip curves for this wheel. Sound of tire skidding is available only for vehicles with advanced physics model.

Curve line:
The graph represents the sound curve of each sound type. There are 4 sets of 2 curves: roll curves based on speed and slip, and skid curve based on speed and slip. The values of each curve can be edited in the Volume and Pitch tabs, and on the graph, the volume curve is shown in red and pitch curve is shown in green. Use the "Test" button to test the rolling sound of tires. It is possible to move the track bars' cursor to play the sound for a specific speed and slip.
Volume: The sound files of the rolling tires and skidding (slipping).
Pitch: The sound pitch is modified depending on the vehicle speed and slip.
Overall volume: the overall volume when testing sounds in the Road Surface Editor.
Sound File：The sound files of the rolling tires and skidding(slipping).

・Force Feedback Effect tab

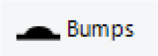
It is assigned to different roads based on different conditions. With a steering wheel or game controller, tiny difference in road conditions such as asphalt, gravel, ruts, etc. can be represented and felt through the haptics motors.

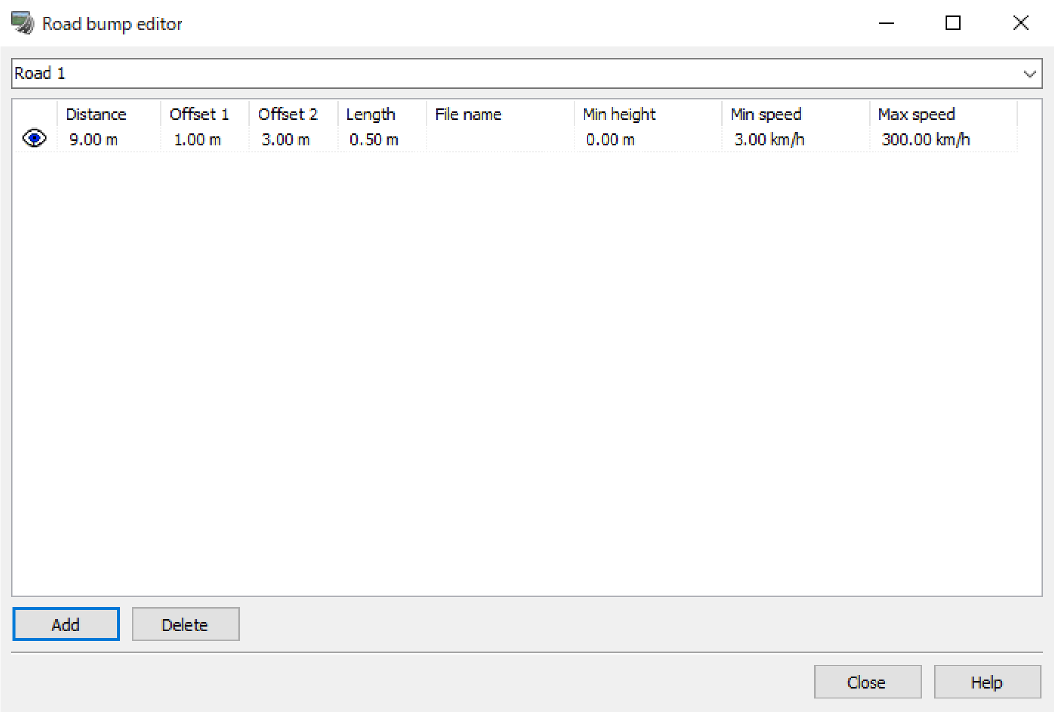


Effect file name: Select a file of the force feedback effect. The files listed here are saved under <<User Data Folder>>¥Effectsby default.
Minimum speed of the vehicle to play the effect: Set the minimum speed that the vehicle must travel at in order for the force feedback effect to be activated. There will be no effect when the speed is less than it.
Maximum speed of the vehicle to play the effect: Set the upper limit on the speed required to activate the force feedback effect. There will be no effect when the speed is more than it.
Minimum physical bump size of the road surface to active the effect:
When driving on a road with a height more than the height set here, the effect of force feedback is generated. If set 0, the height will be ignored.

Road bump

Set up road bumps with force feedback effects.
When set on the rail of a railroad track at a railroad crossing or at the junction of a roadway and sidewalk, the controller will vibrate, adding to the realism.

Go to Edit - Road - Bumps. 

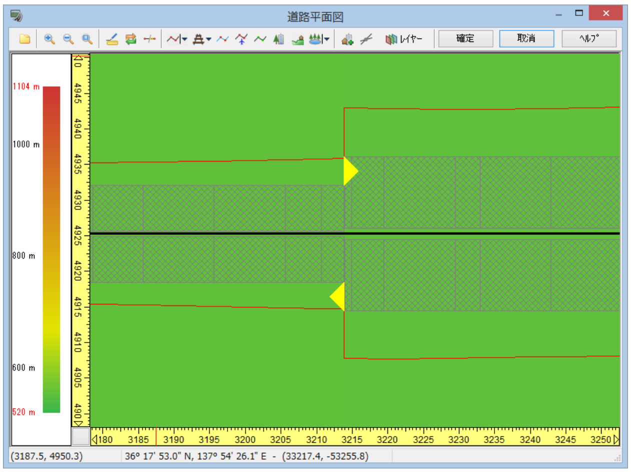


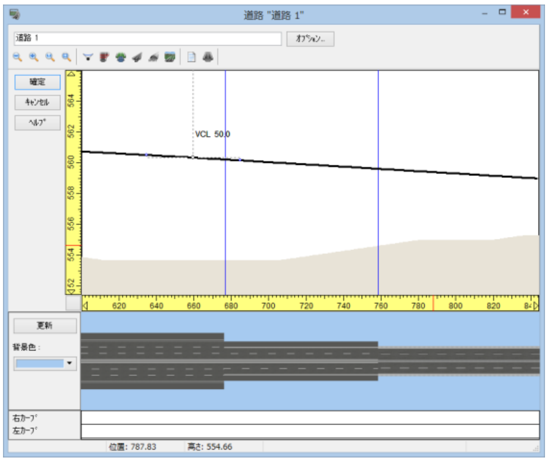
Distance：Define a position to place the bump by inputting how far it is from the starting point in meters.
File name：Select the force feedback effect file.
The files listed here is saved in the following folder by default. <<User Data Folder>>¥Effects
Minimum height：Set the minimum height of the bump which the vehicle must run on to activate the effect.
When the value is greater than 0, force feedback effect will be activated when the vehicle runs over a bump with a height having a value greater than this value. When the value is 0, the height will be ignored.
Minimum Speed：Define the minimum speed that must be achieved to activate the effect.
Maximum Speed：Define the maximum speed which is the upper speed limit to activate the effect.

On/Off ramp

A ramp can be placed on the road where the number of lanes changes.
Double click on a road to open Editing road form. Or right click on a road and go to Edit – Edit road.

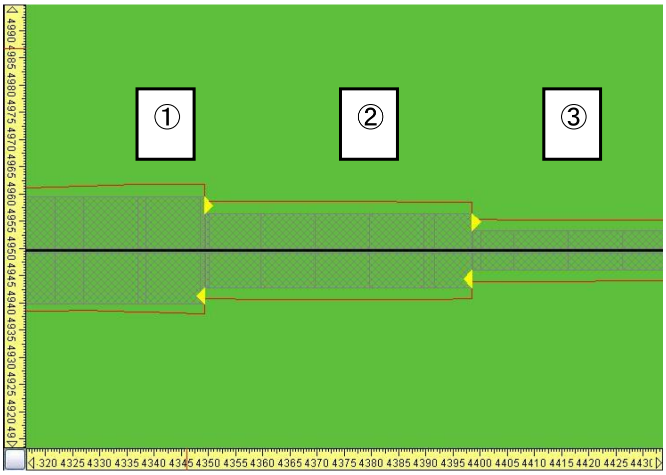
Add a section change  on the Plane View.

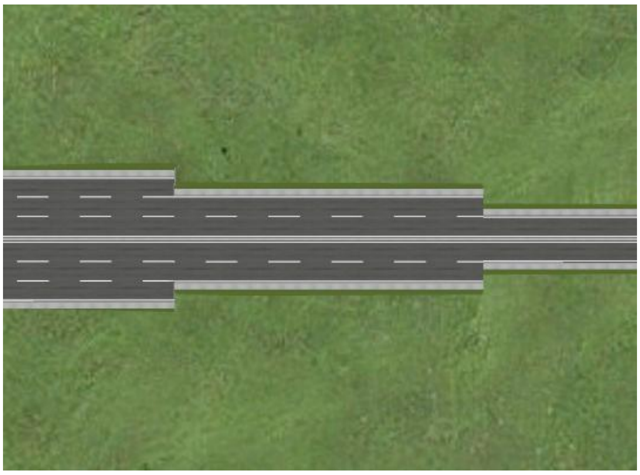




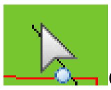
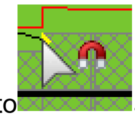
E.g.) 3 lanes→ 2 lanes, 2 lanes→ 3 lanes
Yellow △ indicates the point on the road where the ramp can be created.

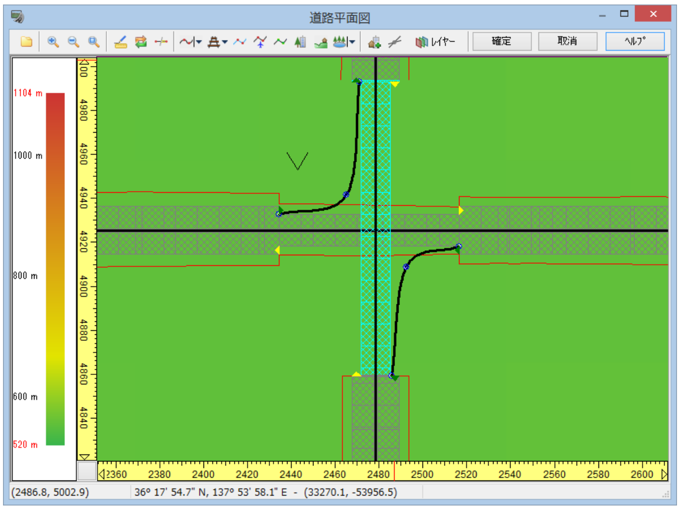
Next, Enter the position at which section change occurs
Define the ramp's horizontal alignment, ramp's longitudinal alignment and ramp's section.





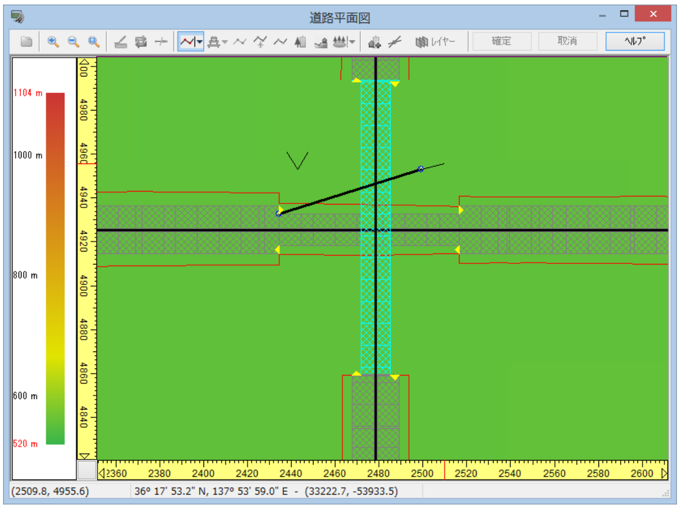
Connecting off ramp and on ramp

Move the cursor to the off ramp triangle. When the cursor changes to , right mouse-click and select "Start Off Ramp" from “Start”. Add turning points with  cursor. When the cursor changes to  at the on ramp, left click to connect the ramp.



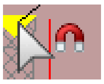
Connecting off ramp and another road

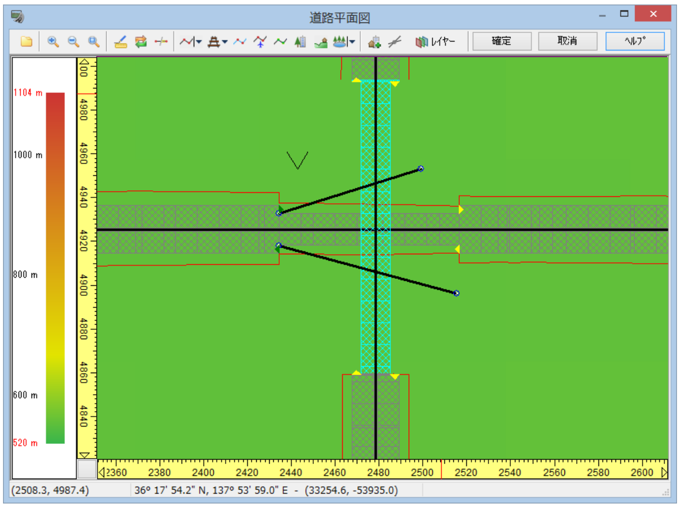
Move the mouse to the off ramp triangle. When the cursor changes to , right mouse-click and select "Start off Ramp" from “Start”. Add turning points as appropriate. Right click at the off ramp to be connected and select "Finish Road". An intersection with another road can also be created.

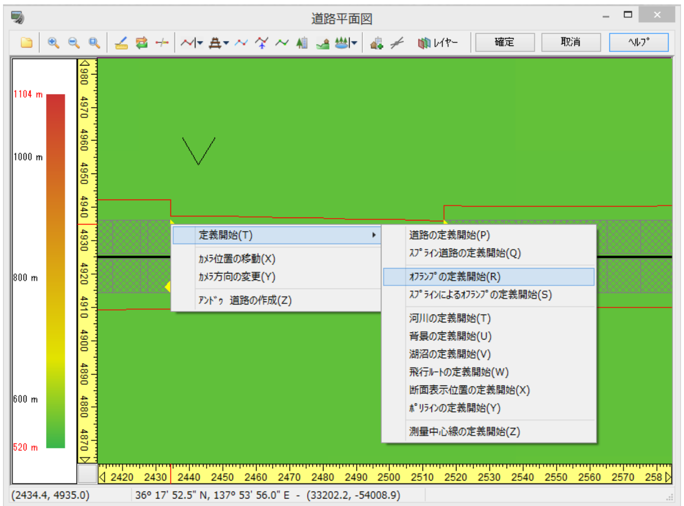


Connecting another road and on ramp

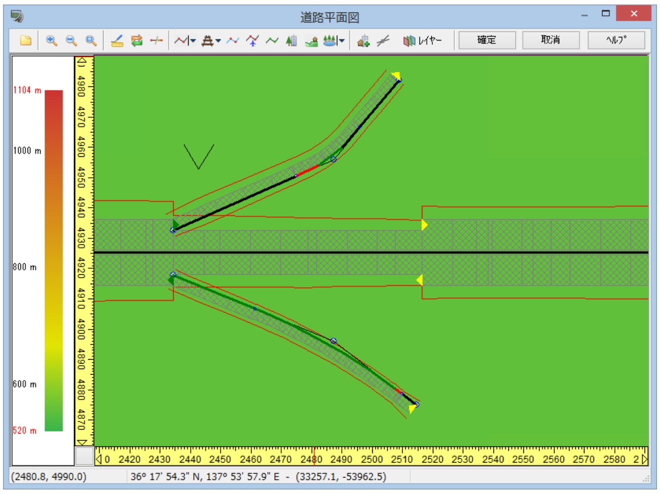
Right click on another road and select “Start” - "Start On Ramp". Add a turning point.

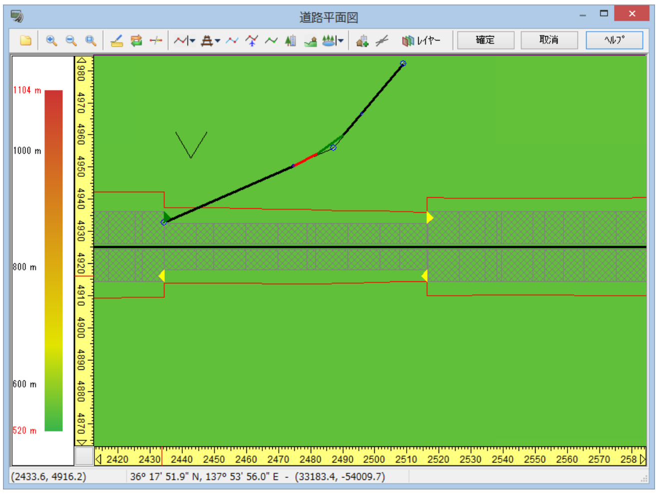
When the cursor changes to  at the on ramp, click to connect the ramp.

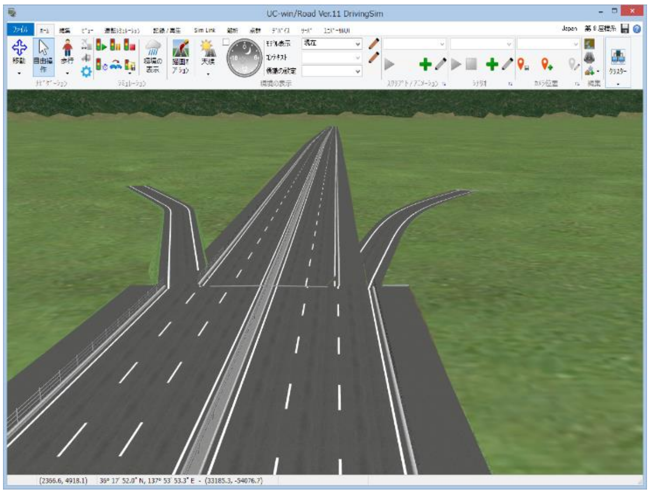




Left: On ramp Right: Off ramp



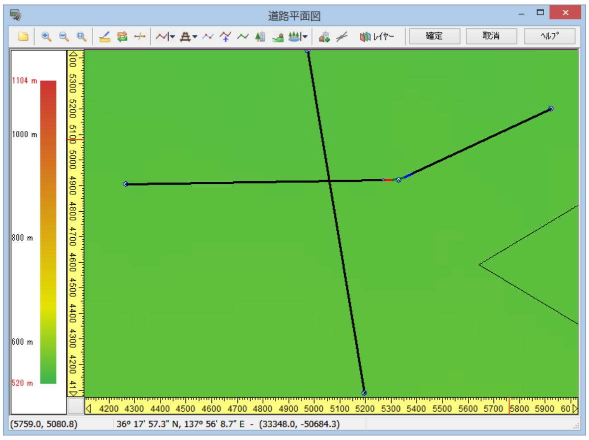


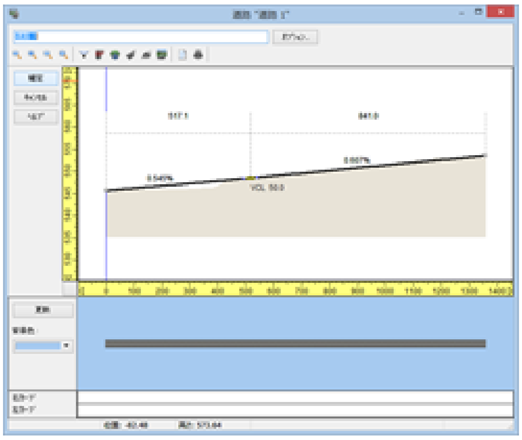


Intersection

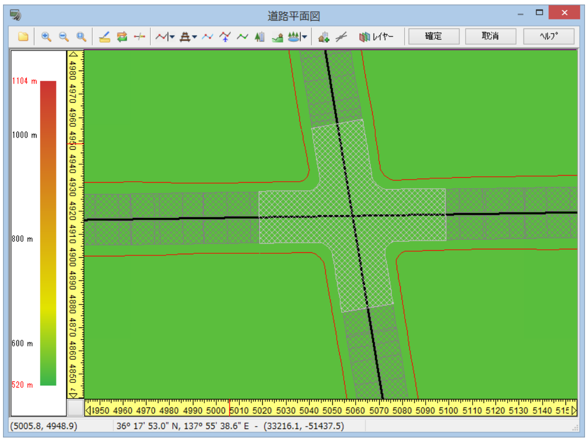
1. Generate

1. Generate a road intersect in Plan view.
2. Align the height for roads in Editing road window.
3. Click "Build Roads"  in Plan view .



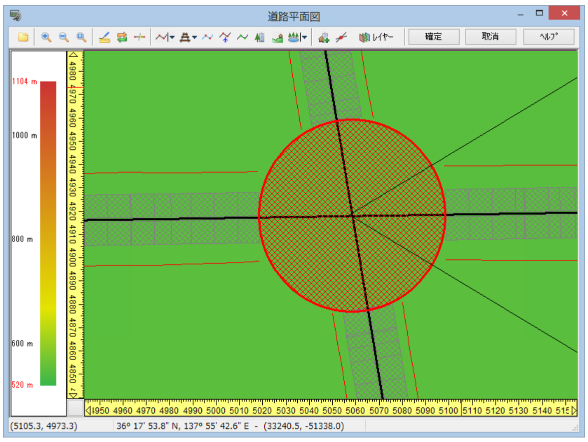


When creating the intersection fails, red meshes are displayed.Click  to display invalid intersections at the center of the screen. To solve this problem, select "Intersection troubleshooter" by right mouse-click on the mesh and select "View Intersection Error".



Reasons of failure in intersection formation

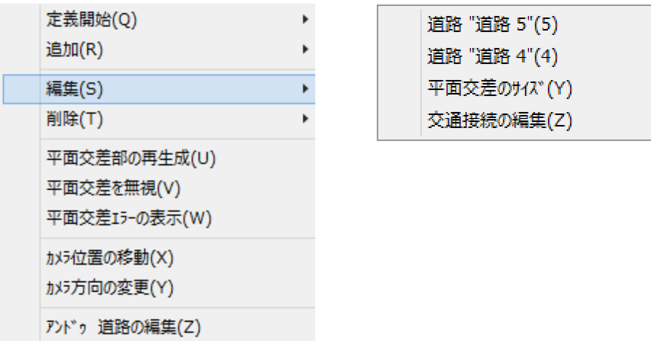
- altitude of intersecting roads is too different
- intersecting road is too close to a parallel.
- unsecured banking
- The center of intersection cannot be found.
- intersection area is overlapped with bridge or tunnel



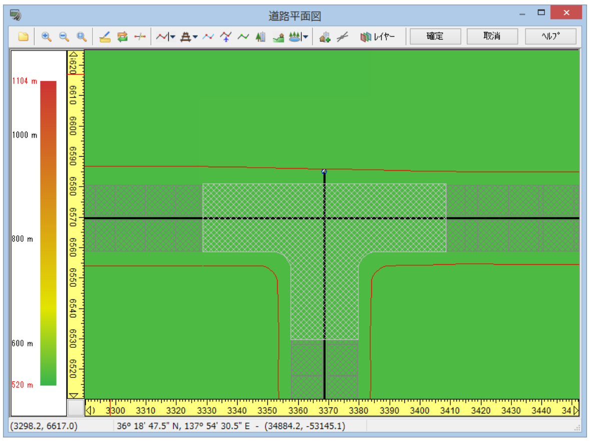
Editing & Recreating Intersection

- Check to edit the intersection height difference in the Plan View.
- Perform right mouse-click on the intersection and change the intersection area from Edit - "Edit Intersection Size".

Pop-up menu
Right click on an intersection to open the pop-up menu.



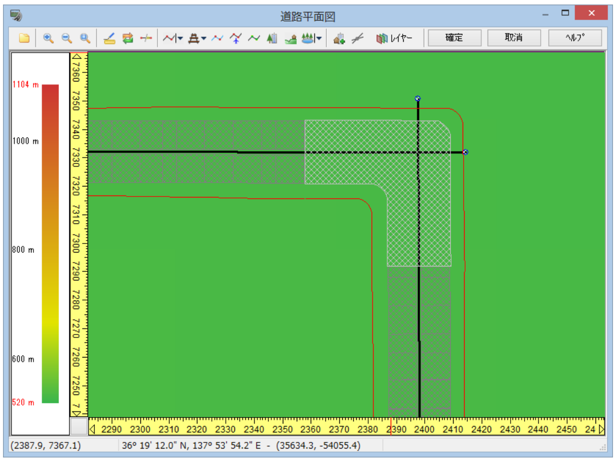
3-Way Junc



Draw one road first, and then create a second road that only slightly makes the starting or ending point of the second road cross the alignment of the first road.

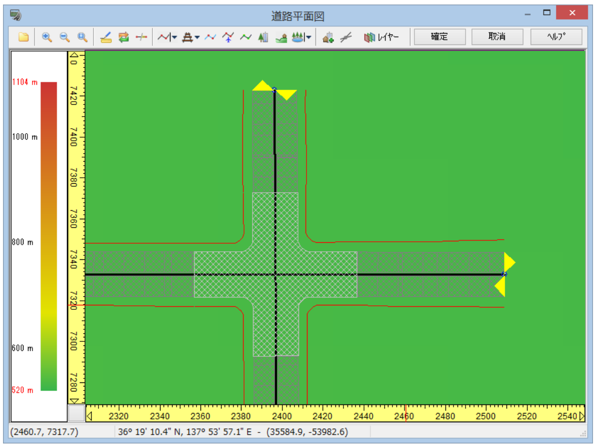
Note: Even if it exceeds, if the distance of the exceeded part is shorter than the size of the intersection size, the leg for it is not created.

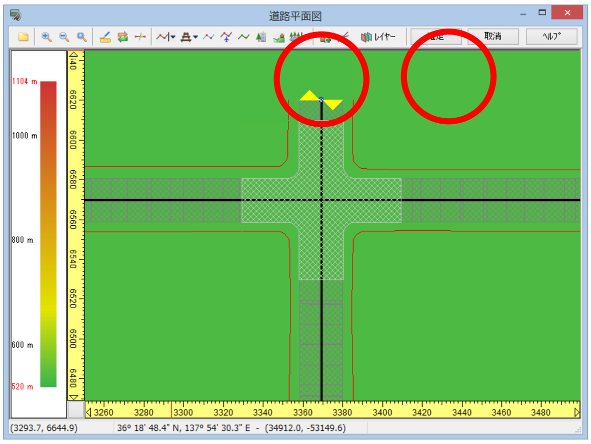
L-shaped intersections



Slightly intersect the starting and ending points of two different roads.
*The part of intersection will be created only if the distance goes over the size of the intersection.

Roads need to be short enough to prevent unintentional generation of a normal crossroad while making a 3-way intersection or L-shaped intersection. Fix the error by simply click and dragging the start/end points to shorten it.



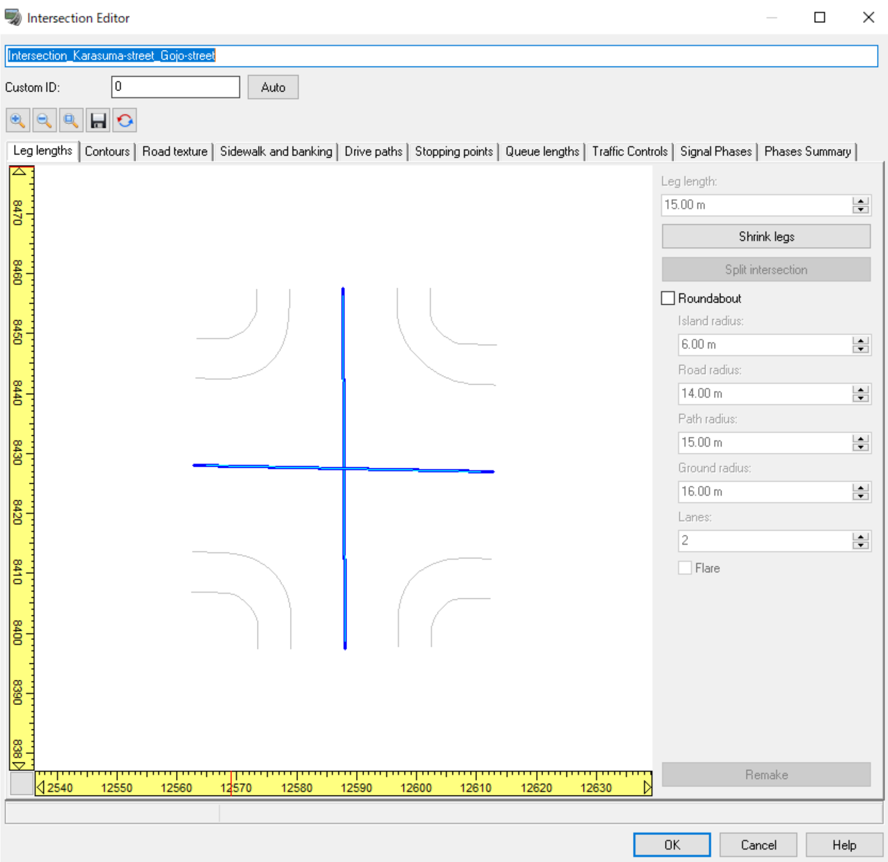


2. Intersection Editor

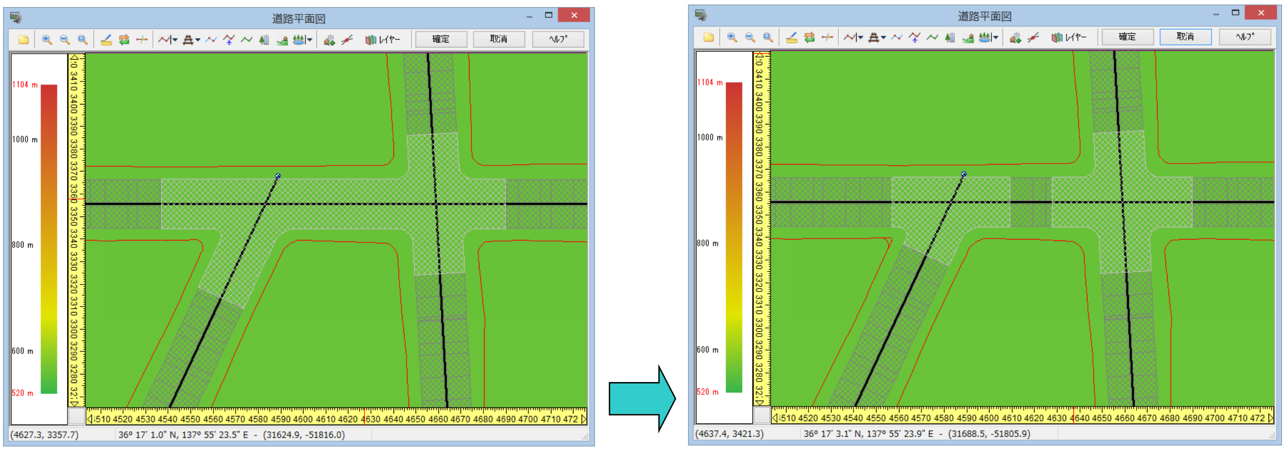
Edit the leg lengths, contours, road texture, sidewalk and banking, drive paths on the intersection editor.
Right click on the intersection and go to Edit Intersection.
Please refer to Help for details on the setting items on each tab.

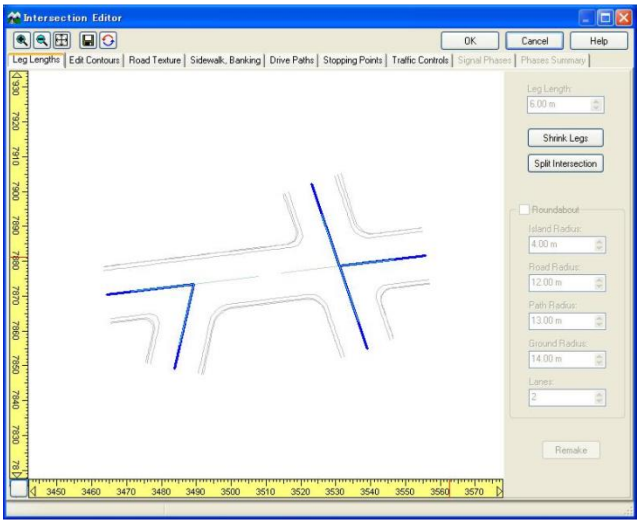
(1) Leg length tab

Changing the size
In cross leg selection, the leg length can be changed.The intersection size can be minimized by clicking on "Shrink Legs".

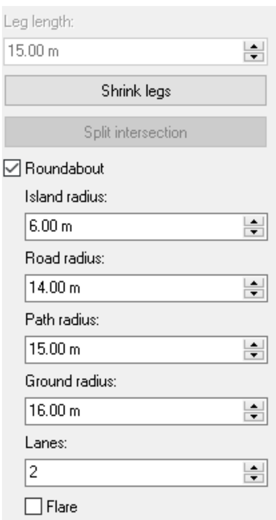


The intersection can be sub-divided when the approaching intersection creates another intersection.



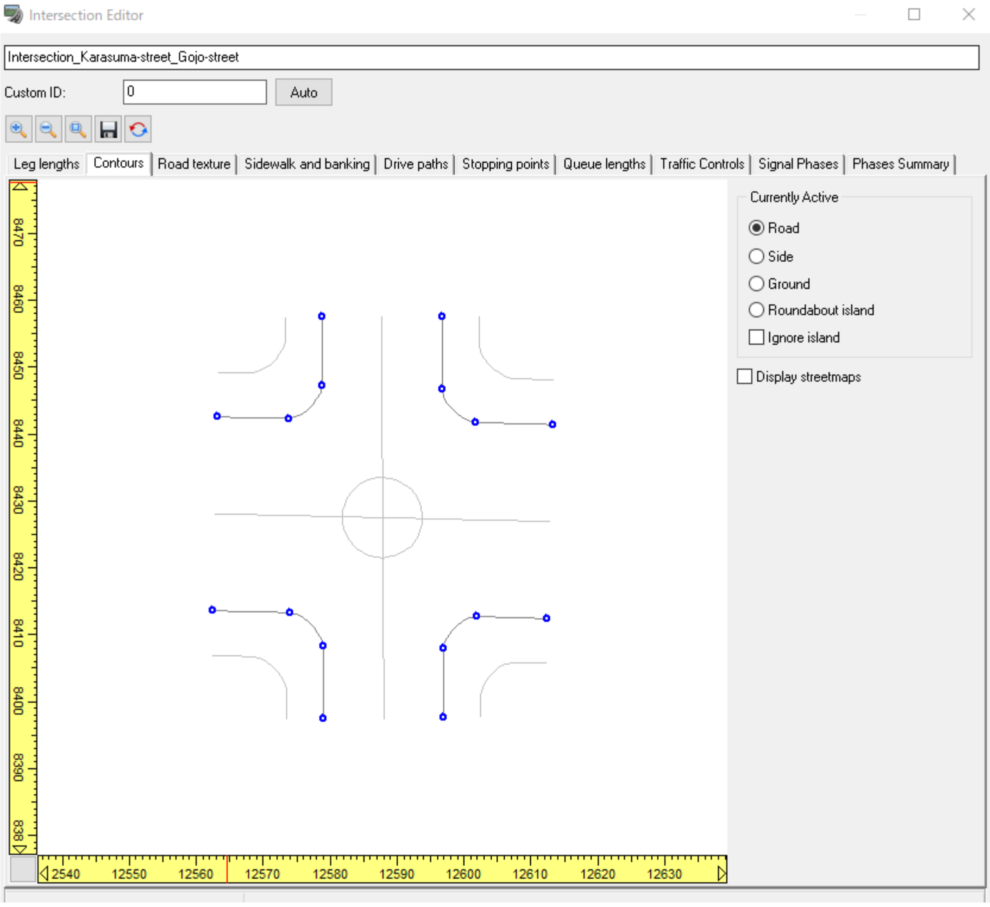


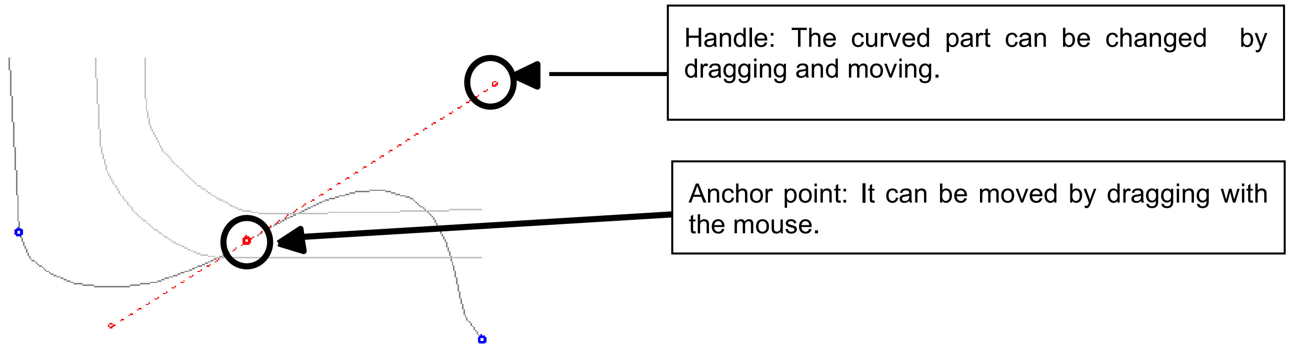
Checking "Roundabout" will create a roundabout island in the center. The rotary intersection can be further edited. Edit each radius. The size of radius is in relation to "Island" < "Road" ≦ "Path" ≦ "Ground".



(2) Contours tab

Road, sidewalk, banking and Roundabout Island can be edited. Right mouse-click on the line and the control point can be added or deleted. It is possible to edit the control point and arrange the shape.

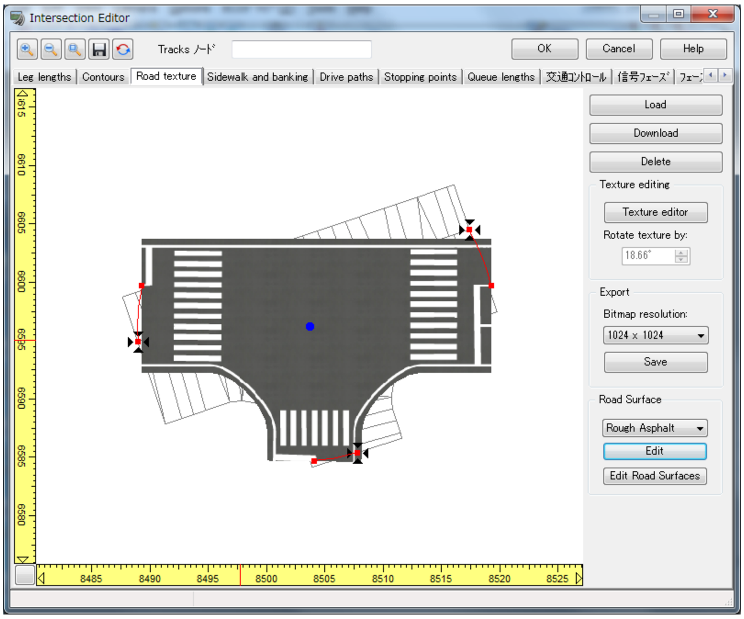




Refer to the following sections to find out more information on the detailed editing method of the control point.
"Operation" - "Editing" - "Editing intersection"- "Editing intersection" screen - "shape" tab

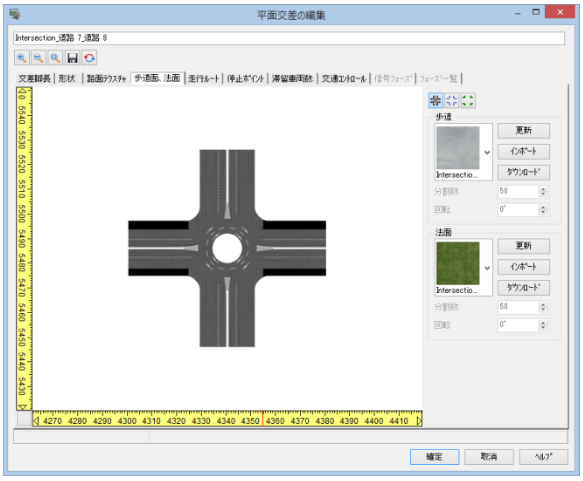
(3) Road texture tab

Set up the intersection textures.
Click Load to load textures or Click Texture editor to design load texture and markings.
About Intersection Texture Editor, Please refer to 4. Intersection Texture Editor.

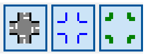


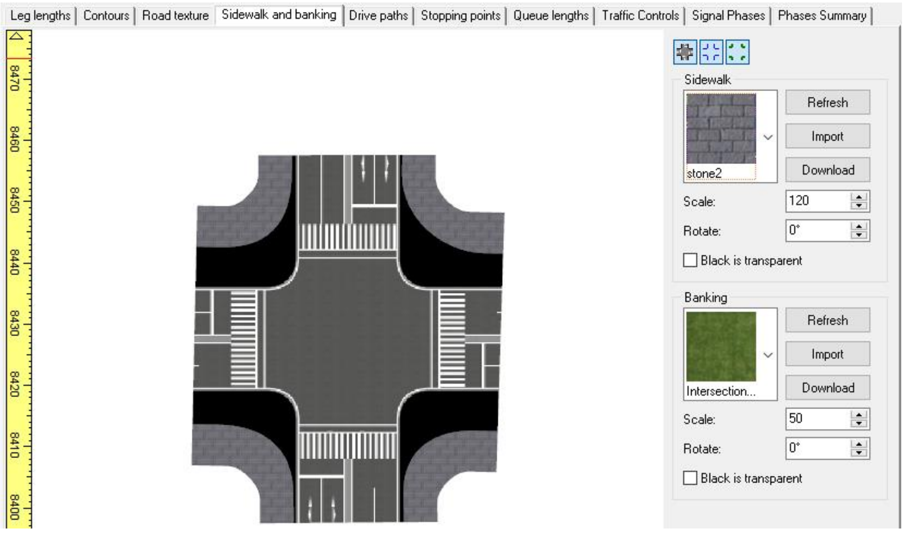
Example: Texture of the roundabout

Texture cannot be pasted on the roundabout island of the roundabout. Therefore, after exporting to 3DS model, specify the texture on the model.



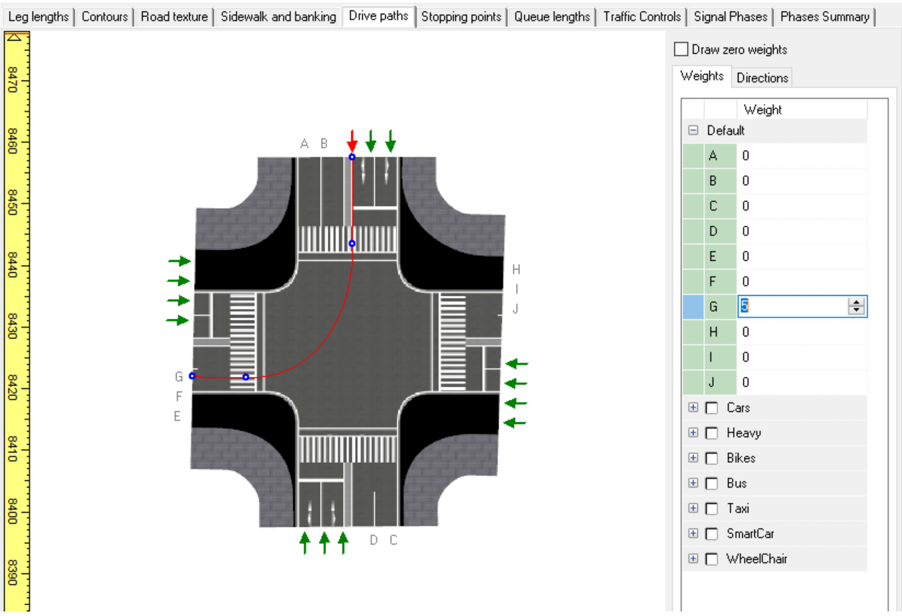
(4) Sidewalk/ Banking tab

Click  button each, correspondence texture is displayed.Select a texture for each sidewalk and banking, and enter the values for "Scale" "Rotate".



(5) Drive paths tab

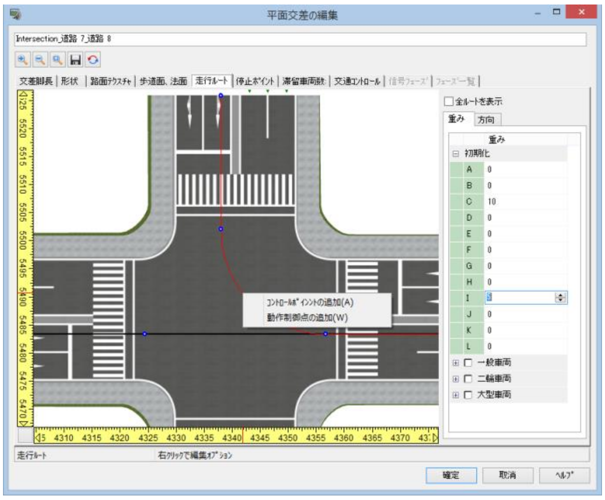
The drive path and the driving path at the intersection can be edited.

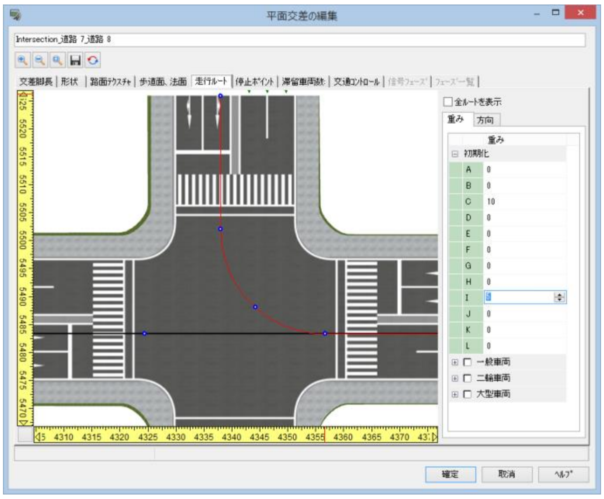


1. Left mouse-click on the arrow of the approaching intersection.
2. All possible drive paths are displayed. Set the weight (driving ratio). Driving is absent when weight is defined to be 0.

The control-point can be added by right clicking on a drive path.

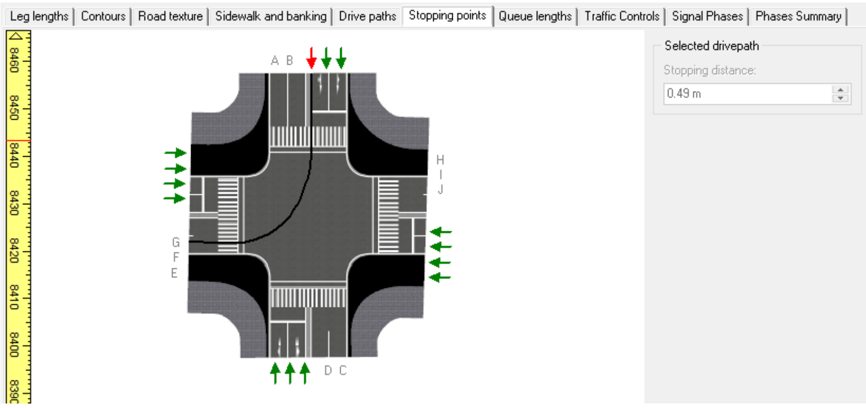
Right-click on the route to assign movement control points (way points) to every single driving path.
This way point enables speed control of traffic flow and event transition in scenarios.





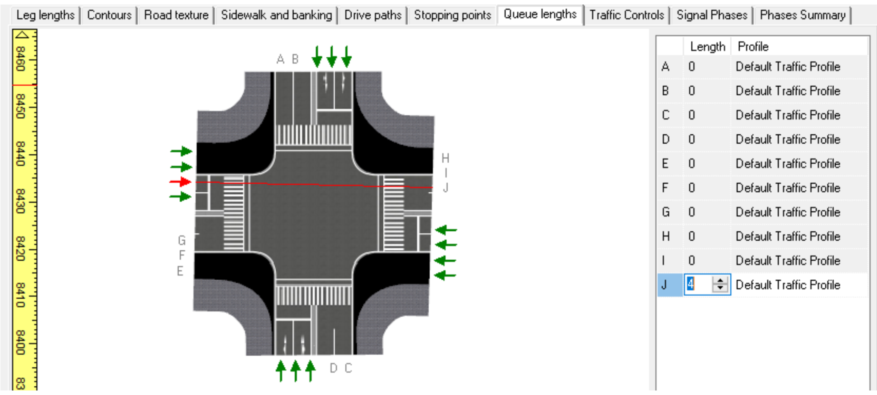
(6) Stopping points tab

It is possible to set up the stopping points at an intersection.



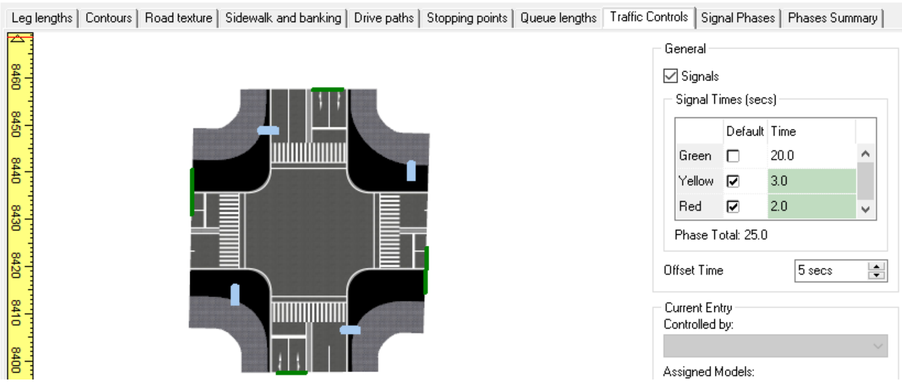
(7) Queue lengths tab

It is possible to edit the numbers of vehicles staying on each lane.



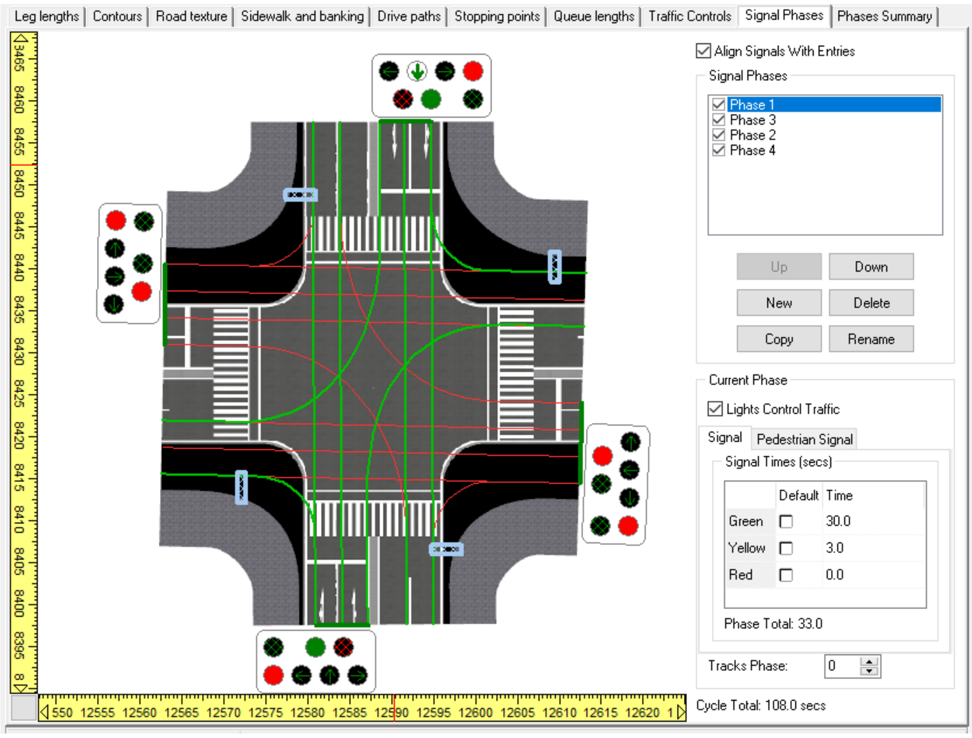
(8) Traffic Controls tab

Sets traffic control within the intersection without and with traffic signals.



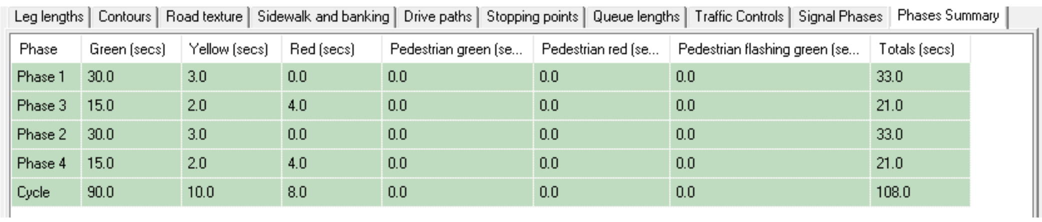
(9) Signal Phases tab

Sets the lighting phase for traffic and pedestrian signals when traffic control is performed with traffic signals.



(10) Phases Summary tab

It Displays a list of traffic signal phases as set in the "Traffic Controsl" tab and the "Signal Phases" tab.



Phase	Green (secs)	Yellow (secs)	Red (secs)	Pedestrian green (se...	Pedestrian red (se...	Pedestrian flashing green (se...	Totals (secs)
Phase 1	30.0	3.0	0.0	0.0	0.0	0.0	33.0
Phase 3	15.0	2.0	4.0	0.0	0.0	0.0	21.0
Phase 2	30.0	3.0	0.0	0.0	0.0	0.0	33.0
Phase 4	15.0	2.0	4.0	0.0	0.0	0.0	21.0
Cycle	90.0	10.0	8.0	0.0	0.0	0.0	108.0

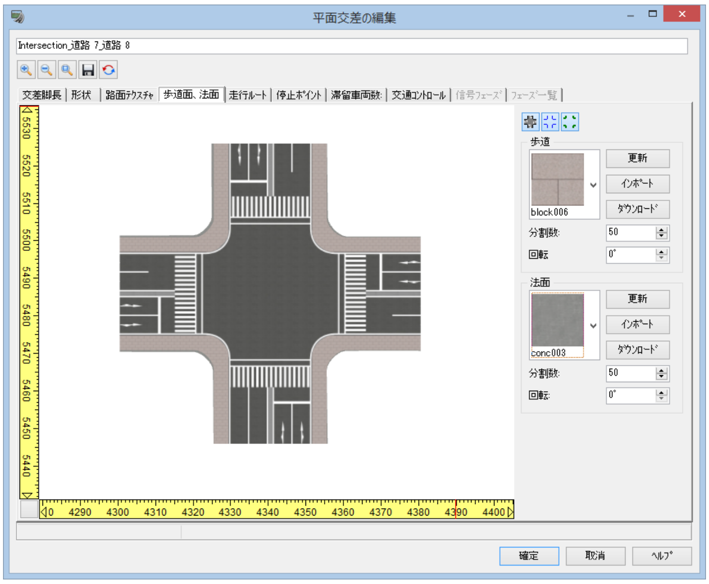
3. 3DS model export

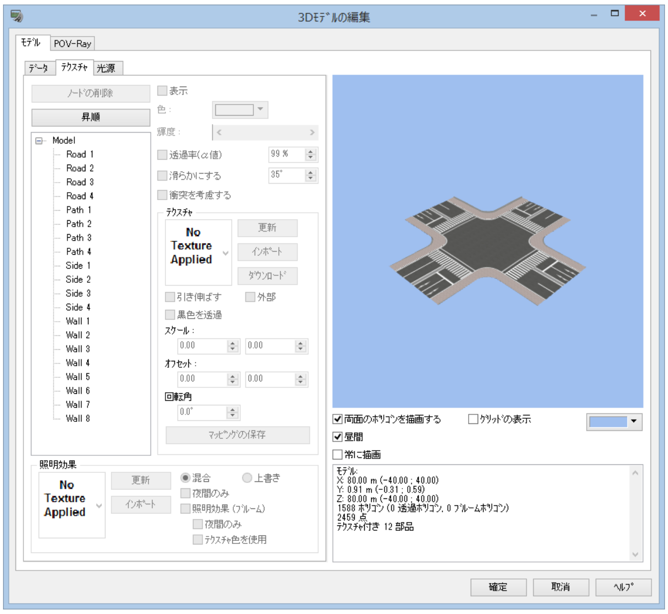
The generated intersections can be output in a 3DS model, modified in the 3DS model, and then replaced with the modified intersections.

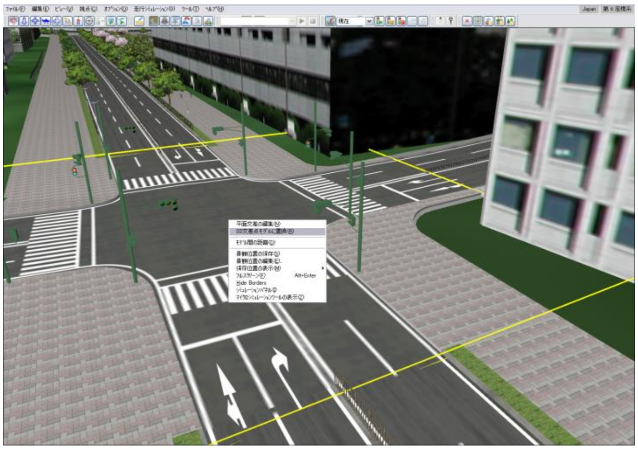
(1) Click  while the intersection is in editing mode to convert the intersection into 3DS export. The model is saved in ¥model¥intersections#. "#" is a sequence number starting with 1. It is possible to generate high precision intersection by editing this 3DS model.

(2) Click  to open "Intersection Replacement" form. Click on "Load 3DS", and select the model (*.3DS) saved in (1).

(3) Click "OK" button in the Model Editor to register the model to "Intersection Replacement".
(4) Click on the intersection model located in "Intersection Replacement" screen and click "OK" button. The intersection is replaced by the registered intersection model.







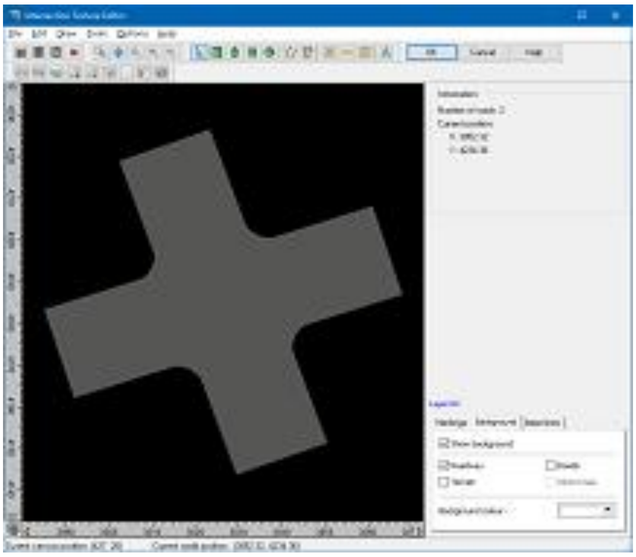
Right click on the intersection with 3DS output to open "Replace Intersection with 3DS" screen.
By replacing normal intersection with 3DS model, editing with an external tool is possible. Hence, high-precision intersection can be created.

4. Intesection Texture Editort

This is a CAD tool which draws marking on intersections. It is possible to draw vector markings, construct marking library for reuse of vector marking, adjusting color balance of texture, outputting vector marking to CAD file (*.dxf) , etc.

Go to the Road Texture tab and click 

to access the window.



Function explanation of main screen

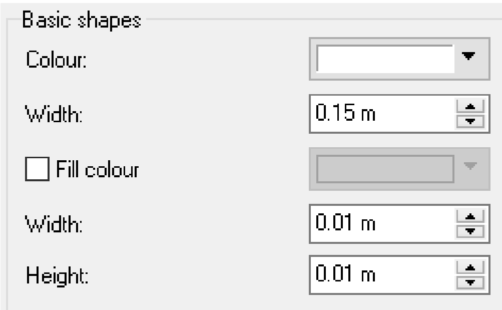
- Ruler		Displays the coordinate values (East-West, North-South) of the cursor position in the local coordinate system at the edge of the screen. The horizontal ruler indicates the east-west position from the origin, and the vertical ruler indicates the north-south position from the origin. The rulers can be scrolled by clicking on the arrow at the end of each ruler or by clicking and dragging the ruler.
Toolbar Tool		Automatically Generate Markings.
		Carriageway Texture
		Markings Library
		Clear all markings
Display		Zoom to selected area
		Pan
		Full size: Put the screen into the state of an initial display.
		Zoom in: Expand the screen based on the center of the display area.
		Zoom out: Reduce the screen based on the center of the display area.
Drawing		Edit mode: Switch to Edit mode.
		Rectangle: Draw rectangle.
		Ellipse: Draw oval.
		Square: Draw square.
		Circle: Draw circle.
		Bezier polyline: Draw [Bezier polyline].
		Bezier polygon: Draw [Bezier polygon].
		Zebra zone: Draw Zebra zone.
		Stop-line.
		Crosswalk
		Text Markings
Basic edit		Undo: Return it based on the operation of the previous state.

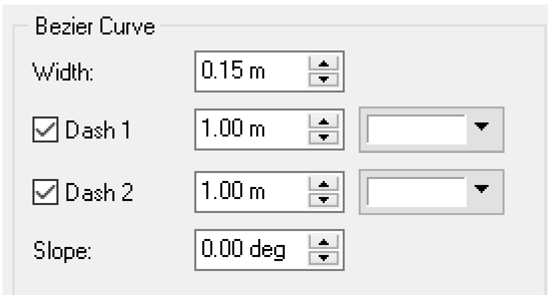
		[Redo;]: Do the operation returned before over again.
		Add to marking library: the selected marking to the library.
		Make group: Make two or more selected marking a group.
		Release the group.
		Cut
		Copy
		Paste
		Delete

Property panels

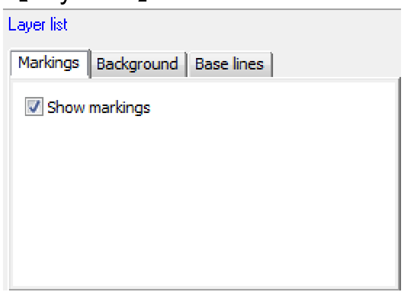
Once a drawing shape is selected, the following panel appears on the right.

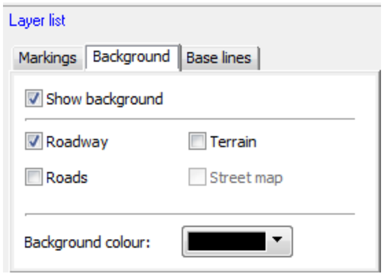
【Drawing shape property】

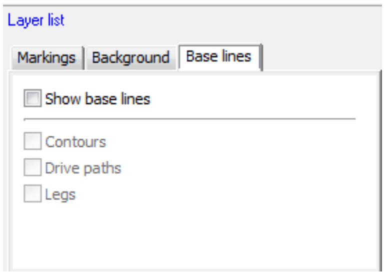




【Layer list】





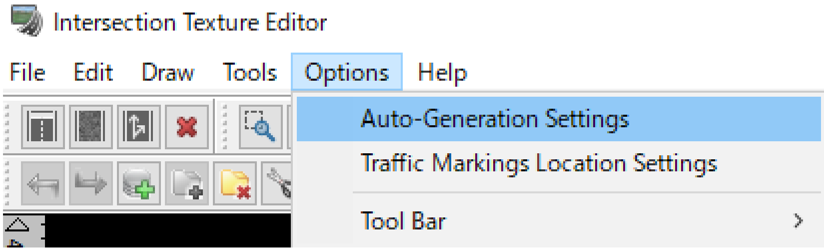


Marking Editing

Click on the tool button of the shape you wish to draw from among [Basic Shapes], [Bezier Curves], and [Traffic Markings].
Define the properties of the shape in the Properties panel. This can be done before and during drawing. Click on the intersection and move the mouse. Click once to finalize the shape and apply the shape to the intersection.

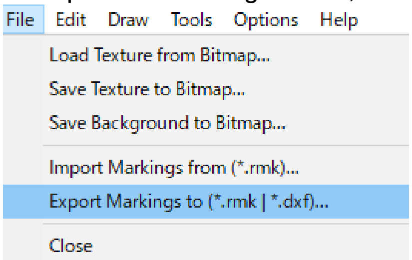
When a shape is selected, eight red dots appear around the shape.A blue dot appears in the center of the shape. These red dots, called resize points, allow to change the width, height, and size of the shape depending on the points. The left and right points change the width, and these points resize the shape while maintaining the aspect ratio of the shape.
The top and bottom points change the height. However, the aspect ratio of the shape is not preserved in this case.

Auto-generation function generates the automatic generation function intersection automatically. "Option" -" Auto-generation settings"



 Define the intersection marking parameter of default by using automatic optional generation.

To export the marking texture, Go to "File" - “Export Markings to" as RMK or DXF file



Road Sign, Markings

It is possible to arrange road signs, models, trees, or markings as side objects.

1. Arrange

Go to the ribbon, Edit - Road – Side Objects 

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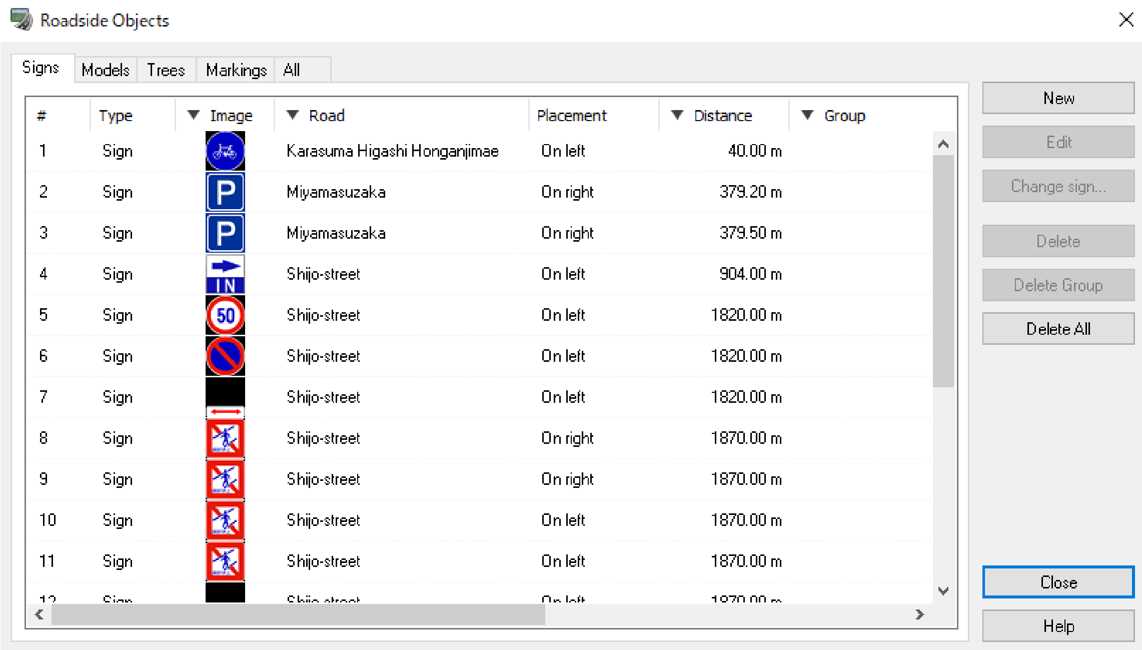
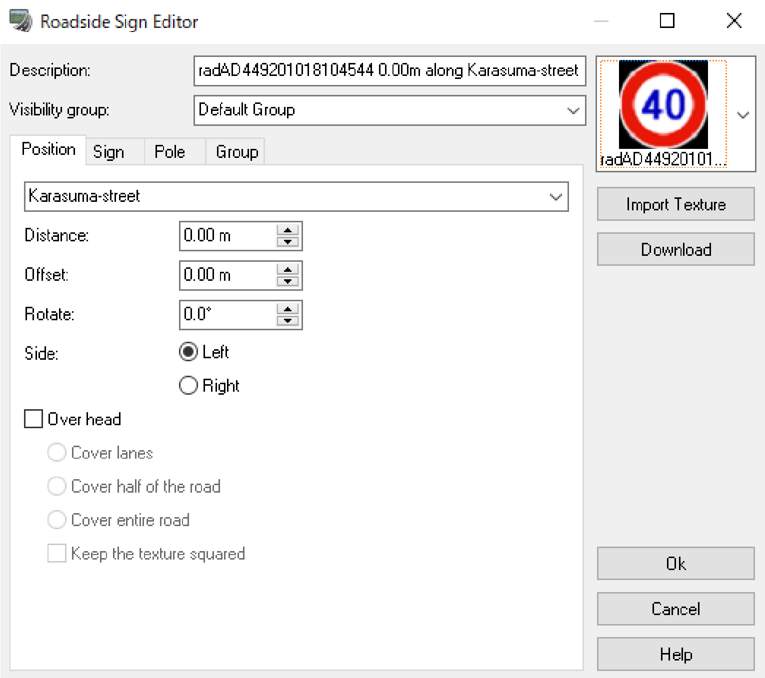
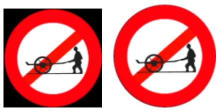
There are 5 tabs; Signs, Models, Trees, Markings and All.
Click a object to use, and click New. Then set the parameters and click OK.





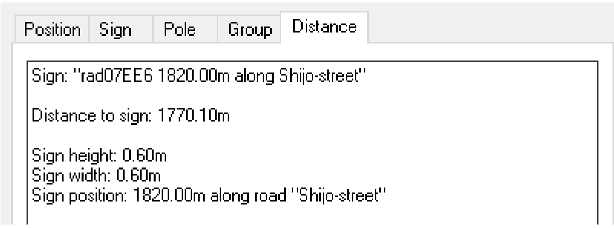
Position tab: set the position to arrange.
Sign tab: set the size and the display.
Hint: it is possible to set black as transparent.



Pole tab: set the size and type of the pole.
Group tab: it is possible to place signs together. Set the number of signs to be placed and the spacing between them.

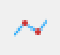
2. Edit

Click a sign and click Edit. It is also possible to edit the parameters above, in addition, a "Distance" tab is added. It is possible to confirm the visibility of the sign by clicking Can see or Can read.



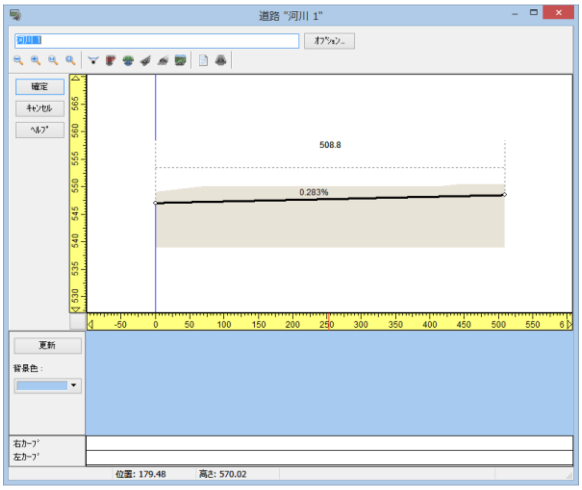
Basic - Landscape

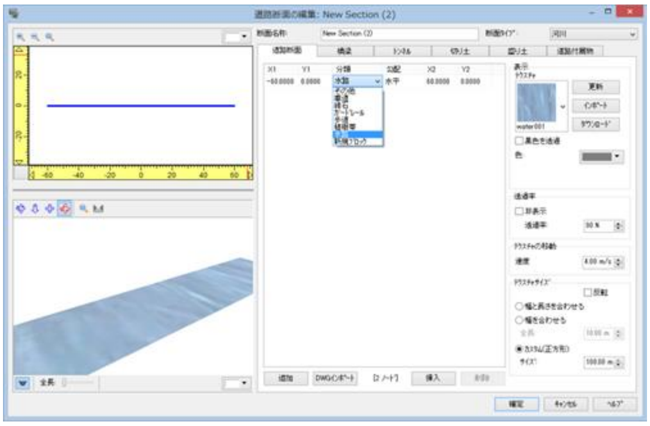
River

1. Click "Make River"  on Plan View. 

2. Define a river in the same way as a road.
3. Right click on the river and go to Edit – River. Define the road alignment.
4. Then,  click to define the section with river shape.

Set up a river texture. The shape of the river shore can be defined with a section.
Back to the main window. The river has been created.





It is possible to define the movement speed of the texture in "Edit section.

And turn on Environment  to make the texture moving.

Backdrop

It is possible to add or edit a landscape of mountain, buildings or fences, etc.

1. Select "Make Backdrop"  on Plan view.
2. Click on a point(s) to place a backdrop.
3. Double click on the point and select a image.
4. The backdrop is generated in the main screen.

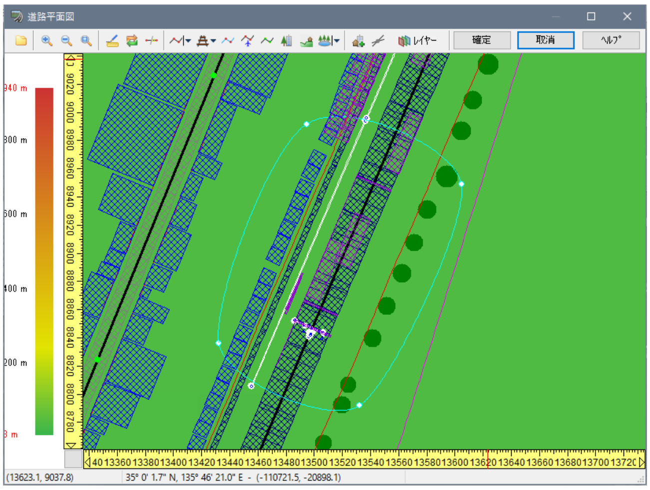
Fill in gaps within backdrops of objects, such as fences and guardrails, black to make them transparent.
Backdrops are pasted to fit the terrain.

Activate Environment 

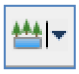
to make the backdrop moving.

Lake

The water surface can be visualized from "Edit" - "Plan view" - "Make a Lake". 
Click any points to define a lake.
Right click on the line to edit the details. On the main screen, click on the water surface to open the edit form.



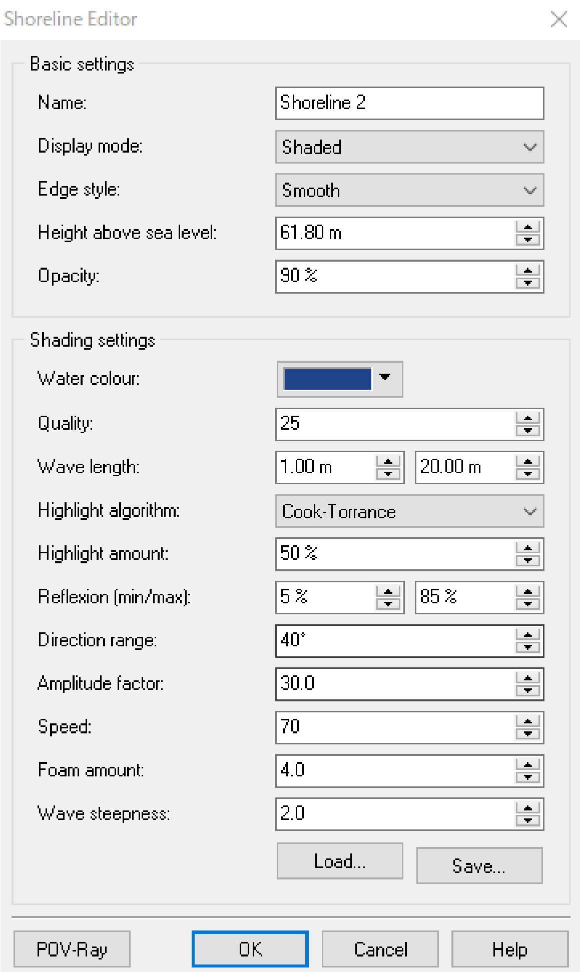
 Smooth edges

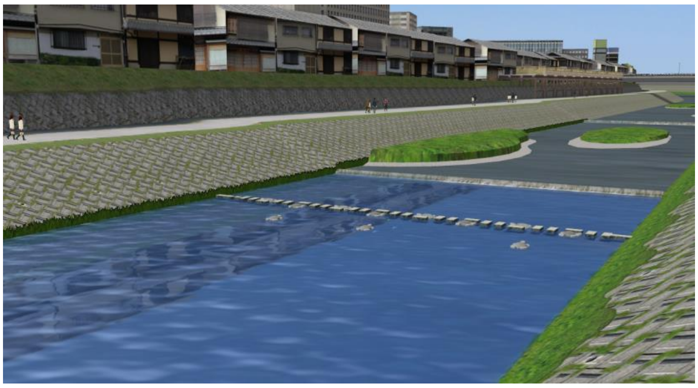
 Straight edges

It is also possible to visualize the ripple by the wind by switching on Environment .

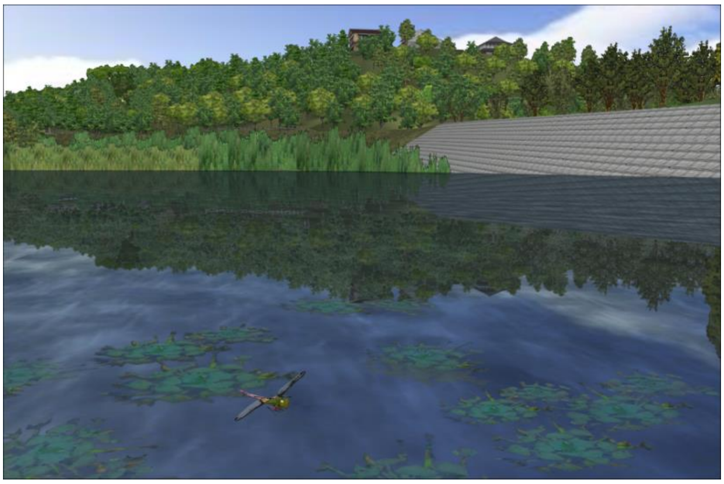
Shoreline can be edited on the main view, too.

For more information about the setting items, please refer to the Help section.





The following options are enabled when Texture is selected as the display mode.

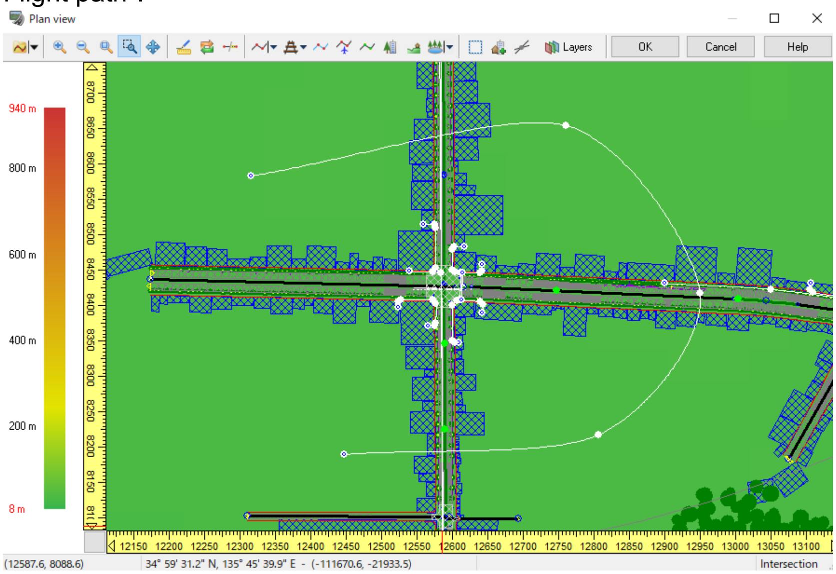


Flightpath

In addition to free flight using the flight button, simulations can be performed using set flight paths.

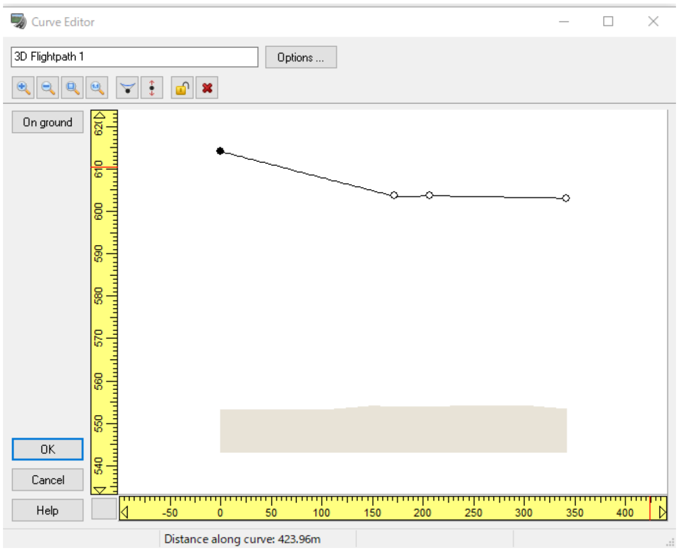
On Plan view

The flight path is defined in Plan view. The path can be used not only for the flight path, but also the walking path for the character.
Draw flight path from  button or Start Filthtpath from right-click menu.
Click on a starting point, turning point1, turning point 2 and end point in order. Then right click and select "Finish Flight path".



It is possible to add waypoints or vertex to the defined flightpath from rightclick menu.

Right click on the flightpath, and go to "Edit" - "Flight path" to open the curve editor. A curve indicates the current vertical curve, and ○mark indicates a turning point.



Add turning point
Right-click anywhere and click "Add Vertex".

Edit turning point
Edit a curve by dragging ○marks or right click to select Edit Vertex..

Lock turning point
Right-click on a turning point and click "Lock Vertex". It is displayed as ■.

Delete turning point
Right-click on a turning point and click "Delete Vertex".

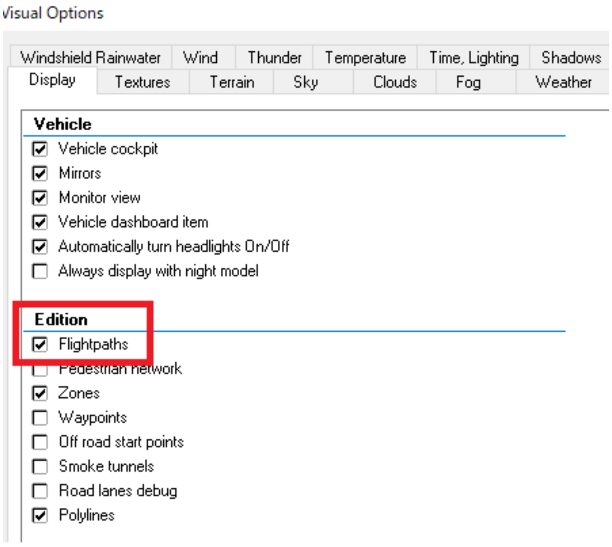
Click  to edit the altitude of the point selected manually.

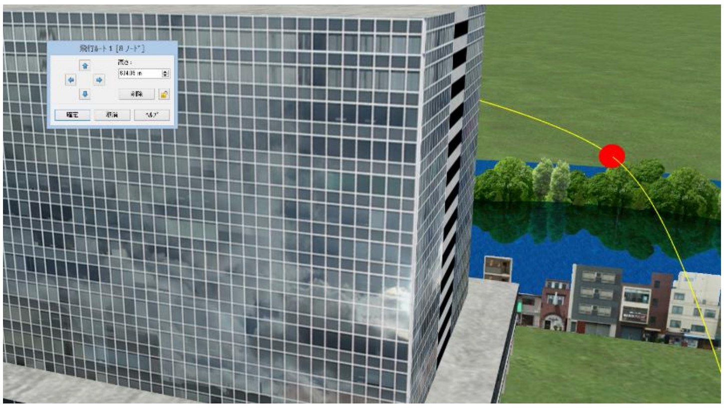
On Main screen

1. Check on Flightpath on Visual Options  from Home - Environment.

2. Go to Edit–Flightpath - Record Flight Path. 
3. Start flying. Press the space key at a point to start a flight path.
4. During flying, press the space key to add a vertex.
5. Repeat step 3 as needed.
6. Click on the record button of the flight path to finish.

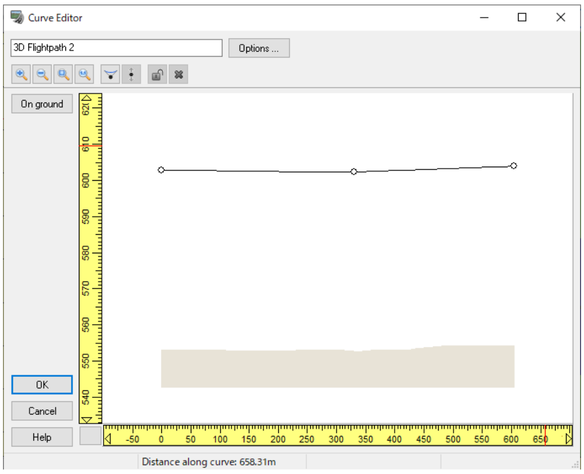
Click the yellow spher, it changes to red. Click it to open the popup editor. The spheres can be moved by dragging the sphere while holding down Ctrl and Alt.

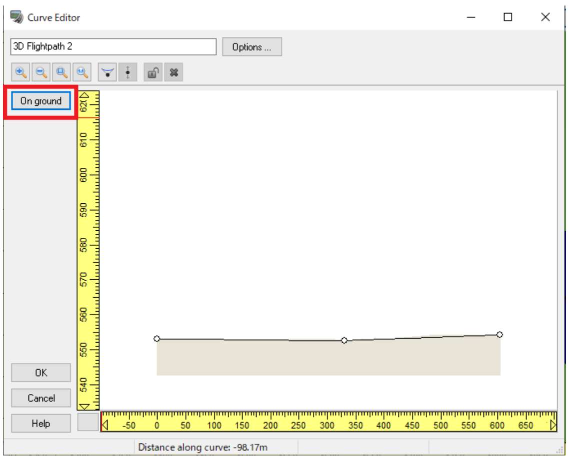




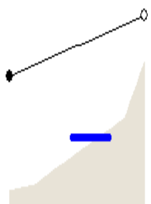
Walking path

Define a walking path on which MD3 character can walk.
Define a flightopath on Plan View, then click On Ground on the Curve editor.



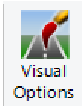


The thick blue line indicates where an intersecting horizontal curve is.

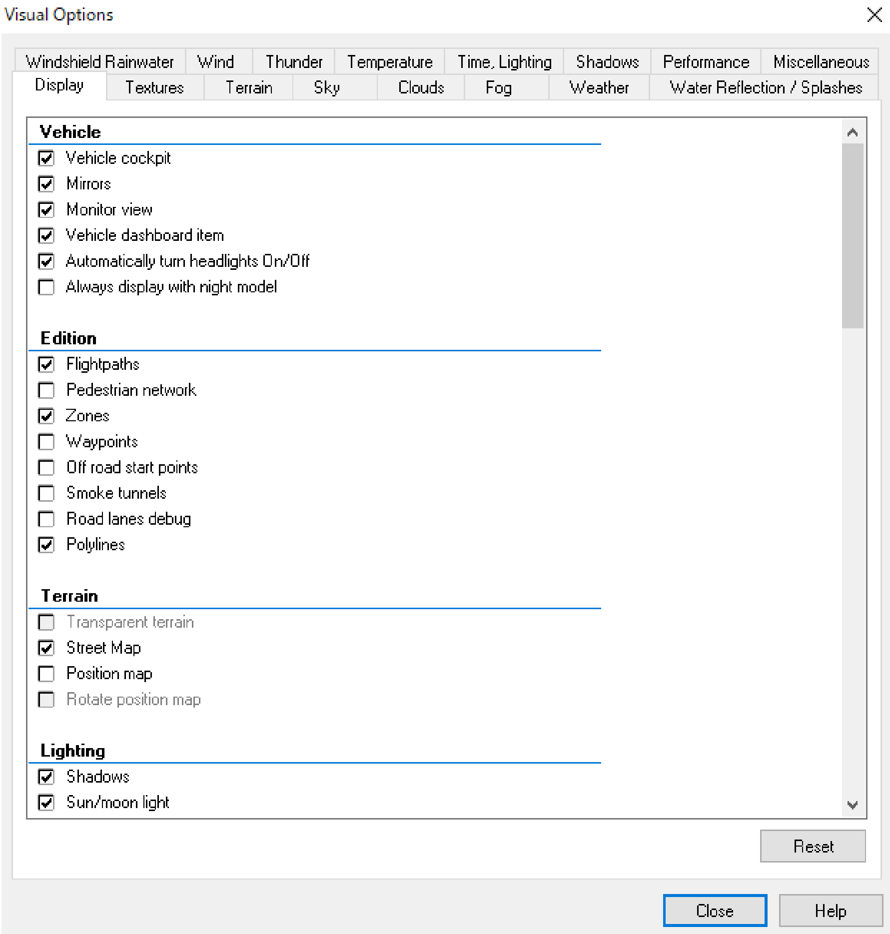


Visual Option

This can be used to set the elements and drawing effects to display.

On the main menu, click Visual Options 

from Home – Environment.
See Help for detailed drawing effects.



Display tab: Set the elements and effects to display.
Tectures tab: Set how textures are displayed.
Terrain tab: Set terrain textures by elevation and slope.
Sky tab: Set the sky texture and the sky color.
Clouds tab: Set the cloud texture and cloud generation conditions.
Fog tab: Set the fog color, the fog type and generation conditions.
Weather tab: Set the weather type, wind speed, and wind direction.
Water Reflection/Splashes tab: Set the reflectivity of puddle, mask texture of puddle shape, and water splash
Windshied Rainwater tab: Set up for windshield rainwater and windshield wipers.
Wind tab: Set up wind sound and display of dust such as leaves and cloth.
Thunder tab: Set the direction, distance, height, radius to be generated, spacing, and thickness of the lightning.
Temperature tab: Set the color for heat and cold, and the degree of heat and cold.
Time, Lighting tab: Set the position of the sun and moon according to the date and time.
Shadows tab: Set the conditions for shadow simulation.
Performance tab: Set the drawing performance.
Miscellaneous tab: Other settings.

3D Model (Registration, Editing, Arrangement)

Register, edit, and place 3D models.
Create, register, edit, download, save, and configure 3D models in the Model Panel.

Models Panel

Go to Edit – Scene – Library 

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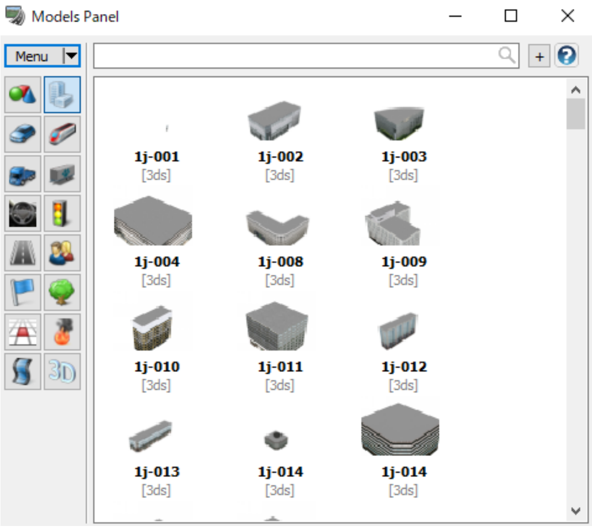
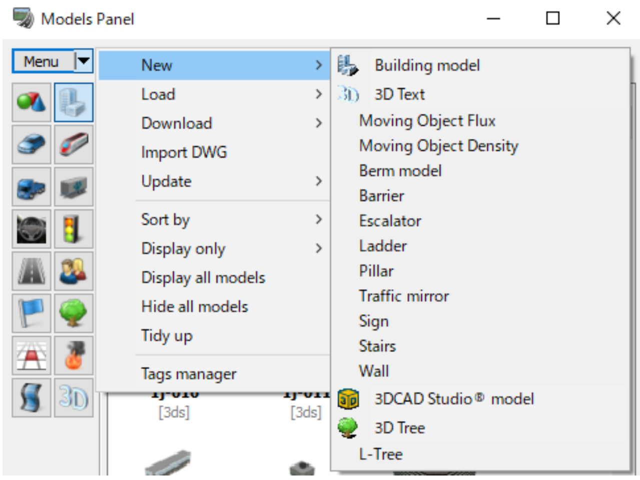
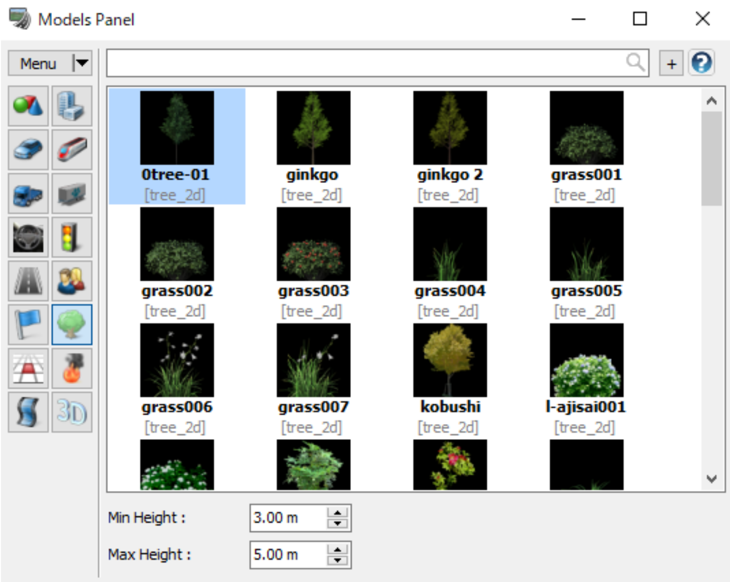
From the Menu, it is possible to add, load, download models or textures. Also, it is possible to choose to show or hide by type, sort by name, extension, or modification date, and search by name.





For 2D trees, it allows to edit the minimum height / maximum height.



Arrange and move

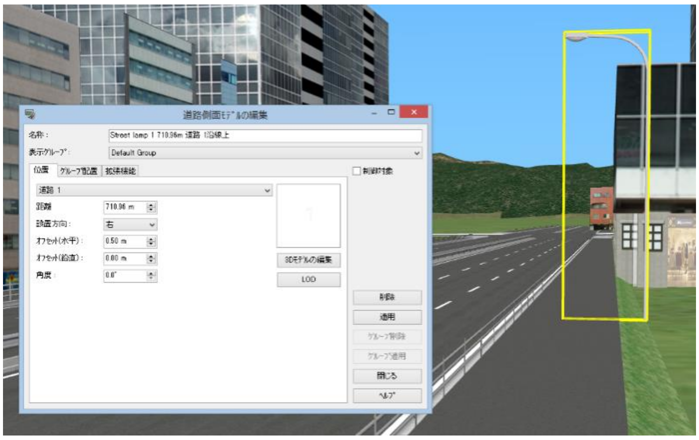
Arrangement of the model

1. Select a 3D model on Models Panel.
2. Click a point to place it.
3. Click it to open an Model editor.

How to move a model by dragging

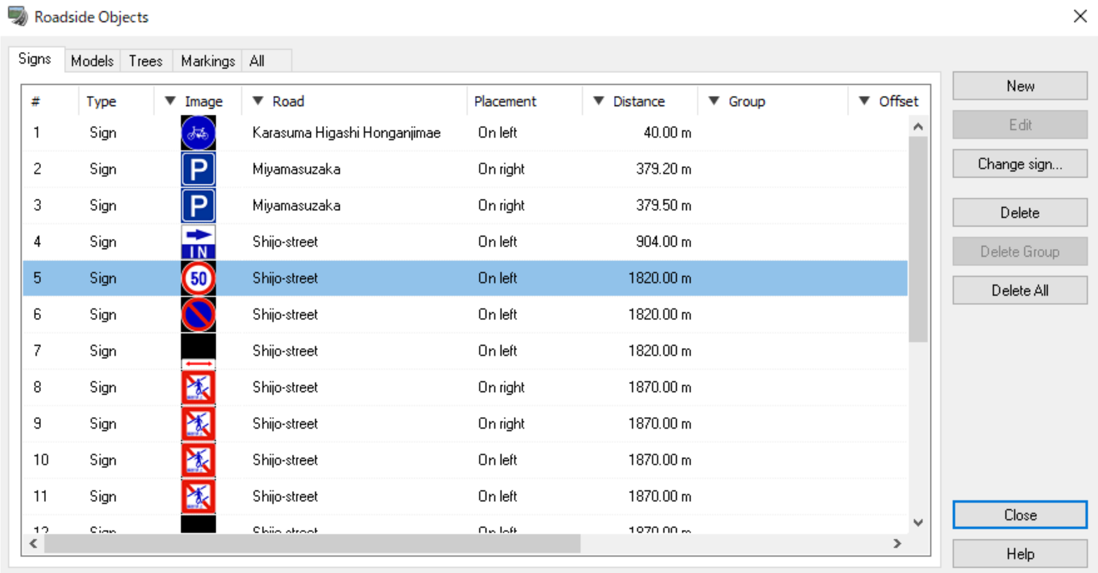
・To move it vertically: Click it, and drag with pressing Alt key
・To move it horizontally: Click it, and drag with pressing Ctrl key.
・To rotate it : Click it, and drag with pressing Shift+Ctrl key.

Press [Ctrl]＋[Shift]＋[Alt]＋click on the road to arrange a 3D model as a road side model.

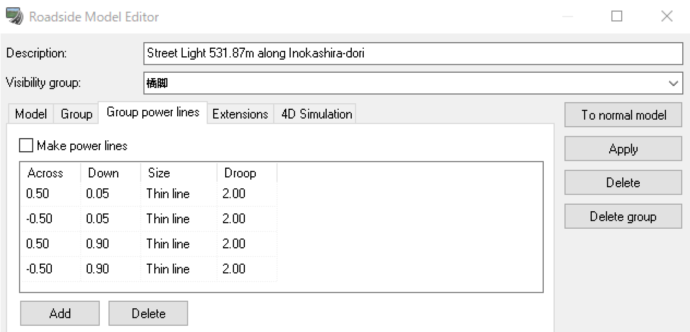


Arrange as roadside objects

Go to the ribbon Edit – Road – Side Objects. 
Select a model to be used and click New. Please refer to Chapter Road sign, Makings.



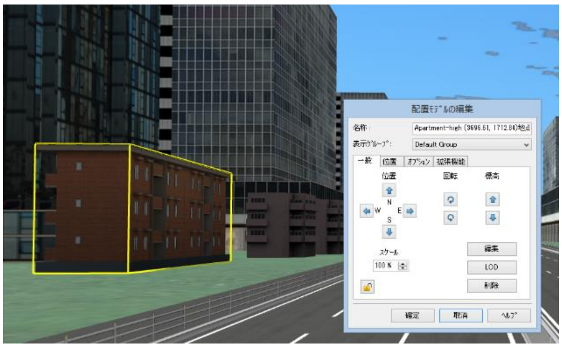
Group Power Lines
Checking the "Make power lines" checkbox on the Group power tab will place wires between models belonging to the same group. Holding down the Shift key and clicking on two poles in the main screen will also place wires between the poles.



Delete

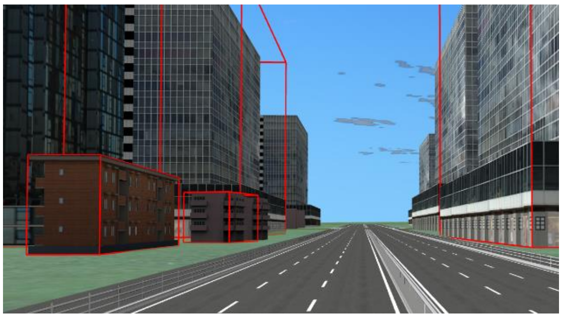
- Individual

Click on each model and then the delete button in the window.



- Mass Delete

Select more than one terrain.(Shift or Ctrl + Click) Next, from right-click menu select "Select Objects On Selected Terrain". And select the types to be deleted from "Delete Selected Objects"



- Multi-select deletion

Click a model continuously while holding Ctrl key. Nexr, select the types to delete from "Delete Selected Objects" of the right-click menu. Cancel the selection by pressing the Space bar.

Copy

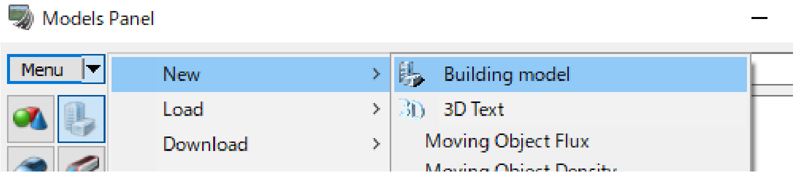
1. Click the model continuously while holding down the Ctrl key. Click again to release.
2. Right-click and select "Duplicate Models" from the menu. To deselect, press the space key.
3. Click at the position to place the selected models. While multiple models are selected, Ctrl + drag to move horizontally, Alt + drag to move vertically, and Shift + Ctrl + drag to rotate.[67]

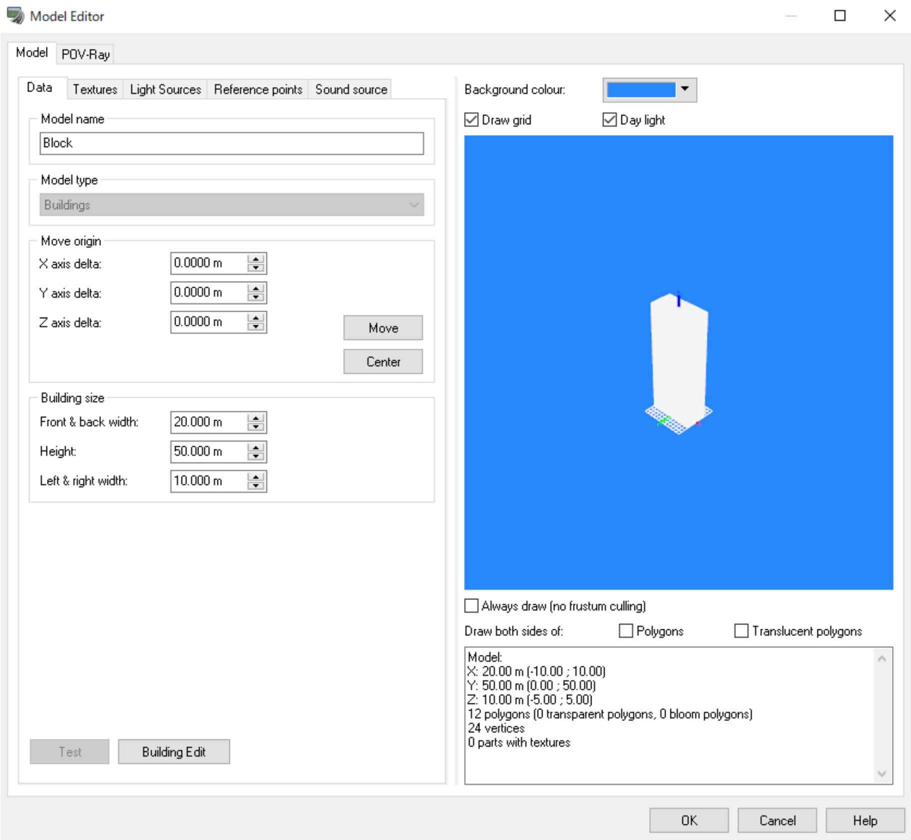
[67] Please note that undo is not available.

Register

New models

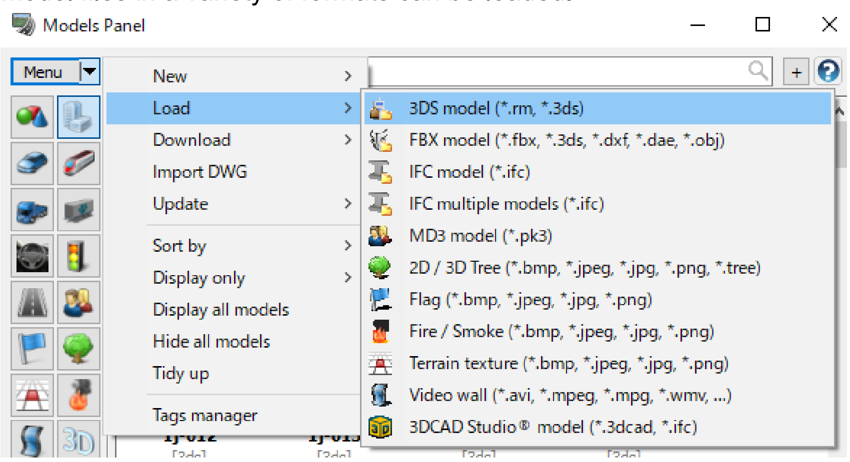
Register a building model from Menu – New- Building model. Rectangular and 3D building models can be created and textures can be set.
To create a complex 3D building model, click Building Edit. Please refer to the chapter Complex 3D building model.





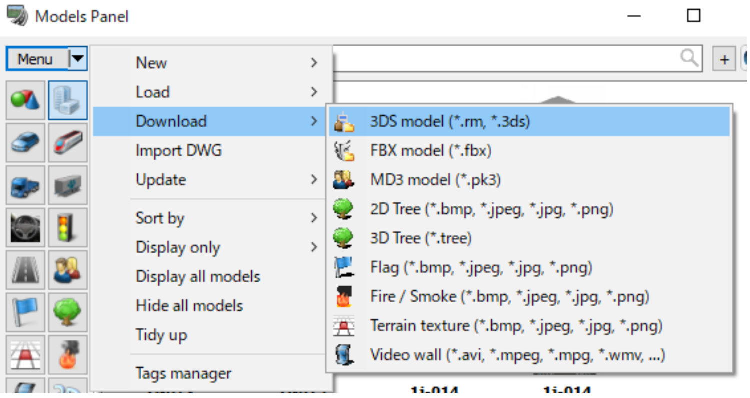
Load models

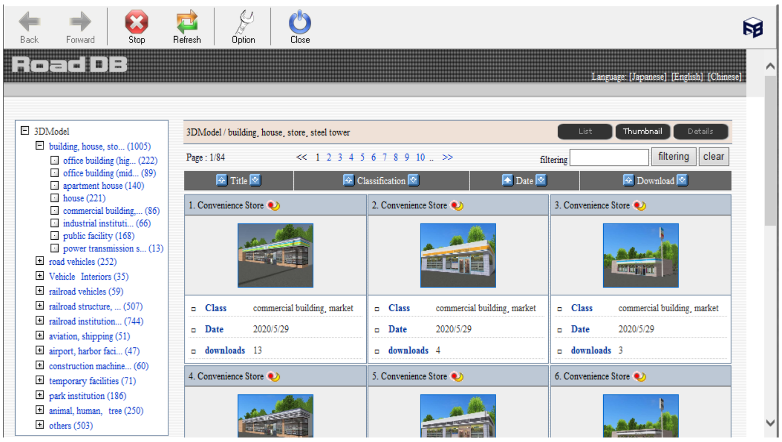
Model files in a variety of formats can be loaded.



Dowinload from RoadDB

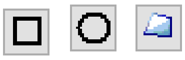
It is possible to download materials such as 3D models, textures, Road models (mobile models), road sections and MD3 characters. The database is always added and updated.It requires to be accessed via internet.



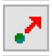


Complex 3D building model

Go to Menu New – Building Model. Click Building Edit on Model Editor. It is possible to generate a complex 3D building model.

Define the building ourline with drawing tools;  .

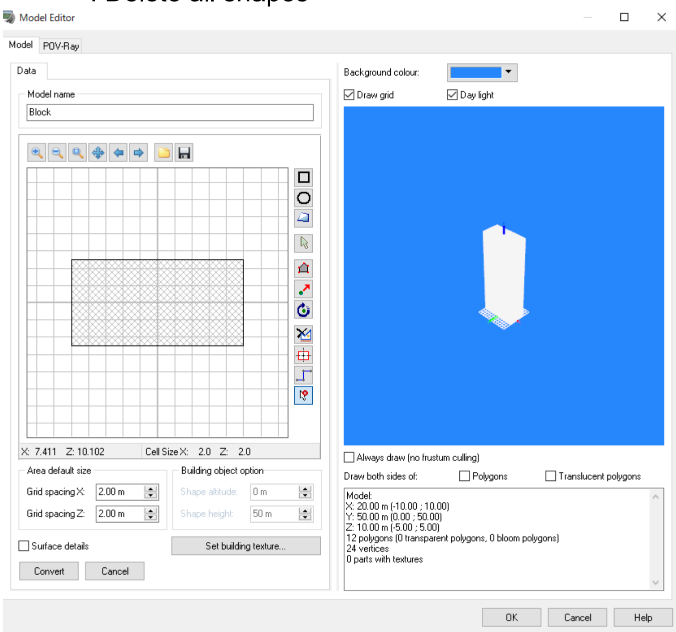
 : move an individual top

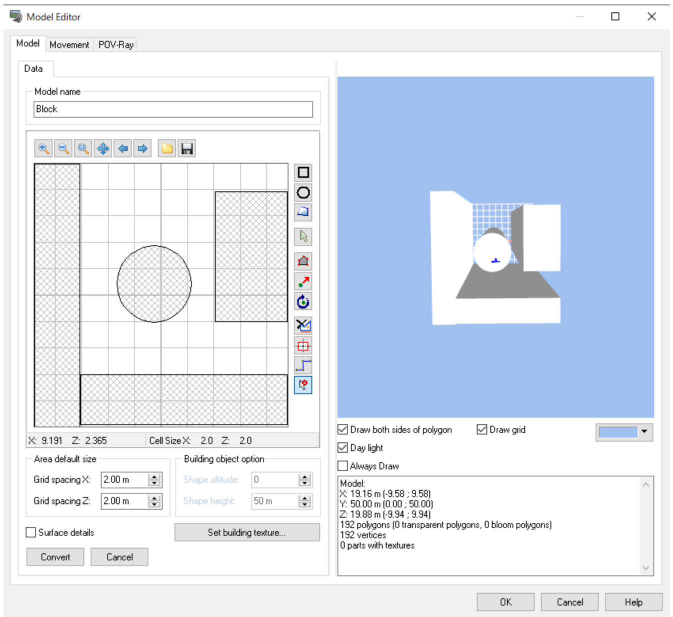
 : move the shape

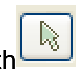
 : rotate the shape

 : Select a shape. Then right click to delete.

 : Delete all shapes

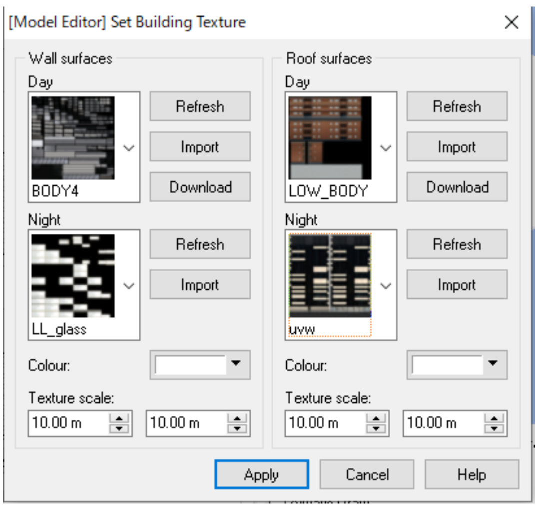


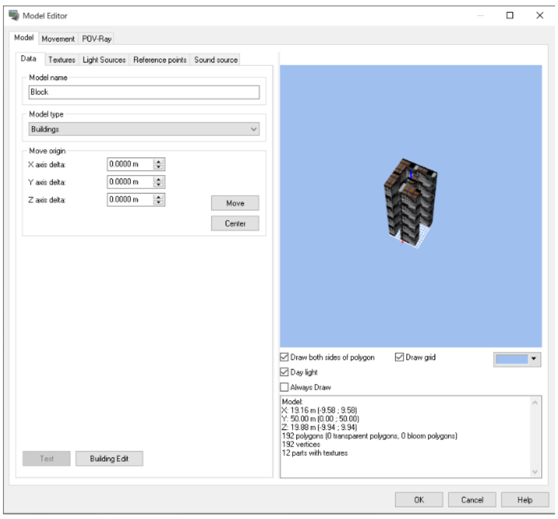


To change the height and altitude, select a shape with  and input the parameters.

To apply building texture, click 

. Select a texture for each shape.

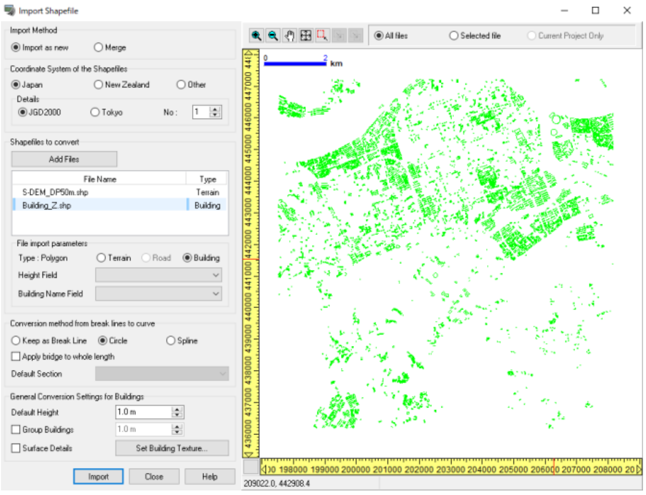




Import Shapefile data

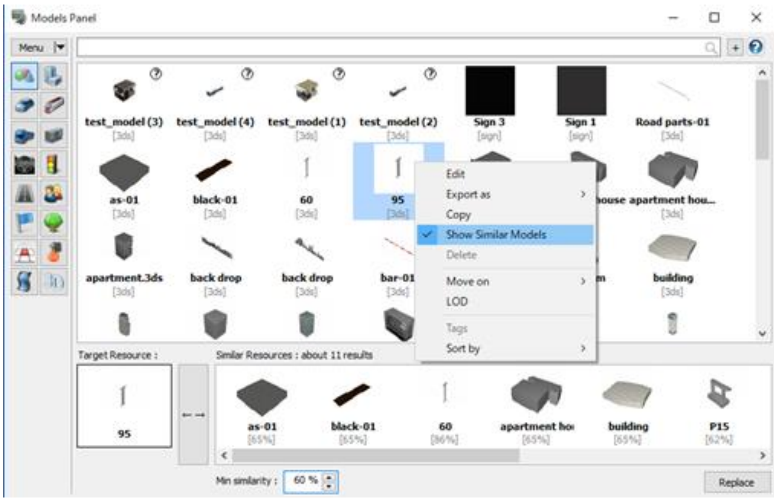
1. Go to File "Import" - "Import Shapefile".
2. Click Add Files to specify (a) file(s).
3. Select each object type as File import parameters.
4. Set up the conversion method and settings.
5. Click Import to start impor

It is possible to export 3D models created as Shapefile.
On Model Editor, click Building edit. Specify the directory and the file name.



Integrate duplicated models

By the operations such as merging files or copying a model, many duplicated models are generated, which increases the file size. This function enables to integrate duplicated models or sections and to delete unnecessary ones. This function is composed of 3 processes; Similarity calculation process, Object replacement process and Tidy Up process.



1. Similarity calculation process
Detect objects which have similar settings or internal parameters as Similar objects. The parameters to be compared depend on the object type.

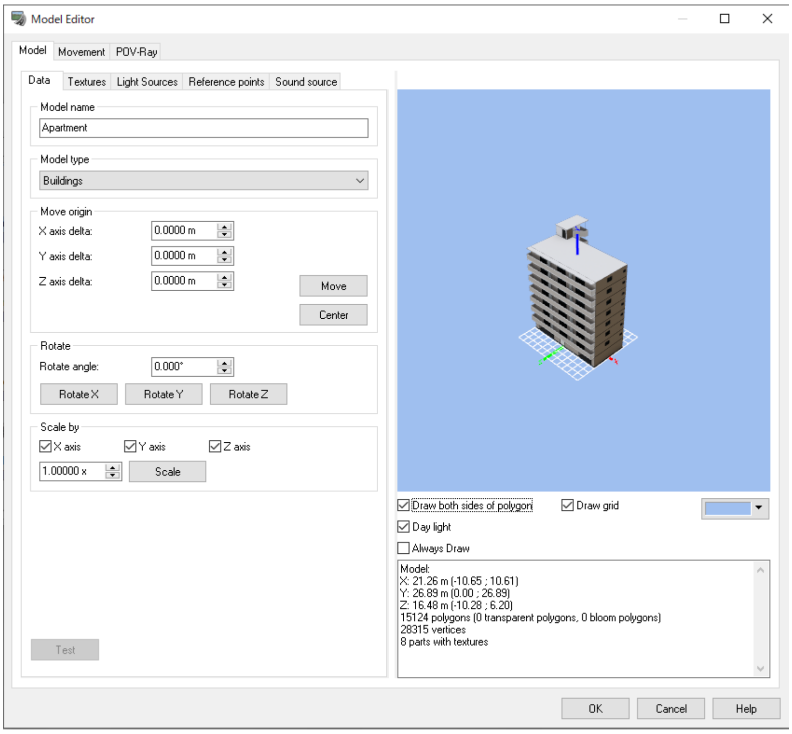
2. Object replacement process
Similar objects can be replaced with a target model which has similar settings. This process replaces all places referring to the similar objects with the target object. For example, when a similar model used for a resource of model instance with a target model is replaced, all objects with the similar model are replaced. This process is applied to all settings.

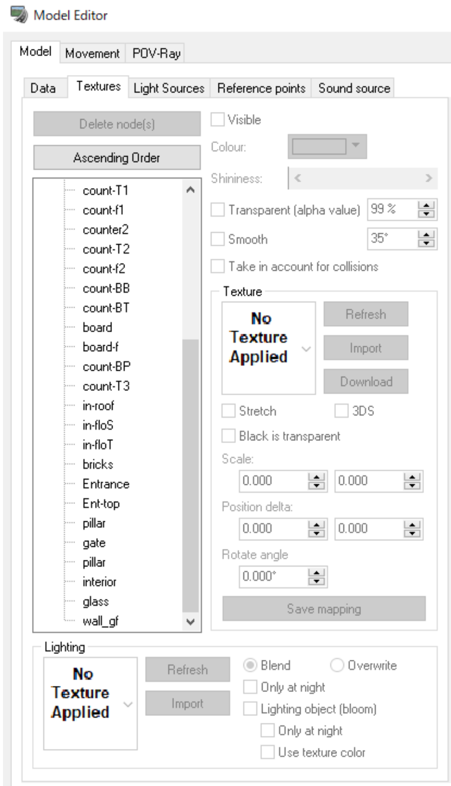
3. Tidy up Process
Tidy up similar models at unused state. This process deletes the similar models from the project.
It is the Integration function so that the project is downsized using these processes.

Show Similar Models
Use the flame on the bottom of the model panel to show similar models to a selected model and to replace them with it. Resources which are similar to Target resource are shown as similar resources. And they can be replaced with a target resource, so that the replicated resources can be integrated.

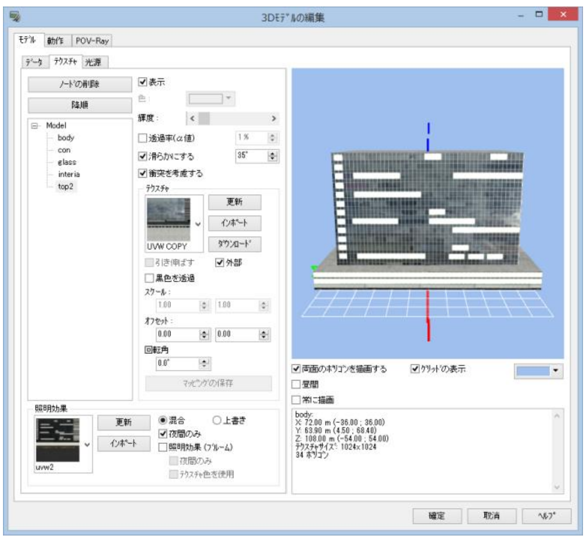
Model Editor

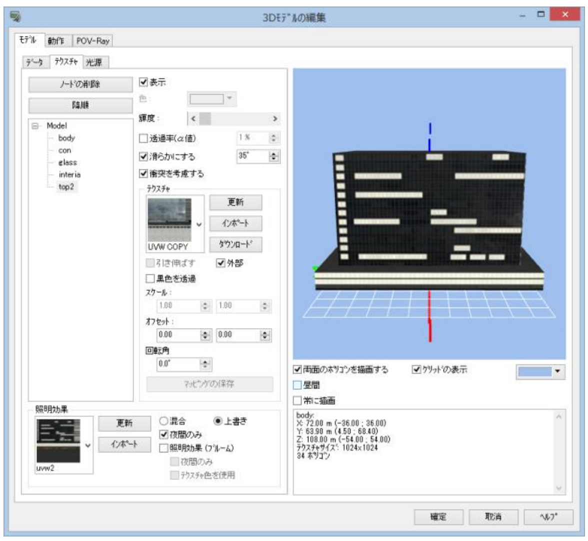
Double-click on a model or select Edit from right click menu on Models Panel to open Model Editor.
It is possible to set up it on this form.



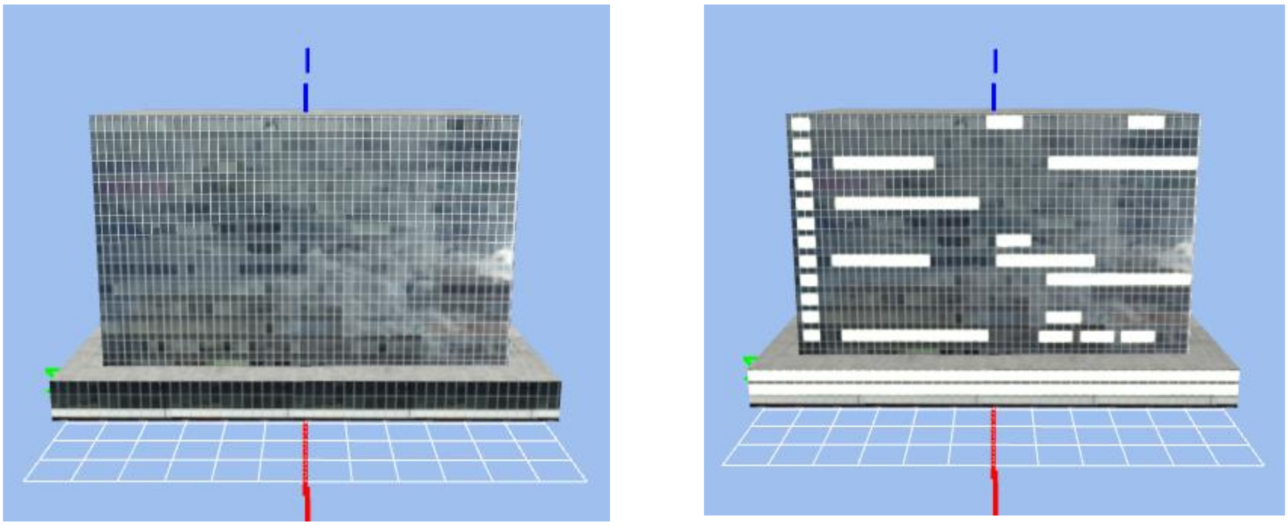


Examples
Left: Blend, Right; Overwrite



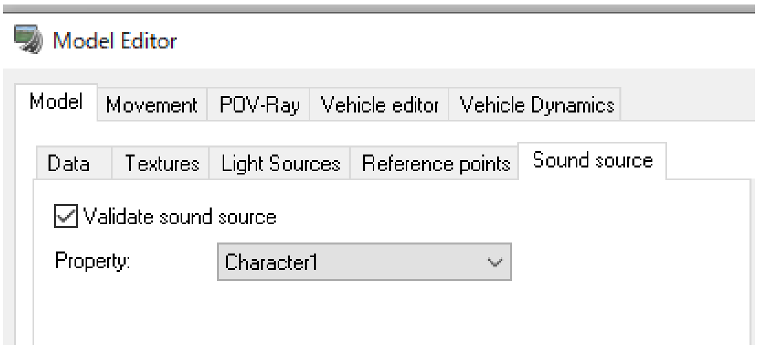


Left: at daytime, Right: at night



Sound source tab

When noise simulation option is effective, 3D model can be set as sound source.



Light sources tab

It is possible to add lighting effects to 3D models. Go to Visual Options – Display, and check the “Advanced Lighting” checkbox to display the lighting effects. The light effects can be applied to models such as vehicles, streetlights, or buildings.

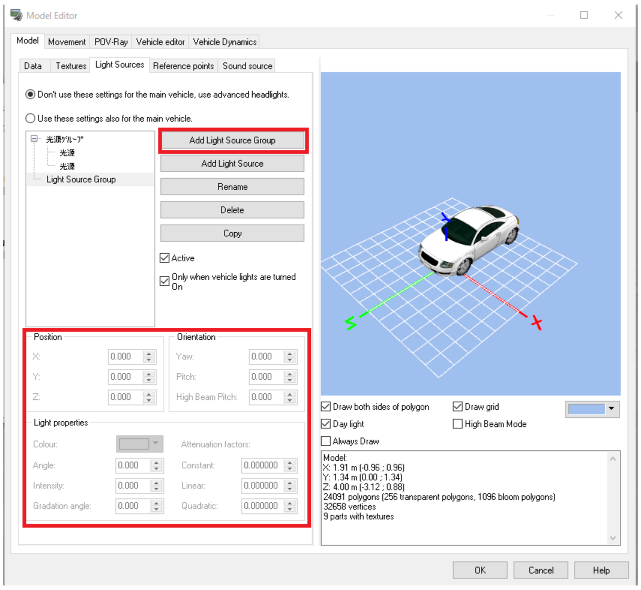
While there is a limit on the amount of light sources that can be displayed simultaneously, there is no limit on how many light sources can be set. The limits can be adjusted on Performance tab in the Visual Setting screen.

A model can have multiple lighting sources, but they must belong to at least one lighting groups.

Click on “Add Light Source Group” to generate a new light group. Select the new group and click “Add Light

Source”.

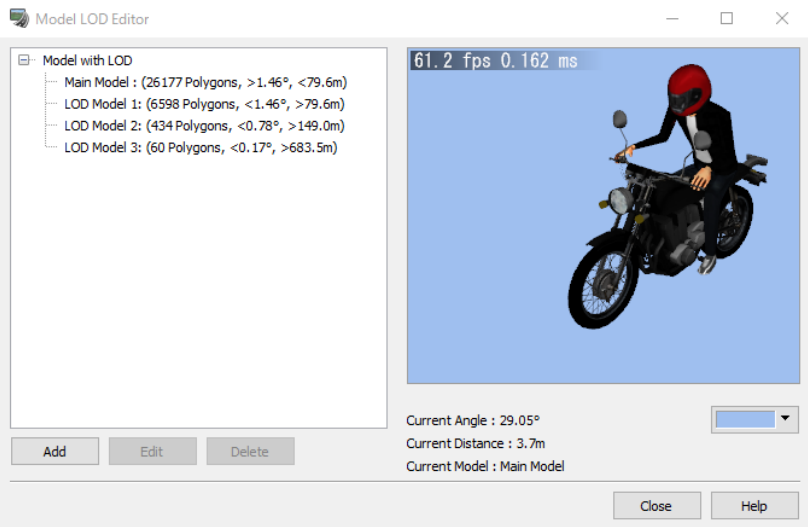
The settings for lighting are basically the same as for spotlights, and are represented by radial lines with the current position as the apex (this area is the area illuminated by the selected light source in the 3D view).



Switching between low beam and high beam
Low beam / high beam switching function can be assigned to either a game controller or a manual simulator switch. Cars that belong to the traffic flow automatically uses low beam lights during nights or inside tunnels.
Although high beam needs to be manually activated, low beam can be automatically switched on and off during night or daytimes. To enable it automatically, go to File – Application Options - Game Controller Options and check the “Automatically turn headlights On/Off” checkbox. This option is also available in the Visual Options window, under the Display tab.

Model Level of Detail

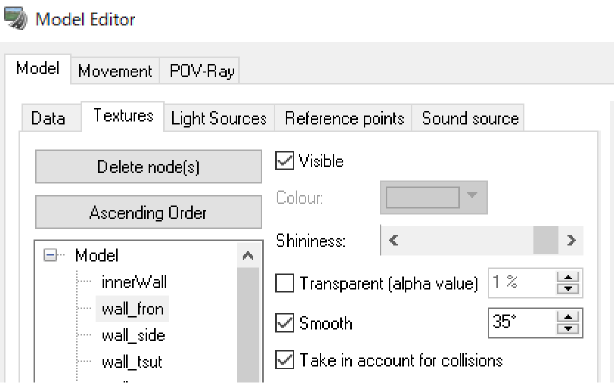
Right click on a model on the Models panel. The Model LOD Editor will open.
I LOD (Level Of Detail) speeds up the drawing of complicated models by displaying a simplified model for a distant model. For example, a building model may have detailed internal information to display nearby, but it does not need to be drawn because they are not visible from a distance.



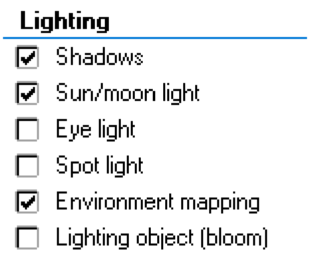
Environment mapping

Environment mapping is to draw a texture of the surrounding environment and use it to represent reflections. It cannot represent exact reflections, but it is possible to express reflection effects in real time.
For example, it is possible to reproduce the sky color reflected on the body of vehicles and other objects.
Environment mapping can be used when advanced lighting or shadows (daytime only) are enabled. It applies when lighting > environment mapping is enabled in the drawing options. The intensity to which the environment mapping is applied is determined by the product of the reflectance setting of the 3D model and the global reflection coefficient of the drawing options.

On the Model Editor, select a part to which reflection effects will be applied. And move the "Shininess" setting bar from the leftmost state to the right. (The leftmost setting is 0% and the rightmost is 100%.)



Next, activate "Shadows" and "Environment Mapping" on the Visual Options.

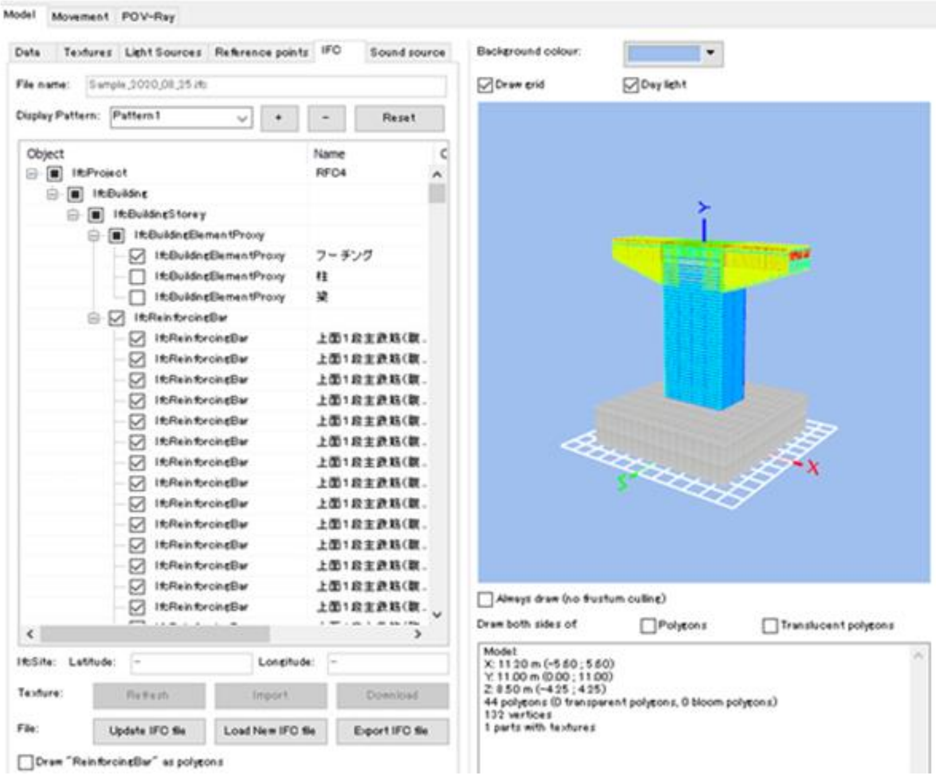


The environment mapping is applied to the model you have just selected.
If the model does not reflect, or if you need to adjust the reflection, please see Help.

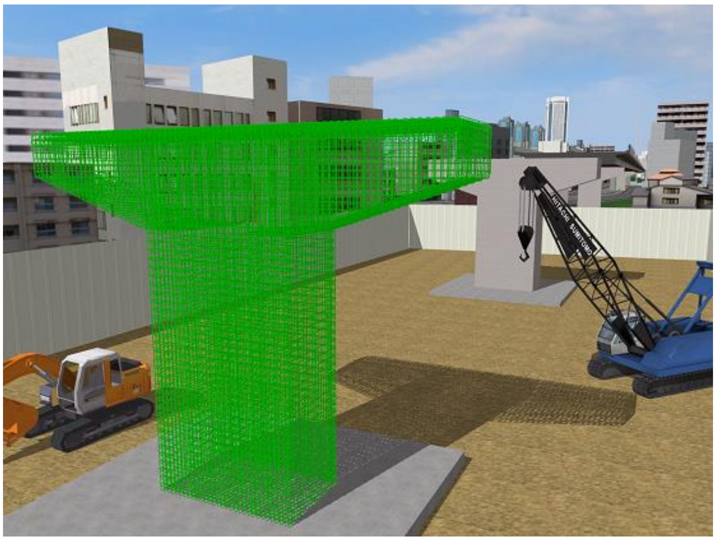
IFC model

After a IFC file is imported, IFC tab is added to the Model tab on Model Editor and displays information of constructions and reinforcing bars. On this tab, IFC entities are shown as a tree.

It is possible to switch Show/Hide, edit the colour, the opacity, and the texture.
Registering the models as a Pattern, It enables to use for simulation and switching them from Model Tool.
On this tab, it is also possible to update, load and export IFC files.

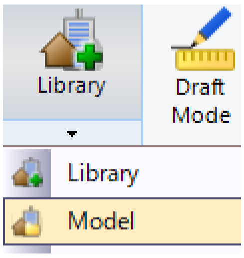


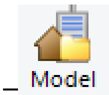
On the left side, a tree view of IFC entities with model information is displayed. For each part, set show/hide, color, opacity, and texture.
When a IFC model contains reinforcing bars, it is possible to switch between line drawing and polyggon drawing of reinforcing bar.



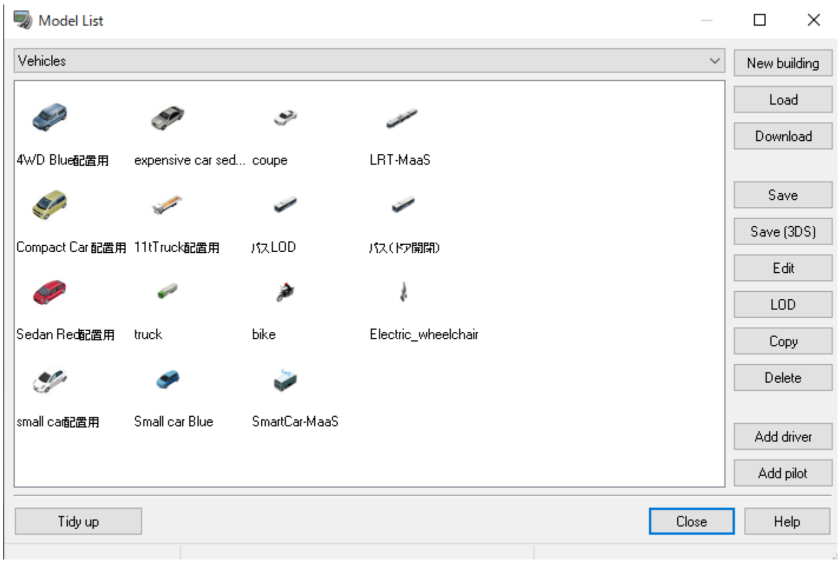
Addition of the driver / the pilot

It is possible to set the registered model as a driving vehicle running car on the road, and as a flight object on the flight path.

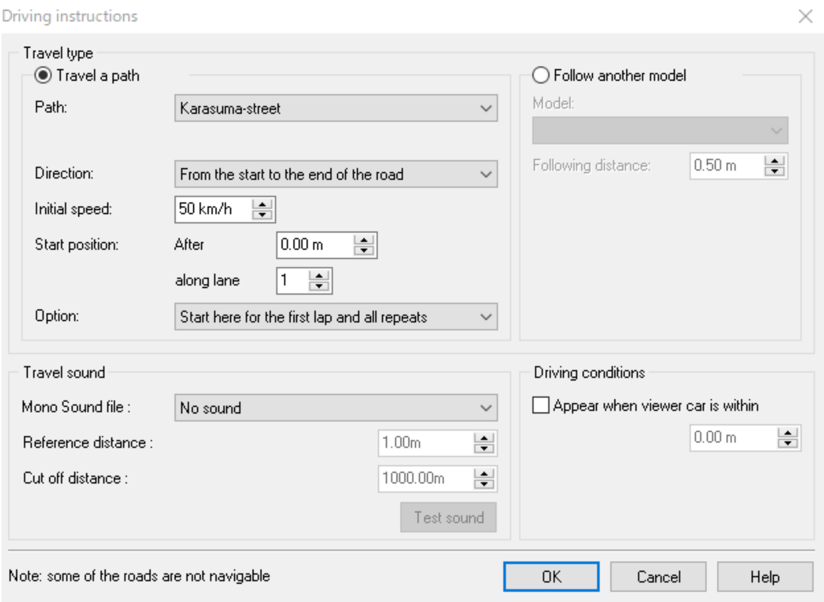


Go to Edit – Scene – 

to open Model List.

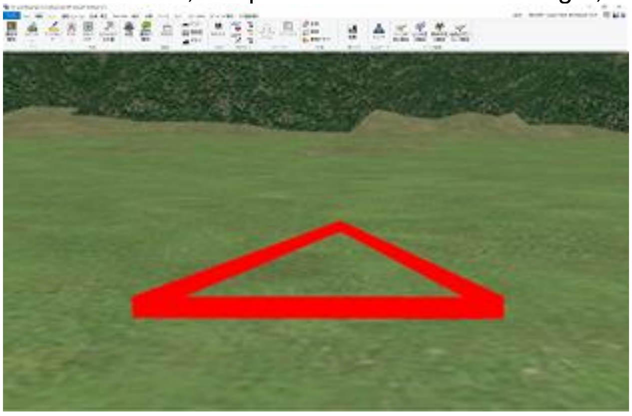


If the model is a vehicle, train, cab, airplane, boat, etc., the buttons “Add driver” or/and “Add pilot” are actibated. In the pop-up menu, select "Road/Railway" or "Flightpath" and set up the driving route, initial speed, and starting position.



Zone editing

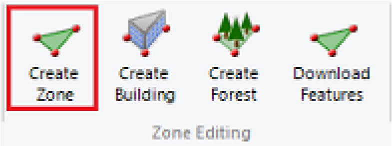
Zone is an area enclosed by three or more points selected by the mouse as vertex on the terrain.
It is a polygon that connects adjacent points with a straight line, and the sides are defined as the boundary of the zone.
Within the zone, it is possible to confirm the height, create buildings or forests, and download the features.



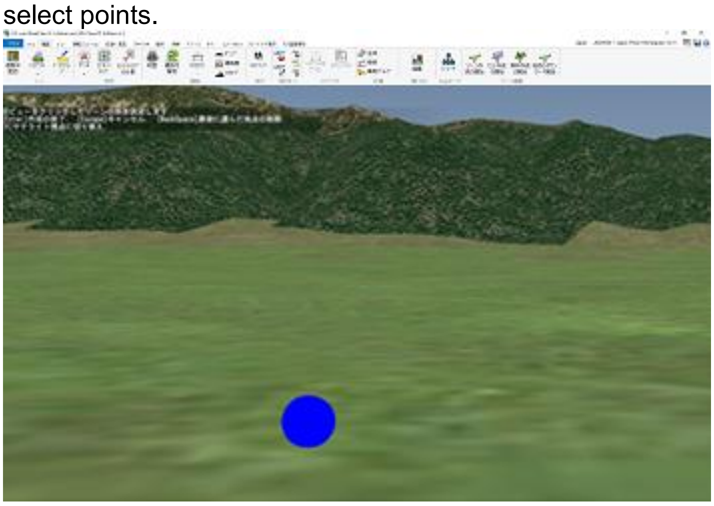
Zone creating mode

Move to the zone creating mode.

1. Open a new project
2. On the Edit ribbon, select Create Zone in the Zone Editing group.

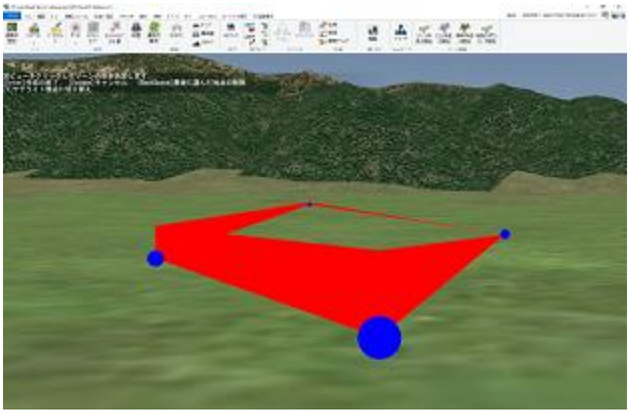


3. Zone creating mode starts. The explanations are shown in upper left corner. Click any points on the terrain to select points.

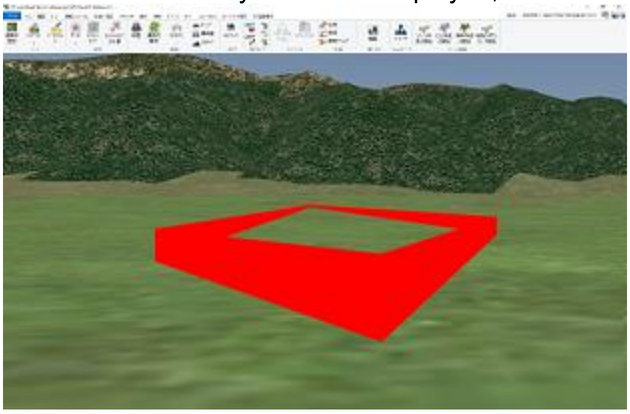


4. Select more than three points to specify the shape of the zone.

- About vertices, the previous and the next one are connected by red walls.
- The first and the last vertex are connected with a blue ball at the position of the mouse cursor by red wall.



5. Once the shape is defined, press the [Enter] key to fix it.
6. Press Enter to start Zone editing mode again. The defined zone area is surrounded by the red wall.
Note: If the boundary line is not displayed, check "Zone" in the "Display" tab - "Visual Options".

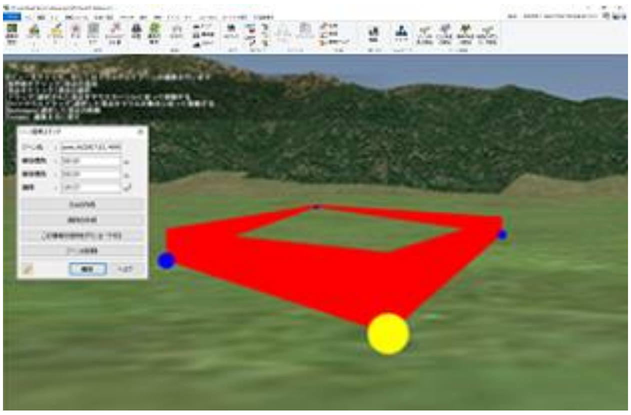


7. Press the [ESC] key to finish the zone creating.

It is possible to edit the shape of created zone by the following three methods.

- Select vertex

Doubleclick a zone then click a vertex. The color is changed to yellow.



Press [v] key to move the camera to the viewpoint from the sky. At this time the camera mode becomes satellite.

(1) Add vertex
Move the mouse cursor on the red wall to display a blue ball at the cursor position. Click it to add a new vertex.

(2) Move vertex
(A) With mouse cursor
Select a vertex to move, and drag it. It moves according to the mouse cursor and are fixed at the point where dragging stops.
(B) With mouse movement

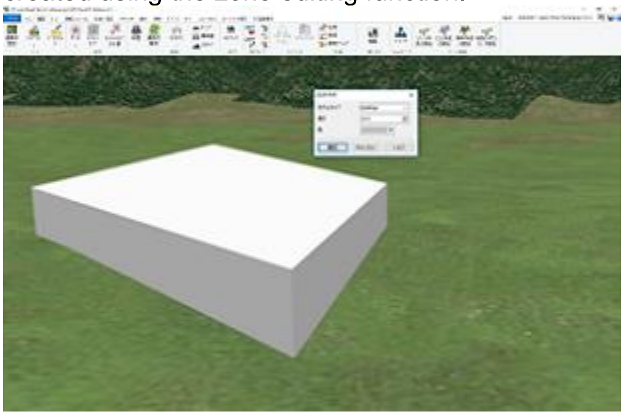
Select a vertex to move, and holding down the left button with pressing [Ctrl] key. It moves according to the mouse movement. Release the left button or Ctrl key to fix the position.

(3) Delete vertex
Select a vertex to delete, and press [Backspace] key. The vertexes on both side of the delete one are connected.

Finish zone editing
Click "OK" button in the "Zone Editor" to finish the zone editing. The zone editing mode finishes and backs to the normal main form.
Press[ESC] key on the zone editing to cancel the operation and back to the normal main form. All changes are canceled.

Building creating (Zone editing)

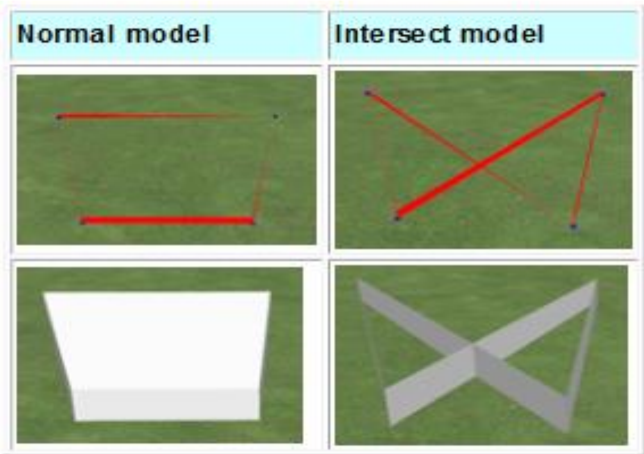
It is possible to create an object by specifying its bottom shape by an arbitrary polygon. The bottom shape is created using the zone editing function.



There are two methods to create an object.

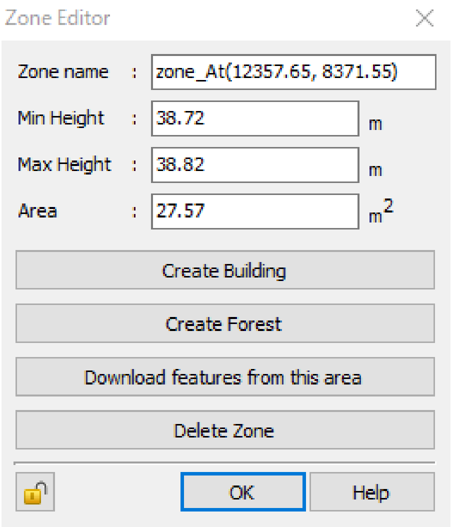
A. From the ribbon menu
1. Open a new project.
2. On the Edit ribbon, select Create Building in the Zone Editing group.

3. The function of creating building starts, and the mode is changed to the shape creating mode. Create the bottom shape, and press [Enter] key to change the mode to the option editing mode and open the Building Generator form.

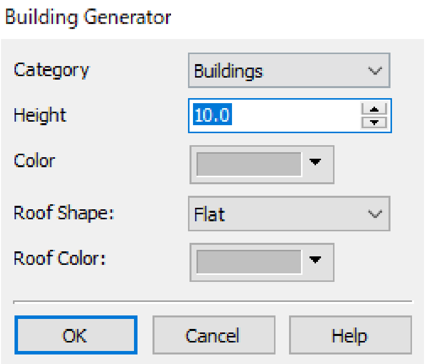


B. From the existing Zone

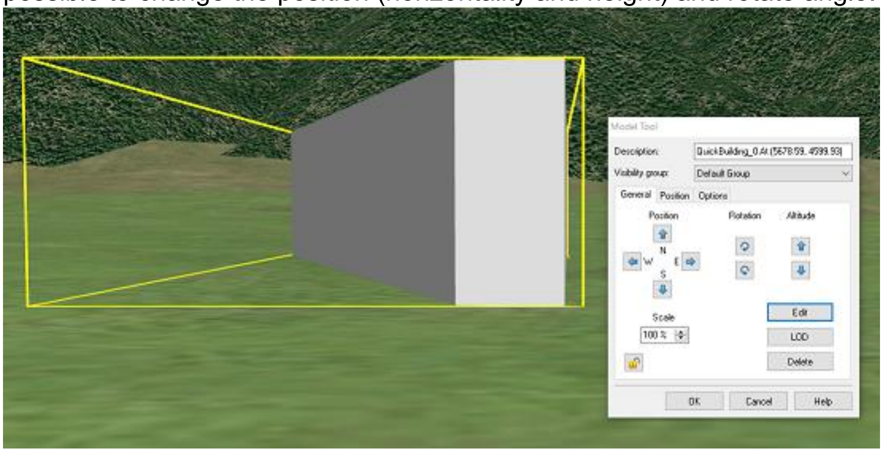
1. Create the object using the existing zone.
2. Click a zone to change the mode to zone editing mode.
3. On Zone Editor form, click Create Building button.



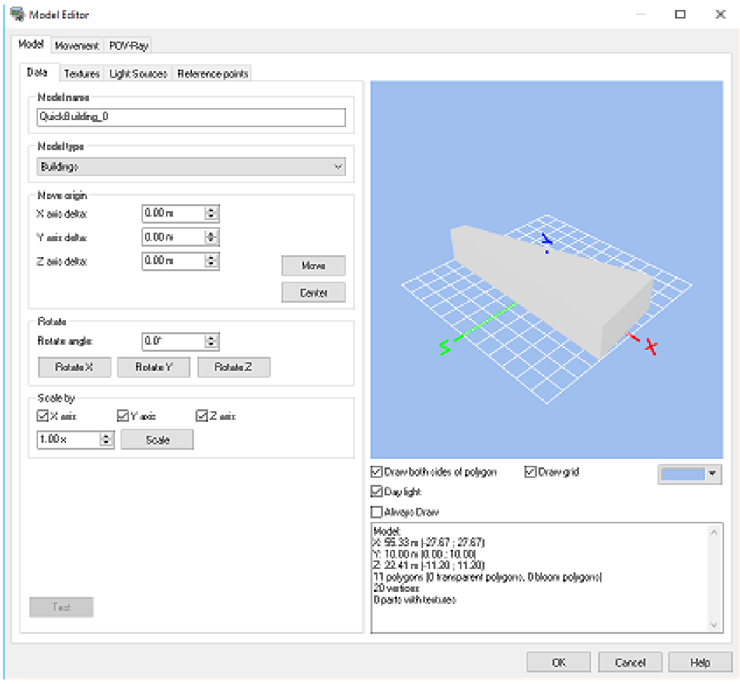
The generated model can be edited from the edition form. When starting the option editor mode, the following Building Generator is opened. Easy editing can be done on this form. Click OK after edited to apply the changes directly.



Saved objects can be treated as 3D models. Click on an object in the 3D view to display the Model Tool. It is possible to change the position (horizontality and height) and rotate angle.

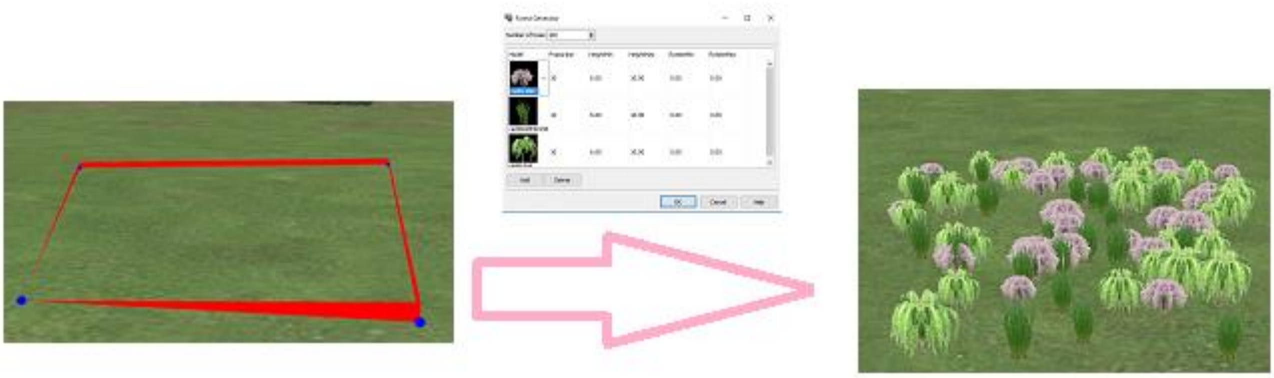


The Model Editor form will be displayed when the Edit button in the Model Tool is clicked. More detailed model editing such as model type, slope angle, and scale is available.



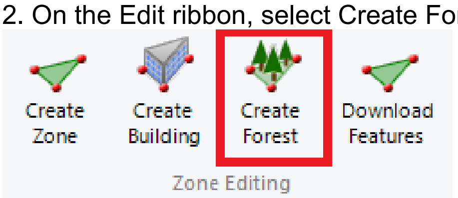
Forest creating (Zone Editing)

The forest creation function using zone edition function is a function to create forests in a specified area on the UC-win/Road. The forest can be created by putting trees within the area specified using zone edition function.



There are two methods to create forests.

A. From the ribbon menu
1. Start the UC-win/Road and create forests.
2. On the Edit ribbon, select Create Forest in the Zone Editing group.

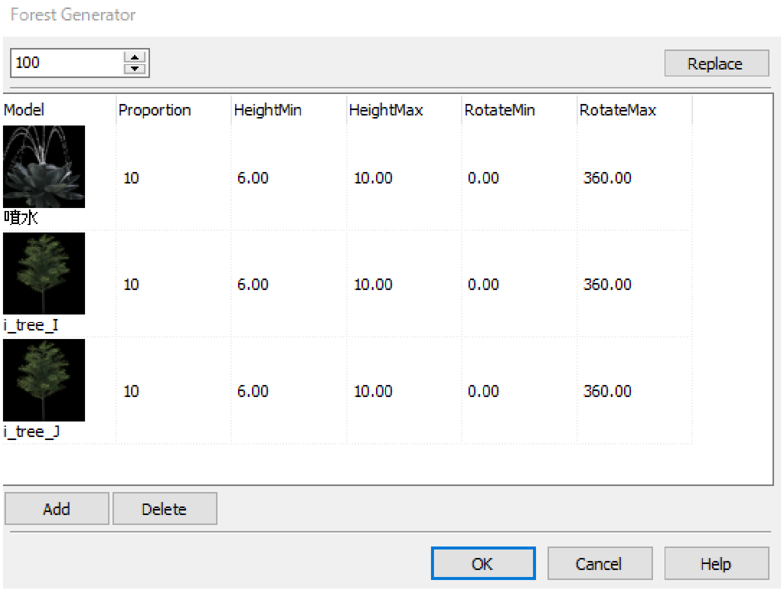


3.After selecting it, the forest creating function is started and it changes the mode to the area creating mode. Specify an area to create a forest.

B. From the existing zone
1.Click the "Create Forest" button in the "Zone Editor" for the zone already created.
2. Specify the area to create the forest. Click on the vertices of polygonal area to create the forest in order.
3. After specifying the forest creating area, press the [Enter] key. Then, the area creating mode is finished, a forest made in initial value and the "Forest Generator" is displayed.

Hint
Selecting a placed forest tree opens an edit screen for the selected tree. The position, display angle, etc. can be edited individually on this screen.After adding the tree, inputting the attributes and clicking "OK" button, trees are

placed in the specified area at the rate specified.

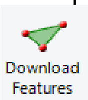


Download features (Zone editing)

The download feature function is one of the zone editing function that creating zone on the specified area in the UC-win/Road, in which we can download to arrange building and forest models defined by OpenStreetMap on the internet.

There are 2ways to import zone information.

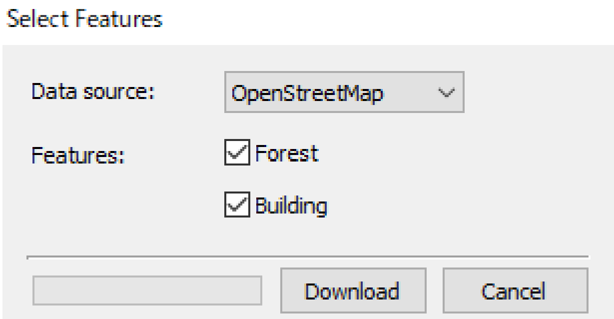
A. Download features from ribbon menu
1. Start UC-win/Road and create a project.

2. Click Download features 

on the ribbon menu to start zone creating mode.
3.Specify the area where to get infromation. Click on the vertices of polygonal area in order.

B. Download features from zone editor
Open the Zone Editor form the existing zone and click "Download features" button.

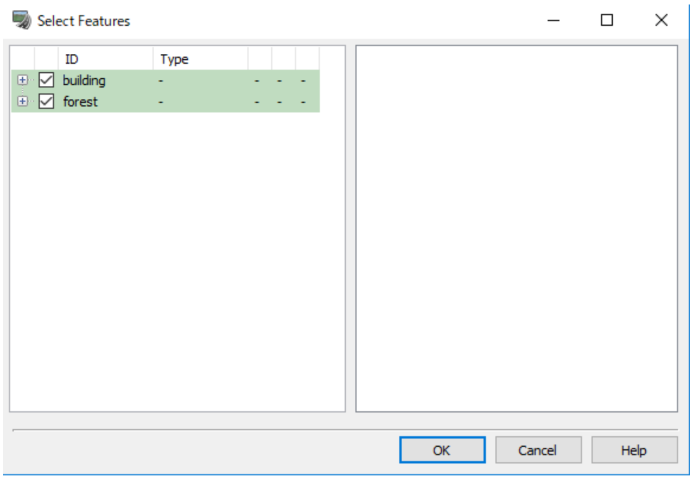
After creating a zone, select features to be downloaded.



Edit objects to generate
After downloading the features, the "Select Features" form is displayed, on which there is an features list generated with the initial value. Using this form, it is possible to edit a object to be imported finally.

Add building object to library
A building object created using OSM(OpenStreetMap) import function is not added to a model library by just creating it. To add it to library, select it severally and click OK inthe "Model Tool" form.

Select Features Form
After downloading buildings or forest infromation, a form is opened to select objects used on UC-win/Road. On this form, choose to save generated objects(on a project) or not and edit the namesand the parameters. Parameters can be edited in the same way as forest creating and building creating.
Click "Download" button in "Select Features"form to display objects with default settings and the object list.



Object list(unfolded)
Open Category to unfold the list.
The selected object on Model list is displayed with hilighted colour.

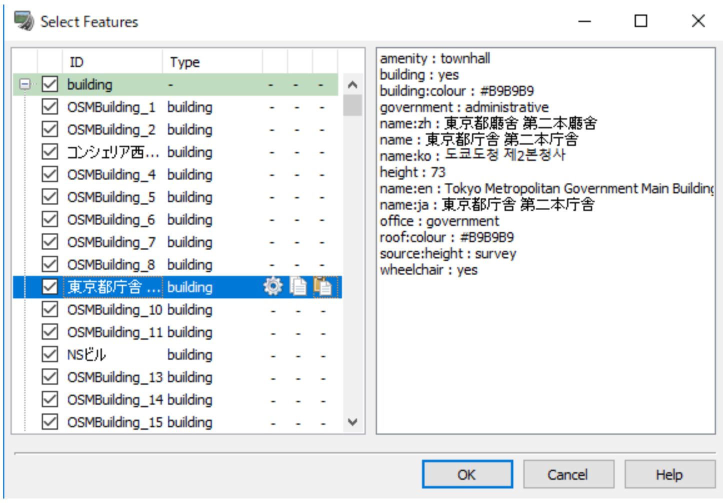
▼When selecting a building object

▼Whenselecting a forest object

Save
Save the objects or not by checking or unchecking the checkbox in object list.
When unchecked, the model is hide temporarily on the main screen. And when checked again, it is displayed again. check/uncheck a category name to select all objects of the category together.

Rename
Click the name column on Object list to reename.

Editing objects
Click the setting button ( icon) on object list to edit the selected object.
But the model is unchecked, it is uneditable.
When clicking a setting icon of forest type object, the same editing form as forest creating function is displayed.
When building type object, the same editing form as building creating function is displayed.



Copy

Click the Copy button (icon) to copy and retain the editing infromation of the object list. One infromation per model type can be retained.

Paste

Click the Paste button (icon) to overwrite the editing information.

Object information

Select a object on object list to display the object information on the right window.

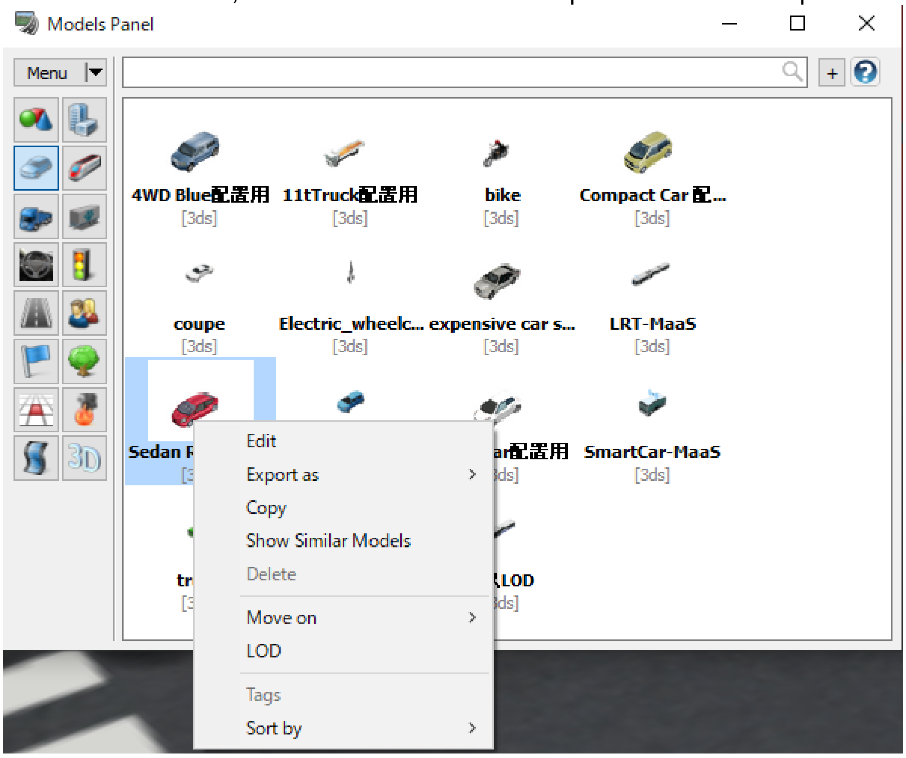
Parametric model

It is possible to generate parametric models. Open the model panel from Home Ribbon - Edit tab - Library.

Models panel

Loadable objects: Signs, Stairs, Escalators, Polygonal column (prismatic column and cylinder), Ladder, Wall and Barrier

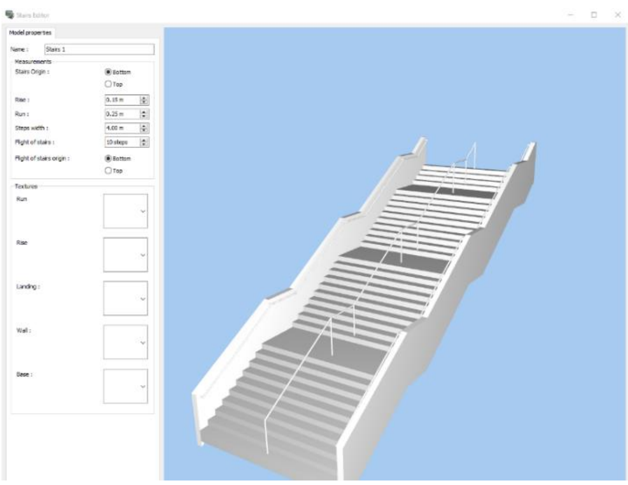
Go to New – Model, select a model to load. It is possible to edit the parameters from the right-click menu.

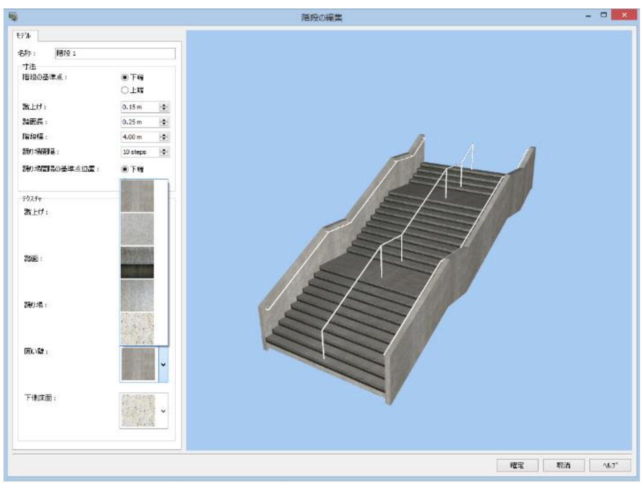


Editor

Example: Editing newly created / loaded stairways.

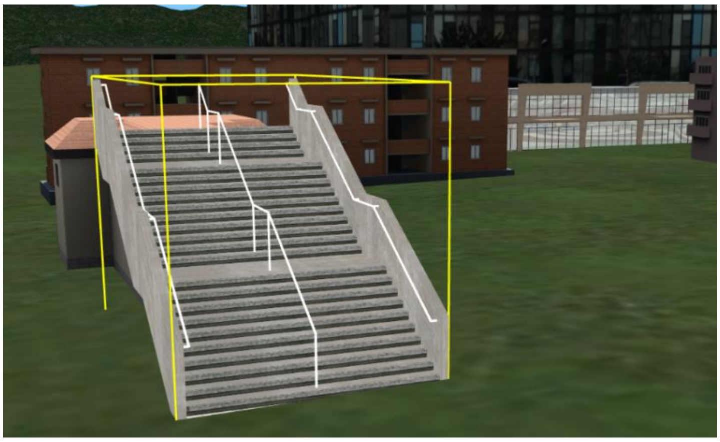
Set the staircase reference point, kick height, tread length, landing spacing, and texture for each section.

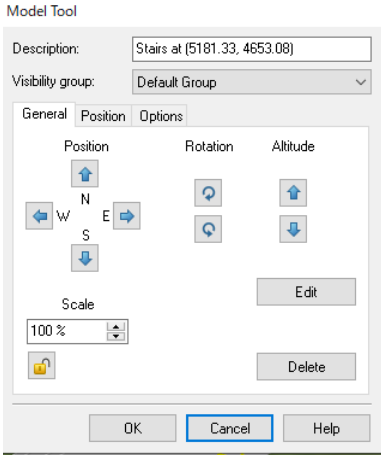




Arrangement of parametric models

Select a model and click on 3D space.

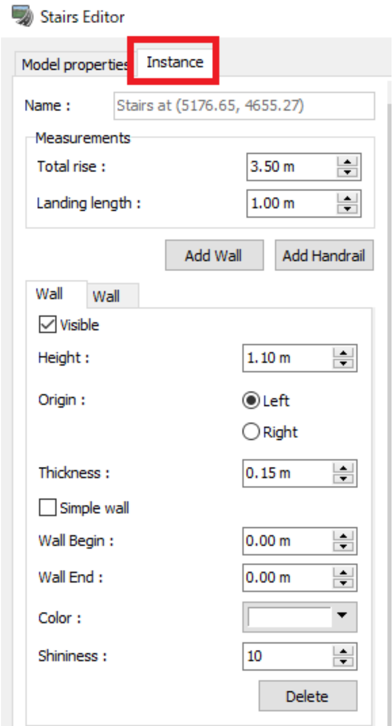




Click Edit on Model Tool to open the Editor again.
On Instance tab, check "Apply changes to all instances which share the same model" to apply them to all instances of this model.

Instances tab

On the Instance tab, the entire height and the depth of the landing can be set and the stairs can be customized by adding, editing and deleting the wall and handrail. Please refer to Help for the setting parameters.

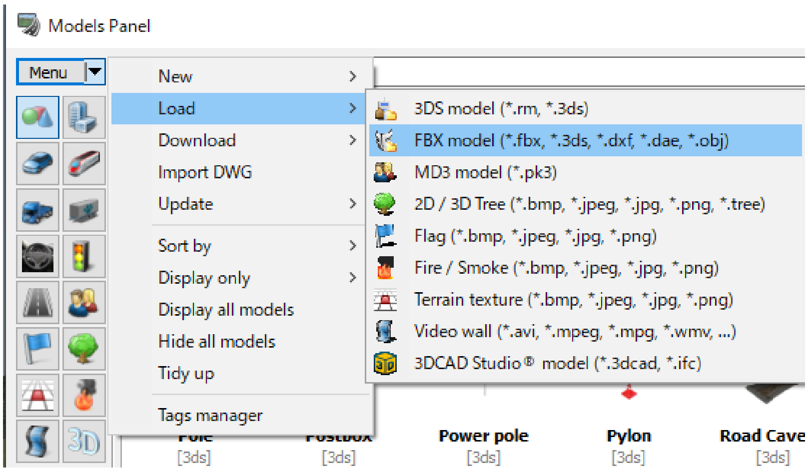


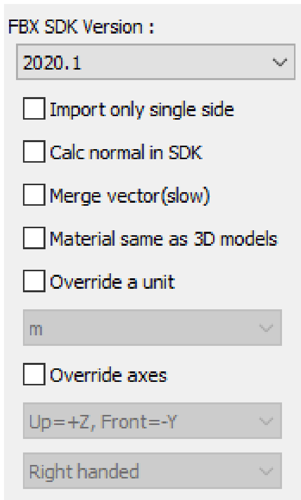
FBX Scene

UC-win/Road supports high accuracy FBX file.
It can be imported and edited from Edit - Scene - Library - Model Panel - Menu – Load and Download.

1. Load FBX file

Load or download FBX scenes (.fbx). The new model is registered and added to the model panel.
Supported file types: FBX (*.fbx), 3DS (*.3DS), DXF (*.dxf), Collada (*.dae) and Alias OBJ (*.obj).



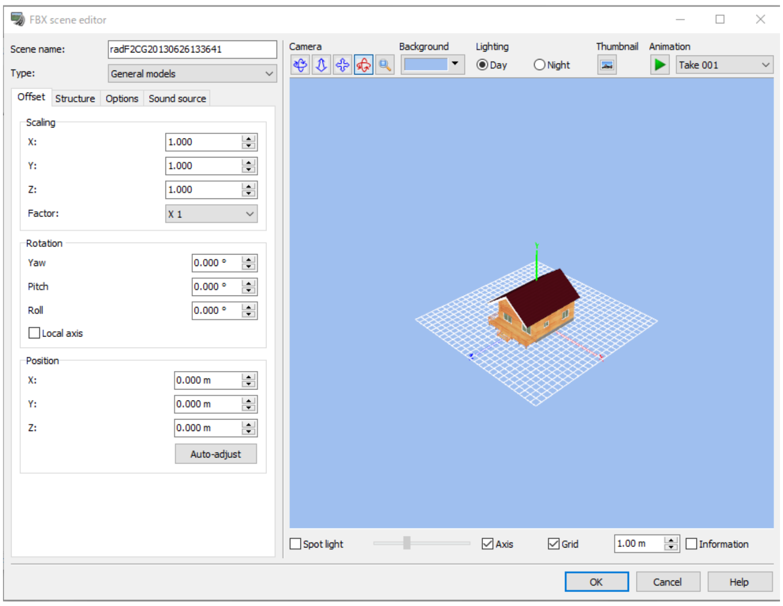


On the import screen, check the import settings if necessary.

2. Edit FBX file

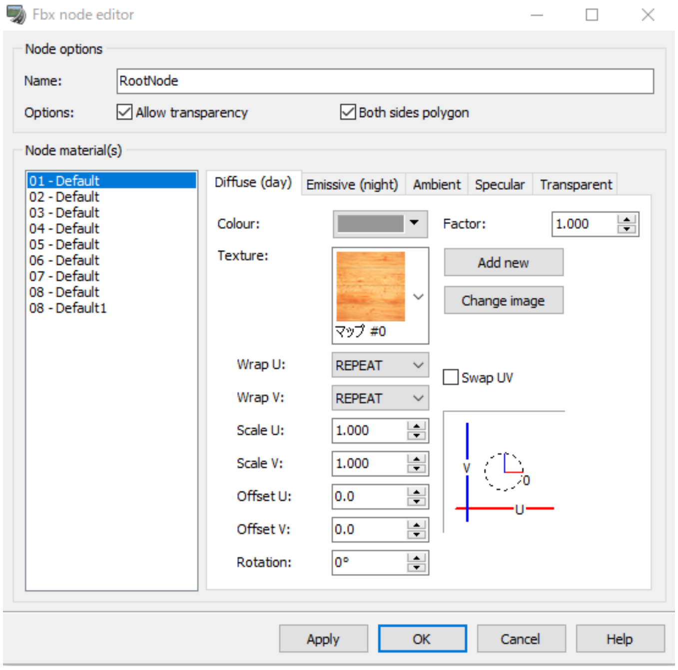
Edit FBX model on FBX scene editor.

Set the position, orientation, and scaling offsets for the scene on the Offset tab.

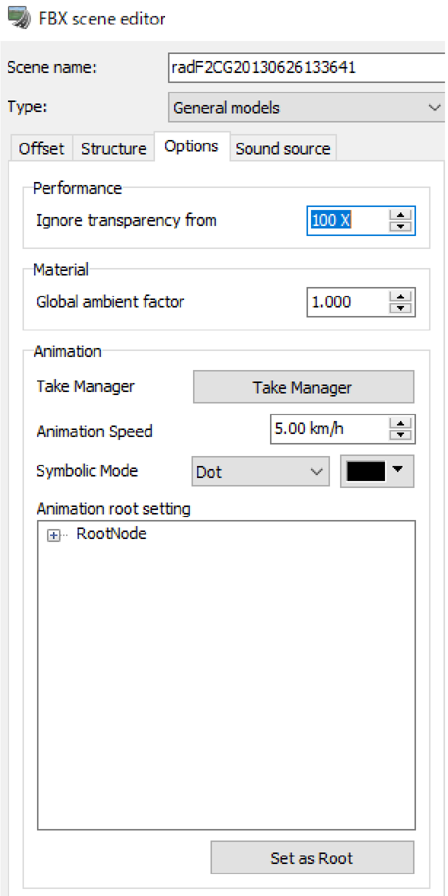


On the Structure tab, expand the structure and click  to open Fbx node editor.

There are four types of channel: Diffuse, Emmisive, Ambient, Specular and Transparent.
Each channel contain the colour attribute, but Diffuse and Emissive channels contain the texture attribute.



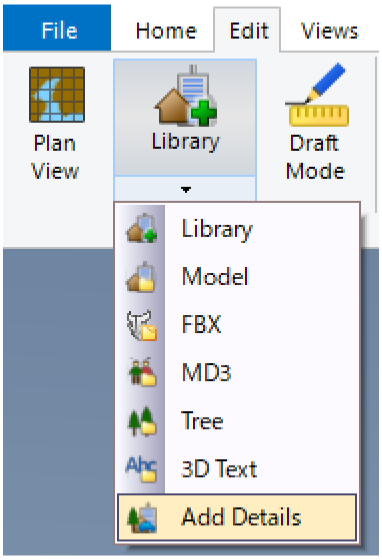
On the Option tab, set up the illumination rendering coefficient and animation for the scene.

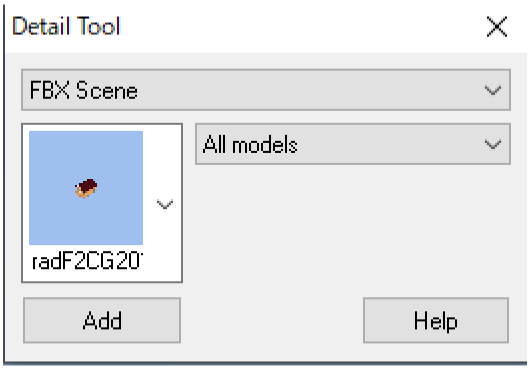


The Sound source tab is used when an FBX scene model is used as the sound source in a noise simulation.

3. Assign FBX model

The registered scene can be assigned from Add Drtails button.
Select a "FBX Scene" from the list.



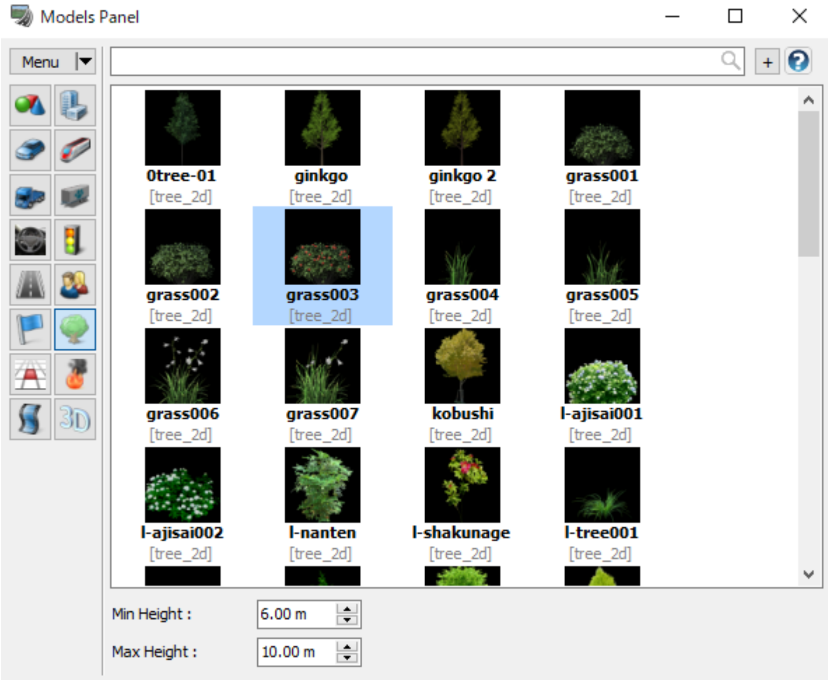


Texture Tree

it is possible to download materials of tree and arrange it.

1. Arrange

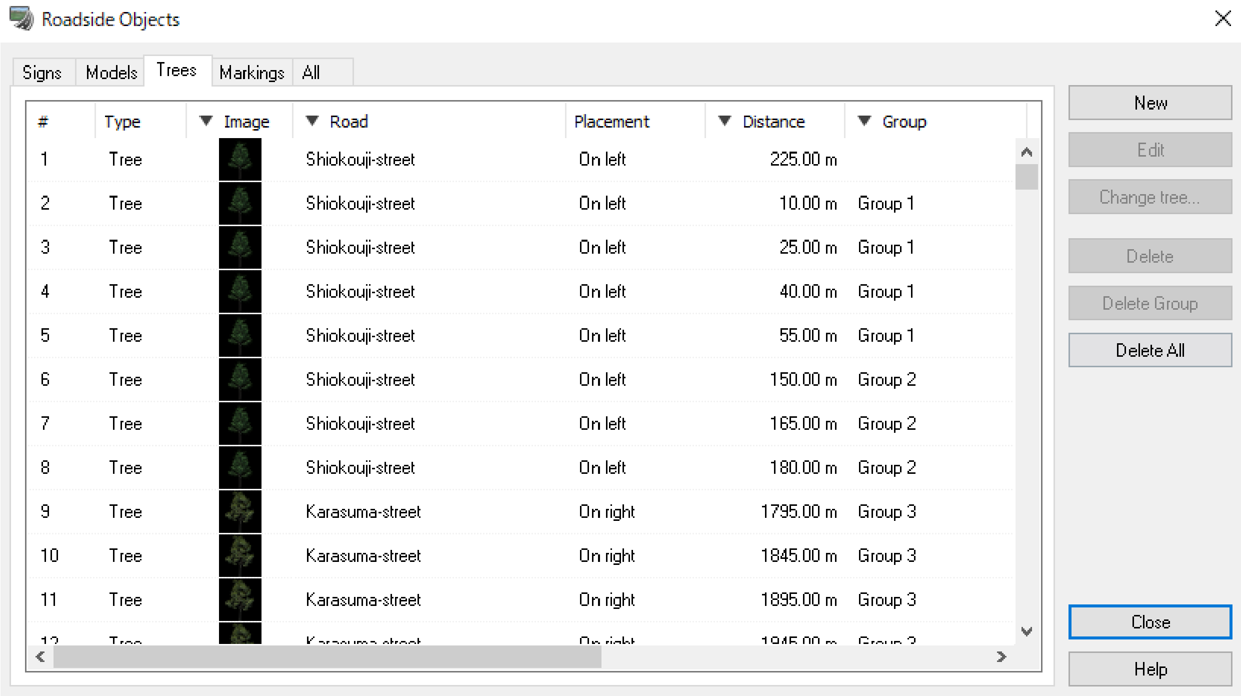
Go to the ribbon, Edit - Scene - Library - Model Panel - Menu – Load, Download, or click  .



Choose a texture from Model Panel. When the height of the tree is not specified, it is randomly set. After arranging it, It is also possible to change the size from Add - Model Tool.

2. Roadside Tree Editor

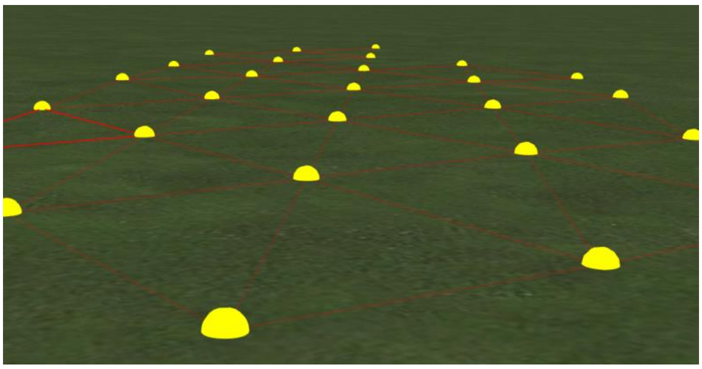
It is possible to place trees as a roadside model. Go to the ribbon, Edit - Road - Side Objects.

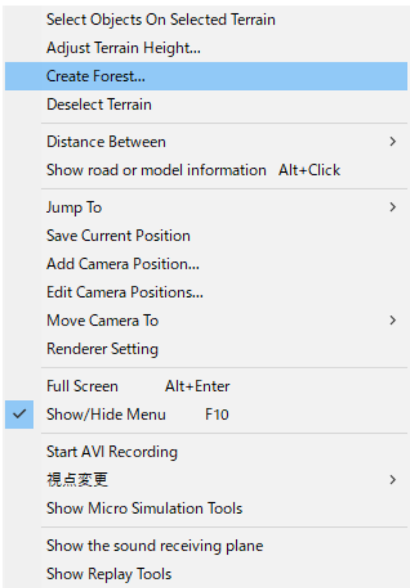


On the tree tab, select a model and click Edit, or double click on a model to open the editor.
Set up the following parameters: Road name, Distance (distance from the road starting position), Offset (distance from the roadside), Rotate, Height, dH, and side of the road.
On the Group tab, set up the following parameters: Number, Start Position (the distance from the starting point of the road) and Spacing.

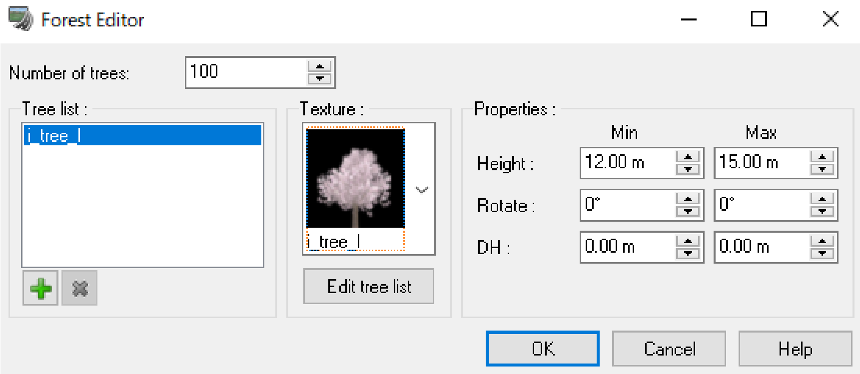
3. Create forest

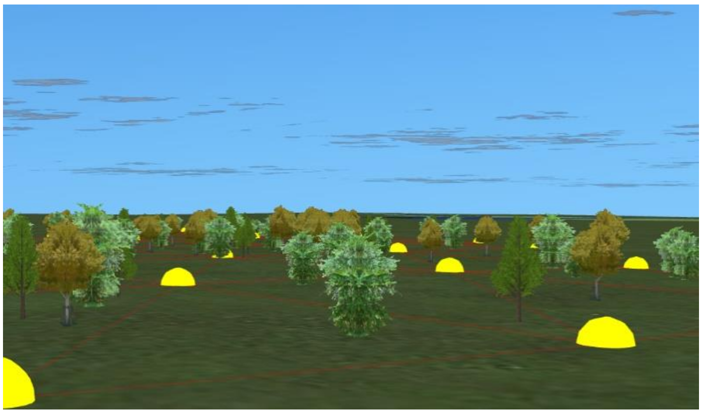
Clicking more than one points holding Ctrl key and go to "Create Forest" on the right click menu.





On the editor, set up each parameter. Click OK to generate forest.



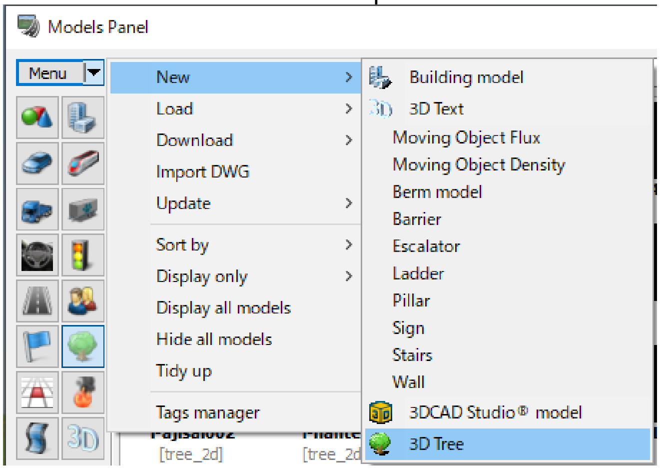


To delete it, hold the control key while selecting the terrain area, then right-click to open a menu and click Delete Selected Trees.

3D Tree

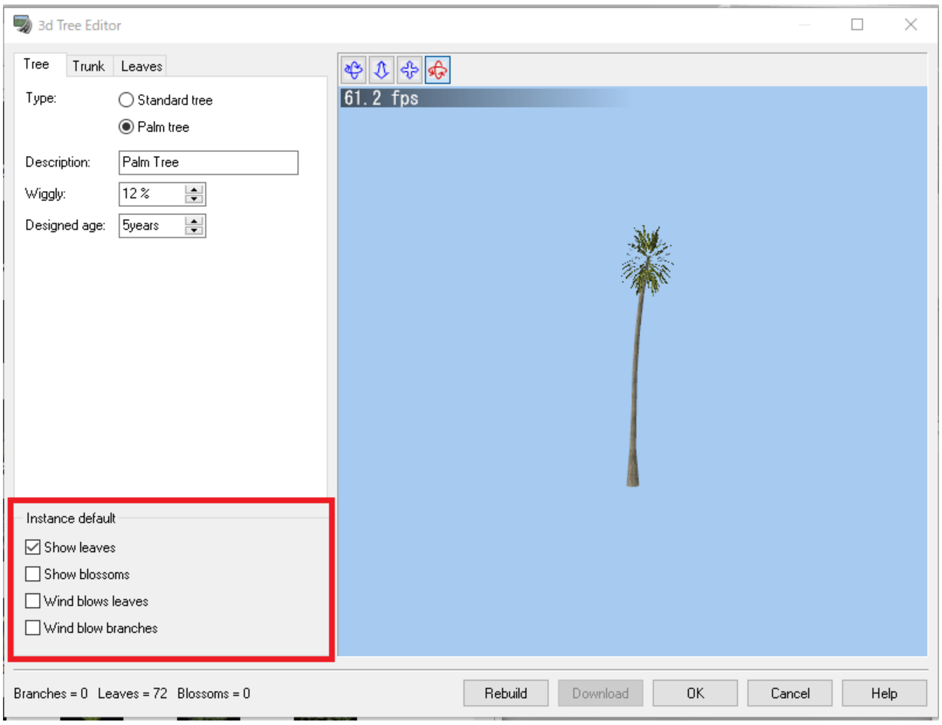
1. Register and Edit

To create a 3D tree newly, open the Models Panel by selecting the ribbon, Edit - Scene - Library, and select the menu. Go to New - 3D tree to open the 3D tree editor.



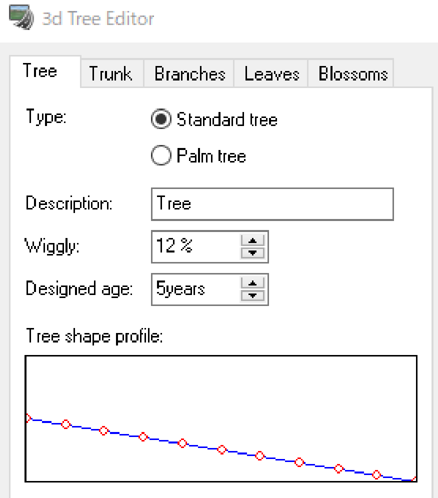
3D tree is roughly divided to "standard tree" and "palm tree".
"Standard tree" is composed of the tree, trunk, branch, leaves and blossoms.
"Palm Tree" is composed of the tree, trunk and leaves.

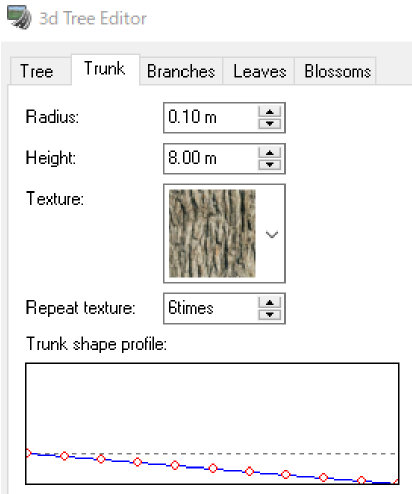
"Instance Default"
Check the following options as needed: Show Leaves, Show Blossoms, Wind Blows Leaves and Wind Blow Branches

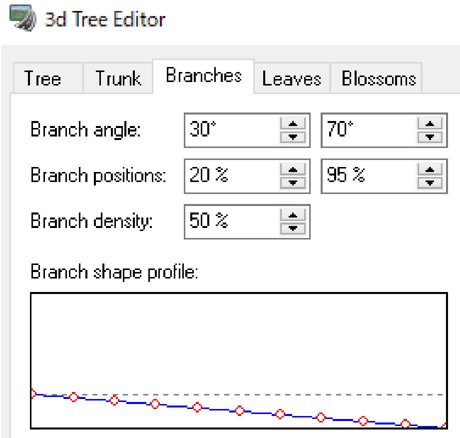


On the tree tab, set up the tree type, name, bend, and shape.
On the Trunk tab", set up the parameters of trunk.
On the Branches tab, set up the branch angle, positions, density.

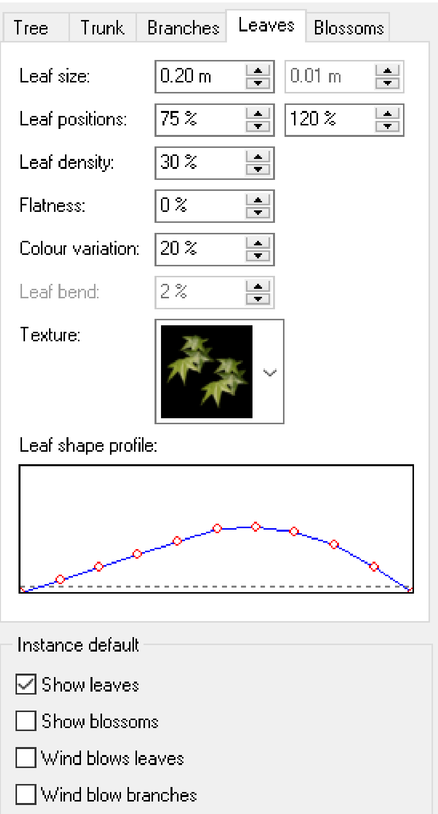
To edit the shape profile, drag the point.

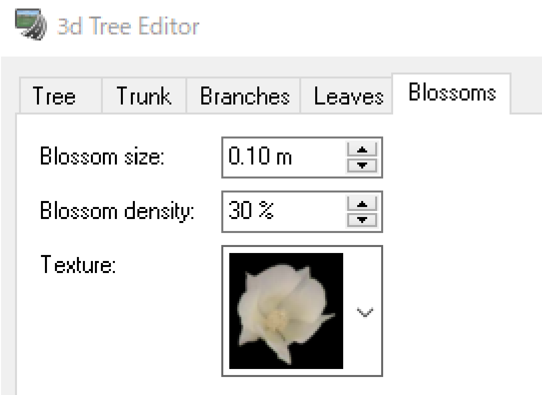






On the Leaves tab, set up the leaf size, positions, density, flatness, colour variation.
Check the following options as needed: Show Leaves, Show Blossoms, Wind Blows Leaves and Wind Blow Branches
On the Blossoms tab, set up the blossom size, density and texture.

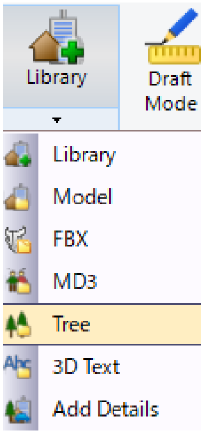




2. Load and download

On Models Panel, go to Load - 

or Download - 3D tree (*.tree) to load or download 3D tree.
Or click Edit – Scene – Tree to open Tree List Editor.



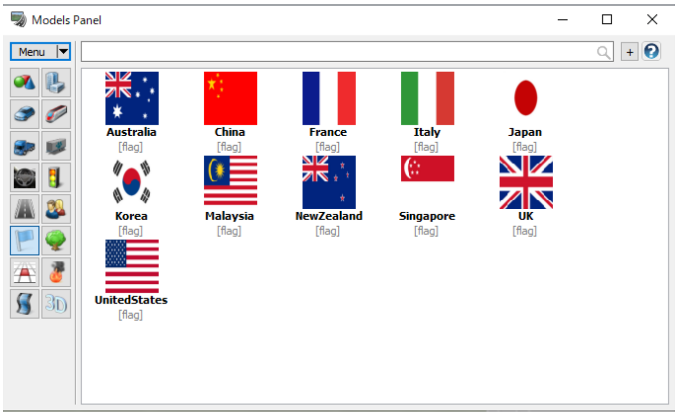
3. Arrange

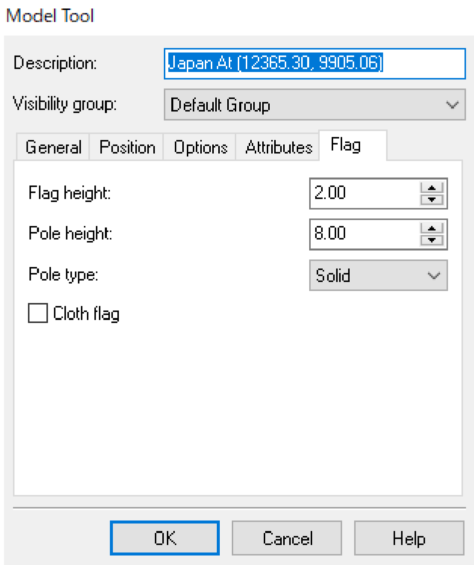
Select a model on Models Panel, and click on any points where to arrange it.
The arranged 3D tree can be moved with "Model Tool". It is possible to enable "Show Leaves", "Show Blossoms", "Wind blows leaves", "Wind blows branches" and "tree age".

Flag

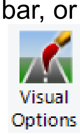
Go to Edit - Scene - Library - Model Panel to load or download a flag.

Choose a texture of the flag, and arrange it. Click it on main screen to change the size and the position on Model Tool.





Set the height of the flag and the pole.
Choose from "No Pole", "Line Pole" and "Solid Pole"
If "Cloth Flag" is checked, the flag will move more realistically according to wind speeds. Enable movement via the Environment button in the tool bar, or go Options - Environment Movement" 

. Also, it is possible to change wind speed on Visual Settings 

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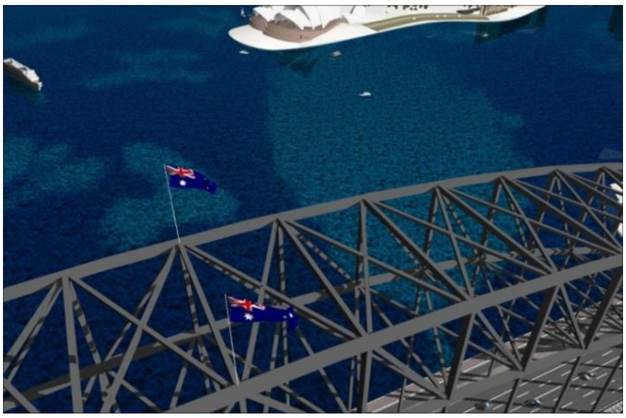
By assigning black colors to a part of the flag model, it is possible to have non-rectangular shaped flags

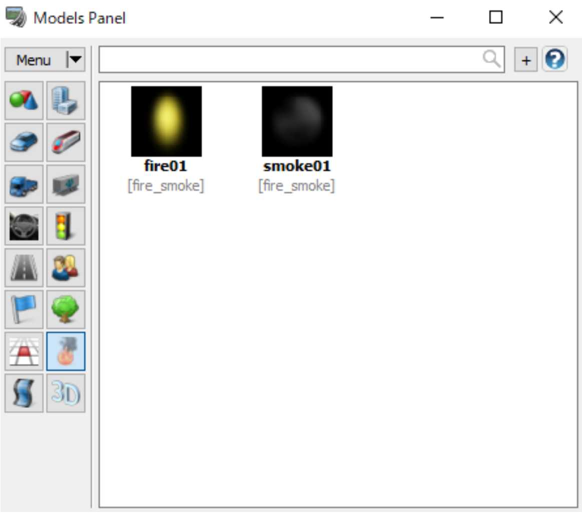


Fire and smoke

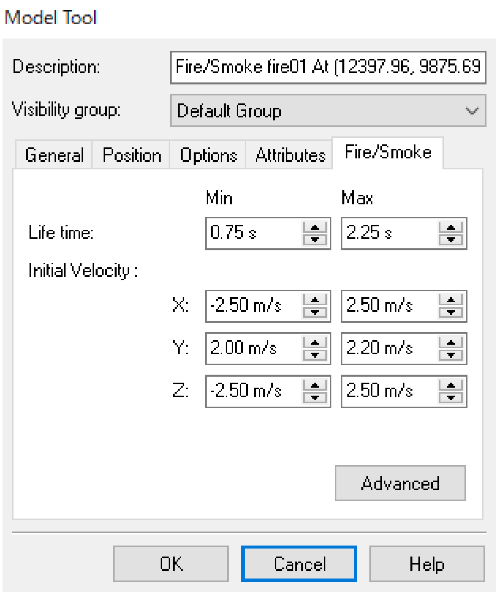
Fire and smoke can be visualized. Various phenomena such as flame, smoke, steam and sparks from a fire can be visualized.

Fire and smoke

Select fire or smoke from t Models Panel. 

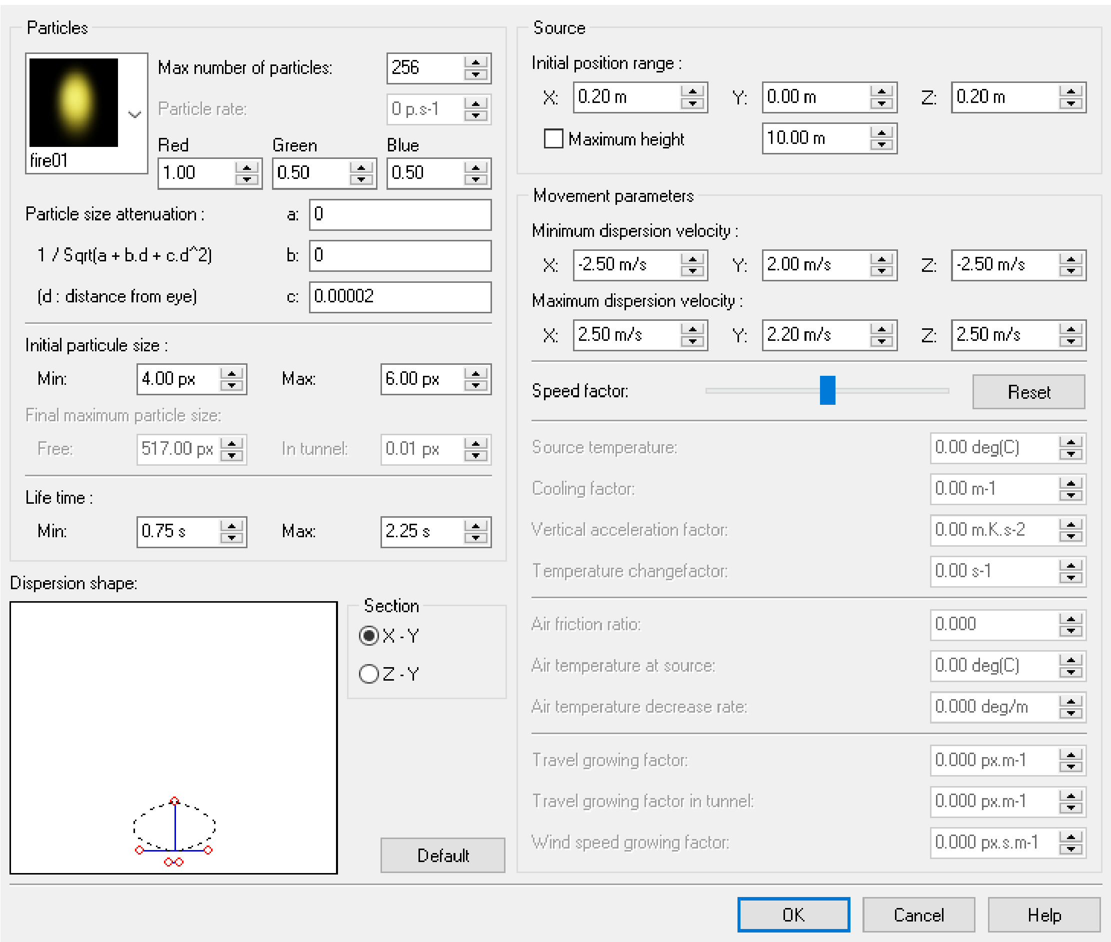


Once a fire or smoke texture is selected, the cursor will be changed to  . Click on a position to put a fire or smoke in the main screen. Texture of fire and smoke can be downloaded from our database.
It is possible to edit the life time and initial velocity of the fire or smoke already arranged.

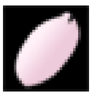


Click Advanced to open Fire and Smoke Editor. Please refer to Help for the setting parameters.

Fire and Smoke Editor



Petals and leaves falling from the trees and water splashing can be visualized by changing the texture of particles.



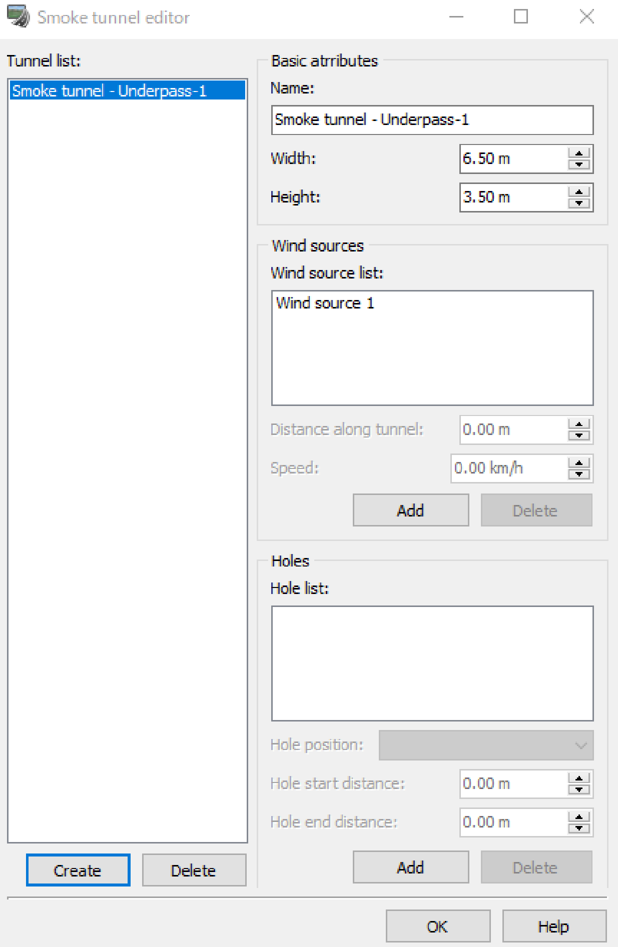
Smoke tunnel

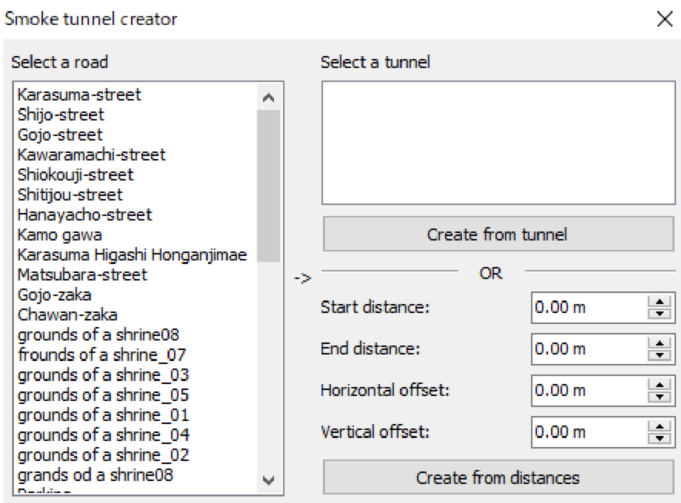
Smoke and fire inside tunnels can be visualized. Smoke tunnel has a rectangular section. If the source of the smoke is located inside a tunnel, the direction to which the smoke travels can be set arbitrarily. Furthermore, placing wind sources will allow the simulation of the behavior of smoke particles taking into consideration the wind direction, and then smoke particles traveling in the wind direction.

Go to the ribbon “Edit” - "Smoke Tunnel" – 

.

1. Click the "Create" button in the "Smoke tunnel editor" window to open "Smoke tunnel creator".





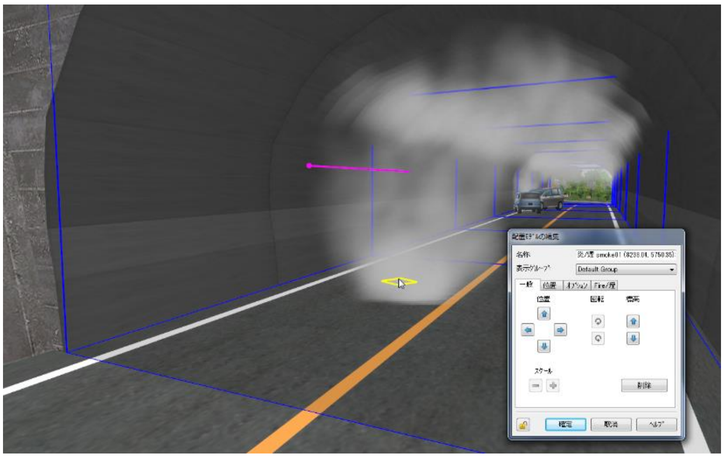
2. In the Smoke tunnel creator, select a road in “Select a road” list. Tunnel(s) that exists at a certain interval along this road will be listed under “Select a tunnel” on the right.
3. Select a tunnel from this list and click “Create from tunnel”.
4. Newly created settings will appear in the "Tunnel list" in the Smoke tunnel editor.
5. Click "Add" in the "Wind sources" box. Click a wind source item to set the position as a distance from the tunnel entrance. Wind speed can be set in km/h. Therefore; tunnel entrance is represented as 0m. Set a value bigger than 0km/h to add speed to wind.
6. Click the "Environment" 

button to place the smoke within the tunnel and move it in the direction been set. Smokes placed inside the smoke tunnel all move in the same direction.

7. Check "Smoke tunnel" on "Display" tab in "Visual Options" 

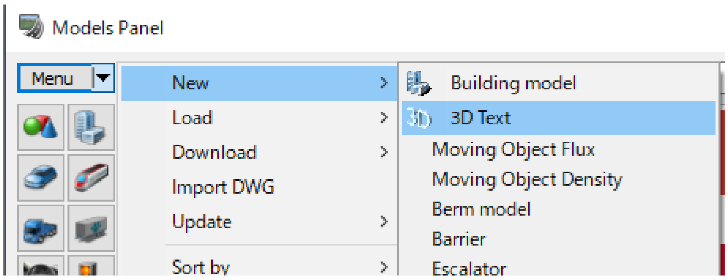
to show smoke tunnel with blue frames, and displayed the wind sources and wind direction in magenta. Click on smoke to appear a yellow lozenge in the area.

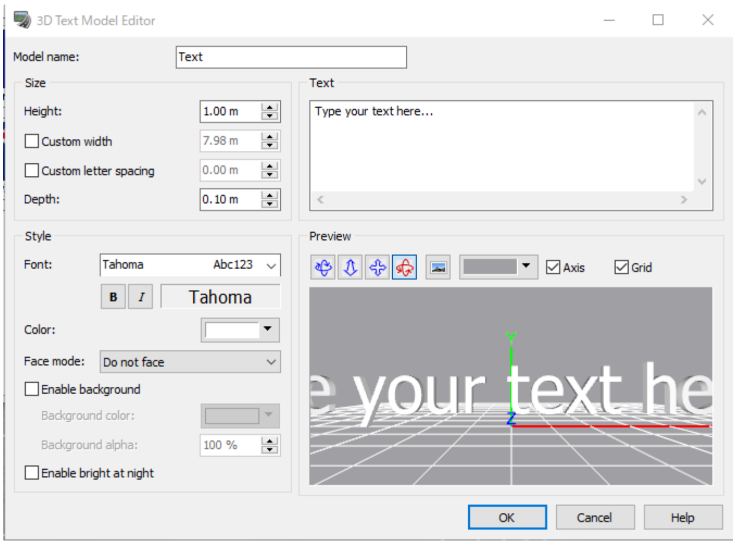


*If the smoke does not move in accordance to its settings, it may be partly buried. Increase its altitude a bit to move the way that it has been set to move.

3D Text

3D text can be placed on the space.
Go to Edit - Scene - Library - Model Panel - 3D text.
Enter a text and define settings on 3D Text Model Editor. Click on a position to place it.
If Face to camera is checked, the model can be rotated along the view point.

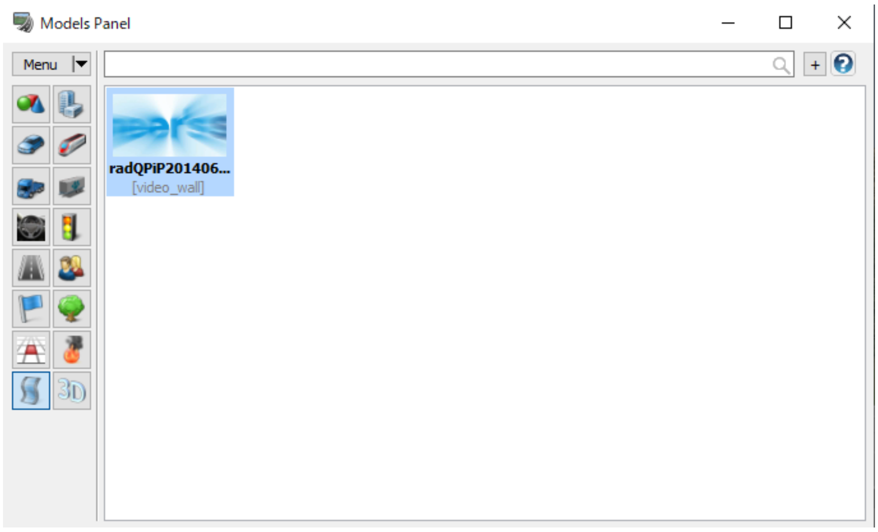




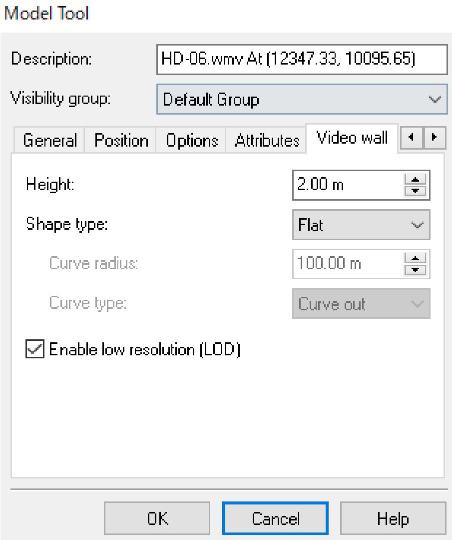
Video Wall

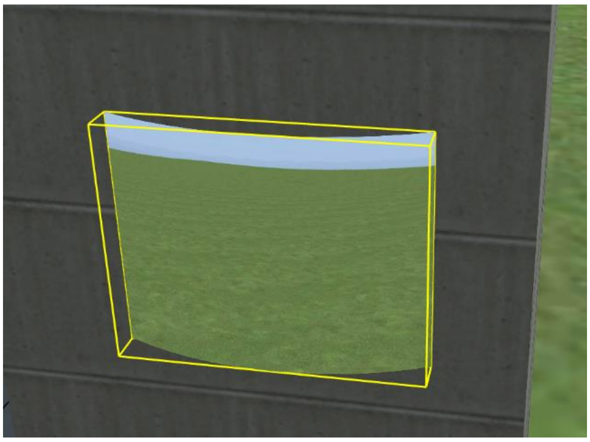
It is possible to place a video wall, which represents an electrical bulletin board.
On the Model Panel, go to Menu – Load or Download – Video Wall on Models Panel, select the video wall and click at a point to place it on.

Available video file extension: Avi, mpeg, mpg, wmv, mp4, mov, flv, f4v, mkv, mts, m2ts



Click it on the main screen to open Model Tool. The position can be set as the ordinary model. The height can be set from [Edit model]-[Video walls] form.





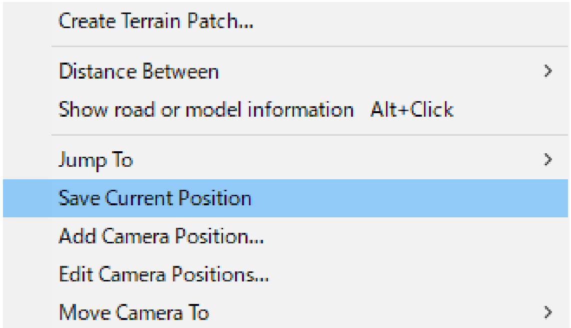
Turn on "Environment" 

to play the video.

Switching between Viewpoint Positions

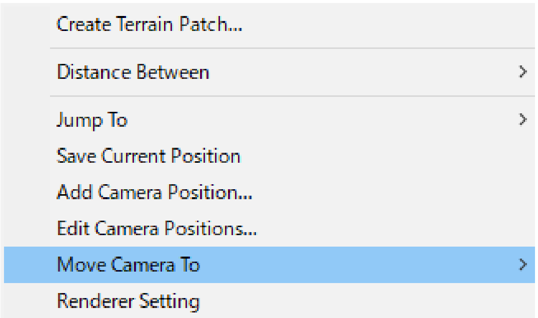
It is possible to change, save and edit viewpoints. Also it is possible to switch between them.

1. Save Current Position



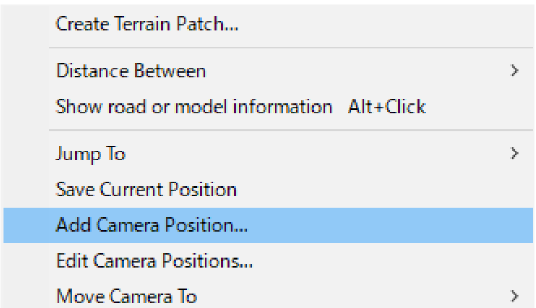
Right-click in the main window to show the pop-up menu and select "Save Current Position".Or from the main menu, ribbon Home – Camera Position - Save camera position. 
The current camera position is saved as "Camera Position x".
Several camera positions can also be saved. The numeric keys 1 to 0 are automatically allocated to the first ten saved camera positions.

2. Move Camera To



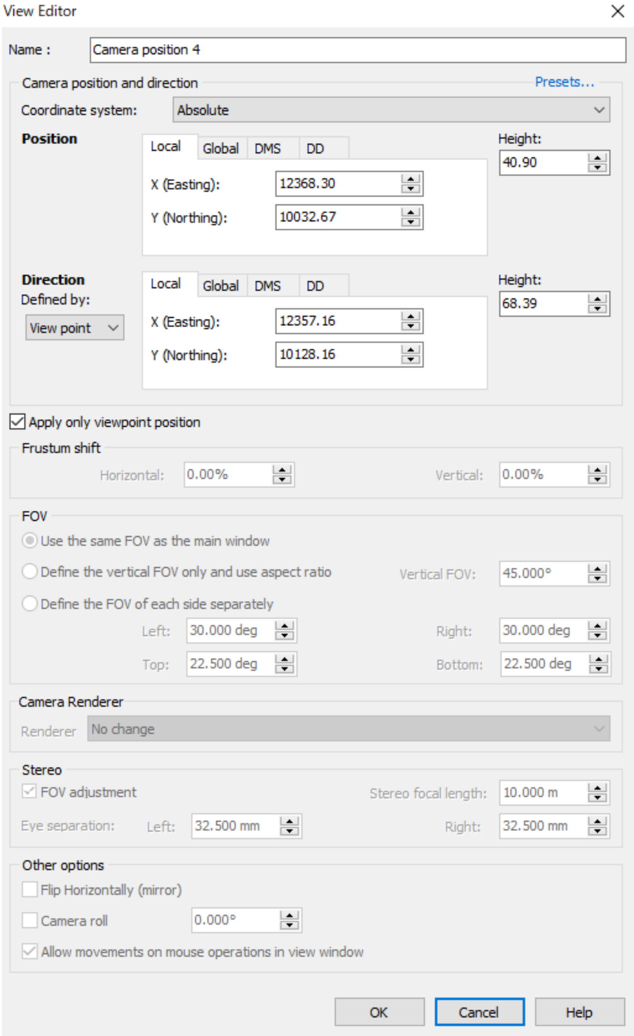
Right-click in the main window to show the pop-up menu and click Move Camera To to show a list of the saved camera positions.
Or from the main menu, select one of the camera positions in the combo box from Home – Camera Position.

3. Add Camera Position



Right-click in the main window to show the pop-up menu and click Add Camera Position… or go to Home – Camera Position and click  to save the current camera position. The "View Editor "is opened, where it is possible to set up the details.

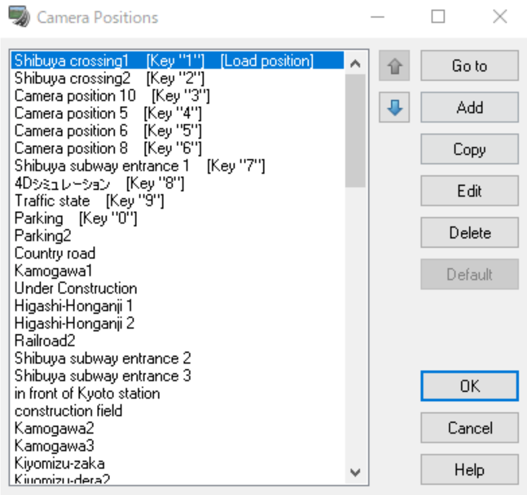
Refer to Help for the settings



Example of mirror

4. Edit Camera Positions

Right click on main screen and go to Edit camera positions. Or go to Ribbon Home – Camera positions and click .



5. Output landscape

The screen can be output to printer and file.

・To print: Go to ribbon [File] - [Print]

・To output: Go to ribbon [File] - [Save current image]

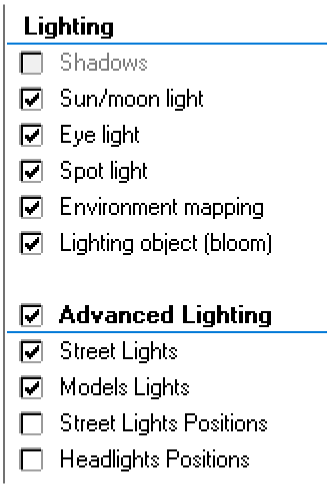
Mancellcolor file (.mcs) can be exported at File- Export - Save to MancellColor file…
* The size of saved image is the same as the displayed area on a main screen.
* Refer to [Movie Option - POV-Ray] for output of POV-Ray file.

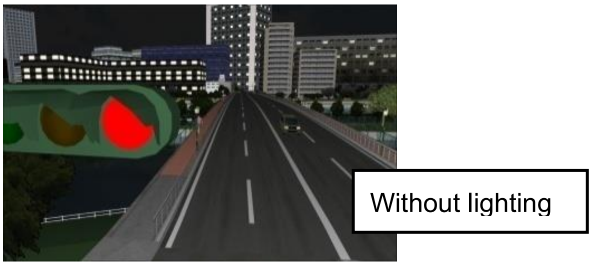
6. Saved camera view

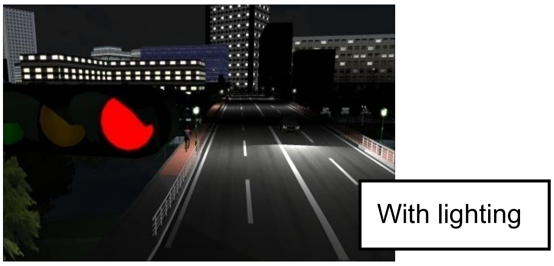
Open a new screen ("Saved camera view" screen) and display the image from the camera position which is registered by "Save camera position". By selecting several views, it is possible to view the image from various camera positions.

Lighting

On Visual Options, check "Advanced Lights" and "lighting object (bloom)".
Light effects use the Bloom function, which can visualize lights, such as traffic lights, warning lights and headlights.

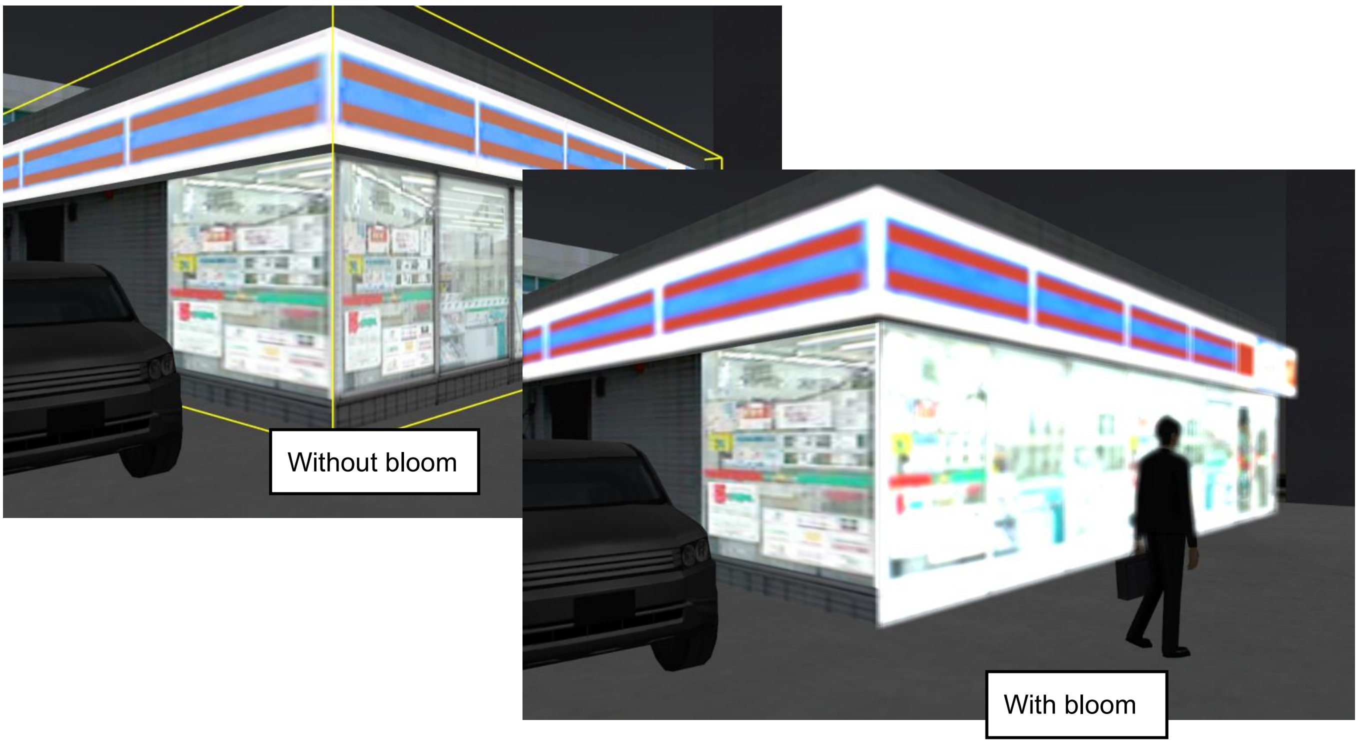






Bloom Function

Select the target model and open the edit window.
Select (a) texture(s) to add bloom on the Textures tab, and check the checkbox. The color of the bloom can be either the color you set or the color of the texture. It is also possible to enable bloom only at night.
The application of bloom to traffic lights and car blinkers and brake lights is only enabled when traffic flow is generated.



Headlight/Street light

Check "Advanced lighting" on Visual option to enable headlights and street lights.

Headlight

The headlights of the vehicle turn on. Generate the traffic flow, get on a vehicle by clicking and turn on the headlights.

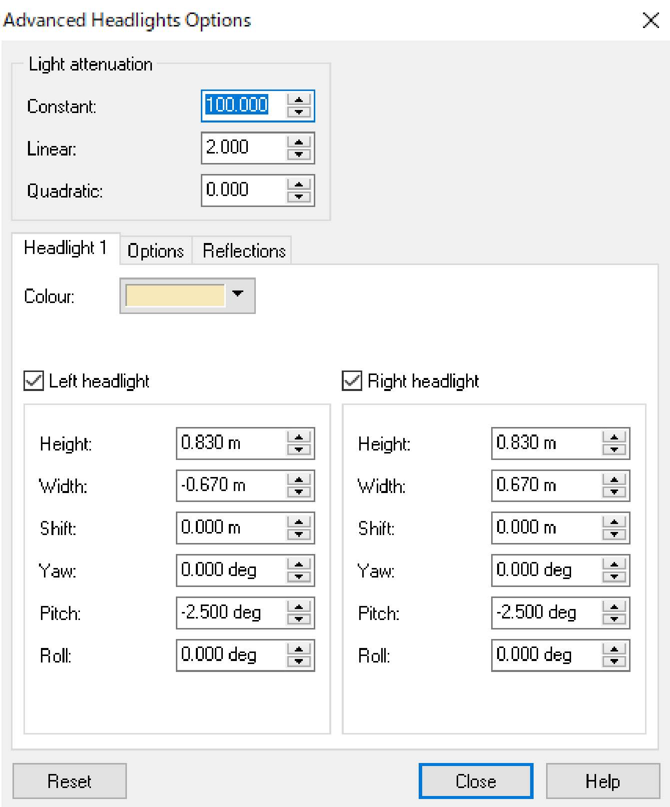
*The headlight lights turns on by driving 

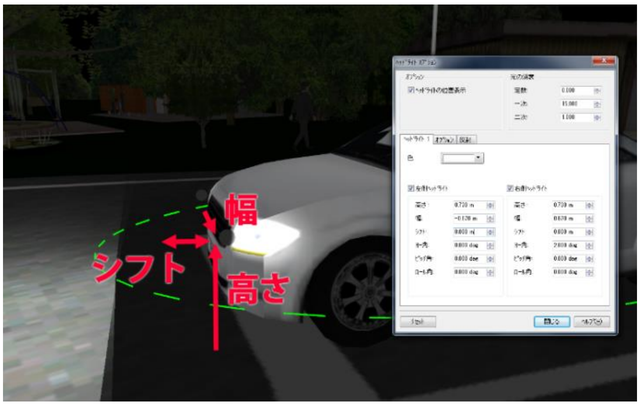
, too.
*Confirm the headlights by moving the aspect to outside the car using a mouse wheel or "Movement" tool
*If this button is not displayed, activate the menu "Options" - "Application Options" - "Toolbar" - "Headlight".

Click 

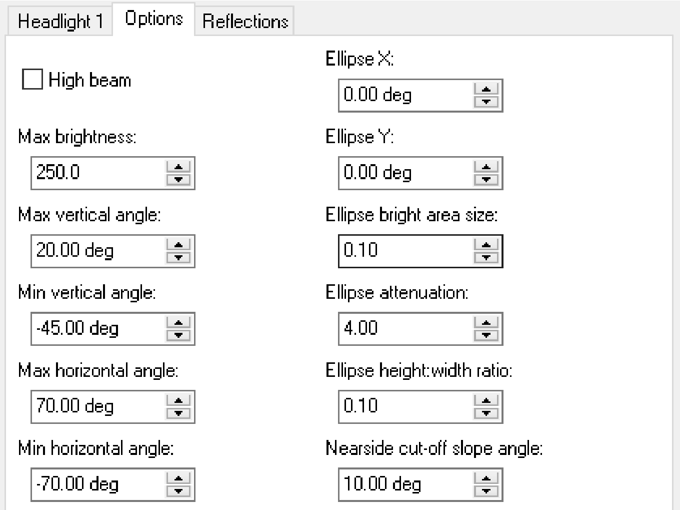
from Edit – Headlights.

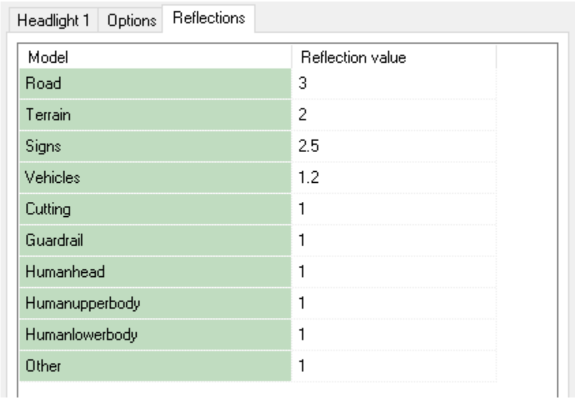
On the Headlight 1 tab, edit the positions and directions.





On the Option tabs, set up the following parameters: brightness, vertival angle, horizontal angle, elipseX/Y and etc. On the Reflections tab, edit the reflection values.

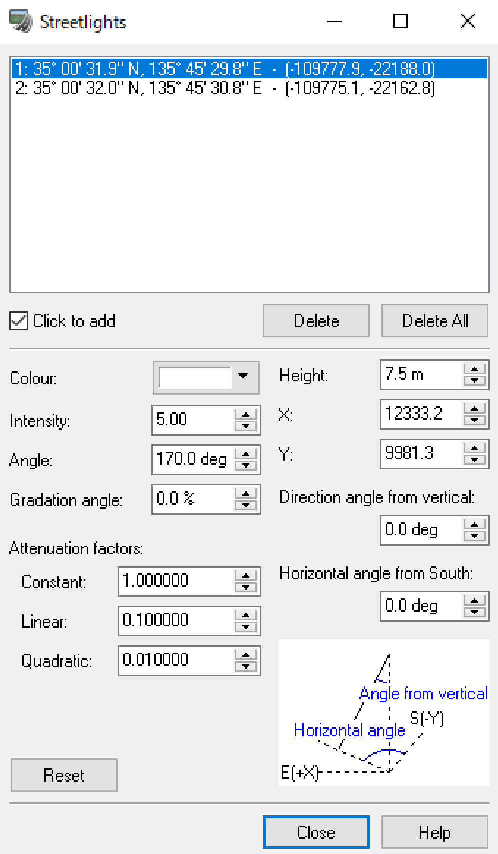


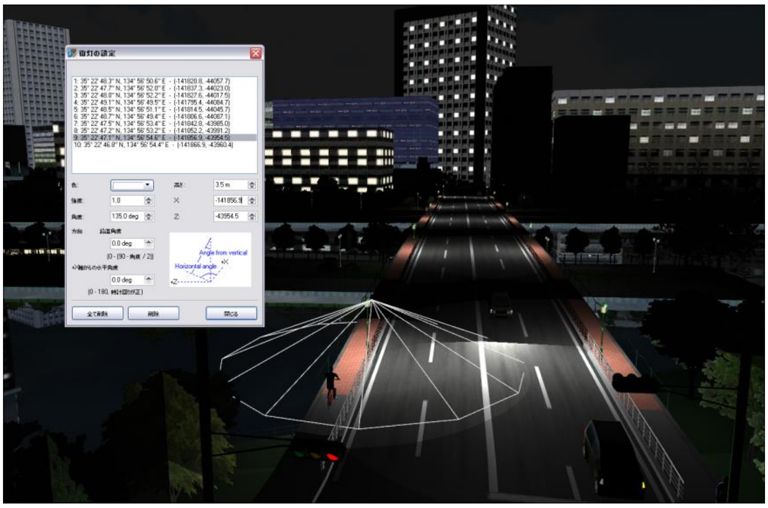


Streetlights

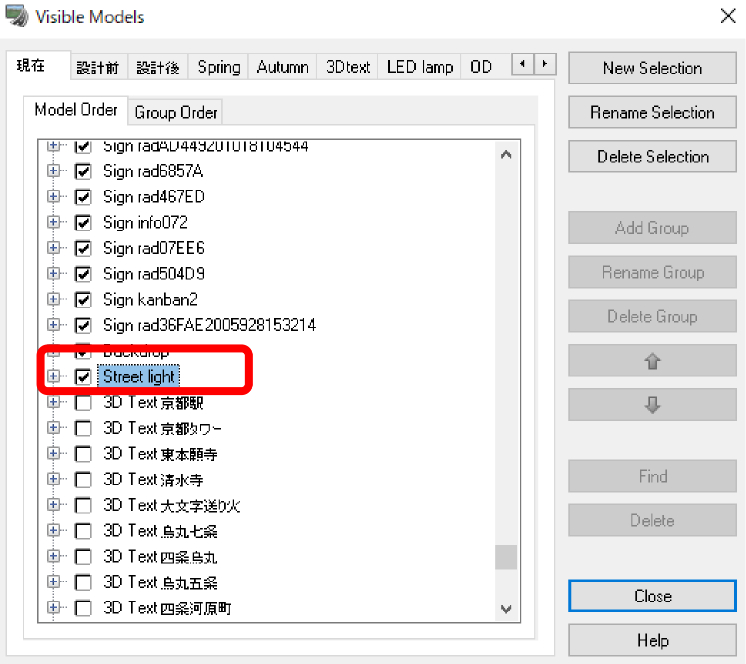
Click 

. And Click on a terrain or a road to arrange streetlights. The source of light can be edited by selecting the streetlight on the list. When arranging it on the terrain, the streetlights with the same parameters as the streetlight which was selected previously.



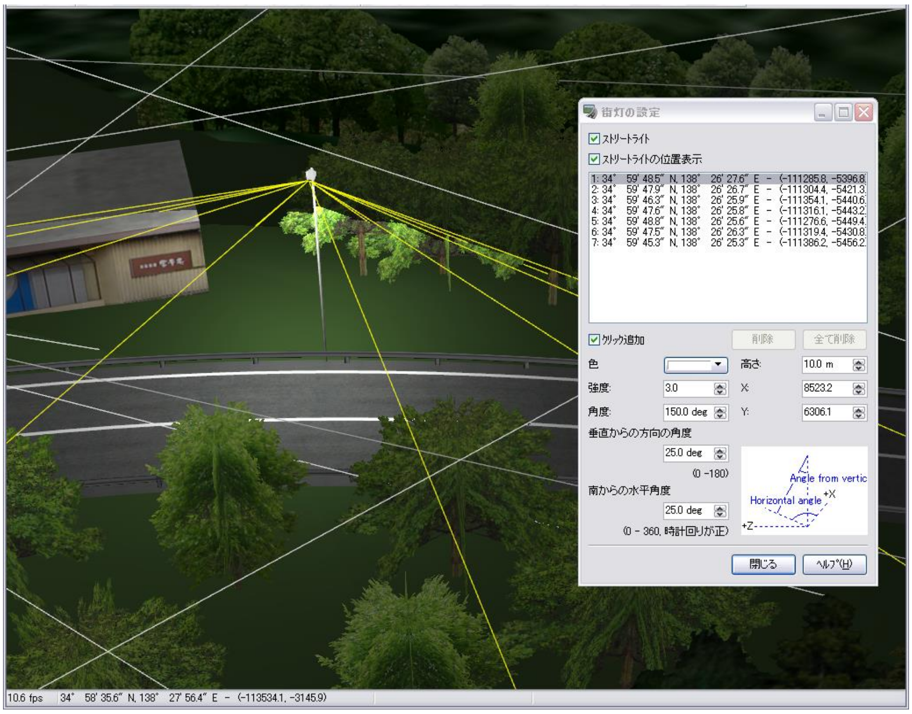


If streetlights are not represented as they should be placed, the "Street Lights" may be turned off as Visible models . Check "Streetlight" From Home – Environment – Visibility  .



The following settings can be edited;
・The color of light
・The strength of light
・The spread angle of light
・The position of the source of light
・The irradiation direction
*There is no absolute limit on the amount of light sources, but only about 50 of them closest to the main camera are rendered.

Turn on positional display of the street light to display the extension of light. And The selected light is displayed in yellow.



Basic - Railway

Definition of Horizontal line for Railway

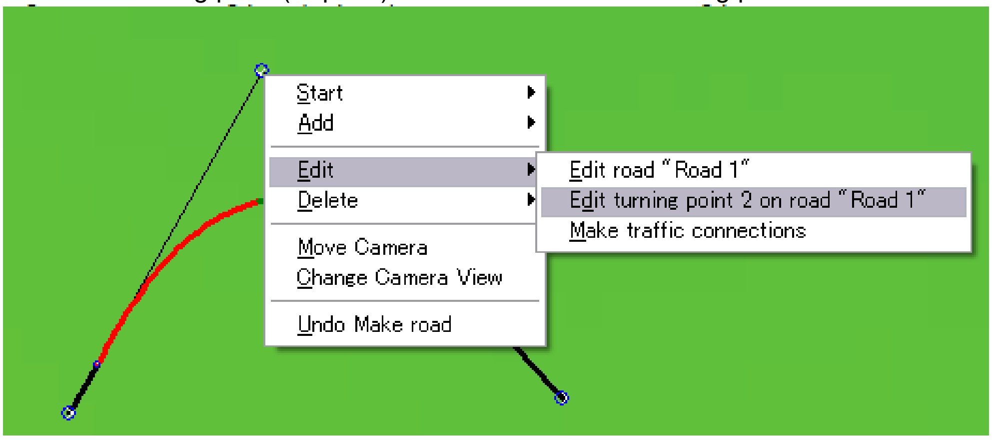
Define the horizontal line, the vertical line and section line for the railway on the UC-win/Road.

1. Simple method

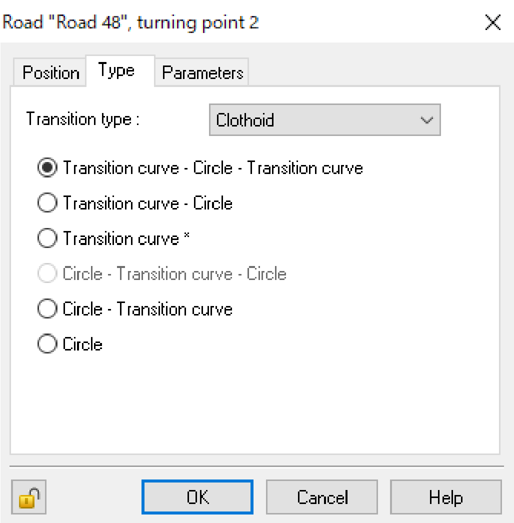
Create horizontal, vertical and section lines by creating road lines. Select cubic parabola and Sign half wave length curve used on railway line for transition curve used on the turning point of horizontal line. Select single line on vertical line.

(1) Horizontal line

In the Plan View, add start point, turning point1, turning point2, and end point. Refer to Definition of Horizontal Curve for detail.
Right click the turning point (IP point) and select Edit - Edit turning point.

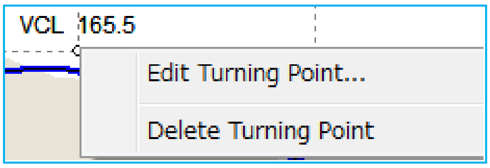


On the Type tab of Turning point editor, Select a Transition Type.

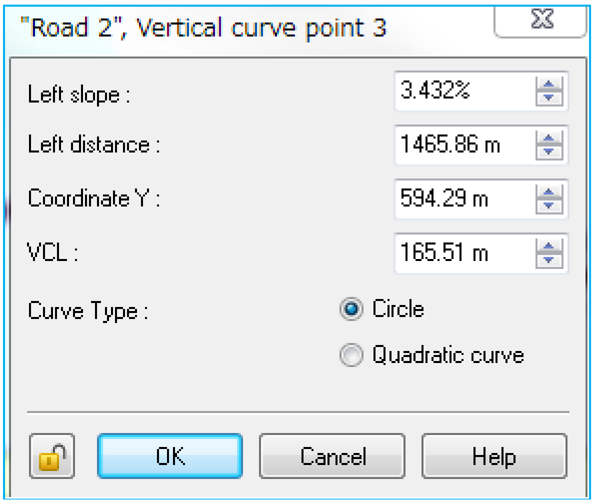


(2) Vertical curve

In the Vertical Curve Editor, add the starting point, turning point 1, turning point 2, and the terminal point. Then edit the added each turning point to form the curve. First double-click the targeted point or right-click it and select Edit Turning Point...



On the Turning point editor, select the curve type. The difference between the types is only how the curvature of the curve section changes. In general, the Quadric curve is used for the road and the Circle for the railway.



(3) Section curve

Define the section curve by the same method for the road.

2. Railway Definition in Details

Railway alignments consist of 3 elements: surveyed centerline (railroad), structural centerline (roadway) and track centerline (track). Each has its own horizontal alignment, vertical alignment, and section alignment, which are defined in the exact respective order. Track centerlines can have cants and turnout switches which lead to other tracks.
Basically, the track and the portion of the roadbed on which the track rides are defined by the track centerline and its cross section, and the roadbed, fill, cut, tunnel, and bridge sections are defined by the structure centerline and its cross section.

(1) Surveyed Centerline - Horizontal Alignment

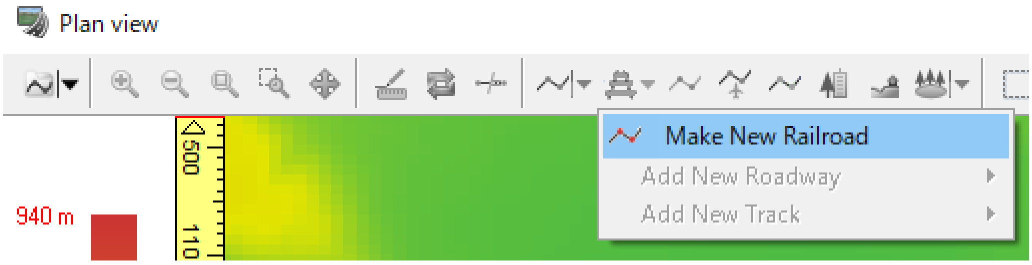
The surveyed centerline is the designed line for railroad construction planning, which is also used to indicate the railroad distance in reality. It consists of horizontal and vertical alignments, and it is not displayed in the 3D space

<IP curve>

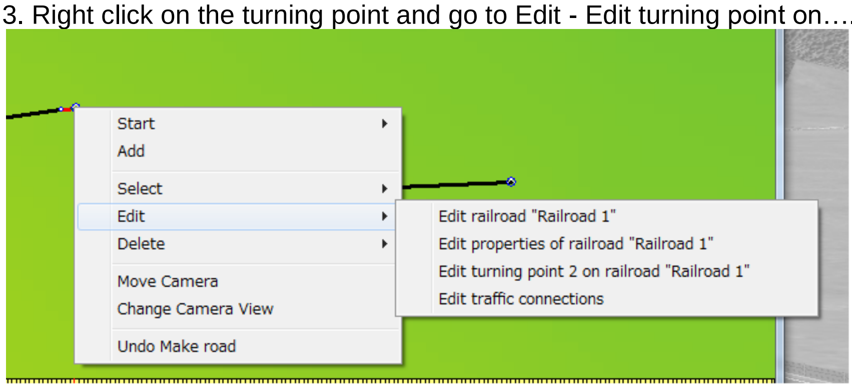
1. Open Plan View 

from a tool bar button or go to Edit - Plan View.

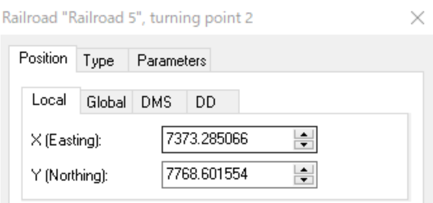
2. Click the railroad icon  and select “make new railroad”. Add a start point (BP), turning point(s) (IP), and endpoint (EP).

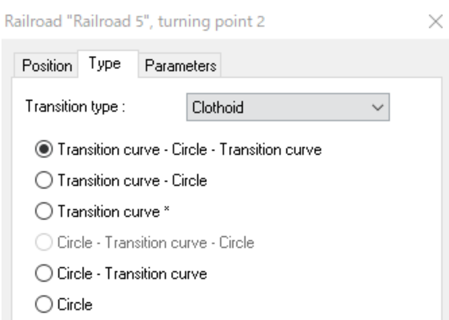


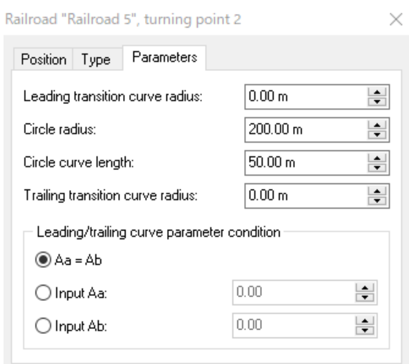
3. Right click on the turning point and go to Edit - Edit turning point on….



4. Specify the coordinates on Position tab (X-Y tab uses world geodetic datum).
5. Define the type of transition curve on Type tab.
6. Define the curvature radius and the length on Parameter tab.

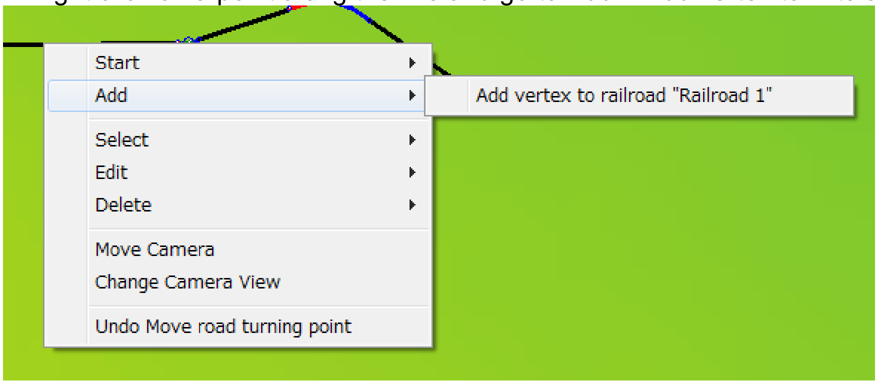




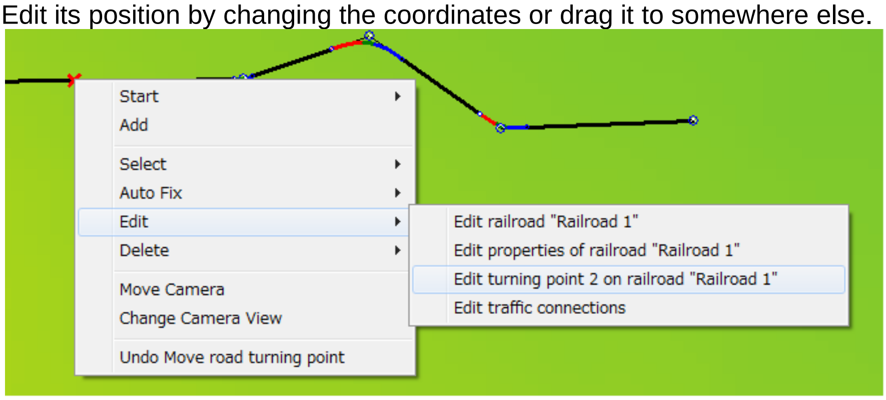


Repeat 4 -7 steps for BP and EP.

7. Right click on a point along the line and go to Add > Add vertex to… to add a turning point.

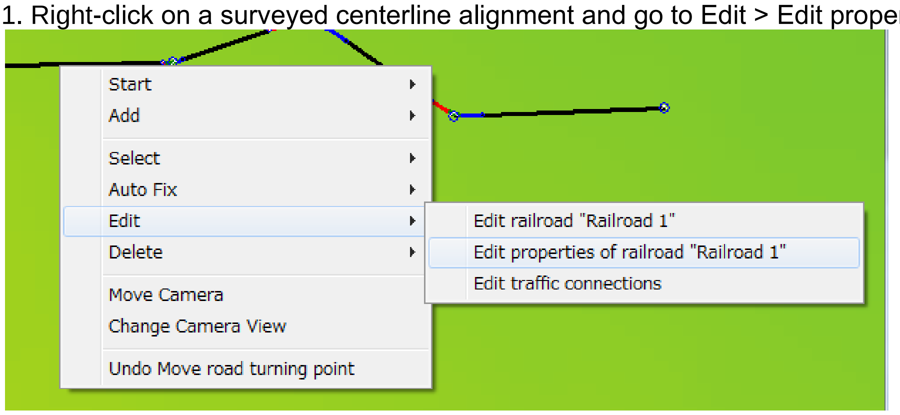


8. Click the added turning point to edit it. If it is displayed with a red X, it is too close to an existing transition curve. Edit its position by changing the coordinates or drag it to somewhere else.

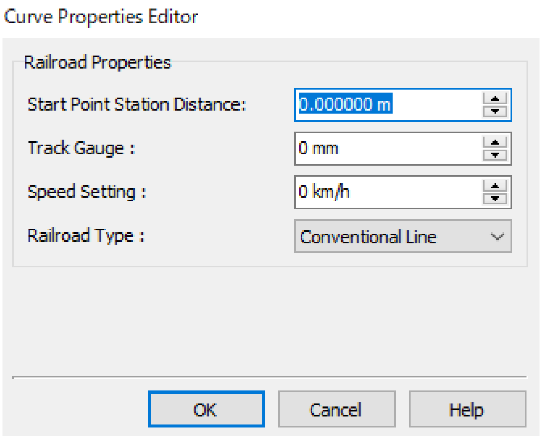


【How to edit the start point station distance on the surveyed centerline】

1. Right-click on a surveyed centerline alignment and go to Edit > Edit properties of….

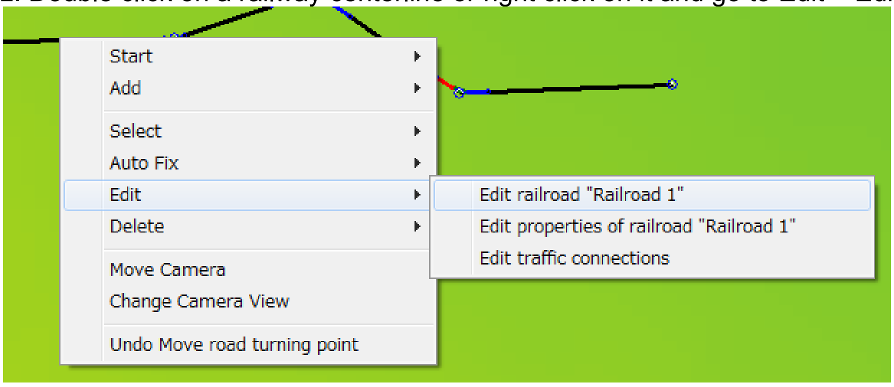


2. Specify the Start Point Station Distance. The negative value is also possible.

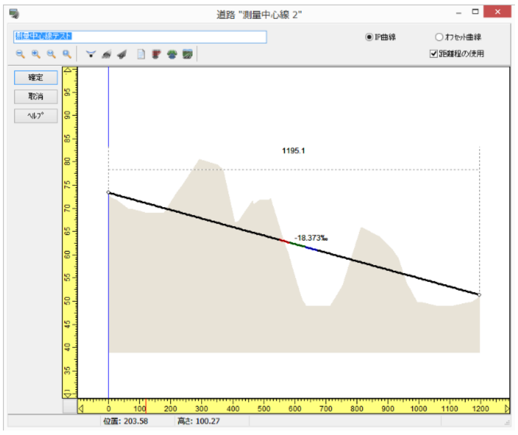


(2) Surveyed Centerline – Vertical Alignment

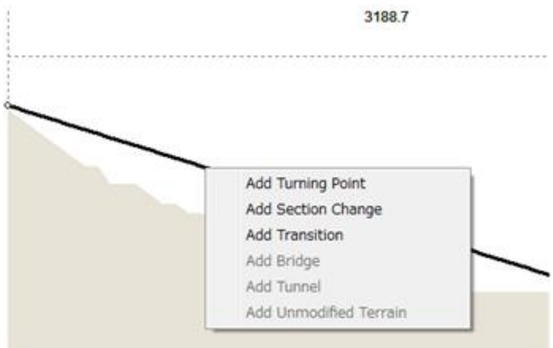
1. Double click on a railway centerline or right click on it and go to Edit > Edit Railroad…



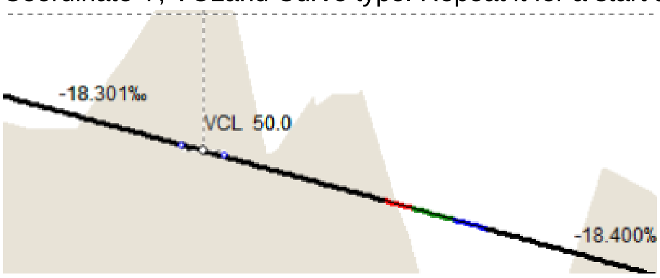
2. Change the name at the top left box.



3. Right click on a point to add a vertical turning point and select Add Turning Point, or simply click Add Turning Point in the toolbar and left-click on a point on the curve.

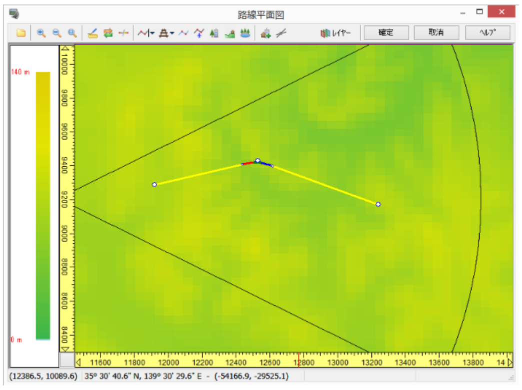


4. Right click on a turning point and go to Edit Turning Point. Define Left slope, Left distance, Station distance, Coordinate Y, VCLand Curve type. Repeat it for a start and end point.



(3) Structural Centerline (horizontal)

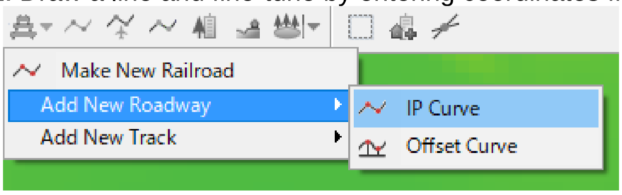
Click the drawn surveyed centerline. The line will turn yellow



Structural centerline can be drawn in a similar way as the surveyed centerline. There are 2 methods:
IP Curve: click turning points to draw a line.
Offset Curve: draw a line at the offset from the surveyed line.

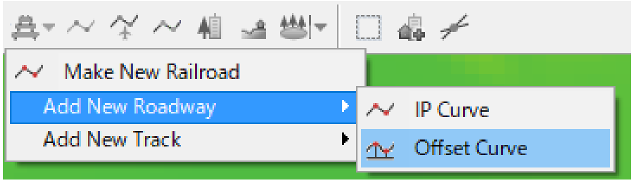
＜IP Curve＞

1. Go to Make Railroad button and Add New Roadway > IP Curve.
2. Draw a line and fine-tune by entering coordinates from the right-click menu.



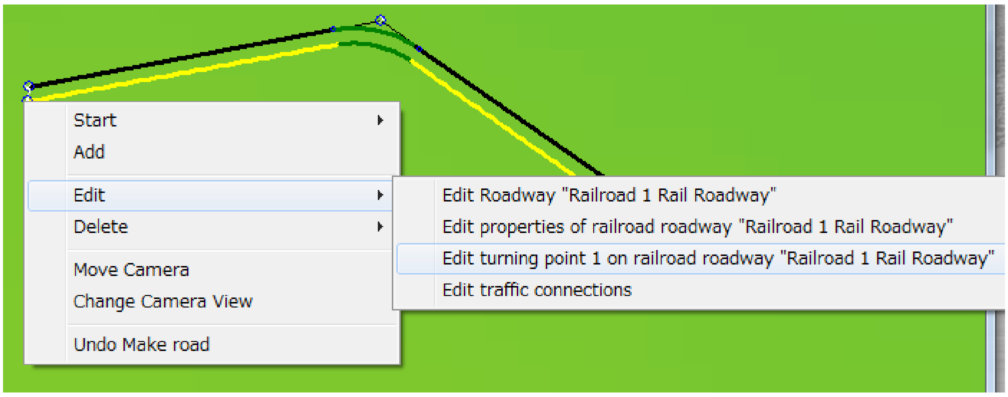
＜Offset Curve＞

1. Draw a line in the same way as IP point and select Offset Curve.
2. Click on positions of start point and end point, then right click to finish.

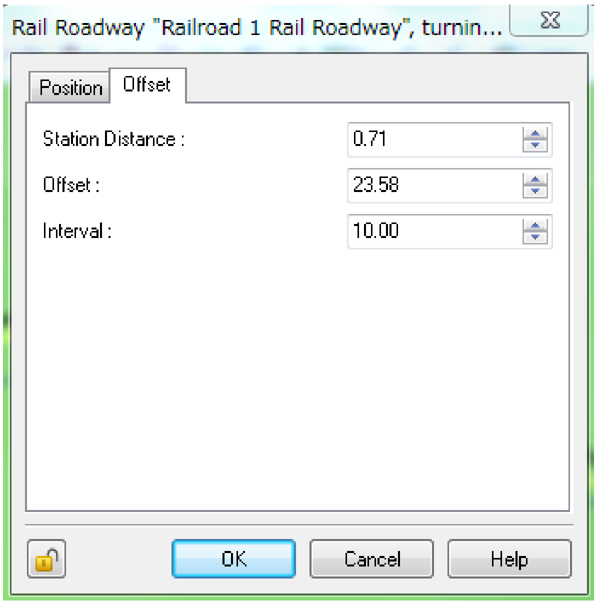


*Note: In this example, the lines are deliberately drawn with a gap.

3. Right-click on the starting point of structural centerline

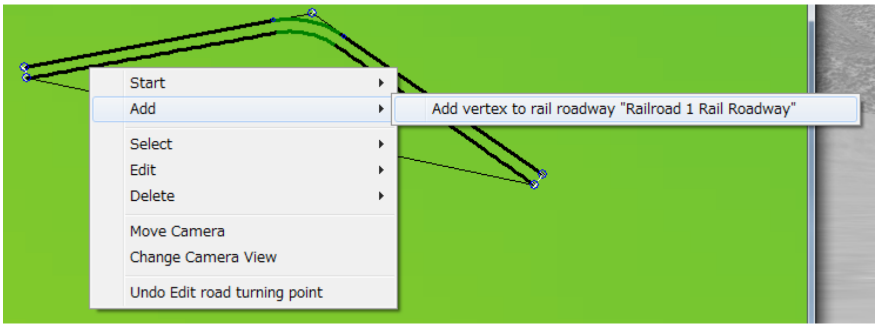


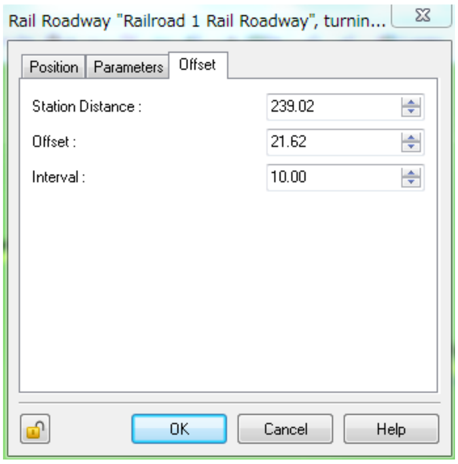
4. Edit parameters on Offset tab.



・Station Distance: Station distance of the structural line.
・Offset: Offset distance from the surveyed line. (Positive: to the right)
・Interval: Interval of plotted points.
Repeat it for the end point.
If the offset values of start point and those of end point are different, the line will be interpolated.

5. Turning points can be added by right click menu.





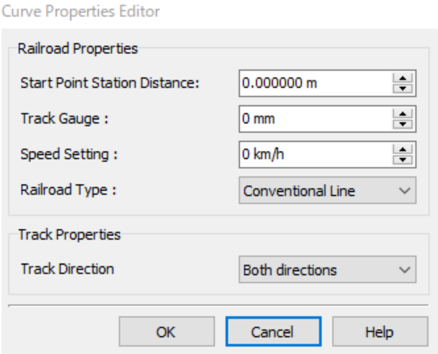
6. Right click the added turning point to edit it.

(4) Structural Centerline (vertical)
Define in the same way as a surveyed centerline (railroad).

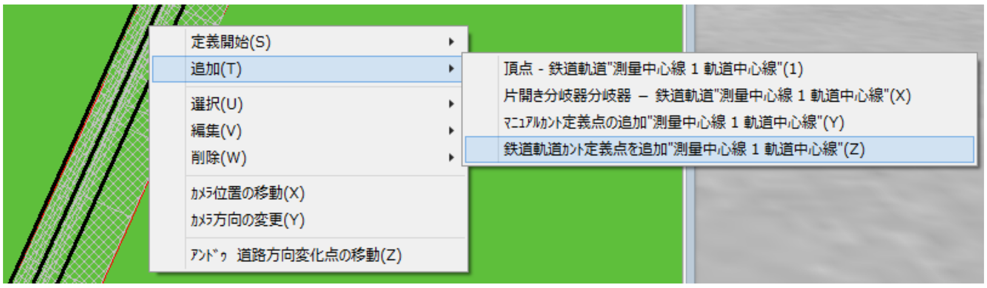
(5) Track Centerline (horizontal)
Define in the same way as a structural centerline (horizontal).

(6) Cant settings
Cants can be specified from automatic calculation or manual calculation.
There are 2 ways.
A.Right click on the track line in Plan View and go to Edit > Edit properties of railroad track <name>.
B.Right click on a desired position on the line and go to Add > Add railroad track cant calculator to track.

A: FromProperties window.

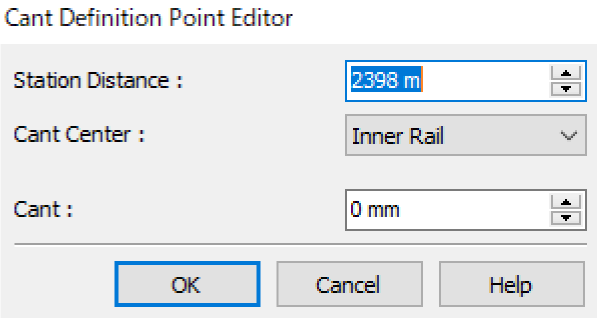


B: From Add railroad track cant calculator to track <name>.



・Station Distance
・Cant Centre: Conventional Lines use Inner rail, Shinkansen uses Track center.
・Maximum Cant: Maximum allowable cant. If the results are bigger than this, this value will be used instead.

■Manual Cant Setting
Right click on the track centerline and go to Add > Add manual cant calculator to track <name>.



(7)Track Centerline (vertical)
Define in the same way as Surveyed Centerline.

Simulation

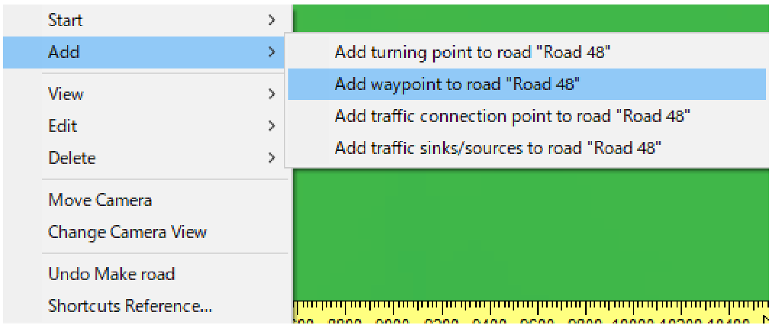
Waypoint (The motion-control point)

The movement of dynamic models can be controlled when passing waypoints on road or flight path.

The following motion settings are possible;
- Speed change
- Lane change
- Viewpoint change (Up and Down, Left and Right)
- Focus on a model
- Control dynamic models

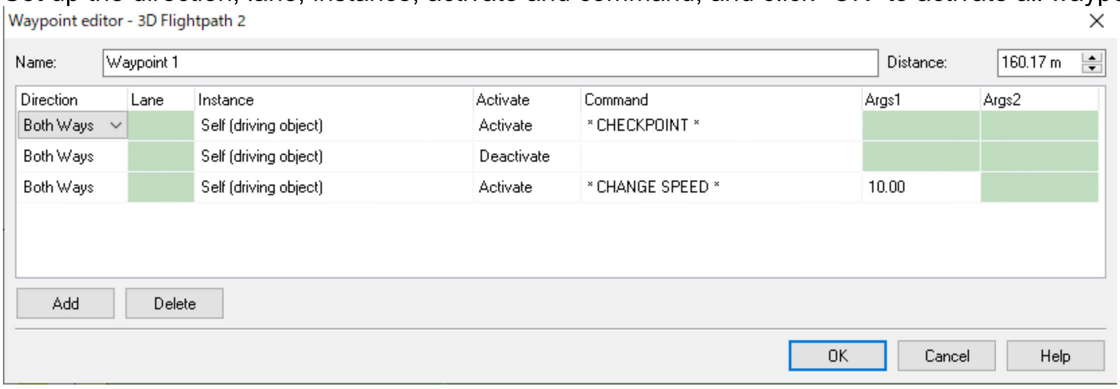
1. Add waypoint

Right-click on road or flight path in the plan view and click Add - Add Waypoint to Road. It can be edited by right-clicking "Edit" - Waypoint".



2. Movement Settings

Right click on a Waypoint and go to "Edit" - "Waypoint", or double click on a Waypoint to open "Waypoint Editor". Set up the direction, lane, instance, activate and command, and click "OK" to activate all waypoints.



4. Command list

Command Name	Motion	Args 1	Args 2
CHANGE SPEED	Change speed	Change speed	–
CHANGE LANE	Change lane	Inside/outside direction, rate *(Range -100% ~ 100%) Apositive value: to inner lanes A negative value: to outer lanes. 100% always makes vehicles change lanes to the specified direction.	Change distance
RESET	Cancel in the operation	Speed after RESET *0 maintains the current speed.	–
SLOWLY TURN HEAD	Change the viewpoint to right or left by 45 degrees per second	Angle *Positive value: to the right. 0 means straight ahead.	–
SLOWLY TILT HEAD	Change the viewpoint to up or down by 45 degrees per second	Angle *Positive value: to the right. 0 means straight ahead.	–
TURN HEAD	Change the viewpoint to right or left	Angle *Positive value: to the right. 0 means straight ahead.	–
TILT HEAD	Change the viewpoint to up or down	Angle *Positive value: to the right. 0 means straight ahead.	–
VIEW CAMERA 	Change the monitor display contents in the 3D cockpit	Display saved camera views. *0 turns off the car monitor. *1~998 displays a view corresponded to the number. And blank will be ignored *999 switches the monitor to complete 2D perspective.	–
LOOK AT ME[68]	Focus on a specific model[69]	Args 1	–
Command of the mobile model	Start the movement of dynamic models	Change speed	–
CHECKPOINT	Used in scenarios	Inside/outside direction, rate *Range -100% ~ 100% A positive value: to inner lanes A negative value: to outer lanes. 100% always makes vehicles change lanes to the specified direction. .	–
SET PROFILE[70]	Set the profile to be used for the log export	Speed after RESET *0 maintains the current speed.	–
LOG START[71]	Start logging data	Angle *Positive value: to the right. 0 means straight ahead.	–
LOG STOP[72]	Stop logging data	Angle *Positive value: to the right. 0 means straight ahead.	–

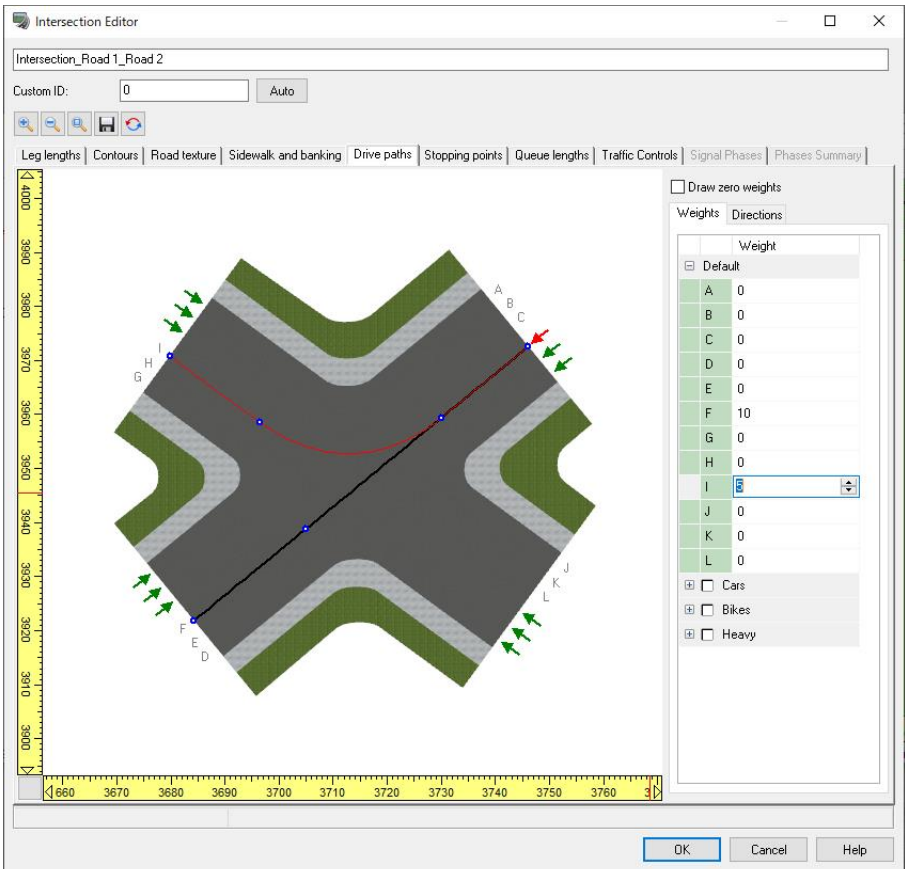
Notes
・Movements are automatically reset at the start of roads / spline roads / flight paths
・If view perspective has been changed at the initial stages of a movement command, it will remain unless otherwise changed again. It does not affect the movement direction.

68 Flight path only
69 Requires model that has action commands set, or model that has the “control target” checkbox checked.
70 Requires log export plugin
71 Requires log export plugin
72 Requires log export plugin

・The following does not affect movement controls:
- Deleting a model after it has been setup in waypoint window, the command would still remain.
- Deleting the action commands after setup will cause the command row to read “> - DELETED -<”
・Commands other than “CHANGE SPEED” and “CHANGE LANE” has no effect on the traffic flow.

・CHANGE LANE :
(e.g.)
To make 30% of the cars traveling on lane 1 change to lane 2: Select 1 in Lane column and in Args1 enter 30%.
To make 30% of the cars traveling on lane 2 change to lane 1: Select 2 in Lane column, and in Args1 enter -30%.
To make all cars in lane 3 never change lanes: Select 3 in Lane column and in Args1 enter 0%.
Note: Lane changes are limited to adjacent lanes only at a time. It is not possible to skip lane, such as changing lanes from lane 3 directly to lane 1.
・Animated model commands : The model must be animated to have an effect.

*Starting from Ver. 8 or later, it is possible to add movement control points in the intersection editor.
Here, traffic flow speed control and scenario event progression can be defined.
・Open intersection editor, right-click on a drive path and select Add Control Point.
・Control positions are measured from the starting point of the drive path.



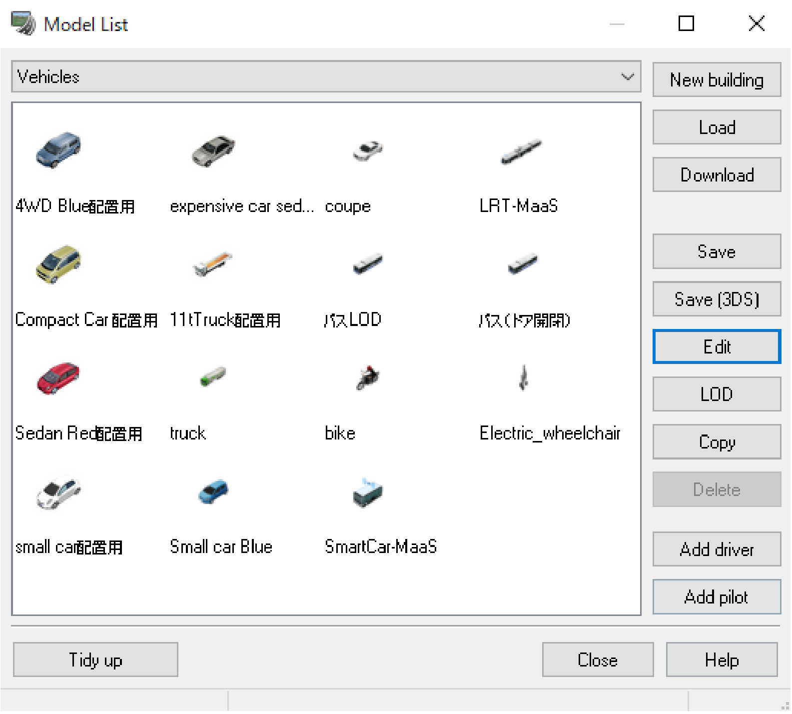
Vehicle Settings

Set a running vehicle to be used in the simulation.

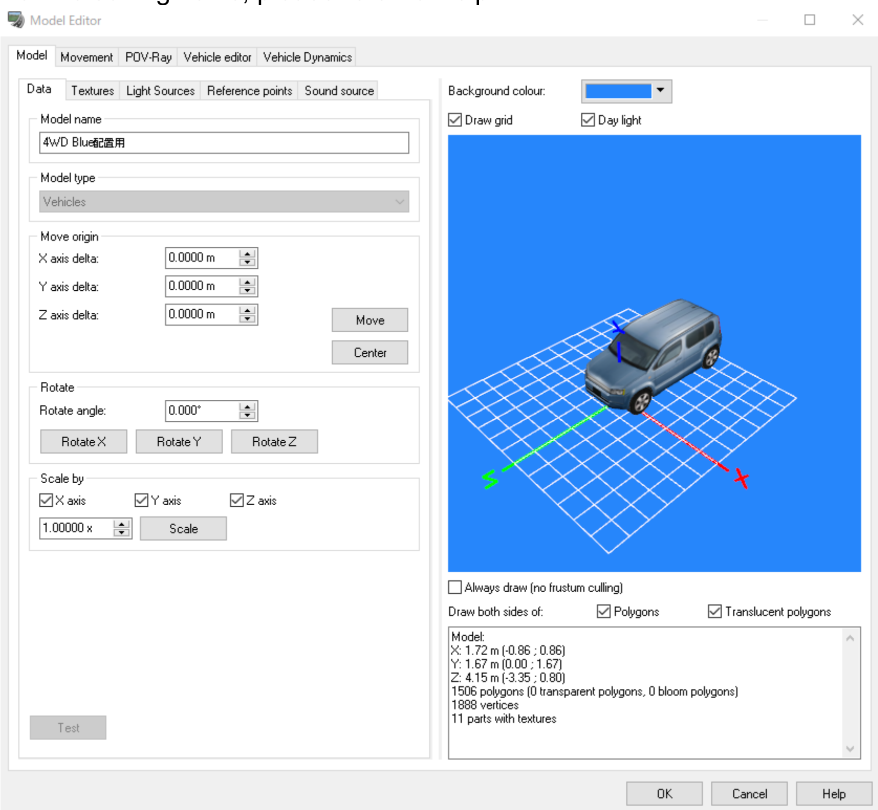
Car Performance settings

Go to Edit Scene - Library - Models panel 

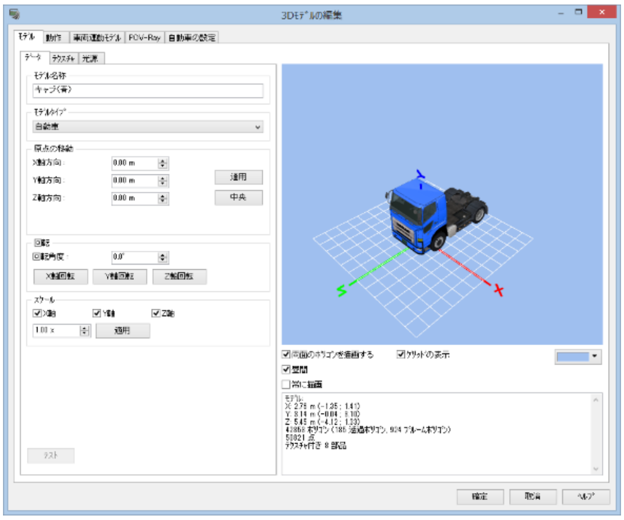
and select a vehicle. Double-click on it or click Edit to open the Model Editor.



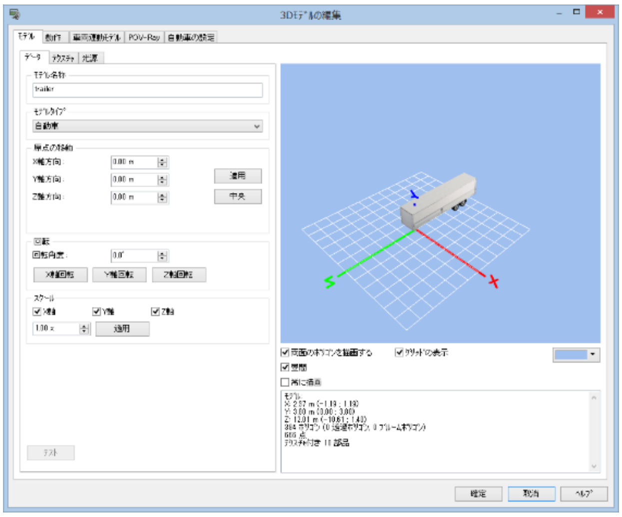
For the setting items, please refer to Help.



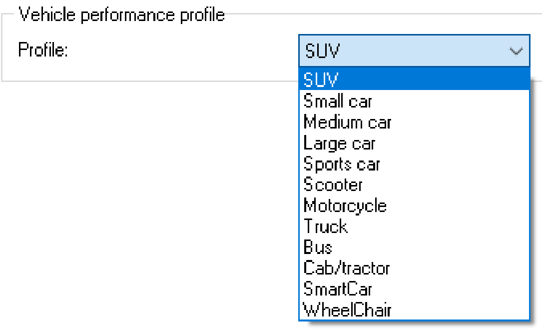
Setting display for truck



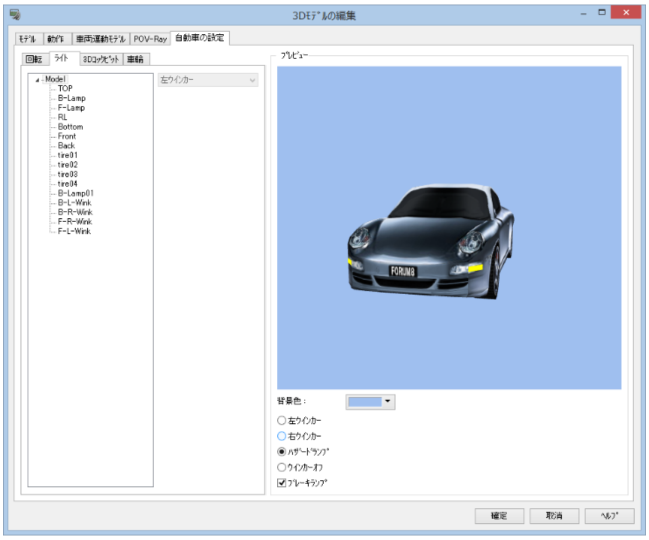
for trailer



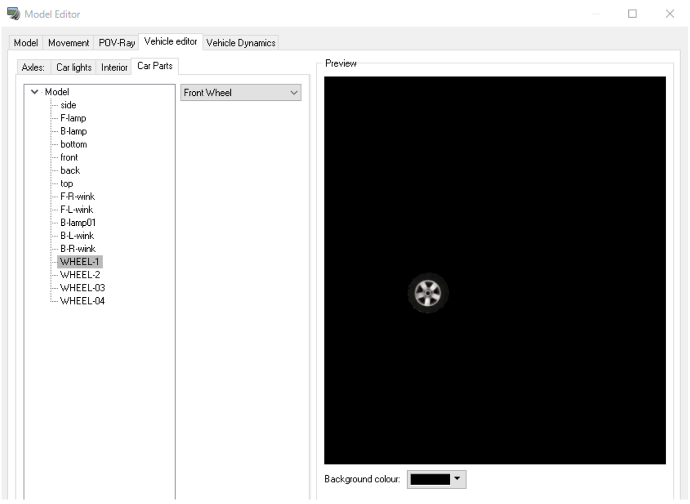
On Vehicle editor – Axles, It is possible to select a vehicle performance profiles from Small car, Medium car, Large car, SUV, Sports car, Scooter, Motorcycle, Truck, Bus, Cab/Trailer, Smartcar or Wheelchair.

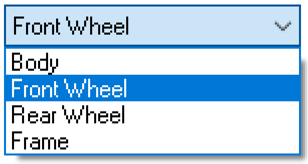


On the Vehicle editor – Car light, it is possible to set up the right/left turning lights, hazard lights and brake lights.



If the model type is set to "Car", "Wheel" tab is enabled.
Select the node to operate as a wheel and then select the front wheels, back wheels and chassis.



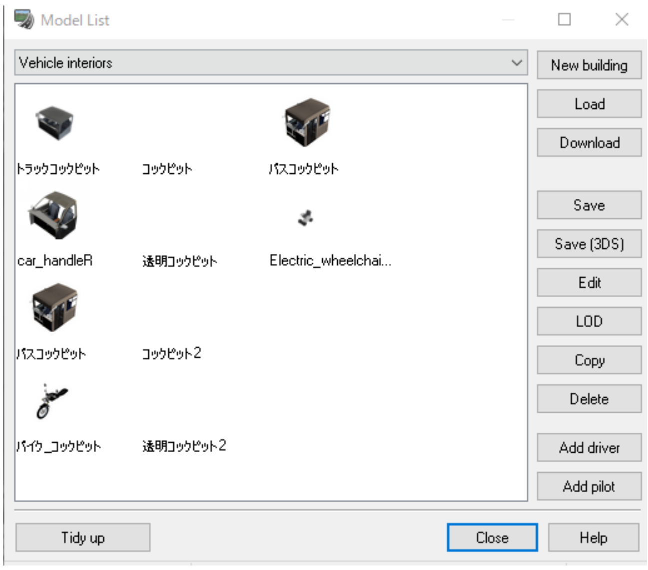


3D Cockpit settings

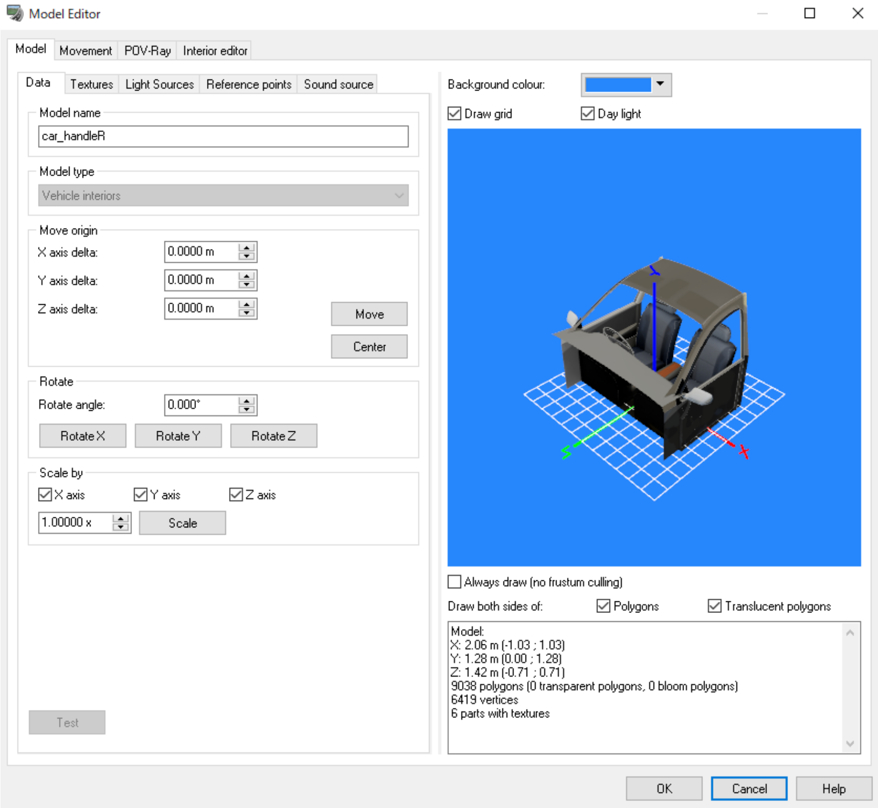
Mount a 3-D cockpit in a driving car to present more realistic landscape views from the car during driving simulation.

(1) Applying an interior model

Select a 3D cockpit on Model List from Edit - Scene - Library – Model.

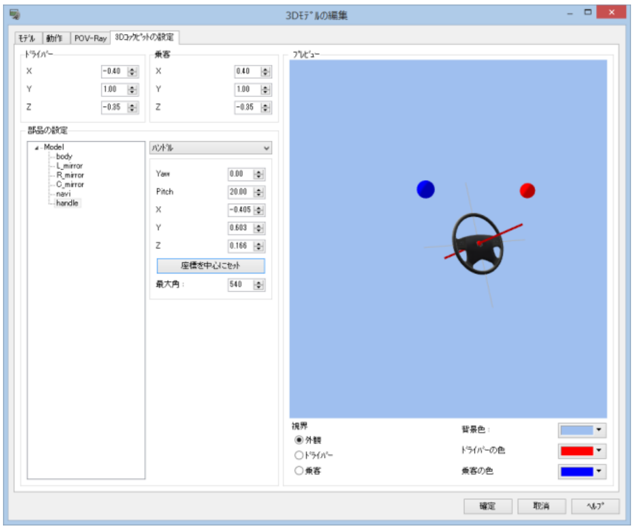


The currently set viewpoint positions of the driver and passenger are displayed as dots in the 3D space.
Edit the viewpoint positions of the driver and passenger.

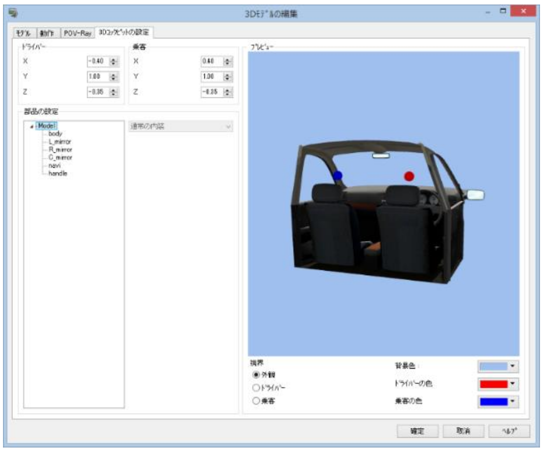
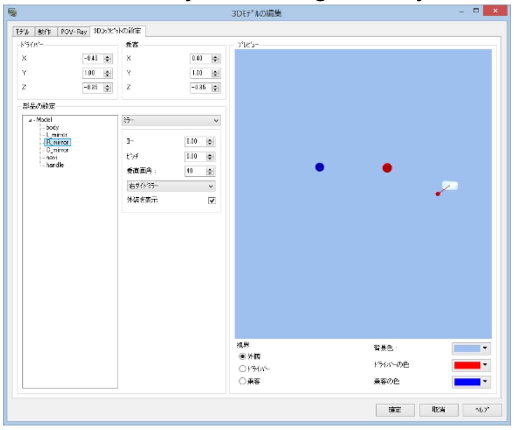


Handle settings

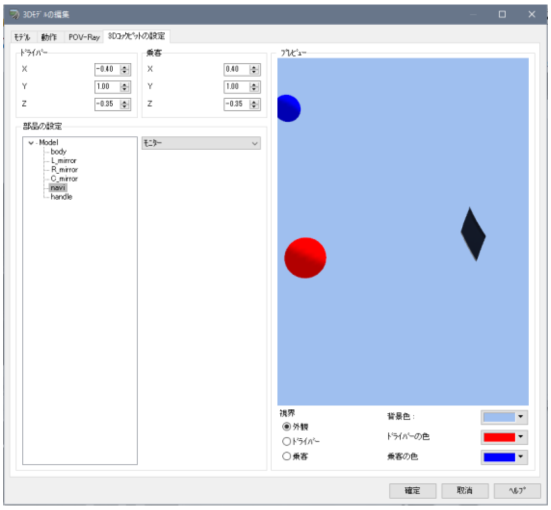
Select the parts of steering handle in "Parts settings" on Interior editor tab, and specify it as "handle". It rotates around the rotation axis.



Mirror settings
Select and configure the part that corresponds to the mirror in Parts settings on the Interior editor tab.
Enter the mirror type, yaw/pitch angle, and vertical angle of view. If "Show Exterior" is checked, the driving scene and the exterior of the vehicle will be drawn. If not checked, only the driving scenery will be rendered.

Monitor settings
Select the part of monitor in "Parts settings" on the Interior editor tab, and specify it as "navi".
The content of the display can be switched in the pop-up menu displayed by clicking on the monitor of 3D main screen. Also the display can be switched at an arbitrary position on "Edit of the operation control point" screen.



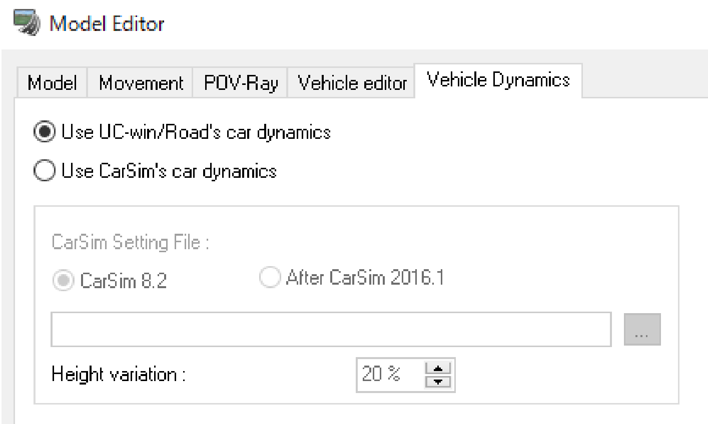

(2) Application to a driving car

Select a model on Model List and click edit.
On Vehicle editor tab- Interior tab, it is possible to select a interior model to be apply.

Vehicle Movement Model

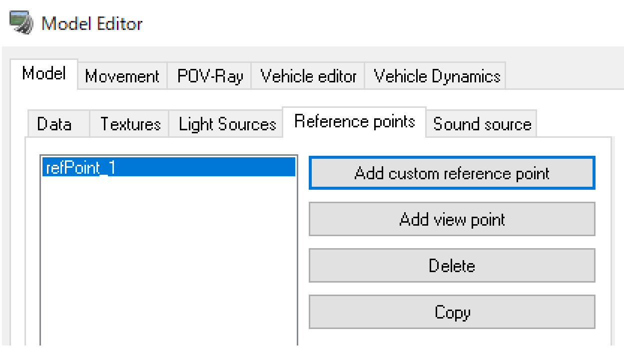
When the DS plug-in is effective, the dynamics model in the vehicle can be set.
Under this tab, vehicle dynamics models can be chosen. Dynamics model and will affect some detailed vehicle driving characteristics. This has no effect on the cars that are not currently under direct user control.
The vehicle engine braking mounted and vehicle mechanics settings for the engine are updated.

Setting Items: Number of gears and ratio of each gear, Torque curve of engine, Weight range track pitch of vehicle, Power of brake, Radius minimum rotation radius of wheel, Coefficient of vehicle air resistance and Transmission parameter.



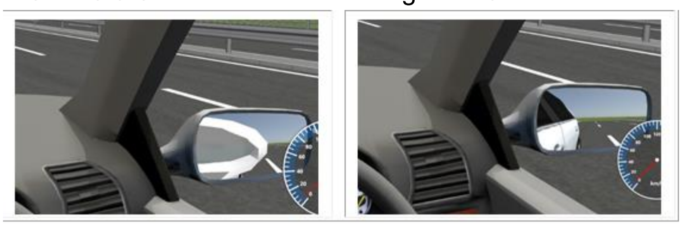
Add custom reference point

A custom reference point enables to adjust view point of mirrors different in size. Click Add custom reference point from Model – Reference point tab and add a reference point of default position and direction. After adding it, it is possible to edit the name, the position and the direction.

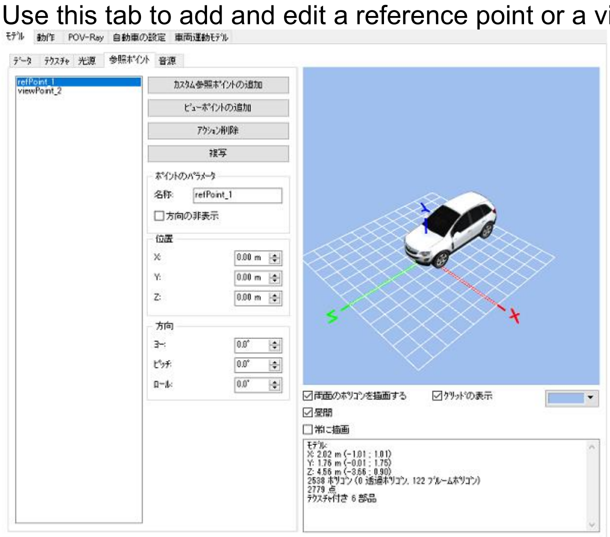


Left: Before

Right: After



Use this tab to add and edit a reference point or a view point to adjust a position of mirror.



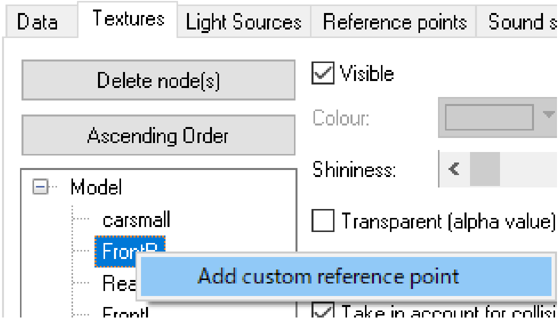
Viewpoint adjustment of side mirror point

This function adjusts images on a side mirror or a room mirror seen from a cockpit. A mirror of 3D cockpit reflects the physical position relation. If the body does not match with the cockpit, the mirror of cockpit may reflect the mirror of body.

In such a case, by adjusting the viewpoint of images, unnecessary parts are not reflected in the mirror, so that the expression is more natural.

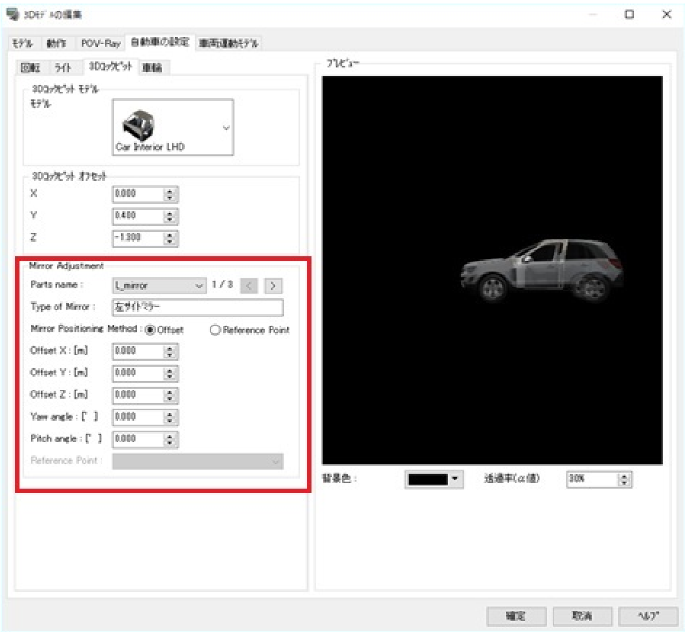
Hint：

By clicking any parts from Model – Texture tab, a popup menu of Add custom reference point is displayed. Click it to add a reference point at the center of gravity of the part. It is useful when a mirror is registered as a part.



Mirror settings

Mirror settings are defined from Vehicle settings – 3Dcockpit – Mirror settings. If the cockpit has some mirrors, settings can be defined for each mirror.

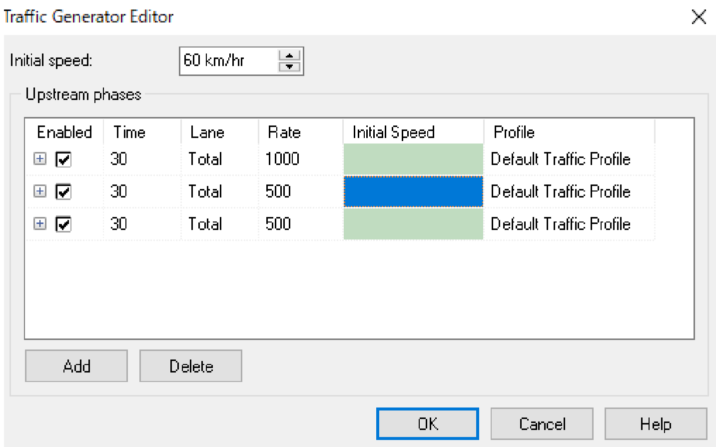


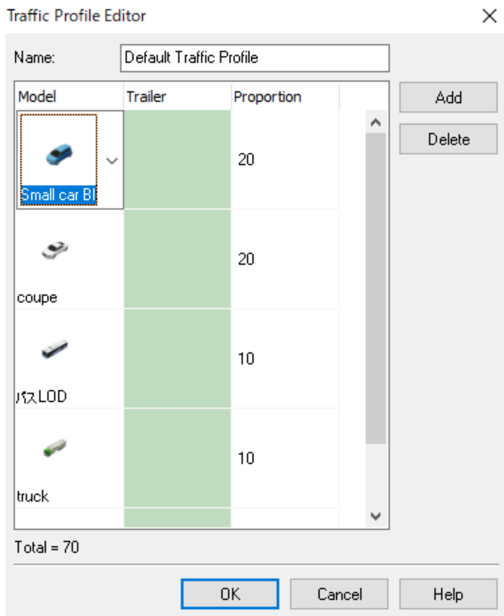
Traffic Flow Settings

Generate traffic flow on the created road. Go to "Edit" - "Traffic" – "Generator" Generator

1. Traffic Generator Editor / Traffic Profile Editor

Select a road and click Edit on Traffic Generator List, and then set up the initial speed, rate, time and lane on Traffic Generator Editor.
Click on Profiles…on Traffic Generator List to define traffic profiles. Traffic volumes and the proportion can be generated automatically for each road.

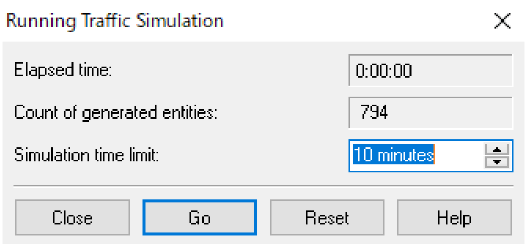




2. Start Traffic

Click the Start Traffic button. Traffic starts according to the settings.

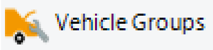
It is possible to check the status after a certain period of time from "Home" – "Simulation" Tab – "Run Traffic" .
It enables to shorten the waiting time for generating traffic flow. Click Close during calculation to generate the traffic flow at that point.



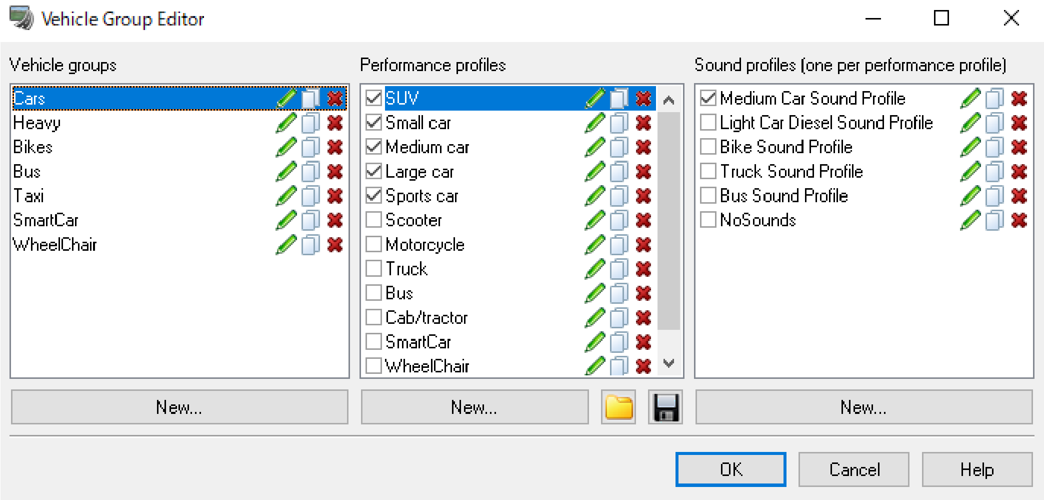
Traffic settings etc. can be changed during the simulation. Go to the ribbon, "Edit" – "Traffic" - "Generator"
When the traffic flow has stopped due to congestion, cars that are causing the congestion can be excluded by the method described below. The car can be excluded for Ctrl+Alt+"D" + click.

3. Vehicle Group Setting - Performance profiles

The types of vehicles traveling are grouped together to control traffic flow.

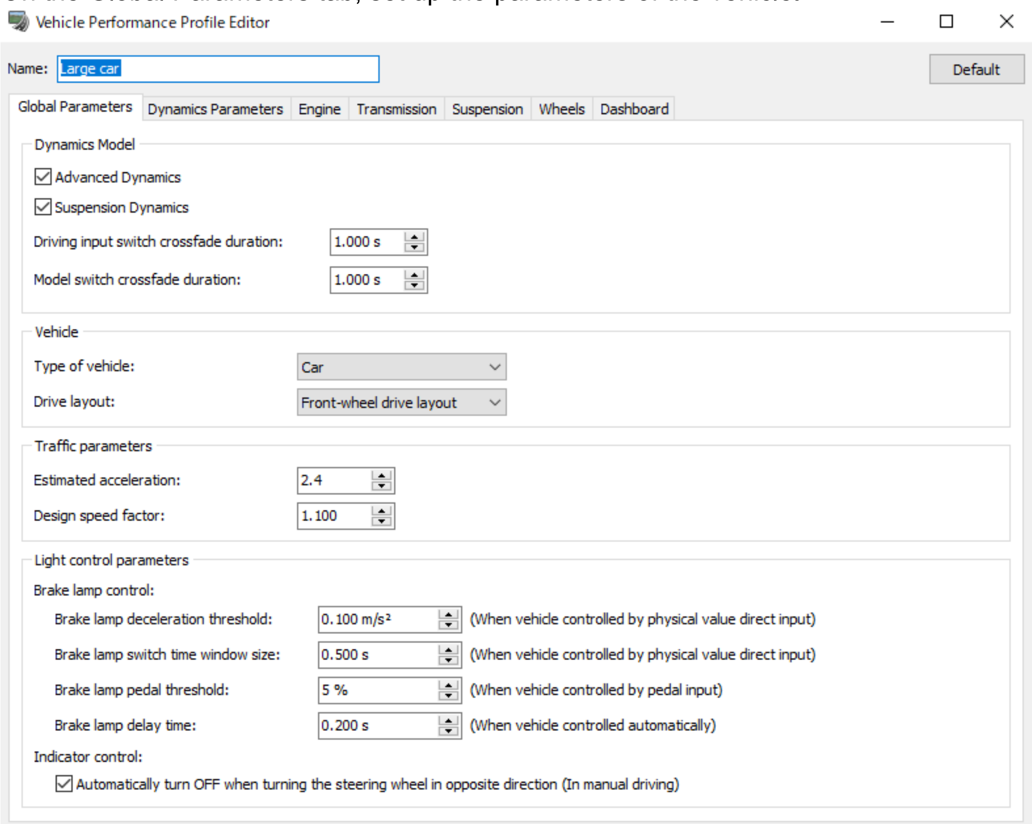
Go to Edit – Traffic -  .

Performance profiles and Sound profile to show the Vehicle Group Editor. Click the [New] button to create a new group.

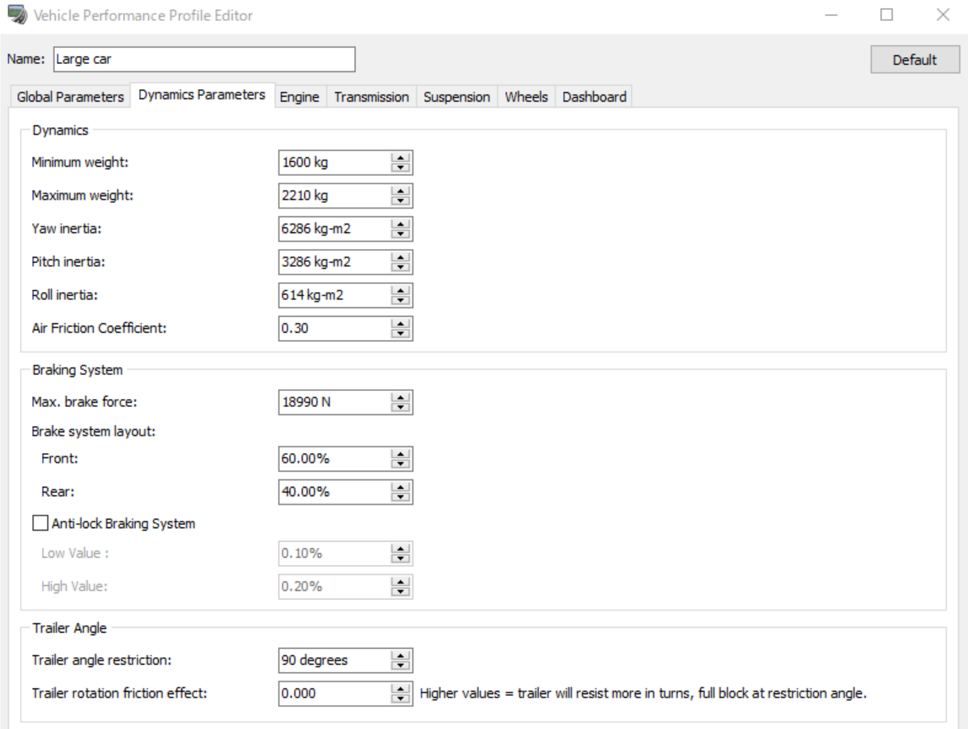


Click  on the Performance profiles, it opens Vehicle Performance Profile Editor.

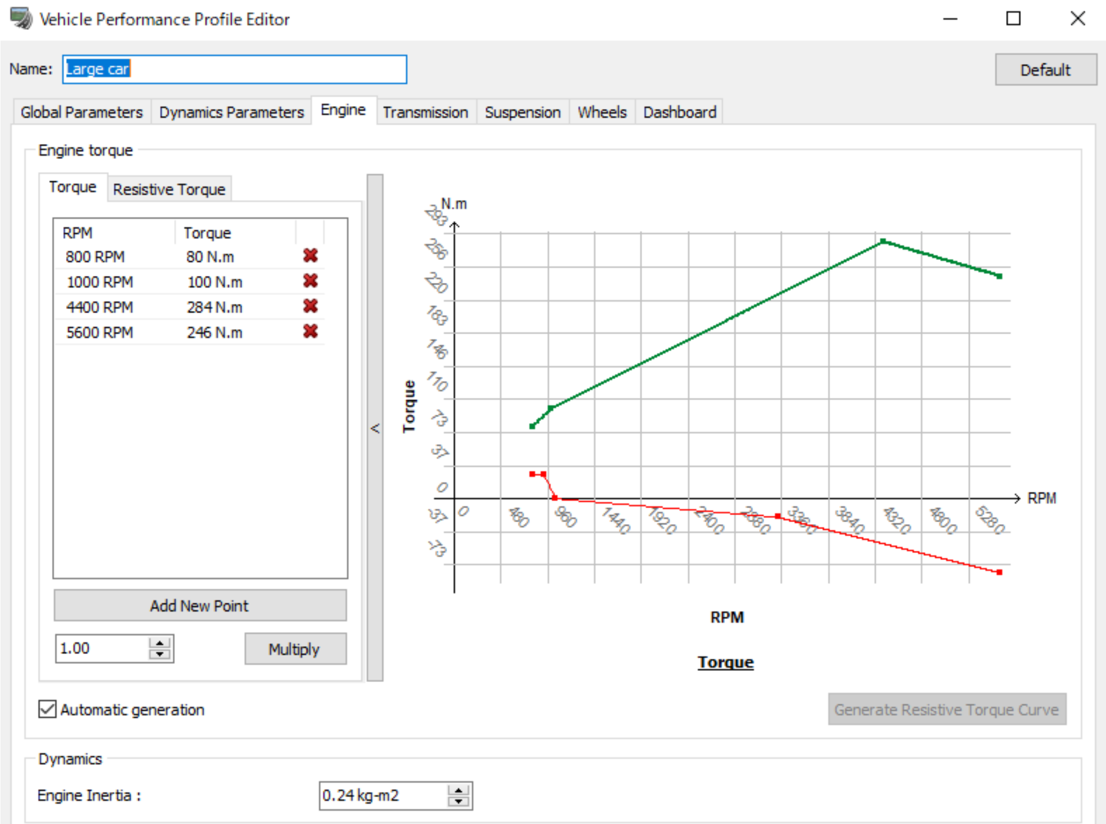
On the Global Parameters tab, set up the parameters of the vehicle.



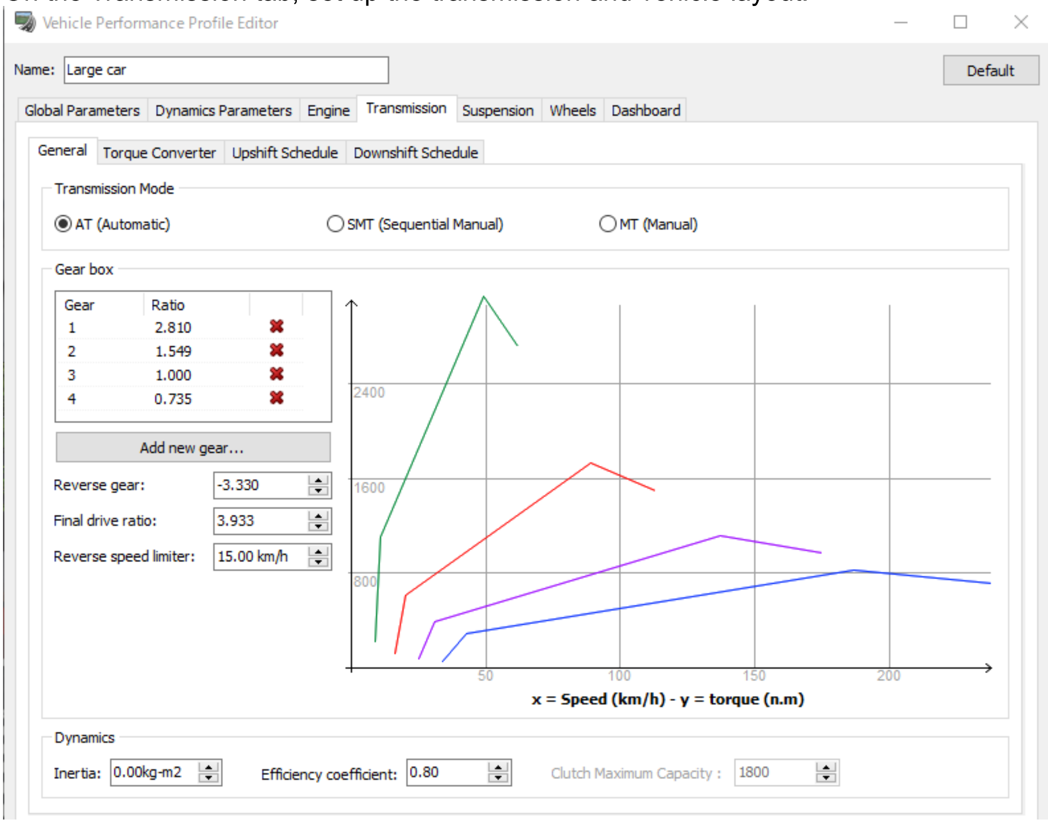
On the Dynamics Parameters tab, set up the properties of vehicular dynamics.



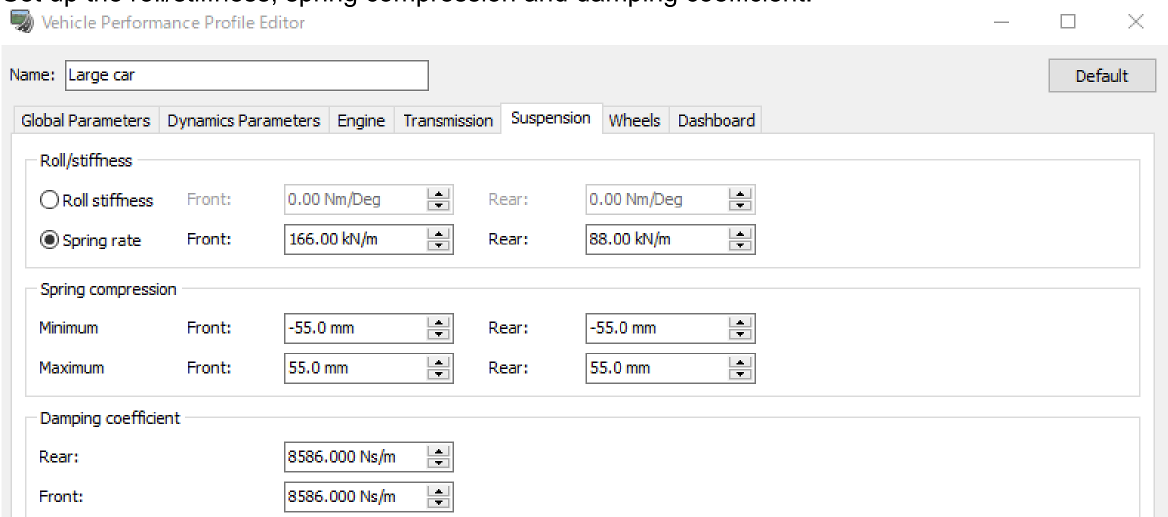
On the Engine tab, set up the amount of engine torque.



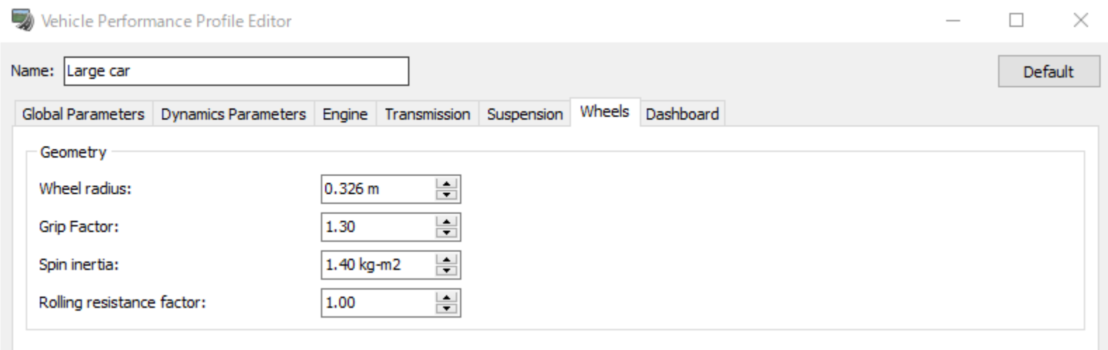
On the Transmission tab, set up the transmission and vehicle layout.



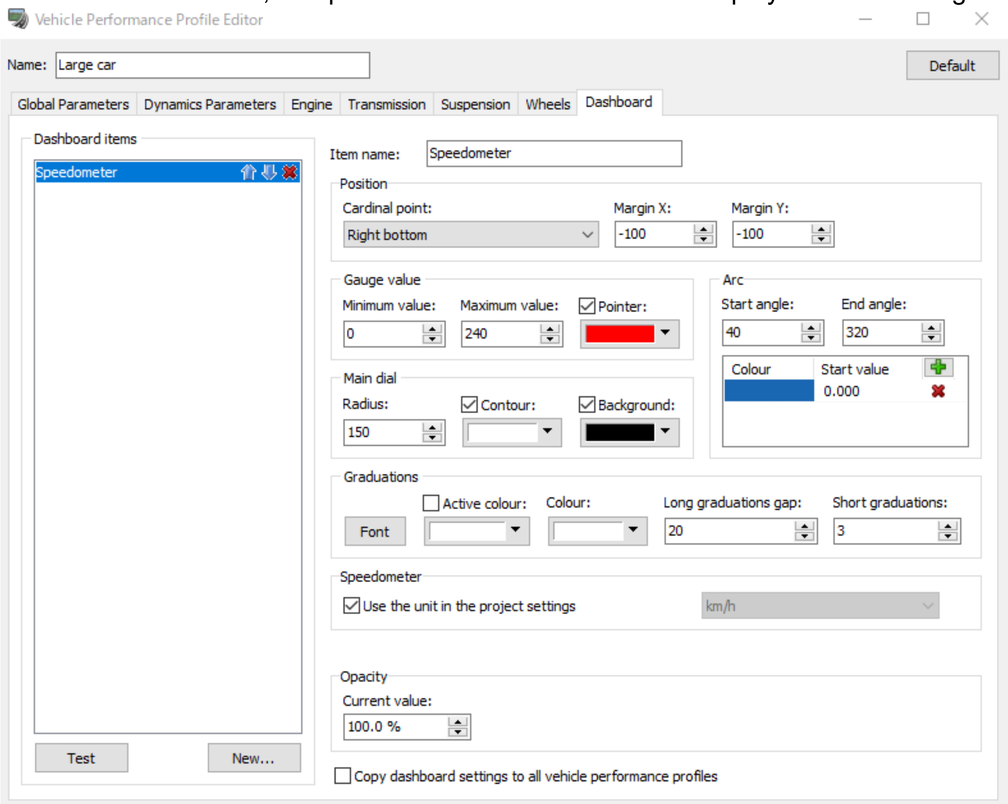
The Suspension tab is displayed only when "Suspension mechanics" is activated on "Global parameter". Set up the roll/stiffness, spring compression and damping coefficient.



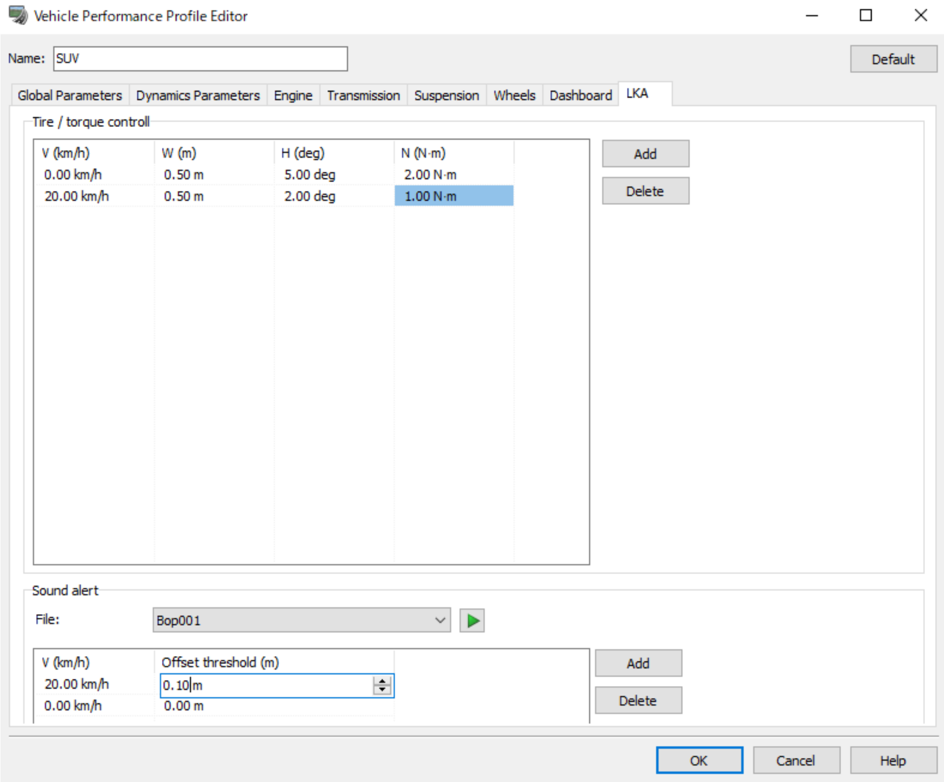
The Wheels tab is displayed only when "Advanced Dynamics" is activated on "Global parameter". Set up the geometry settings of wheels.



On the Dashboard tab,set up the dashboard items that are displayed when driving.



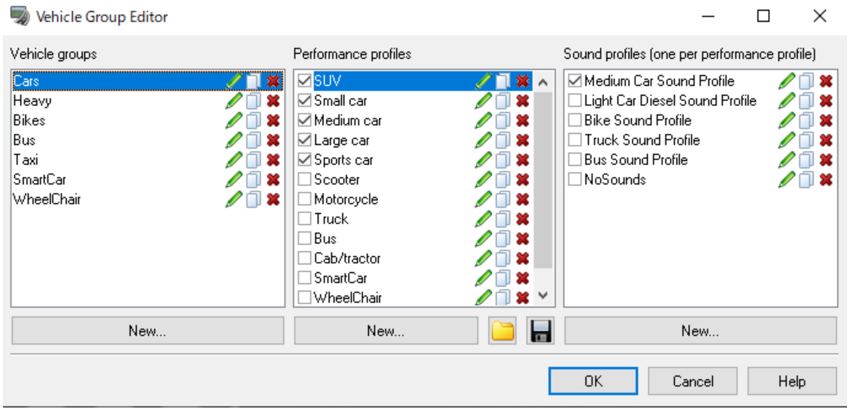
On the LKA tab, configure parameters of LKA (Lane Keep Assist)



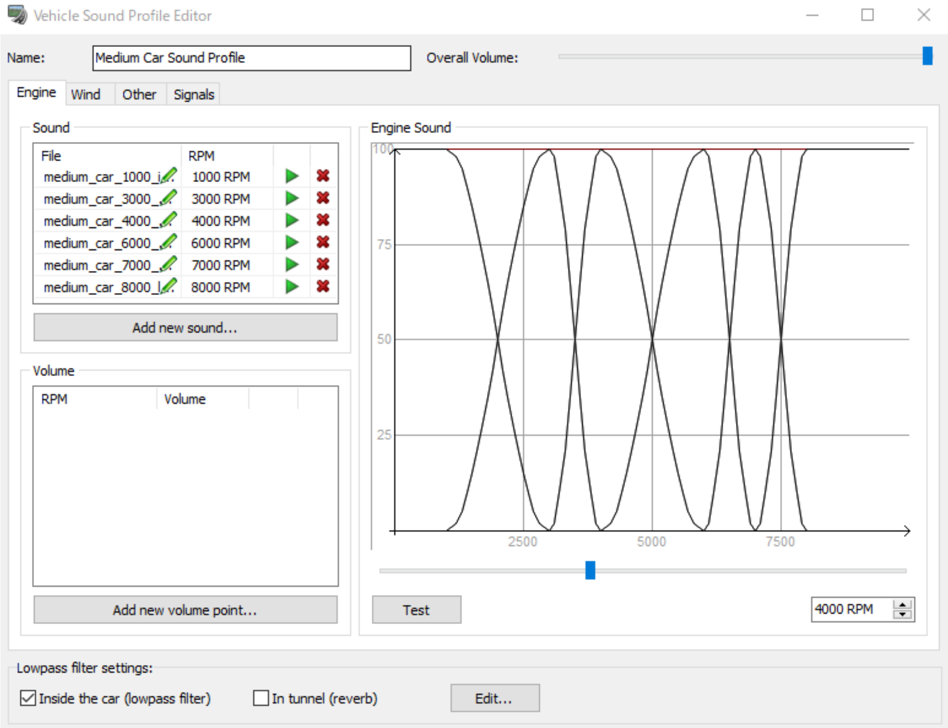
It is possible to provide feedback to the game controller based on the amount of lane protrusion. Configure

4. Vehicle Group Setting - Sound profiles

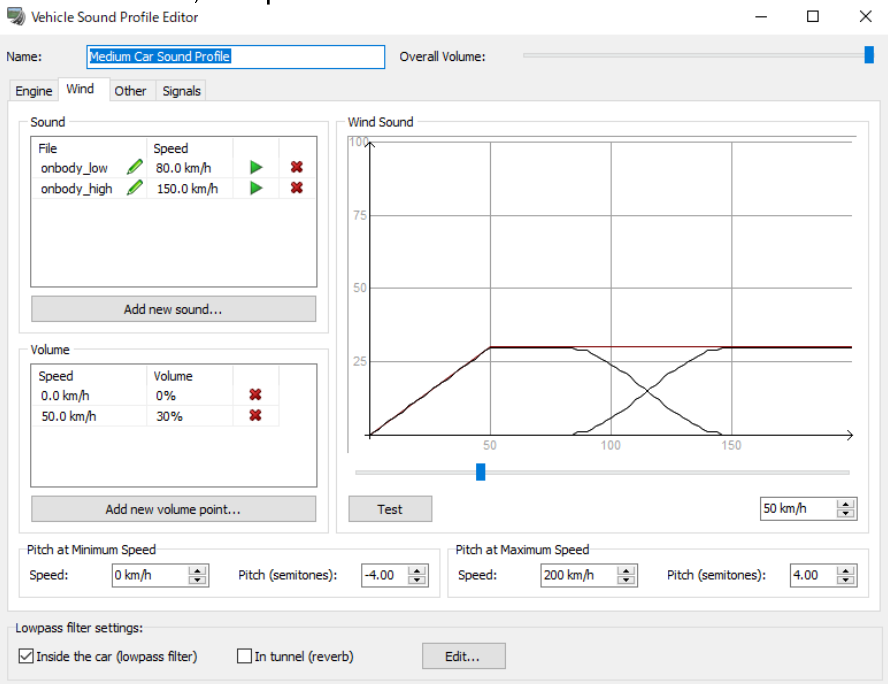
Click on the Sound profiles, it opens Vehicle Sound Profile Editor.



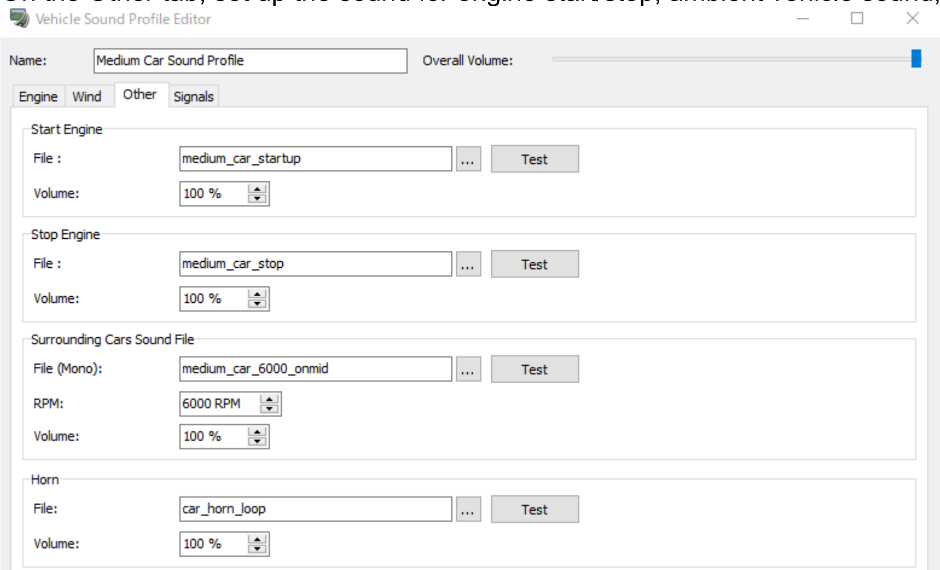
On the Engine tab, set up the engine sound.



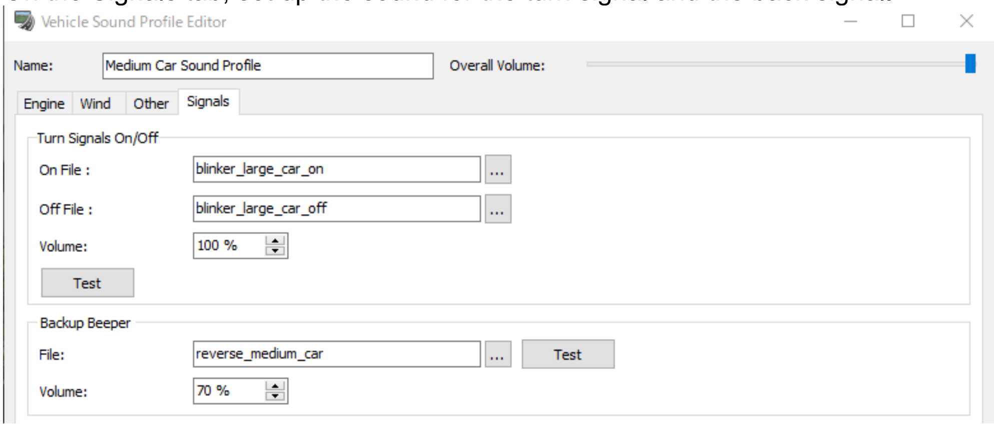
On the Wind tab, set up the wind noise.



On the Other tab, set up the sound for engine start/stop, ambient vehicle sound, and horn sound.

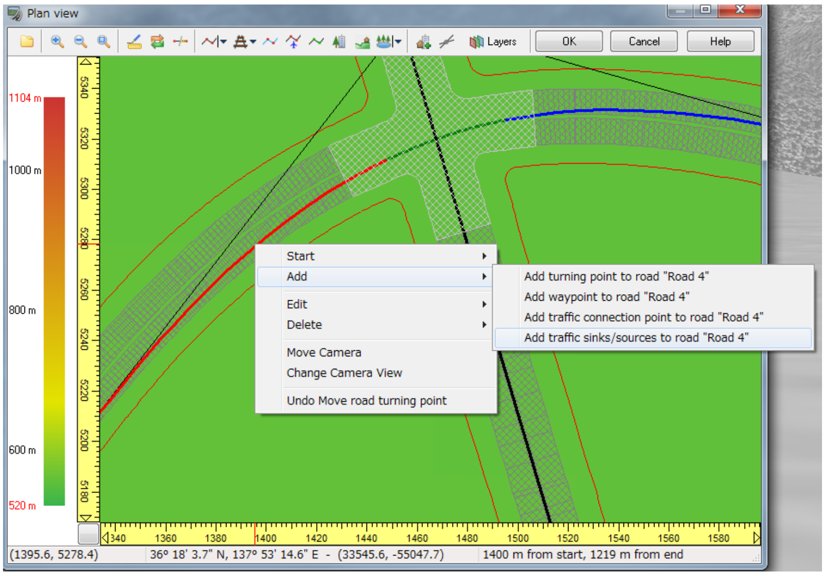


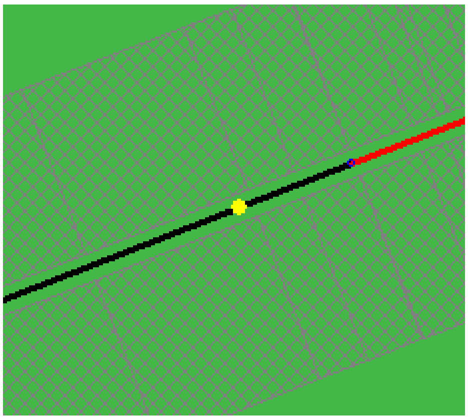
On the Signals tab, set up the sound for the turn signal and the back signal.



5. Traffic sink/source

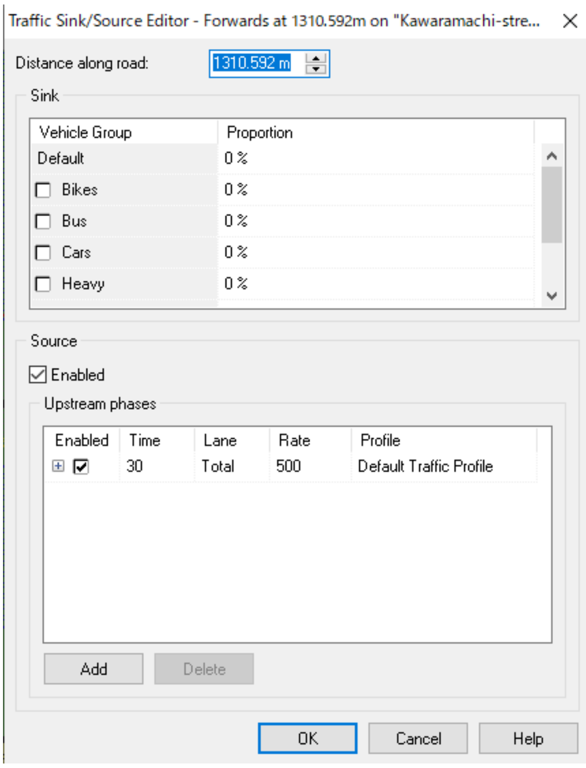
It is possible to put the position of sink or source the traffic vehicles except starting or end point.
On the Plan View, right click on the road and select [Add]-[Add Traffic Sink/Source to Road.
Right click on the yellow node to edit it. Select [Edit]-[Edit Forward (Backward) Traffic Sink/Source]





- To Sink Traffic
At [Sink], check vehicle group to make sink in Enabled and set its rate by percentage.
Example
0: No sinking at the point
100: All vehicles are sunk

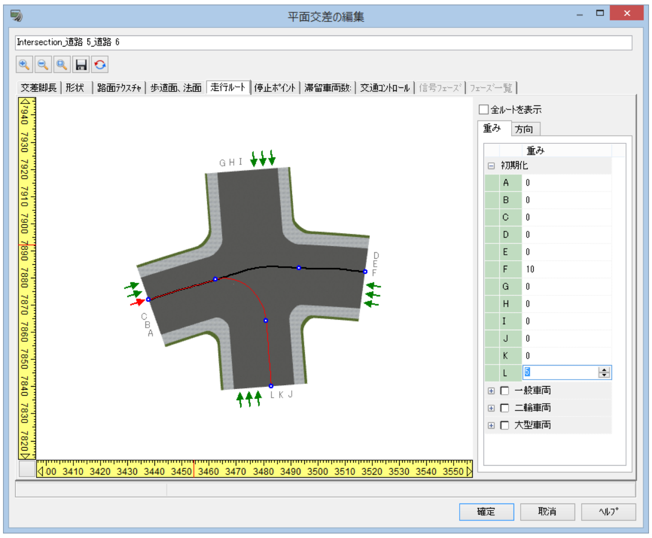
- To Generate Traffic
1) At [Source] check Enabled and add phases by [Add] button
2) Set time, rate and profile of each phase.



6. Intersection Drive Paths and Vehicle Counts

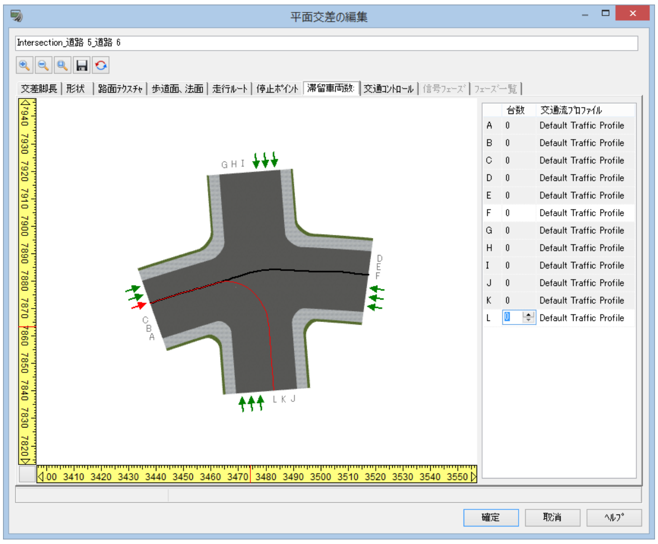
At the entry points for each intersection, it is possible to set the rate at which vehicles will travel in different lanes.
In the Plan view, right click on an intersection and select [Edit] - [Edit Intersection]. In the Intersection Editor, go to the [Drive Paths] tab.

1) Click green arrow at each entry point.
2) Check vehicle groups and click [+] to open the route list
3) Set a vehicle weight (rate) for each route
* If weight is 0, no vehicles drive on the route.



7. Queue lengths setting

It is possible to set vehicle queue lengths where traffic begins.
On the Plan view, right click on an intersection and select [Edit]-[Edit intersection] and [Queue length] in the Intersection Editor.
1. Click green arrow at each entry point.
2. Set number of vehicle to put there in each path respectively (0 to 50)
3. Select traffic profile for the path.

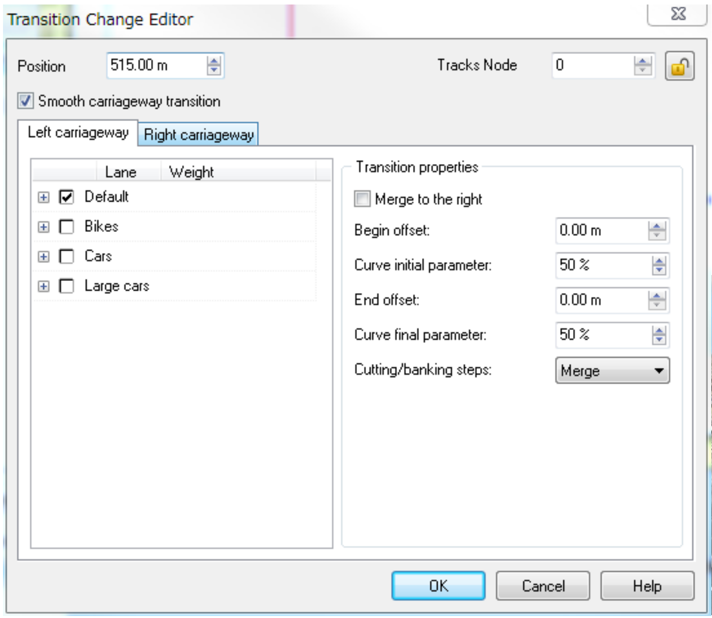


This settings can be also set in "Edit intersection" appeared by right clicking after selection the intersection on main screen.

8. Vehicles setting at off ramps

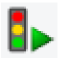
At off ramp position, it is possible to set the number of vehicles at each lane.
This setting can be done in the "Vertical Curve Editor" opened in the "Plan View", right-click on a rod, select "Edit" – "Edit road".

1. Open the Transition Change Editor in the Vertical Curve Editor
2. Set rate of vehicle driving to off ramp
- This value is for the vehicle on lane 1 just before the transition point.

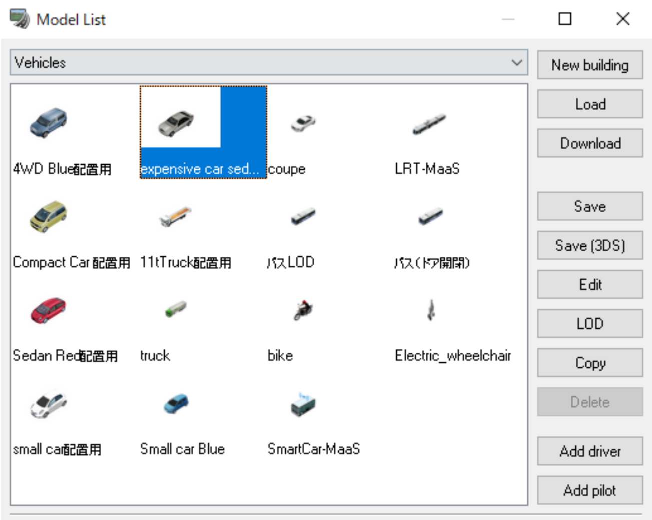


9. Vehicle Movement Setting

1. Select a vehicle on the Model List.
2. Click Add Driver on the right.

3. Click Start Traffic button and watch the traffic flow. 

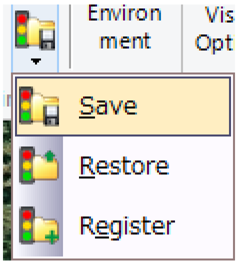
*The moving vehicles here are not influenced by signal controls.
*For the second vehicle in a train situation, the "Follow another model" function can be applied.



10. Save and load traffic status

This feature allows the saving of the current traffic for later uses, where it can be resumed from under the exact same condition. This is useful when a certain traffic condition such as accidents that need to be examined repeatedly for research purposes.　When a traffic snapshot file is loaded, traffic will continue the same way it was at the time of saving.

■Saving
1. Go to the ribbon, "Home" – "Simulation" - "Save Traffic Status".
2. By clicking on Save Traffic Status, the current traffic flow condition will be saved. The file format has an extension of “.trs”.



■Restoring
1. If there is still existing traffic flow, it must be turned off first.
2. Go to the ribbon, "Home" – "Simulation" - "Restore Traffic Status"
3. Select and load the previously saved .trs file.
4. Once loaded, the traffic flow will be restarted from the condition restored.

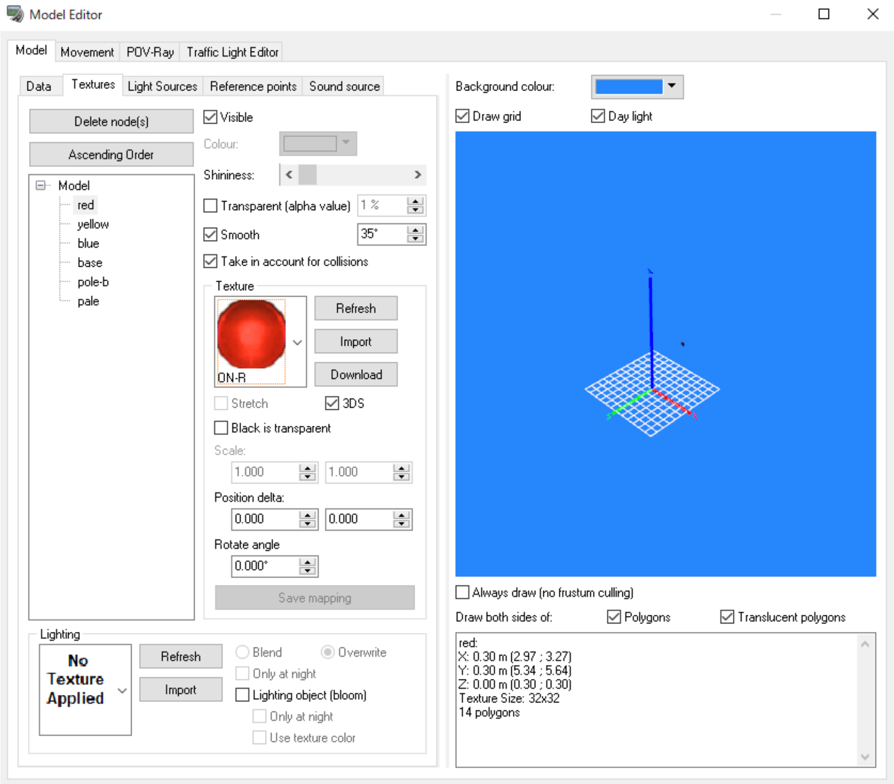
*If traffic already exists on at the time of loading, the condition written in the trs file will be integrated into the current status instead of a full restoration.
*Multiple conditions cannot be loaded simultaneously.

Traffic Light Control

1. Detailed settings

Select a traffic light model on the Model Lists, then click Edit to open the Model Editor.
Expand the model under the "Texture" tab. It is possible to verify the lights and each object.

Open "Traffic Light Editor" tab to display the layer of the model and select a blue light. Set it as "Main Green Light" from the drop-down menu on the right. Repeat it for yellow and red.

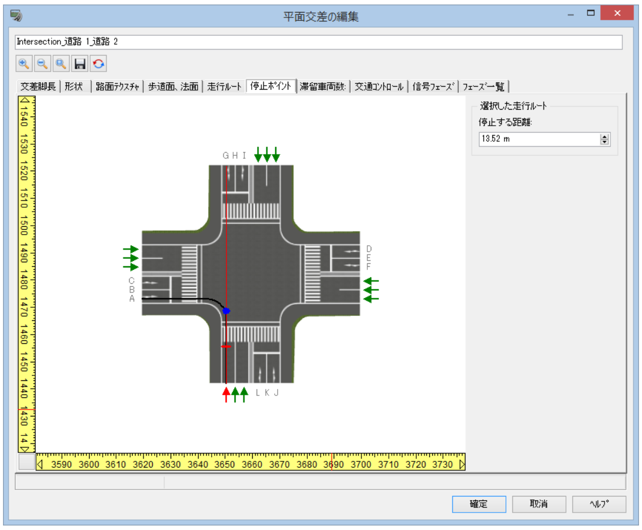


Set "Right Green Arrow" for the right turn signal. Also, it is possible to test the settings from "Model" "Test" radio button. The signal setting can be adjusted according to the country locations from "Options" – "Application Options".

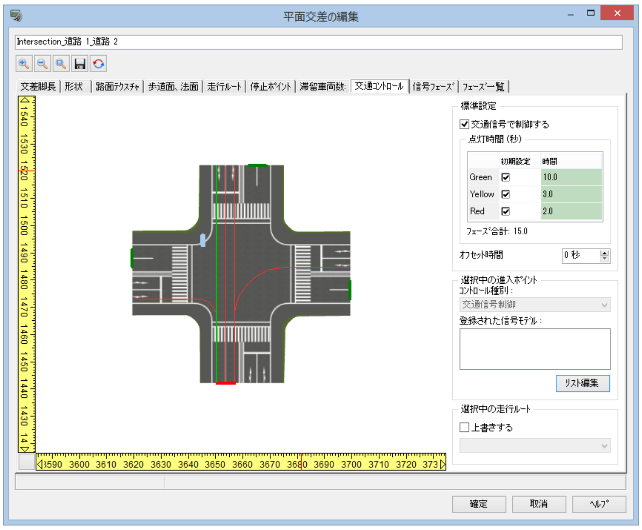
2. Intersection Traffic Light Control

Arrange a traffic light model at an intersection.

Click the intersection and select Edit intersection from right-click menu to open Intersection Editor.

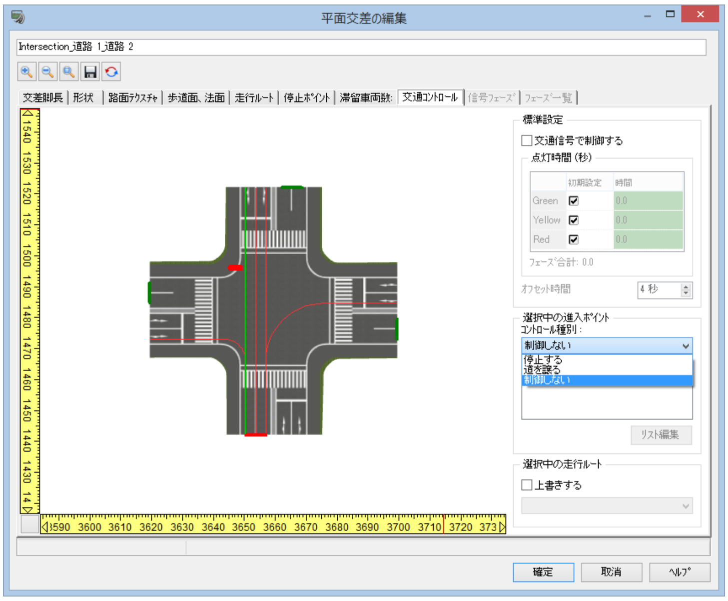


On the Stopping points tab,
①Click → on the intersection admission-port.
②Click a driving route.
③Uncheck "Use the default". Drag or enter a value.
Repeat them for each route.

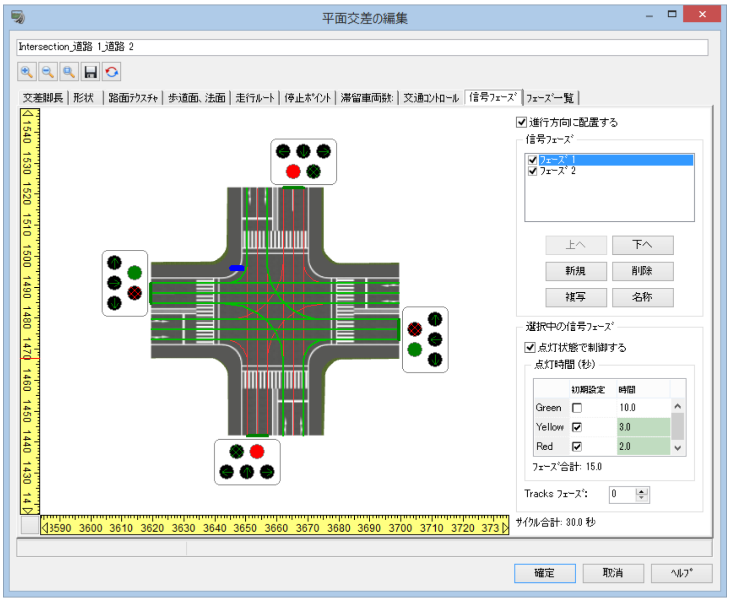


Then, select a signal and an access road on "Traffic control" tab.
①Check "control with a signal" on "standard setting".
②Click a green line on the intersection admission port.
③Click "Edit list" button and select the traffic light to control the road direction.
It is displayed in the following color.

・ Choosing: Green
・ Unregistered: Light blue
・ Registered : Red
・ Registered as the other traffic approaching point: Blue



To control an intersection without traffic lights, choose a control type of the selected approach point. It is possible to control the priority settings. Check "Override" to overwrite it.
Hint:By checking Controll with traffic lights, the signal phase is enabled.



On the "Signal Phase" tab, it is possible to change the signal on each road direction by each travel pattern
① Set traffic lights for each phase. Click the colors and the arrows of the traffic lights to change them. Uncheck "Lights Control Traffic" to set up traffic lights and driving paths separately.
② Enter the lighting-up time for each signal on "Signal Time". (Check "Default" or enter optional time)

The settings can be confirmed on the phase list.

Phase	Green (secs)	Yellow (secs)	Red (secs)	Totals (secs)
Phase 1	10.0	2.0	1.0	13
Phase 2	3.0	2.0	3.0	8
Phase 3	10.0	2.0	1.0	13
Phase 4	3.0	2.0	3.0	8
Cycle	26.0	8.0	8.0	42

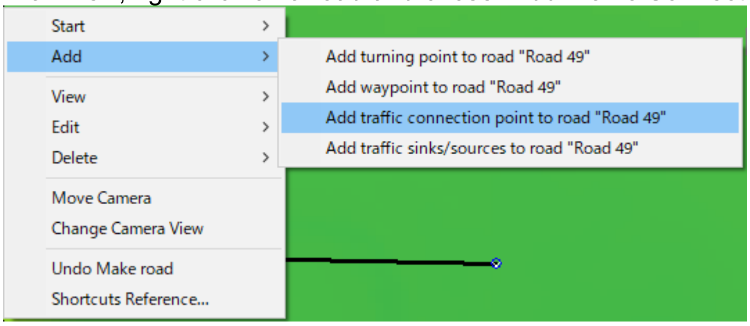
3. Traffic control simulation

Return to the main screen and generate a traffic flow controlled by the signal.

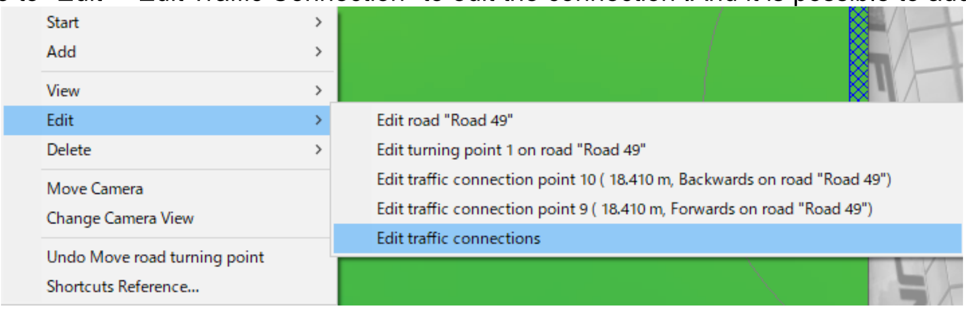
Traffic Connector

By adding Traffic connection points, it is possible to move momentarily from one road to another when driving on the road.
Traffic connectors allow to drive various road routes without having to drive manually and It is possible to create long roads in sections only where necessary, allowing for continuous manual operation.
Furthermore, even if the vehicle is driven or driven to the edge of the road, it can be returned to the point where it can be driven again.

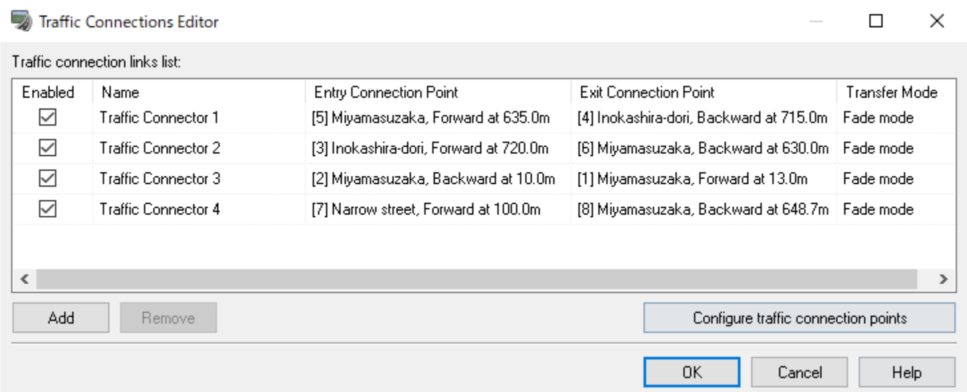
In Plan view, right click on a road and chose "Add Traffic Connection Point". Set 2 points: an entrance and an exit.

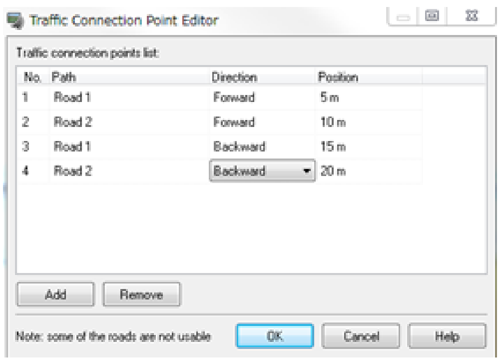


Go to "Edit"- "Edit Traffic Connection" to edit the connection .And it is possible to add or delete it.

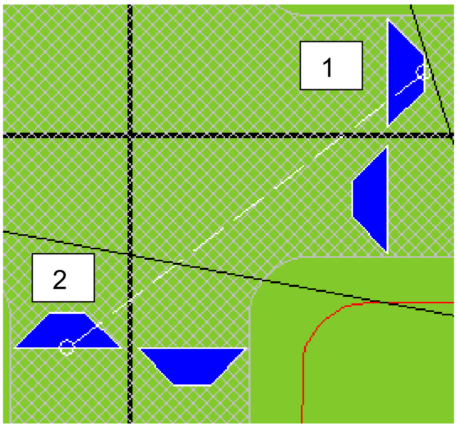


Edit the entrance point and the exit point on Traffic Connections Editor. Select a connecter and click “Configure traffic connection point” to list all connection point. It is possible to change the direction and position.





After settings, the traffic connector is enabled. The traffic moves from point 1 to point 2 instantaneously.

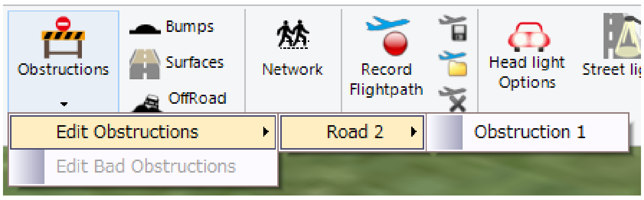


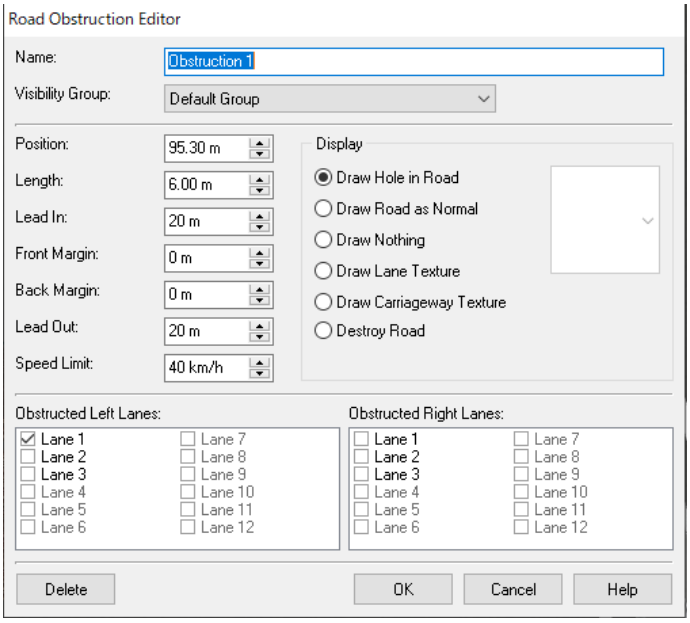
- It is possible to drive on various routes by using a traffic connector even if it is nota manual drive.
- It is possible to divide a long route into several parts so that the manual driving can be done continuously.
*After reaching the edge of the road, the driving can be restart.

- The connection from the edge of the road to another edge is also possible.

Road Obstructions

Hold Shift+Ctrl+Alt and click on a road to create an obstruction.
Click the collapsed area or go to "Edit - Edit Obstructions", to open Road Obstruction Editor.
Set up the position, length, Lead In / Out, margins, speed limit, right and left lane as well as the display method.



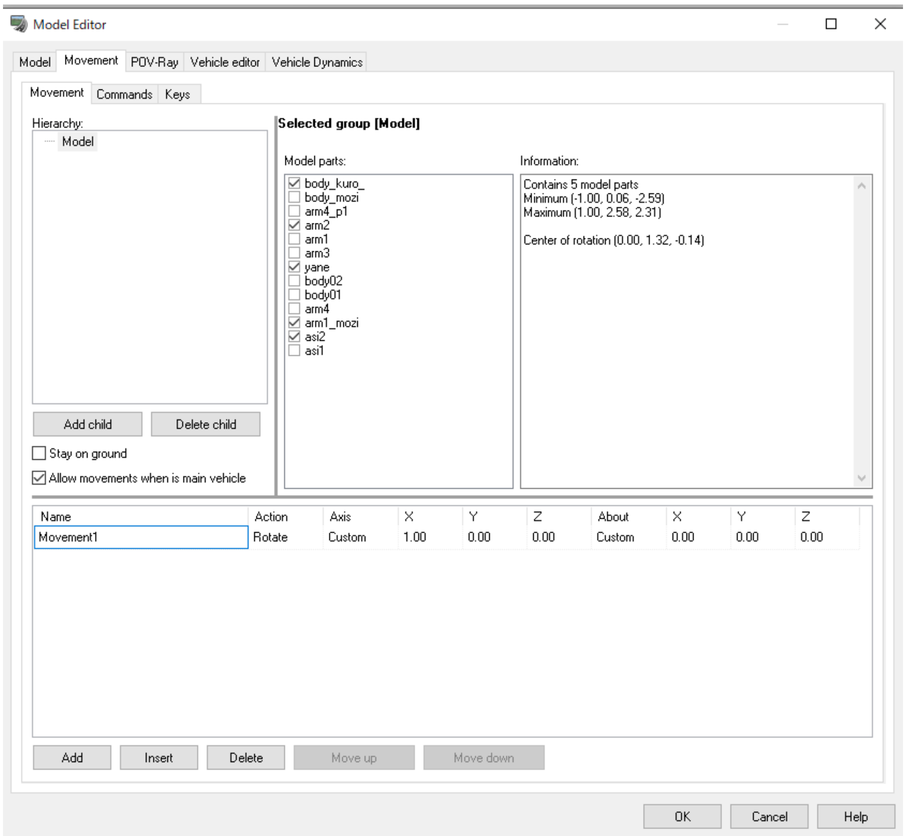


Left: A road collapse as a result of a falling bridge girder.
Right: A road collapse using a highway-regulation model.

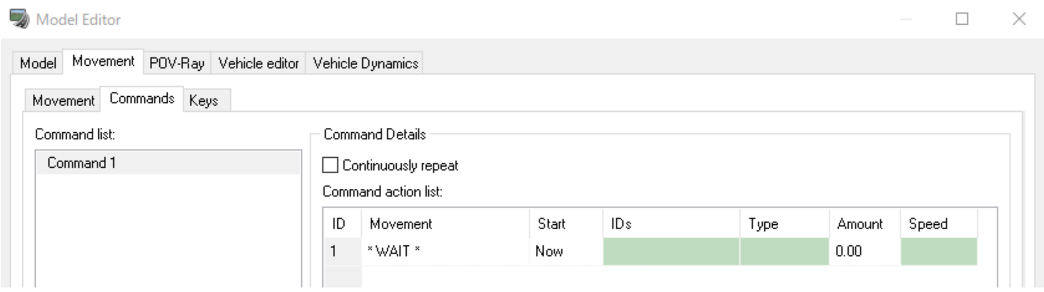
Movable Model Settings

It is possible to apply movement settings to models.
Example: "Constructionmachine" - "Mini shovel" from RoadDB

Click on the model and open the Model Editor.
On Movement tab, set the grouping and the model parts to work. Then add actions.



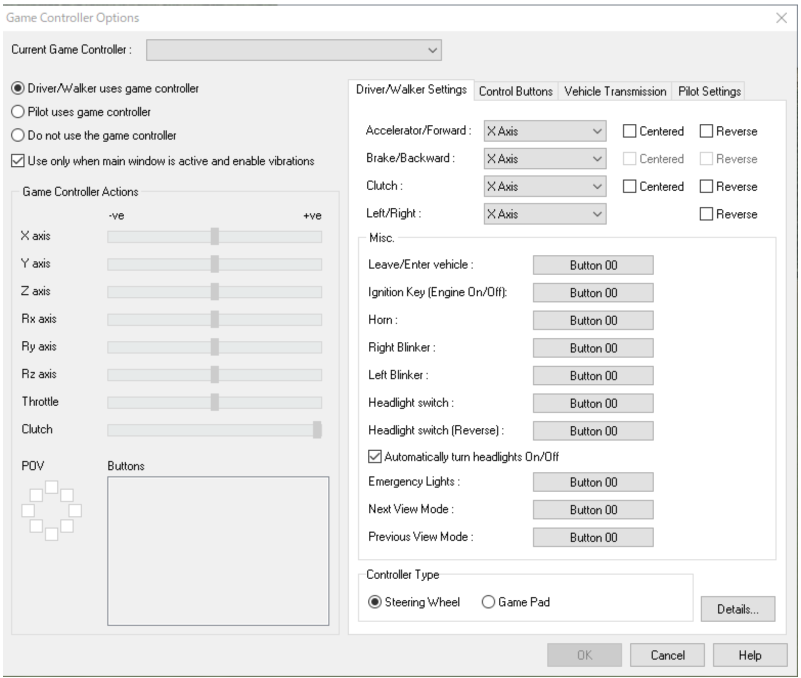
On the Command tab, register the procedure of operations to the command list. And On the Key tab, it is possible to allocate hot keys.



Driving Simulation

*Note
When using controller like steering wheel, axel, brake etc., connect it to PC before activating UC-win/Road.
Go to File - [Application Options] - [Game Controller Options] after activating it.

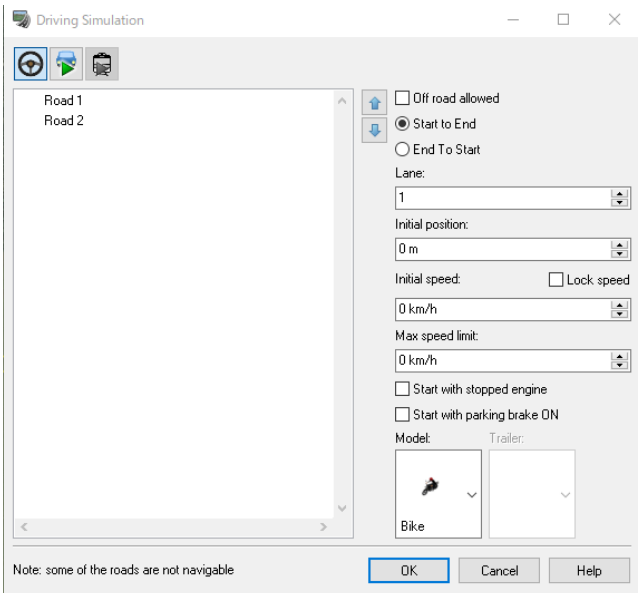
Operate the joystick, steering wheel and button, and confirm each axis in Driver /Walkers setting to Pilot mapping. On the Drive Responsiveness Settings opened by clicking "Default" button on the Drive / Walker Settings, input the numerical value in a field of each reactive property such as steering and brake to set the play for each axis. 1.0 is for no play and the bigger the value is the bigger the play becomes.



Click Ribbon [Home] - [Navigation] -  to start driving.

1. Driving Simulation

Click "Drive" button to open the setting form.

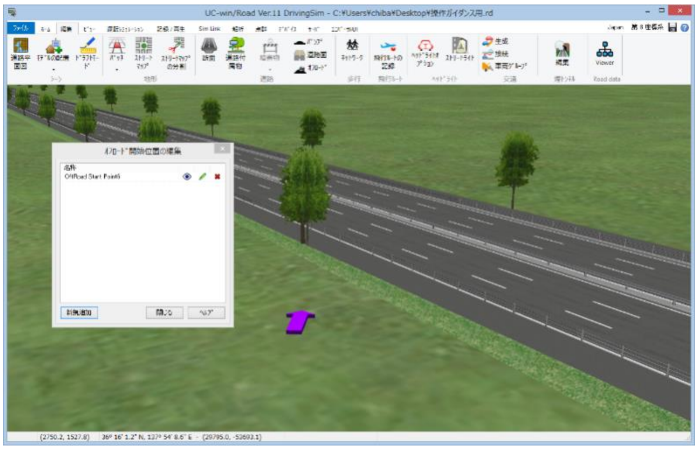


If the "Off road allowed" is checked, it is possible to start driving and drive out of the road.

Select a driving direction from the driving method.
And Set up the following parameters
・Driving lane
・Start driving position
・Limit value of max speed and initial speed
・Lock Speed
・Start with stopped engine
・Start with parking brake ON
Select a car from the dropdown list.
*Model and trailer can be selected separately

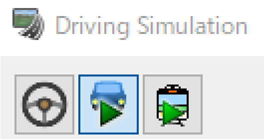
To drive on offroad, go to Edit- Road - 

and add and edit the start position of offroad.



2. Traveling Simulation

Click Drive button and then click "Travel on road"  .



After enabling the settings of the driving direction, lane, initial position, initial speed, view point height, it is possible to start travelling on the road.
To keep the driving speed stable, check to Lock Speed.
Depending on the specifications, it may take a while before the simulation begins.
It is possible to make use of the ramp to enter another road. Check Ignore waypoints to ignore waypoints while driving.

Operation keys
While travelling, the travelling speed can be adjusted by pressing "↑" or"↓" on the key board.
In addition, the driving lane can be changed by pressing "←" or "→"

 Pause, Resume  Start/Restart

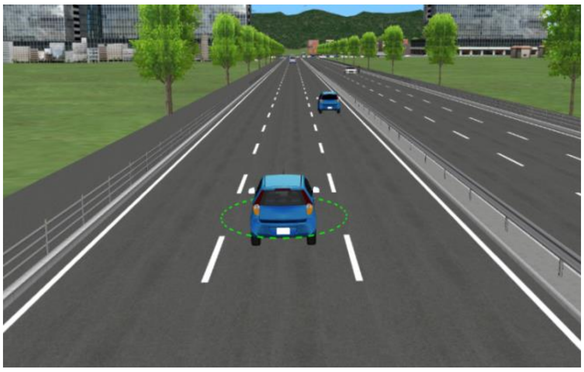
[↑] key: 5km/hr acceleration
[↓] key: 5km/hr deceleration
[←] key: Move to the lane on the left
[→] key: Move to the lane on the right
[Ctrl]+[↑]or[↓] key: Look up or look down
[Ctrl]+[←] or [Ctrl]+[→] : Look left and right.
[PageUp] key: Increase viewpoint height
[PageDown] key: Decrease viewpoint height

The number keys: Change the viewpoint by every 45°
Holding down [Ctrl] + [Alt] key and clicking on another vehicle: Move the viewpoint to the vehicle.
Holding [Alt] key and clicking on the road: "Road Information" screen will open.

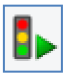
It is possible to change the visual settings with "Visual Options". 

■Navigation Function

-By going back while rotating a mouse wheel, it is possible to trace a vehicle.
The target object is enclosed in a green frame. Camera can rotate and satellite around it.
-When dragging the mouse while keeping right-clicking, a white ball appears. And it is possible to rotate around it.

■Auto Driving/ Manual Driving

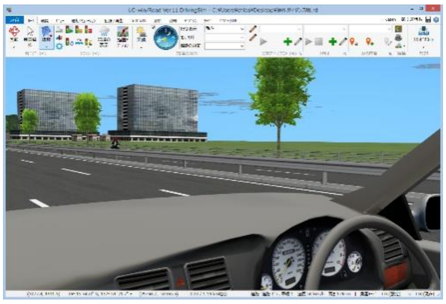
Click "Traffic Movement"  Click to select a vehicle and ride on the passenger side.

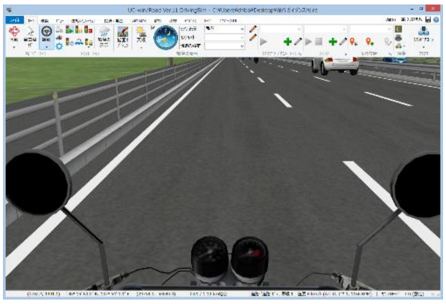
The direction of the viewpoint can be changed using the number keys.
[1]: Lower left
[2]: Down
[3]: Lower right
[4]: Left
[5]: Front
[6]: Right
[7]: Upper left
[8]: Up
[9]: Upper right

By pressing [Enter] key while sitting on the passenger seat, the view will switch to the view from the driver seat. It is possible to drive with a steering wheel, accelerator and brake.
The interior of the vehicle will change depending on the vehicle. The car, bus, truck and the motorcycle are available.

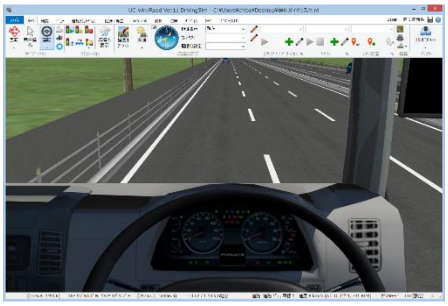
Vehicle



Bike



truck



Bus

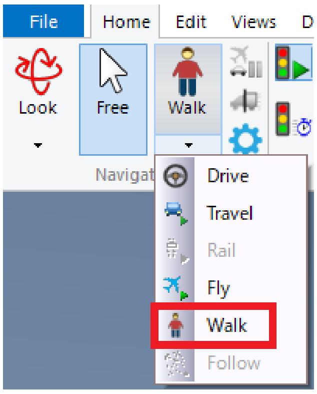
Bicycle

■Multi-screen display

It is possible to display driving and pedestrian simulation with multi-screen. It contains of right, left, front and rear view.
The views can be displayed or hided from the ribbon, Views - Left, Right and Rear.

Pedestrian Simulation

Click "Pedestrian" button and open "Pedestrian Settings".



It is possible to simulate walking on terrain, carriage-way, and the sidewalk. It can be moved forwards and backwards using "↑" or "↓" and right or left using "←" or "→".
Change direction by dragging on the mouse.
Increase the speed by pressing "Shift". Press [J] key and click on the field to jump there. Collision is valid when moving slower than 40 km/h.
Height of obstacles that avatar can jump over can be changed from "Home" Ribbon – "Navigation" – "Navigation options".

*Walking can also be simulated by assigning a flight path for the Pedestrian.

- The MD3 character model displayed as avatar on "Navigation option" screen can be selected.
- It is possible to walk by the operation only with the mouse. The pace of walking is changed when the mouse is moved back and forth while clicking, and it rotates right and left when moving it right and left. The direction of the gaze is set forward of the direction where it walks. The distance with avatar can be adjusted by using the mouse wheel. The setting of the operation can be changed on an optional form of the navigation.
- The game controller is also available. For instance, when the steering wheel is used, the direction where it walks can be controlled by turning the steering wheel right and left. The pace of walking can be adjusted by stepping on the gas pedal.
- When the walking mode is begun, the camera is moved to the height of person's aspect even if whatever it is under the camera. (Therefore, it is not possible to walk on in the air and the geographical features which are not seen.)

Walk and run
The pedestrian can walk on roads, a ground or any models.
It is possible to change the height or the walking speed of the pedestrian in the Navigation Options.
The camera can be moved by keyboard and rotated by mouse. The 3D mouse enables to do both, then the mouse wheel is disabled.
It is also possible to run. The running speed changes according to the walking speed and the Boost factor defined in the Navigation Options Form. Over 40km/h the pedestrian can only run over the ground.

Collisions
The pedestrian can notice the obstacles and bump into whatever prevents from going further. He will bump into things higher than him or things too high to be climbed. If a slope is too high, he cannot.
It is possible to bump into obstacle on the side or behind the pedestrian.
The pedestrian can go inside a model which has an entrance way.
If there is an obstacle higher than ground level but lower than the pedestrian, he will bump into it.
Moreover, if the width of the way is lower than 80cm it will not be possible to go further.
(Over 40km/h, the collision check is not available).

Climb and fall

The pedestrian can walk over anything lower than 40% of his own height; therefore what can be climbed depends on the pedestrian's height. Over 40%, the pedestrian will bump into it. If he is on something high, it is possible to fall up to 120% of his own height. Over 120%, the pedestrian will not go further.

Crouch

Crouching enables to go under obstacles that are too high to be climbed and too low normally walk into. When the pedestrian is crouched the height of the camera is Crouched height defined in the Options.
As long as he is under the obstacle, if the pedestrian can bump his head, he will not stand, even if the keyboard key to stand is pressed. When the pedestrian is crouched, changing the height with the keyboard will change the crouched height. To change the height, it will stop changing before the real maximum if there an obstacle.

Jump

If there is a narrow hole in the way of the pedestrian (smaller in distance than the height of the pedestrian), it will be possible to go over it and reach the other side of the hole without falling.
The jump function of the Free mode is also available in the Walk mode. Therefore, the option is available in the popup menu and it is possible to jump to the point clicked with the mouse.
The camera will be moved on the exact position and then be adjusted to allow walking at the new position.

Flight Simulation

It is possible to do “Free Flying" 

and flight simulation "Fly About". 

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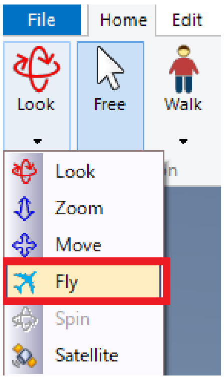
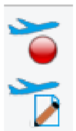
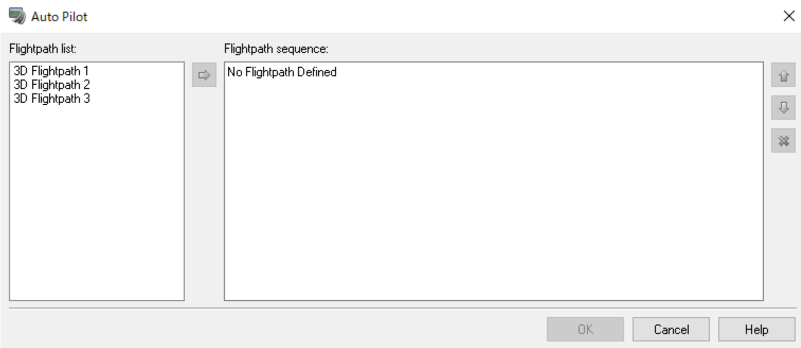


Create the flight path on the plan view.

Click "Make Flight Path"  or select it on the right-click menu. The settings are the same as the road alignment.

From main screen, go to the ribbon, Edit – Flight path – Make Flight Path or Edit Flight Path. 
The driving and walking paths are also possible.

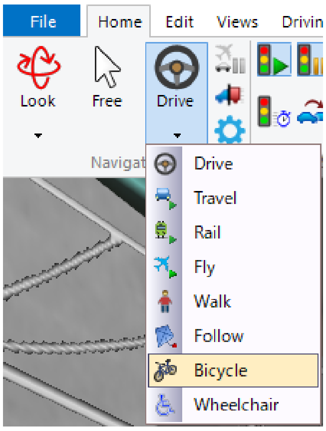


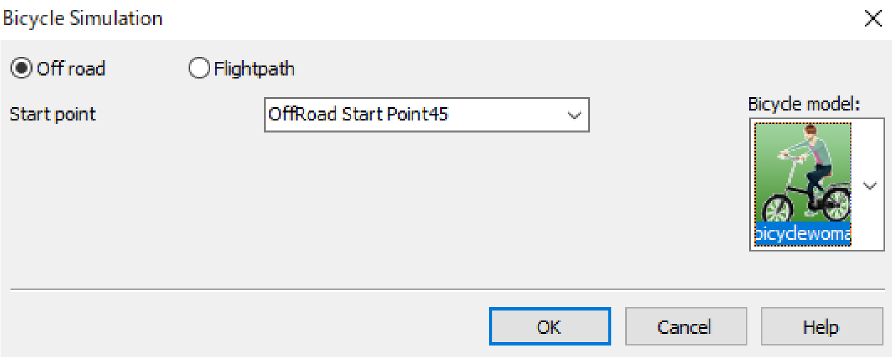
Select a flight path and click on the blue arrow to add it into the flight path sequence. It is possible to select some flight paths and fly along them continuously. Specify the starting and finishing position, flight speed, height offset.
e.g.)For walking path, input 1.5m as the height.
Roll means the inclination during the flight.
The flight speed can be changed at a rate of 5km/hr using [↑] key or [↓] key.
The number keys will allow change of 360 degrees viewpoint for every 45 degrees.

Bicycle Simulation

The bicycle can be driven on a flightpath or on an off-road.
This screen will not appear if the project does not have an off-road start or flight path.

From the ribbon [Home] - [Navigation], select "Bicycle". 





There are 2 modes; Off road and Flightpath.

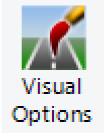
Offroad – Start driving on the offroad start position. This is available when an offroad starting position has been already added. A list of valid off-road starting positions will be displayed. From that list, select the off-road position to start bicycling.

Flightpath – Start driving on the flightpath. This is available when a flightpath has been already registered. A list of valid flight routes is displayed. Select a flight route and specify the initial position and travel direction.

It is possible to select a model registered as an MD3 character as a bicycle model. Please select an MD3 character that can be used for bicycle riding.

Click OK to start driving.

Simulation using Visual Options

It is possible to simulate various scenes using 

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Examples

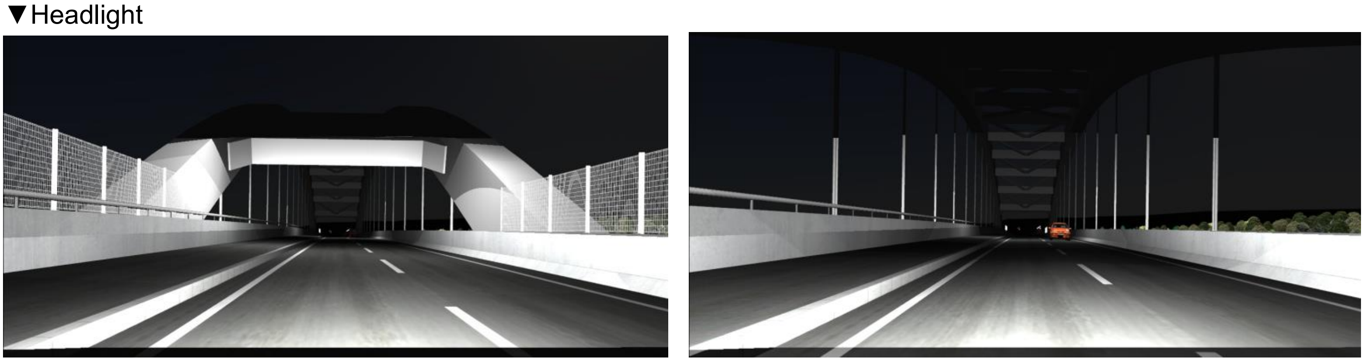
▼Spotlight

▼Spotlight while night driving

▼Sun and shadow

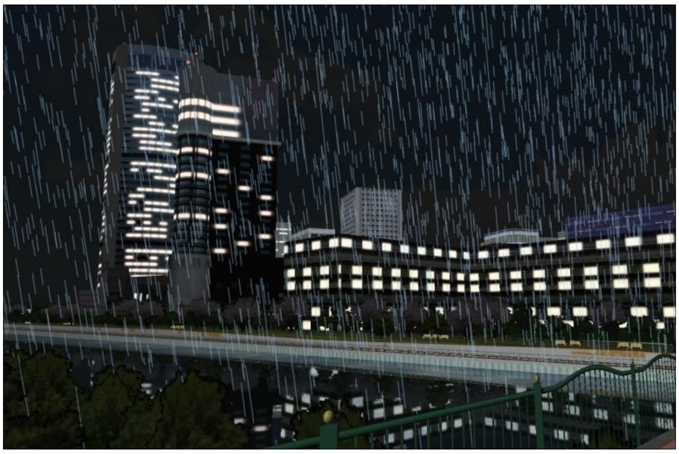
▼Sunset

▼Headlight



■Weather

▼Rain



▼Snow

▼Puddle

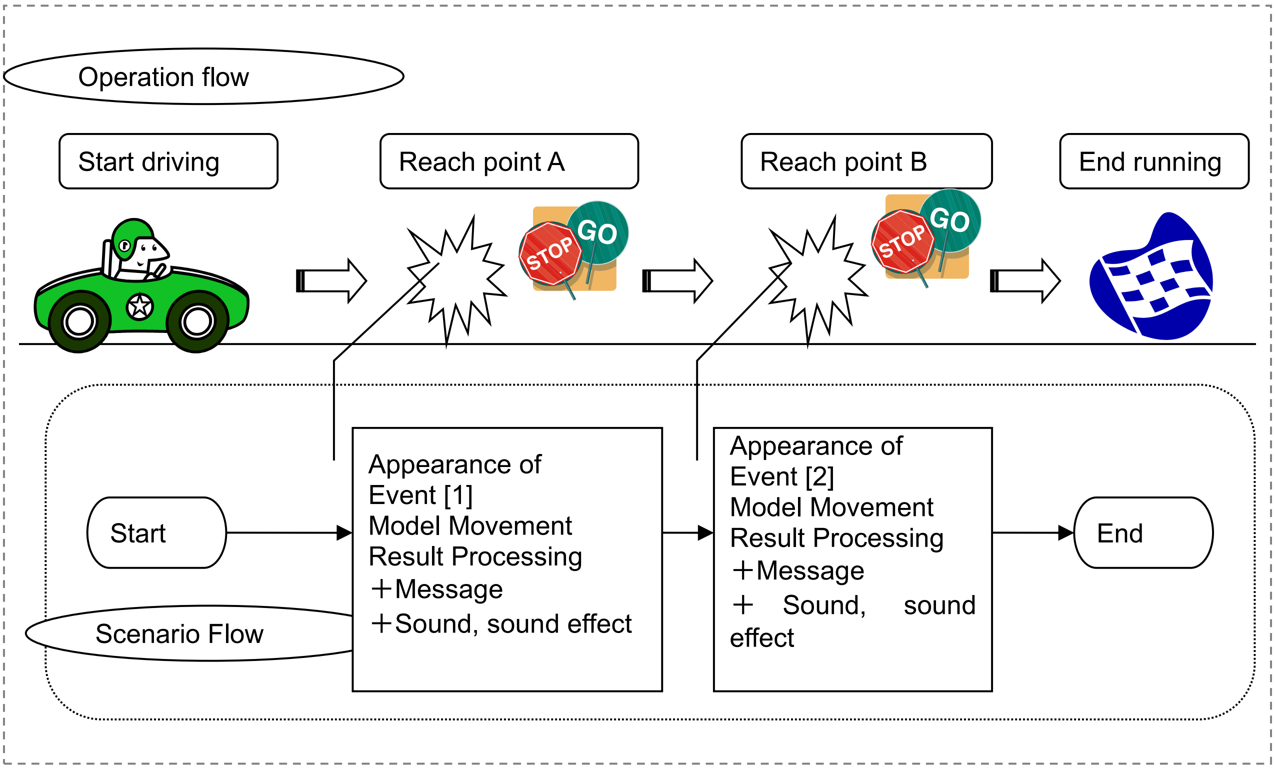
▼Splash

Scenario

Scenario is a series of events from the start to end of the simulation. It consists of two or more events generated according to conditions. By performing simulation based on the scenario which is created to reflect events that may occur in real life, and conditions to test, the intention of VR creation can be attained more effectively.

1. Scenario function

This shows the foundations of an event and a scenario



The event is generated when the vehicle arrives at a certain point.
Moreover, message and sound can be generated as a result of the event.

■ Scenario
Scenario is the flow from the start to the end of the simulation. It contains two or more events within the simulation.

■ Event
In the flow of a scenario, an event means on action that is started and ended by the timing condition and the route condition of the driving vehicles etc. After one event is completed, it progresses to the next event. Triggers can be defined by waypoints and events. Note that since waypoints are placed on roads and contain certain vehicle or model movement parameters defined inside, they are only triggered when directly driving.

A scenario is set up by combining two or more events. Set the condition, action, result, etc to be generated. One scenario is created by adding as many events as needed.

2. Driving through scenario

(1) Initial setting
Connect hardware, such as steering wheel, to the computer before starting UC-win/Road.
* Connect the steering wheel and the pedals before starting UC-win/Road.

(2) Adjustment of Device
After starting UC-win/Road, configure the game controller in Game Controller Options from File – Application Options. Set up the movement of joysticks, steering wheels, or the buttons, which and the corresponding [axis] and buttons react to the movements.

(3)Driving by Scenario
Choose scenario from list in the "scenario" in the ribbon, Home - Scenario on the main screen.
Push the button of start scenario and operation will start.

Start Scenario  End Scenario 

Add Scenario  Edit Scenario 

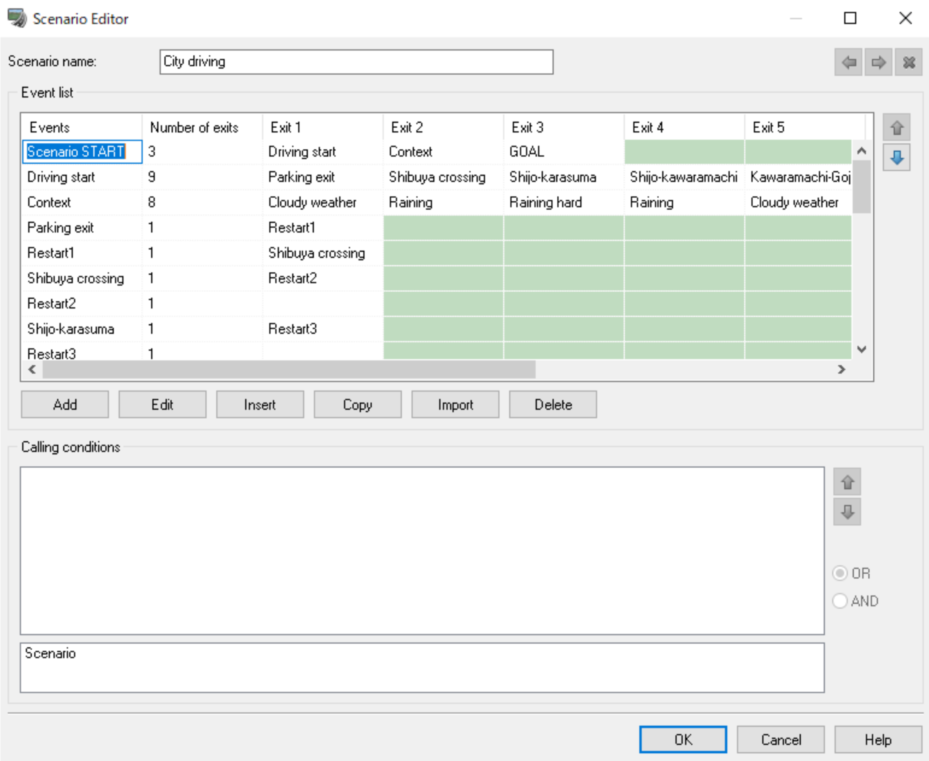
Multi User Editor for Scenario 

- When the "scenario" ribbon is not displayed, "scenario" can be validated in the License Manager opened by File – License Manager in the License Manager opened by File - License Manager

3. Add and edit Scenario

(1)Scenario Editor

Click  or click  to open Scenario Editor. On this screen, add scenarios or click on the scenario to edit.



(2)Transitions

The first event that exists in the table begins automatically when the scenario is begun.
It is necessary to set "Exit condition" to link the event with the scenario to trigger other events and scenarios.
Create a new event with "Add" button in the Event list, set the "Number of exit", and select destination event in Exit1, Exit2,… .
Then selecting the event set in Exit1, Exit2,…, set exit conditions with the Add button in the "Exit condition" List.
Set each transition 1, transition 2, and the destination of each result of the event.
*it is possible to proceed without destination.

To add the exit to the event
Select the number of transitions to be added in exit number row (Exit Number) or input it.
To make the event that makes other events a target
Create a new event with "Add" button in the Event list, set the "Number of exit", and select destination event in Exit1, Exit2,… .
Then selecting the event set in Exit1, Exit2,…, set exit conditions with the Add button in the "Exit condition" List.

To edit the exit
The selected exit exists in the exit row, which displays the exit condition.

(3)Edit Conditions

Define the condition that the event occurs.
It is possible to specify it from the time condition, the speed condition, the checkpoint street condition, and the crash condition.
Two or more condition settings are also possible. The event is not begun if there is no condition.
The target event or the scenario begins when all requirements are met.
Moreover, when all requirements are met, the behavior of the event and the scenario can be decided.

- **Time condition**

The time condition becomes effective before and after the specified time period.

Condition	Target model	Argument 1	Argument 2	Argument 3
Temporal		>	10 s	

- **Speed condition**

The speed condition becomes effective when it is more than the specified speed condition.

Condition	Target model	Argument 1	Argument 2	Argument 3
Speed	Simulation vehicle	>	50 km/h	

- **Checkpoint operation at the Waypoints**

This condition is effective only when Checkpoint operation at the Waypoints is enabled.
Note: Only the drive simulation of this condition is effective.

Condition	Target model	Argument 1	Argument 2	Argument 3
Checkpoint waypoint		No checkpoint		

- **Collision condition**

When the target model collides with another model, this condition becomes effective.
True when collide means the condition is met when a collision occurs. True when do not collide means the condition is met when a collision does not occur. As default, True when collide is selected.

Condition	Target model	Argument 1	Argument 2	Argument 3
Collision	Simulation vehicle	0 model	True when collide	

- **Road condition**

In Argument 1, select the road.
In Argument　2, choose one of the following.

　・On the Road: The condition is effective when travelling on the selected road.
　・Off the Road: The condition is effective when not travelling on the selected road.

Condition	Target model	Argument 1	Argument 2	Argument 3
Road	Simulation vehicle	Karasuma-street	On the road	

- **Direct distance condition**

This condition is effective when the distance between 2 target models is more or less than the specified distance.
In Argument 1, choose whether the condition is more or less than the specified distance.
In Argument 2, select the distance.
In Argument 3, click an ellipse button and select a second target model.

Condition	Target model	Argument 1	Argument 2	Argument 3
Direct distance	Simulation vehicle	<	10 m	Simulation vehicle

- **Travel distance to condition**

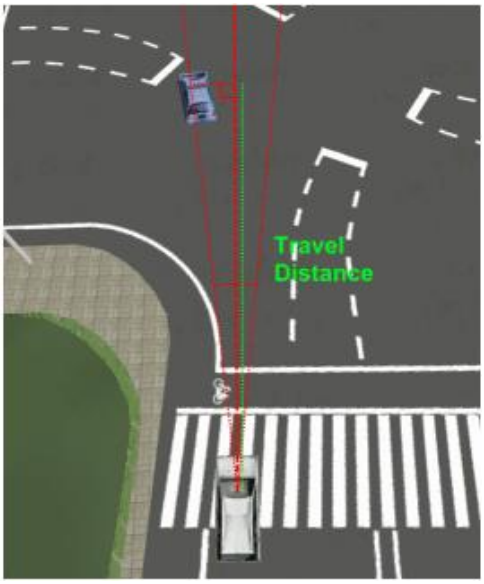
This condition is effective when a distance to the second target models is more or less than the specified distance. Travel distance means the road distance from a position of the first target model to the second target model. Select a movable model as a first model such as simulation vehicle or event moving model.

Condition	Target model	Argument 1	Argument 2	Argument 3
Travel distance to	Simulation vehicle	<	10 m	Simulation vehicle

Travel distance is calculated as bellows. :

2 target models on the same road :　Travel distance is a distance between 2 models.

2 target models on the different roads or intersections : When the second model is driving in front of the first model at an angle of less than 15, the travel distance is based on the travel direction of the first model.



Any other cases: Travel distance is a distance between 2 models.

- **Time to reach condition**

This condition is effective when a first model reaches a second model sooner or later than a specified time.

In Argument 1, choose whether the condition is less or lager the specified time period.
In Argument 2, input the time.
In Argument 3, click an ellipse button and select a second target model.

Condition	Target model	Argument 1	Argument 2	Argument 3
Time to reach	Simulation vehicle	<	2 s	Simulation vehicle

- **Key event condition**

Press or release a specified key of a keyboard to enable this condition.
”On Kay Up” means it is effective when releasing a specified key. “On Key Down” means it is effective when pressing a specified key.

Condition	Target model	Argument 1	Argument 2	Argument 3
Key event	User avatar	N/A	On key up	

- **Controller button event condition**

This condition is effective when pressing or releasing a specified button of a joystick, game controller or steering.
“On Button Up” means it is effective when releasing a specified button. “On Button Down” means it is effective when pressing a specified button

Condition	Target model	Argument 1	Argument 2	Argument 3
Controller button event	User avatar	Button 1	On button up	

- **Car driver input**

In Argument 1, select a driver’s type; Steering, Throttle or Brake
In Argument 2, choose whether the condition is less or larger than the specified value.
In Argument 3, input the value.

Condition	Target model	Argument 1	Argument 2	Argument 3
Car driver input	Simulation vehicle	Steering wheel	>	0 %

- **Model click condition**

This condition is effective by clicking a specified model.

Condition	Target model	Argument 1	Argument 2	Argument 3
Model click	User avatar	0 model		

条件	ﾀｰｹﾞｯﾄﾓﾃﾞﾙ	項目 1	項目 2	項目 3	項目 4
ﾓﾃﾞﾙｸﾘｯｸ		ﾓﾃﾞﾙ0			

- **Driving Control Mode condition**

This condition becomes effective by changing the driving mode for the driving simulation vehicle.

条件	ﾀｰｹﾞｯﾄﾓﾃﾞﾙ	項目 1	項目 2	項目 3
実際の運転操作量		ﾊﾝﾄﾞﾙ	>	0 %

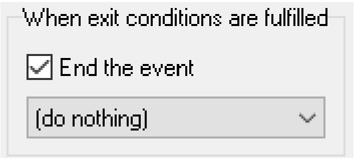
- **Raw driving input**

This becomes active when using the actual operation value such as steering wheel and accelerator pedal as a condition on automatic driving or using ACC.

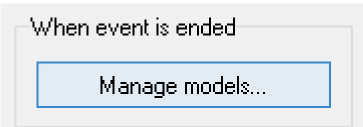
Condition	Target model	Argument 1	Argument 2	Argument 3
Raw driving input	User avatar	Steering wheel	>	0 %

- **When exit condition are fulfilled**

It is possible to add an events when exit conditions are fulfilled.



When the event ends, the dynamic model can be managed by "Event model form".
The model that is stopped or deleted can be selected.
Note: This button can only be used when "End Event" is checked.



(4)Calling conditions

When the event is from multiple event targets, the call condition can be defined.
Select the event to display the call condition of the event.

Event list

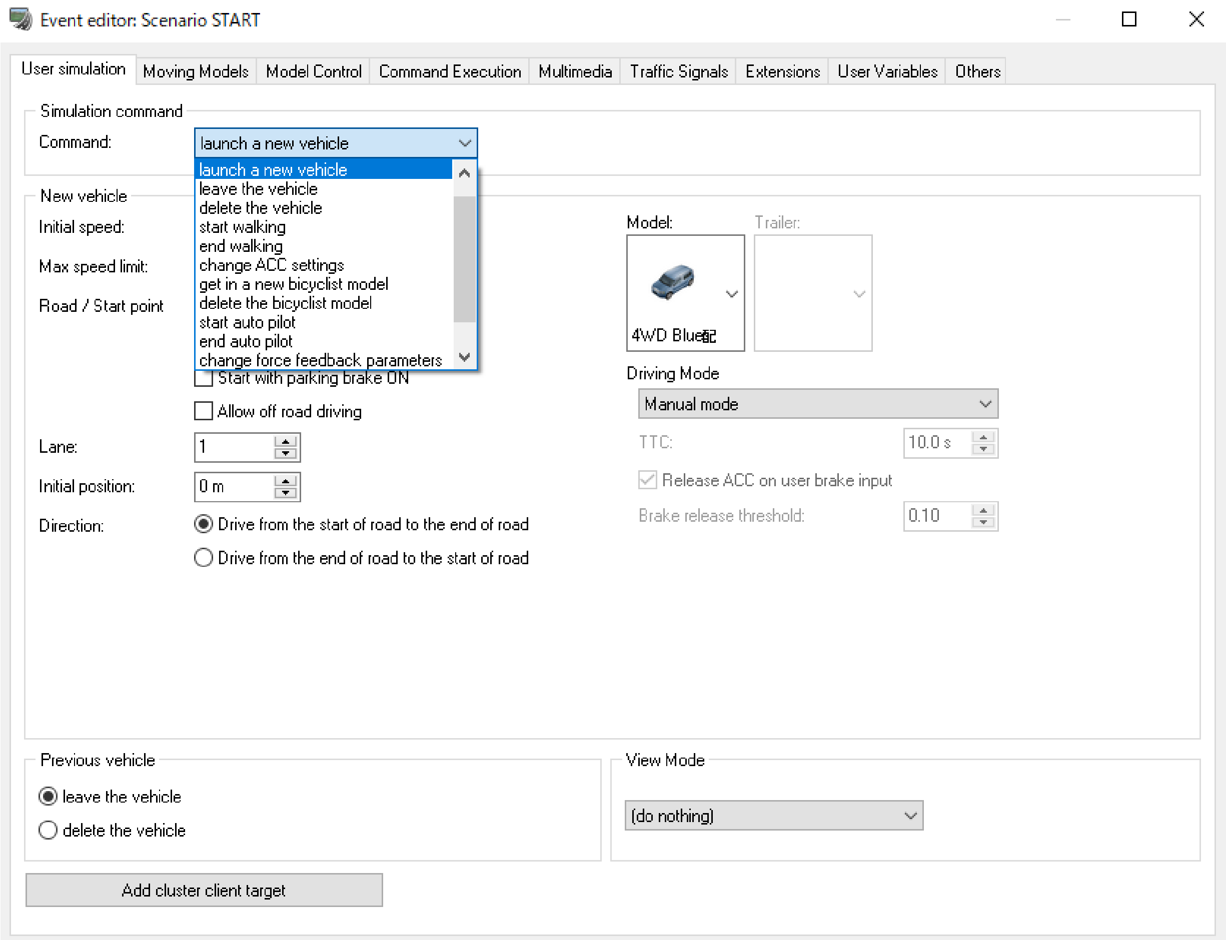
Events	Number of exits	Exit 1	Exit 2	Exit 3	Exit 4	Exit 5
Scenario START	3	Driving start	Context	GOAL		
Driving start	9	Parking exit	Shibuya crossing	Shijo-karasuma	Shijo-kawaramachi	Kawaramachi-Goj
Context	8	Cloudy weather	Raining	Raining hard	Raining	Cloudy weather
Parking exit	1	Restart1				
Restart1	1	Shibuya crossing				
Shibuya crossing	1	Restart2				
Restart2	1					
Shijo-karasuma	1	Restart3				
Restart3	1					

Add | Edit | Insert | Copy | Import | Delete

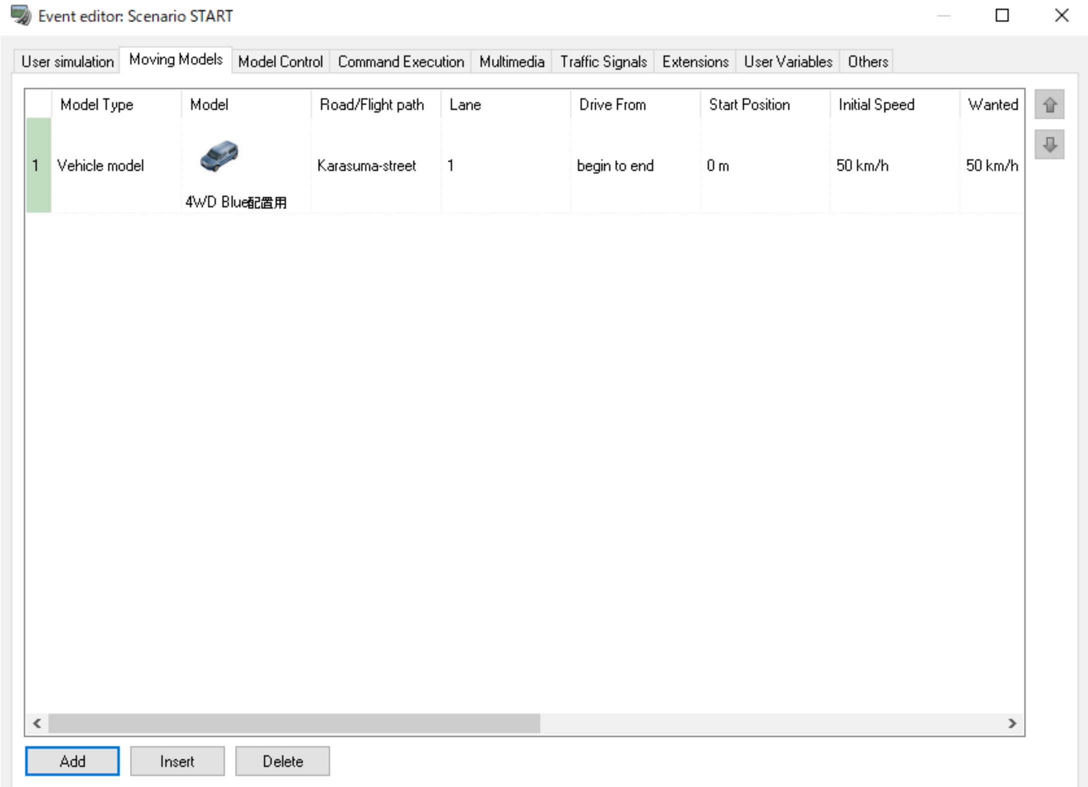
(5)Event editor

To open Event editor, select an event and click Edit.

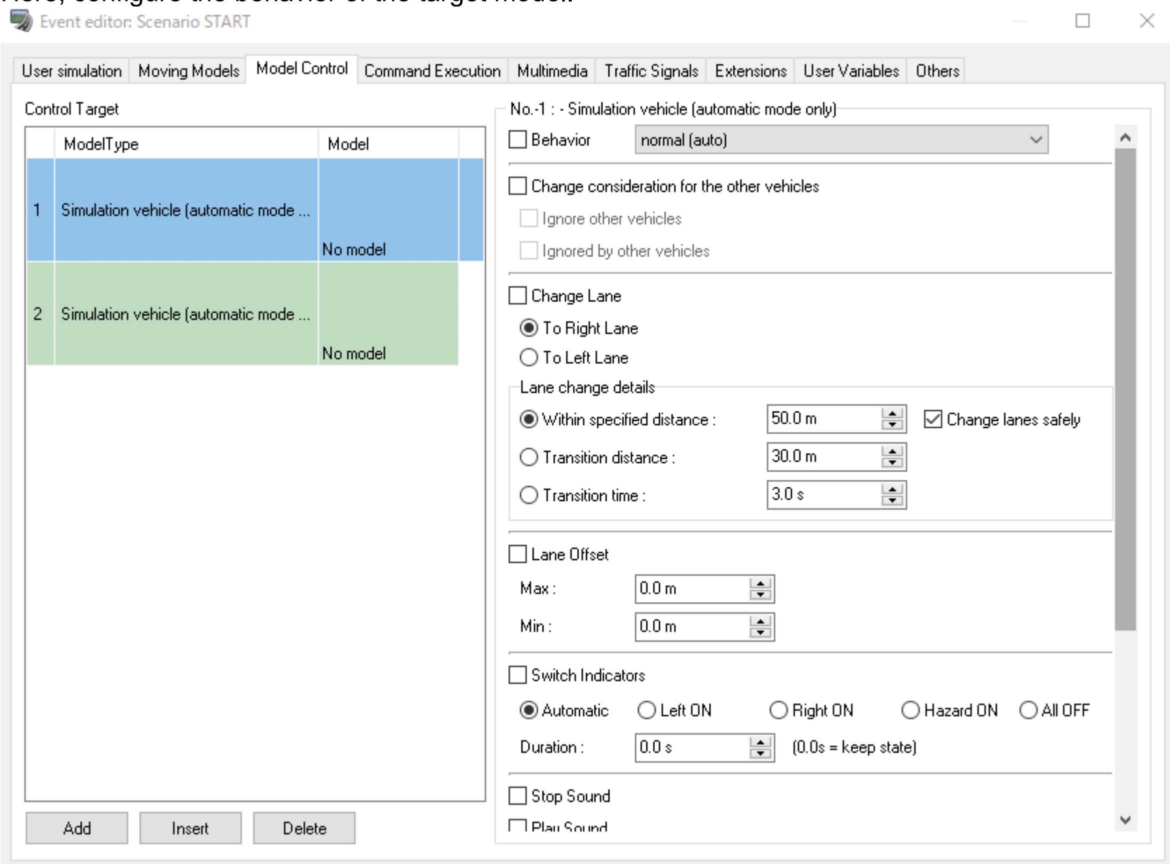
■ User simulation tab
Manage the drive simulation on this tab. Set up the simulation command, the parameter for a new vehicle, the setting of previous vehicle and the view mode.



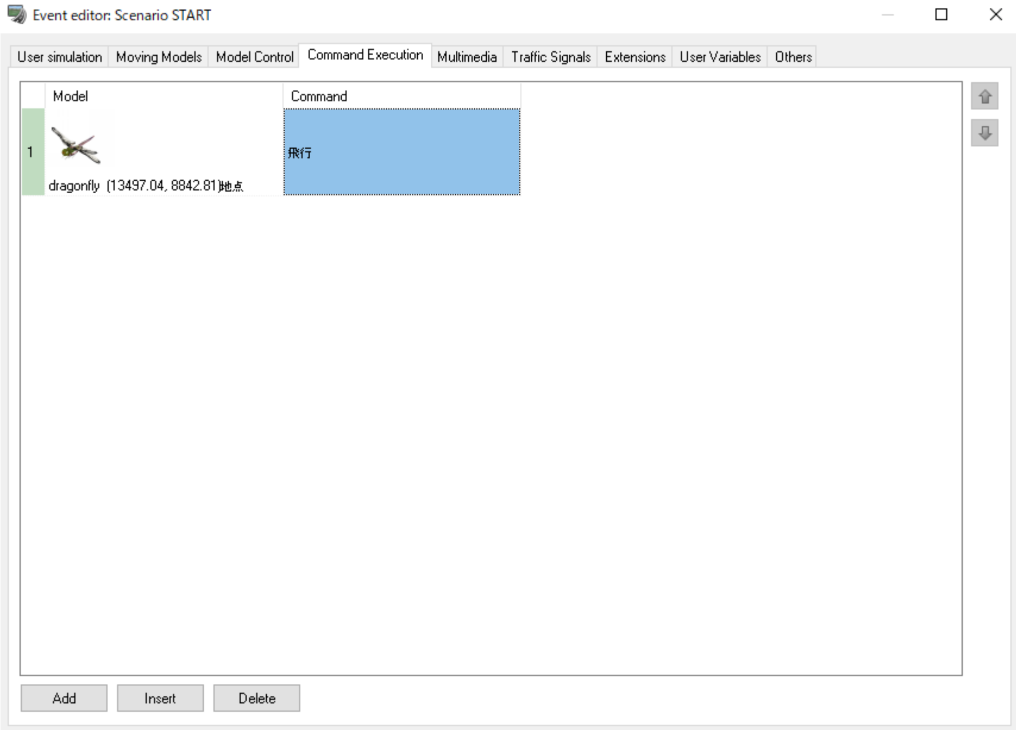
■Moving Models tab
Choose travel models to operate. It is possible to define the model, road/flight path, lane, drive from, start position, initial speed, wanted speed, frequency, etc. for each model.



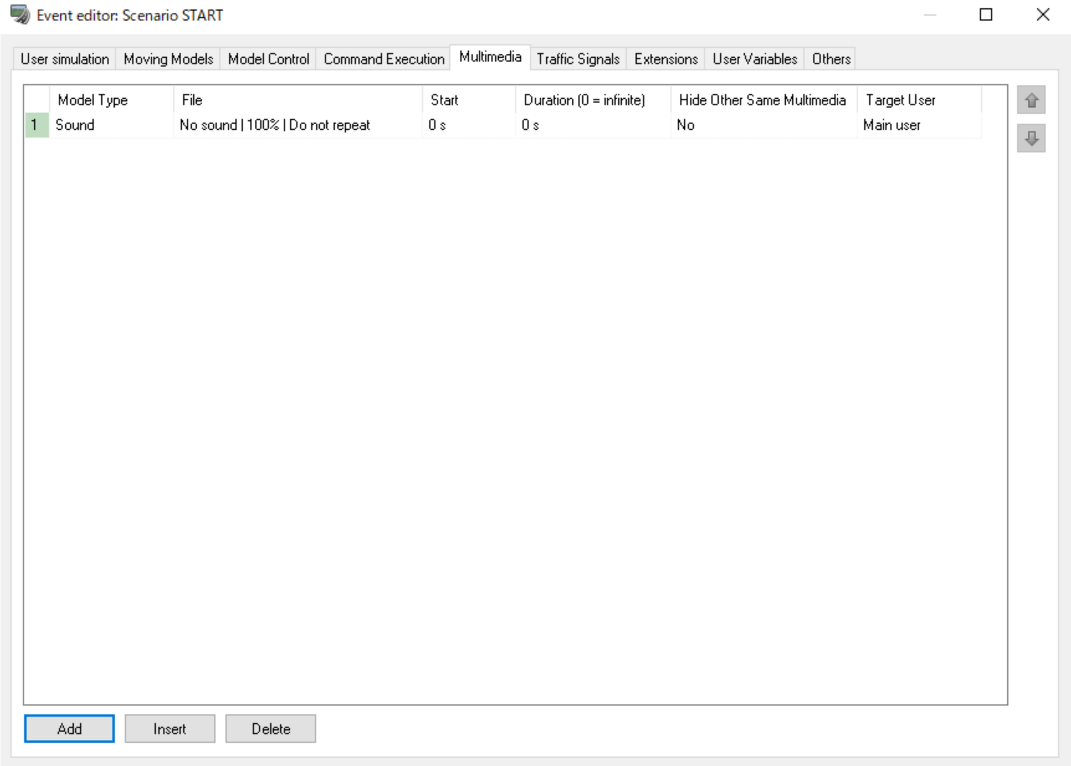
■Model Control tab
Here, configure the behavior of the target model.



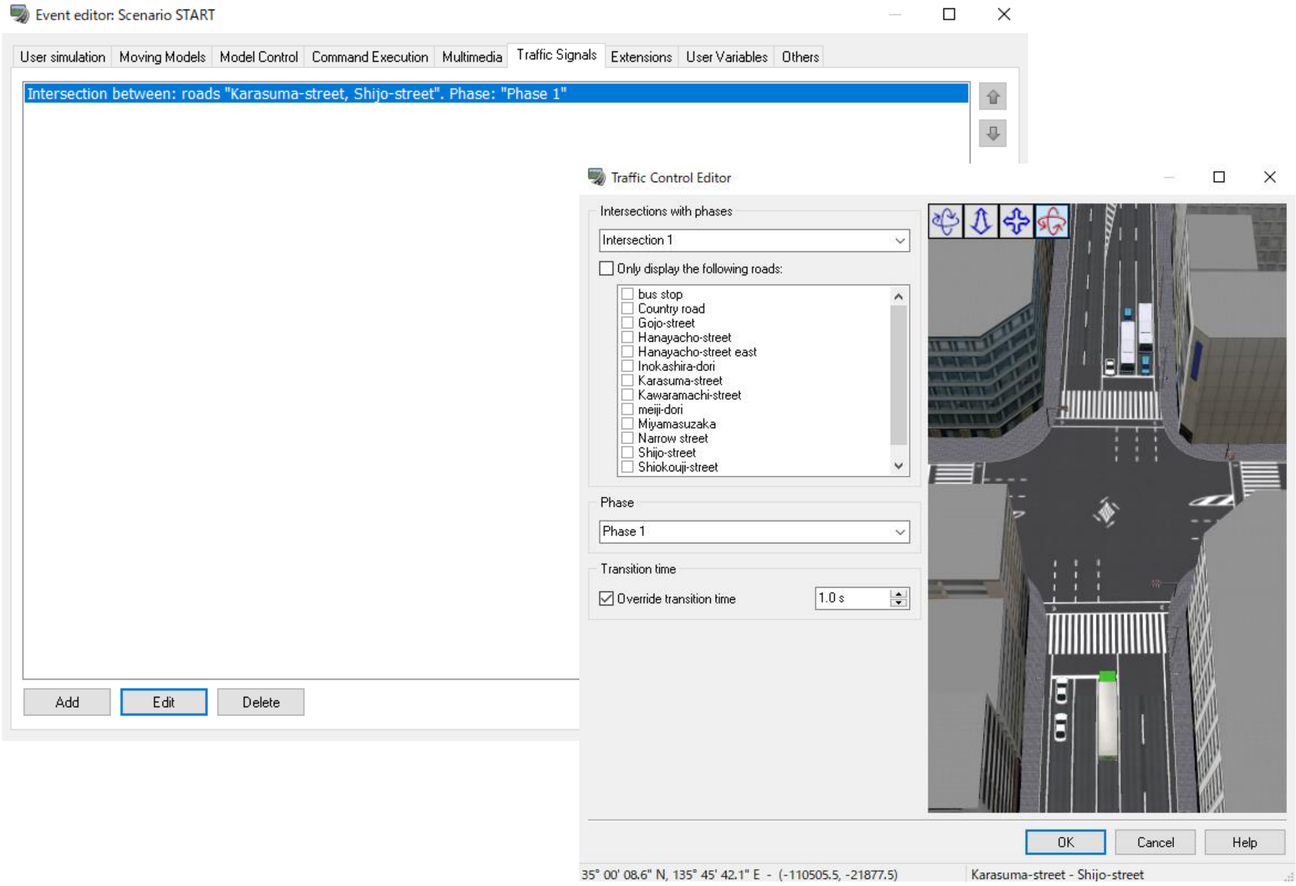
■Command Execution tab
Use the Command Execution tab to specify the scene models to be controlled　such as when a signal to blink, a railroad crossing to open and close, or a balloon to fly.



■Multimedia model tab
Define the multimedia model to play. The multimedia model can be selected from sound, image, message, video, virtual display, or opacity editing.



■Traffic Signals tab
Traffic phases can be modified using the Traffic Control tab. Only intersections with one or more signal phases set in Signal Control will appear in this list.



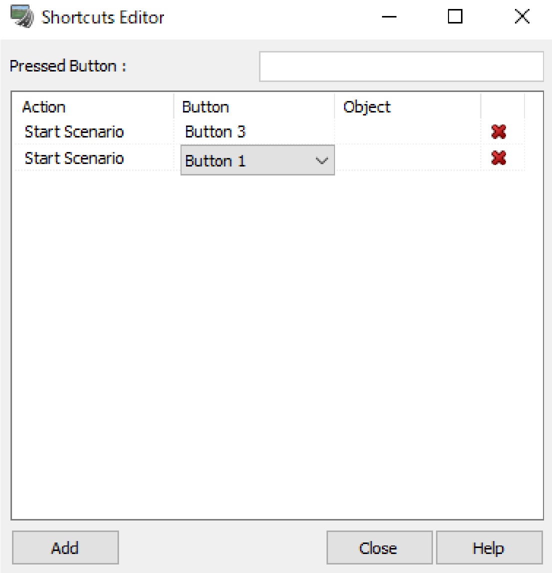
■Extension tab
The Extensions tab contains multiple tabs. Each plug-in data can be controlled by events.
Click Help for the setting details.

(6)Edit shortcut

An unused button of a game controller can be used as a shortcut key to start scenario.

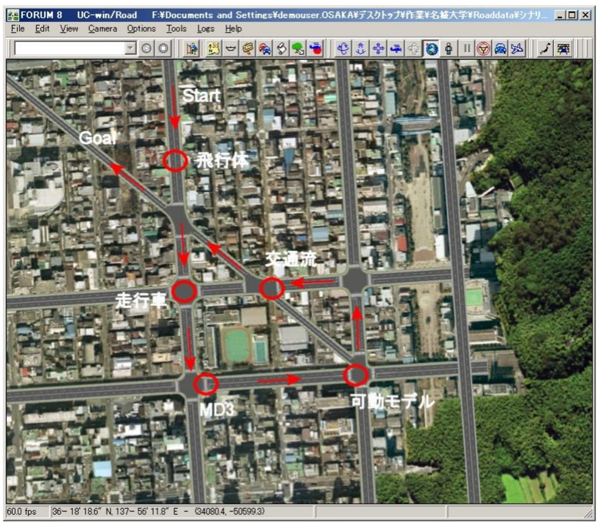
Go to Home – Scenario, click  and 

on Scenario Manager.



4． Setup event route

Although multiple data input of the route can be carried out, it cannot pass through the same place due to the event setup.



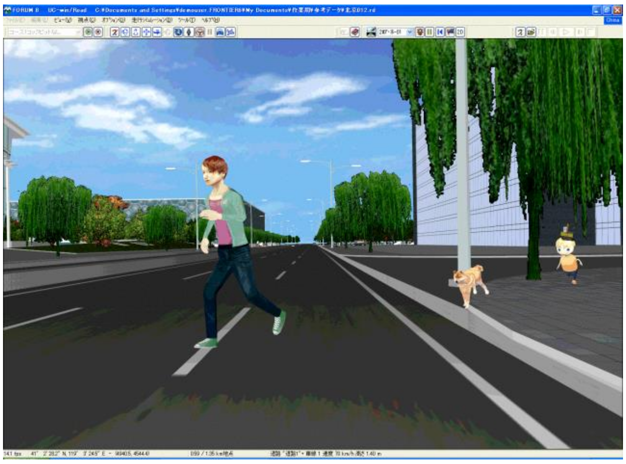
Motion control point (Way Point) can be set at the position where event is triggered at the position where the event ends.

On the Plan View, right-click on the horizontal road alignment, and select the menu, [Add] - [Add way point road #].

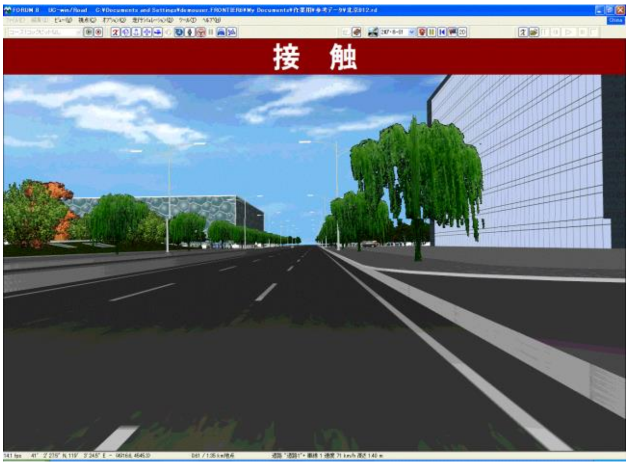
Select the command, "* CHECKPOINT *"

■ Example

Appearance of pedestrian jumping out



Collision occurs



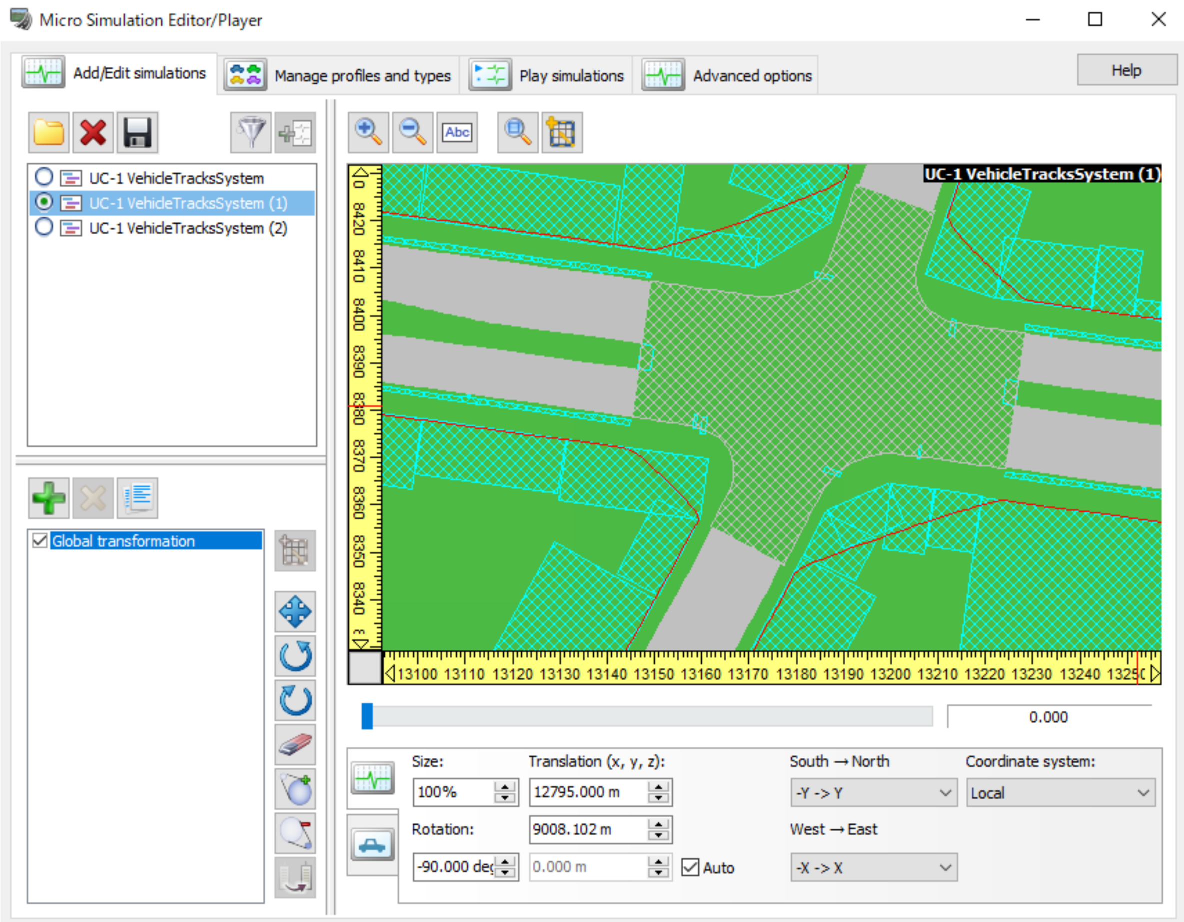
Micro Simulation Player

The micro simulation player can reproduce the simulation result from other applications in UC-win/Road. Microsimulation of traffic, construction management and pedestrian movement etc. can be reproduced by using 3D models in UC-win/Road.
Moreover, the traffic signal cycle, vehicles and the movement of characters can be recorded. And it is also possible to record the traffic in UC-win/Road as simulation and reproduce it in this plug-in, and to display movements of objects that are not on roads, such as those on pavements and flight path.

1. Micro simulation editor

Go to Record/Play Ribbon - Micro Simulation - Editor/Player. 

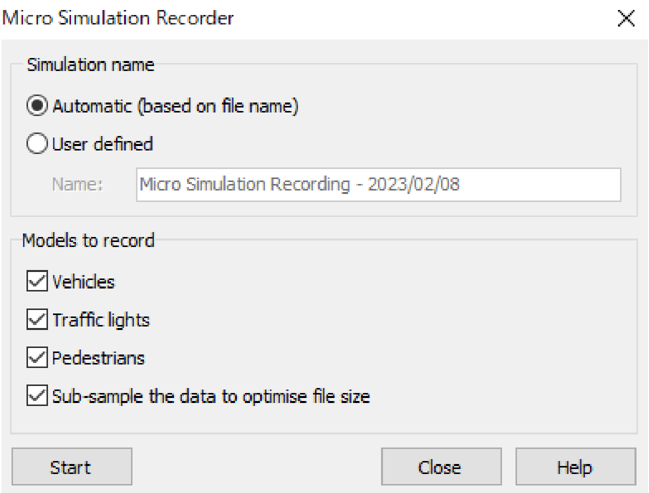
Loadable files;　XML files in the OpenMicroSim format, VISSIM files, S-PARAMICS files and Legion XML files.
All simulation data from the simulations is listed on the upper left.



2. Record traffic

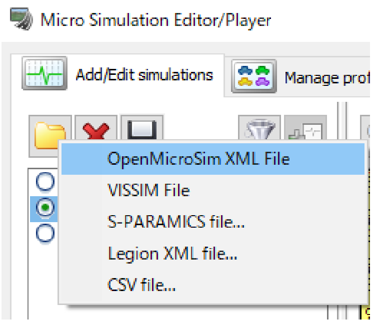
Go to Record/Play Ribbon - Micro Simulation – Recorder. 

The models' movements are saved in the Open Micro Simulation format (.xml), which can then be used in a simulation. It is possible to record vehicles, characters or traffic signals.



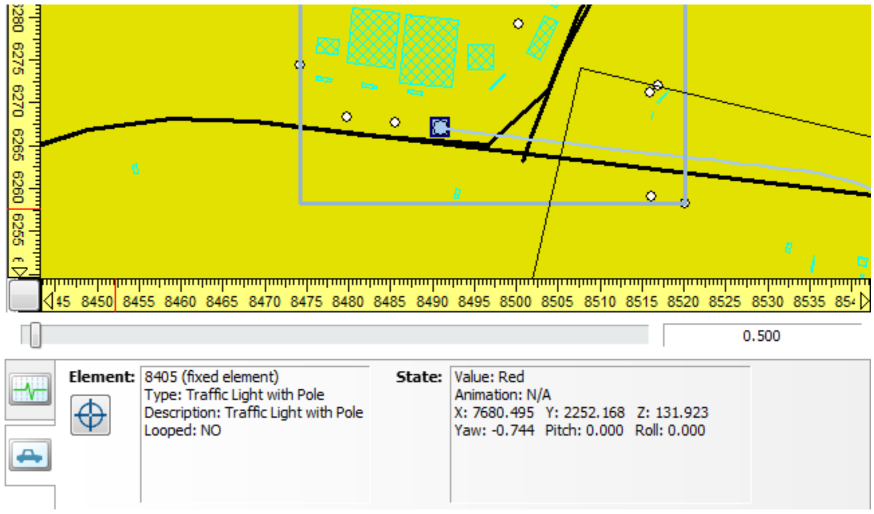
3. Load Simulation

On Micro Simulation Editor, click  to load a recorded simulation data.

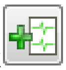


On the lower right, it shows all transformation parameters for the selected simulation.

Moving the time slide bar below the 2D view displays the movement of the element. Click on the circle of an element to select it.The status of the element will be displayed in the tab below.

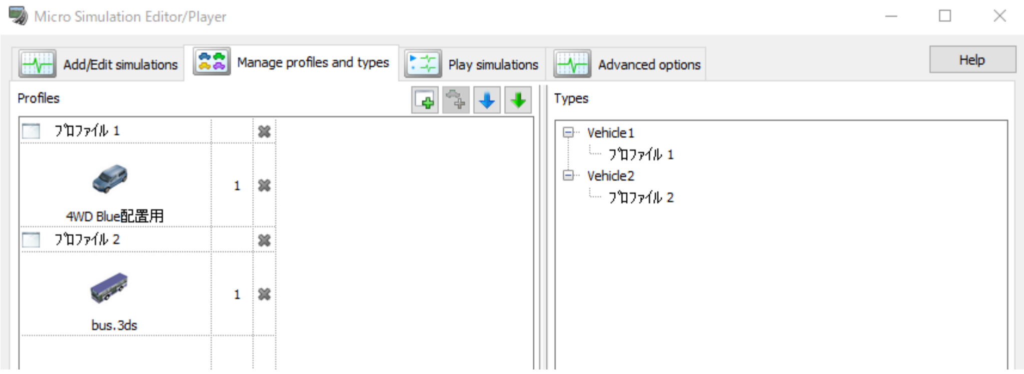


Click the radio button to add the selected simulation to the playlist.
"Define a target zone" can rotate the simulation of selected range or change the scale of it.

Click  "Add to the play list “on add/edit tab of the simulation to add the selected simulation to the playlist

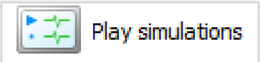
4. Manage Profile and type

Create profiles. The profile can be allocated to each type of simulation.
Go to "Manage profiles and types".
Then, the created profile created can be assigned to the simulation on
Once a type is associated, all unassociated elements will randomly select a model from the profile. When the animation starts, an instance of that model is created and associated with the element.

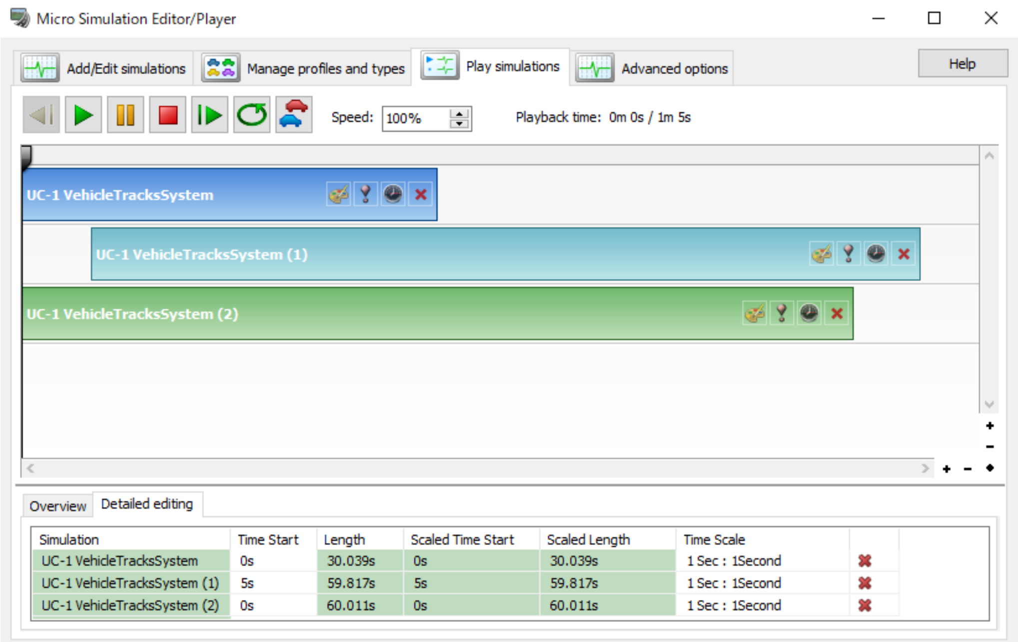


5. Playback Simulation

Click  to add the selected simulation to the playlist

On 

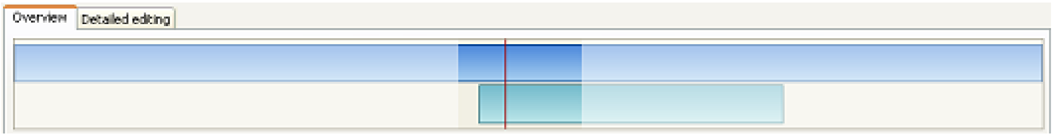
tab, the simulation can be added on the Simulation Playback Tab.



- : Each bar shows one simulation.

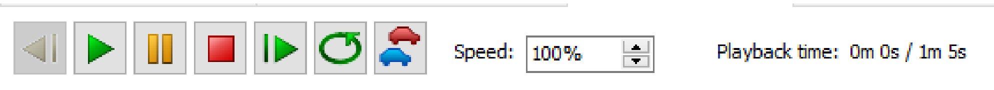
- : The track bar shows the run time of the animation playback.
- : Display color can be selected from the color chart.
- : Add to the current simulation. The popup Normal, Invisible and Solo are shown.
- : Select a time unit.
- : Delete the simulation from the playlist.
- : Zoom in/out.
- : Restore the size.

Outline tab:

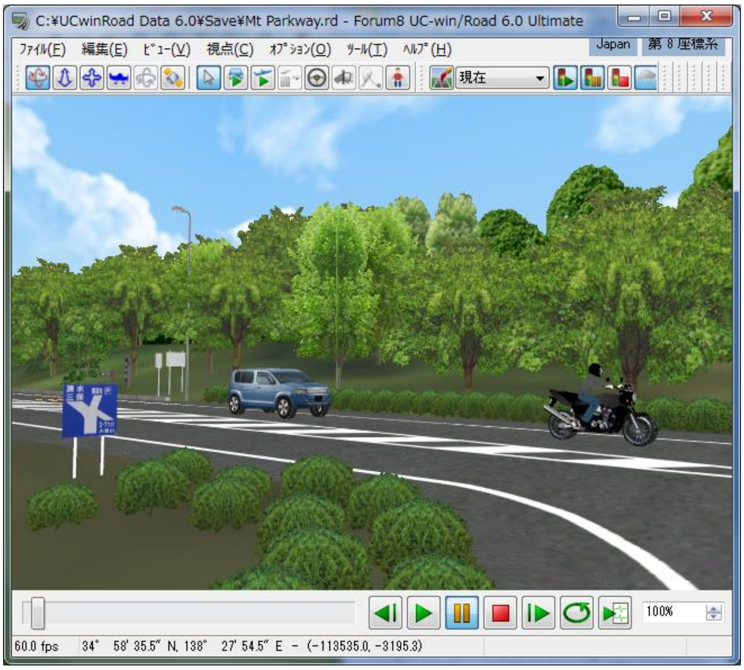


In this tab, the following information is displayed.
Ratio between simulations in the playlist
Position of the track bar when invisible due to zoom
The part of animation that is currently visible in the timeline (The part invisible is displayed in lighter color)

Controls



Microsimulation player's toolbar can be opened by right-clicking on the main screen of UC-win/Road and clicking "Display the micro simulation player toolbar" from the pop-up menu.



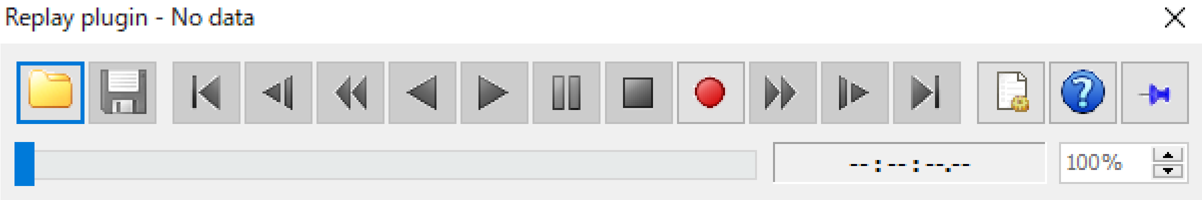
Replay Plug-in

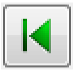
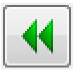
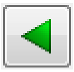
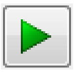
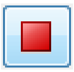
This plug-in saves movements of vehicles and pedestrians in UC-win/Road, and replays them. It is possible to confirm scenes of an accident from the driver's perspective or outside the vehicle, and observe traffic simulation at an intersection.

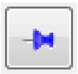
1. Operation Panel

Go to Record/Play - Replay - 

to open the operation panel.

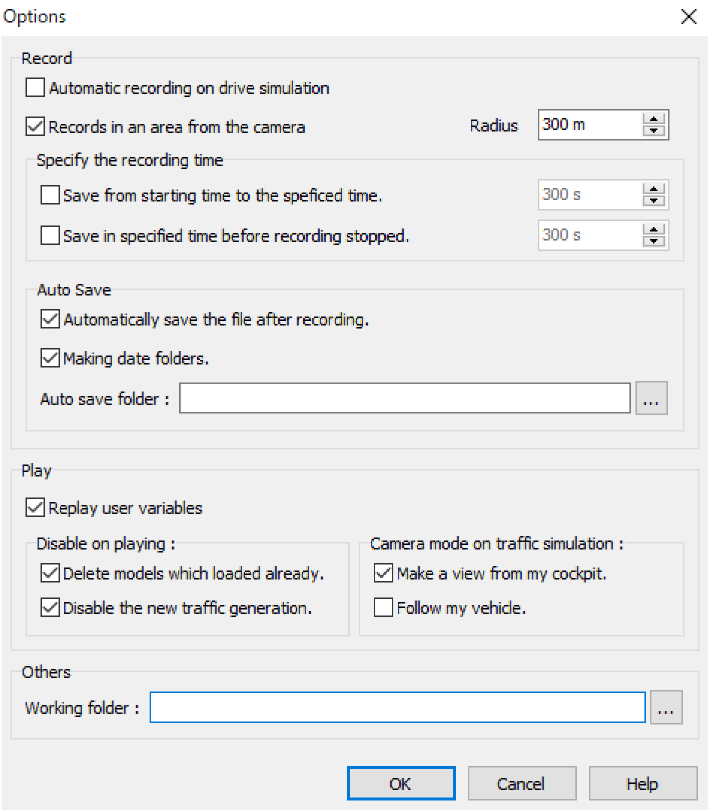


	Open replay data file (*.RR). This button is inactive while recording or replaying data.
	Save the data into a file (*.RR). This button is inactive while recording or replaying data or having no recorded data.
	Jump to the start of the data.
	Play backward (Slow).
	Play backward (Fast).
	Play backward.
	Play.
	Pause recording or playing.
	Stop recording or playing. Stop recording to save it. When [Automatic recording on drive simulation] options is checked, it is automatically stopped at the end of drive simulation.
	Start recording. When [Automatic recording on drive simulation] option is checked, the record starts automatically when starting a drive simulation.
	Fast Forward.
	Play slowly.
	Jump to the end of the replay.
	Open the Option form.
	Open the Help.

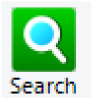
	Pin the Replay plug-in control panel.

2. Option

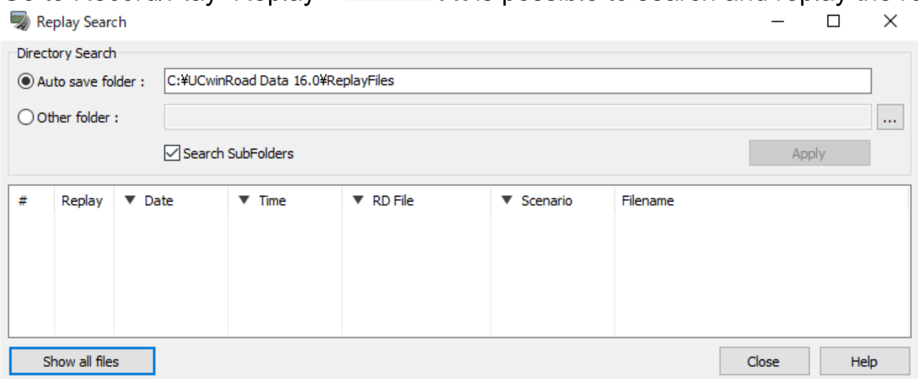
Go to Replay – Options to open the option window.
Set up the ecord settings, auto save settings, settings related to playback, and the folder designation.



3. Replay Search form

Go to Record/Play–Replay - 

. It is possible to search and replay the recorded playback file on this form.



Hint
It is possible to sort and refine the columns, [Date], [Time], [RD file] and [Scenario]. Click on the top of the column to open the pop-up window. They can be sorted in "Ascending Order" or "Descending Order", and refined with substring. Items which are unique are listed with checkbox. Check it off to exclude for the target.

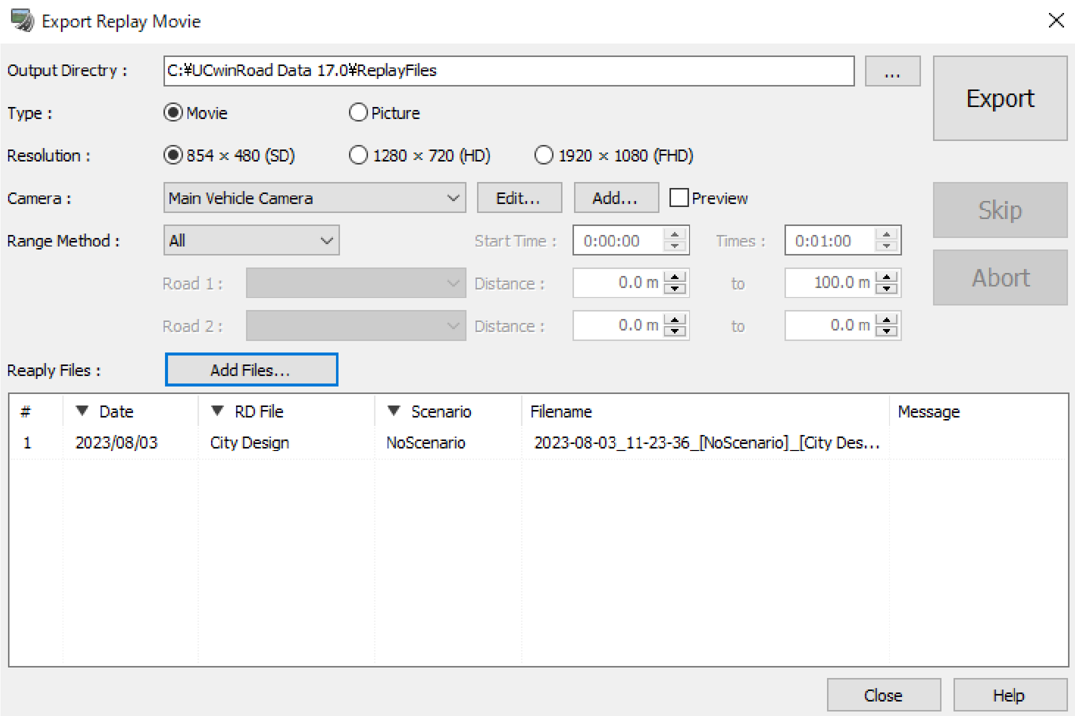
4. Toolbar (Replay Option)

Right-click on the main screen, and click [Show Replay Tool] to open the toolbar.
* It is enabled only when "Replay plug-in" is active.

5. Movie Export

Click 

. Replay data can be selected to output a video file according to the output settings.



Configure output settings and click Export to output the video file.

ECO Drive Plug-in

1. About the ECO drive

This plug-in calculates the fuel consumption and the carbon-dioxide emissions of a vehicle during driving simulation, and produces graphs from data logged by UC-win/Road. It is possible to use it for Eco-driving training and ITS research with driving simulator.

Carbon dioxide emissions are known to be proportional to fuel consumption and can be appropriately quantified by three factors: trip time T, trip distance D, and vehicle speed variation characteristics as follows

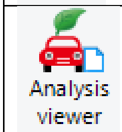
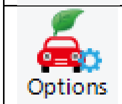
$$E = K_c\,(0.3T + 0.028D + 0.056 \sum_k \delta_k(\nu_k^2 - \nu_{k-1}^2)) \quad \cdots 式(1)$$

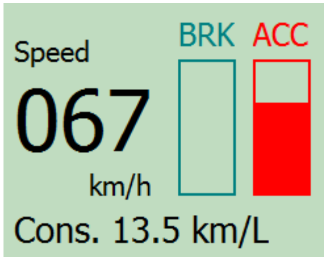
ここに、

E:旅行時間Tに対する二酸化炭素排出量（kg-C）	δk :直前の計測点より速度大 のとき 1 それ以外 のとき 0
T:旅行時間（sec）	vk :第k点における走行速度（m／sec）
D:旅行距離（m）	Kc :排出係数 CO2 0.00231kg-C／ガソリン cc （平成11年 環境省）
K:速度計測点数	

※1 大口･片倉･谷口「都市部道路交通における自動車の二酸化炭素排出量推定モデル」
土木学会論文集No.695/Ⅳ-54,125-136,2002.1

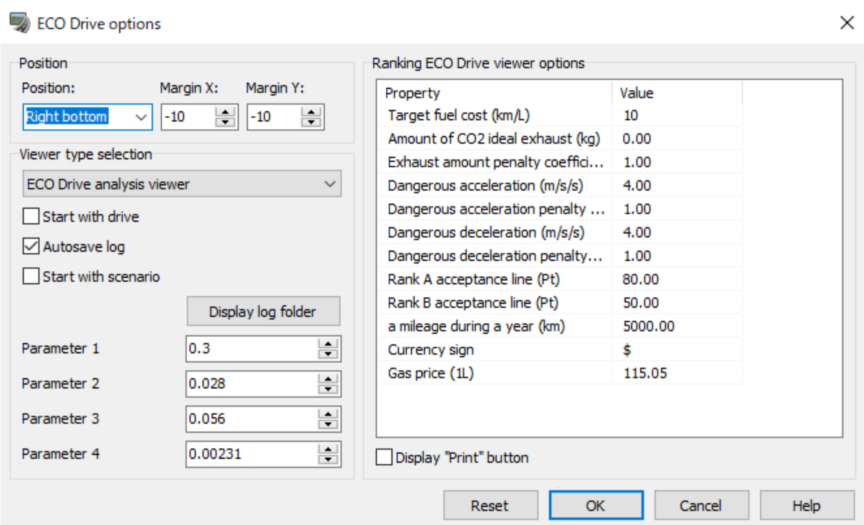
2. Toolbar

	Start the data logging.
	End the data logging.
	Display the ECO drive analysis results.
	Settings for ECO drive.



3. Options

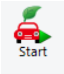
The menu is displayed when ECO drive plug-in is installed.



(1) Selection of result screen

Select "ECO drive analysis viewer" to display the graphs of results after logging, and select "Ranking ECO Drive viewer" to display the ECO drive diagnosis.

1) Start with drive: Begin logging when driving simulation is started, and end logging when the driving simulation ends.
2) Start with scenario: Data logging is started simultaneously with scenario, when used with the scenario function.

* Data logging can also be started with 

and stopped with 

.

3) Auto save log: Save automatically the data when the logging ends.

Parameter 1: Change the coefficient of travel time (T) in the calculation formula for carbon-dioxide emissions. Default is 0.3.
Parameter 2: Change the coefficient of travel distance (D) in the calculation formula for carbon-dioxide emissions. Default is 0.028.
Parameter 3: Change the coefficient in the calculation formula for carbon-dioxide emissions in clause 3 (clause Σ). Default is 0.056.
Parameter 4: Change carbon dioxide exhaust coefficient Kc f in the calculation formula for carbon-dioxide emissions. Default is 0.00231.

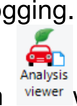
(2) Ranking ECO Drive viewer options

Change the option for the ECO drive diagnosis

Variable identifier	Value
Target fuel cost	Optimum fuel consumption, unit in Km/L. The greater the value, the closer the result is to the optimum fuel consumption.
Amount of CO_2 ideal exhaust	Optimum carbon emission, unit in Kg. Penalty is added as the CO_2 emission exceeds the optimum amount.
Exhaust amount penalty coefficient	Coefficient for how excess CO_2 emission penalty is calculated. When this coefficient is kco2, Penalty = (CO2 excess: kg-C) × kco2.
Dangerous acceleration	It becomes the subject to penalty.
Dangerous acceleration penalty coefficient	When the coefficient to be kacc, Penalty = (frequency that exceeds it) × kacc.
Dangerous deceleration	It becomes the subject to penalty.
Dangerous deceleration penalty coefficient	When the coefficient is kbrk, Penalty = (frequency that exceeds it) × kbrk.
Rank A acceptance line	Passing grade for rank A.
Rank B acceptance line	Passing grade for rank B (must be < rank A/B Border) Anything below Rank B is ranked as C.
Standard Annual Mileage	Used to calculate the total fuel consumed in one year.
Currency sign	Currency used.
Gas price	Price of gasoline per liter. Use it to calculate the gasoline costs of one year.

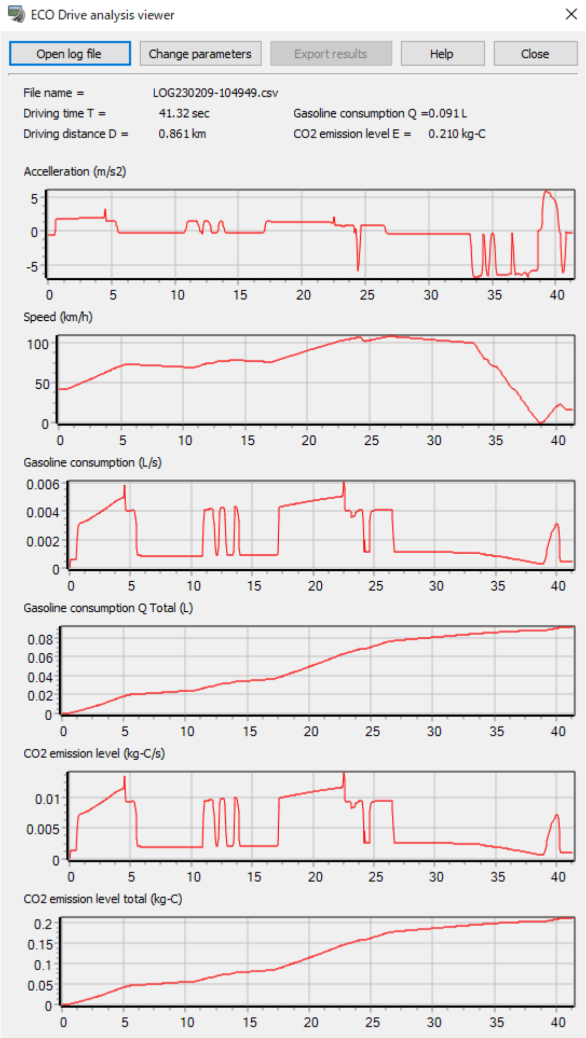
4. Analysis viewer

Load the CSV output for the calculation of carbon dioxide emissions. The carbon dioxide emissions are calculated and graphed. When the ECO drive analysis viewer is selected on the main menu, the results are displayed after the data logging.

Or click on 

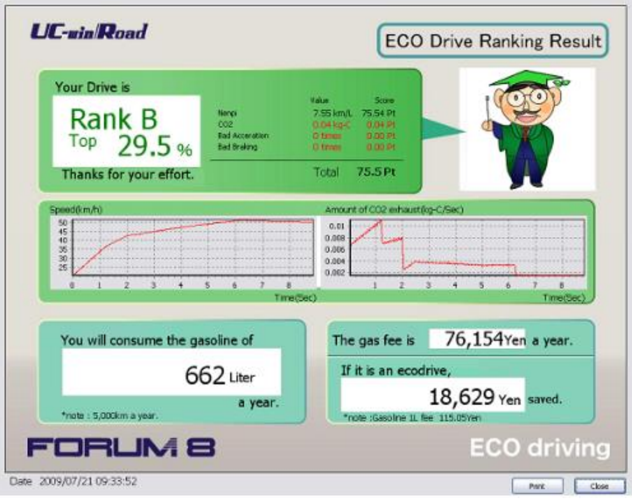
will also display the results.

Click Open log file to load a log file (*.csv). The graphs shows acceleration, speed, gasoline consumption and CO2 emission level.
It is possible to change parameters of the formula from Change parameters.



5. ECO drive diagnosis result

The driving result is diagnosed based on the amount of exhaust carbon dioxide emission (fuel consumption). After driving, the results are automatically displayed if the "Selection of the result screen" is set to "ECO drive ranking" on the ECO drive option screen.



Contents

Rank:
Shows the rank of A, B, or C, based on the scored from the diagnostic results, and displays the position in relation to the top score in percentage.

Score:
The score on gasoline consumption is the fundamental score. Penalty points on carbon dioxide, dangerous acceleration, and dangerous deceleration will be deducted from this fundamental score. The final score =100 points - penalty points.
The scores are calculated as follows:
Total score = fuel consumption score - (CO_2 penalty + bad acceleration penalty + bad braking penalty)
Fuel consumption score = (spending on fuel/ideal fuel cost) x 100
CO_2 penalty = excess CO_2 emission (kg-C) x CO_2 emissions penalty coefficient (Pt / kg-C)
Bad acceleration penalty = frequency of excess bad acceleration x bad acceleration penalty coefficient (Pt/time)
Bad braking penalty = frequency of excess bad braking x bad braking penalty coefficient (Pt/time)

Speed: The driving speed is displayed as a graph
CO_2 emissions: CO_2 emissions during driving is displayed as a graph
Gasoline consumption: Display the consumption of gasoline converted into the mileage in a standard year by the unit of L.
Annual Gas Price: Display the total cost on fuel in a standard year based on the set gas price.
Amount of money saved: Display amount saved during year compared to when driven at the ideal fuel consumption rate.

Log Export Plug-in

The log export plug-in enables toexport information of simulation as a csv file or through a UDP stream to another machine on the same network. It is possible to export information about user's vehicle, the vehicle in front of the user's vehicle and other moving objects. The operation can be done manually or synchronized with a scenario. When exporting to CSV, it is possible to add fixed objects selected in the scenario to the log content, which exports a distance between objects and the user's vehicle.

1. Setup UC-win/Road environment

License Manager

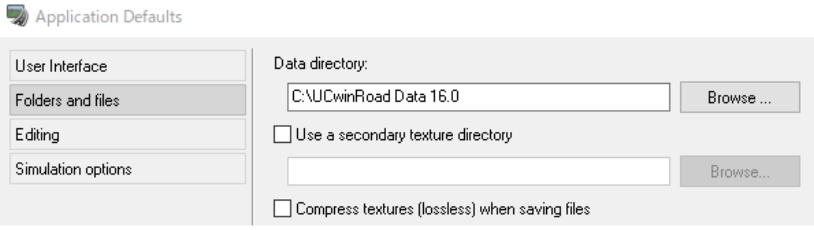
Check if Log Export plugin is in Loaded plugins list from File – License Manager.

Select LogExportPlugin.bpl in Available plugins list and click Load. Repeat the operations for ScenarioPlugin.bpl as needed.

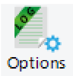
Output log file directory

The output log file will be saved to<User data directory>¥Log¥ folder.

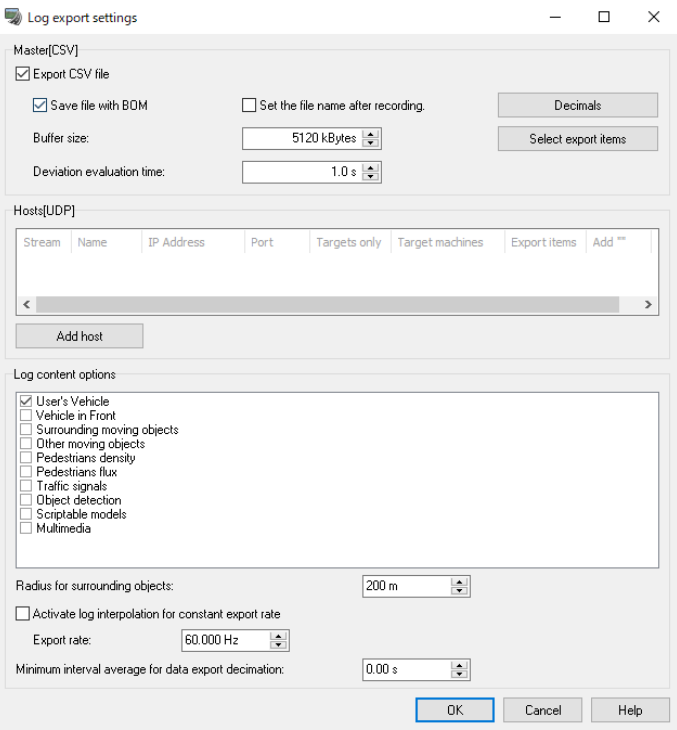
It can be changed at "Folder and files" section in the Application Default windows opened by File menu - Application Options – Default settings – Folders and files.



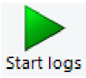
2. Log export settings

Go to Diving Sim - Log Export - 

. Set up the log output target and log content.



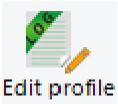
3. Basic functions

Start logs by clicking 

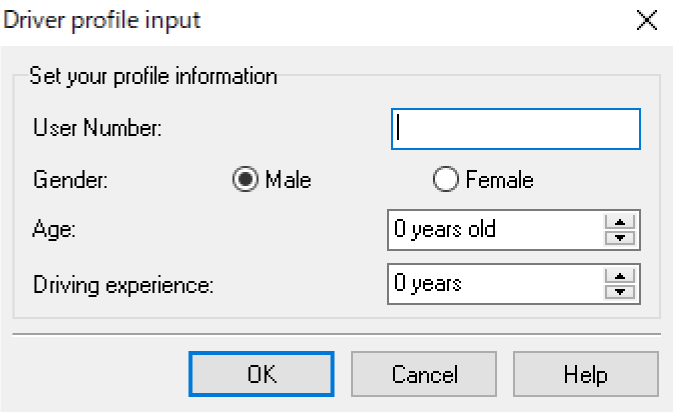
or triggering an event which has a Start Logs command selected in the Log tab of the Event Editor.

Stop logs by clicking 

or triggering an event which has a Stop Logs command selected in the Log tab of the Event Editor.

Open this form by clicking 

or triggering an event which has a **Set Profile** command selected in the Log tab of the Event Editor.



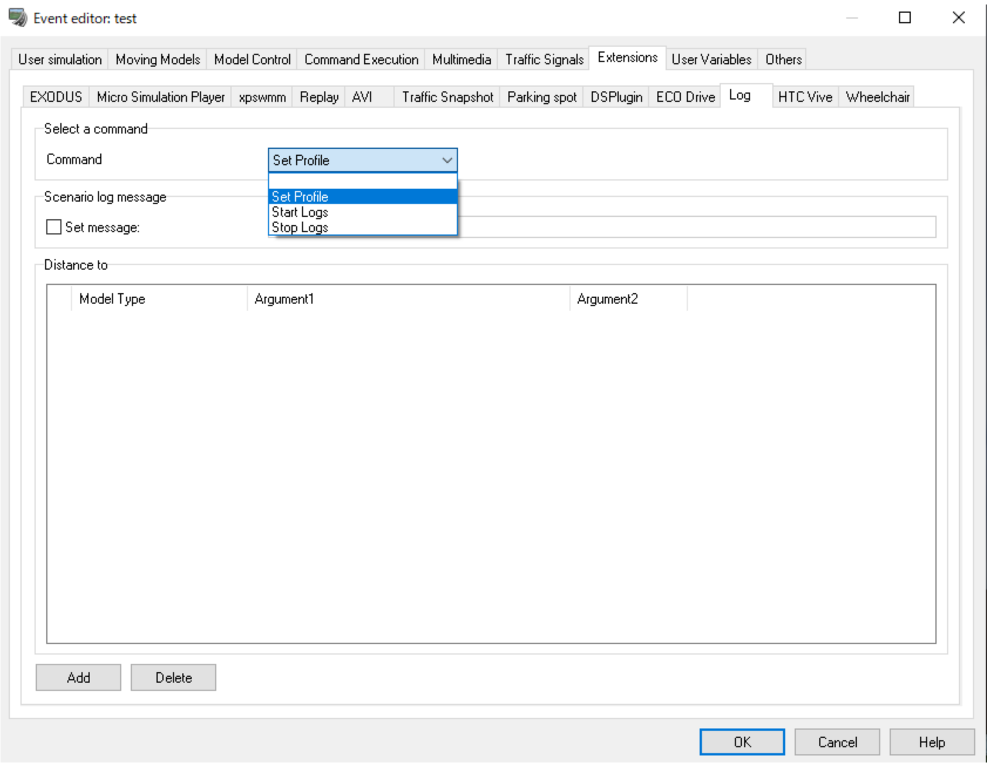
The log file name: "Log_" + YYYYMMDD + HHMMSS + "_" + RoadName + "_" + UserNumber + "_" + Gender + "_" + Age + "_" + DrivingExperience + ".csv".

For example, the output log file name is Log_20120315093000_Road 1_10_0_24_5.csv means it has done in 03/15/2012 at 9:30:00 am on Road 1.
And the profile is as follows.
User number = 10, Gender = Male, Age = 24 years old, Driving experience = 5 years
Nott: This function is not effective on UDP output.

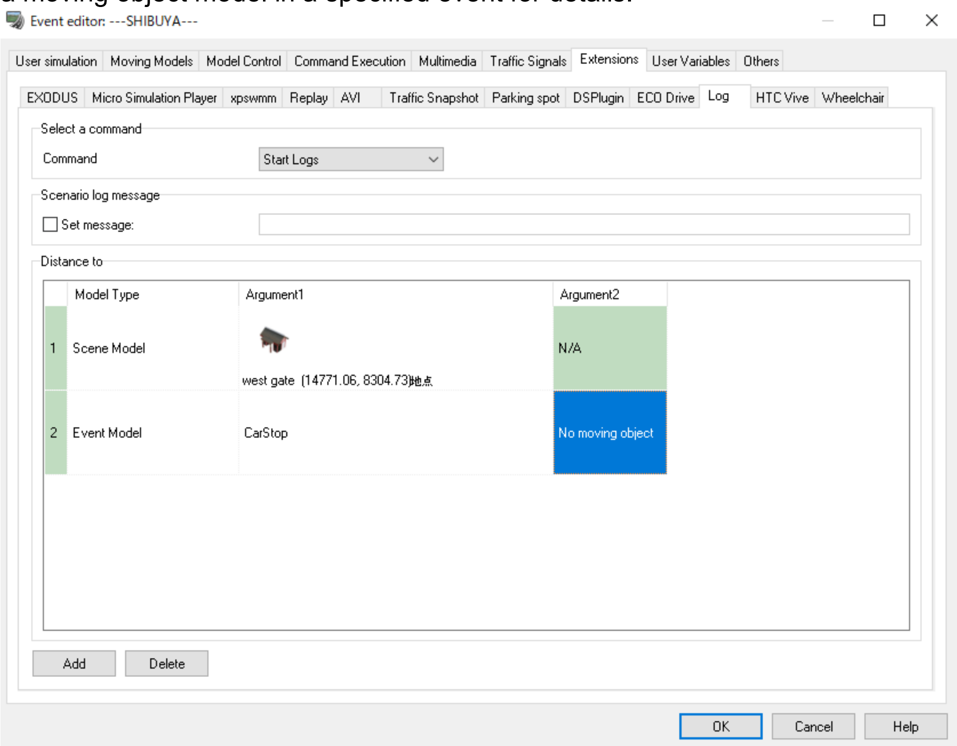
4. How to start/stop log Export by Scenario

It is possible to configure an event which will launch the log start/stop/edit during a scenario.

Create a new scenario or edit a scenario from ribbon Home - **Scenario**. Click on  to edit or  to add a new scenario.
Select a event and click Edit to open Event editor. On the Extensions tab – Log tab, it is possible to select a command from Set profile, Start logs or Stop logs.



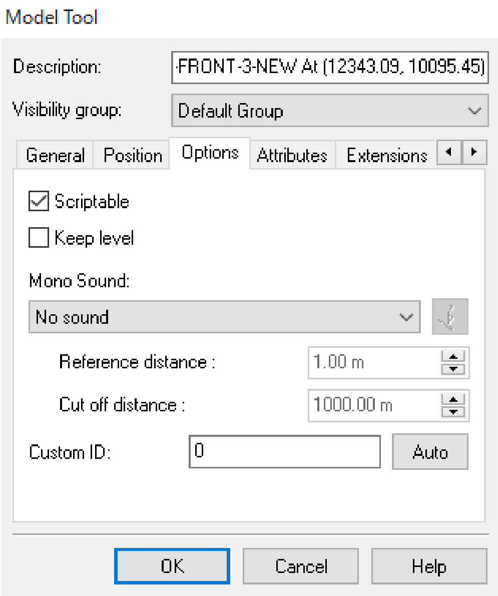
・To save the distance between a driving vehicle and a **scriptable scene model** in the log file, choose **Scene Model** as a model type, and select a scriptable scene model. Refer to make a scriptable scene model for details.
・To have the distance between a driving vehicle and a **moving object** created during an event, choose Event Model as a model type and select the ID number of the moving object model. Refer to how to find the ID number of a moving object model in a specified event for details.



5. How to make a scriptable scene model

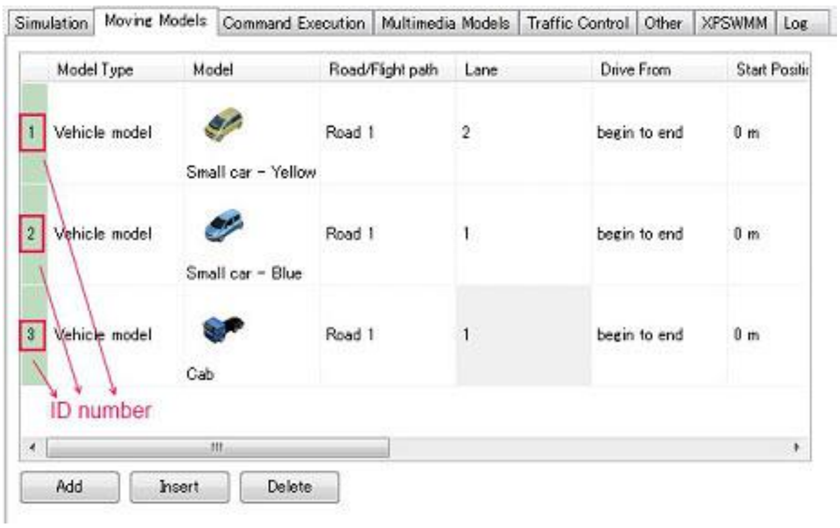
It is possible to set scriptable scene models in the Argument1 when selecting Scene Model as Model Type on the Log tab in the Event Editor. This operation needs LogExportPlugin.bpl.

Left-click a model in the 3D view. Then check **Scriptable** on the **Options** tab.



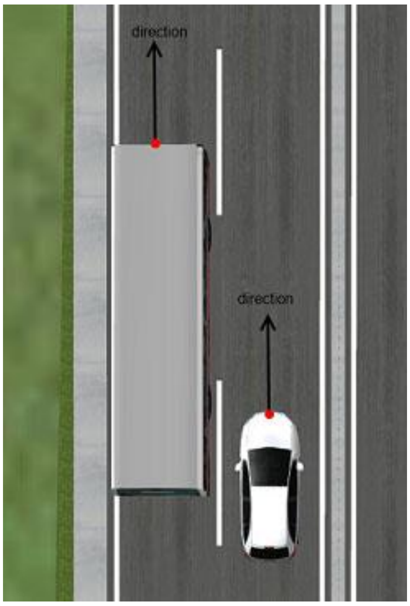
6. How to find the ID number from moving object models

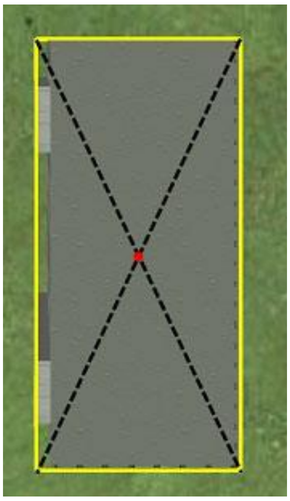
Select an event which has moving object models, and find the ID numbers on the Moving Model tab in Event Editor.



7. Distance between your vehicle and a model instance

Set a model instance on the Log tab in Event Editor to export the distance between a driving car and a model.
If the model instance is moving, the instance position is the front center of the car.





If the model instance is not a vehicle or is not moving, The instance position is the center of the model.

VISSIM Link Plug-in

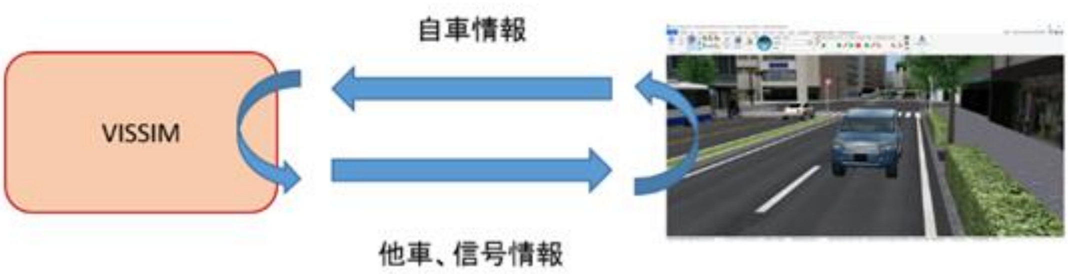
This is a plugin for the cooperation of UC-win/Road and VISSIM in real time. This plugin can send information of a driving vehicle in UC-win/Road to VISSIM in real time using DLL and execute a traffic simulation of the vehicle in operation and surrounding vehicles on VISSIM. The result of VISSIM traffic simulation (caluculation results of surrounding vehicles and traffic lights) are sent to and visualized in UC-win/Road.

The following data can be sent to VISSIM and visualized in UC-win/Road.

- A vehicle in operation（position and speed）
- Surrounding vehicles（position and speed）
- Traffic signals

Simulation flow

The information of vehicles and signals are mapped between UC-win/Road and VISSIM, so that the information can be sent to and caluculated in VISSIM, then it can be reflected in UC-win/Road.

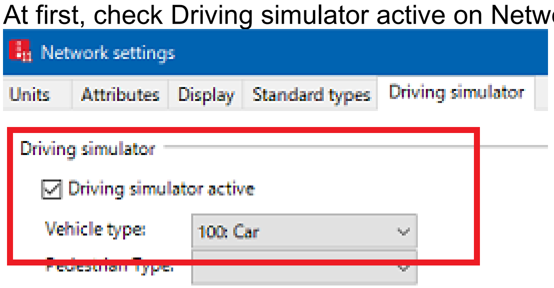


Operation flow

1. On VISSIM

VISSIM uses COM interface to get setting information. Set up VISSIM as COM server. Refer to the operation manual of VISSIM for details

At first, check Driving simulator active on Network settings form on VISSIM, and select the one of the vehicle type.



2. Prepare VISSIM data

Prepare VISSIM data to link with UC-win/Road.

3. Create a project

Create a VISSIM project to link with UC-win/Road. As needed, set up the following settings.

・ Register a vehicle model to use.
・ Register a pedestrian model to use.
・ Add a road or signal to use.

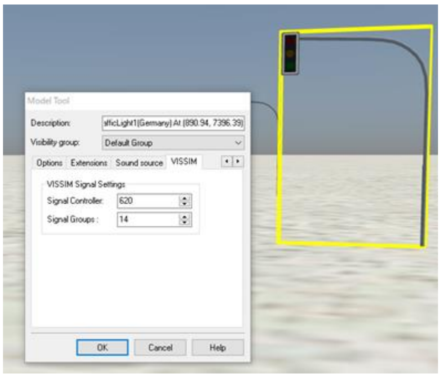
4. Settings

Go to Simulation Link – VISSIM - 

to open the settings form.

5. Signal settings

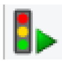
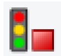
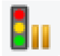
Click a signal model to open the Model Tool. Set up the Signal Controller ID and Signal Group ID.



6. Start connection with VISSIM

Click Connect on VISSIM group to start connecting and open VISSIM road network data.

7. After connection

Click  button from the main ribbon Home – Simulation to start the data exchange. Click  to stop, and click  to pause.

When driving starts on UC-win/Road, the information of driving vehicle is sent to VISSIM. Then information of other vehicles and singal color, etc. are relrected on UC-win/Road.

8. Disconnect

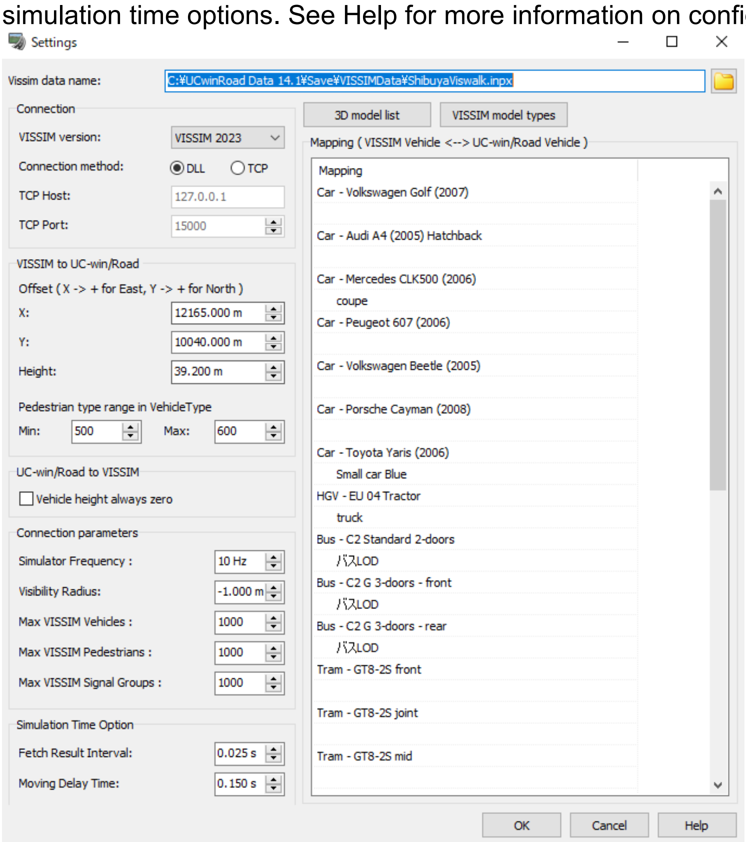
Click Disconnect to end the connection.

Settings

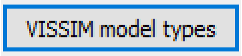
Click Settings 

from ribbon Simulation Link – VISSIM.

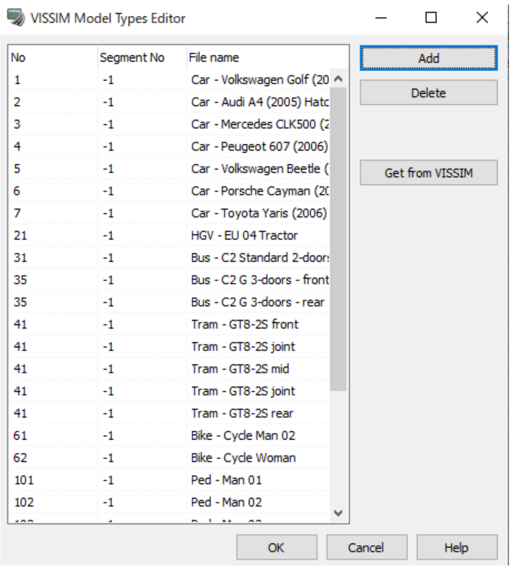
Set up items for connection between UC-win/Road and VISSIM.
Set VISSIM vehicle information, offset values from VISSM to UC-win/Road, connection parameters to VISSIM, and simulation time options. See Help for more information on configuration items.



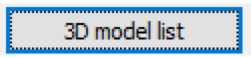
VISSIM Vehicle Editor

Click 

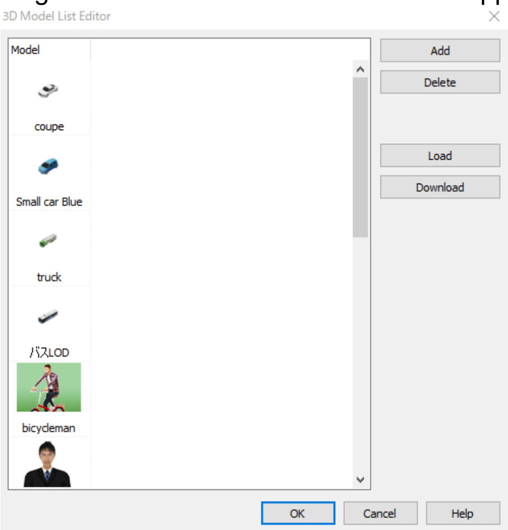
on the Setting form. Add the VISSIM ID, secment No. and file name.



Road Vehicle List Editor

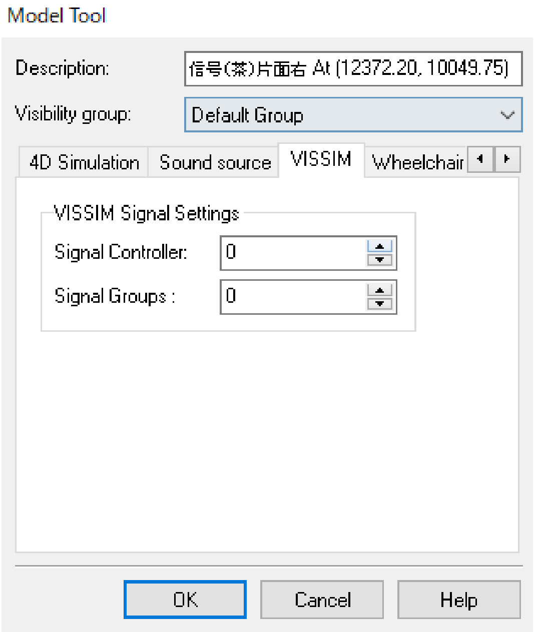
Register UC-win/Road vehicles to be mapped. Click 

on the Settings form.



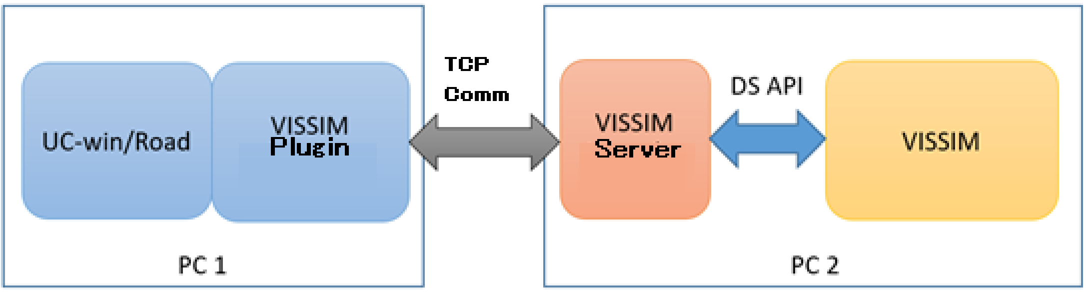
Signal Settings

Assign Signal Controller ID and Signal Group to the sigmal models on the project.
Click a signal model on the main screen and open Model Tool, and go to VISSIM tab.



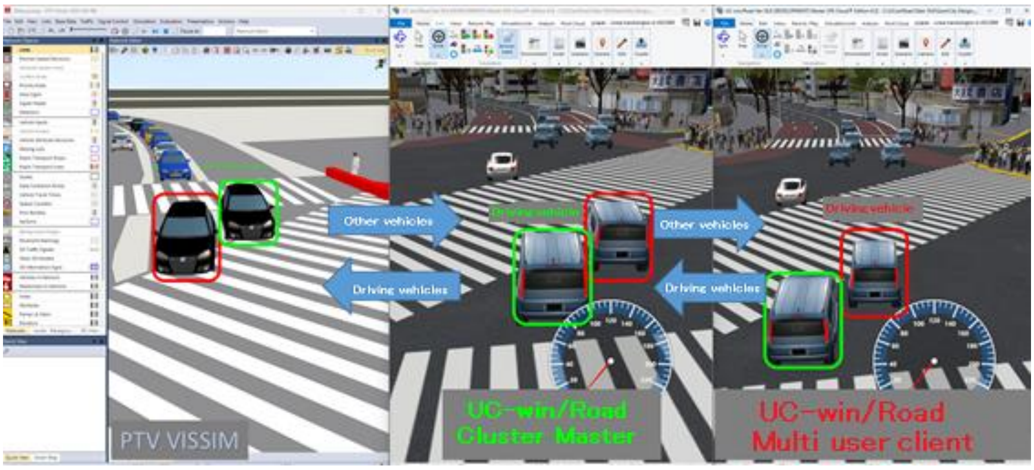
VISSIM TCP Linkage

This function allows UC-win/Road and VISSIM to work together even when installed on different PCs.
If the VISSIM server attached to UC-win/Road is started on the PC on which VISSIM is installed, when TCP linkage is selected in the VISSIM plug-in settings in UC- win/Road and the connection destination, etc. are set, information is exchanged using TCP communication instead of DLL linkage. Therefore, it is now possible to link between different PCs as long as a network is established.
Please refer to the Help for the setting details.



Multi-User Linkage

When a cluster master performs VISSIM linkage, if there is a multi-user client in the linked clients, the cluster master now acquires the driving vehicle information of that client.
When sending information to VISSIM, the own vehicle information and the client's driving vehicle information are combined and sent as vehicle information controlled by UC-win/Road.



Simulator

Cluster Option Plug-in

The cluster system has been developed for use with large-scale and complex driving simulators.
Until recently, the cluster system was a system in which two or more PCs were synchronized and one of these PCs outputs the resultant image to all monitors.
This new system synchronizes the work of two or more PC's and outputs the resultant image to multiple monitors, thus it becomes possible to maintain a constantly high level of performance and frame rate irrespective of the number of channels since each one is displayed on an independent PC.

Starting from Ver.9 and on, the Cluster System Option now allows all Client PCs to perform walking or driving simulation as well. Previously these were limited to the Master PC.
Two different modes can be assigned to Clients PCs:

- Display Only Mode: Display only the information shown in the Master PC.
- Free Control Mode： Client PCs can freely navigate, drive/walk, drive. Master PC now also has the option to track individual client PC’s camera.

To use these features, the Master PC must have the Clustering options installed and enabled, while the Client PCs require the multi-user client option.

1. Structure of cluster system

Cluster system is composed of a master machine and multiple client machines.

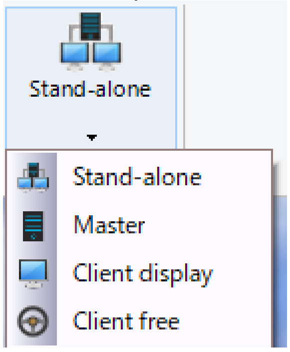
■Master Machine
Master machine is linked with client machine. As for master machine, perform usual calculation (movement of model, animation and camera movement etc.) of UC-win/Road and send the required data to synchronize the dynamic data (camera view, traffic model, drawing setting, setting of weather and performance etc.) of UC-win/Road project.

■Client Machine
Client machine is used only for rendering. Required data to synchronize the dynamic data of UC-win/Road project from master machine is received.

■Program
Program to use the cluster function is as follows.
Master: UCwinRoad.exe + ClusterPlugin.bpl
Client: UCwinRoad.exe, or UCwinRoadClusterClient.exe, or UCwinRoadMultiUserClient.,exe + ClusterPlugin

2. Hardware Setting

Set IP address to all PCs. Those are required to be static IP address.
All machines of cluster machine have to be connected each other in local private network. Set the network speed to make it enough speed to avoid performance degradation
Make the speed of network card of all computers 100Mbps.



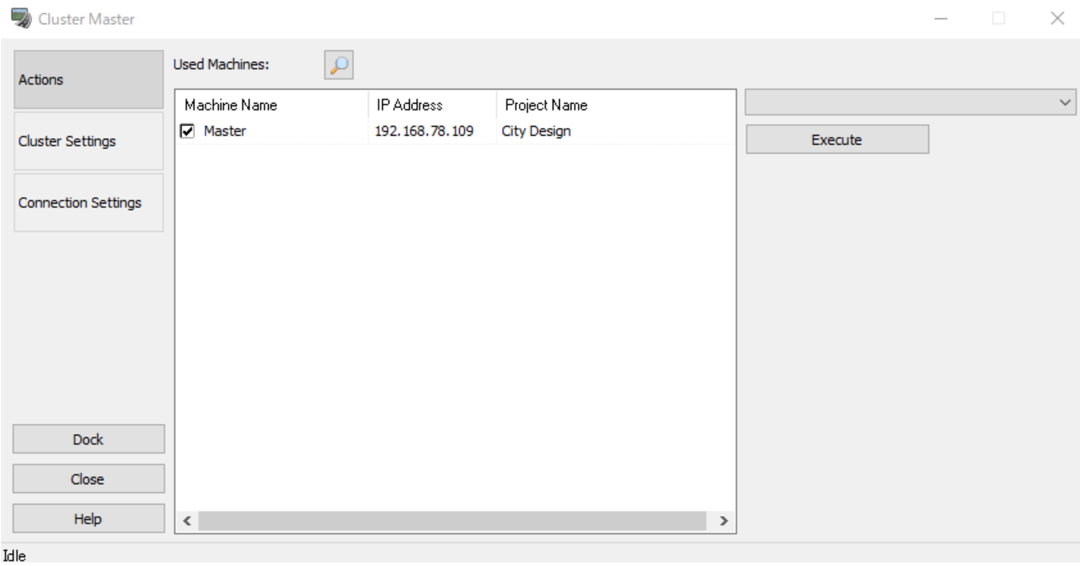
3. Cluster Setting

3-1. Cluster Master setting

Activate UC-win/Road on one machine, select Home - Cluster - Master and switch to cluster master machine. Master setting screen is displayed on the bottom of the main screen of UC-win/Road.

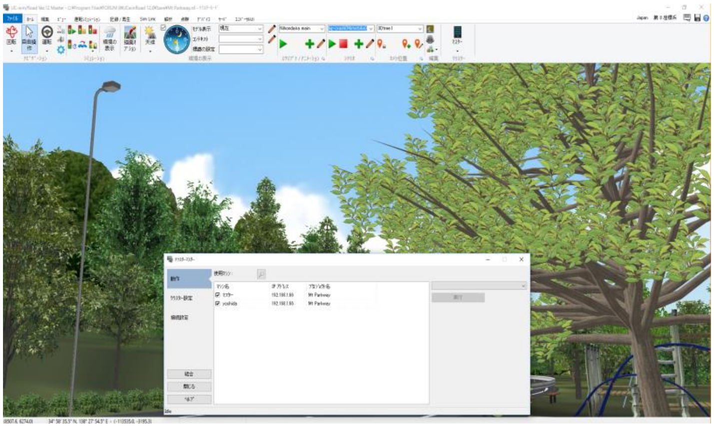
[1] Actions

Synchronize the cluster machine from here. Click  searches cluster client machine and display it. Only machines in client mode will be displayed.



Various commands (importing a file, end of UC-win/Road etc.) can be sent to each machine.
Check the machine to execute, select the command from the list box and click the execution button.

Load a file	Select a file and checked machine imports the file from where the selected file is saved. We strongly recommend using the same file where all machines are saved in the shared folder and network folder for cluster synchronization. All machines have to have access right to the selected file.
Load a file from UC-win/Road save data directory	Select a file of save data directly of UC-win/Road. Checked machine imports a file from the individual save data directly.
Close UC-win/Road.	Checked machine finishes UC-win/Road.
Restart UC-win/Road.	Checked machine restarts UC-win/Road.
Shut down Windows.	Checked machine shuts Windows down.
Restart Windows	Checked machine restarts Windows.
Load xpswmm files	Load xpswmm file from a chosen save space. Since all computers are synchronized together with clustering, it is highly recommended that a shared folder or network is created beforehand. All client devices require the same access authorization to the same file.
Load xpswmm file from UC-win/Road's save directory	Select and load xpswmm files from UC-win/Road's save directory. The checked devices will each read from the data directory.
Load debris-avalanche file	Load debris-avalanche analysis file from a chosen save space. Since all computers are synchronized together with clustering, it is highly recommended that a shared folder or network is created beforehand. All client devices require the same access authorization to the same file.
Load debris-avalanche file from UC-win/Road's save directory	Select and load debris-avalanche analysis files from UC-win/Road's save directory. The checked devices will each read from the data directory.

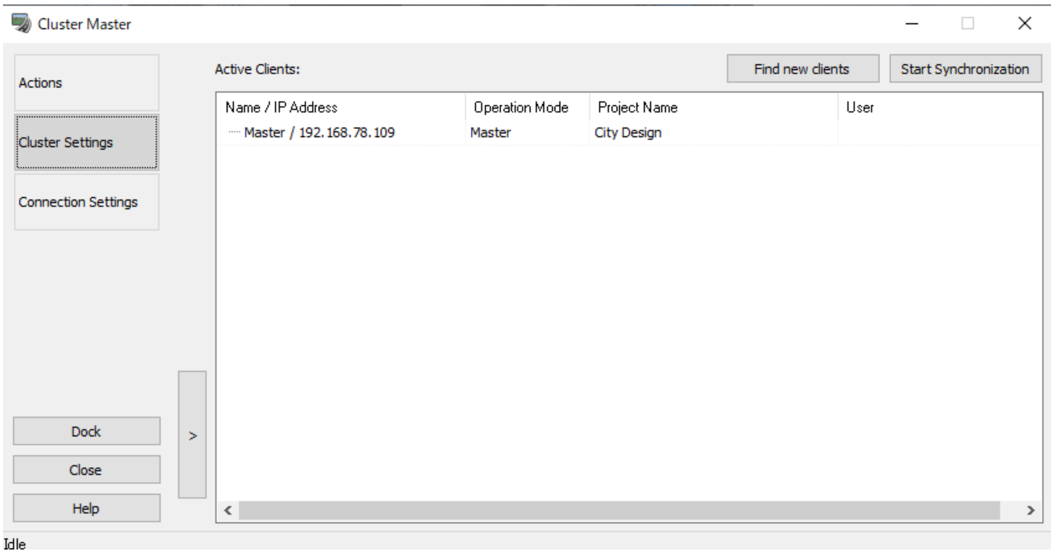


▲Master Screen

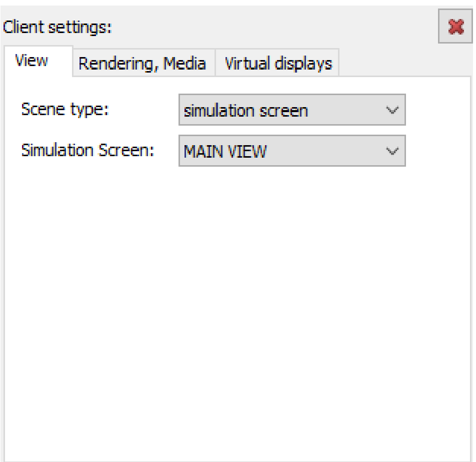
▲Client Screen

[2] Cluster Settings

Each client and master is listed. Change of display setting of each client is possible. To synchronize between clusters, click on Start Synchronization and all computers registered on the list will be registered.
To avoid synchronization errors due to insufficient data, make sure that all connected machines have had already loaded the same exact files.



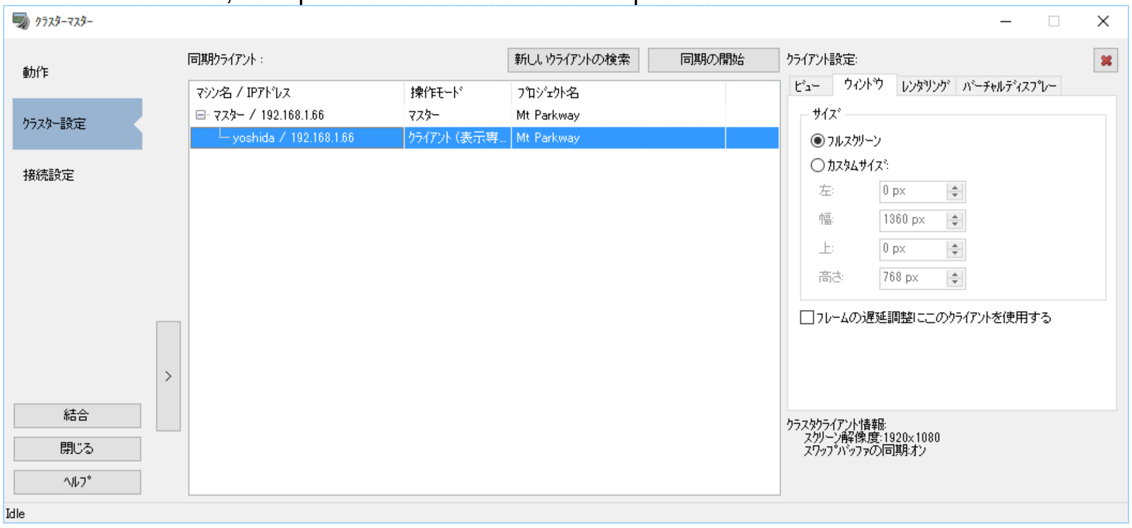
Click  on Scenario tab of the ribbon menu to open the multi-user edit screen for scenarios, where it is possible to register users. Registered users can be used as targets for scenario transition conditions and events. To assign a user to a machine, go to the Cluster Master screen and assign a user to each machine.



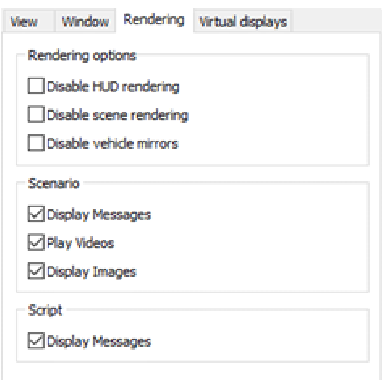
The new tabs "View", "Window", "Rendering" and "Virtual Display" will appear on the right side of the list.

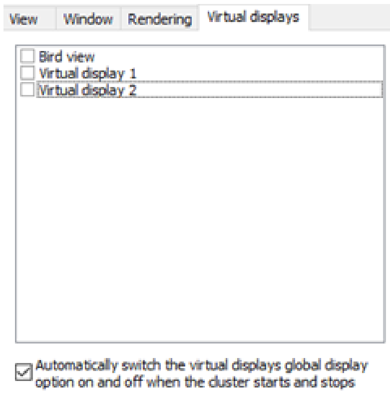
On the View tab, select a "Scene type" to be displayed on the client selected in the "Active clients".
・simulation screen
・bird view
・left mirror
・right mirror
・rear mirror
・camera view
And then set parameters based on the selected "Scene type".

On the Window tab, set up the size of screen and the posision.



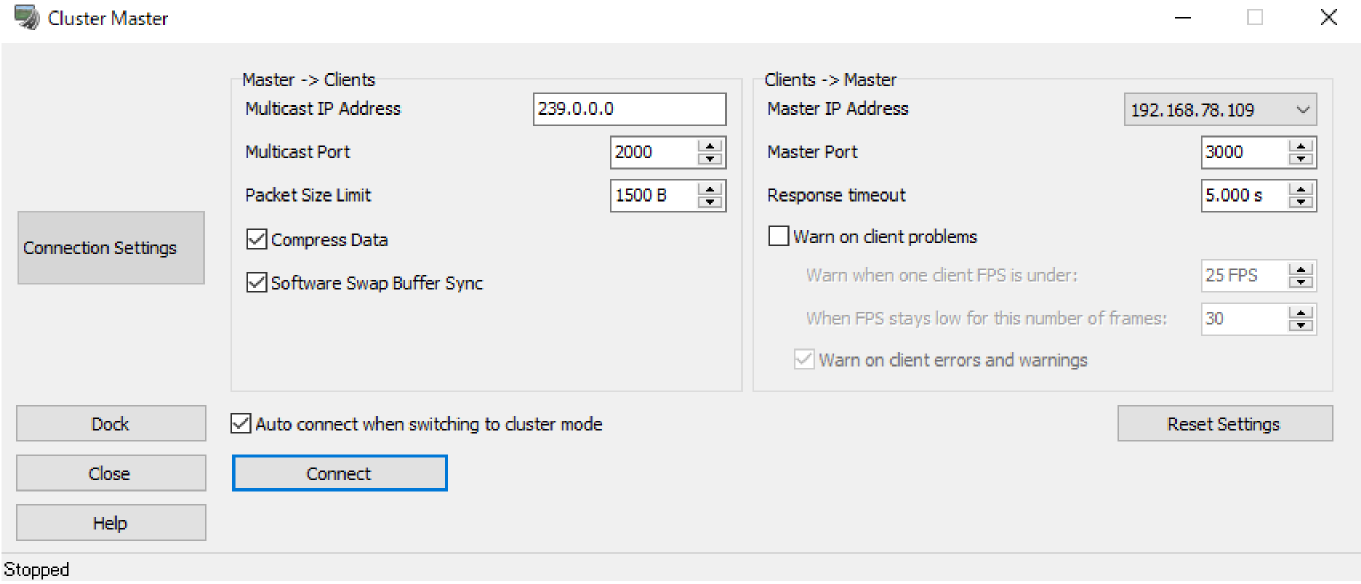
On the Rendering tab, configure settings related to rendering.
On the Virtual displays tab, it is possible to choose which virtual display will actually be drawn on the client.





[3] Connection Settings

Master sends the data to all clients through multi cast protocol. The same multi cast IP and port has to be set to whole cluster computer.



Master->Clients

[Multicast IP Address]
Range of multicast IP address is 224.0.0.0 - 239.255.255.255. However 239.0.0.0 - 239.255.255.255 is recommended for use in intranet.
The selected address has to be set not to crash the other multicast address on network.
[Multicast Port]
Port range is 1025 - 49150.
When firewall is used, make sure the port is not blocked.
Set the number of multi cast port which is different from the number of master port.
[Packet Size Limit]
Maximum size of packet sent to clients.
The value of limited packet size must not be greater than MTU. When using the huge frame, it is possible to set to greater value up to MTU value.
[Compress Data]
The master sends the compress data to the clients.
[Software Swap Buffer Sync]
Just before called the OpenGL swap buffer in the main window, cluster master synchronizes the swap buffer call of the entire cluster.

Clients ->Master

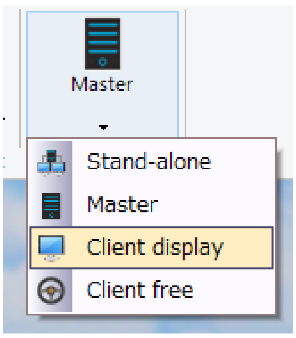
[Master IP Address]
When the several network cards stick in computer, select IP address of network card to use.
[Master Port]
Port range is 1025 - 49150. . .Please ask network manager before allocating the port.
When firewall is used, make sure the port is not blocked.
Set the number of master port so that it is different from the number of multi cast port.
Response timeout]
During the simulation, any client not responding after the specified time will be considered as not answering and displayed with the status “Timeout”.

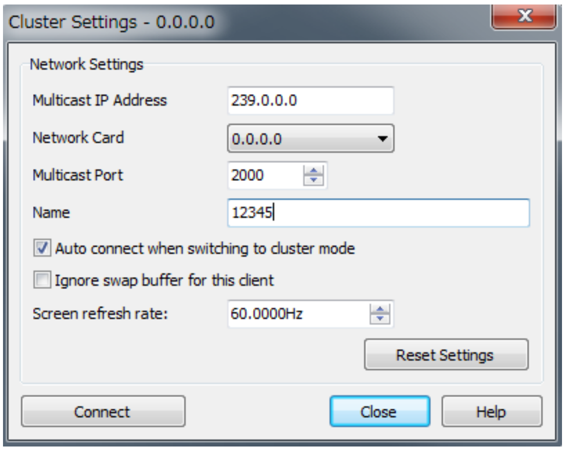
[Warn on client problems]
If one or more client is in timeout or has a low FPS a warning is displayed in the event console of the application.
The threshold setting for the warning on low FPS can be setup in the following parameters.
The parameters “Warn when one client FPS is under:” and “When FPS stays low for this number of frames:” are used together to determine if a client is having FPS slowdown issues. If for the given number of frame the client refresh rate stays under the given FPS a warning will be displayed.

[Auto connect when switching to cluster mode]
When checked, the master will automatically connect to the client at the same time when it comes to cluster mode.

3-2. Cluster client setting

Activate UC-win/Road on the other PC, select Home Ribbon - Cluster - Client display or Client free to switch to the cluster client.Right-click on a main screen as client mode, and select pop-up menu / Cluster Settings.

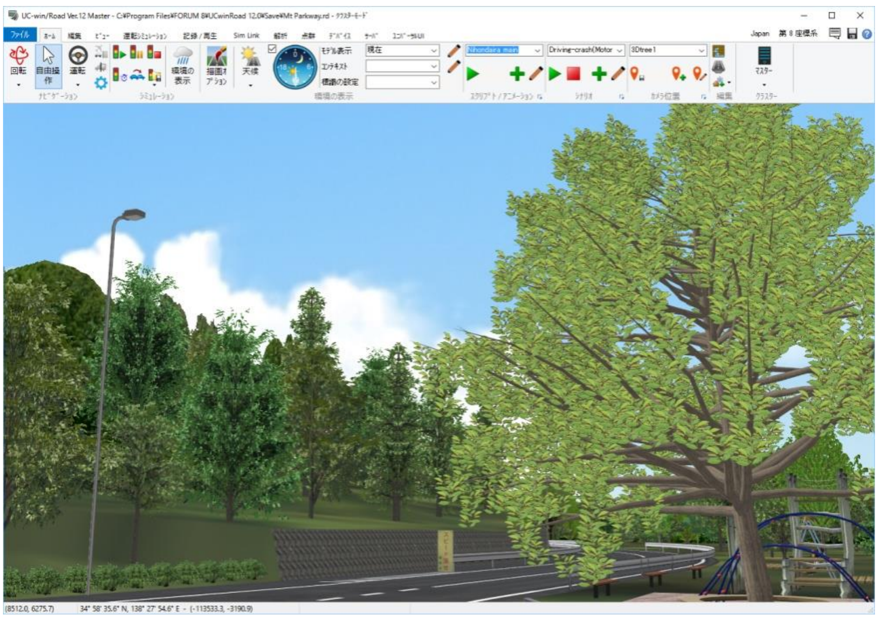




[Multicast IP Address]: Range of multicast IP address is 224.0.0.0 - 239.255.255.255. However 239.0.0.0 - 239.255.255.255 is recommended for use in intranet.
[Network card]: Specify IP adress of cluster client.
[Multicast Port]: Rage of port is 1025 - 49150. . . When firewall is used, make sure the port is not blocked.
[Name]: Set the name to specify the master machine.
[Auto connect when switching to cluster mode]: When it's checked, it is connected to master automatically during cluster mode.
[Ignore swap buffer for this client]: When it's checked, swap buffer is ignored during drawing.
[Screen refresh rate]: Setting of refresh rate for client

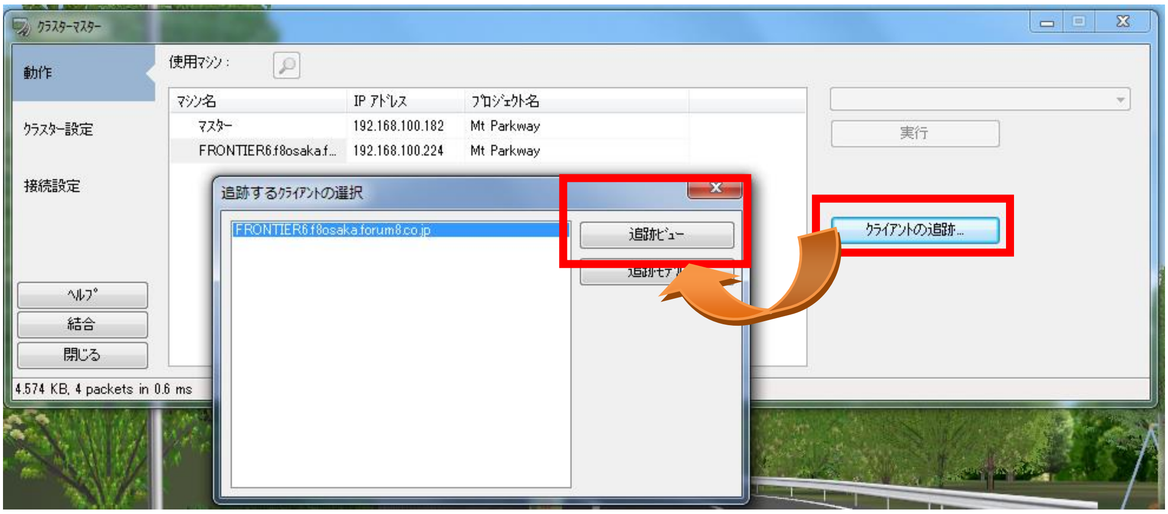
4. Client (Free Mode)

Once the project is loaded and synchronized with the master, the screen display and toolbar will be activated. The viewpoint position of the camera can be changed by selecting the camera movement method on the toolbar and then using the mouse or keyboard on the main screen.



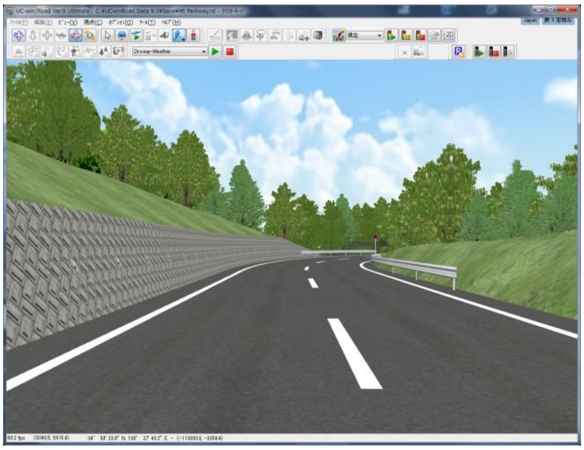
5. Tracking

The Cluster Master can track a Cluster Client's (who is in Client Free Mode) current view camera and the driving or navigational conditions.From the Action tab in Cluster Master setting window, selecting "Follow a client" will display a list of tractable clients.



Upon selecting a client from the list, two view options become available: Track Video or Follow Model. Track View synchronizes the Master's camera with that of the selected Client, while Follow Model tracks the model the Client is currently controlling (e.g. pedestrian, cars). If the Client is using Free Camera Mode and not controlling anything, Follow Model will only switch the Master's Camera to the Client's screen once, and will stop tracking further.

▲Client Screen



▲Master Screen (Tracking View)

▲Client Screen

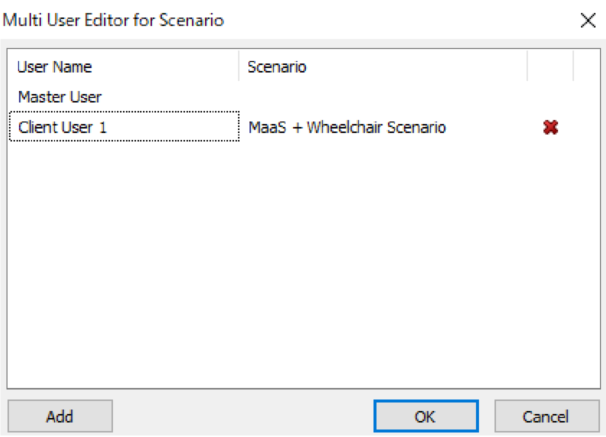
▲Master Screen (Tracking Model)

Tracking view will sync the view point to the same as the Client. If Tracking Model is selected, using the mouse wheel can switch to external third-person view.

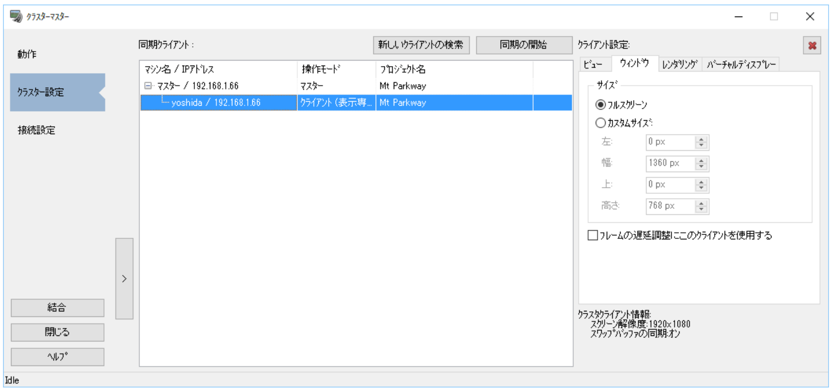
To end tracking, select the click on the Free View  button, or go to the ribbon Navigation - Free.

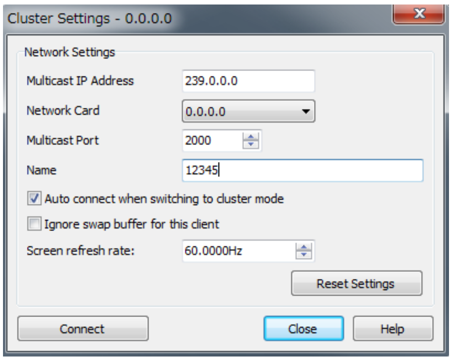
6. How to Add Client Targets from Scenario Events

Click  on Home - Scenario to open the multi-user edit screen for scenarios, where it is possible to register users. Registered users can be used as targets for scenario transition conditions and events. To assign a user to a machine, go to the Cluster Master screen and assign a user to each machine.



Click on the button above to add a new client tab. Under this new tab, the Master can assign driving or walking simulation to a particular Client.The Machine Name should match the client's name as was shown in Cluster Master. To modify these, refer to the previous sections on how to use the Cluster Master.





Cluster Master window

Setting Client machine name

*The following scenario commands cannot be assigned to a Client:
・Resetting the traffic flow (there is no traffic flow on the Client)
・Leading car in front of the driver (The Client's car is always deleted at the end of driving).
・View mode

7. Multi Driver

The cluster system can be used to perform multiple driving runs and walks in the same VR space. Select Free operation mode on the cluster client from Home – Cluster – Client Free and synchronize with the cluster master.
To use this function, a cluster master version of UC-win/Road or a cluster multi user client version and a cluster plug-in are needed.

- Follow from Cluster Master

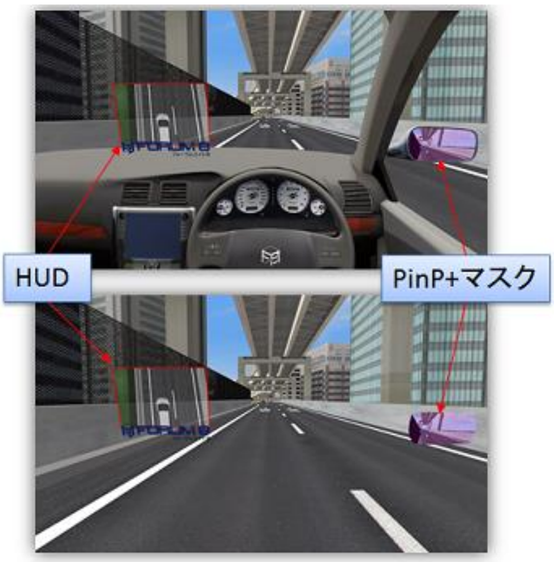
The cluster master's viewpoint position can be synchronized with the cluster client's viewpoint position

- Driving and walking by scenario

The master and each client can start and end driving and walking by scenario.

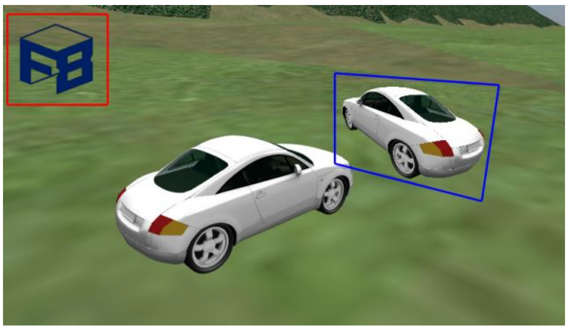
Virtual Display Plug-in

Virtual Displays can either be 2D overlays (Picture in Picture, PinP) displayed over the 3D view, or 3D objects place within the scene. They can be used to display solid colors, images or camera views that are updated in real time. Virtual displays can also be made into any shape by applying a mask.
In the following example image shows the inclined PinP picture on the front surface of cockpit dashboard, or the virtual display whose rearview mirror is covered with mask.



Views can be combined by adding a mask. Image mask and polygon mask are supported, and in both mask modes, virtual display will be transparent in dark part of mask, and in transparent in bright part. This virtual display can be displayed as multimedia model when running scenario.
Please refer to "Overview of Virtual Display Plug-in" for details.

In the following example the virtual display highlighted in red is an image 2D overlay (with alpha). The virtual display highlighted in blue is a camera view 3D object.

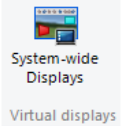


Operation Flow

1. Activation

Activate "VirtualDisplaysPlugin.bpl" from the menu "File" - "License Manager".

2. Setting of Virtual Display

Click 

from the "Virtual Display" group on the ribbon "View" on the main screen to open the Virtual Display Editor.

3. Display of virtual display

When "Virtual display" is checked on "Visual options" - "Display", the set virtual display is displayed.

4. Display in scenario

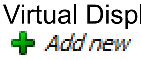
It is possible to add virtual display events with scenario events. Select "Virtual Display" on the "Multimedia Model" tab of the Event Editor. Open Virtual Display Manager, which is the setting form of virtual display, from "Open file".

Settings

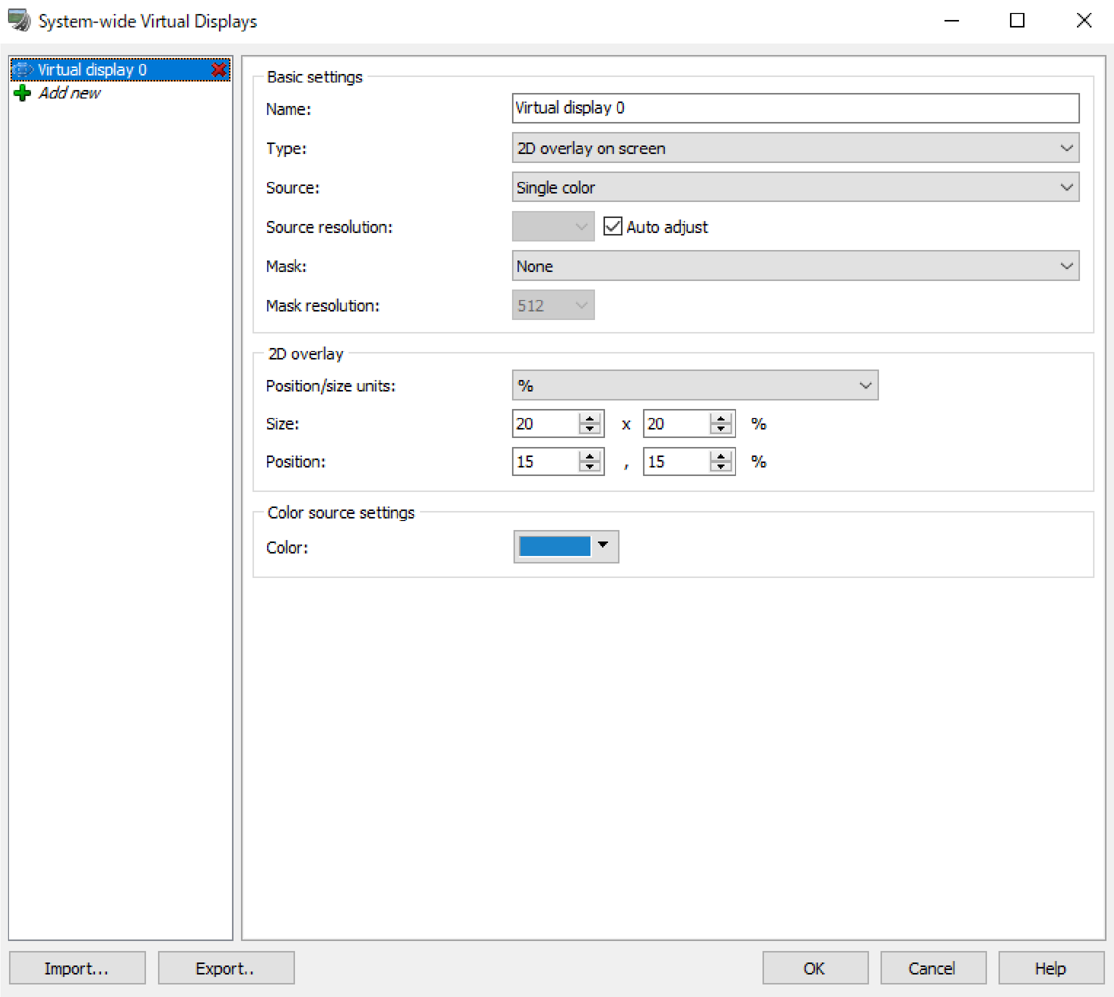
Once virtual displays are set, they will be displayed for all projects.

Click Virtual Display icon 

from the ribbon, Views – Virtual Displays to open this form.

Click 

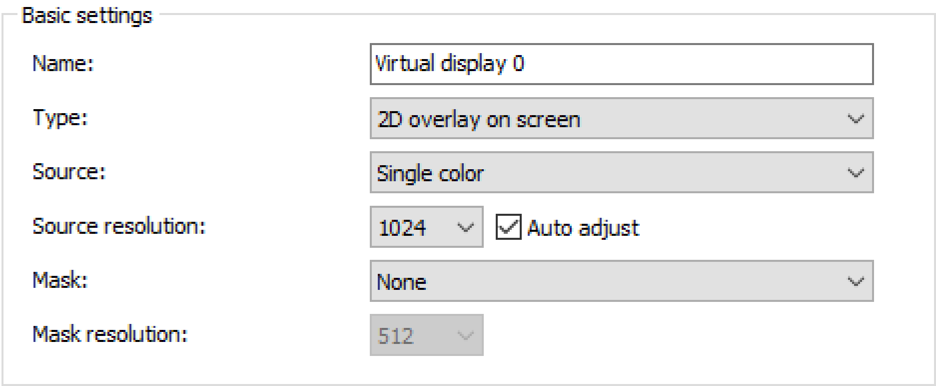
.



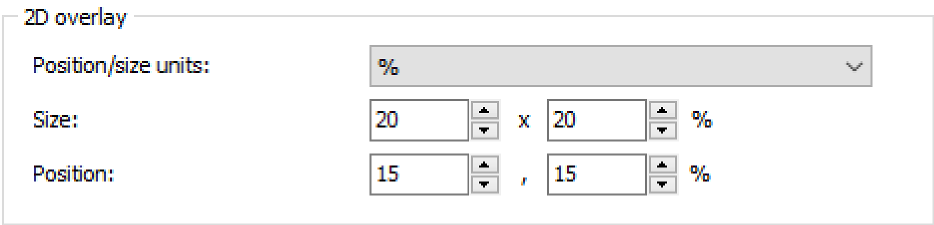
■Display list
The list on the left displays all the displays. A new display can be added by clicking on Add new, and deleted them by clicking on the red crosses that appear on the list. The order in which the displays are rendered can also be changed using the blue arrows. Finally it is possible to show/hide each display by clicking on the eye icon.
The settings of the display selected in the list will be shown on the right side of the window.

■Import/Export
The Import and Export buttons are used to load and save all display configurations from files. It is possible to choose between the Import/Export of the configuration itself or the visibility preset.

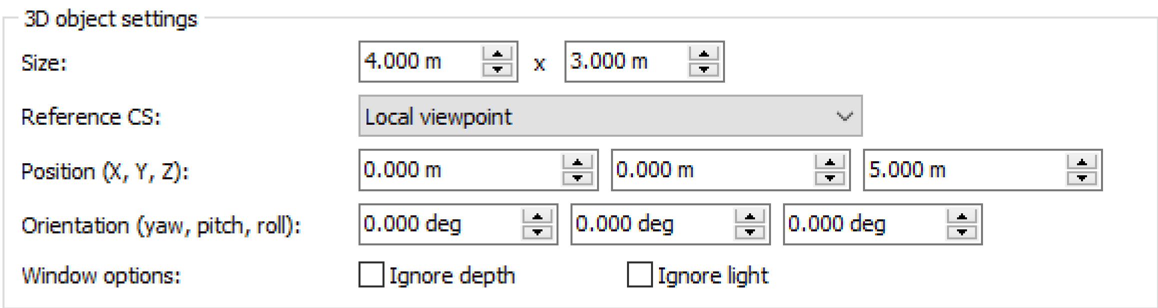
■Basic settings



■2D Overlay Settings
If the display has been set to be a 2D overlay type in the basic settings, the display will be shown as an overlay on top of the 3D scene. The following options are available:



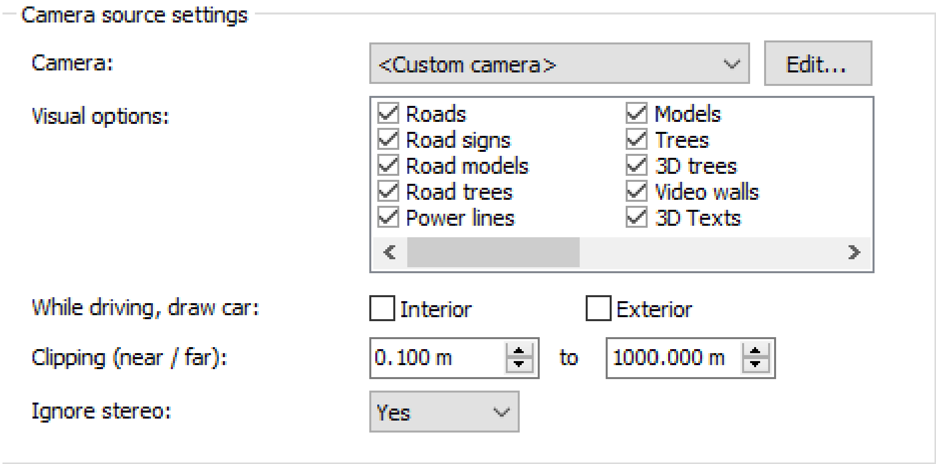
■3D Object Settings
If the display has been set to be a 3D object in the environment in the basic settings, the display will be shown as an a 3D object. The following options are available:



■Color Source Settings
If the source of the display has been set to be a single color in the basic settings, the display will simply be drawn with a solid color. The following options are available:

■Image Source Settings
If the source of the display has been set to be an image in the basic settings, the display will show an image. The following options are available:

■Camera Source Settings
If the source of the display has been set to be the Camera view in the basic settings, the display will show the scene as seen from the set camera. The following options are available:

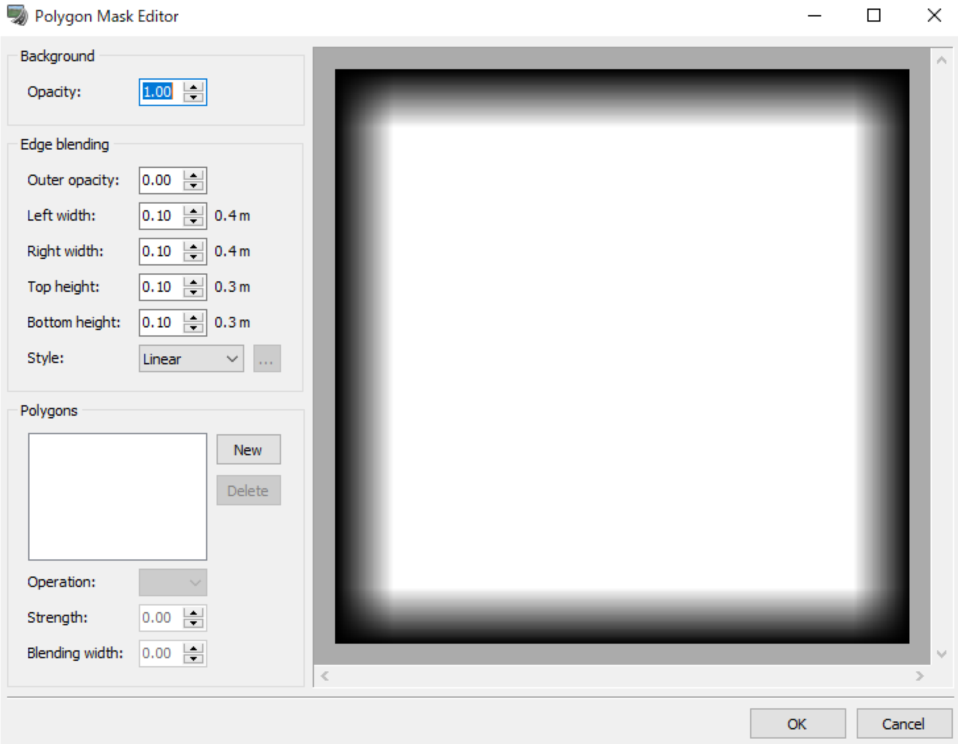


■Image Mask Settings
If the mask of the display has been set to be an image in the basic settings, the display will be blended based on an image. The following options are available:

■Image Mask Settings (Polygon)
If the mask of the display has been set to be an image in the basic settings, the display will be blended based on a polygonal image. The following options are available:

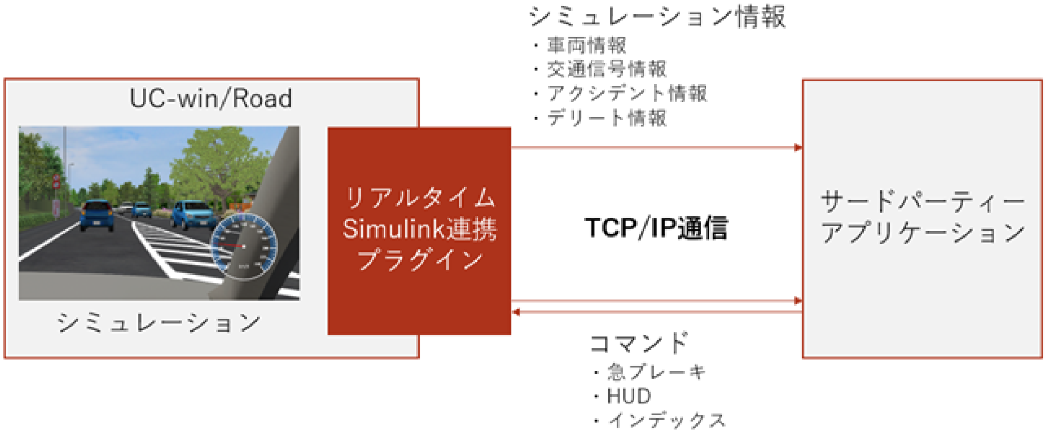
Polygon Mask Editor

The polygon mask editor is used to define the polygons, as well as few other options, used to generate the image that will be used as a mask to render the display. The following options are available:



SimLink Linkage Plugin

SimLink Plugin is for Real-time Link between UC-win/Road and third party application by exchanging data. It is possible to send information on UC-win/Road about the vehicle, simulation such as other vehicles or traffic light information, or accident. And it is also possible to operate simulation on UC-win/Road by command from third party application.
During connection, it is possible to check the simulation information on operation panel of this plug-in. Transmission and reception with third-party applications is done via TCP/IP communication.



Basic functions

- **UC-win/Road Plugin**
  It contains plug-in activation/deactivation and activation by license manager.

- **Send data**
  It is possible to send simulation information to third-party application.

- **Receive command**
  It is possible to operate the simulation on UC-win/Road by receiving commands from third party application.

- **Operator form**
  It is possible to edit settings for connection with another application or to check simulation information. All operations in this plug-in can be done on this panel.

- **Accident List**
  Accident list saves accidents automatically.

※Operation environment
UC-win/Road and third party application are connected with TCP/IP communication.
Note:
This plug-in generates automatically four files in UC-win/Road data folder¥Plugins¥RTSimLinkPlugin¥; Image.ini, LogValue.ini, Setteings.ini and Text.in. When they are deleted, restart this plug-in to regenerate it. All parameters are initialized to default settings.

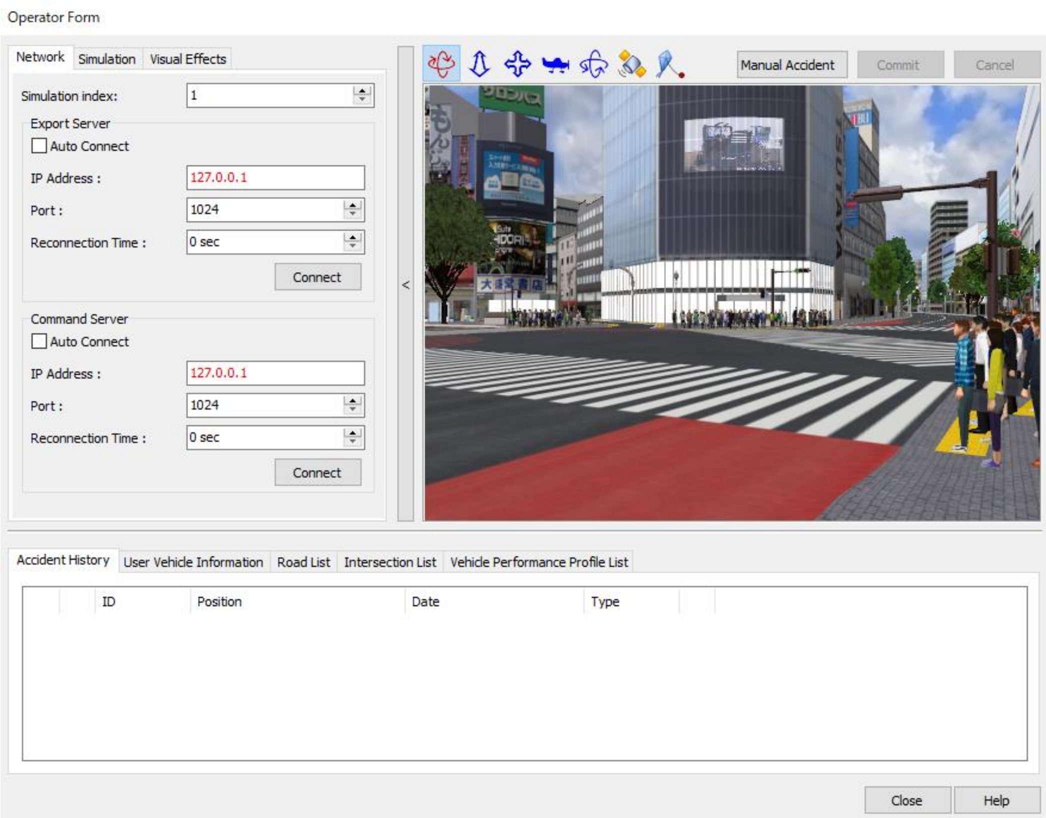
Operation flow

1. Activate

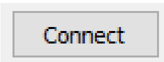
Go to License Manager from UC-win/Road Menu. Check the checkbox of Real-Time Simulation link Plugin and activate the license. After activation on license manager, Real-time Simulink Link group is added to ribbon “Driving Sim”.

2. Prepare for connection with third-party application

Start the plug-in and third party application. Click Operator form from ribbon Driving Sim- RT Simulink. Settings of network, simulation and visual effect are configured on this operation screen.



3. Connect

Click 

on the form. During connection, it is possible to send simulation information on UC-win/Road and receive commands from third party application.

And on simulation view panel or Simulation information display panel, it is possible to edit Accident settings and to check simulation information from UC- win/Road. By click Connect button once, it switches to Disconnect.

4. Disconnect

Click Disconnect button at the bottom.

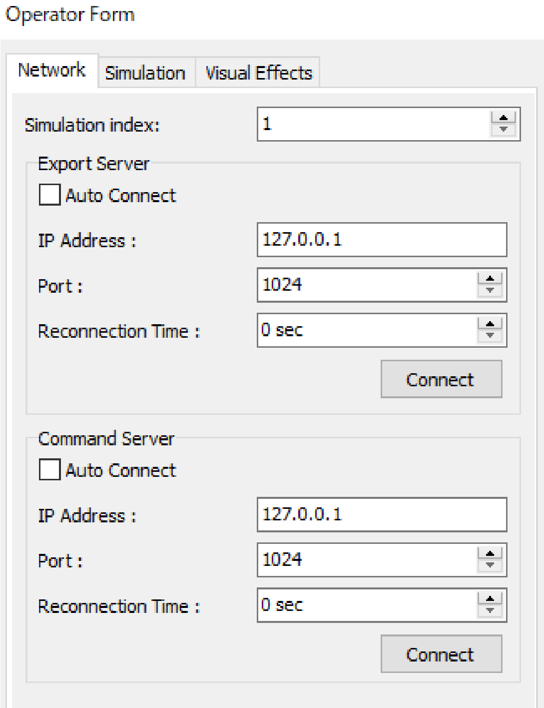
Operatior Form

There are 3 tabs on operation panel.

(1) Setting forms

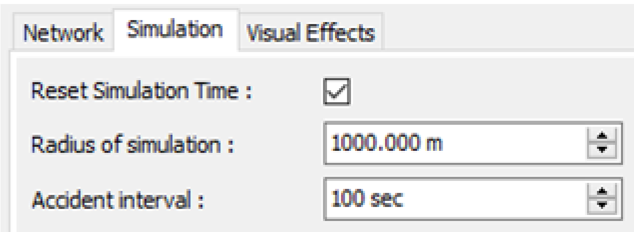
- Network setting tab

Here, configure IP addresses, port numbers, and other settings necessary for communication with third-party applications. Settings will be saved to a Settings.ini file and applied automatically.



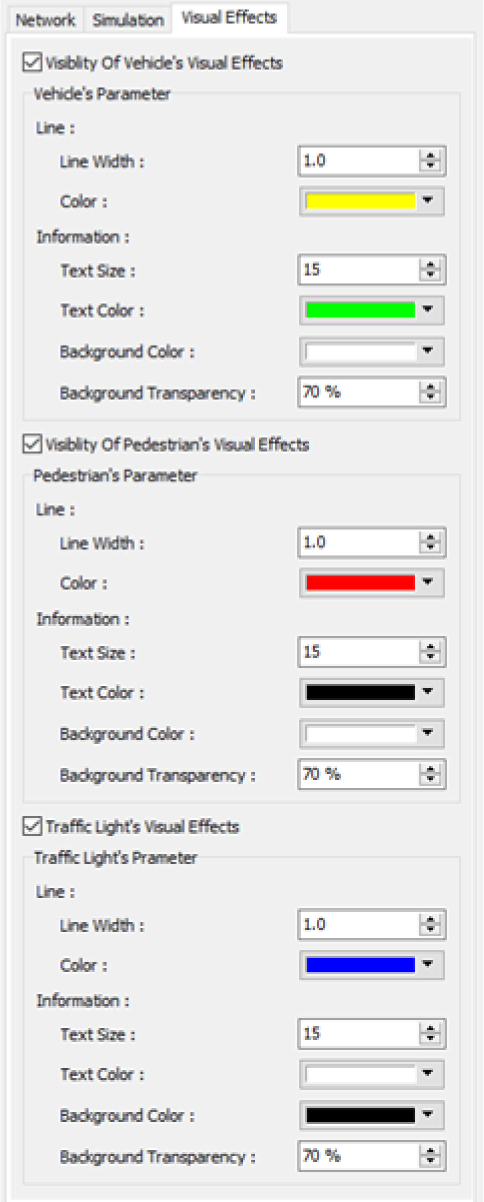
- Simulation setting tub

Configure settings about simulation information which is sent from UC-win/Road to third party application.



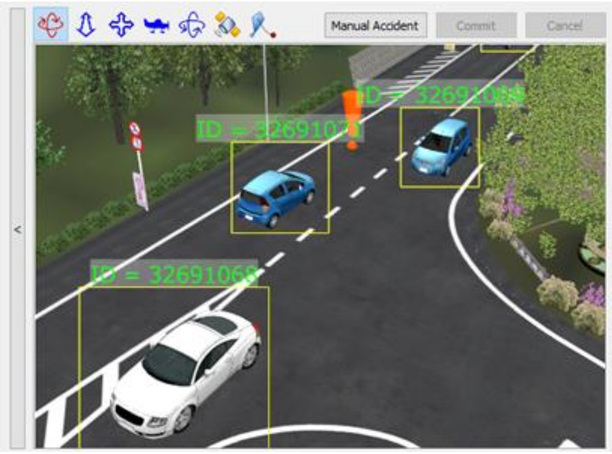
- Visual Effects tab

Configure settings about visual effect on simulation view.



(2) Simulation view panel

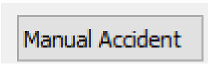
On the right side, it is possible to operate simulation view or edit settings of Manual Accident.



Click each icon to change mode to
Rotate Zoom, Move, Fly, Spin, Satellite or Follow.

(3) Manual Accident settins

Click Manual Accident button on upper right on simulation view panel and click a point to generate Accident. This point is registered as a Manual Accident and it is processed like other accident, for example the crash accident between vehicles. It is possible to check the Accident history on simulation information tab.

1. Click .

2. Click any point on simulation view.
3. A pencil icon  appears at the point.
4. Click Commit button.

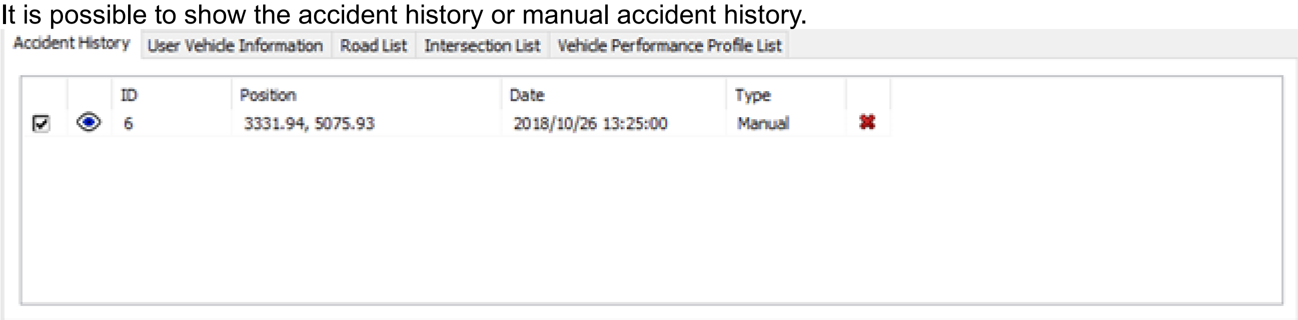
The pencil icon changes to an exclamation mark icon . Then it is registered as an accident.

(4) Simulation information tab

This screen displays information about the simulation.

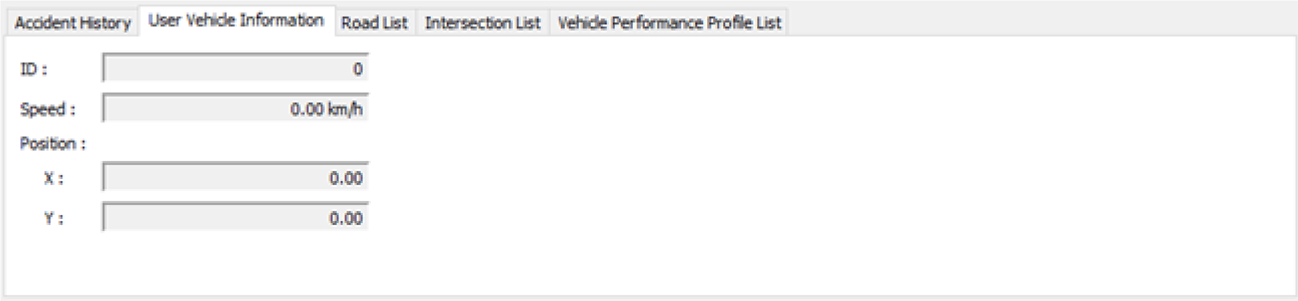
Accident History tab

It is possible to show the accident history or manual accident history.



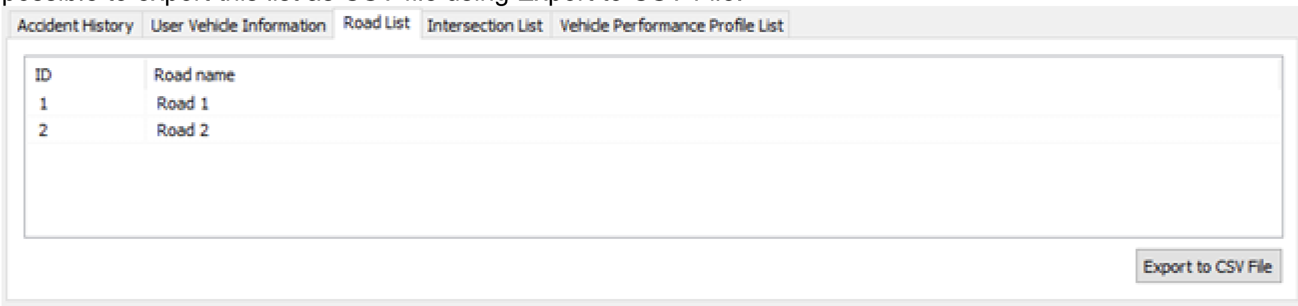
User Vehicle Information tab

It shows the information of the user vehicle.



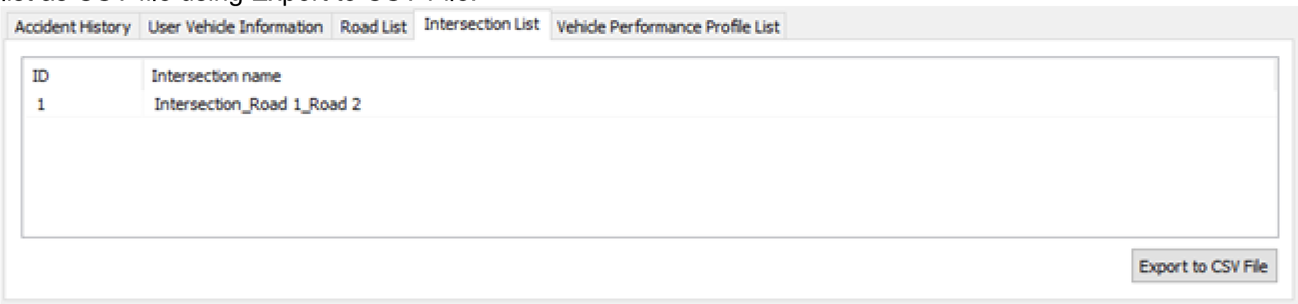
Road List tab

It contains all roads in the project on UC-win/Road. ID is assigned automatically when road is generated. It is possible to export this list as CSV file using Export to CSV File.



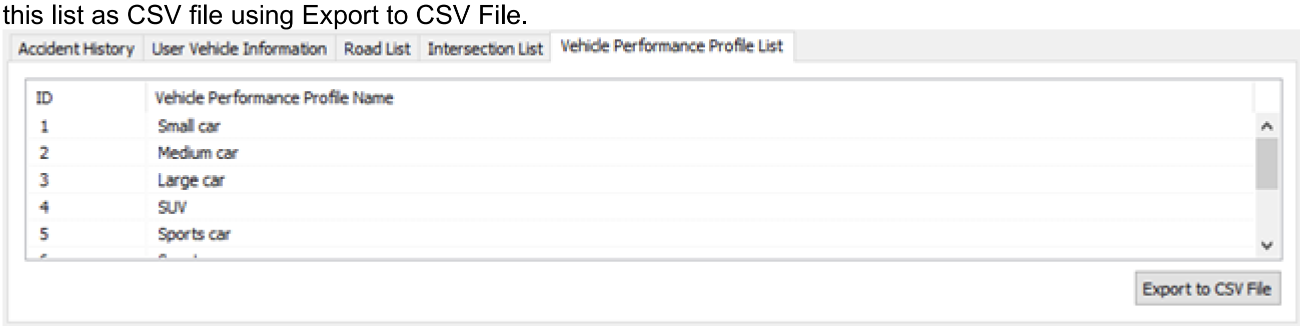
Intersection List tab

It contains all intersections in the project on UC-win/Road. ID is assigned automatically. It is possible to export this list as CSV file using Export to CSV File.



Vehicle Performance Profile List tab

It contains all vehicles profiles in the project on UC-win/Road. ID is assigned automatically. It is possible to export this list as CSV file using Export to CSV File.

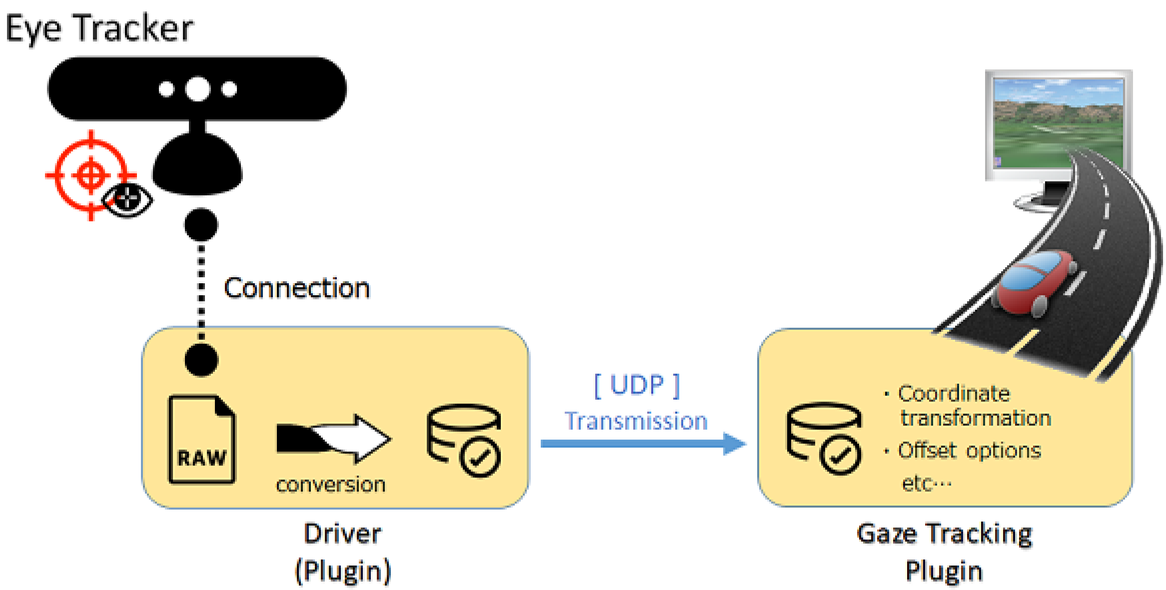


Gaze Tracking Plug-in

This plugin is to connect UC-win/Road and any eye tracking device. It is possible to detect the tracked objects. The data is converted to the data format for UC-win/Road. This plugin can be linked with Object Detection Plug-in.

1. Connect with eye tracking device

(1) Driver
In most cases, a driver suitable for the type of eye tracking device is required to be developed to connect with UC-win/Road and convert the tracking data to the data format used in UC-win/Road.

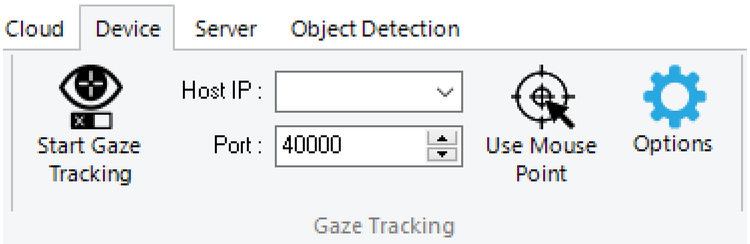


(2) Communication format
Refer to the chapter Communication format.

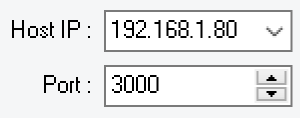
(3) Receiving gaze tracking information
The tracking information is transferred to UC-win/Road via UDP. Click Start Gaze Tracking to start receiving the data besed on the setting of Host IP and Port. For details, refer to Settings.

2. Ribbon menu

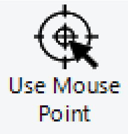
After enabling Gaze Tracking Plug-in, the gaze tracking menus will be added to the Device ribbon.



: Click to start gaze tracking. After clicking it, the icon changes to Stop Gaze tracking.



: Set up the host IP address and port number.



: Use mouse point to adjust the eye tracking data.

: Open the setting option form.

3. Receiving gaze tracking information

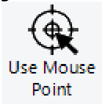
The gaze tracking information is transmitted to UC-win/Road via UDP. Click 

to start receiving the information. And UC-win/Road displays it on the screen depending on the settings.

Settings
1) Host IP
Choose a Host IP listed on the combo box. It is possible to assign a loop back address manually too.

2) Port
Assign a port to receive the tracking information. When the port is already used, an error message will be displayed. 4000 is assigned as default. The input range is from 1024 to 49151.

4. Eye tracking simulation with mouse point

Click 

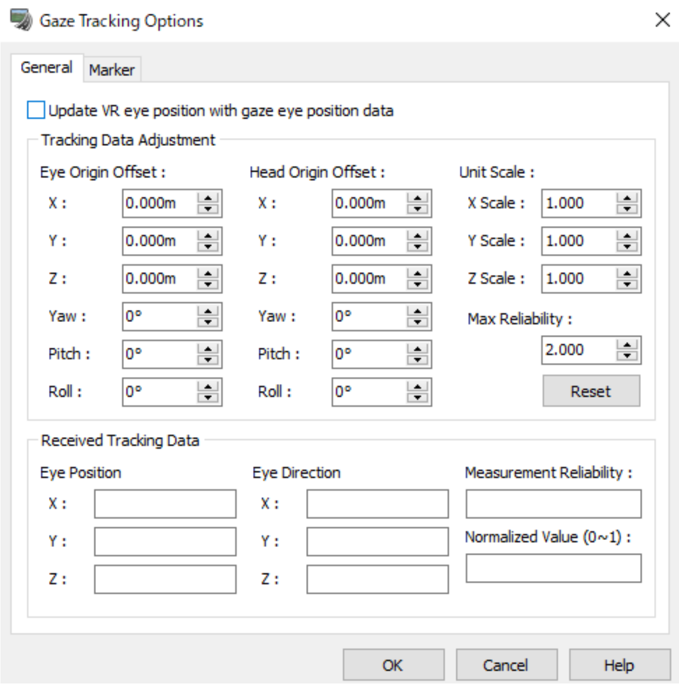
to start eye tracking simulation with mouse pointer. The point indicated by the mouse pointer can be the position to which the experiencer is looking toward.

However, it is not possible to use in the following cases;
- While the actual eye tracking information is being receiving.
- When the camera movement is not “Rotate”.

5. Gaze tracking options

Here adjust the gaze tracking information position and set up marker settings. Go to the ribbon Server – Gaze tracking, and click 

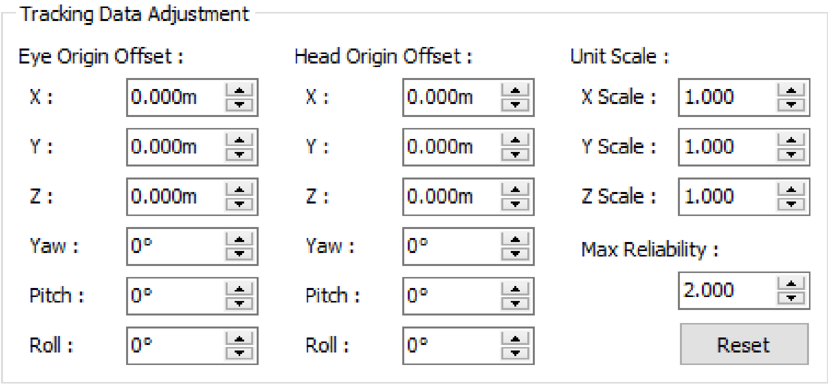
. Please refer to the Help for setting details.



General tab

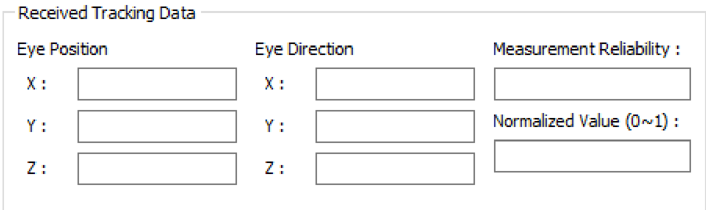
Tracking Data Adjustment

It is possible to adjust the received eye tracking information using offsets or scaling.



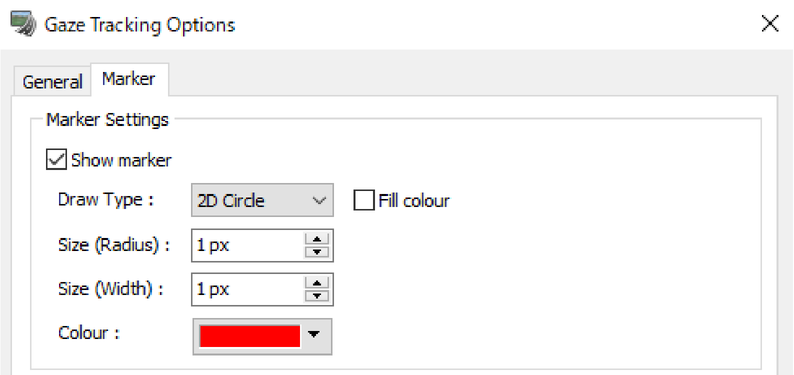
Received tracking data

It shows the received tracking information in real time.



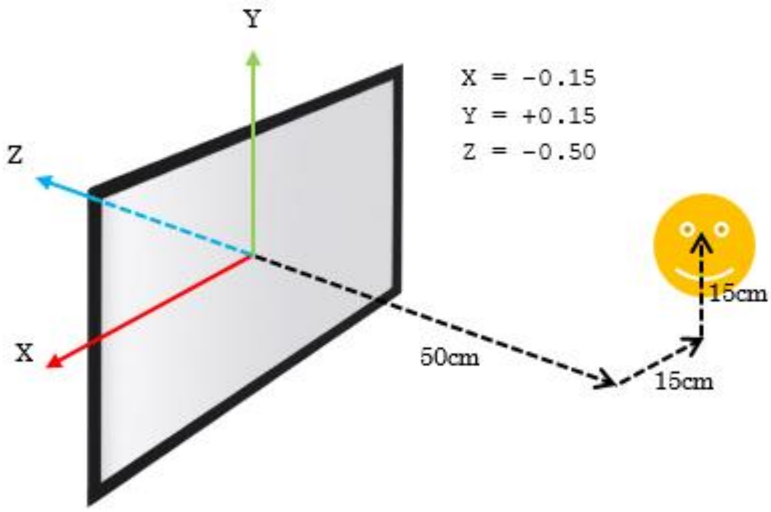
Marker tab

It is possible to display the actual eye sight with marker. Set up the color, size and type.



6. Communication format

EyePositionX, EyePositionY, EyePositionZ
There are information of eye position in X, Y, Z.



EyeDirectionX, EyeDirectionY, EyeDirectionZ
These are information about direction of eye sight line.

HeadPositionX, HeadPositionY, HeadPositionZ
These are information about the head position.

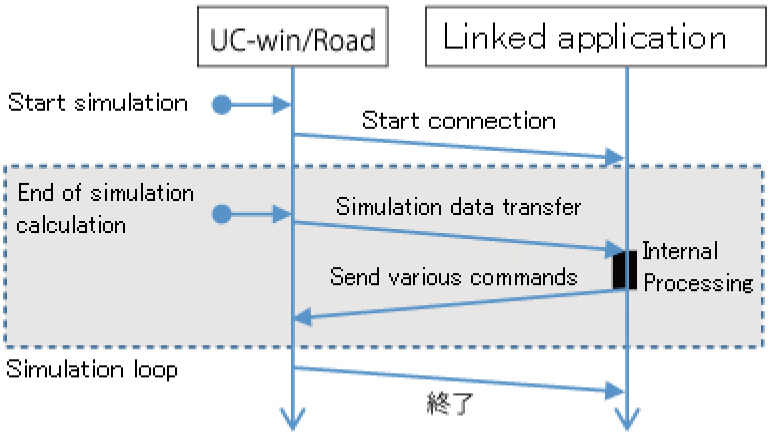
HeadDirectionX, HeadDirectionY, HeadDirectionZ
These are information about the head direction.

MeasurementReliability
This is a value of measurement reliability. This must be more than 0.

Object Detection Plug-in

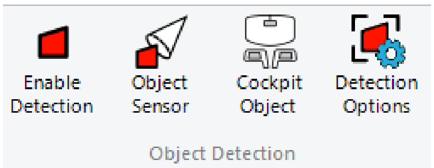
It is possible to acquire and utilize the object information detected in UC-win/Road. The apex angle and distance defines a cone-shaped detection range as an object sensor, and the sensor detects objects in the range.

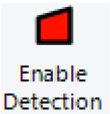
The detection results can be used in the simulation real time function.
The simulation information including the object detection result can be transferred to the cooperated application via TCP/IP in real time and the application sends vehicle control commands based on that information to execute simulations of in-vehicle devices combining UC-win/Road and external applications.



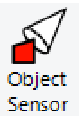
Menu

Go to License Manager, and enable Object Detection Plug-in. Once the plugin is enabled, the menus will be added to Object Detection ribbon.





: Click to start object detection.



: Open object sensor setting form. Refer to Object Sensor settings.

: Opens cockpit object setting form. Refer to Cockpit Object Settings.

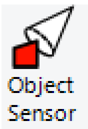
: Open Option form. Refer to Object Detection Options.

Start detection

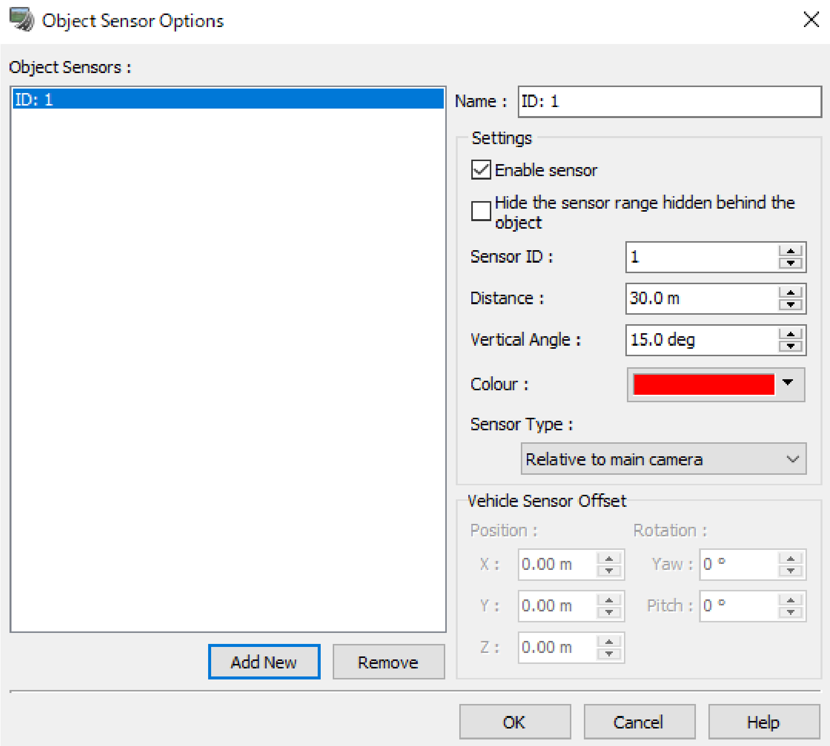
Start object detection. At first, click Object Sensor, Cockpit Object and Options to set up settings.

1. Object sensor settings

Object sensor means a cone shaped detection range. It is possible to register object sensors as needed and each object sensor detect objects.

Click 

. Register the range of cones to be judged for detecting objects.



Object Sensor Settings

Set up a size of cone shaped detection range. Each object sensor has each ID.

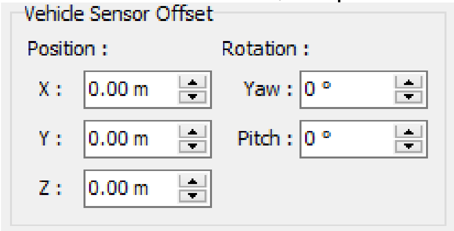
- Add: Add a new object sensor.
- Delete: Delete the selected object sensor
- Enable Sensor: Turn on/off the sensor.
- Sensor ID: it is a unique ID for each sensor.
- Detection distance: Set up the detection distance in meters.
- Apex angle: Set up the apex angle.
- Color: Set up a color to display the detected objects.

Sensor type

Set up the position and direction of the sensor. Choose one from the following 3 types.

- **Relative to main camera**: Sensor moves relative to the main camera of UC-win/Road.
- **Relative to vehicle chassis**: Sensor moves relative to the direction of vehicle. It can be enable only during driving.

Hint: Furthermore, it is possible to adjust the position and direction of sensor with offsets. This is a sensor mounted on the vehicle, the position of sensor must be within ±20m.



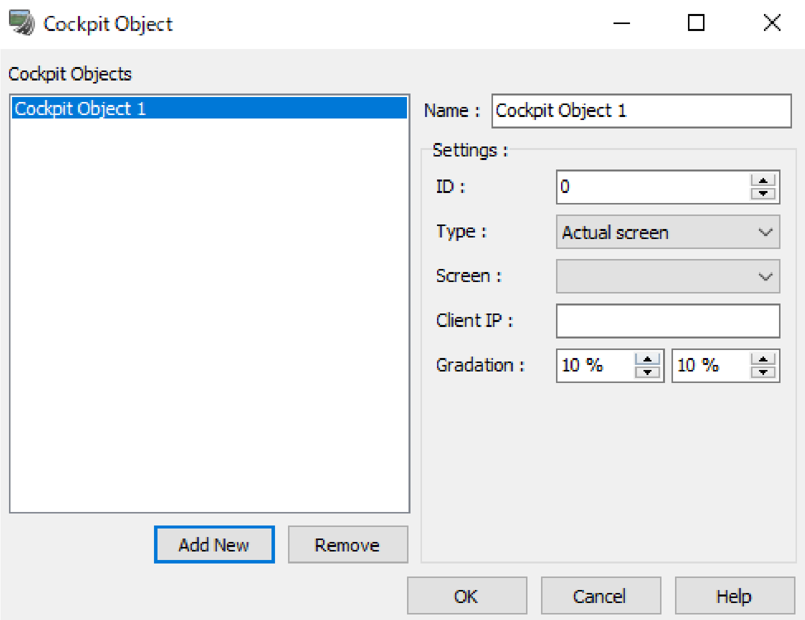
- **Relative to eye position:** This is a function connected with Gaze Tracking Plugin. Sensor moves relative to the eye positions received from an eye tracking device. Without the eye tracking data, sensor moves relative to the main camera.

2. Cockpit Object settings

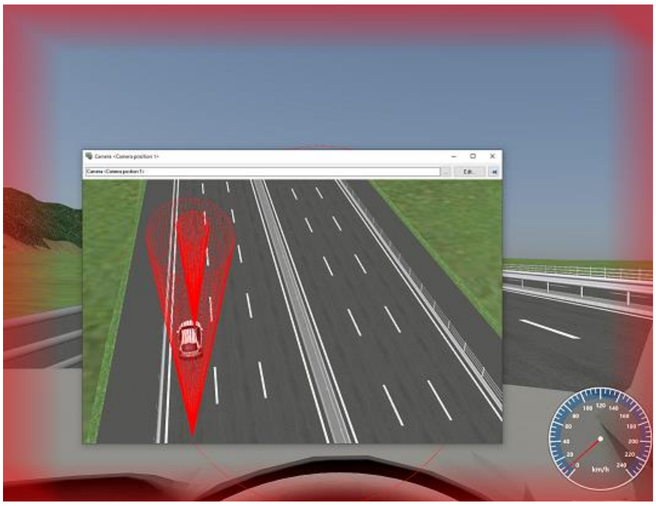
It is possible to register cockpit objects as detection range.
For example, without cockpit object settings, objects off side of the mirror, which it cannot be seen actually, are detected if the driver gaze into a mirror. By setting the mirror as a cockpit object, if the driver gaze into a mirror, the mirror can be detected.

Click 

.



- ID: Assign the ID number to cockpit. It is not a unique number, so it is possible to assign same number to the cockpits.
- Type: Select a cockpit type to be detected. Now only Actual Screen is available.
- Screen: Select a screen to be linked with cockpit object.
- Client IP: Input a client IP which displays a simulation screen to be detected.
- Gradation**:** set up the range of gradation display when cockpit objects are detected. Input the percentage in vertical and horizontal direction.



3. Object Detection Options

It is possible to select objects to be detected. Click 

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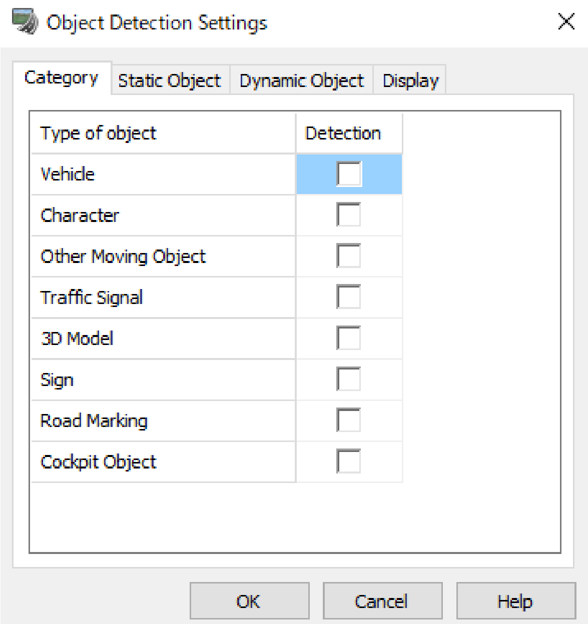
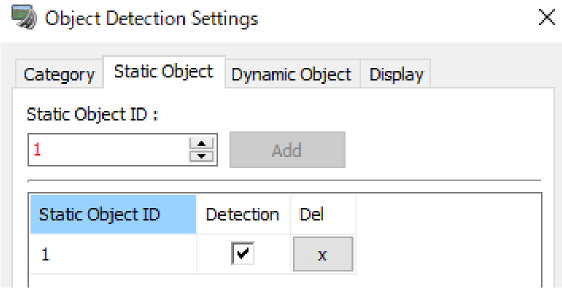


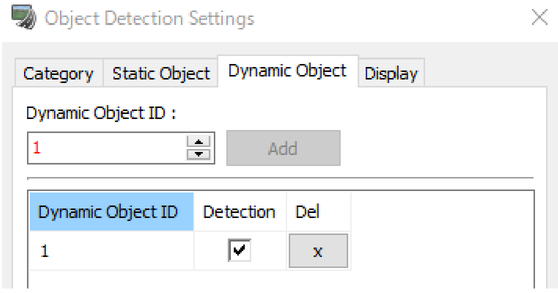
Category tab
It is possible to filter the objects, such as vehicles, characters, other movable models, signals, 3D models, signs, markings and cockpit objects, to be detected. Check it on/off to turn the detection on/off.
The settings are applied automatically

Static object tab
Set up this options to detect 3D models arranged on the project. It is possible to specify the target 3D models by Custom ID.
Disable the object type to be detected on Category tab, and then register the Custom ID for the target object type on Static Object tab, so that it is possible to detect only the object with same custom ID.

Dynamic object tab
Set up this options to detect 3D models arranged on the project. It is possible to specify the target 3D models by Custom ID.

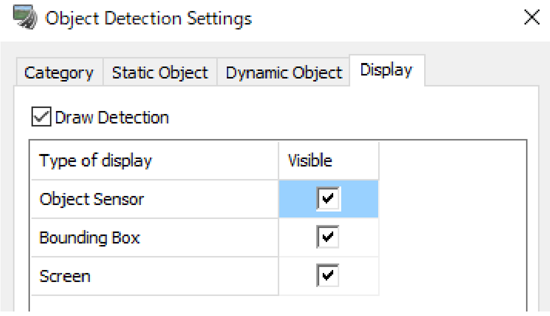
Disable the object type to be detected on Category tab, and then register the Custom ID for the target object type on Dynamic Object tab, so that it is possible to detect only the object with same custom ID.
It is recommended to assign as big custom ID number as possible.





Display tab

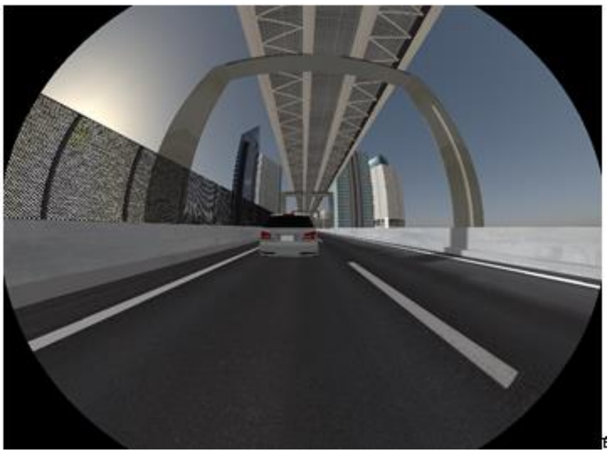
Able or disable the display of object sensor, bounding box and screen respectively.
Hint: If the displays are turned off, the detected object information contains the results. And the display settings are applied for the next time automatically because it is saved to the registry.



Vehicle

Camera Sensor Base Plug-in

Camera Sensor Basic plug-in provides the function of simulating image distortion by fisheye lens etc.
The lens distortion parameters support basic projection methods such as equidistant projection, isometric projection, stereographic projection, and orthographic projection besides polynomials, parameter specifications in distortion table files. These lens simulations can be applied to any camera view as well as the main screen.



1. Flow

1. License authenticate
   Go to File – License Manager and authenticate “CameraSensorBasePlugin.bpl”.

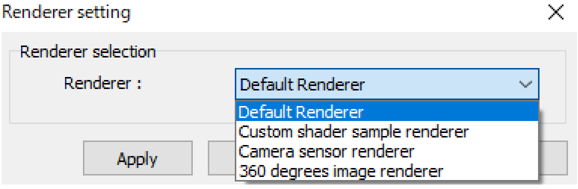
2. Main view setting

3. Camera view setting

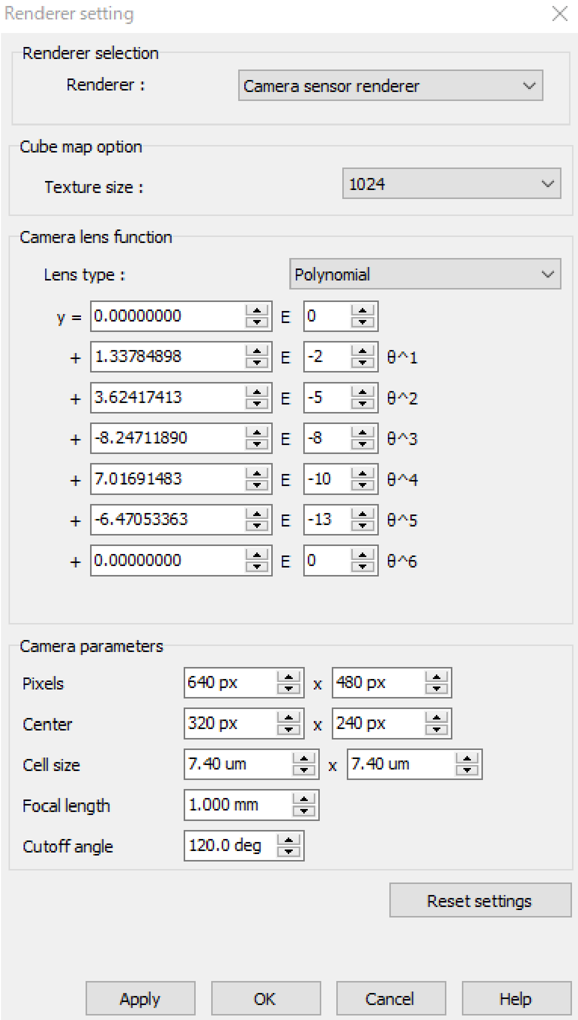
4. Start simulation

2. From Main view

Right click on the main screen and select Renderer Settings.

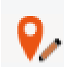


Select Camera Sensor Renderer as Renderer. Edit parameters as necessary and click the "Apply" button.
Refer to Help for the setting details.

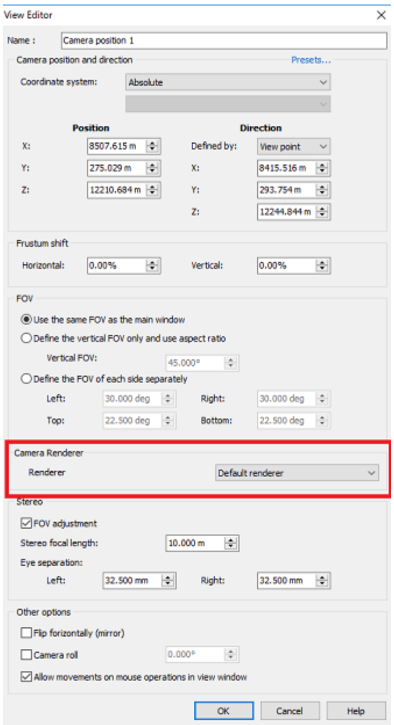


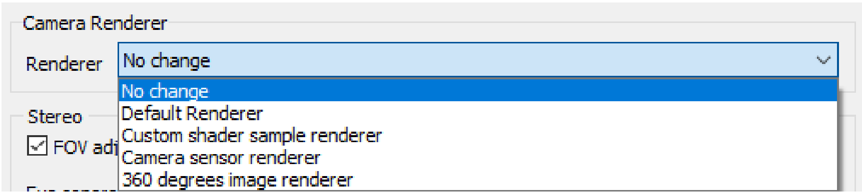
3. From Camera view

By following the steps below to set up the renderer, the camera view screen can be used to simulate camera sensors such as a fisheye lens.

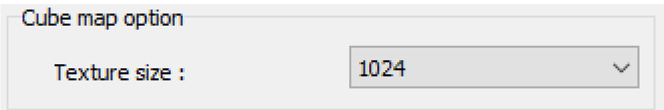
Click on the main view and click Edit camera positions… Then select a camera position and click Edit. Or select a camera position and click  on Home- Camera position.

Select Camera Sensor Renderer as Camera Renderer on View Editor. Edit the parameters on the right side and then click OK.



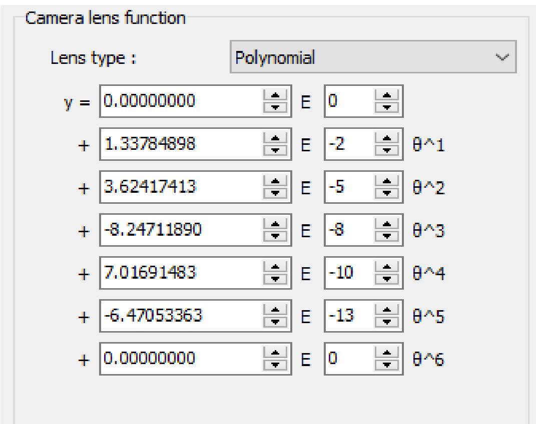


■Cube map option



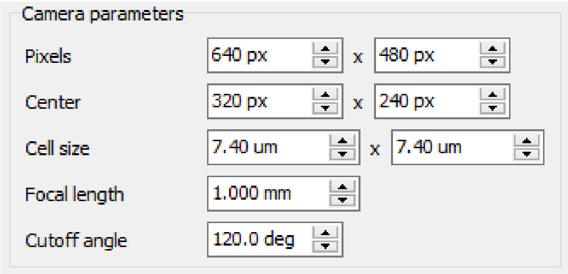
Texture size
Select texture size when generating the cube map. The size is specified size in + X, -X, + Y, -Y, + Z, and -Z directions respectively. Select a power of 2 from 128 to 4096. Depending on the performance of the video card, images may not be generated.

■Camera lens function



Lens type
Select a lens type from the followings.
-Polynomial (Enter the constant term and the 6 coefficients.)
-Distortion table file (Click Open to load a distortion table file.)
-Equidistant projection
-Equal solid angle projection
-3D projection
-Orthographic

■Camera parameters



DS Course Converter plug-in

The DS course conversion plug-in exports data of roads or lanes. Center coordinates, width, curvature radius etc. can be exported as a CSV format at a fixed interval or at each curvature variation. Furthermore, the coordinate system ("Local", "XY", "TKY", and “DD") is exported so that the coordinates of roads can be read in different software. The graph of curvature change can be built for road data exports with a fixed interval.

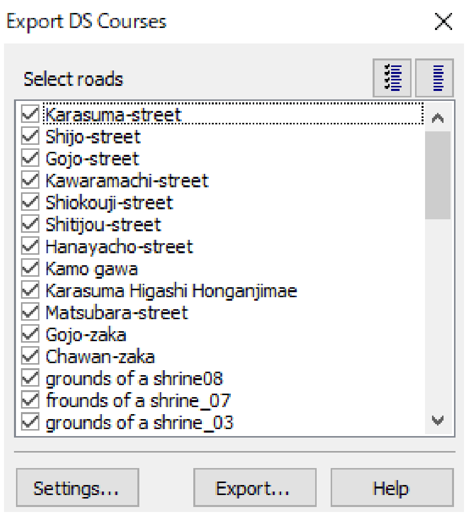
Operation flow

1. Activation

Go to "File" – "License Manager" and activate the plug-in.

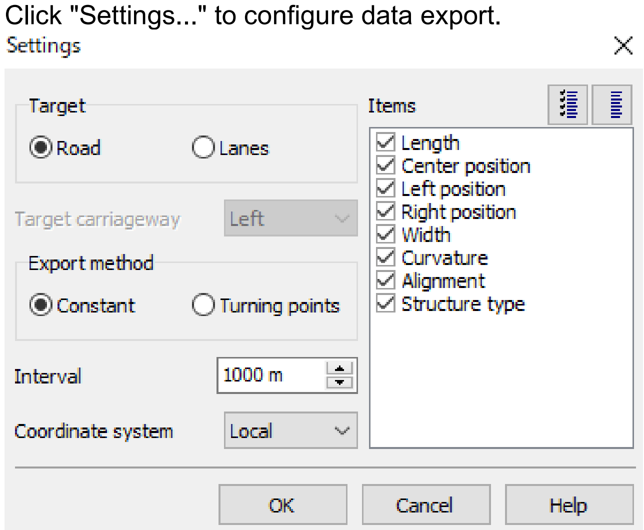
2. Road selection

Load a project. Then go to File – Export – Export DS Courses… and select roads to be exported.



3. Export data settings

Click "Settings..." to configure data export.



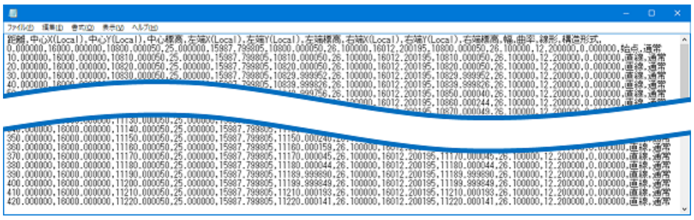
4. Data exporting

Click Export button in the road selecting form to export the data.

Output Data

Data format

If "Road" is selected as the Export Target, one csv file is created per road, and if "Lanes" is selected, a csv file is created per lane.
Each item in a csv file is separated by comma (,). The first row shows a name of item, and data for corresponding distance is displayed from the second row. For position items ("Center position", "Left position", and "Right position"), each X, Y and altitude value are displayed with the coordinate system in parenthesis. For example, if "Center position" is exported in "Local" coordinate system, three columns are created: of Center X (Local), Center Y (Local), and CenterHeight.



Length, CenterX (Local), CenterY (Local), CenterHeight,
Alignment, Structure type
0, 500, 1000, 610,..., Begin, Normal,
100, 600, 1000, 610,..., Straight, Normal,
200, 700, 1000, 615,..., Curve, Normal,
..., ..., ..., ...,..., ..., ...,
1200, 800, 600, 612,..., End, Normal,

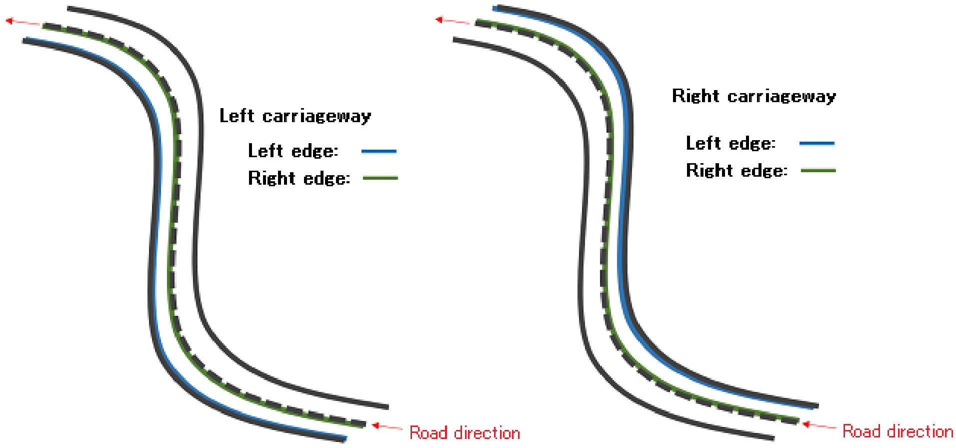
Selected items are exported by columns from left to right.

Exceptions

Depending on the lane file, there are items where data is not exported for the number of lane changed. For example, there is a case that a road exists, whose lane number changes from 2 to 1 at a distance of 100m. At that point, because the lane 2 disappears, the data for lane 2 is not exported after 100m (the distance will be done.).

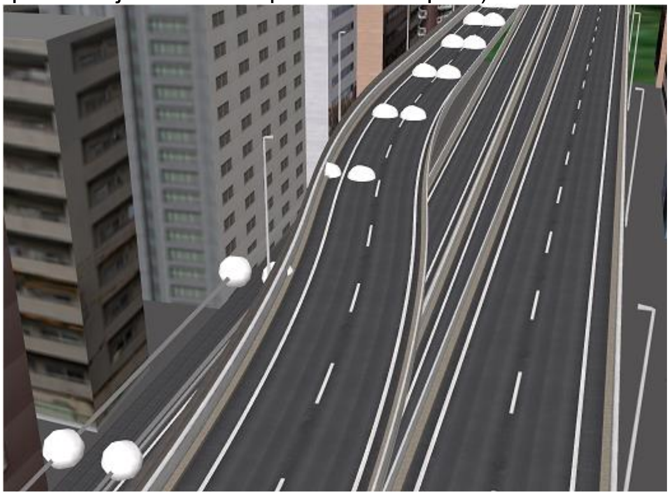
Coordinate position

When the target is a road, the left side of the road direction is the left carriageway and the right side is the right carriageway. If the target is in each lane, the lane of the left carriageway depends on the road direction, but the lane of the right carriageway depends on the opposite of the road direction. The coordinates of the left edge and the right edge for each lane are as shown in the figure below, respectively.



Coordinates of roads and lanes

The lane coordinates is exported based on the lane center of UC-win/Road. When exporting with the special VR data such as data created by roads that overlap with invisible roads, the coordinate different from appearance may be exported. To get the appearance coordinate, manually edit the exported coordinate data. The figure below shows an example of exporting the invisible lane coordinates of Highway.rd bundled with UC-win/Road (White sphere objects are the position of export.).



About Transition section

The width of each lane will be a constant value in the section where the section changes. Because "Lane left edge" and "Lane right edge" are calculated using the "Lane width", it is not guaranteed that those value are accurate.

Speed meter display plug-in

This is a function to display a meter panel, which shows the speed of driving vehicle, the rotating speed of engine, the direction indicator and so on. It is displayed on a separate form, different from the Main Form. In driving mode, the components react to the driving situation: warning lights, speedometer, tachometer etc.

Go to Edit ribbon – Speed Meter Display - 

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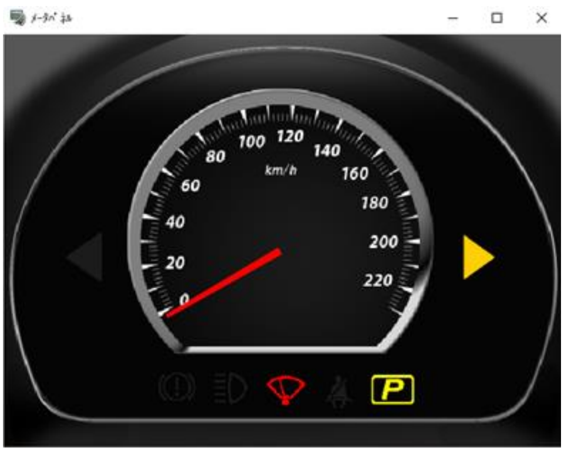
1. Background image
2. Speedometer
3. Tachometer
4. Turn signals (hazard warning)
5. Gearstick position indicator
6. Hand brake warning
7. Full beam indicator
8. Wiper indicator
9. Seat belt warning

It is possible to customize the dashboard from 

.



About input device
The instruments react according to the input device. Available input devices depend on the status of the drive simulator plug-in.

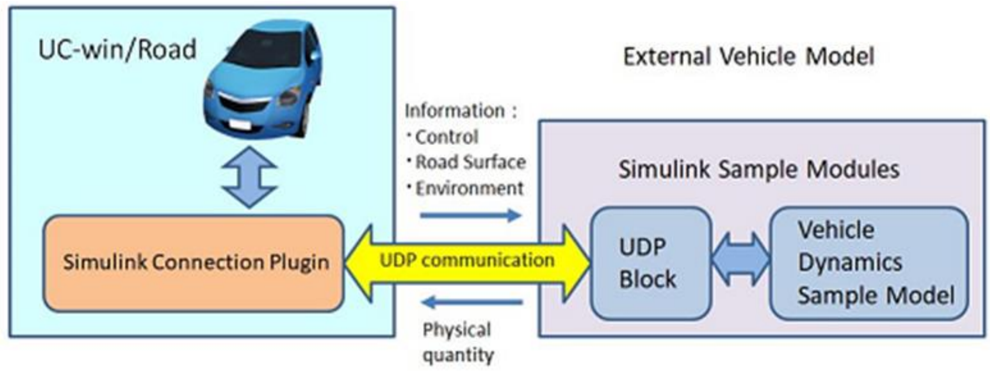
- DS plug-in is used: input data from DS is reflected on the meter panel.
- DS plug-in is not used: Input data from keyboard or game controller is reflected on the meter panel.

When using keyboard or game controller as input device, seatbelt and hand brake warning are always off.

Simulink Connection Plug-in

1. Overview

Simulink connection plug-in is to operate the own car driving by using the vehicle model external to UC-win/Road. The external vehicle model and Simulink connection plugin are linked via UDP communication.
Normally the external vehicle model needs to be prepared, however we provide a sample here, which contains a connection block that is always used in Simulink and also a simple vehicle model. It is possible to check the operation immediately. And if you follow the communication protocol, it is not necessary to use Simulink to realize the external vehicle model.



Basic Function

・It is possible to select between the UC-win/Road's vehicle model and the external vehicle model.
・It is possible to define IP address and port (excluding transmission port) used for UDP communication.
・It is possible to define the communication interval time on transmission.
・Transmission and reception are done asynchronously.
・It is not guaranteed that all received packets will be processed.
・Logs of communication data can be saved in CSV file.

2. Environment

Since the external vehicle model and UC-win/Road are linked via UDP communication, there is no restrictions on the execution environment for the external vehicle model as long as it follows the communication specifications. Besides external hardware and PC, it can also be executed on the local PC. The environment required for the operation of the external vehicle model depends on the model. The MATLAB / Simulink license required to run the sample model is as follows.

・MATLAB
・Simulink
・Simulink Desktop Real-Time

It is recommended to use the following licenses as options.

・Simulink Coder (Required for operation in external mode, not required in normal mode.)
・MATLAB Coder (It is an operation requirement of Simulink Coder, unnecessary in normal mode.)

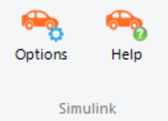
The sample model is confirmed with MATLAB / Simulink version R2016b, R2017a.
MATLAB / Simulink can operate on the same PC which runs UC-win/Road or on another PC.
When operating on the same PC, use the local IP address for communication and set port numbers that do not overlap. If more than one network can be used, please define a physical IP address instead of local IP address 127.0.0.1.
When operating on a different PC, Mac OS X is also possible in addition to Windows OS.
Linux does not support Simulink Desktop Real-Time, so it is not possible to use the sample model.

3. Operation flow

1. Prepare the environment
With MATLAB / Simulink environment, it is possible to use the sample model to check the operation of the plugin.

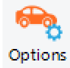
2. Connect the external vehicle model with UC-win/Road.
When operating the external vehicle model on the PC which does not operate UC-win/Road, connect the devices by LANs. The sample model works with MATLAB / Simulink environment on the same PC or another PC.

3. Activate Simulink connection plugin on UC-win/Road.

Simulink icons 

will be added to Driving Sim ribbon.

4. Check "Auto connect when driving" on the option screen of Simulink connection plugin.

The Options screen is opened by the ribbon, Driving Sim - Simulink – 

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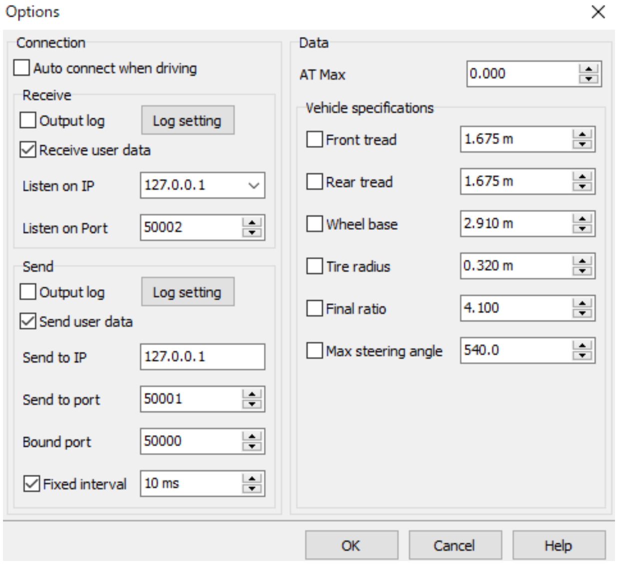


5. Set parameters such as logs and vehicle specifications as needed in Option screen.

6. Communication settings in UC-win/Road
Set the "Listen on IP" and "Send to IP" in the Option screen of UC-win/Road.
For the "Listen on IP", select it from the drop down list.
When executing the external vehicle model on the same PC with UC-win/Road, both of the transmission and reception IP address can be defined to be the same one. When executing on an external device, set the IP address of the external device as the transmission IP address.

7. Communication settings on the side of the external vehicle model
Define it to be the IP address of PC which operates the UC-win/Road on the side of the external vehicle model. When using the sample model, set the transmission and reception IP address according to the "Communication module settings". The IP address on the side of external vehicle model depends on the model configuration, however it refers to the PC settings when using PC.

8. Start running the external vehicle model.

9. Start driving on UC-win/Road.

10. Stop driving on UC-win/Road, then stop executing the external exercise model.

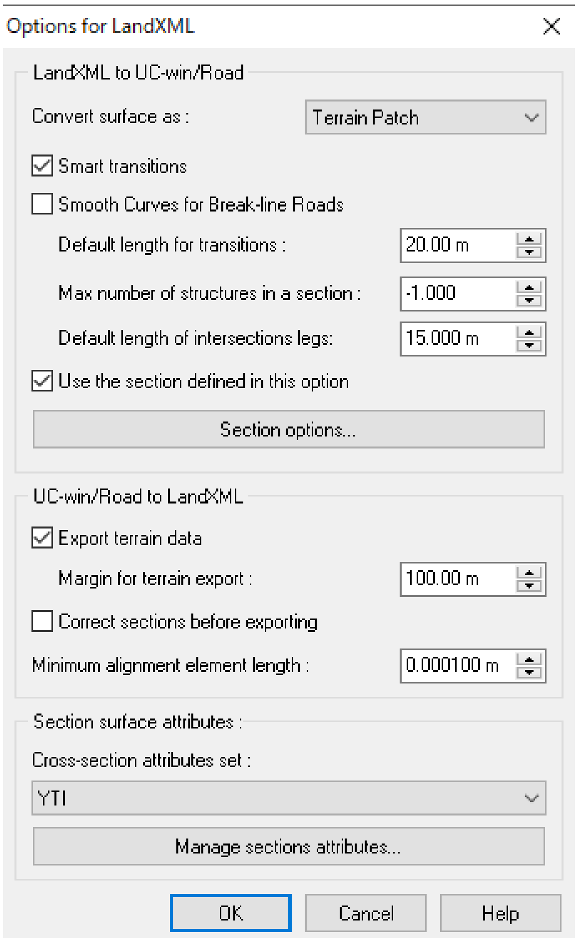
BIM/CIM

Import / Export LandXML

It is possible to import and export Land XML files.

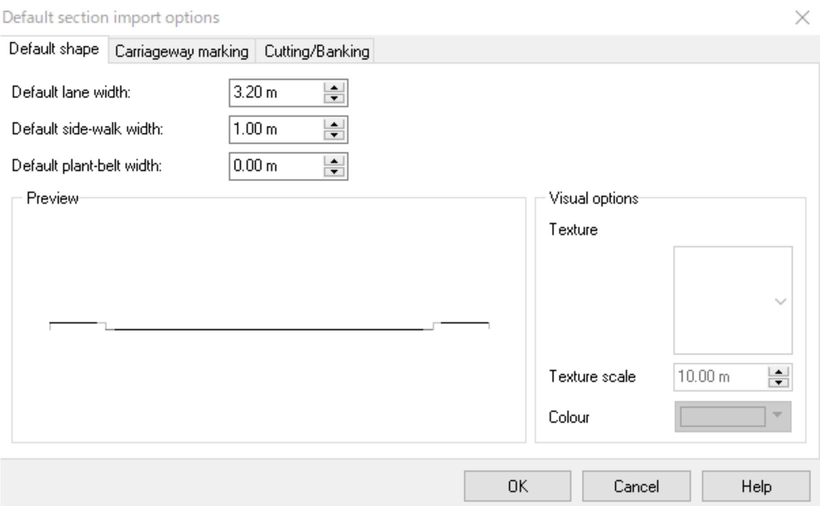
1. Settings

Go to "File" - "Import" - "Import LandXML" and click Options….Set up the conversion settings.
Refer to the Help for the setting details.

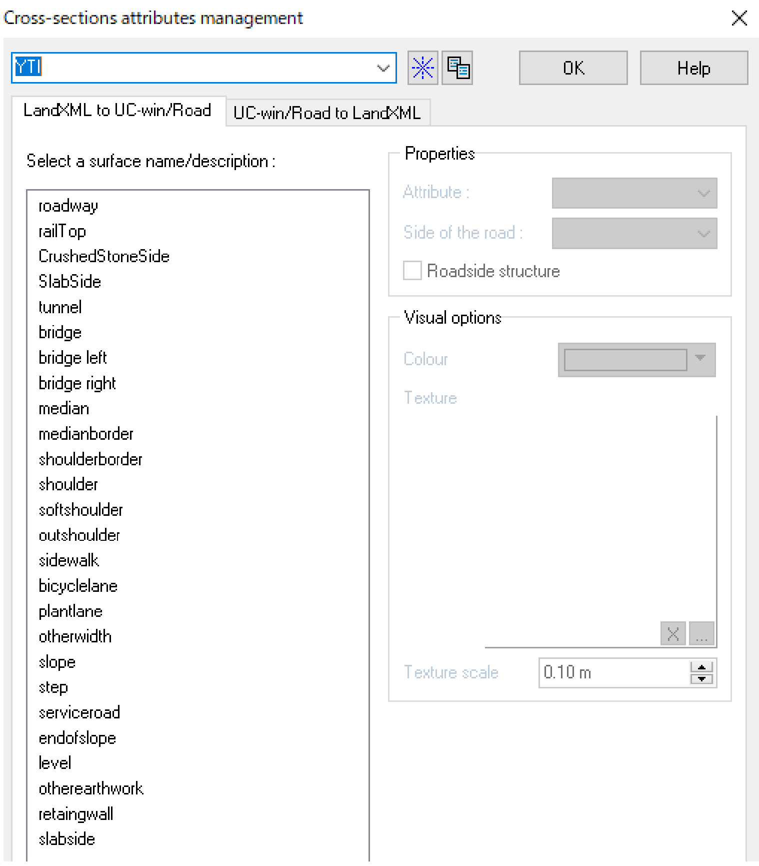


Click 

to open Default section import options form.
Textures, their sizes, angles, etc. can be configured on each tab for the default shapes of standard cross sections, road surface markings, and cut/fill.



Click  to open Cross-sections attributes management form.



- **"LandXML to UC-win/Road" tab**

Select the attribute of UC-win/Road and set up the texture and size. Then Add the attribute element by clicking "Add" button.

Edit the following parameters.
Color, texture, and size

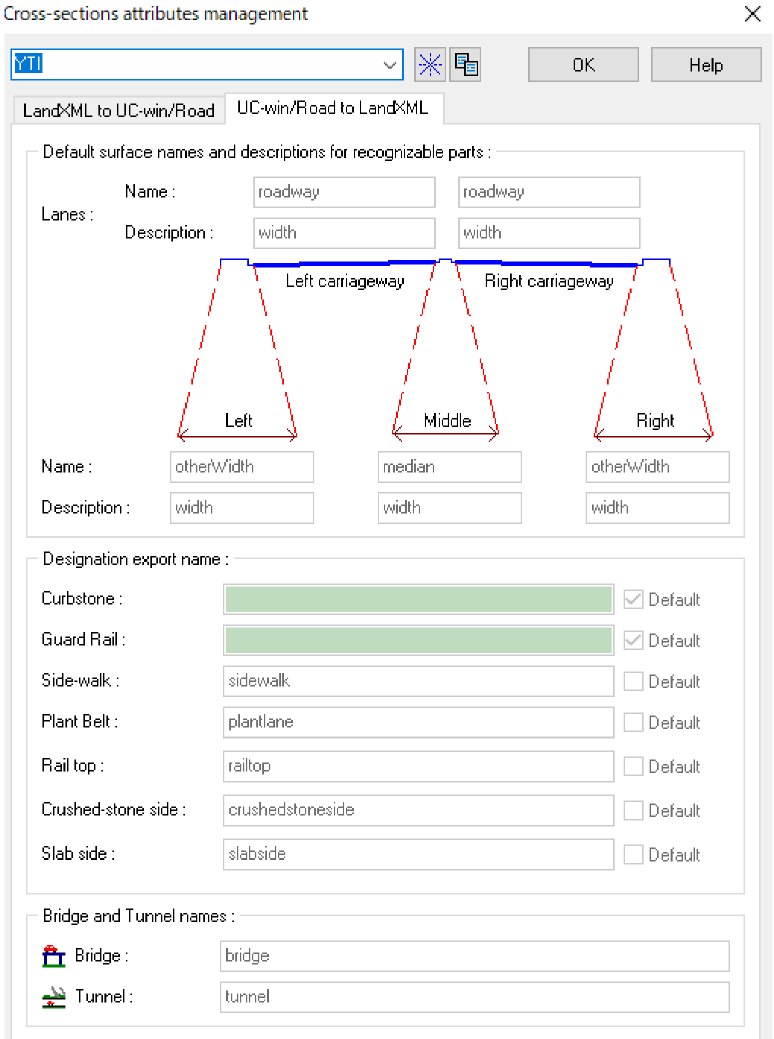
- YTI: LandXML cross section which is used forHICAD (Yokokawa Gijutu Joho)
- MTC: LandXML cross section which is used for APS-Mark Ⅳ Win (MTC)

The defined cross section's attribute data is saved to《product installed folder》¥Data¥XMLSurfaces.cfg
Copy it when importing LandXML to another PC.

It can be added, copied, and deleted by the buttons on top. 

- **"UC-win/Road to LandXML" tab**

Set Name/Description of the attribute of UC-win/Road for the cross section's attribute of LandXML



2. Import

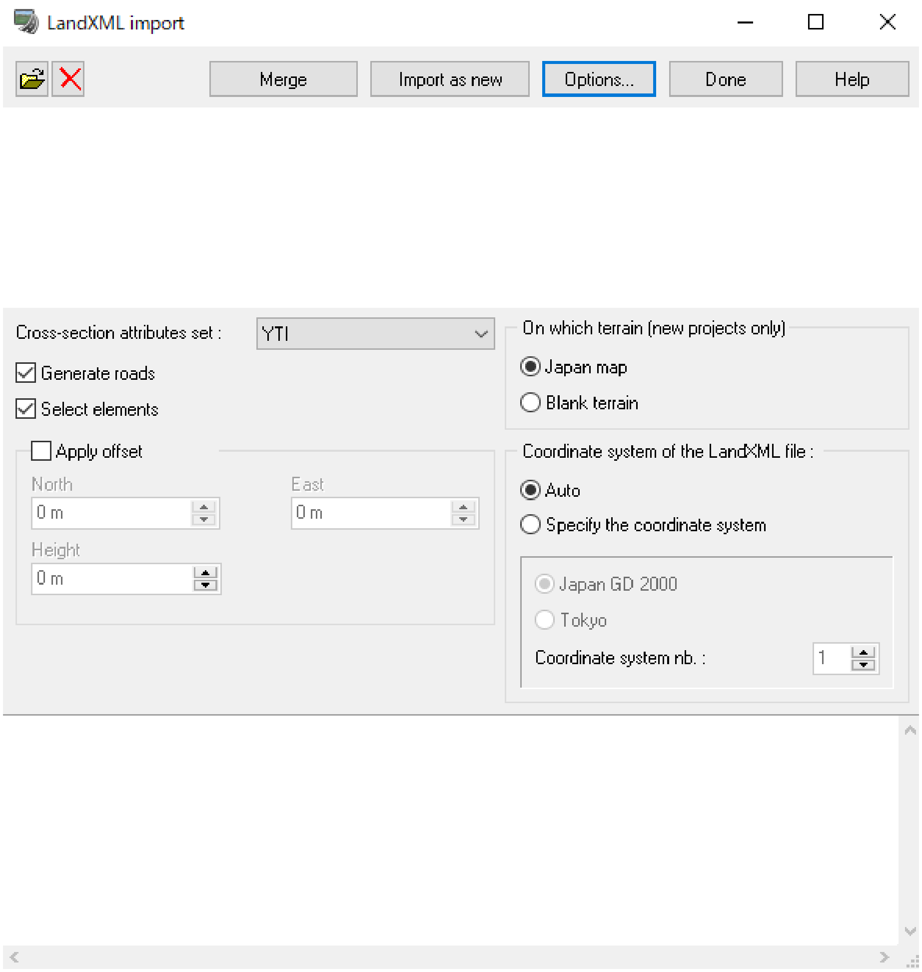
1. Go to "File" - "Import" - "Import LandXML".

2. Click [Import as new] and select a file.

3. Set up import options.
Specify the coordinate system when there is no information of the coordinate number (1-19) in the LandXML file.

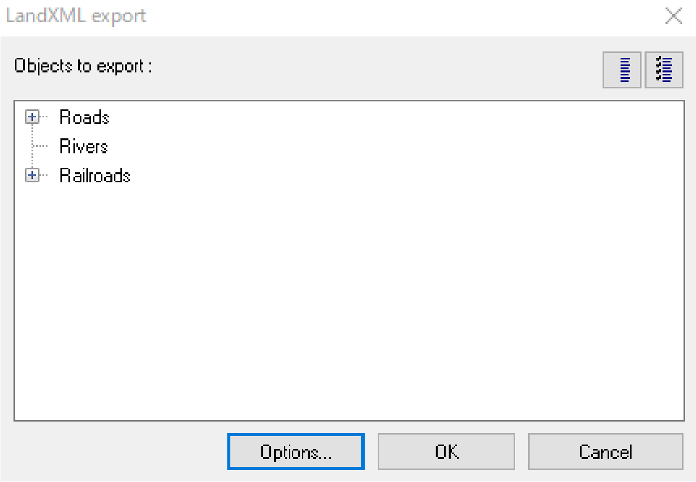
4. Click [Merge].
Click [Import as new] to generate data newly. Check "Select elements" option to select elements to import.

5. Click [Done].

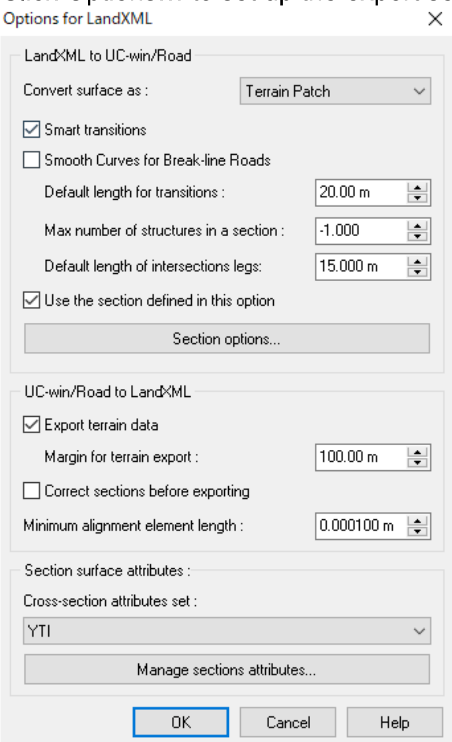


Export

Go to [File] Ribbon - [Export] - [Export LandXML…] Check on objects to export.



Click Options… to set up the export settings.



Click OK and specify the destination folder. Refer to the Help for the details.

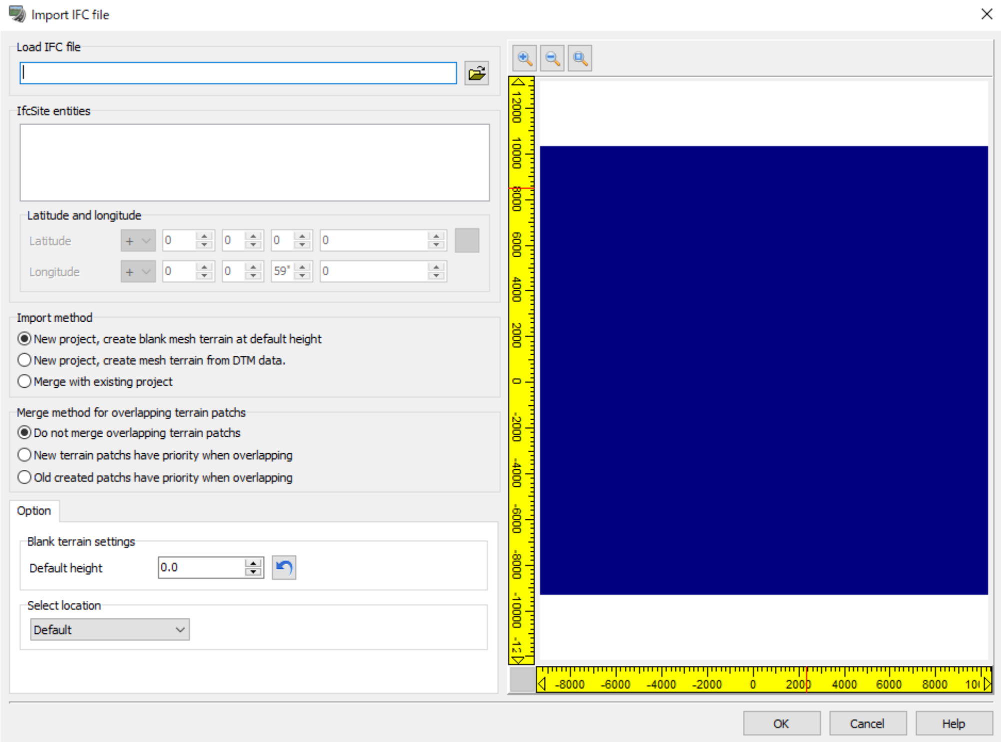
IFC Plug-in

It is possible to import and export IFC files.

Import IFC file

The geographical features defined by IfcSite in IFC format is imported in UC-win/Road. When importing, the geographical features data is converted into the geographical features patch data of UC-win/Road.

Go to "File" - "Import" - "Import IFC file".



・Load IFC file

Click Open icon, select the IFC file (*.ifc) to be loaded, and Click Open in the open dialog.
IfcSite entity will be displayed in the box if it is found in the IFC file.

・IfcSite entities

The IfcSite entity information is displayed.
Select the entities to convert into a UC-win/Road terrain patch. The regions of the selected ones will be indicated in the plan view on the right side in red boxes. The entities not selected will be indicated in blue.

・Latitude and longitude

Select the latitude and longitude.
It is possible only when "New project, create mesh terrain from DTM data" is selected from the Import Methods.
Click the button to reset the IFC file to the initial state.

・Import method

The following import methods are available.
○New project, create blank mesh terrain at default height
○New project, create mesh terrain from DTM data.
○Merge with existing project

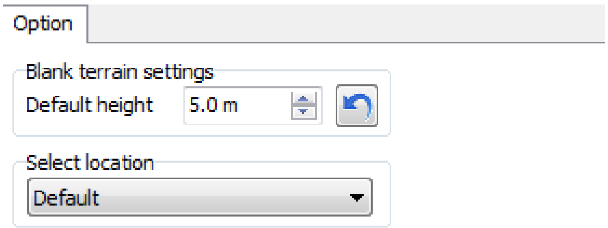
・Merge method for overlapping terrain patches

Terrain patches cannot be placed on top the existing terrain patch, therefore, select the method to overlap terrain patches.
○Do not merge overlapping terrain patches
○New terrain patches have priority when overlapping
○Old created patches have priority when overlapping

Option settings

Set up the parameters depending on the import method.

- In case of “New project and create blank mesh terrain at default height"

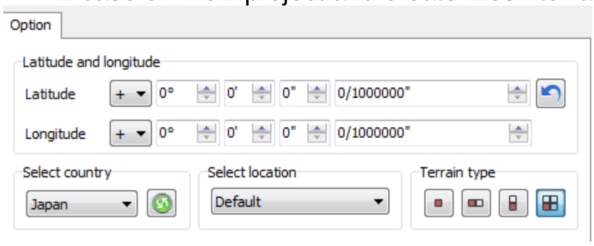


・Blank terrain settings　Default height

Define the vertex height of the blank terrain mesh. When the IFC file is loaded, the default height of all IfcSite data is converted to the smallest possible value. Click the back button to reset it.

・Select location

- In case of "New project and create mesh terrain from DTM data".



・Latitude and longitude

The smallest the latitude and longitude values in all IfcSite entities are displayed.

Click  to reset it to the smallest values.

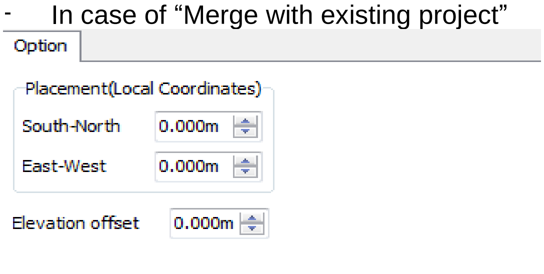
・Select country

Select the country of the terrain file. Copy the terrain file to the folder C:¥UCwinRoadData XX.X¥Data

・Select location

・Terrain Type

- In case of “Merge with existing project”



・Placement

Set the location of geographical features patch generated by IfcSite data. Local coordinate system of UC-win/Road is used.

・Elevation offset

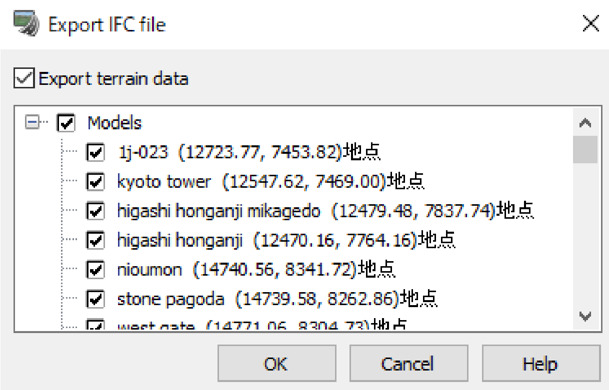
Set the offset value in the direction of the altitude when the IfcSite data is converted into geographical features.

Export IFC file

Geographical features and the arranged model can be output from UC-win/Road as IFC data. It can be imported by the application that supports other IFC.
Export IFC file from File - "Export" - "Export IFC file".

Set items before exporting, on the export settings window opened by above menu.
Check Export Terrain Data and select model to export.
Click OK to start exporting. Click Cancel to close the window without exporting.

Click "OK" to start exporting, and specify the file name of the destination file.

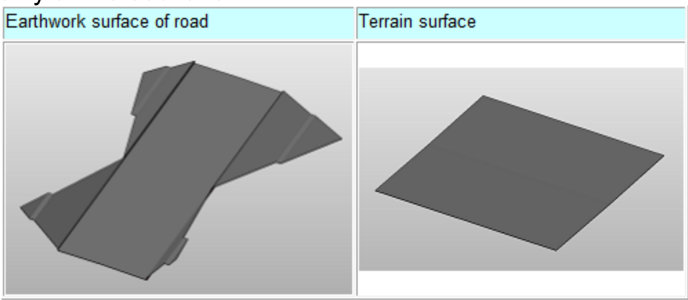


Soil calculation

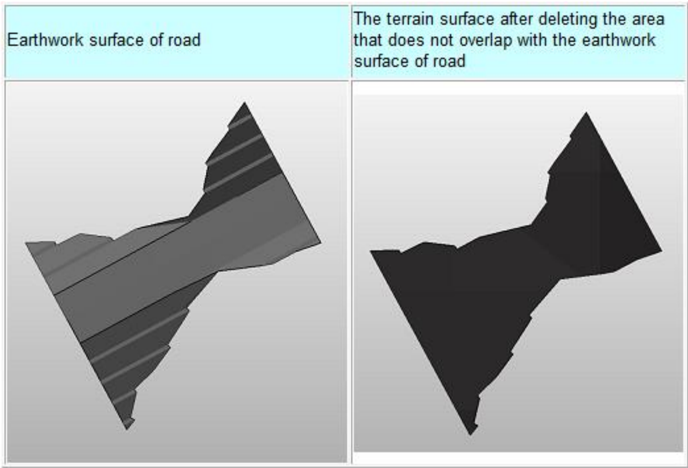
It is possible to calculate the amount of cutting and banking from the difference of the shape before and after construction.

Soil calculation of road earthwork

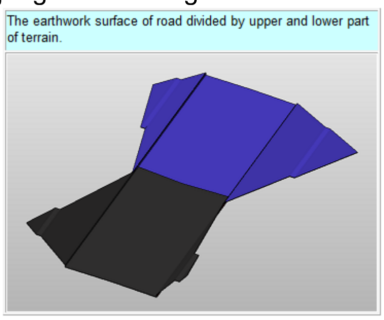
On the soil calculation of road earthwork, the amount of soil is calculated from the difference between the surface of the road earthwork and the surface of the terrain. First create the shape of the road earthwork using the soil section set in the road section. After specifying sections for the calculation case, the shape of soil section is created only at the sections.



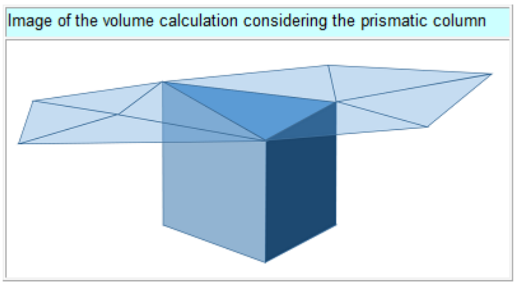
Next, delete the area that does not overlap when looking at the earthwork surface of road and the terrain surface from above.



Then, compare the earthwork surface of road and the terrain surface, and divide it into the area where the earthwork surface of road is over than the terrain surface or under. The former is judged as banking and the latter is judged as cutting.



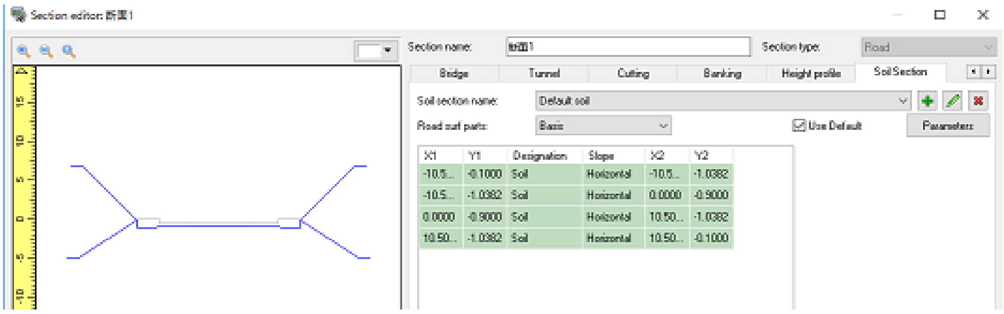
After that, considering the prismatic column from the surface to the lowest height for each of earthwork surface of the road and the terrain surface, the volume of the prismatic column is calculated.



Calculation flow

1. Set the soil section on the road section

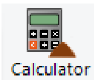
Set the soil section on the road section or use the default soil section.
See Soil section tab in the Section Editor form for further details.



2. Generate a road

Create a road just like as a normal road, and apply the road section with a soil section on the Vertical curve Editor form.

3. Open the Soil Calculator

From the ribbon "Analysis"-"Soil calculate", click  to open the Soil Calculator

4. Define the calculation case

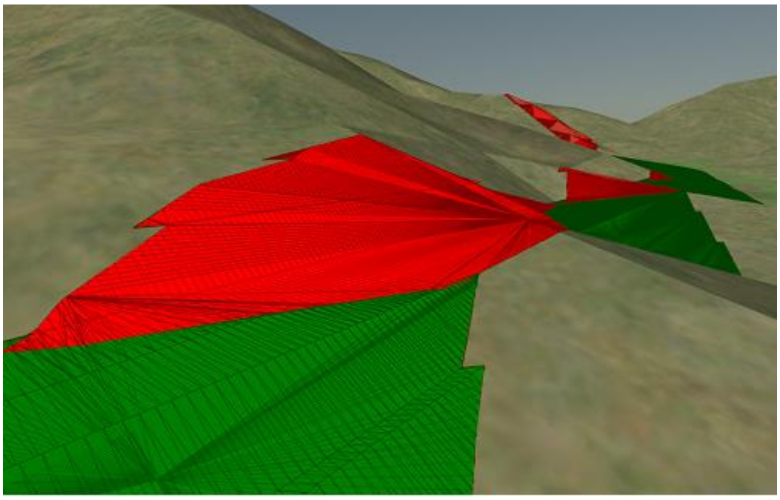
Define the calculation case of soil. See Soil Calculator form for further details.

5. Execute the calculation

Click "Calculate" button in the Soil Calculator form.

6. Check the calculation result

It is possible to check the calculation result, export the table to the file and display the result on the main form.



4Dsimulation

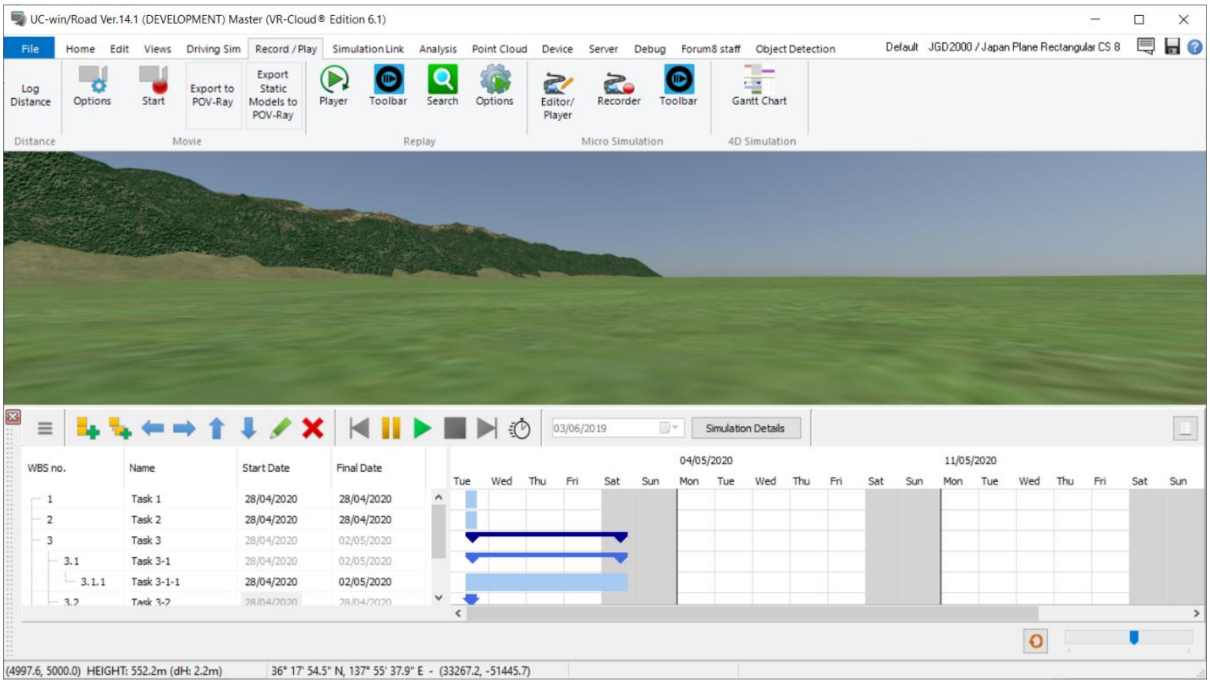
1. Overview

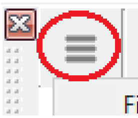
The 4D Simulation plug-in offers different functionalities to manage a schedule starting from creating the tasks of the schedule all the way to launching the simulation to see the progression of your project.
The Gantt chart allows the management of the calendar according to national holidays and the addition of other holidays, and the Gantt chart displays the construction work system in tasks and subtasks.

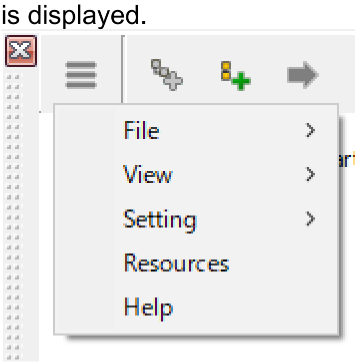
Go to “Record / Play” tab and click 

of 4D Simulation.

The Gantt chart provides a visualization for the schedule. It contains a calendar that shows the working hours and the holidays. In the gantt chart, the list of tasks of the schedule are displayed.
Using the zoom, it is possible to display different levels of details of the schedule. Drag it to see a smooth expansion or contraction of the span of the calendar.



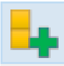
After opening the 4D Simulation main screen a pull-down menu  that can be used for 4D simulation is displayed.



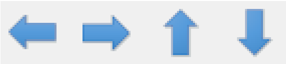
2. Gantt-chart

2.1 Task

The following buttons allows to add, delete, or edit tasks or childtasks.

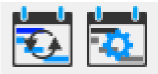
: Add task

: Add childtask

: Go to Parent, Go to Child, Go up, Go down

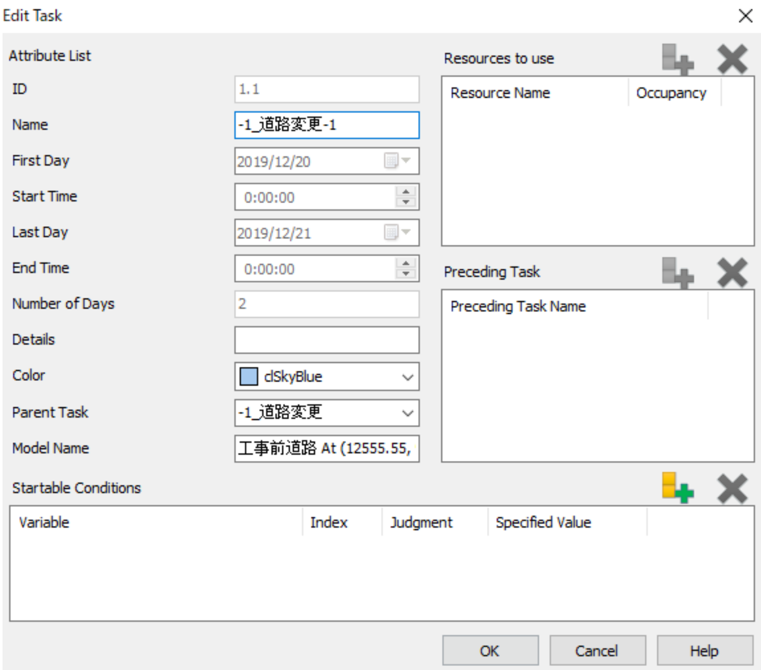
: Edit task

: Delete task

: Simulation Speed, Auto Adjusting Options

2.2 Task Editor

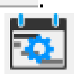
Click  to open Edit Task form. It is possible to set the attributes of the selected task, the resources to be used, the preceding task, and the starting conditions for that task.

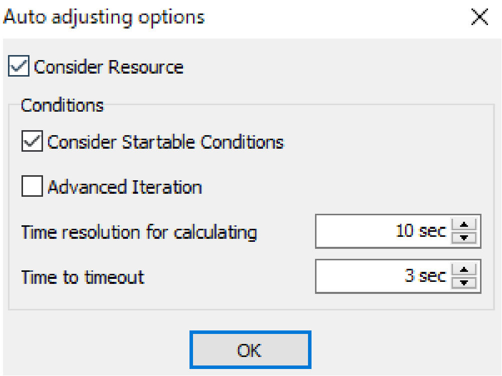


2.3 Task Resource

By creating various tasks as task resources and assigning them to each task, it is possible to adjust the schedule so that multiple tasks do not use the same resource at the same time. Please refer to 3. Resources

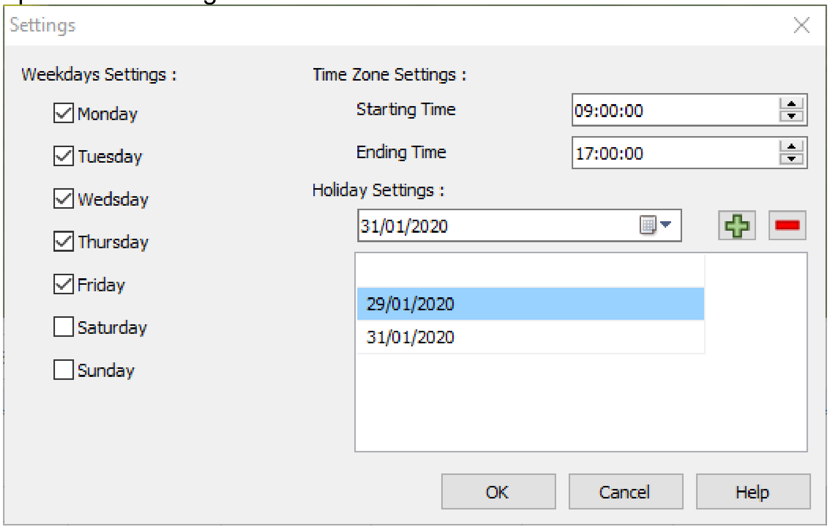
After assign task resources, click .

To set options for auto adjusting, click 



2.4 Calendar settings

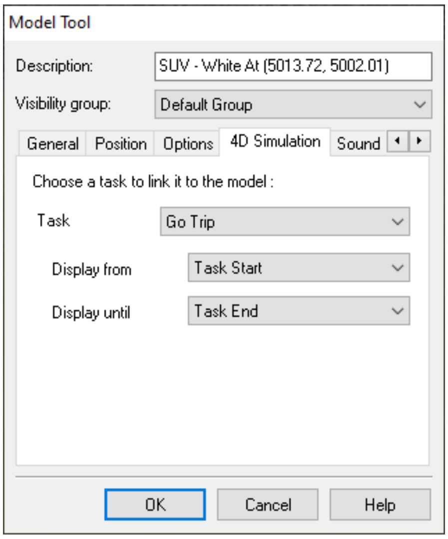
To change the settings of the calendar, select the menu on the Gantt chart, Setting - "Holiday Settings". This will open the following window:



Check the days of the week as weekdays in the Weekdays Settings. Basically, the day without check becomes a holiday.
It is also possible to set the Starting Time and End Time of the working hours of the day.
Moreover, any day can be individually set as a holiday. Select a holiday date from the calendar and click the "+" button to add a new holiday to the list. To delete a set holiday, select a date in the list and click the "-" button.

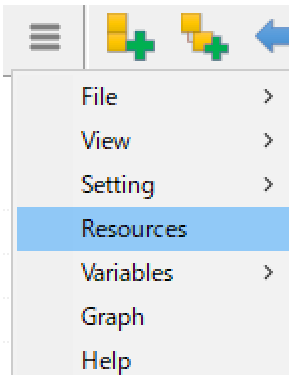
2.5 3D models

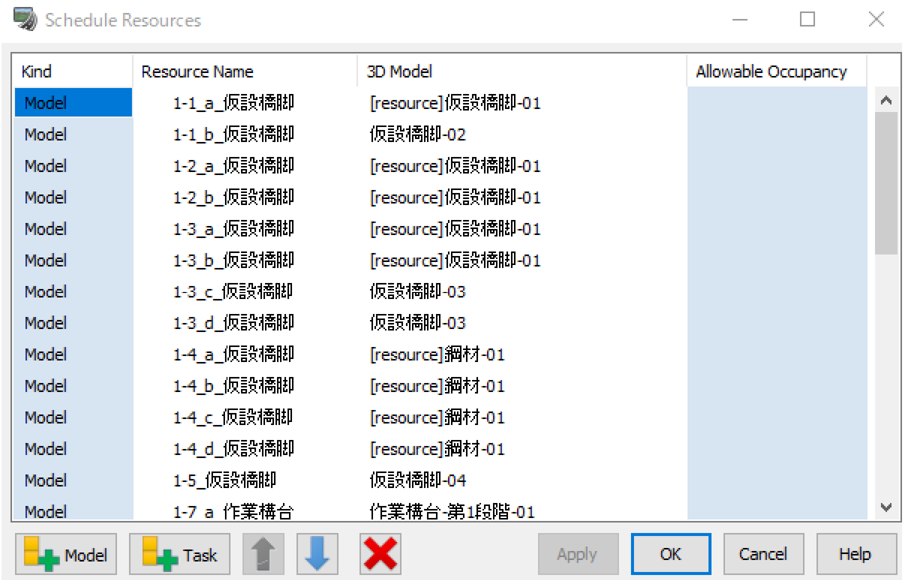
When linking a model to a task, it is possible to choose to display the model in different intervals depending on the start and end of the task and the start and end of the schedule.



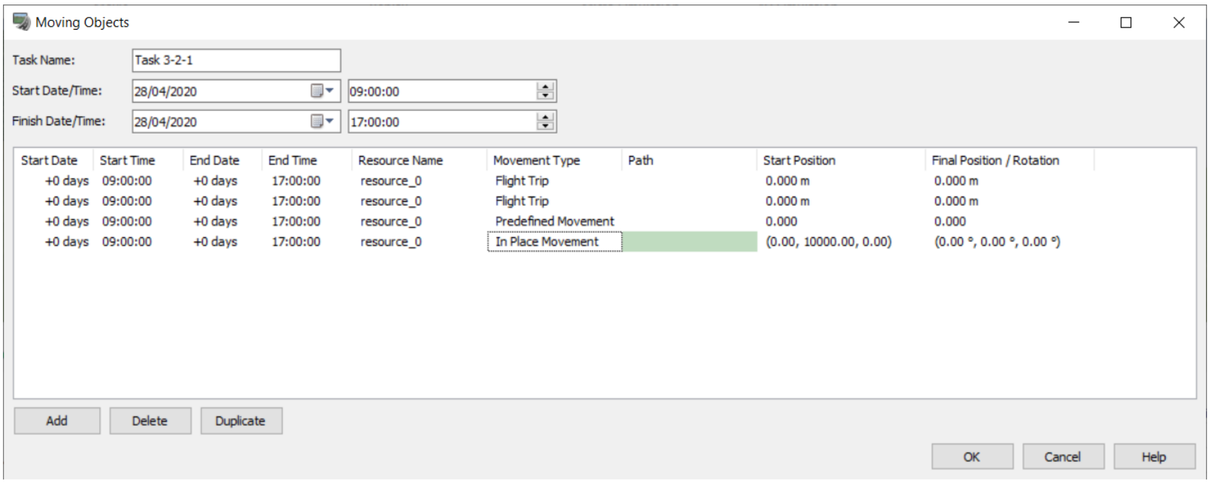
3. Resources

To add new resources to the project, select "Resources" from the menu.
On this screen, the unique resource name used in the Gantt chart is associated with the corresponding 3D model on UC-win / Road. Add one or more resources using the ‘Add’ button, then select the 3D model for the added resource name from "3D Model".



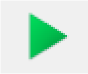


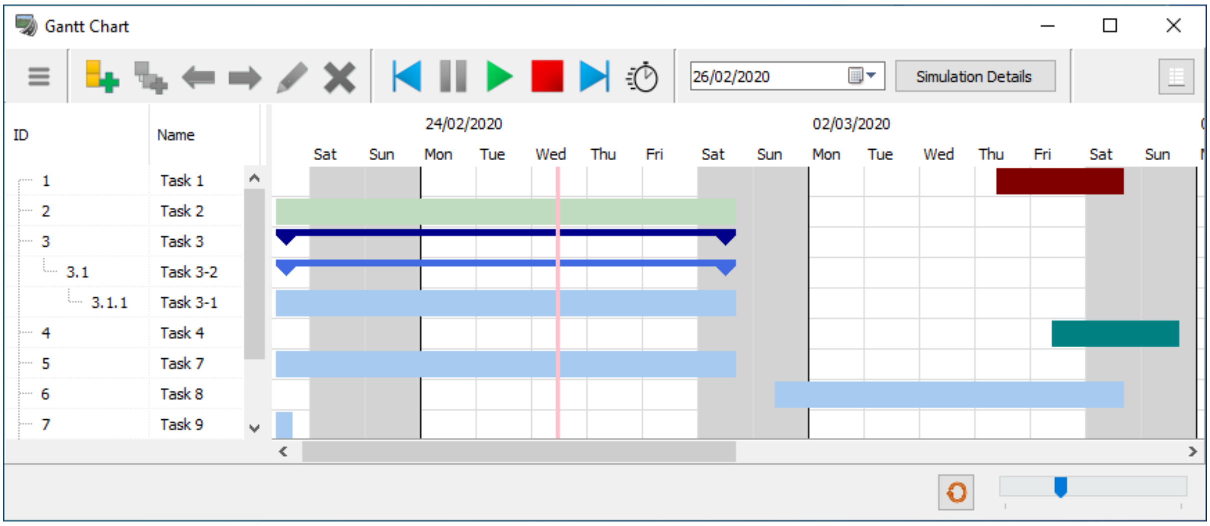
If the model resources used in the simulation is movable, it can be moved for a specific task. The movement can be a rotation, translation or trip on a road or flight path.
On this screen, set the type of movement of the selected model resource and the operation for the type of movement.
Select a task in the Gantt chart task list, right-click, and select "Edit Moving Objects.

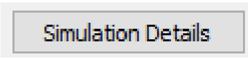


4. Simulation

When all the tasks, resources and movements are set, it is possible to play the simulation to see the progression of the project.

Click on the green triangle  to start the simulation.
The simulation can be paused, moved forward one day, or backward one day. The simulation can also be stopped by pressing the stop button. The calendar displays the day's simulation.
When the schedule is turned on, it is possible to see the progress in the calendar, and the pink line moves according to the ongoing simulation.

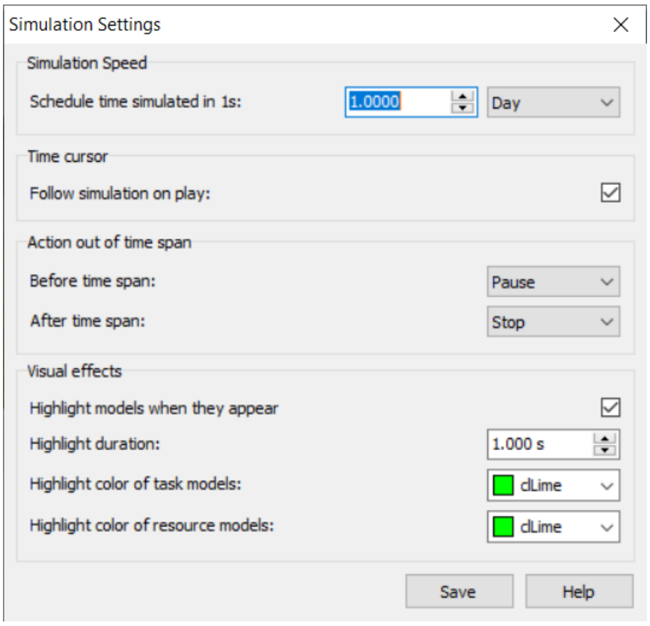


Click 

to see the information of tasks and the ratio.

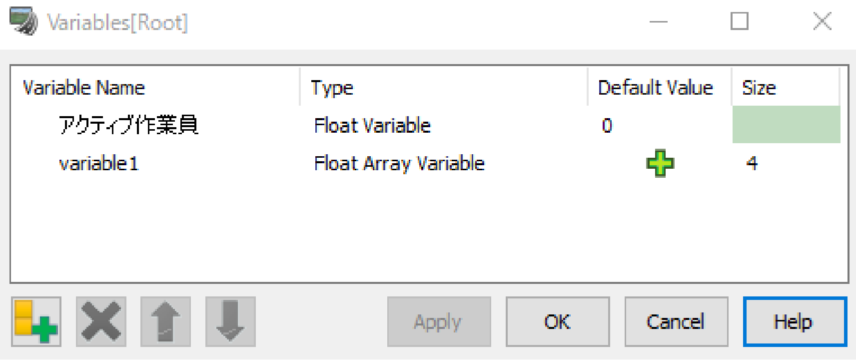
Click  to disable the camera movement. The icon will change to .

Various simulation settings for 4D simulation can be set on this screen from . For the setting details, please refer to Help,

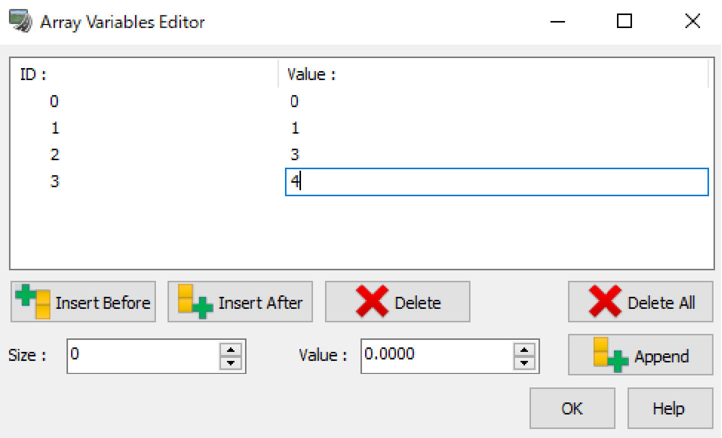


5. Variables

It is possible to set up variables used for the graph. From menu, click Variables – Variables List.
There are 2 types: Fload Variable and Float Array Variable.

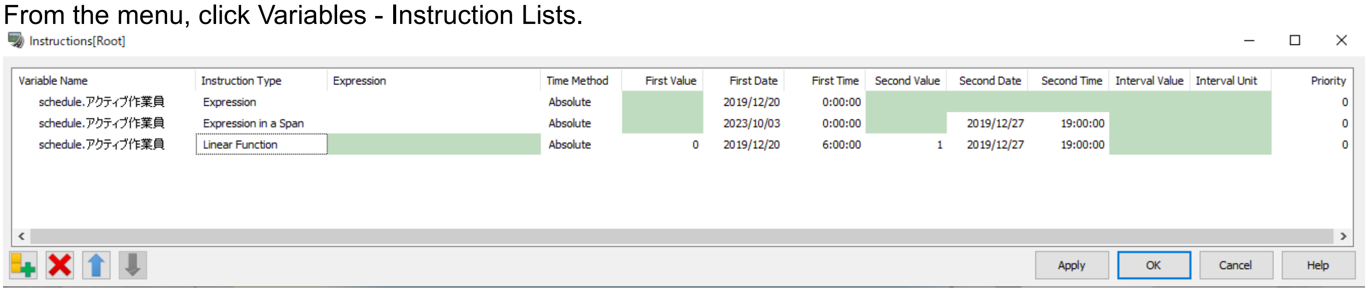


Enter the name, type, default value, and size of the variable. If Float Array Variable is selected, click in the Default Value field and configure the settings in the Array Variables Editor.



6. Instructions

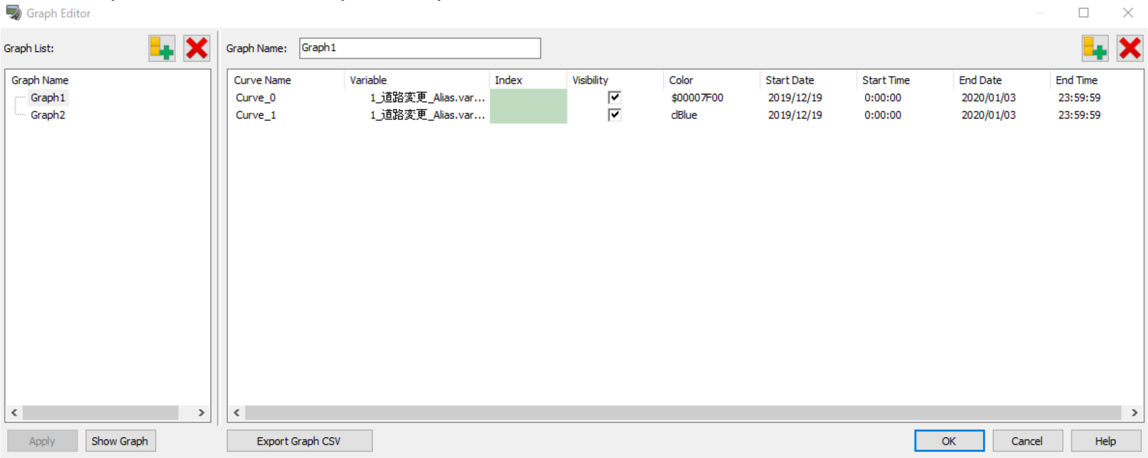
It is possible to define variables to be used in the graph. An indicative list is a mathematical operation, such as a linear function, or a formula that enables new values to be calculated using other variables.
From the menu, click Variables - Instruction Lists.



Set the instruction type, expression, time, date, and value. For the setting items, please refer to the Help.

7. Graph Editor

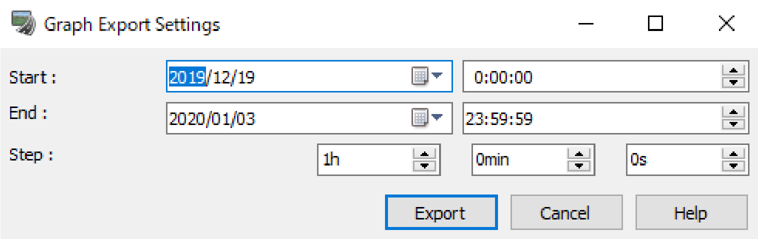
Calculations and metrics related to the amount of building materials and labor costs for a project can be added, and these can be displayed graphically.
Click Graphs from menu to open Graph Editor.



After creating a graph, the graph can be displayed by clicking the "Show Graph" button.

Click 

to export the graph in CVS format for a specified period of time at each specified step.



8. Import / Export

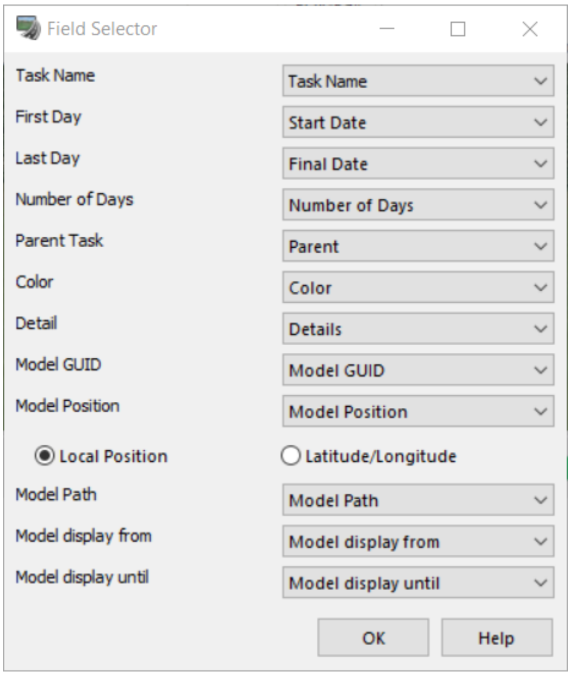
It is also possible to export into a *.csv file the data created in the 4D simulation plugin including the schedule and all the linked models and resources and actions.
The plugin can also read and import a schedule from a *.csv file. This allows the re-usability and manipulation of schedules previously created in other software in order to launch a simulation based on these schedules using UC-Win/Road.
For the Gantt chart it is possible to select which columns of the *.csv file represent what data so Gantt chart can be created in third party application and easily imported into UC-win/Road.
The plugin reads the tasks and displays them on the Gantt chart. It also imports automatically the 3D Models, if the path to the 3D model file is mentioned in the csv file. The import supports different file format for the 3D models such as 3DS and RM formats.

Export Schedule

To export a schedule, go to the main menu – File – Export CSV.
Select a name for the exported schedule and save. The 4D Simulation Plugin will be saved into 4 files.
*.csv: this file will contain the schedule information.
*_resources.csv: this file will contain the resources information.
*_movingobjects.csv: this file will contain the moving commands information.
*_cameras.csv: for camera positions data.

Import Schedule

To import a schedule, go to the main Menu – File – Import CSV. Select the csv file for the schedule to import. The plugin will search for the csv files containing the information for resources and moving objects and camera settings in the same directory under the names:
*_resources.csv: for the resources data.
*_movingobjects.csv: for moving commands data.
*_cameras.csv: for camera positions data.
When selecting a csv file, the field selector window opens.



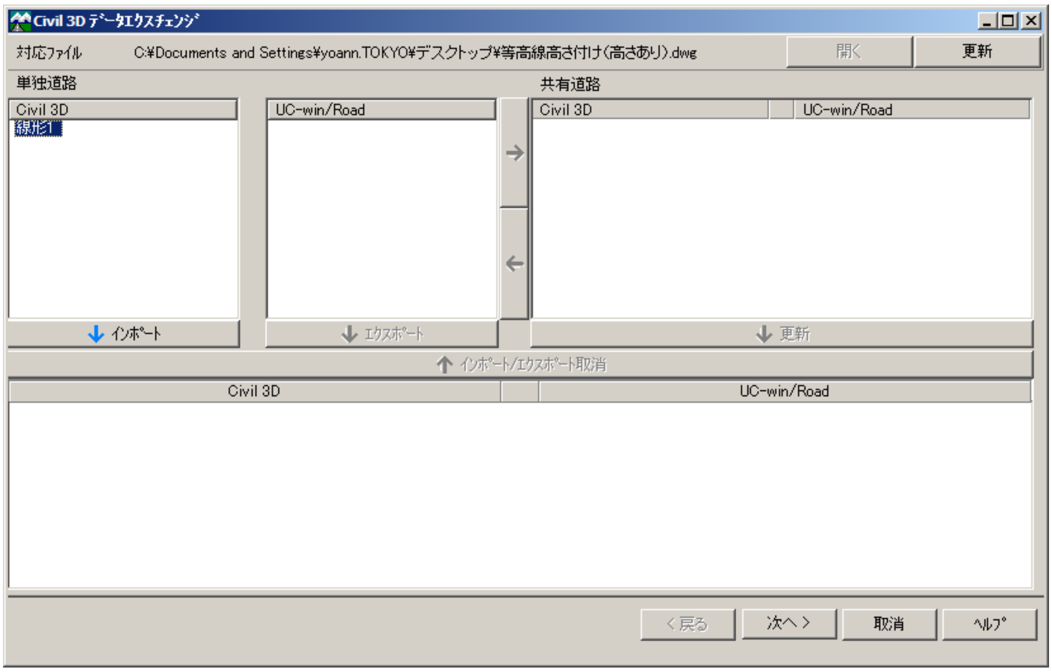
Import settings are configured on this screen. Please refer to the Help for the settings details.

Data exchange with AutoCAD Civil 3D

The data can be imported/exported between UC-win/Road and Autodesk Civil 3D.

From Civil3D into UC-win/Road

Go to File - Import or Export - Civil3D Data exchange...
Select Civil3D version to convert to Civil3D 2006 to 2018.



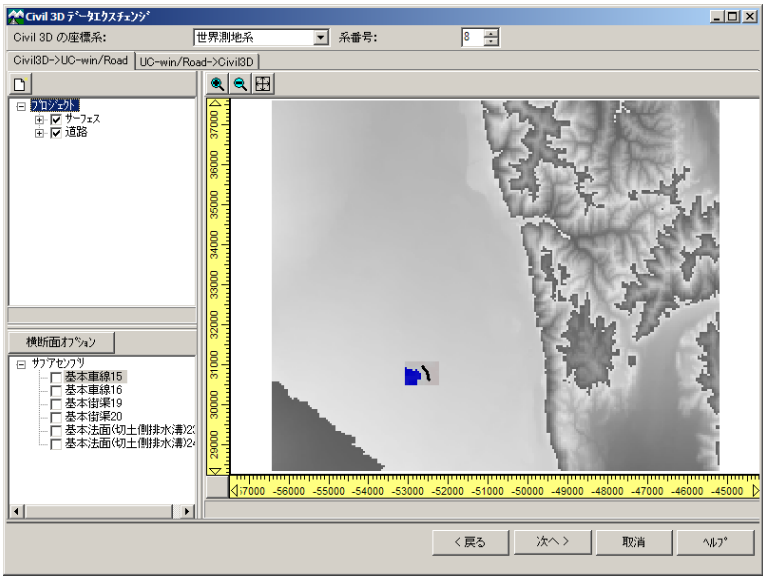
Associated file: File path is displayed here.

Individual Road
Civil 3D
The roads which only exist in Civil3Dare listed. Select roads to be exchanged and click [Import].

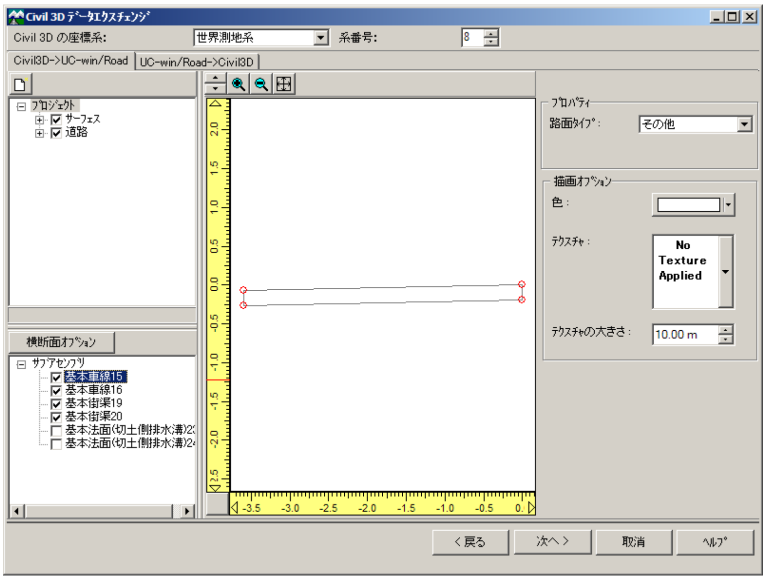
UC-win/Road
The roads which only exist in UC-win/Road are listed. Select road to be exchanged and click [Export].

Shared roads
Common roads between Civil3D and UC-win/Road are listed. Click a road from Civil3D or UC-win/Road, and click [→]. Click [←] to release it. Then click [Upload] to specify it as a common road of Civil3D and UC-win/Road.

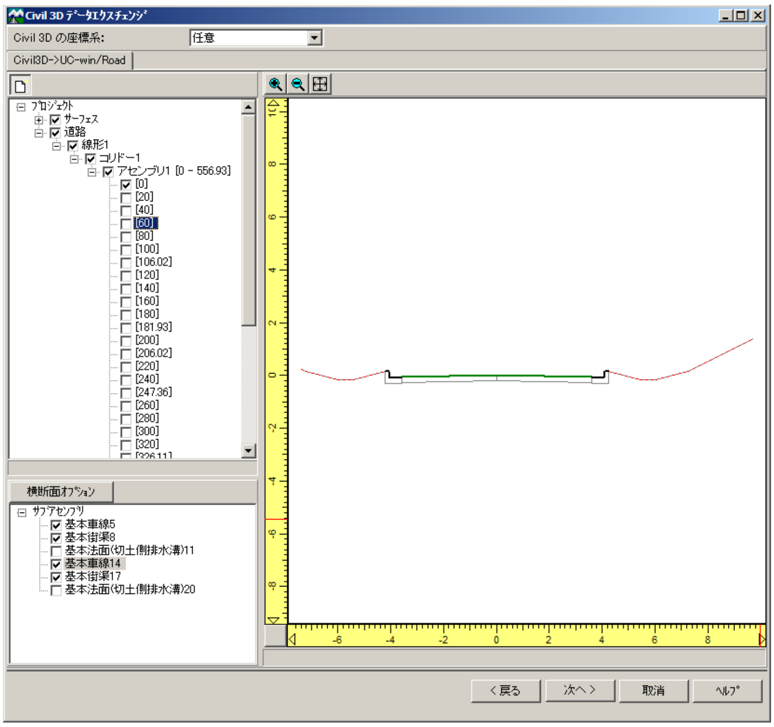
Setting of terrain
When [Surface] is checked, the terrain will be exchanged.



Setting of sub-assembly
Sub-assembly generated by Civil3D is listed. Check Sub-assembly to be transferred to the constitution of the section. Then set up the properties and the textures of checked sub-assemblies.



Check the section configuration
The items are listed in tree view. Click an element to be highlighted in bold line.



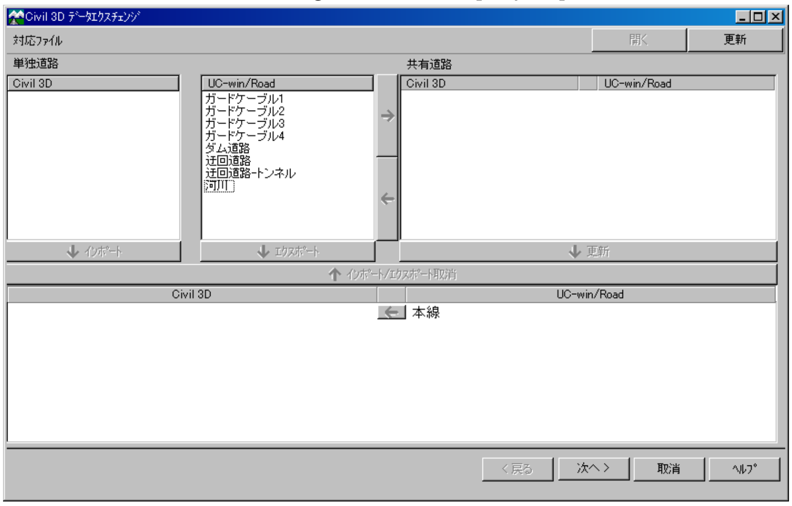
Section Option
Go to Section Option. Edit a road slope on "Cutting/Banking" tab, a roadway boundary and lane gape on “Road marking” tab.

Click Next to start exchanging it.

From UC-win/Road into Civil3D

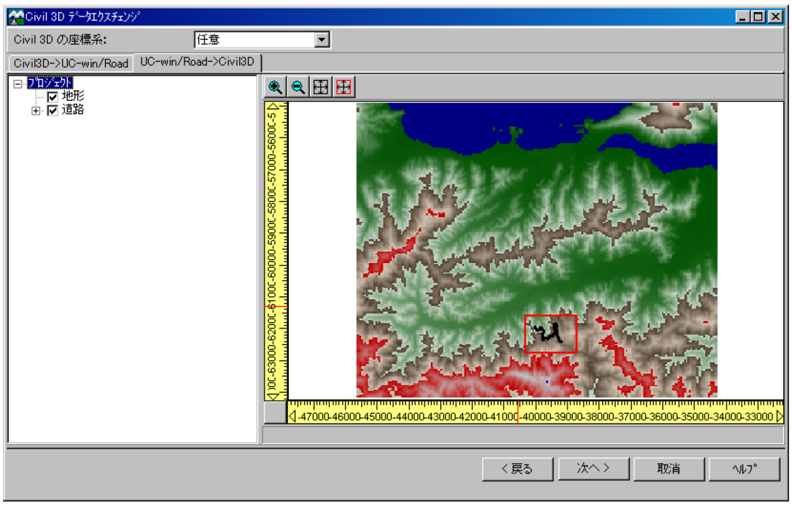
Go to File – Export – Civil 3D data exchange…

Select roads to be exchanged and click [Export].

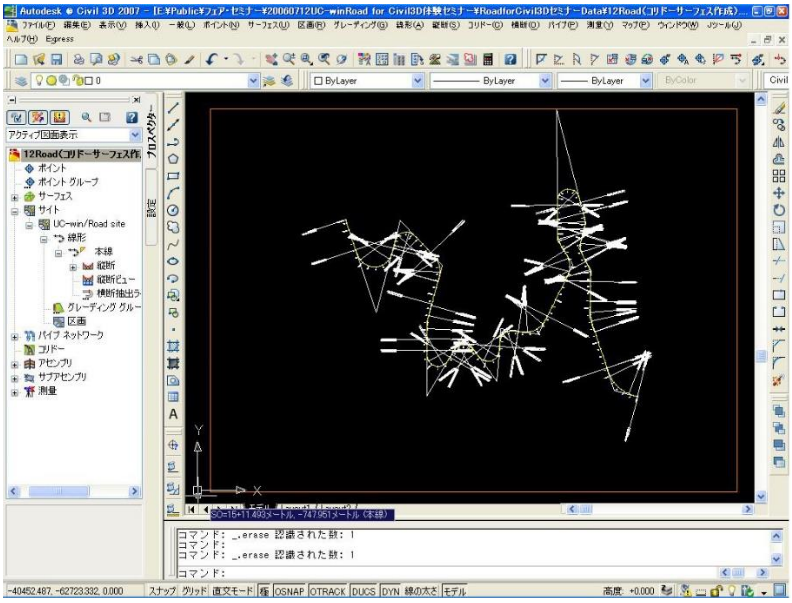


Click Next to display the selected elements.

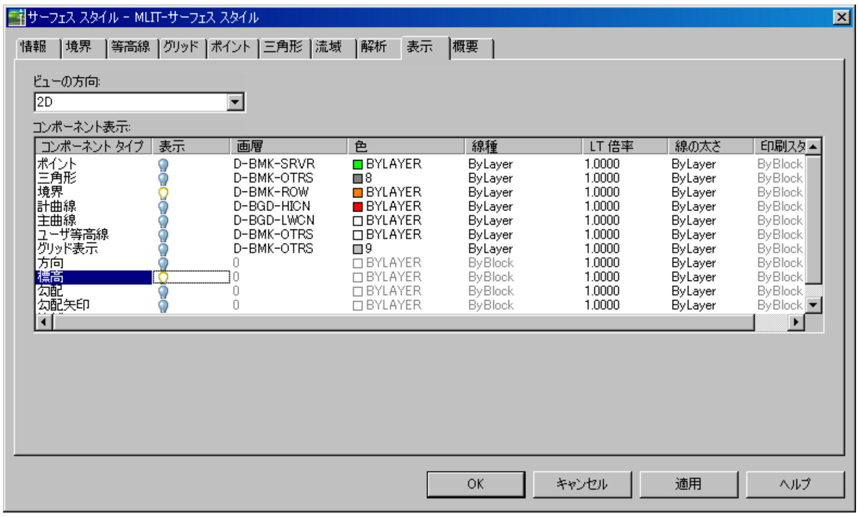
Click an element to be highlighted in red frame, which can be moved by dragging the mouse.



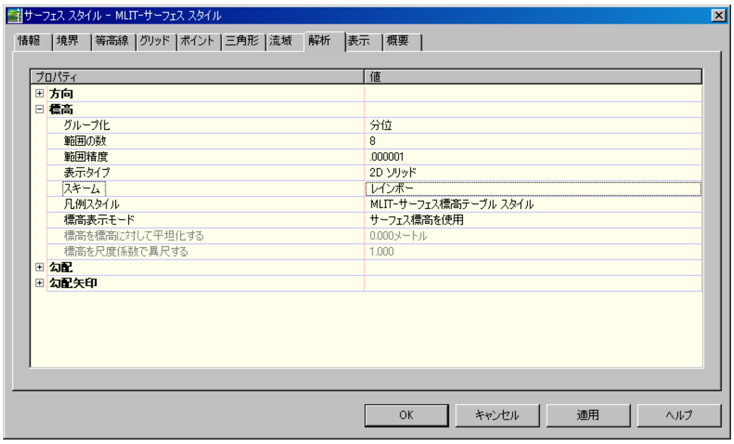
The terrain and the selected road terrain are displayed in Civil3D.

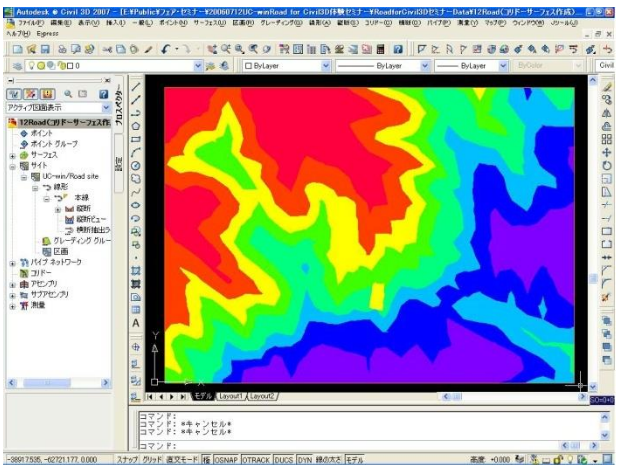


Setting of the surface display
When the data are linked, only the surface borderline is displayed.
To display the components, select the surface border in the window, right click and open [Edit the surface style].
Then check the display ramp on [Display] tab



It is possible to change the colors depending on the altitude on Analysis tab.





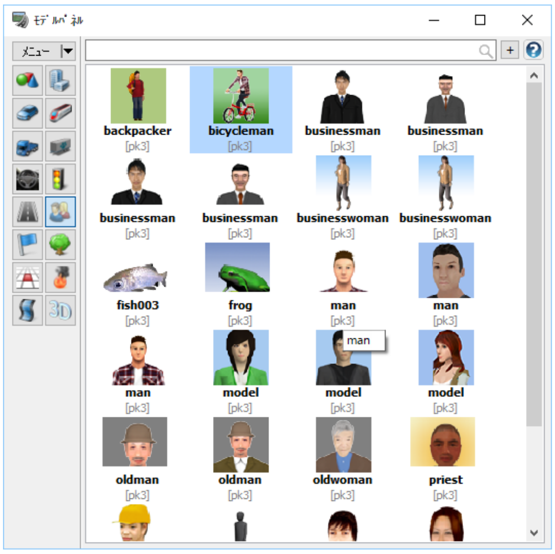
Crowd

Character settings

It is possible to register character models from Edit - Scene - Library - Model Panel. Characters are either in MD3 format or FBX format. They can visualize pedestrians, bicycles, strollers, wheel chairs, and even animals like dogs, cows, birds, and fishes. Load MD3 character models or FBX character models, which saved under C:¥UCwinRoad Data x.x¥Characters. Each FBX character can be saved with textures and loaded from Menu - Load – MD3 model, FBX model.

Download character

Download MD3 or FBX from Edit - Scene - Library - Model Panel menu.

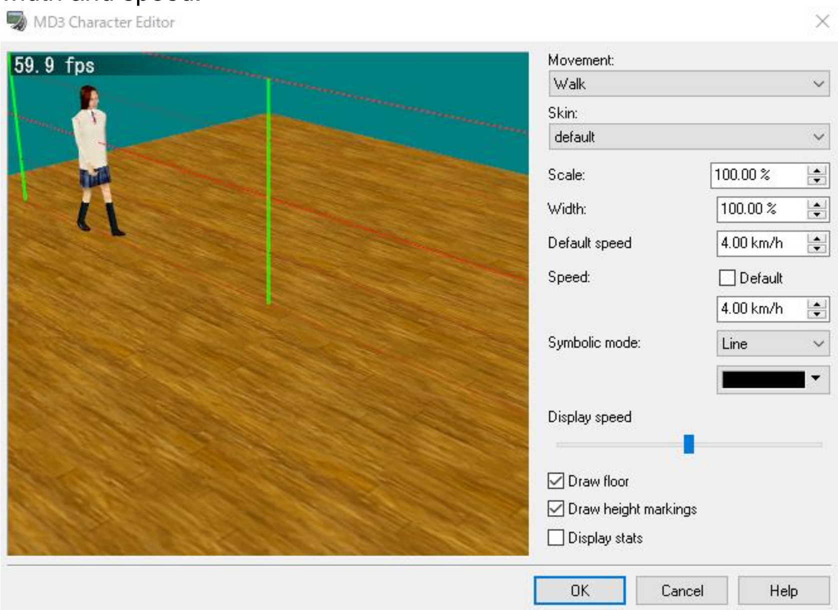


Load MD3
Select a character and click Open toopen "MD3 character editor". The character is added to the "Character List Editor" window.

Load FBX
Select a character and click Open toopen"FBX scene editor". The character is added to the "Character List Editor" window.

Edit MD3 character

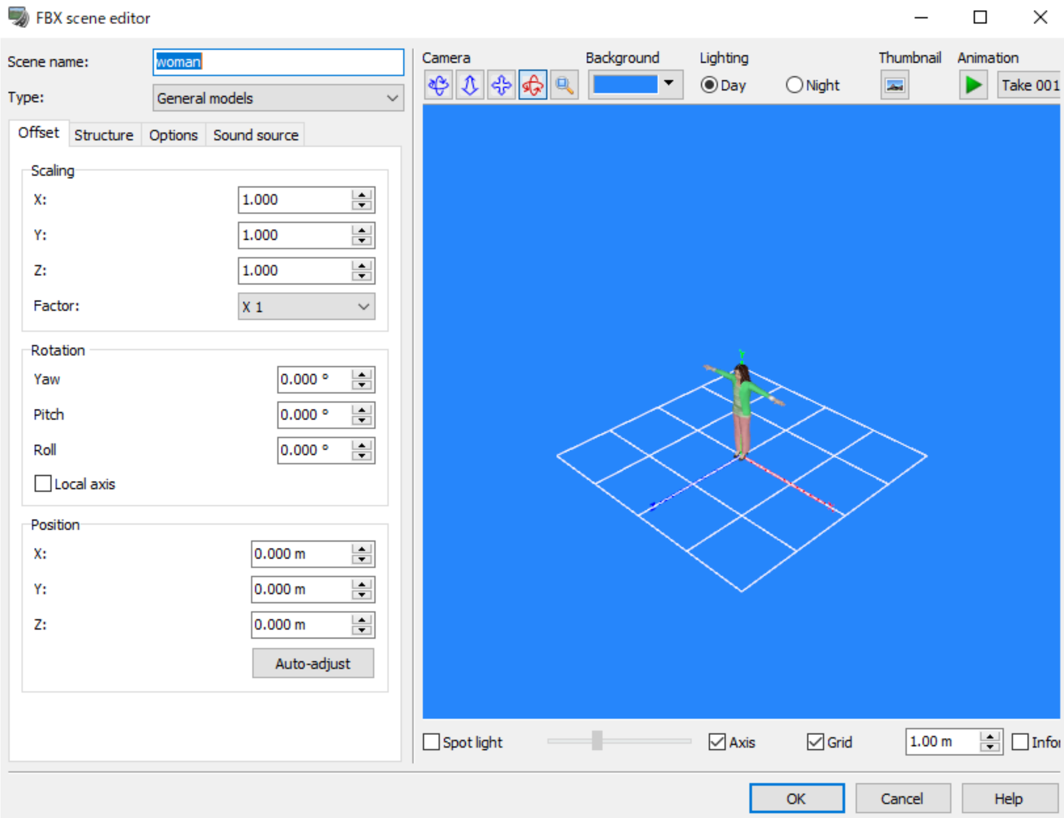
Edit MD3 character by right clicking - Edit. It is possible to customize its movement, skin (clothes), scale (size), width and speed.



Edit FBX character

Edit FBX characters on the "FBX scene editor" form. Select a character and click "Edit" to open the "FBX scene editor" form.

On the right side of the screen where the model is displayed, it is possible to switch camera modes, create thumbnails, and preview animations.



■Offset tab

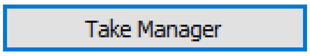
On this tab, set the position, orientation, and scaling offsets for the scene.

■Structure tab

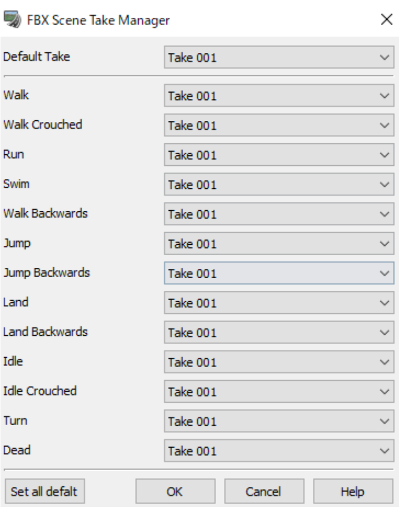
On this tab, show the structure of the FBX scene and edit it.

■Options tab

Set the performance settings and animation settings.

Click 

to open FBX Scene Take Manager form, where it is possible to set default animations and associate walking, running, and other movements used in the simulation with the animations contained in the FBX scene.

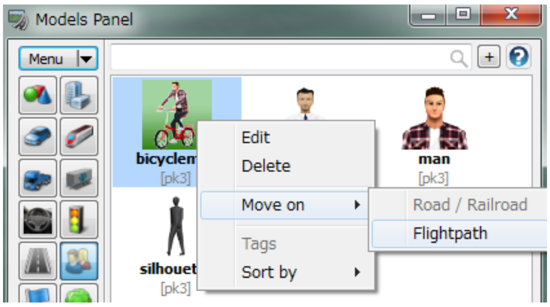


・Ani

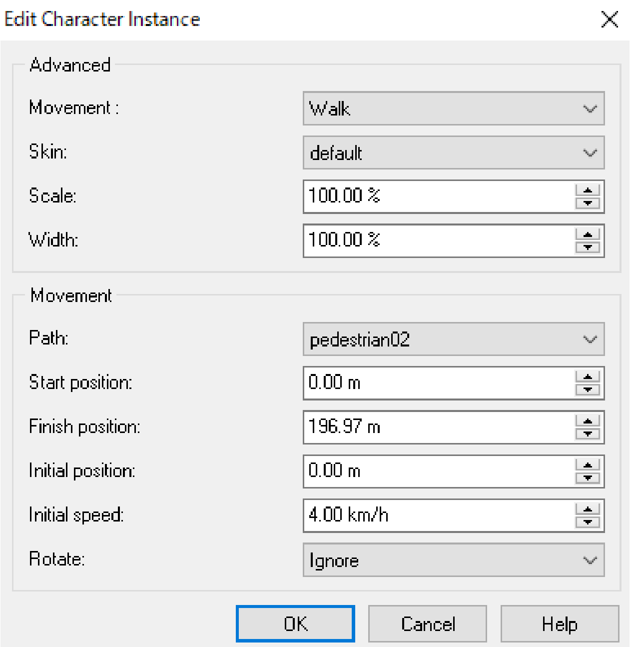
■Sound source tab
Check Validate sound sourve to assign a sound sourve to a FBX scene model.

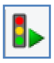
To Move model

Place a character on a flight path.
*[Add Walkers] button is effective only when some flight path has been created.
At first create a flight path, then right click a character and select Move on – Flightpath.



Character Instance Editor will open. Set up the following settings.



Click "Start traffic movement"  button to display the character.

Pedestrian settings

Go to the ribbon, Edit - Pedestrian - Network to have crowd moving in 3D space.

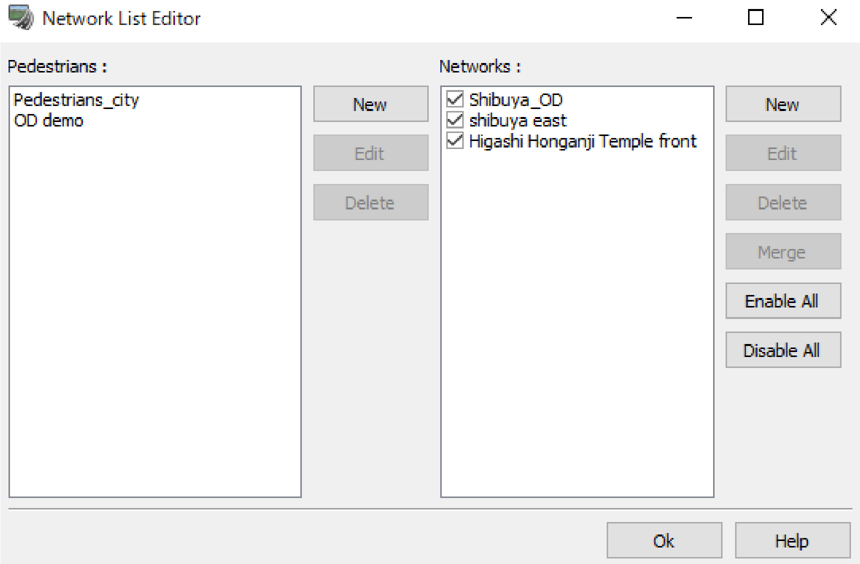
Network of walking routes (pathways) can be built within 3D space in which multiple pedestrians can be arranged at one time.　Each pedestrian determines their own path to walk on while they avoid bumping into each other.

Create/edit network

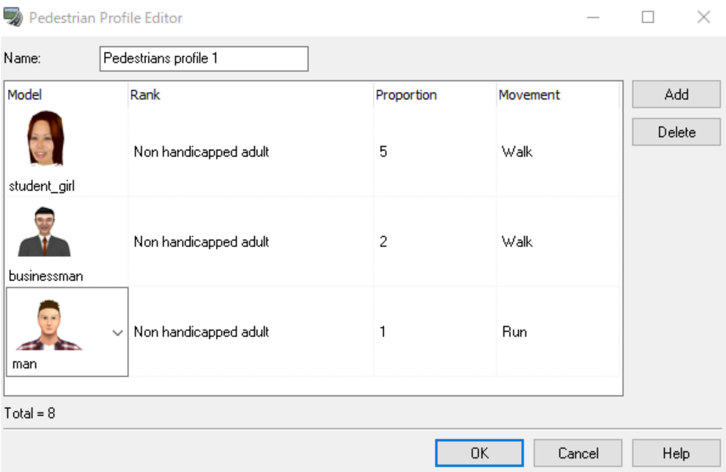
1. Create network and pedestrian profile. Open "Network List Editor". 

Please check Pedestrian Network on Visual Options 

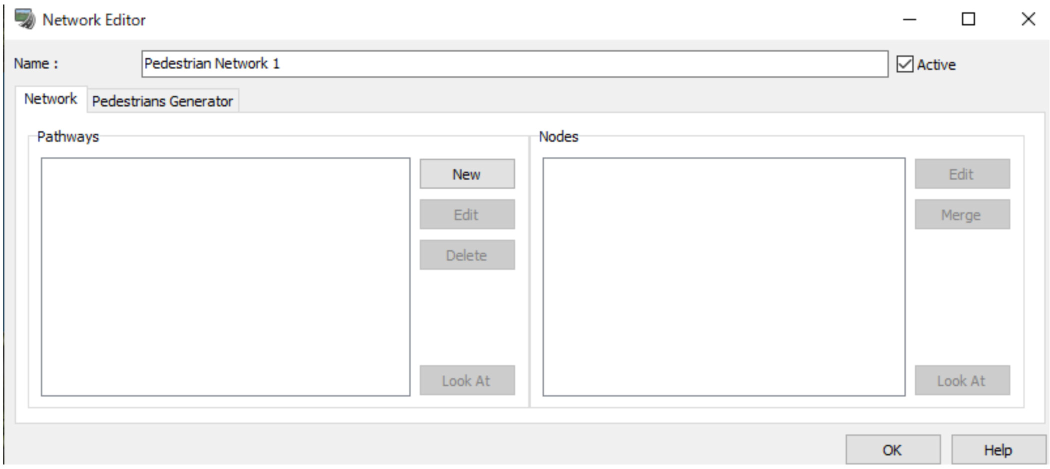
.



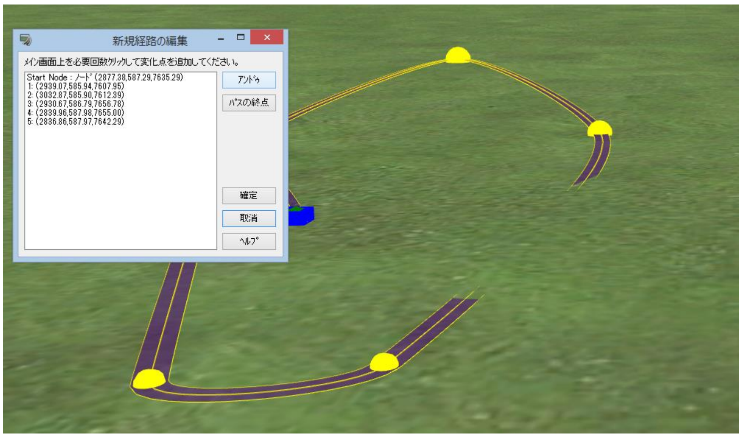
2. Add the character to place to the pedestrian list, set the percentage, speed, and movement, and click OK.



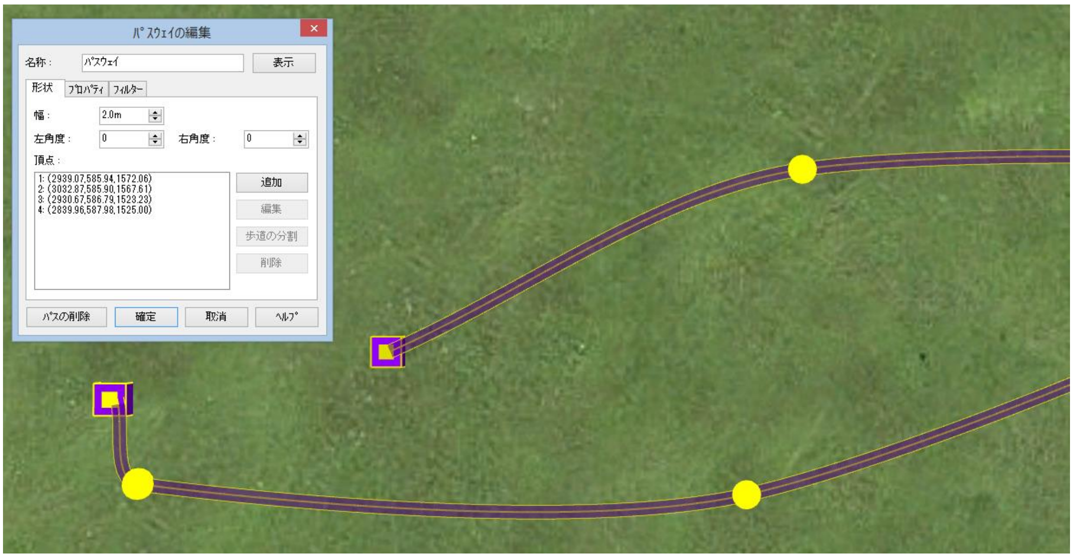
3. Add a new network on Network Editor.



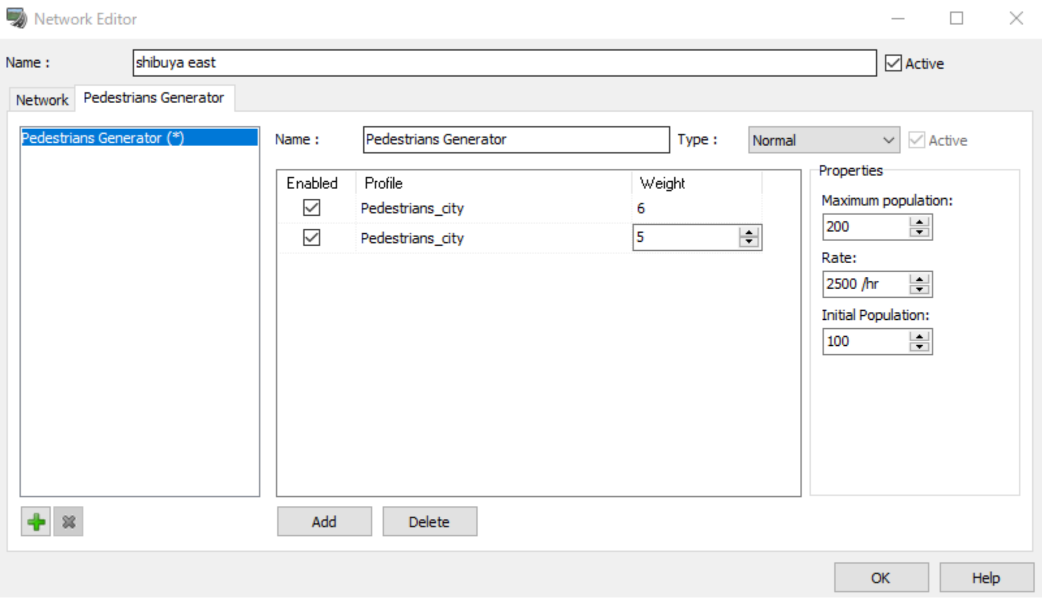
Click New – Pathway. Click to set the route along which to place the pedestrian.
After clicking on the final point on the pathway, click “End path” to end it.

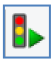


4. “Network editor" window lists added pathways and nodes.
5. Select a pathway and click "Edit". Set the name, pathway shape, weight, start/end node, average speed, etc.



6. On the "Pedestrians Generator" tab in the "Network Editor", click "Add" to add pedestrian profile. Set maximum populate, rate, and initial population.



7. Click "Start traffic movement"  button to display the crowd.
*Position/height of the start/end node or points in between can be edited by clicking on each of them in the main window.

EXODUS Plug-in

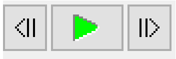
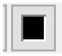
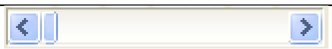
It is possible to import simulation results from building EXODUS and animate the evacuation in UC-win/Road. EXODUS plug-in is required.

Workflow
(1) Create a UC-win/Road project and a building model.
(2) Import EXODUS data and define EXODUS parameters.
(3) Execute EXODUS animation and search with EXODUS viewpoint mode or check EXODUS animation data.
(4) Create and execute the script incorporated EXODUS animation

EXODUS Link screen and settings

Click EXODUS Link… 

from Simulation Link ribbon. The display will open.

	Read EXODUS data.
	Pause the animation.
	Previous Step, Play the animation, Next Step Note: Animation pauses by the first click. Although it is backed to the previous step by clicking again, it is still pausing. Animation will be resumed by clicking PLAY button after that.
	Stop and rewind the animation.
	Specify the PLAY speed of animation.
	Move the Animation to the certaintime.
	Repeat the animation.

There are 3 tabs.

- Camera manager:
  Search for EXODUS scene using EXODUS original viewpoint mode.

- Scene Graph
  Display the detail information of the floors and avatars.

- Options
  Edit the data position and the height of stairs.

Workflow

1. Import EXODUS data
In order to import data certainly, .vrs and .vrg files must exist in the same directory as the same file name.
Create a UC-win/Road project and arrange a 3D building model beforehand.

1) Click EXODUS link on ribbon menu.
2) Click Import button on EXODUS screen. 
3) specify an EXODUS data directory and one of (vrg, vrs) pairs for the EXODUS project.
4) Click Open to start importing.

2. Define EXODUS parameters
Configure the parameter of position offset and environment. It is required in order to calculate correctly the trajectories of avatars and the bottom altitude of the building. Open the related UC-win/Road project before editing the parameters.

- Position offset
Specify the appropriate values in direction, Pos X, Pos Y and Pos Z.
- Environmental model
Specify the new name of environment as needed.
Adjust the bottom altitude of building for all stairs or specified stairs as below.
a) For all stairs: Display all stairs on the class list and specify the height.
b) For specified stairs: Choose the stairs from the class list and specify the height. Repeat it to specify the heights separately for each stairs.

The changes will be reflected immediately. Once the position of avatar is set, it is possible to generate the EXODUS animation and the script.

3. Execute EXODUS animation
Open a UC-win/Road project, to which the EXODUS data was imported.

Click 

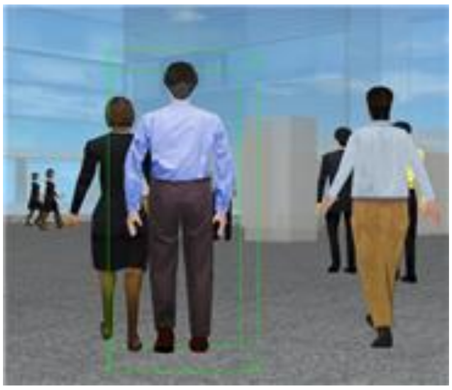
to display characters.
The environment and characters will start automatically. The camera position is above the characters.

1. Move to the animation starting position with the viewpoint mode of UC-win/Road.
2. Click EXODUS link on ribbon Simulation Link – EXODUS Link
3. Execute and control the animation by animation reproduction option on EXODUS screen,

To view the animation from a viewpoint of specified avatar, click Stop button and input the avatar number on camera manager tab. Then restart the animation.

Viewpoint mode: Helicopter view
Viewpoint: View the selected avatar from above.

Viewpoint mode: Pursuit view
Viewpoint: View the selected avatar from the specified direction (compass directions).



Viewpoint mode: Viewpoint of avatar.
Viewpoint: View the direction which the selected avatar looks at.

Viewpoint mode: Search
Viewpoint: View the scene from the left to right from the selected avatar.

4. Execute the animation on different conditions as needed. Select other avatar or other camera mode
5. Click Stop to finish.

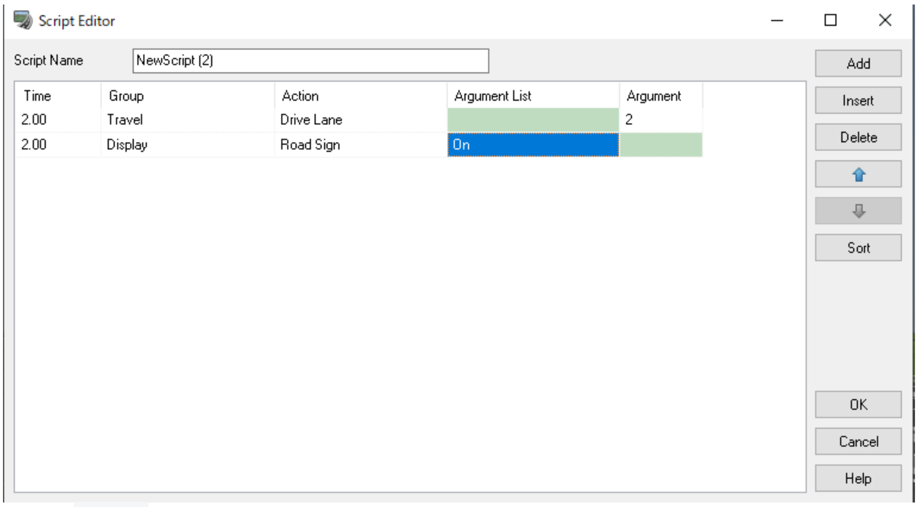
4. Display animation data

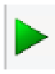
It is possible to display the animation data relevant to stairs or avatars
1) Click EXODUS link on the ribbon
2) Expand the stairs or avatars on scene graph tab.
3) Click Level # or Avatar # to display the information on the right.

Presentation

Script (auto presentation)

When the script to which the content of presentation is set by the command beforehand is registered, a chain of flows can be presented automatically without operating it one by one.
Multiple scripts can be combined and executed as an animation.



Click  in Script / Animation to create a new script, and click  to edit it. After settings, click  to run the script.

*Checking "Loop" 

can run the script repeatedly.

Animation list
It is possible to play animation by playing the scripts in order.

- [New Animation]: Add a new animation in the list. Click on the animation name in the lift to rename it.
- [Copy]: Copy the selected animation. Scripts added into the animation are also copied.

* In the meaning where two or more the names exist, the number of the name immediately after the copied such as 2 and 3 attaches at the end of the name.

- [Delete]: Delete the selected animation.
- [Run]: Execute the selected animation in order of script registered. It ends when the last script is finished

*The button is disabled when all the script are empty registered in the animation.
*When the script registered in the list of animation is selected, it is executed from the script selected about the animation. It returns in the beginning when executed to the last one and it executes it.

- [Repeat]: Repeat the animation.
- [<< Add Script]: Add the selected script in the list on the right side into the selected animation.
- [Remove Script >>]: Remove the selected script in the animation list.
- [Up] / [Down]: Move the selected script up/down.

●Example (Sample Data："Nihondaira Park Way")

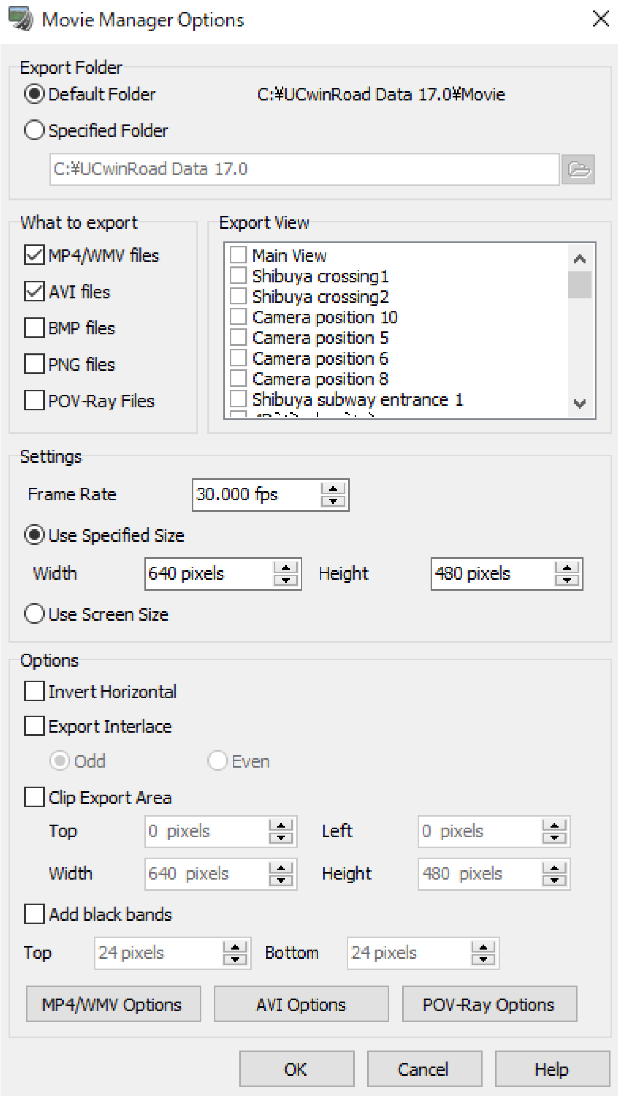
Movie Options

Higher-precision animation can be created by integrating AVI plug-in and the POV-Ray plug-in and outputting automatically the POV-Ray script in each frame of AVI.

1. Movie Manager Options

Open the Movie Manager Options form from Record/Play Ribbon- Options 

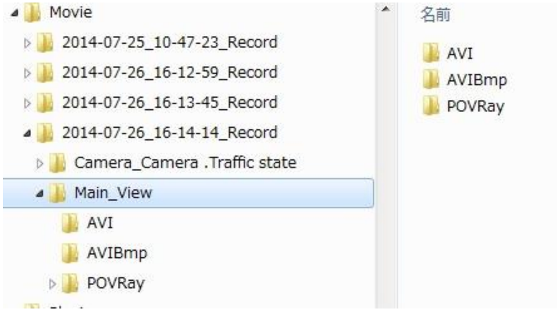
in Movie tab.
Configure the settings of the exporter folder, what to export, select the view to be output and enter settings and values for the output.



【Note】
- The options, Invert Horizontal, Export Interlace and Clip Export Area, are only for AVI.
AVI, AVIBmp and POV-Ray folder of each view for AVI output are created.
Stop AVI recording from Record/Play - Movie. Then a folder titled "Date of starting the record_Record" will be generated in the folder, where the folder of the view for the output is generated.

【Hint】
The folder of the main screen is named "Main_View", and the one of the camera view is named "Camera_the camera position name". If the camera position name contains the following characters, it is converted to "_ (underscore)".

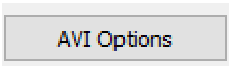
¥ (Backslash), / (Slash), :(Colon), . (Period, dot), ;(Semicolon), * (Asterisk), ? (Question mark), " (Double quotation), <(Left angle, Less than), >(Right angle, Greater than), | (Pipe), CON, PRN, AUX, NUL, COM1-9, LPT1-9, CLOCK$



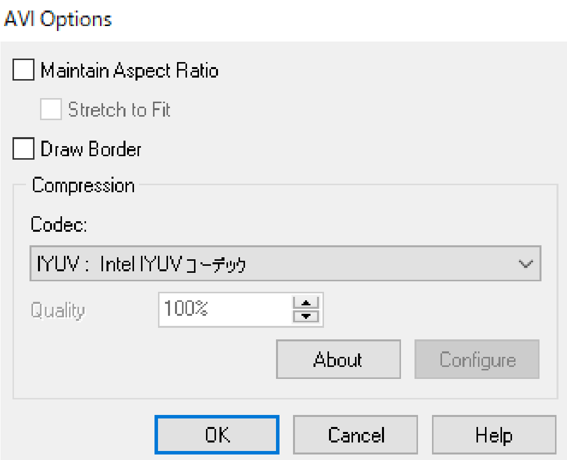
The number of the file name is the one of the beginning and the end. It corresponds with each image when AVI bit map is output.

2. AVI Options and MP4/WMV Options

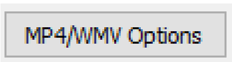
AVI Options

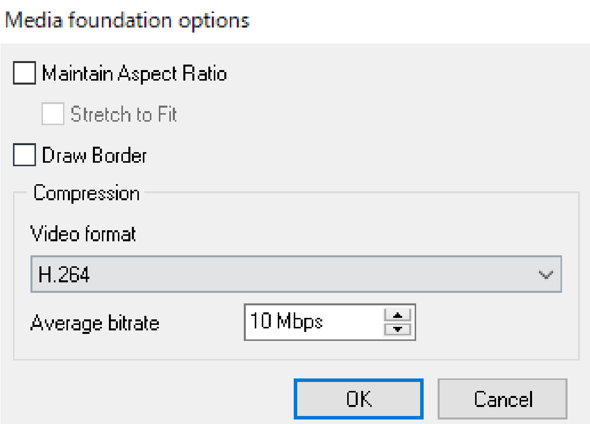
Simulations like driving, flying and script can be recorded in AVI. Open the setting by clicking  on the Movie Manager Options.

Configure the screen size and frame rate for output. And select an engine for compression. DivX and Codec enables to create a AVI file with figh accuracy and high compression ratio.
Increasing the bit rate allows for cleaner recording, but increases the recording time.



MP4/WMV Options

Open the setting by clicking  on the Movie Manager Options.



3. AVI Output

Click "Record/Play" Ribbon - 

to start recording.

Click "Record/Play" Ribbon - 

to stop recording. The recorded AVI file is saved in "UCwinRoad folder¥AVI folder".

The size of the screen is stretched to fit with the height and the width of the screen to be captured.
The current screen size is displayed from "File" menu - "Output Bitmap File".

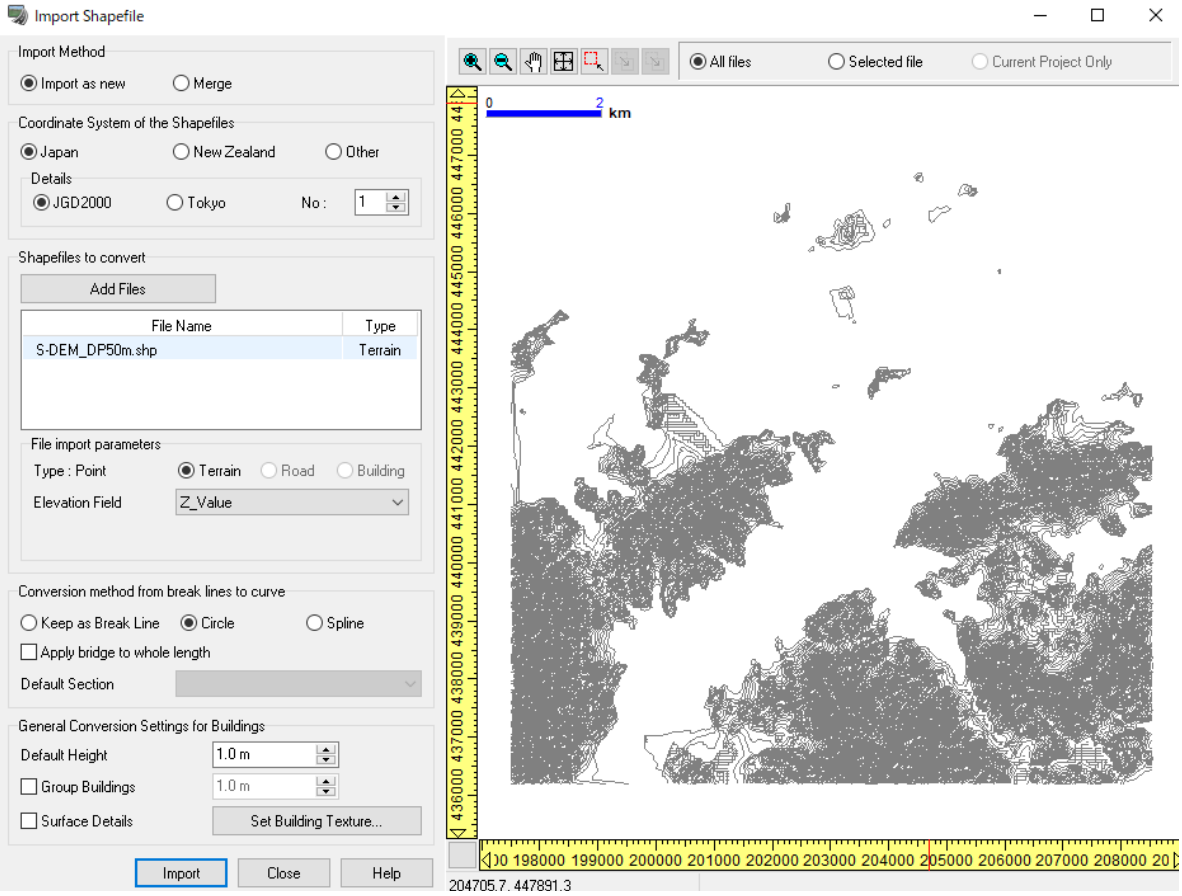
Import / Export

Shapefile Plug-in

Overview
Shapefile is the file format that is developed by ESRI, and is generally used in the world of GIS today. Shapefile means not one file format but the GIS data which consisted of two or more files. At least three files (shp, shx, dbf) are required for one data set, and eight more kinds of option files exist if needed. It can respond to "the peak, the poly line, and a polygon" as geometric information, for example, it can be used for geographical feature, a road, a lake, a river, etc. Furthermore, the attribute data for actually using data is also contained.

Import Shapefile

Read the shapefile or read the factor of shapefile into exiting project to the base edited as a new project by using Shapefile importing screen. Open the screen from File - Import - Import Shapefile.
Road plane alignment, geographical feature altitude, and the information on a building can be directly read from shapefile.



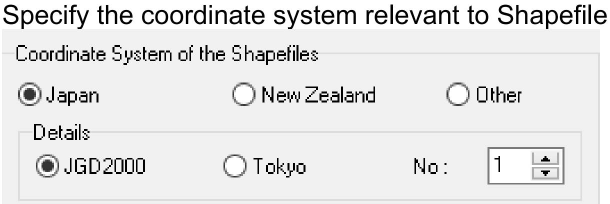
Settings

Importing Method

- **Import as new**: It is possible to import Shapefile as a new project. This option creates the base project used to be edit in future.
- **Merge**: It is possible to import Shapefile into the existing project. The project which reads Shapefile data must be read into UC-win/Road then. This option is helpful to add a deeper detail and realism than the existing project.

Coordinate system of the Shapefiles

Specify the coordinate system relevant to Shapefile. Choose from Japan, New Zealand, and other areas.

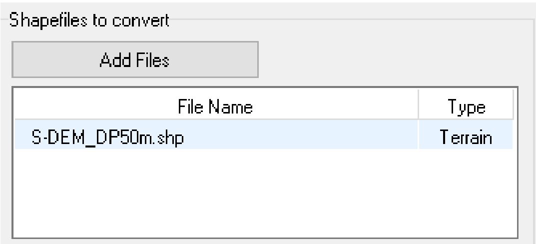


1) Japan
Choose this option, when Shapefile data is Japanese data.
-Details
Choose the area number of the actual coordinate system relevant to Shapefile data, and a coordinate system.

2) New Zealand
Choose this option, when Shapefile data is data of New Zealand.
- Details
Choose the actual coordinate system relevant to Shapefile data.

3)Other
Choose this option, when Shapefile is the data of countries other than Japan and New Zealand. UC-win/Road does not save the map data for foreign countries. Therefore, the coordinate conversion processing cannot be performed. If this option is chosen in a new project, flat geographical feature will be created in the position relevant to the present application option default area setting.
- Details
Input the initial geographical feature altitude in the position which creates blank project.
By a default, the altitude of 1.1m above sea level is created.

Shapefile to convert
All added Shapefile(s) are displayed in the list. Click Add Files button to choose the file and define the parameters.

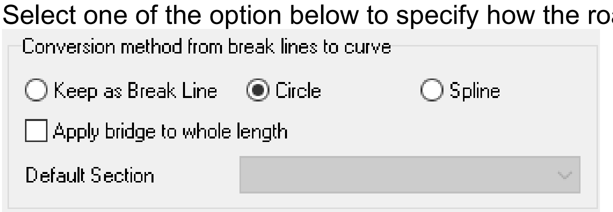


File import parameters
Set up the rules when UC-win/Road converts Shapefiles.
It displays if Shapefile includes the peak, a line or a polygon. This information is useful to determine which file is changed by UC-win/Road. The table below shows the object type and what UC-win/Road will be transferred.

	Point	Line	Polygon
Terrain	○	○	○
Roads		○	
Buildings			○

Note: The options are different in each object.

Conversion method
Select one of the option below to specify how the road chaning direction point is defined during conversion.

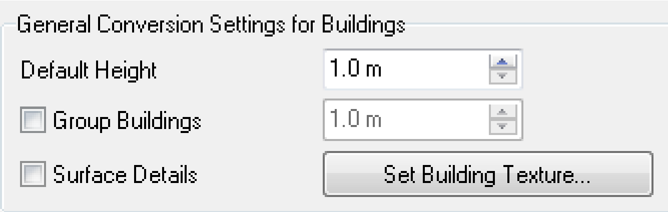


1) Keep as Break Line
The point changing the direction is located as a circle with a radius of 0.1m.
2) Circle
The point changing the direction is located as a circle that is automatically located. A radius is calculated depending on the deviation of the point before and behind on plane alignment changing direction and distance.
3) Spline

A spline road will be created and each point will be used as the peak of a road. Detail information how UC-win/Road manages conversion of Road Shapefile, refer to conversion of Shapefile.

General Conversion Settings for Buildings

The setting here is applied to all the buildings Shapefile listed for Shapefile conversion in global value.



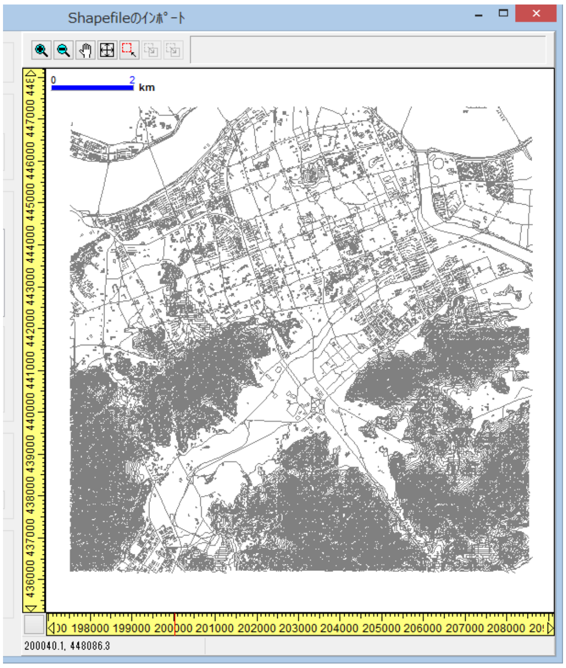
***Surface Details**
If this check box is checked, each wall will generate the building model created as each surface used on the "3D Model Editor" screen (new building). Since this can set a separate texture as each wall of an after-conversion building, it is effective.

***Group Buildings**
If a check box is checked, the buildings are grouped in specific square area. Grouping will become effective if the value of one side of area is set up on the right-hand side.
When a buildings are grouped, a 3D model which consists of many buildings is created.
It is possible to edit the building model together by using "3D model Edit" screen (new building), so it is effective to manage a lot of building models.

***Set Building Texture…**
The building texture screen is opened, and the default texture for all building roof or wall to be changed can be set.

Preview area

On the right, the preview of the object contained in Shapefile to be read from now on. It is helpful when determining which file is used in UC-win/Road if the object type is not clear.
Note: When Shapefile is synthetically imported to the existing project, the geographical feature, a building, and a road of the existing project are displayed here.



Preview color introductory notes

	Shapefile Object	The object of the existing project
Terrain	Deep gray	Thin gray
Road	Blue	Green
Building	Bright green	Non-display

The maximum project area guide
The maximum project area where the visible outline of a purplish red color can read an object is shown.

New project
When having read data as a new project, the visible outline shows the area of 20km x 20km, mainly the reading area. (see the selection of reading area). The visible outline shows the maximum area which can be used in UC-win/Road. The area exceeding this project area cannot be read. Since the size of actual project area is changed when related map data is processed in the case of Japan and the New Zealand project (or project using these area setup), for details, refer to Shapefile conversion.

In case other project, if a selected area is located within a region of a guide, a guide can be moved. refer the movement of project area about this operation.
Note: After selection of reading area, a reduction function may be needed to see a guide.

Existing project
When reading data into the existing project, the actual range of the existing project is displayed inside a guide. The object outside this area is not read.
All the objects settled in the existing project area can be imported (When the area to read is chosen). Or the object of the selection area in a project boundary can be read. Refer to the selection of reading area for this operation.

Note: About the project using Japan map data, the east-and-west width and the north-south width of the area of the existing project are about 20km by the processing method of Japan map data. When choosing reading area, it is necessary to know this, and it needs to exceed the maximum project size which is 20kmx20km, and needs to make it the contents. For details, refer to Shapefile conversion more.
Note: Project area is unmovable to the existing project.

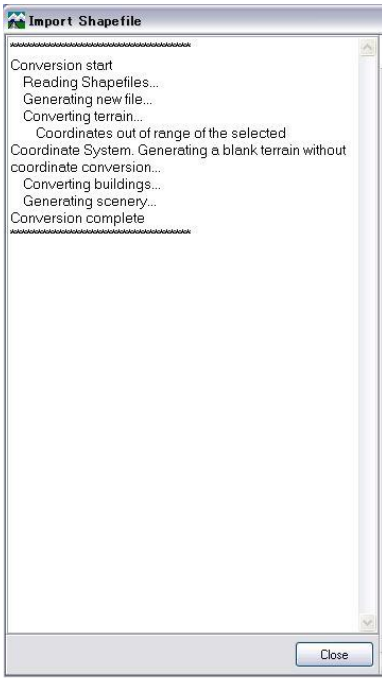
■ Tool bar
The following operations can be performed by preview.

Expand	Display area is expanded based on the center of display area.
Reduce	Display area is reduced based on the center of display area.
Move	Move the preview area to see the invisible part.
Whole display	Back to an initial display state.
Selection of reading area	Select the range to be read Shapefile.
Movement of reading	After the area to be read is selected, this button allows moving this area.
Movement of project area	Once the area to be read is selected (see the note below), the position of the project area can be changed whenever the place that is read by this movement button.

Import

Click 

to start importing Shapefile.
A conversion situation is displayed before reading is completed. Check a situation message, and when solution is a required problem, refer to solution of the problem of the error message in reading. An example of the successful conversion situation message is shown on the right.



Close.
a screen will be closed and one processing will be performed in following.
- If conversion is successful, or if it succeeds partially, the procedure of creating of a new project, or synthetic reading to the existing project is completed.
- When conversion is failed, the screen will be closed without processing anything.
- If the close button is clicked, the screen will be closed without holding data.

It may be shown that the item in Shapefile may be unable to be changed into some messages displayed on the panel which displays a conversion state. The project of the result for giving the determination of which Shapefile item was not changed is shown in a preview panel.

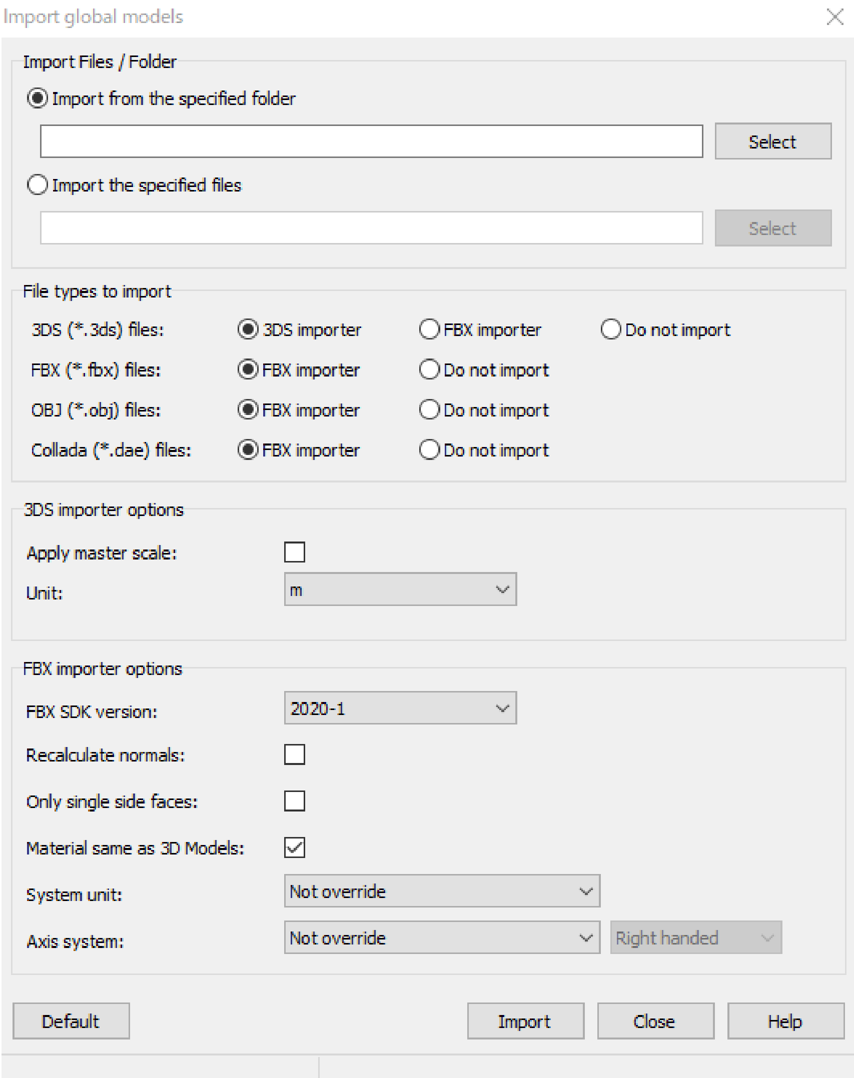
Global Models

It is possible to load and automatically arrange various models which store the coordinate values in the same coordinate system as the UC-win/Road. Mainly, it is possibel to use for the following model data;

- Urban model data
Example: MLIT PLATEAU model data, Zenrin 3D urban model

- Exported data from software
Example: UC-win/Road 3D model (X-Y coordinate)

Go to File – Import – Import global positioned models.
On this form, first specify a folder or a file which contains models, then set up the setting for loading models.
Click "Import" to start arranging the models on the specified coordingate location.



Settings
Import Files / Folder
Specify a file or folder to import.

File types to import
Specify the file type to import from the following;

- 3DS (*.3ds) file
- FBX (*.fbx) file
- OBJ (*.obj) file
- Collada (*.dae) file

3DS importer options
Set up the options for 3DS importer.
Apply master scale: Check to apply the values of the master scale within 3DS file.
Unit: Specify the unit of 3DS file in m, cm, mm or inch.

FBX importer options
Set up the options for FBX importer.
FBX SDK version: Specify FBX SDK version. Basically use the latest version. If the loading failed, try again with the other version.

Recalculate normals:Check to recalculate the normals.

Only single side faces: Check to display only the side faces.

Material same as 3D models: Check to apply materials suitable to 3D models.

System unit: Select whether to overwrite the unit or not. It is not needed to set this up for FBX models, which have the unit information. Set this up in case that the unit is not specified correctly or there are other models whose unit is specified.

Axis system: Select whether to overwrite the axis or not. It is not needed to set this up for FBX models, which have the axis information. Set this up in case that the axis is not specified correctly or there are other models whose axis is specified.

GIS View

GIS View is the tool to import, display, edit and export the GIS data. It is possible to import the GIS data, and integrate the map file (FGW：　Forum8 GIS Workspace). It allows GIS data to import, integrate to the map file (FGW: Forum8 GIS Workspace) and display in UC-win/Road or Google Earth.

1. Supported File Formats

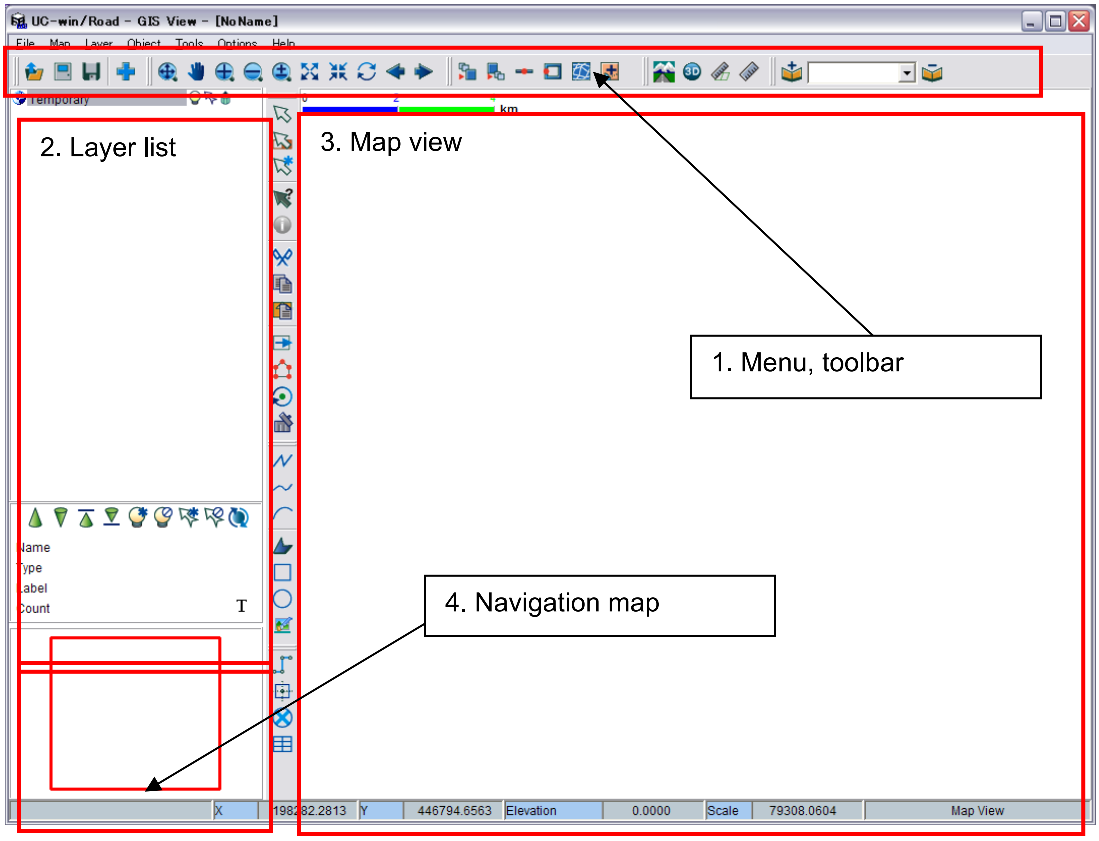
File Type	Args	Supported Action
shp File	ESRI shape file type	Import/export
dxf File	Auto CAD file type	Import/export
slm, slp, sal, xml File	Japan Geographical Survey Institute Digital map 1/25,000,1/2,500	Import
Mem File	Japan Geographical Survey Institute 5m,10m,50m Mesh	Import
Text File	Polyline text	Import/export
Image File(*.bmp,*.tif)		Import/export
fgw File	FGW : Forum8 GIS Working space file	Import/export

2. Export functions

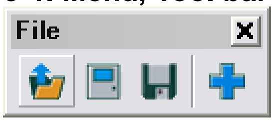
The functions of exporting to UC-win/Road are listed as below.

Object type	Property	Remarks	UC-win/Road
Point	None	The point and the group points included in the optional shape.	Terrain patch
	Height	Define the terrain elevation	Terrain elevation
Line, Polyline	None	Optional line and polyline are exported as a road line	Road
	Name	Set the road name to be exported.	Road name
Spline	None	Optional spline curve is finely cut, and exported as road horizontal line.	Road
	Name	It can be set for exporting the road name	Road name
Polygon	None	Optional polygon is exported such as the block is pushed to the given height in the space	3DModel (building)
	Height	Define the block height	Height of model
	Name	Set the model name to be exported.	Name of model
Rastar Image	None	The image layer is exported as satellite image or street map of UC-win/Road.	Satellite image

3. Window

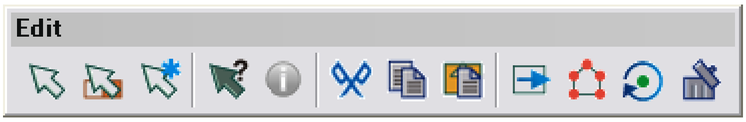


3-1. Menu, Tool bar

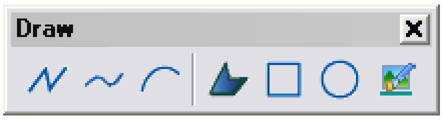


Open map	Open FGW file
Close map	Close the current FGW file
Save	Save the current FGW file
Add layer	Add layer data file (*.dxf, *.shp, *.lem, *.mem, *.pnt, *.arc, *.pgn, *.xml, *.bmp, *.tif, *.txt) to the current map. It is possible to import multiple files.

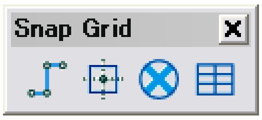
Show Full Extent	Display the map in full size within map view
Panning	Remove the map view by dragging
Zoom In	Left-click on the map view position, drags it to specify the rectangle area and zooms in.
Zoom Out	Zoom out around the position where the map view is left-clicked
Dynamic Zoom	Zoom in/Zoom outs by dragging.
Centre Zoom In	Zoom in around the map view.
Centre Zoom Out	Zoom out around the map view.
Refresh	Refresh the map view.
Previous View	Display the previous map view.
Next View	Display the adjacent map view, then further map view



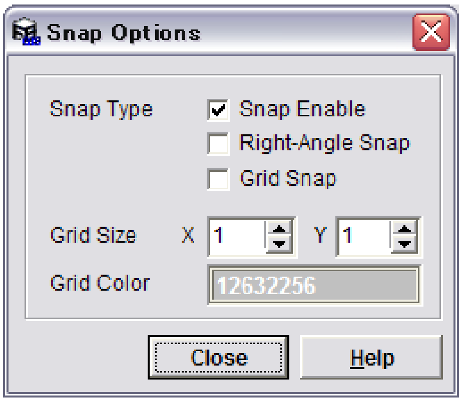
Select object	Select the object.
Select object by area	Select the object within the rectangle area by dragging.
Select/Unselect all	Select/Unselect all available objects.
Selected object's information	If the object is selected, the information will be displayed in [Object information] window.
Cut	Cut the selected object.
Copy	Copy the selected object.
Paste	Paste the copied object to edit layer.
Move object	Select and move the object. Object is selected by first click, then it starts to be moved by second click, and placed by third click.
Edit Vertices	Select the object, and edits the vertex. Edit will be finished by double clicking, and the edited information is saved.
Rotate object	Select and rotates the object. Object is selected by first click, and then decides the rotation center position by second clicking and the rotation will be finished by third clicking.
Delete selected object(s)	Delete the selected object.



Polyline	Add a polyline object to the editing layer. Adds the vertex by clicking the map view. Adds the end by double-clicking.
Spline	Add a spline object to the editing layer. Adds the vertex by clicking the map view. Adds the end by double-clicking.
Arc	Add an arc object to the editing layer. Creates the ellipse figure by first two times clicking, defines the start and end of the arb by next two times clicking.
Polygon	Add a polygon object to the editing layer. Adds the vertex by clicking the map view. Adds the end by double-clicking.
Rectangle	Add a rectangle object to the editing layer. Adds the corner of rectangle by first clicking, defines the opposing corner by next double clicking.
Ellipse	Add an ellipse object to the editing layer. Defines the rectangle angle which defines the ellipse size by first clicking, then defines the opposing corner by next double clicking, and draws the ellipse inside of it.
Load image	Add an image to the editing layer. Clicks the button, and selects the image file (*.bmp, *.tif) in displayed dialogue box. Draws the rectangle which defines the image area.



Right-Angle Snap	Draw the point horizontally or vertically for the previous point.
Grid Snap	Align the figure to the grid in case drawing and editing the object or editing the vertex,
Disable Snap	Release the snap function for the right angle, grid.
Snap Options	Set up the property of the snap grid.



Snap type	Snap Enable	Turn on/off the snap function.
	Right-Angle Snap	Turn on/off the snapping the right angle.
	Grid Snap	Turn on/off the snapping to the grid.
Grid Size	Input the size of grid cell. X is the lateral direction. Y is the vertical direction in meter.	
Grid Color	Input the color of the grid cell for snapping.	

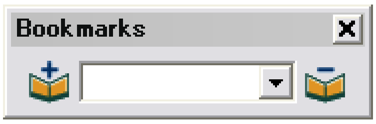
Layer Manager

Layer Merger	Opens [Layer Merger] window.
Layer Separator	Opens [Layer Separator] window.
Line cleaner	Opens [Line cleaner] window.
Polygon cleaner	Opens [Polygon cleaner] window.
DEM cell converter	Opens [DEM cell converter] window.
Coordinate converter	Opens [coordinate converter] window.

Functions

Send Data to UC-win/Road	Draws and defines the rectangle area for exporting to UC-win/Road. [Export to UC-win/Road] window will be opened.
3D View	Defines the rectangle area for displaying [3D view] window.
Area survey	If the polygon is drawn on the map view, the message information window will be displayed in right bottom, and the circumference and dimension of polygon will be displayed.
Distance Measure	If the polyline is drawn on the map view, the message information window will be displayed in right bottom, and the segment distance and total distance will be displayed.

Bookmarks

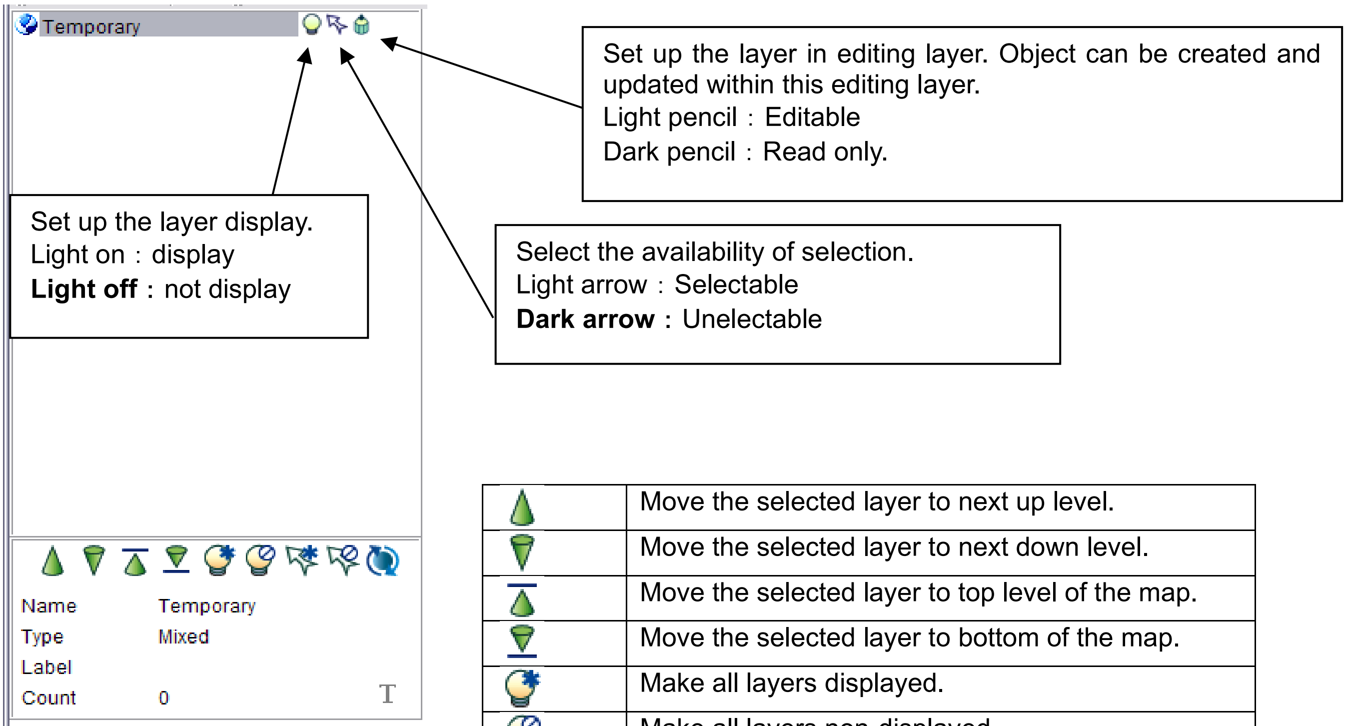


Add the current view to bookmark.	Add the scene of current map view to the bookmark list.
Delete the current bookmark.	Delete the scene of current bookmark from the bookmark list.

3-2. Layer list

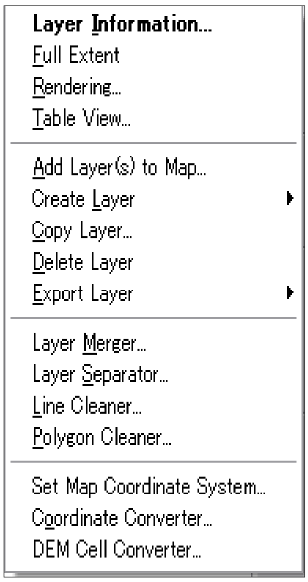
All layer lists included to the current GIS data map are displayed. The layer display in the map view such as adding/deleting the layer, managing the property is controlled in this list.

Layer list manager



	Move the selected layer to next up level.
	Move the selected layer to next down level.
	Move the selected layer to top level of the map.
	Move the selected layer to bottom of the map.
	Make all layers displayed.
	Make all layers non-displayed.
	Make all layers editable.
	Make all layers uneditable.
	Update the map view.
Name	Name of the selected layer.
Type	Type of the selected layer.
Label	Label field of the selected layer.
Count number	Object number of the layer.

Right-clicking opens a pop-up menu.



3-3. Map view

The current map data is displayed by the view which has the different layer and the settings in the map view. Pop-up menu will be opened by right-clicking.

3-4. Navigation map

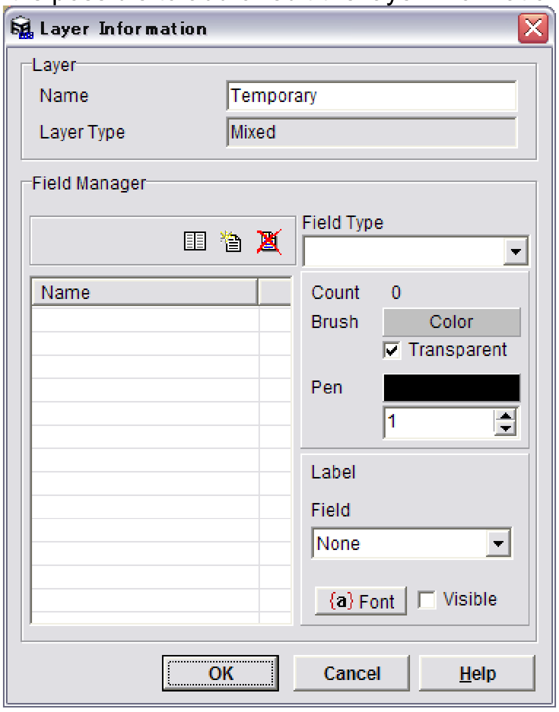
The navigation map displays whole of the current data map.
Red rectangle indicates the range displayed on the current map view. The display range of the map view can be controlled by removing the red rectangle.

Navigation map option window
Choose the layer for displaying on the navigation map from this window.

4. Layer

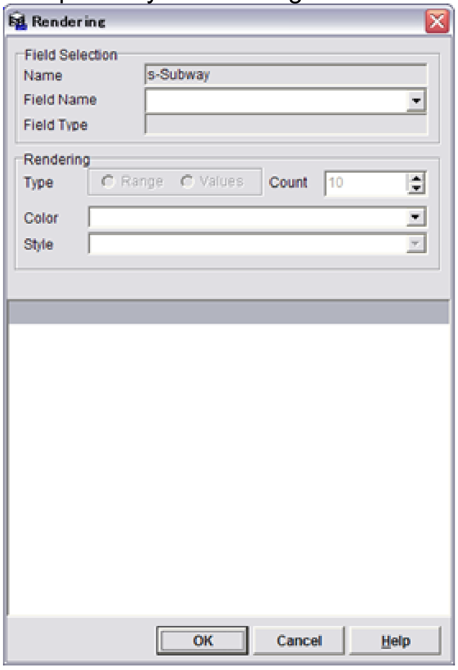
4-1. Layer information

It is possible to add or edit the layer information.



4-2. Layer rendering window

Set up the layer rendering information on this window.

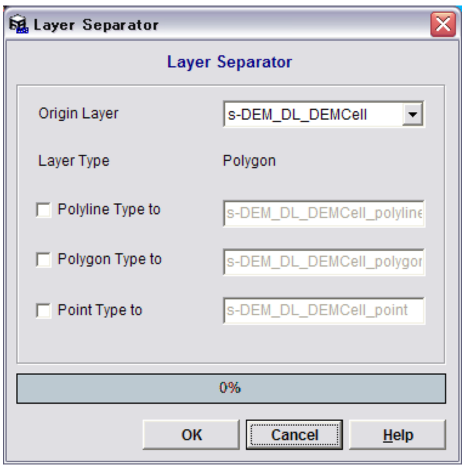


4-3. Layer table view window

This is the table view information. It displays object IDs, filed names, counting numbers. It is possible to display other functions by right-click menu.

4-4. Layer Separateor window

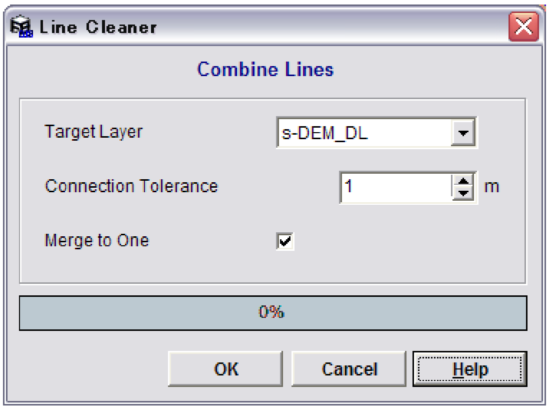
The layer is separated into some new layers based on the object type on this window.



5. Sorting function

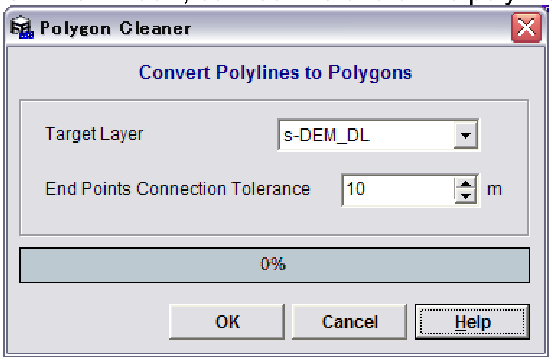
5-1. Line cleaner window

The selected layer will be connected based on the condition setting. On this window, connect the end of the individual line.



5-2. Polygon cleaner window

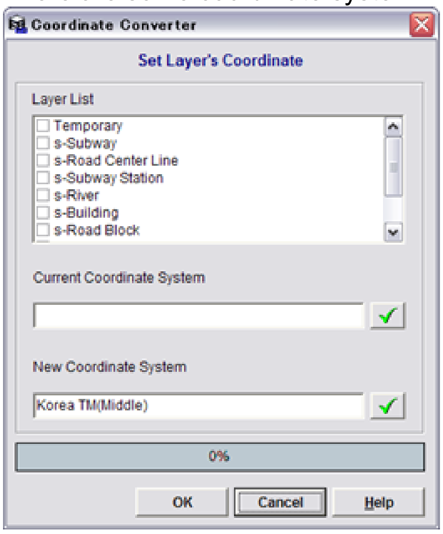
On this window, connect the end of the polyline. The polyline is converted to polygon.



6. Convert function

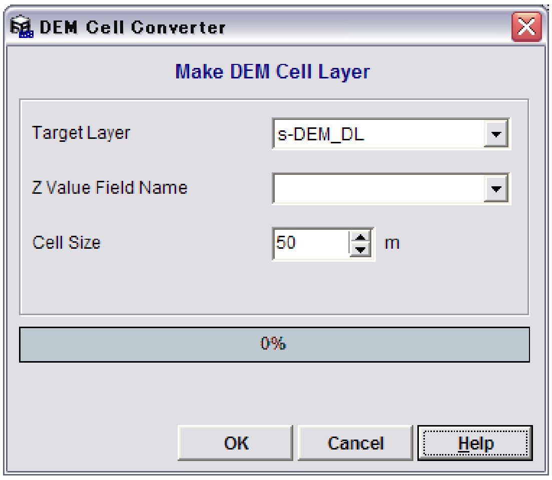
6-1. Coordinate Converter

On this window, set up the layer coordinate system and convert the layer coordinate system to the different one. There are some coordinate system in GIS data, so it is needed to integrate different coordinate system.



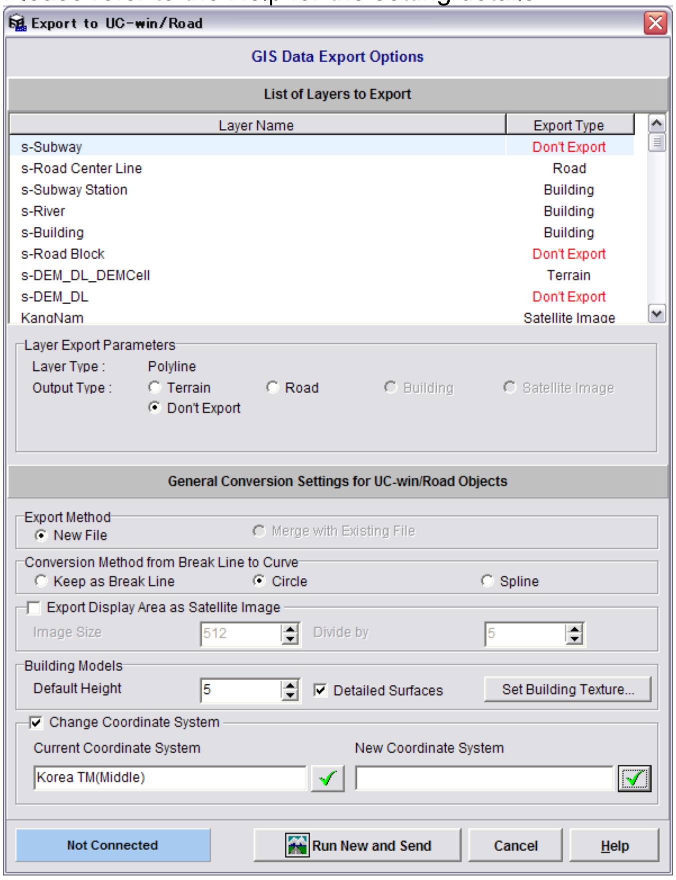
6-2. DEM cell converter window

On this window, create DEM cell which depends on the setting of the z value for target layer (or selected layer) and the cell size. The new DEM cell layer will be created as a layer of polygon type for rendering DEM cell efficiently.



7. Export to UC-win/Road

On this window, connect GIS view data to UC-win/Road.
Set up the layer export parameters, export method, conversion method, building models and coordinate system.
Please refer to the Help for the setting details.



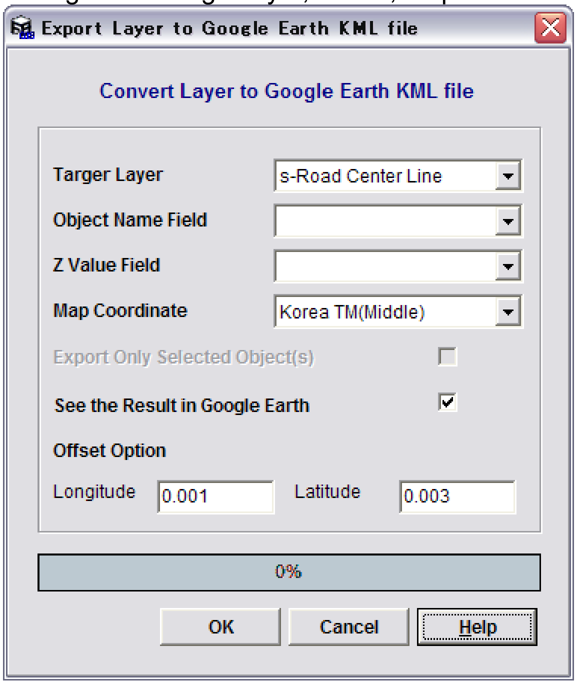
The table below indicates the relationship with UC-win/Road object.

GIS layer type	UC-win/Road object
Polyline type	Road, Terrain
Polygon type	Terrain, Building
Point type	Terrain
Image type, Captured image	Satellite image

UC-win/Road GIS view plug-in
Select [Import GIS view data] from File menu in UC-win/Road main window. [UC-win/Road connecting window] in GIS view is only available when the system is working.
If [UC-win/Road connection window] in GIS view is not opened, the empty message window is not displayed.
Open the [Export to UC-win/Road] window from GIS view user interface, the application will be mutually connected.

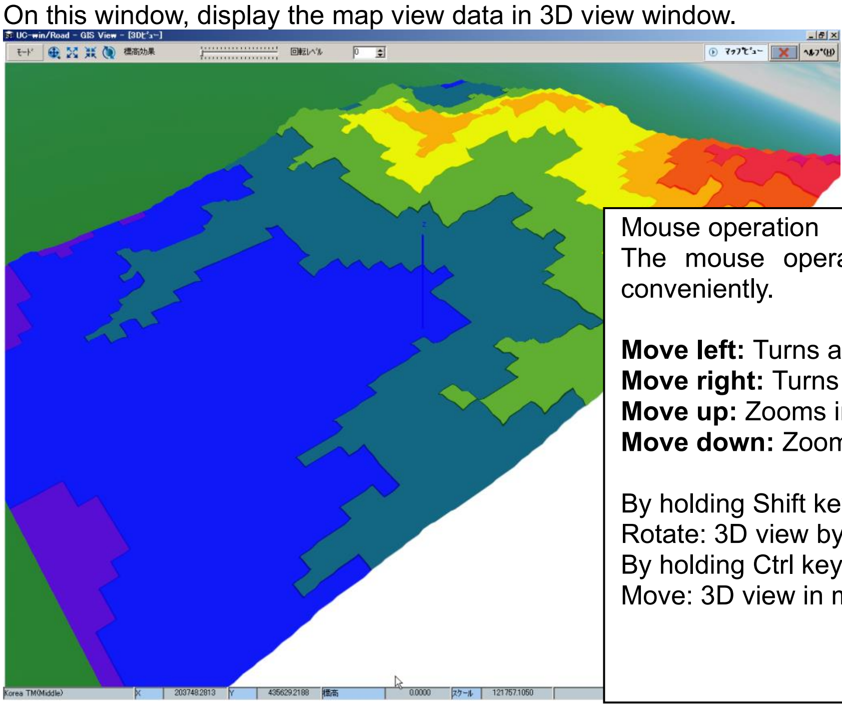
8. KML export window

On this window, export the selected layer to KML file.
Configure the target layer, Z field, map coordinate and coordinate.



9. 3D view window

On this window, display the map view data in 3D view window.



Mouse operation
The mouse operation is available to use 3D view conveniently.

Move left: Turns around Z axis in clockwise.
Move right: Turns around Z axis in anti-clockwise.
Move up: Zooms in the center
Move down: Zooms out the center.

By holding Shift key
Rotate: 3D view by mouse cursor.
By holding Ctrl key
Move: 3D view in mouse cursor.

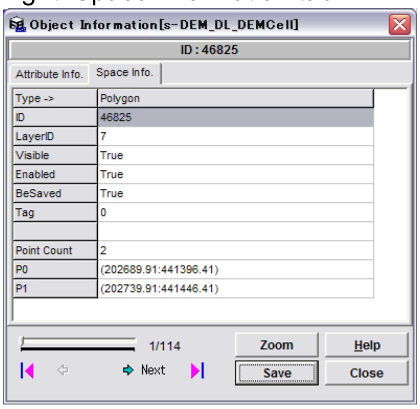
Fully Extent: Display fully 3Dmap.
Zoom in Towards the Center: Zoom in the center of view.

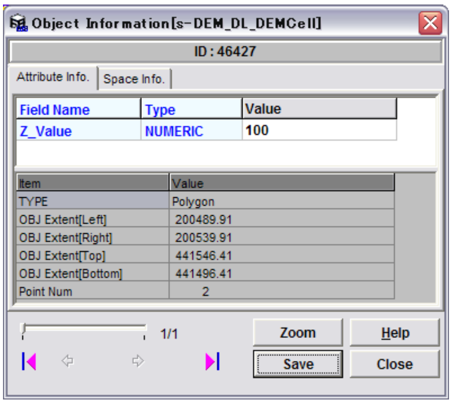
Zoom Out From the Center: Zoom out the center of view.
Vertical Exaggeration: Highlight the vertical direction by adjusting the slide bar.
Rotation Speed: Set up the rotation speed.
Map view: Switch to the map view.

Right click to display the popup menu.

ShowXYZ: Display the coordinate.
Display Sky: Display the sky image.
Rotation
Copy Image to Clipboard: Copy the current image to the clipboard.

Object information window
There are two tabs on the object information window, one displays the layer attribution, another displays the space information.
Left: Attribution information tab
Right: Space Information tab



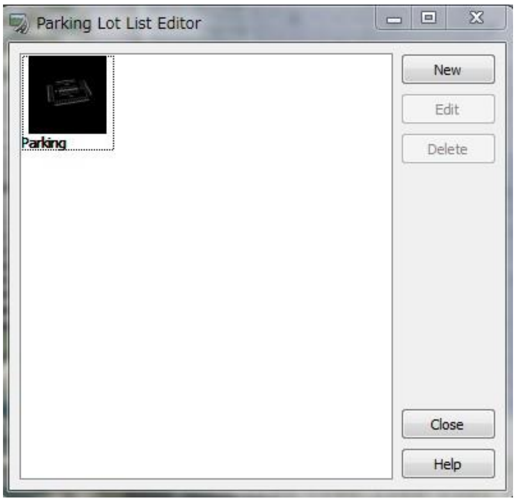


Parking Model Plug-in

It is possible to import parking lot drawing data created by FORUM8's CAD system "UC-1 Parking Drawing System", which is based on parking regulation. The outer line of the parking lot, boundary line for each parking space, and road marking (such as an arrow indicating the driving direction) can be drawn accurately based on it. Since the imported drawing data, like buildings and cars, is treated as a model, it is possible to place them in an arbitrary position or rotate them.
*"Parking Model Plug-in (ParkinglotPlugin.bpl)" is required.

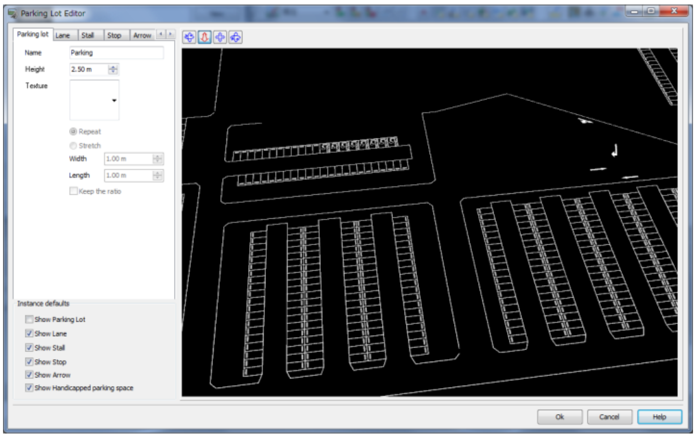
Go to File - Import - Load Parking Lot.

Parking Lot List Editor will open. Here models of parking lot are listed.

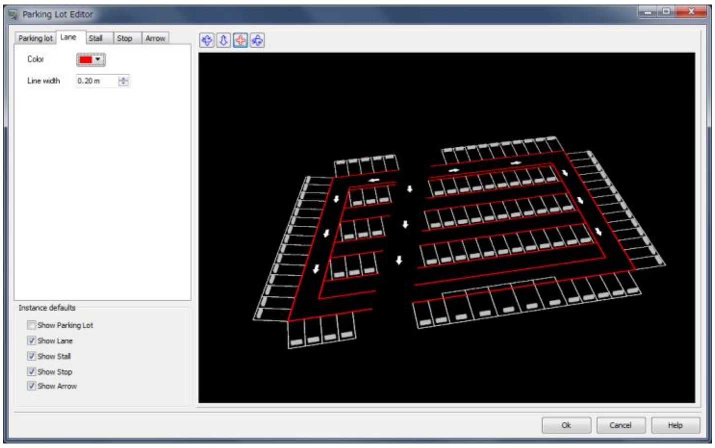


Load a file or select data in the list screen and click the Edit button to configure various settings on Parking Lot Editor

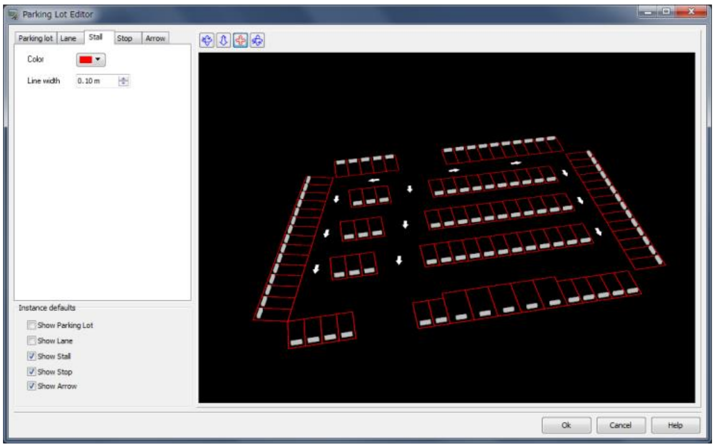
■Parking Lot tab
Input the name of the parking lot, and set upthe texture on the ground.



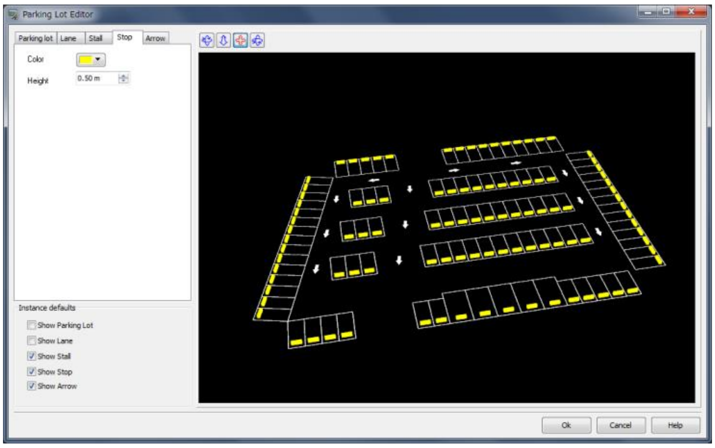
■Lane tab
Set the color and line width of passage line.



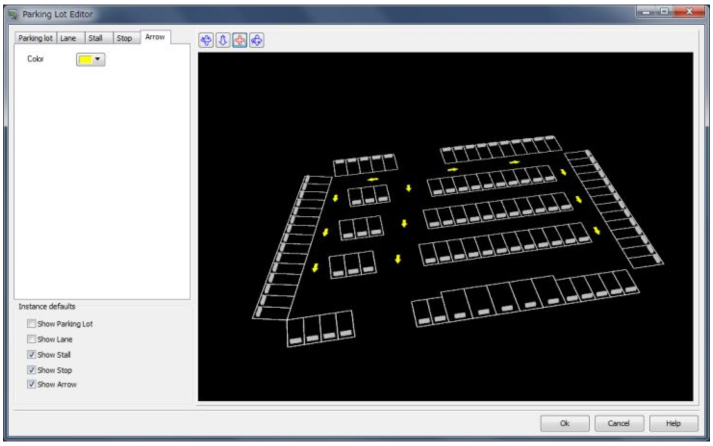
■Stall tab
Set the color and line width for the parking mass for the vehicles.



■Stop tab
Set the color and the height of the stop block set up in each parking mass.

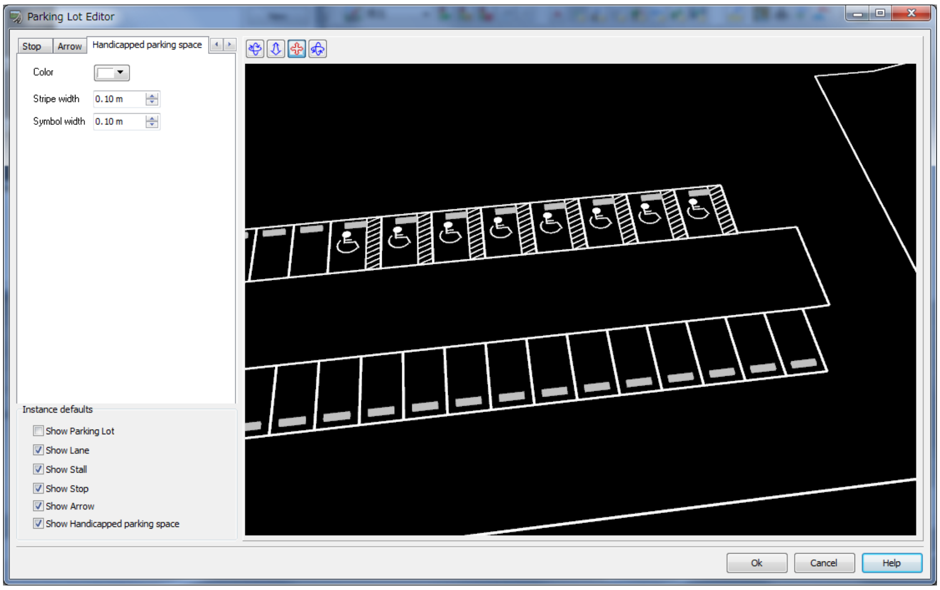


■Arrow tab
Set the color of road sign.



■Handicapped parking space

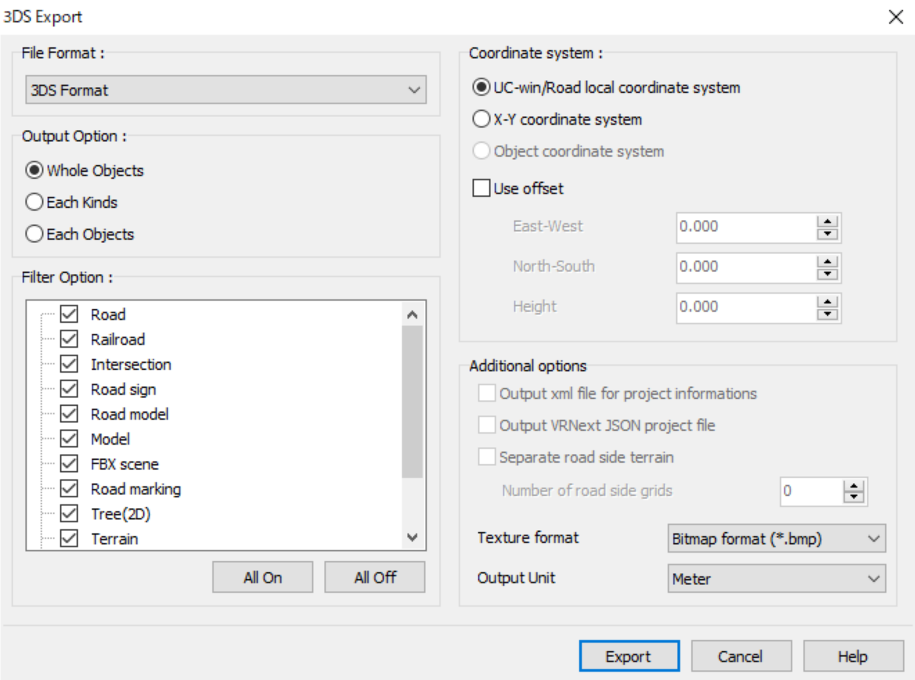
Set the color and width of the stripes and internal parking signs for handicapped spaces.



Export Scene Plug-in

This function enables the outputs of all models with geographical features in 3D space of UC-win/Road in an arbitrary 3D model data format. For example, it will be possible to use it with various editors and tools such as 3ds Max by outputting it in 3ds format, (3ds format is the standard).The 3D model output data for mat is planned to increase to include various formats such as FBX, Obj, VRML and OpenFlight.

Go to File – Export – Export 3DS…
The settings screen will open. After setting the following items, click the Export button to start exporting.

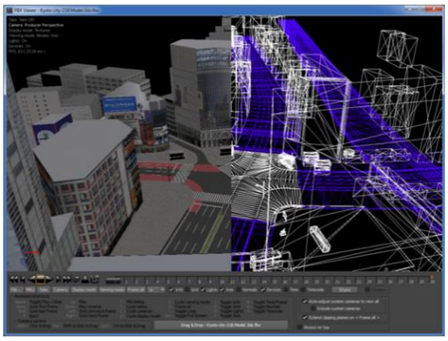


File Format: Specify the format of the 3D model data file
Output Option: Specify the file output method.
Filter Option: Check the boxes for the output.
Coordinate system: Select the coordinate system of the model to be output.

Additional options
Output xml file for project information
This option is available only when "Each Objects" as output option is selected.
If checked, an XML file will be output to the file output destination.

Separate road side terrain
This option is available only when "Each Objects" as output option is selected.
Checl to split the terrain grid containing the road into a terrain grid within the number of grids specified in "Number of road side grids" and other terrain grids, and saves them in two 3DS files.

Texture format: Select the texture file format.

DWG Tool

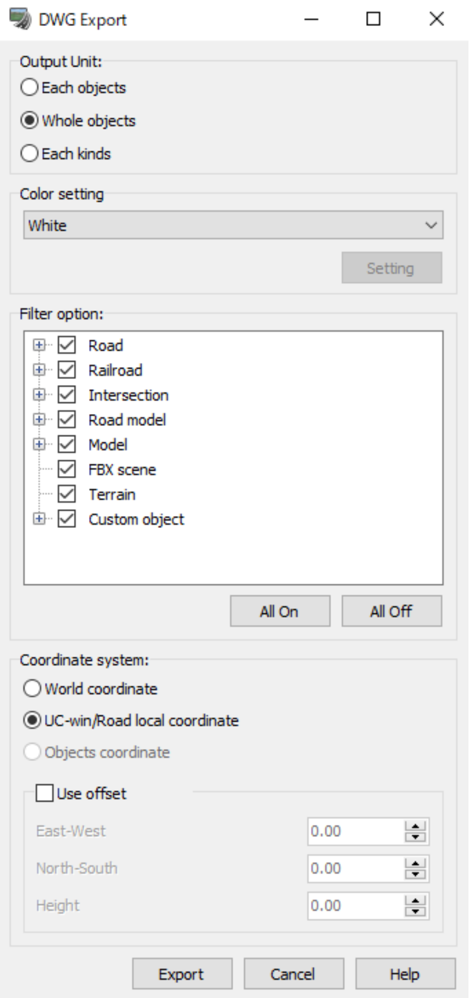
The DWG tool plugin enables to import and load DWG format CAD data into UC-win/Road and to export UC-win/Road projects into DWG format. It is possible to import 3D Model and Road Cross-section and export road and terrain data.
It needs DWGToolPlugin and ExportScenePlugin.

Supported DXF/DWG format versions for import: R13 / R14 / 2000 / 2004 / 2007 / 2010 / 2013 / 2018
Supported DXF/DWG format versions for Export: 2010 / 2013 / 2018

1. From UC-win/Road to DWG

1. Go to File - Export - Export DWG.
2. Enter the criteria the DWG Export window. (■See Below)
3. Click on the Export button and specify a destination folder.
4. Export starts.
5. A message "Finished exporting the scene" appears. Export is completed.

DWG Export setting window
Set up the output unit, color setting, filter option and coordinate system.



Configure the followings;
- Output unit
- Color setting
- Filter option
- Coordinate system

*Moreover, check "Use offset" check box to give the offset to the coordinate.
・East - West
Enter the offset of east-west direction in m. Enter a positive value to move a model to east, a negative value to west.
・North - South
Enter the offset of south - north in m. Enter a positive value to move a model to north, a negative value to south.
・Height
Enter the offset of the vertical direction in m. Enter a positive value to move a model up, a negative value down.

2. From DWG to UC-win/Road

There are 2 methods.

(A) Importing surface information as a 3D model

Import DWG data as a 3D model data. The following entities can be supported;
3DFACE, MESH, 3DMASH, PMESH, TRACE and SOLID

The following entities use the decomposition command and are read for those decomposed into the entities listed above:
BlockReference, SURFACE, Extruded surfaces, Lofted surfaces, Rotation Surfaces, Sweep Surfaces, 3DSOLID, BODY and REGION

1. Go to File - Import - Import DWG.
2. Select a DWG file to be imported.
3. Set parameters.
4. Enter the name displayed in UC-win/Road.
5. Select a Model Group Type and click OK.
6. Find a model from the Model Panel

*Right click any position to open the pop-up menu to sort models. The imported model can be found easily by sorting by “modification date”.
Left click on the imported model to place it on a main screen.

(B) Importing line information as a cross section

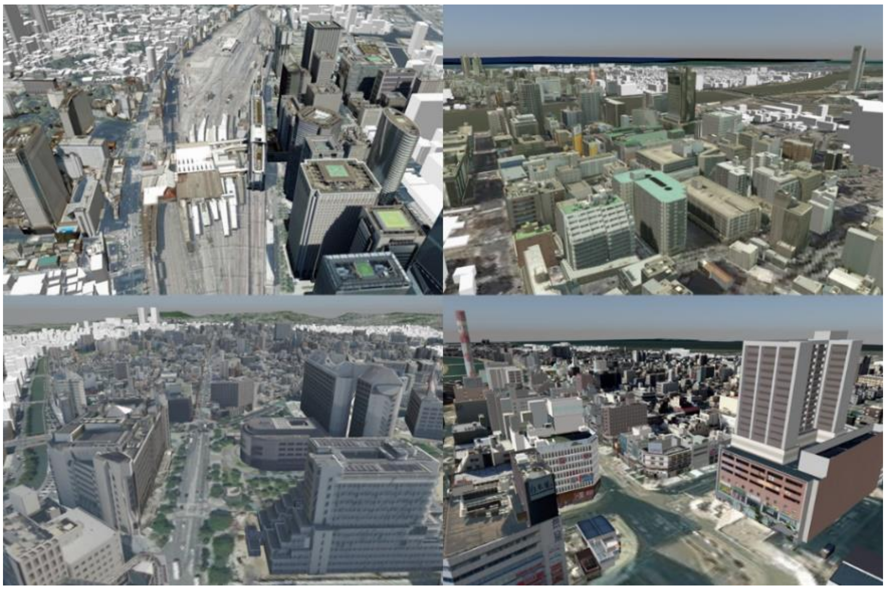
Import DWG data as a cross-sectional data. The following entities can be used:
LINE, LWPOLYLINE, 3DPOLY, POLYLINE, ARC and CIRCLE

BlockReference uses the decomposition command and is read for those decomposed into the entities listed above.

1. Go to File - Import - Import DWG.
2. Select the DWG file to be imported.
3. Set parameters at the setting window.
4. Enter the cross-sectional name displayed in UC-win/Road. Data type is always general cross-sectional parts.
5. Select a section type from road, railway bed or railway tracks.
6. Select whether this is a road, bridge, or tunnel. Although a file contains all 3, it still necessary to specify only one.
7. Select a layer of DWG file.
8. Click OK. The Section List will open.

CityGMLPlug-in

CityGML is an international file format for urban models that stores a variety of models, including buildings, roads, railroads, urban facilities, and plantings. Attribute information may also be assigned.
This application can read CityGML and visualize it. It is also possible to see the values of attributes contained in the CityGML model and to export UC-win/Road project in CityGML format..



Download PLATEAU data

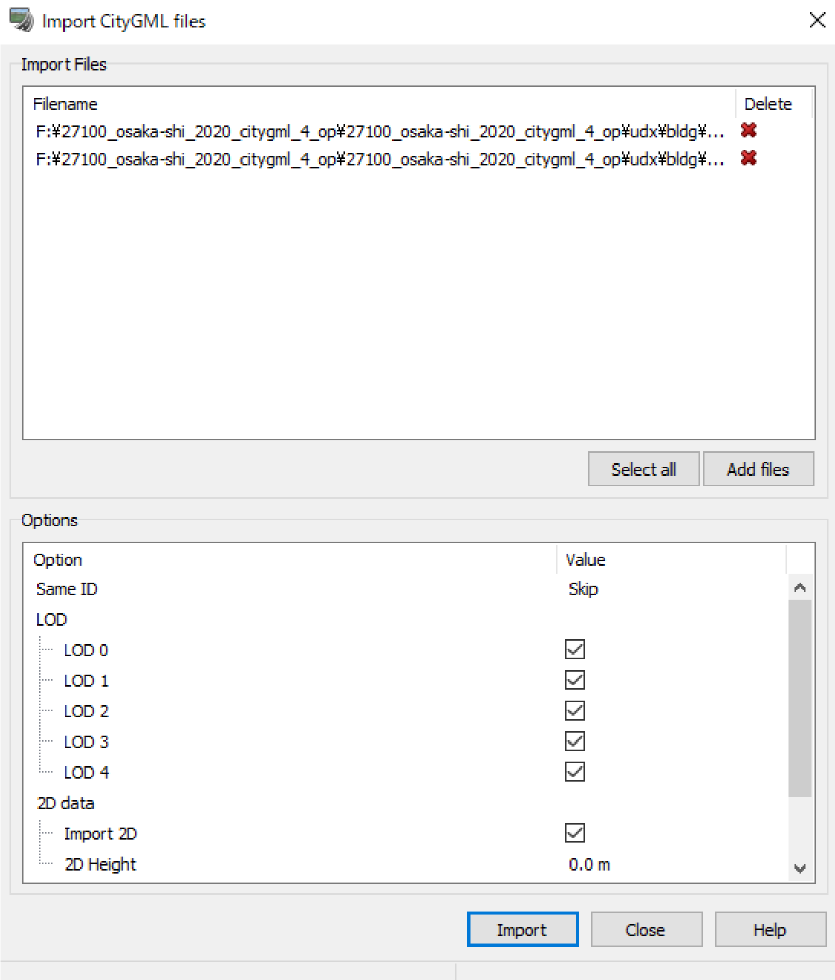
PLATEAU's CityGML data can be downloaded from the following page. Click on the link for each city name.
https://www.mlit.go.jp/plateau/opendata/

Load CityGML data

First, create a project as the basis for the model to be imported. There are several ways to create a project. In the case of Japan, importing the Geographical Survey Institute tiles can be used to easily create a topography with aerial photographs pasted on it.

Next, go to File – Import – Import CityGML files… or Edit – CityGML - 

.
Select a file from Add files, set options, and import. See Help for more information on setting options.



After setting the options, click Import button to begin import. Please check the status on the status display and progress bar at the bottom of the import screen.
To interrupt the process, click "Terminate" to stop the process. However in the case of a file read or cleanup process, even if interrupted, it may wait until the process is complete. When loading is finished, the model will be displayed.

View attributes

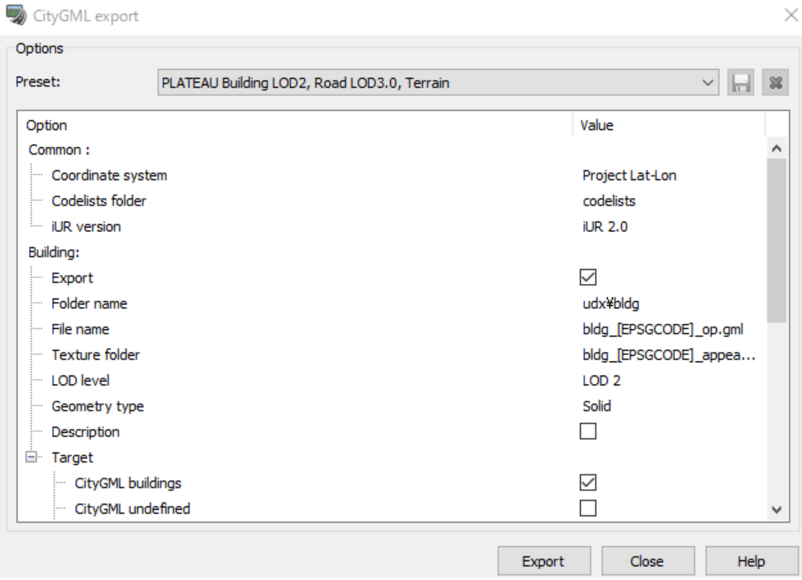
Go to Edit - CityGML - 

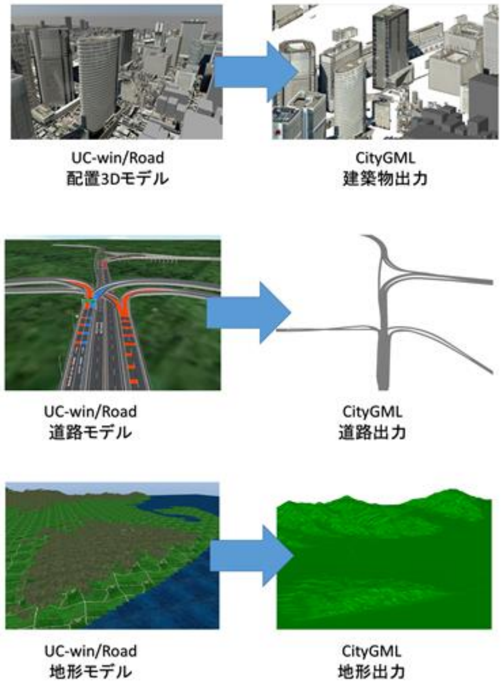
and click a model imported from CityGML file. The display shows the attributes of the model.
The Attributes tab displays the CityGML attributes recorded in the model, and the Raw data tab displays the attribute strings.

Export CityGML

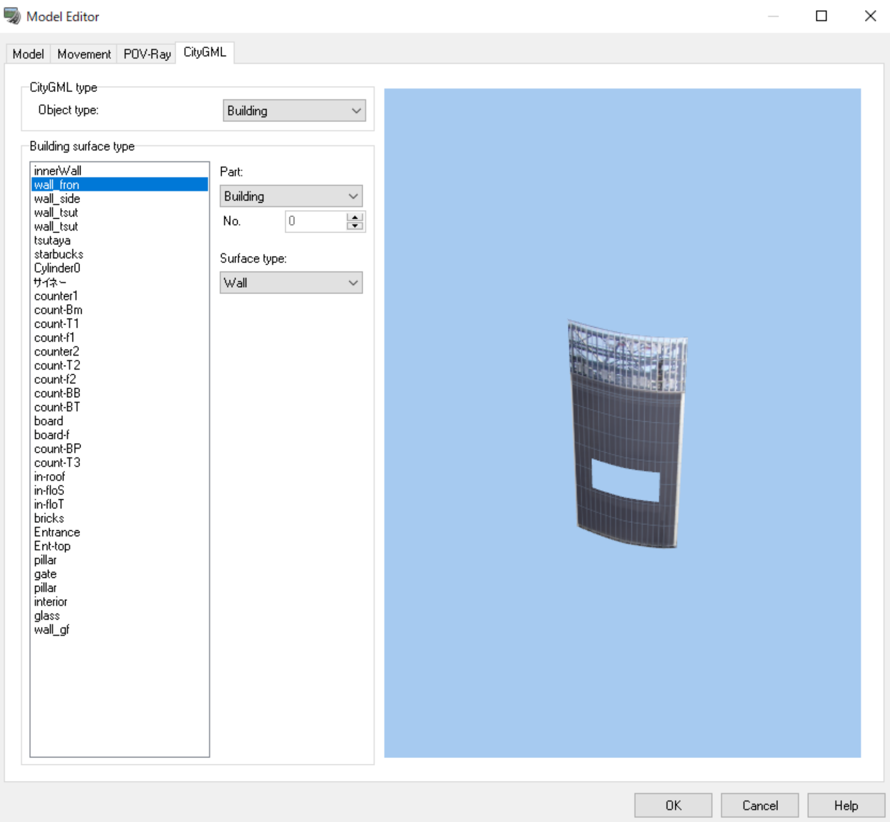
It is possible to export a project of UC-win/Road in CityGML. Buildings from the placed 3D model, roads from the road model, and terrain from the terrain model can be output.

Go to File - Export – Export CityGML to open the CityGML export screen.
Select the output target and click Export to begin the output. Please refer to the Help for notes on use and output.





Information on imported CityGML and output settings for CityGML data can be configured on the "CityGML" tab of the 3D model edit screen.

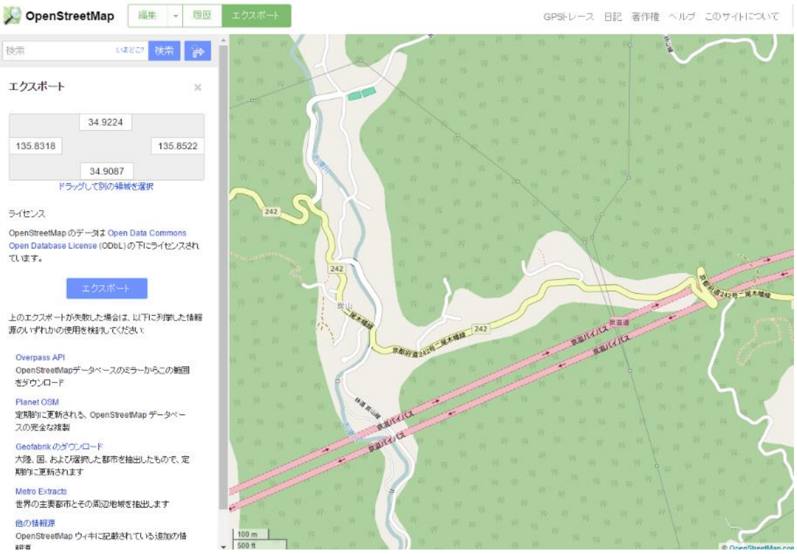


OSM (OpenStreetMap) Plug-in

Open Street Map (OSM) data can be linked with UC-win/Road.
OpenStreetMap (OSM) is a free and collaborative map of the whole world. Elements such as roads, tunnels, bridges and buildings can be displayed.

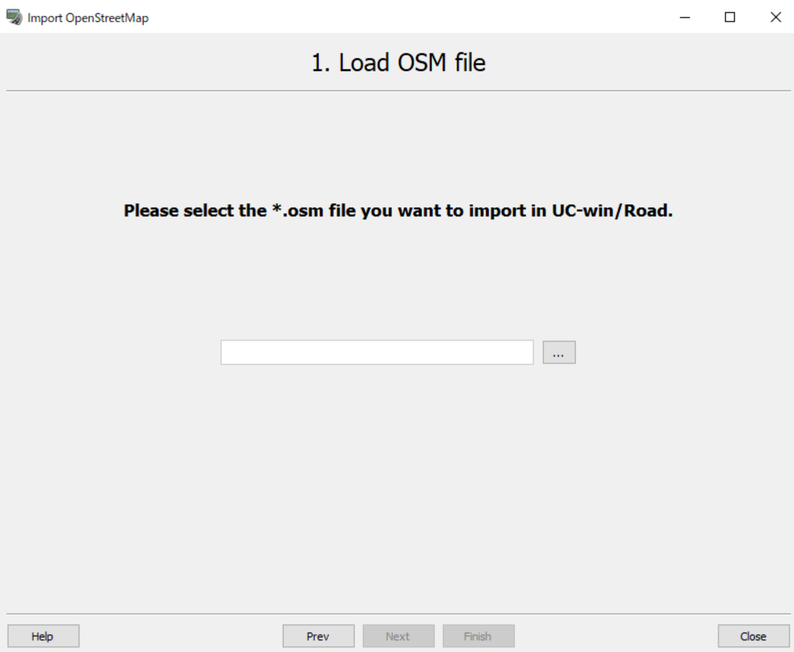
1. Export OSM data

Export map data (.osm) from OSM website).



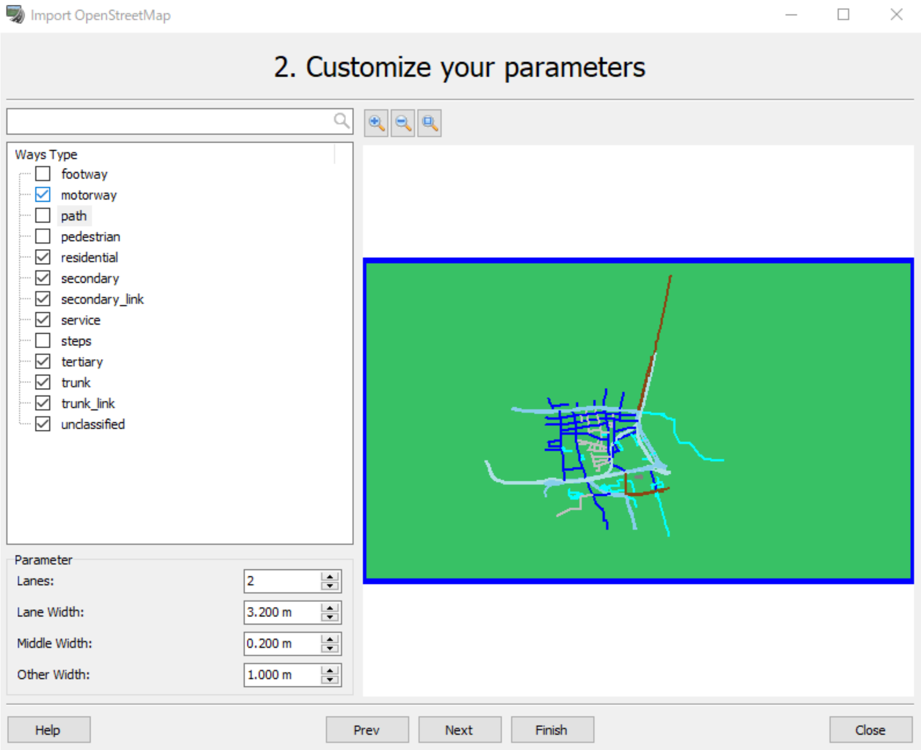
2. Load OSM file from OSM Plugin

Go to File – Import – Import OpenStreetMap Data....
Select a file imported from OSM website and then click Next.



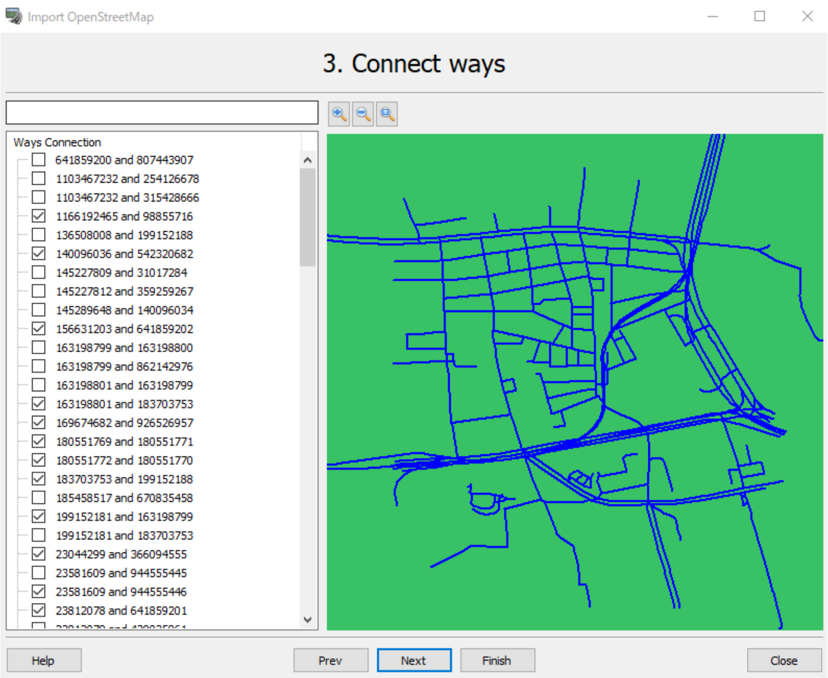
3. Customize your parameters

Set up default parameters for roads such as Lanes, lane's width, middle width, and other width as needed.



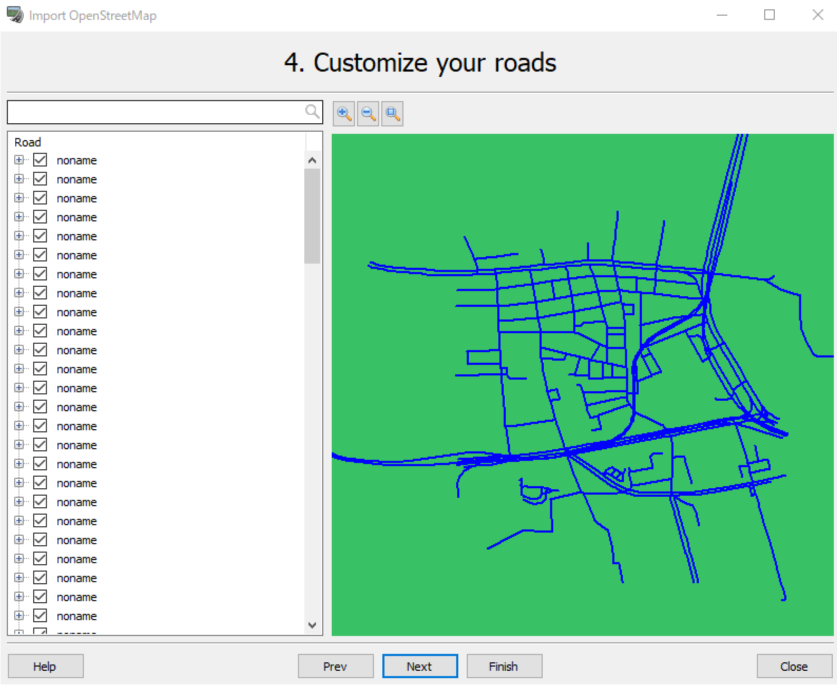
3. Connect ways

Connect road together in order to generate one road in UC-win/Road instead of multiple roads. Selected roads are displayed in red and orange. Clcik Next.



5. Customize road parameters

Change the names of road. Selected road is displayed in color. Whether the road is Two-ways or one way is also displayed.



6. Output

It is possible to import it to current project or save to LandXML

When it is saved to Land XML and loaded, the roads on OSM are reproduced.

OpenFlight Converter plug-in

The OpenFlight file format (PRESAGIS) is a file format to express 3D space. It has a database structure called scene graph and controls information such as 3D geometry, texture, position/direction, etc. for each node.
It is possible to divert 3D models created by OpenFlight format with this OpenFlight Converter plug-in.

The OpenFlight plug-in imports the "3D streetscape scene" created by OpenFlight format and exports UC-win/Road scene to OpenFlight format. The scene file of OpenFlight format exported by the other application can be imported to UC-win/Road.

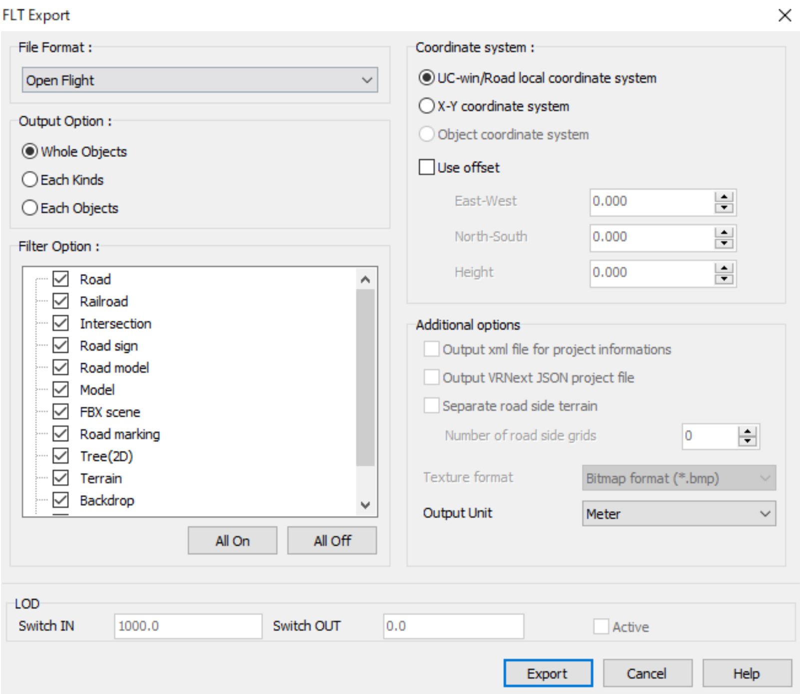
Operation flow

1. Activate

Go to File-License Manager, activate "OpenFlight plug-in"

2. Export FLT file

Open a UC-win/Road project and go to "File"-"Export" - "File" - "Export"-"Export FLT file...". Set up the parameters and click "Export" to export a UC-win/Road project data to the specified folder in FLT format.



3. Import FLT file

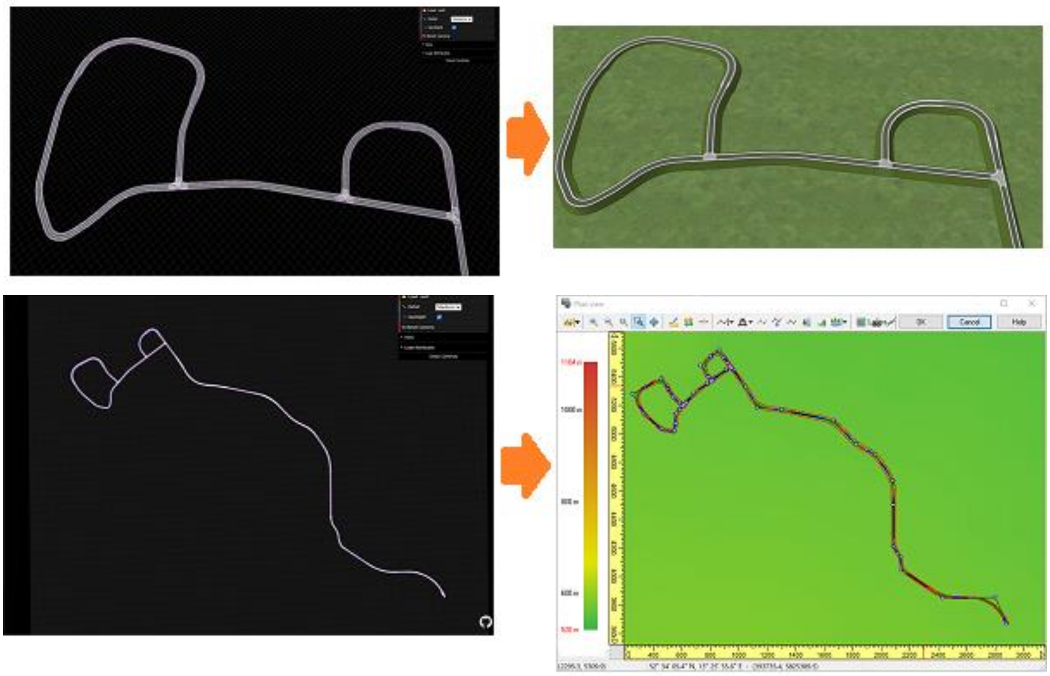
Go to "File" - "Import" - "Import FLT Model" to select a FLT file, and click Open to import the data into the UC-win/Road. The data is imported as a general model, so that it is possible to put the models on the VR space in the same way as the normal models.

4. Create a driving road

The imported OpenFlight model is recognized as 3D model in the UC-win/Road. Add a transparency road fitting with the road on the OpenFlight model and drive on it.

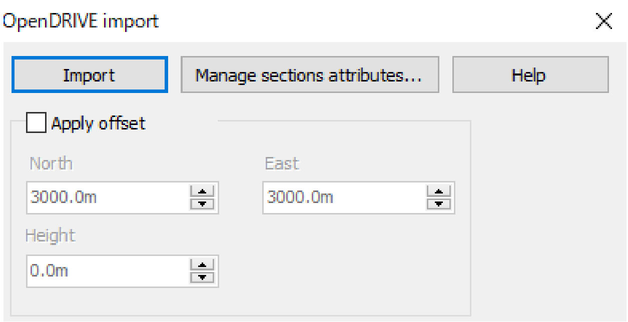
OpenDRIVE Plug-in

OpenDRIVE® is an international standard for highly accurate road networks for advanced automated driving promoted by ASAM (Association for Standardization ofAutomation and Measuring Systems). The data stored in an OpenDRIVE® file is the geometry of road objects such as roads, lanes, and road signs, and can also describe features along the road such as traffic signals.
The purpose of OpenDRIVE® is to provide a road network that can be used for simulation to develop and validate ADAS and AD functions. OpenDRIVE® allows road networks to be exchanged between different simulators, reducing road network file creation and conversion costs.
OpenDRIVE® version 1.7.0 is supported.



Operation flow

1. Go to File – License Manager and activate OpenDRIVE® Plugin.
2. Create a project and go to File – Import – Import OpenDrive…
3. Set up the parameters.



4. Click Import and select a OpenDRIVE file to start importing.

After import

If the imported data contains junctions, generate manually intersections after import. See Help for details.

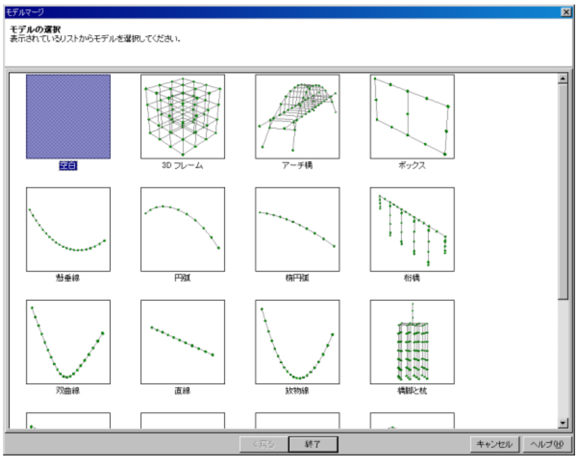
FORUM8 Products (3D Model Creation)

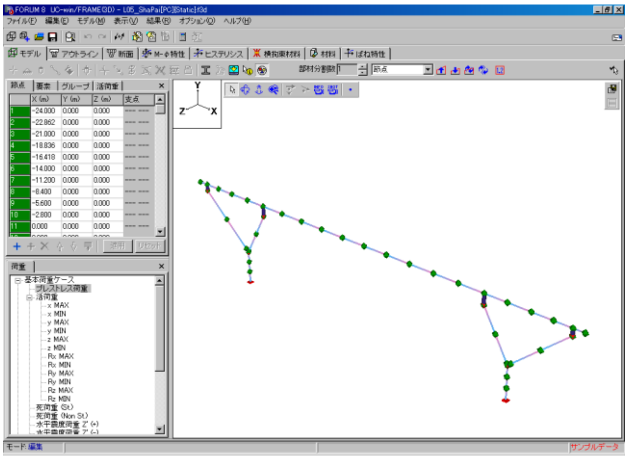
1. Create models by UC-win/FRAME(3D)

The model data which is created in UC-win/FRAME(3D) can be loaded in UC-win/Road.

1-1. Create a flame shape

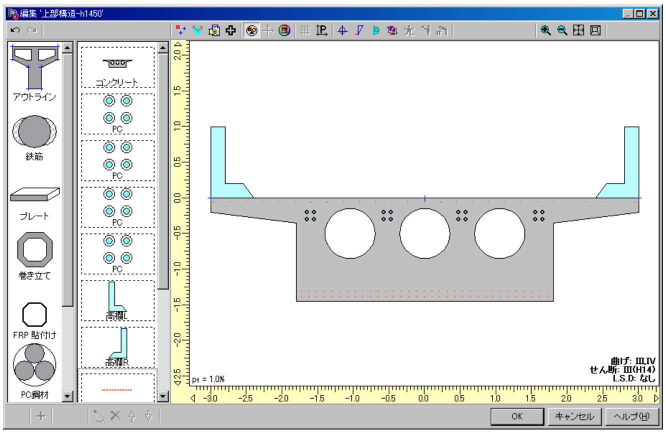
Left: Select a basic pattern, enter the arrangement shape size, and create automatically the node coordinates and elements.
Right: The node coordinates and the elements can be cut and pasted using Excel spread shee

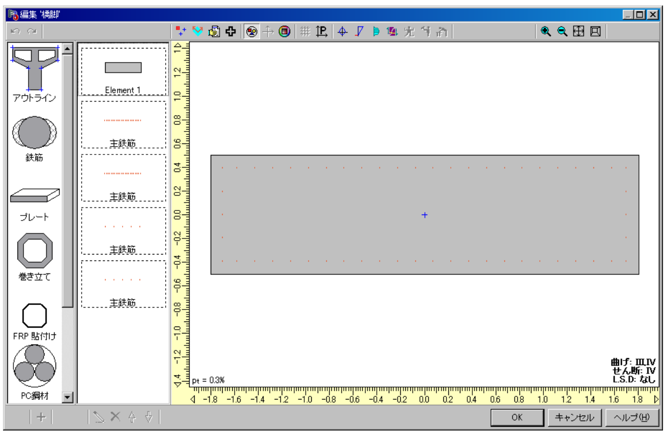




1-2. Create the section shape

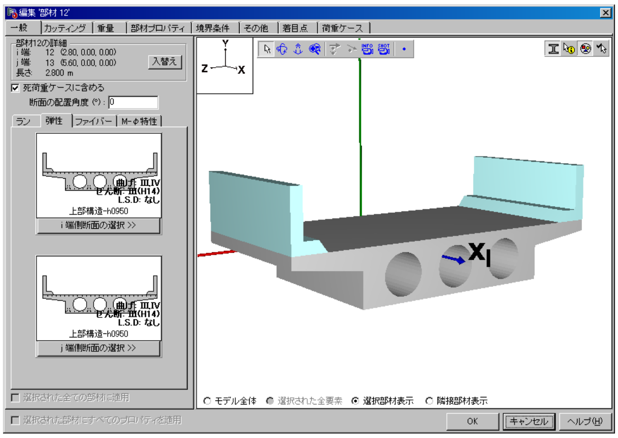
Enter a geometrical shape using the section form template, and create a section. It is possible to generate various shapes by combining several forms.
【Creating section shape 1】The superstructure section 【Section shape creating 2】The diagonal section

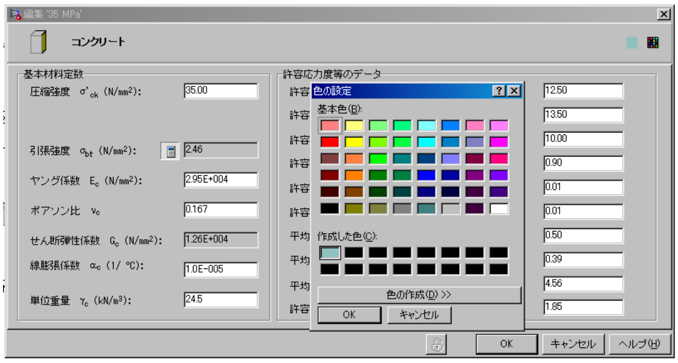




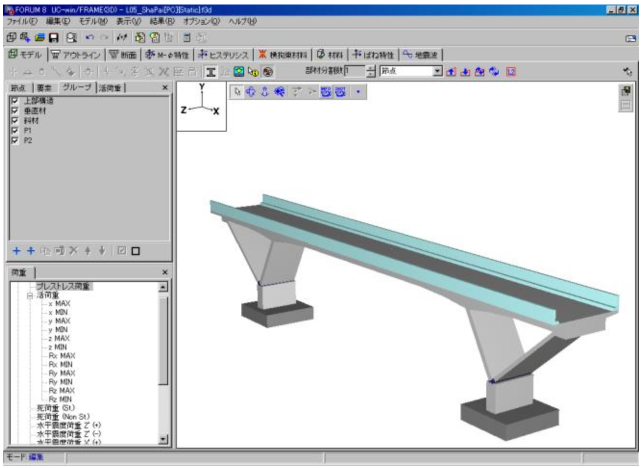
1-3. Define the section shape and set the color

Select an element and define the section

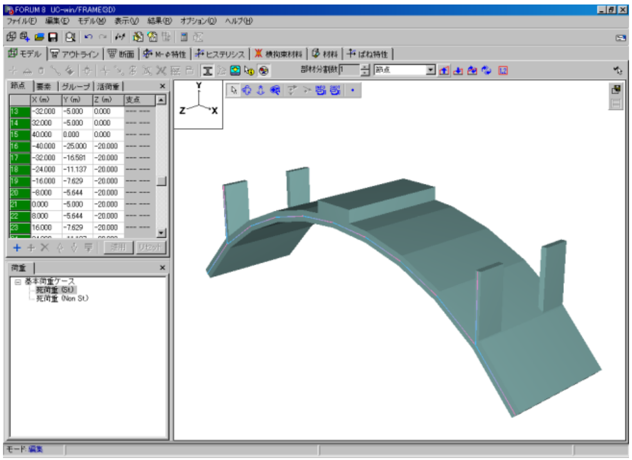


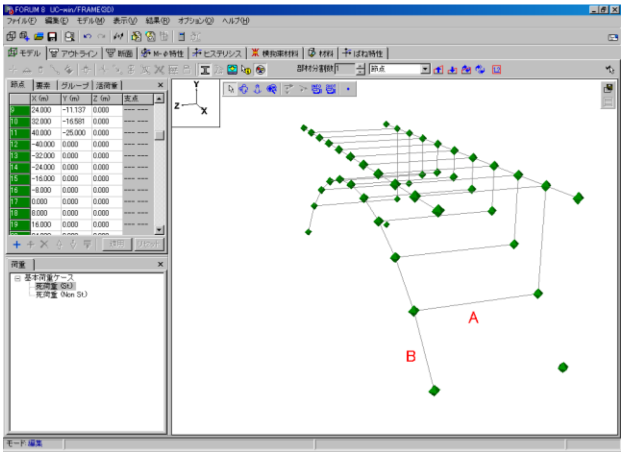


After definition, save the 3ds file from "File"- "Export".

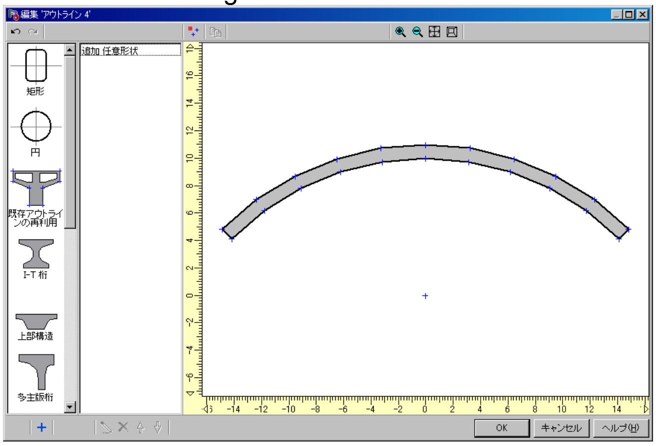


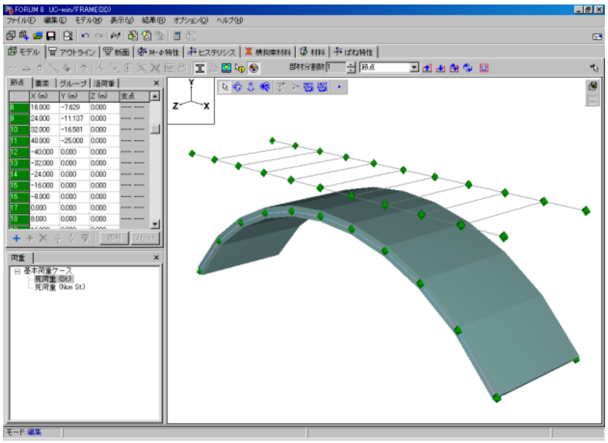
Hint: Depending on the model shape, define the flame and section form better.
For the arch model below, define a section focusing on A component instead of B.





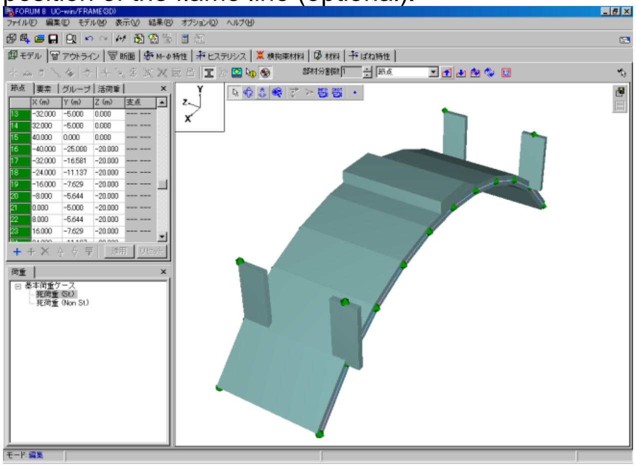
Create the following section and define it.

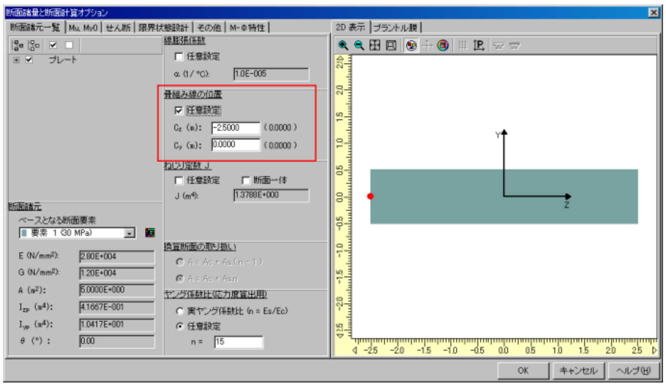




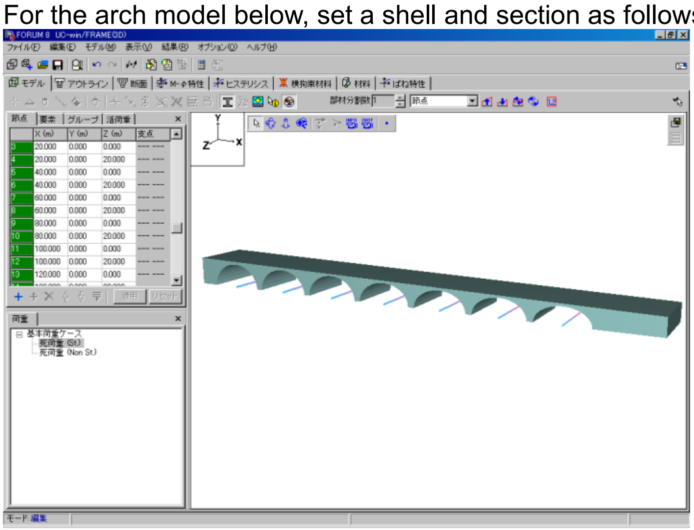
When loading a model in UC-win/Road, it is separated into layers of components. Therefore, do not define unnecessary components. When an unnecessary layer is created, it can be integrated using the other modeling tool.

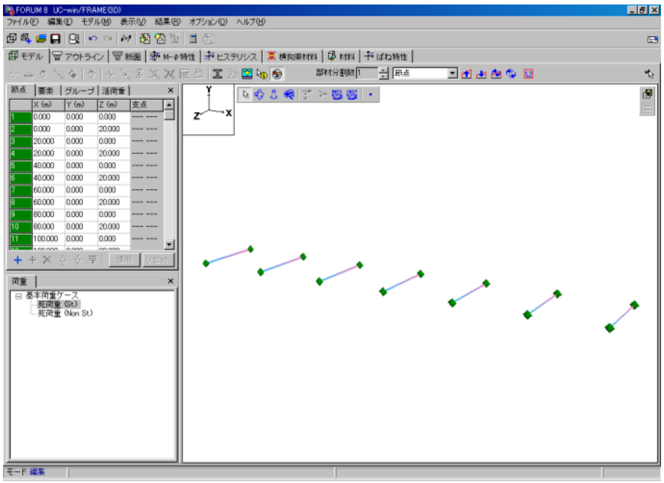
When the section shifts from the flame position, the differences in the section can be adjusted by setting the position of the flame line (optional).

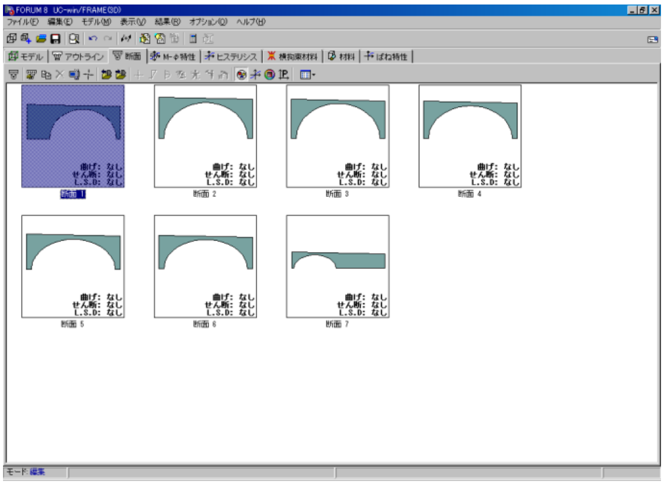




For the arch model below, set a shell and section as follows.

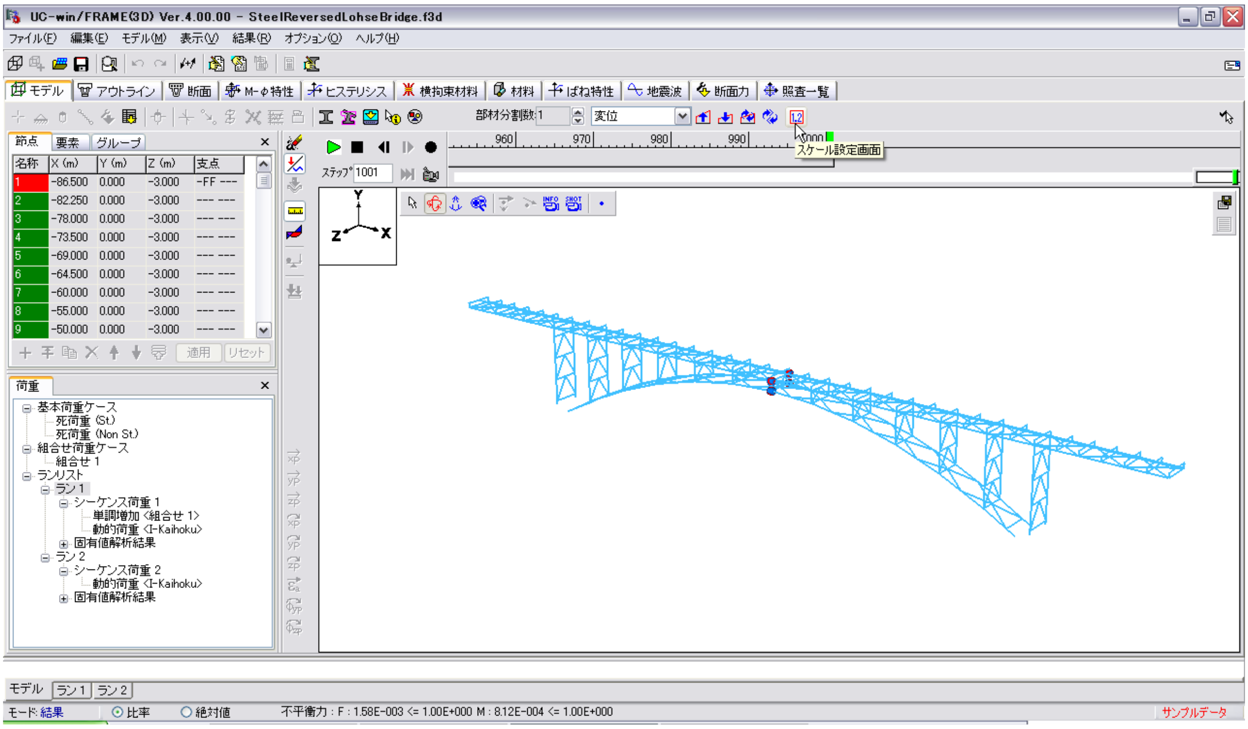




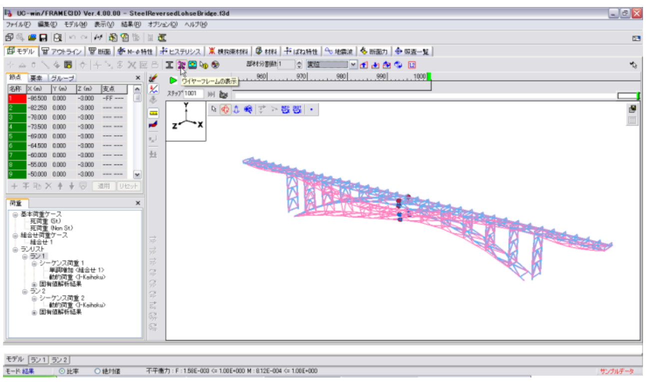


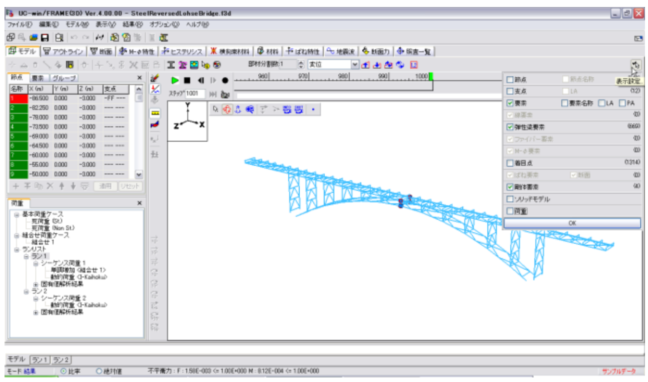
The model after transformation can be output.

Click  after frame calculation, and then click  .

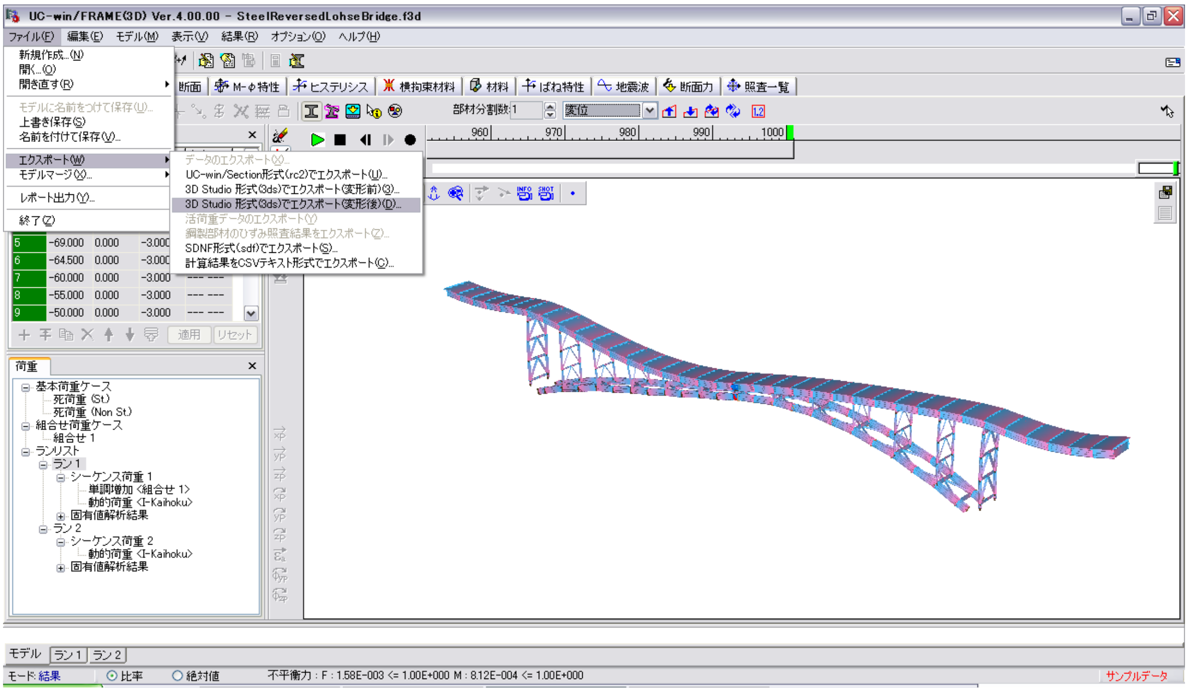


The model before transformation can be hidden by clicking Display wireframe. And the elements to display can be selected.



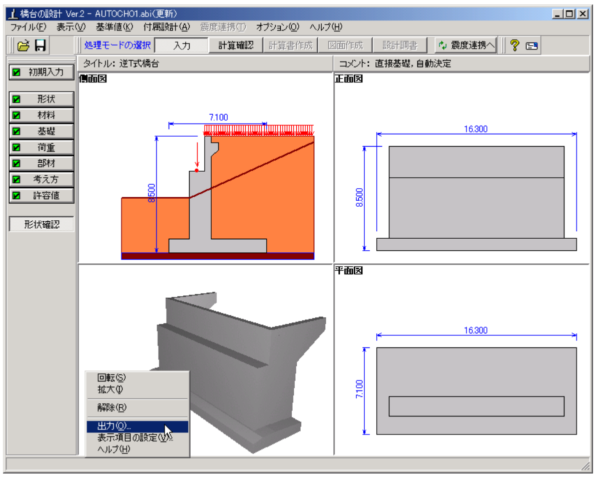


Click Display solid model to export the model before transformation.
Then load it to UC-win/Road.



2. Creating models in UC-1 series

Right click on 3D screen, and click "output", then select 3DS as the file type.



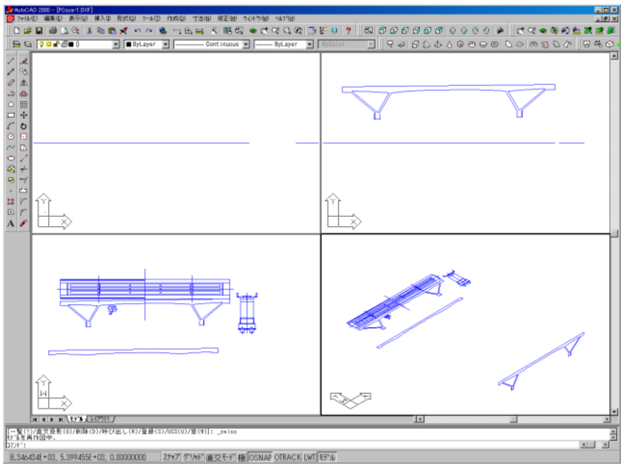
At present, the compatible FORUM8 UC-1products for 3 dimensional file output are followings:
Pier design, Abutment design, Box type abutments design calculation, RC substructure design calculation, Pile foundation design, Foundation design calculation, Temporary sheathing work design, Temporary piled jetty design, Double-wall cofferdam design calculation, Box culvert design, Retaining wall design, Slope stability analysis, Manhole design calculation, 3D landslip slope stability analysis (LEM), UC-Draw Tools

3D model creating software

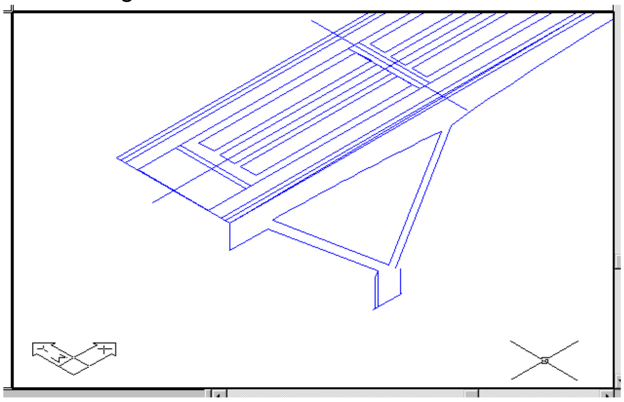
AutoCAD

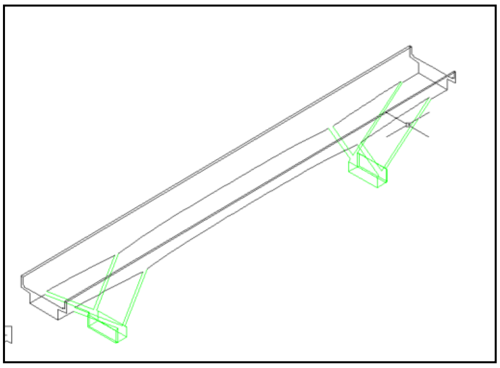
(1) Using a DXF file

1. Go to "File" - "Open", and select DXF file from "File type".
2. Go to "Display" - "Viewport" - "4 Viewport", and set the display screen.
   Set each window to active, and click "Settings" → "3D View" → each view (the side, the front).
   *As the screen which loaded 2D DXF is set to a plan figure, change the viewpoint to the side, front, and 3D (the southwestern isometric-drawing etc.)
3. Move / Copy each figure to each viewpoint.
   1) Select a figure to move (copy), and click "Edit" → "Copy" of the drop-down menu.
   2) Select the position to move (copy), active (click with a mouse), and select "Edit" → "Paste" of the dropdown menu. Arrange to the optional position.
   *When moving (copying) the figure to each viewpoint, "copy" command of Auto-CAD cannot be used.

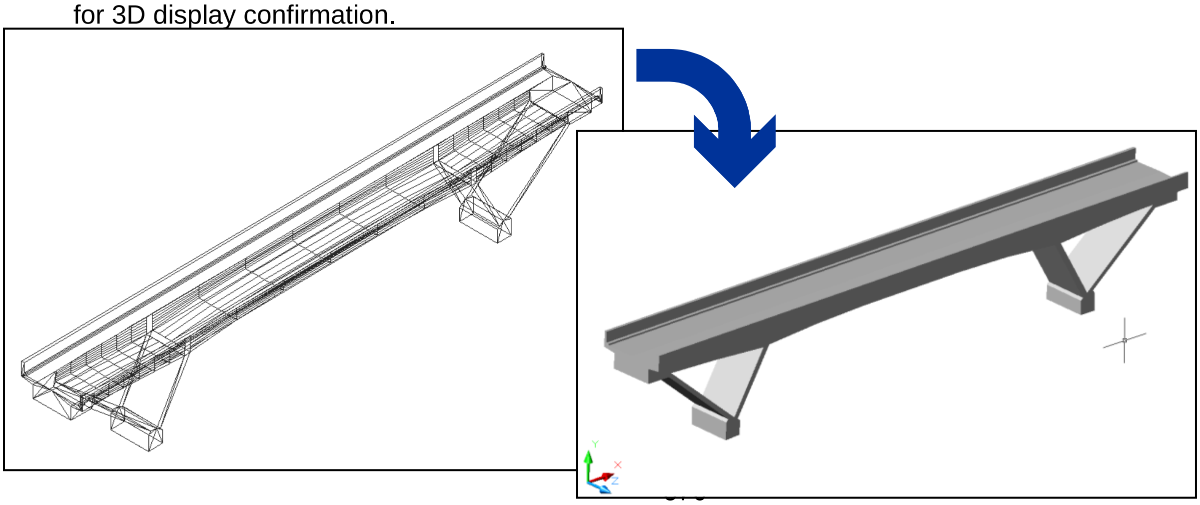


4. Delete the unnecessary figures and lines from the plan figure, and create the intersection point in 3D view by using "move command".

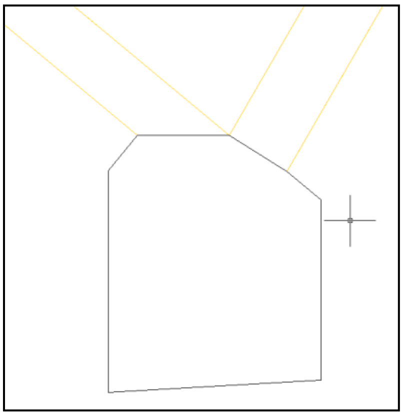
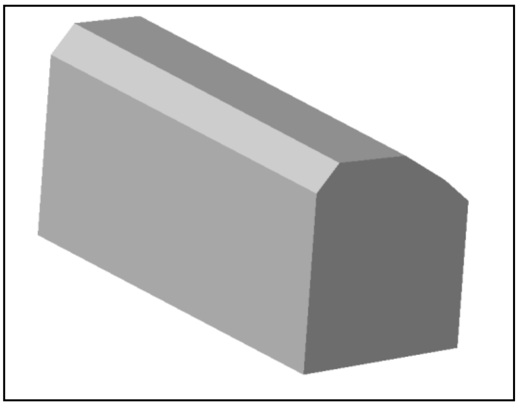




5. Click "Create" - "Surface" - "3D mesh" or "3D face" and define each 3D face. "Display" - "Rendering" is used for 3D display confirmation.

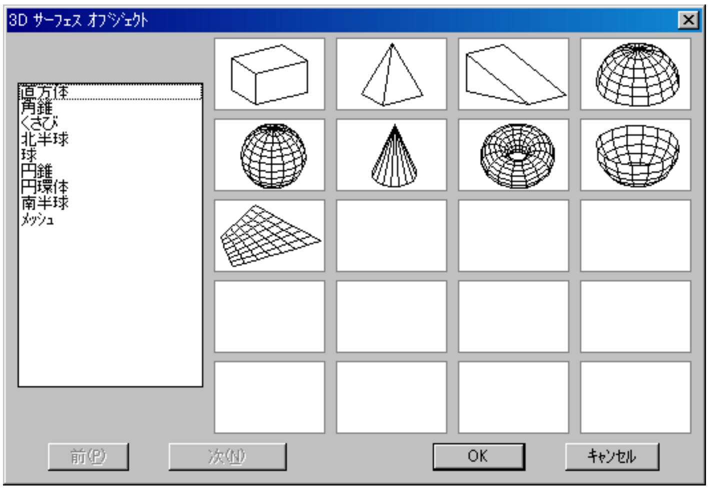


6. It is possible to create 3D through the use of a polyline and depth specification if the diagram is level with some surface.

(2) Using AutoCAD 3D creating tool

Auto-CAD also supports 3D shape commands such as cube, cylinder, etc.



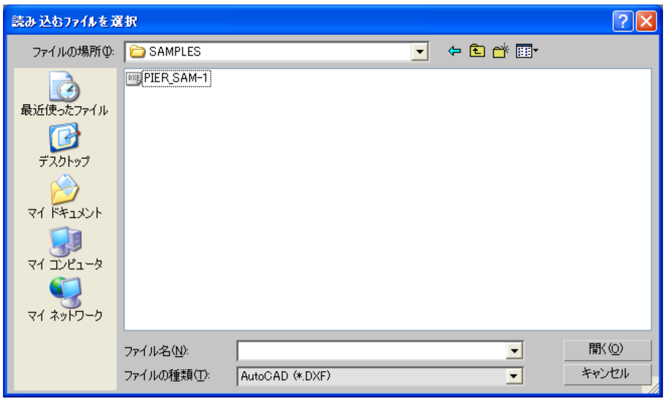
(3) Save to 3DS file

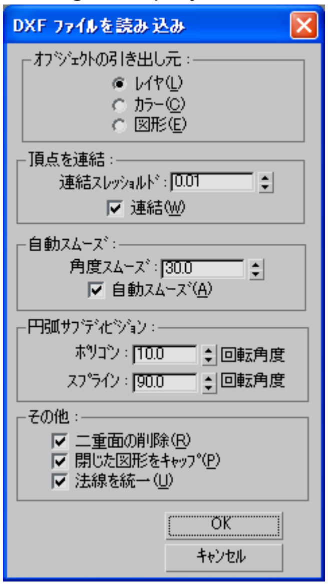
Select the range to convert to 3DS, select 3DS as file type and go to File - Output, and save it.
*The unit of UC-win/Road is "m". When creating by "mm" with Auto-CAD, reduce it to 1/1000 before converting (save to 3DS format), or reduce to 1/1000 after reading with UC-win/Road.

3ds Max

(1) Using DXF file created with CAD

1. Go to File – Load, and select a DXF file. "Load DXF file" dialog is displayed, but click "OK" button as the default.



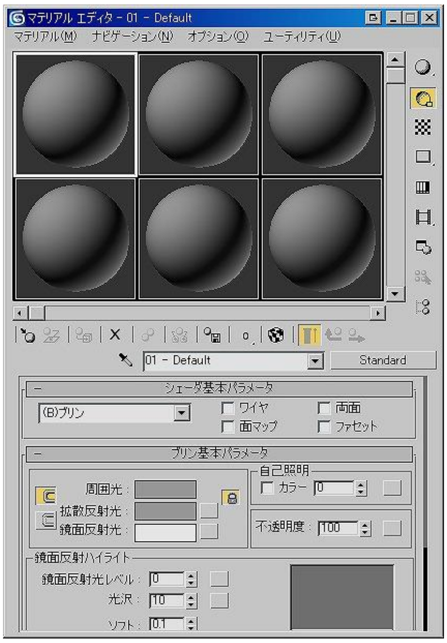


2.Select "Object" from the tab panel or create using the menu from the list.

(2) Paste the texture

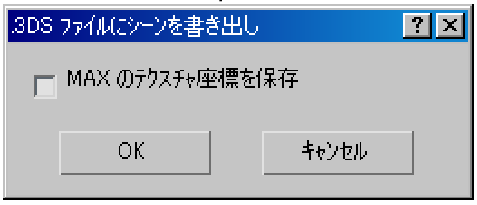
1. Select the "Select by name" button, and while using the "Ctrl" key, select multiple objects with piers selected and click on the "Select" button.

2. When "Rendering"-"Material Editor" is selected, the dialog box of the left figure is displayed. Many spheres can be seen and the sphere within the white frame is in an active state.
3. Refer to the folder which the texture data is saved with Windows Explorer. Drag the texture data to be pasted and drop it on the active sphere. The texture data which was dropped on the sphere is displayed.
4. Click "Allocate the material to the choice"  of the material editor, and close "Material Editor" dialog box.



(3) Save to 3DS file

Go to File – Output and save it. Uncheck "Save Max texture coordinate".



To load the model with pasted texture from UC-win/Road, it is necessary that the saved model and texture data are saved in the same folder.
When saving the model with pasted texture, the maximum length of name of the texture data is 8 characters as it is essential that texture data must be in "8.3 format".

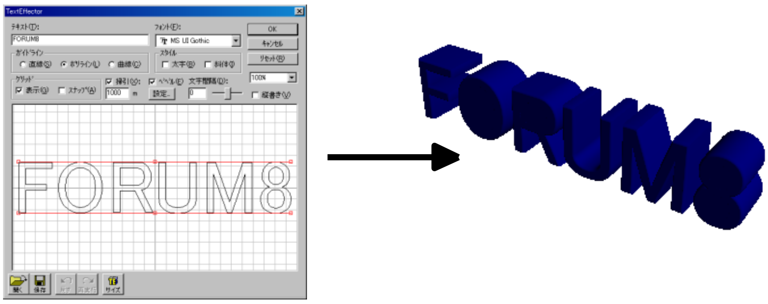
Shade

(1) Create a model

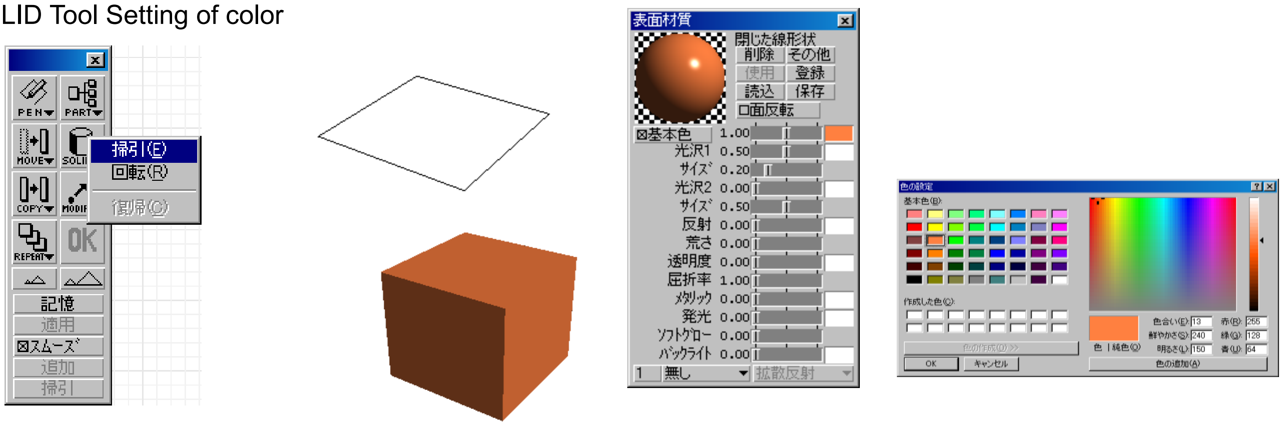
Use the tool box in shape creation.

PEN Tool

Text Effectors



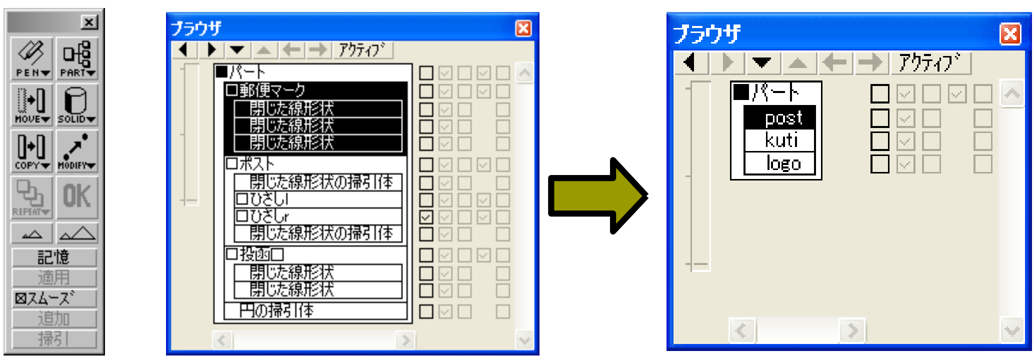
SOLID Tool Setting of color



(2) Save to 3DS file

With UC-win/Road, settings for color and display/ hide functions are done for every layer. When creating a model with Shade, it is necessary to set a layer in the following procedure. (In direct conversion to 3DS, the layer is created for every created element)

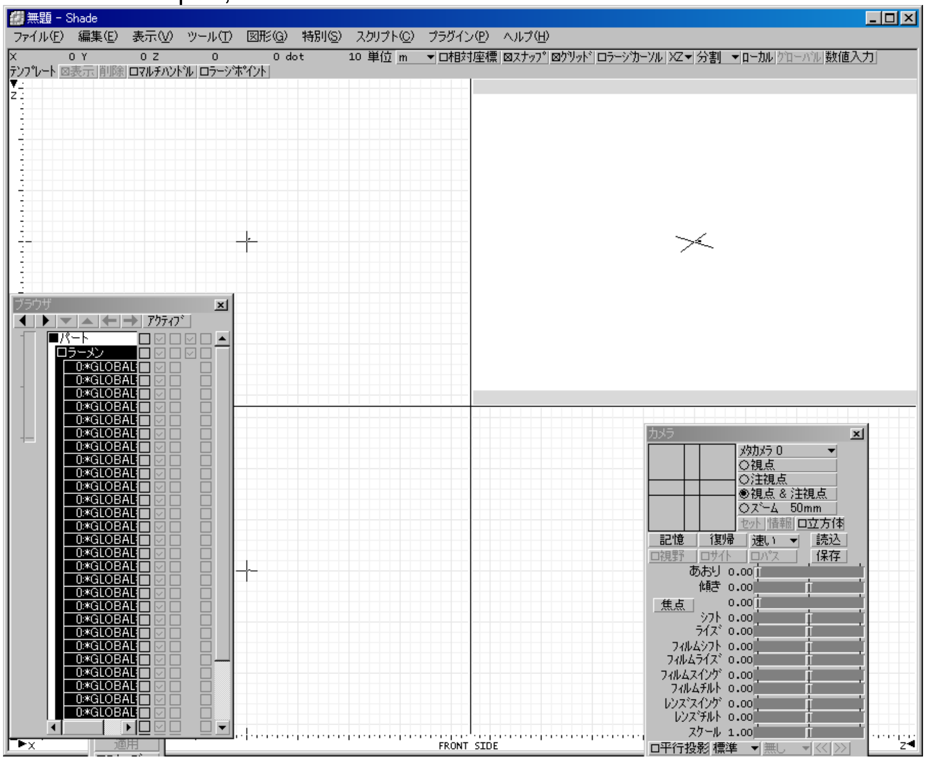
1. Select every parts to classify, and export by clicking "File" → "Export" → "3ds".
2. Import the parts which has been output in the new creation screen.
3. Select "File" → "Import" → "3ds".
4. Select each part perform polygon conversion. Click "Modify" → "Convert.

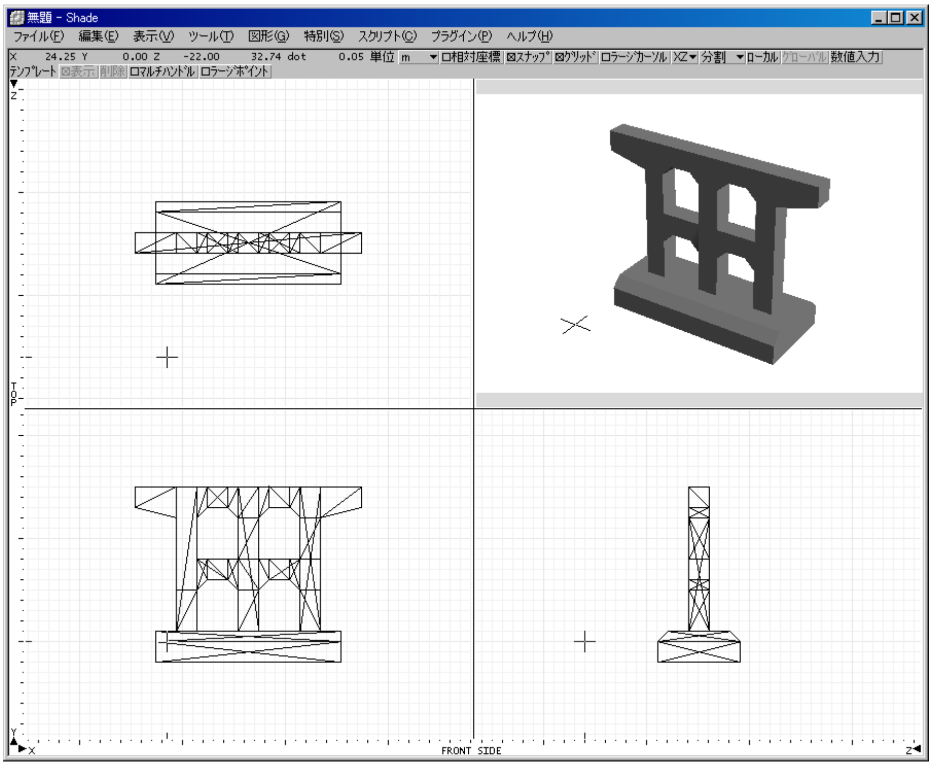


5. Select all and re-export by clicking "File" → "Export" → "3ds"

(3) Uing 3DS file

Go to File – Import, and choose a file to load.

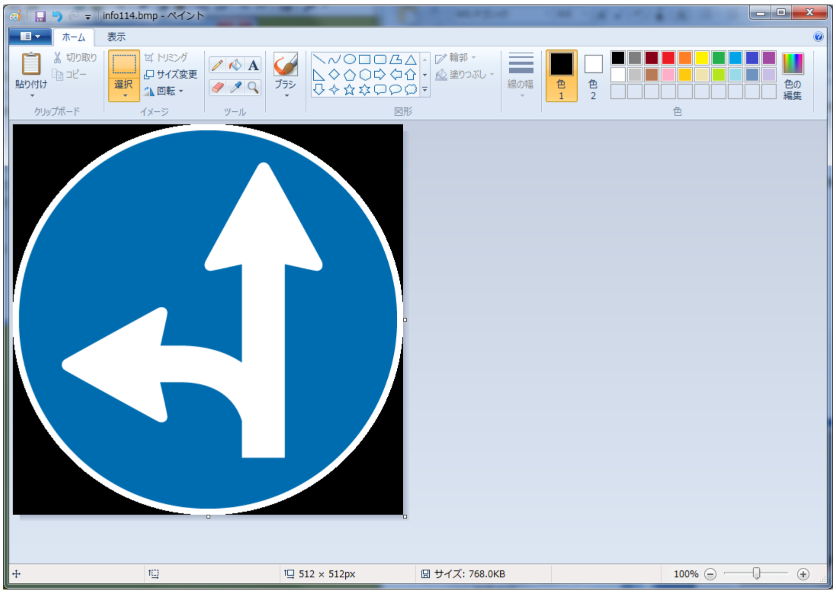


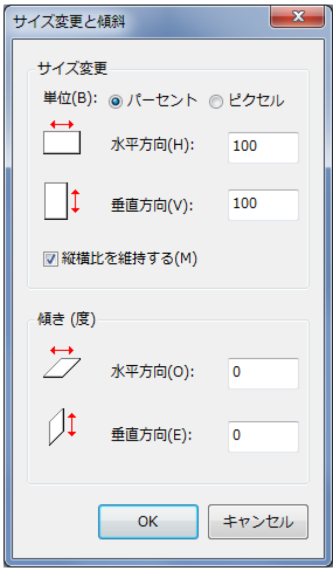


Texture Creating And Editing

1. Windows Paint

1. Open Windows Paint application.
2. Change the size or rotate the picture.



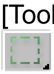


2. PhotoshopNew creation

Create a new file

1. Specify the size from "File" - "New".
2. Draw or edit with the following tools.

[Tool Box]

 Choose: Choose an area.

 Move: Move a range.

 Free choice: Specify a range freely with free hand.

 Auto-select tool: Choose the range (the red flower etc.)which a color is uniformly put to even if it didn't trace out lines.

 Clipping tool: Remove the part of the image to create the focus and the emphasis part of the composition.

 Correcting brush tool: Correct the incomplete part and match it with the image around.

 Brush: Paint with brush.

 Stamp: Create the copy of the image.

 Eraser: Restore the part of the image.

 Fill: Fill in color.

 Shade: Shade a cleared part and an edge of image.

 Text: Enter a text.

 Pen tool: Create or edit the line and the shape of the straight line, the curve or the free-form.

 Drawing tool: Draw a rectangle, a circle, a line etc.

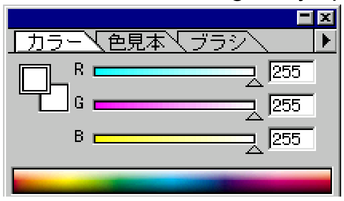
 Syringe: Copy the color.

 View: Move the image.

 Expand/Reduce: Expand/Reduce the view of the image

[Changing color]

Colors can be changed by specifying each color number or choosing from a color sample.

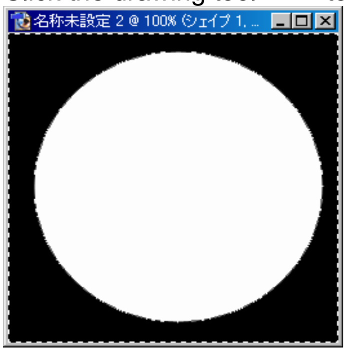


Create a sign

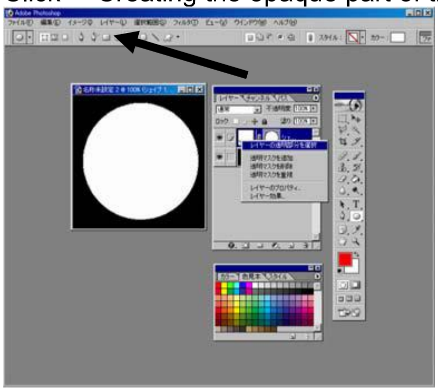
It is possible to process in the penetration by making a background color black.

Use "Fill", and set the background color black.

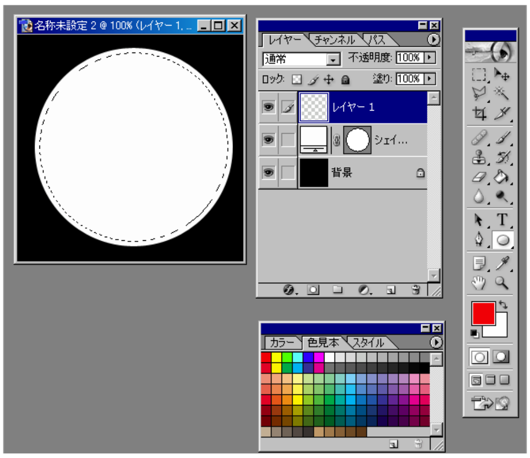
Click the drawing tool  to open the menu bar. Choose "Oval tool". Press shift key and draw a circle.



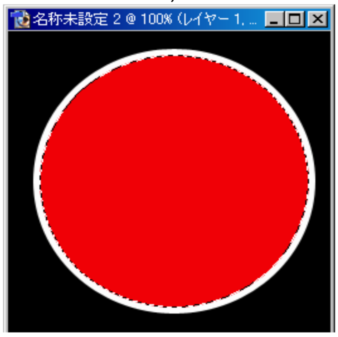
Click "Creating the opaque part of the layer" from the dialog.



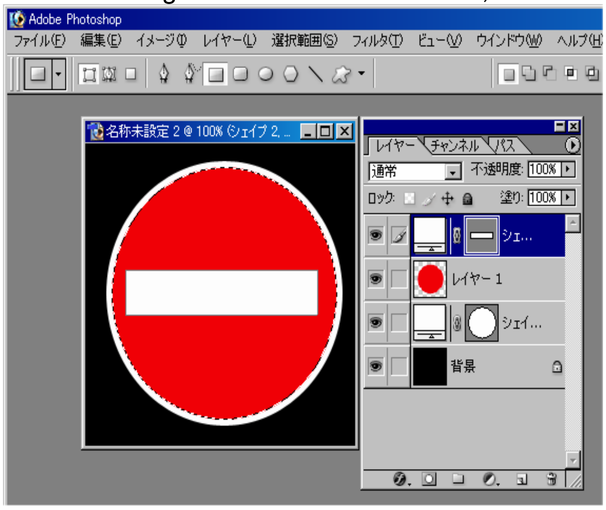
Go to "Choosing range " -"Change the choice range" - "Reduce the choice range", and create a layer from "Layer" - "New Layer".



Choose “Red”, Click "Fill"  .

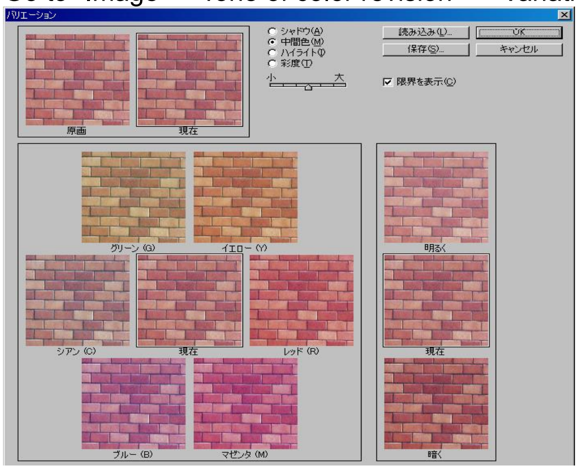


Click "Rectangle tool" from the menu bar, and draw a rectangle.



Change the color of whole texture

Go to "Image “ -”Tone of color revision “ - ”Variation".



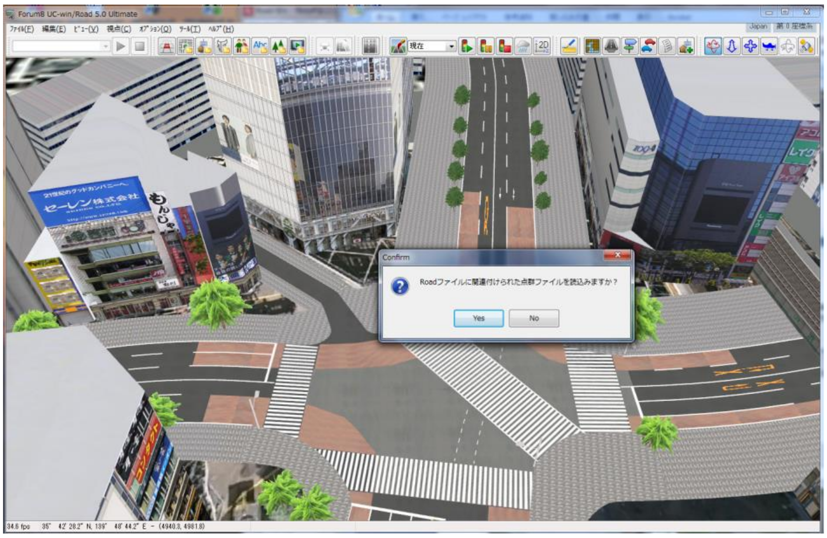
Practical

Point cloud modeling plugin

The point cloud modeling plug-in is the plug-in that import and utilize the millions of point data counted in the field by 3D laser scanner (High accurate GPS mobile counting system) into UC-win/Road. Furthermore, it is possible to import point cloud data collected from a mobile 3D laser scanner, MMS (Mobile Mapping System), to UC-win/Road to create road alignments (horizontal curve, vertical curve, road section curve) or extract and edit road section from an arbitrary point.

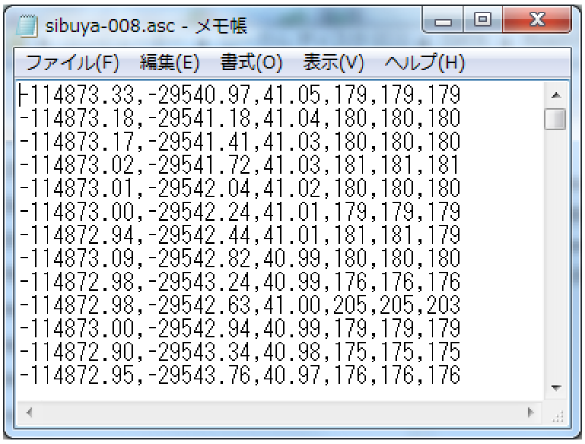
・Import more than 50 million point cloud data (Note: the amount of point cloud data that is importable depends on the PC hardware capacity)
・Extract coordinates and color information from the point cloud data which are recorded in text or CSV format

Note：Point cloud data is not saved with the UC-win/Road data, therefore, the point cloud data is not included in the UC-win/Road data file (.RD). However always keep the UC-win/Road data file and the point cloud data file together in the same relative folder tree.



File format

This is an example of the file format for the point cloud data. Data is divided by comma (,), and decimal point character is period (.).

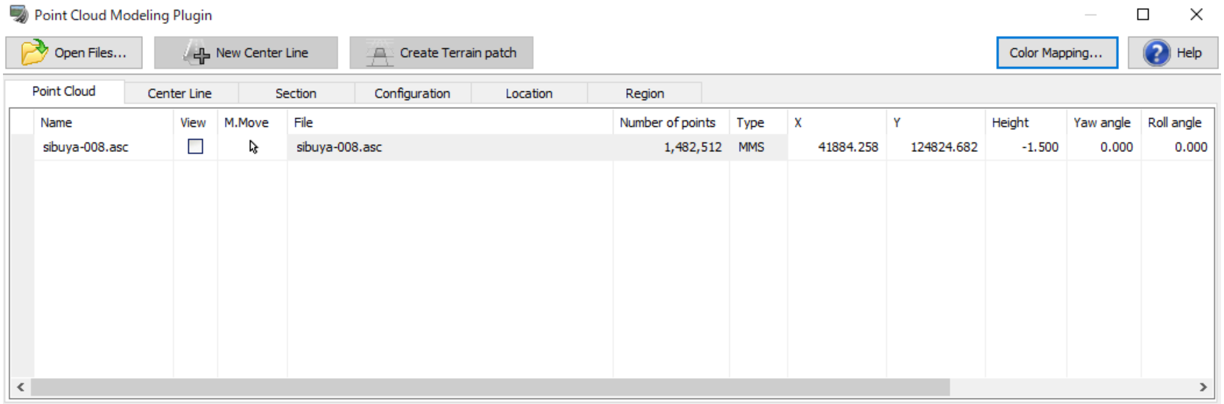


In the point cloud data file, a line shows the information of a point. This plug-in extracts the below data in that csv data
・x coordinate　・z coordinate　・y coordinate(height)
・r value(red constituent)　・g value(green constituent)　・b value(blue constituent)

Load Files

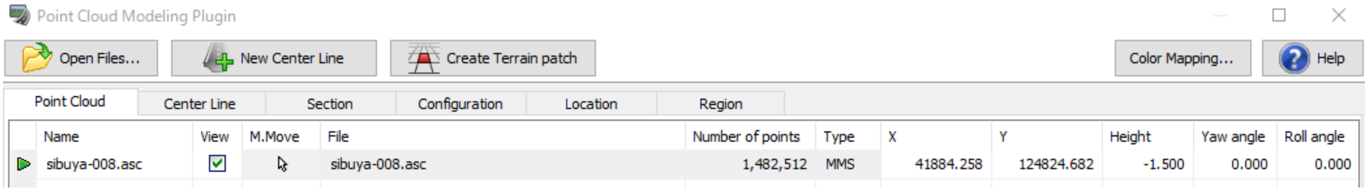
Go to Poing Cloud – 

to import (a) files recording the point cloud information.



Setting of white cell can be changed by placing the cursor over and pressing Enter key.

Name: Display the name of the point cloud data. It can be renamed by pressing Enter.
View: Choose whether to display the point cloud model in the main view. Uncheck the box to hide the model.
Move: Lock or unlock the model using the padlock icon. When locked, the positions and the angles of the model cannot be edited in the main view.



File: Displays the full path and file name of the point cloud data.
Number of points: Indicates the number of points imported.

Type: Indicate the scanning method. Select a scanning method from the settings form opened from Settings button in advance. Normal indicates that the data was collected using a fixed equipment while MMS indicates that a mobile device was used.

Origin X, Y, Z: Display the coordinates of the point cloud data in meters. These coordinates are not based on the coordinate system within the UC-win/Road environment, but it is based on a coordinate system where the center of the point cloud is assumed as 0. The unit is m.

Angle: Indicate the angle of the point cloud model. The unit is Degree.

Delete: Delete the selected point cloud data.

●Coordinate of Point Cloud data
This plug-in adjusts the center position to move onto the center of the terrain map for x coordinate (east - west) and z coordinate (north - south). But for the y coordinate (Height), the height of the center position should be 0 m. So it is required to move the data to specified origin x,y,z by the Point Cloud Modeling Plug-in form. And the angle of data should be also adjusted in Angle.

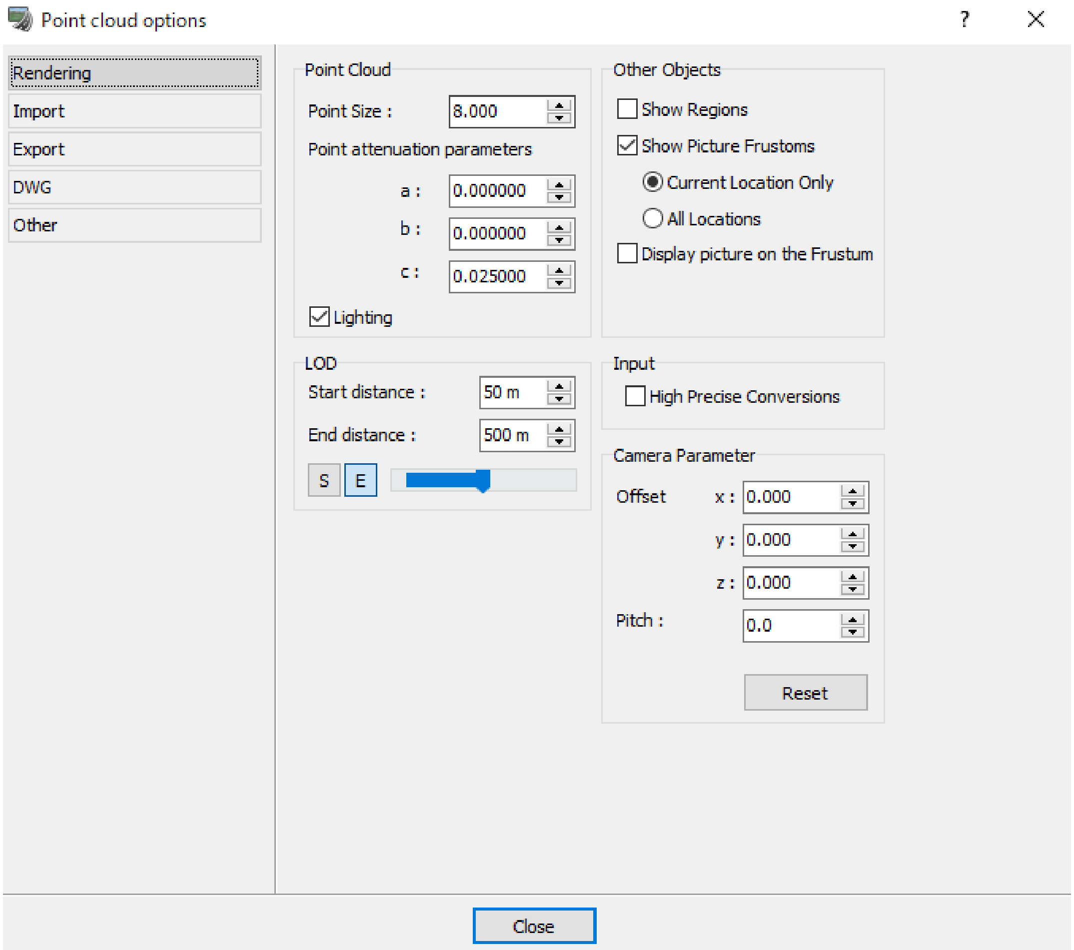
*When loading the point cloud data, the Origin Y of the model is 0m. So if the current terrain is higher than the modeling data, the modeling data is under the terrain. Then, even though the eye position is moved by shown later, there is sometimes not the case it is possible to confirm the model. In that case, set the Origin Y by which the model should be on the terrain.

*If one cloud data is divided into the more than one data, load them at once. If loading one by one there is sometimes that those position are not matched with each other because the position is calculated by the file one by one.

Settings

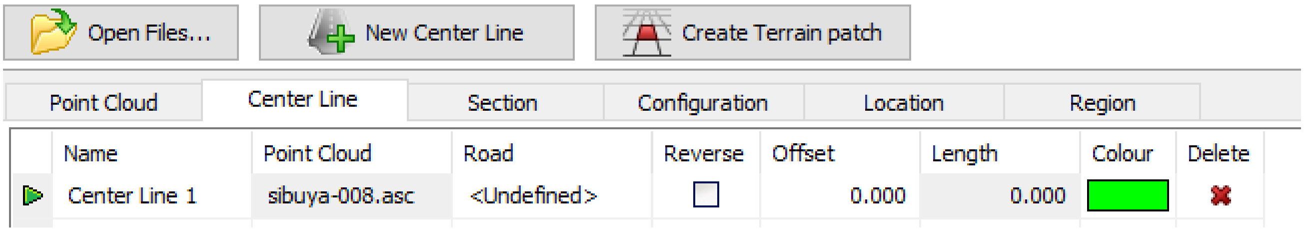
Click 

to open the setting form.
Settings for drawing, import, export, and DWG. Please refer to the help file for details on the settings.



Center Line

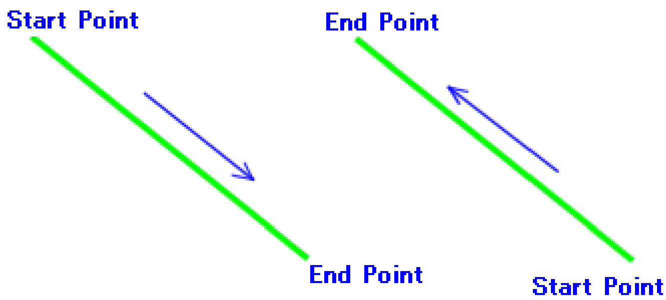
For point cloud data by MMS (Mobile Mapping System), there is a function to help generate road shapes and sections. It enables to generate high-precision roads in a short time from the point cloud data.
Click 「New center line」 button to show information such as a name of an analyzed center lines. White cells can be changed by meeting the cursor on the cell and pressing the Enter key



Name: The name of Center line. It is possible to rename it.
Point Cloud: Name of point cloud data.

Road: If a road has been created for the selected center line, the road name will be displayed here. However, if no road is associated with the center line, <Undefined> will be displayed here.

Reverse:If an analysis of the road of the point cloud data has been carried out using the New Center Line button, the start and the end point will be defined automatically. The horizontal line will need to be defined in the same direction as of the direction used in the analysis. If the direction was defined wrongly, checking the Reverse box will correct the direction of the vertical line.



Offset: Input the offset in meters, if the start position of the road is different from that of the center line. The unit is m.
Length: Display the length of the center line.
Color: Select the color of the center line when shown on the main form and in the plan view. Press the Enter key to edit the color.
Delete: Click on the X to delete the selected point cloud data.

Slide bar: Move the focus point from start point to end point on the center line. For the focus point, the shape of road section (scanning plane) is shown by line with yellow color.

(1) Definition of the Center Line

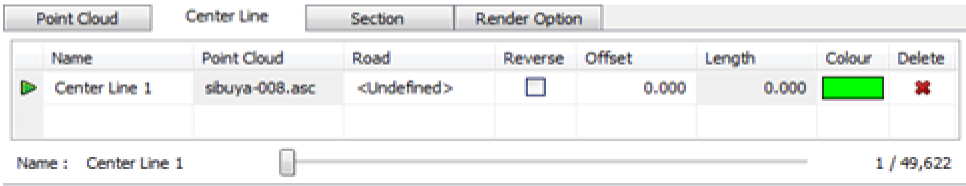
Double-click the point cloud data generating a road to select the point cloud data of the road and click to the button, **New Center Line**. It analyzes the characteristics of MMS point cloud data and estimates the following:
・The possible position of the road
・The road section shapes from the start of the road to the end of the road (scanning plane)

If the analysis is successful, the analyzed road information is added to the table. However, if there is noise, lacking data in the loaded data or if the data format is not MMS, it may fail to estimate the position of the road and the road section properly. In these cases, create the road manually.

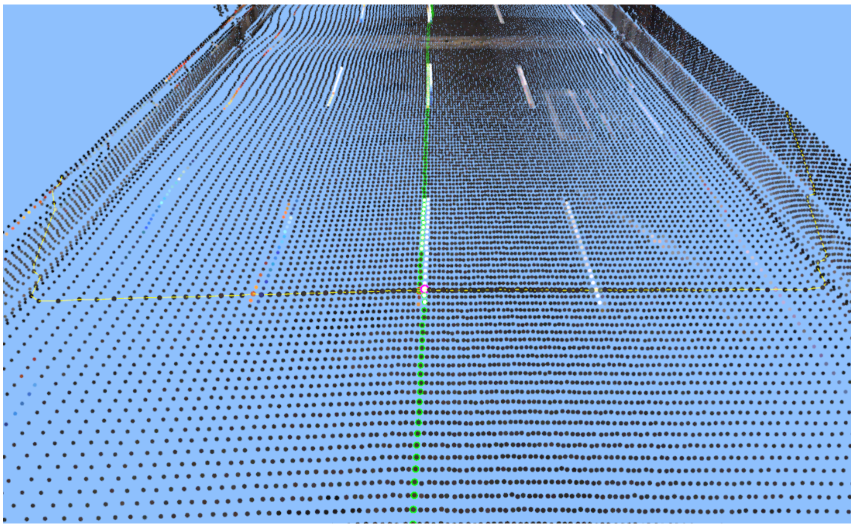
First, using the slide bar shown in the red box (see below image), move the camera to the road in question.
・The left end of the bar・・・represents the beginning of the road

・The right end of the bar・・・represents the end of the road

By moving the bar, the yellow line (scanned plane) in the main form is displayed. Sometimes, the plane is not shown properly due to the presence of noise or obstructions such as cars in the scanned data. When this happens, please move the bar to the position where the yellow line can be seen. If the yellow line is still not visible, moving the camera position in the main form may make it visible.



If the plane displays the possible road section properly, move the mouse cursor onto the line in the scanned plane to set the center line. In the below example, center of the white line for one way of the road is set. By moving the mouse cursor to the line on the plane, the color of the point changes to pink.

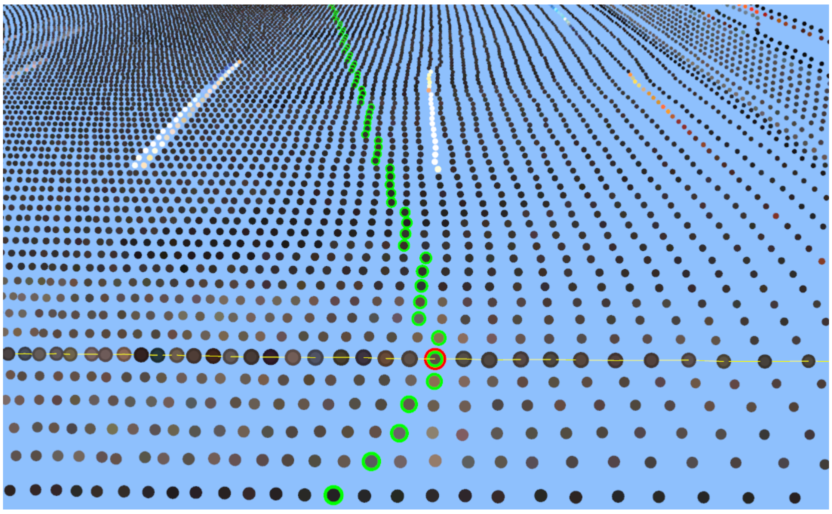


(2) Adjust the center line

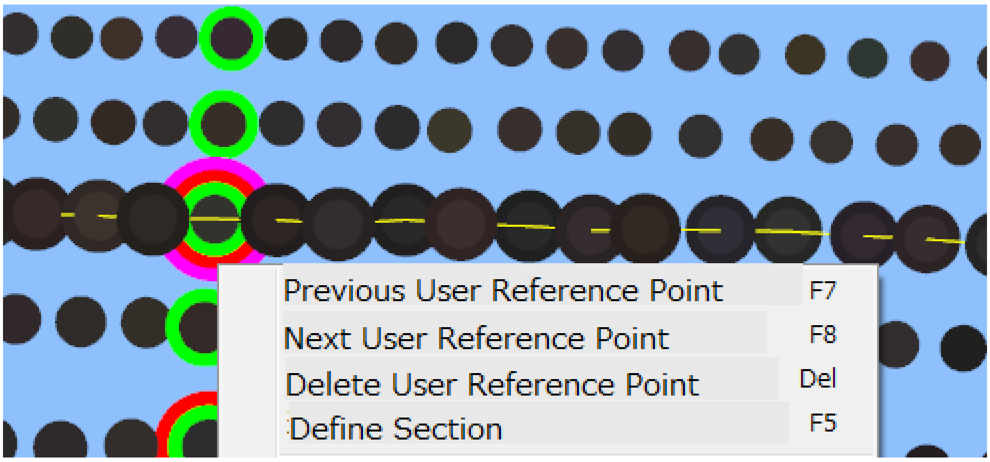
Having estimated the center line, the analysis of the point cloud data is done and the position of the dot sequence of the center line is estimated. The center line is shown in green initially, so using the slide bar in the Center line tab, check the position to adjust.

Sometimes, the center line is placed at the wrong position. If this occurs, first, click on the center line to adjust the position, so the plane (the below yellow line) is shown there. Then click where the mouse cursor is on the line of the plane to estimate the center line again and this moves the new center line there.

Double-click where the mouse cursor is on the center line to set the reference point. If the reference point is set (as shown in the below image) the previous or the next line which passes through the point is set. Please adjust the center line with the reference point added. The reference point is highlighted in red.



Right click to bring up the popup menu, where the reference points that were placed previously can be deleted, and where the selected points can be moved to the previous or the next reference point. And the reference point is shown highlighted on the main form.

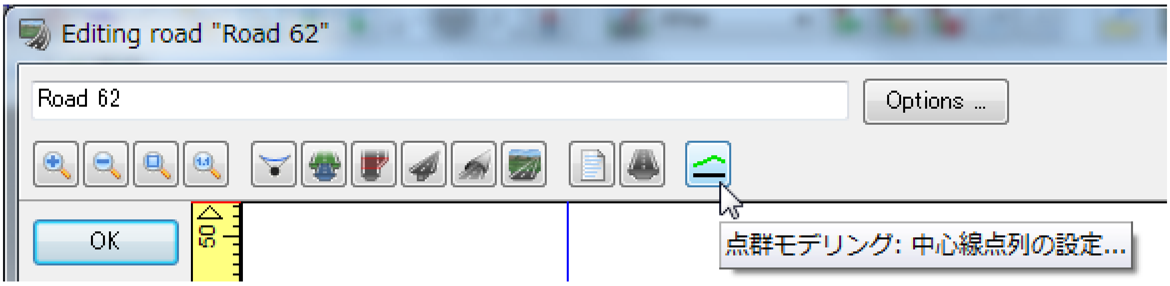


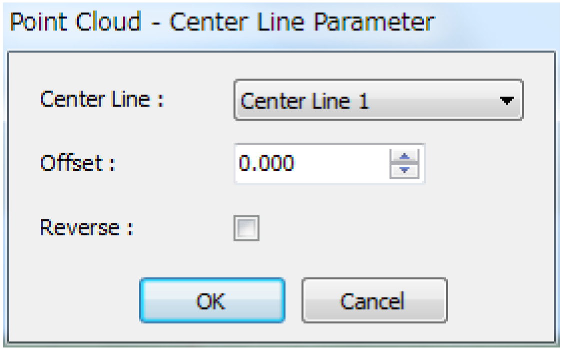
(3) Defining the horizontal line

Open the Plan View form and define the horizontal line. If the center line was defined properly in the previous 4 steps, the center line will be shown in the Plan View form. Zoom in and select Add -> Start the road from the right-click popup menu and define the horizontal line tracing the center line.

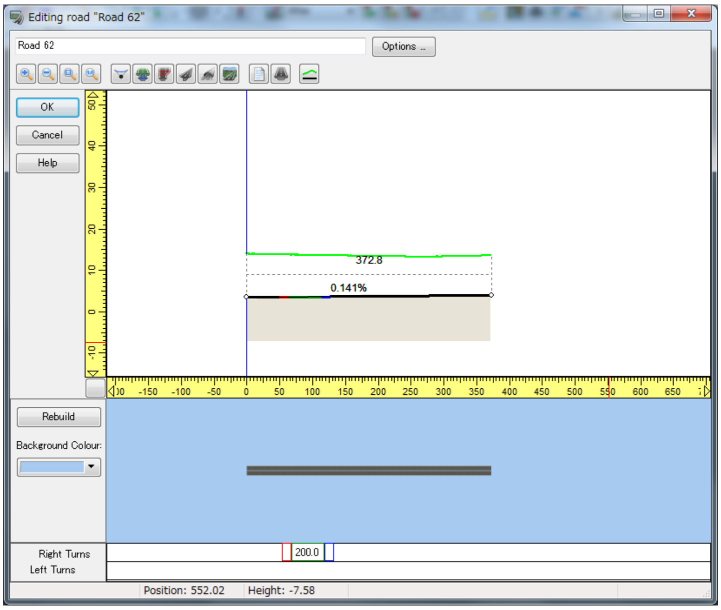
(4) The definition of the vertical line

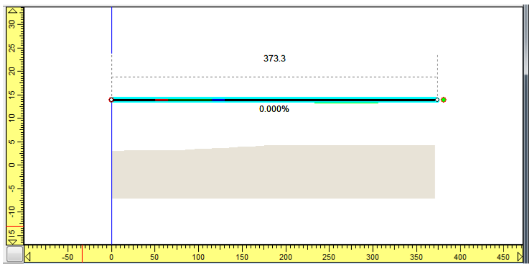
First, click the icon (shown below) and open the editor form. Then, select the center line corresponding to the current road, so that the center line (point cloud data) is associated to the current road. This can also be done in the Point Cloud modeling plug-in form.





Then, define the vertical line by tracing the center line. Adjust the line adding the turning points arbitrarily. And add bridges and tunnels area as required.

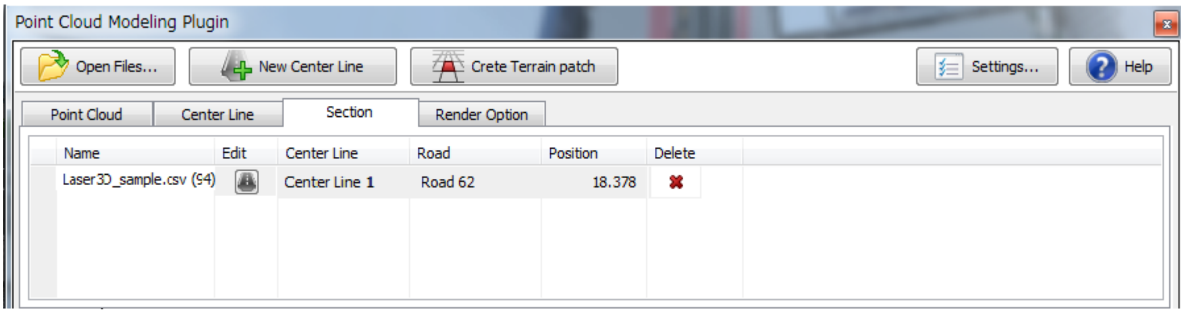




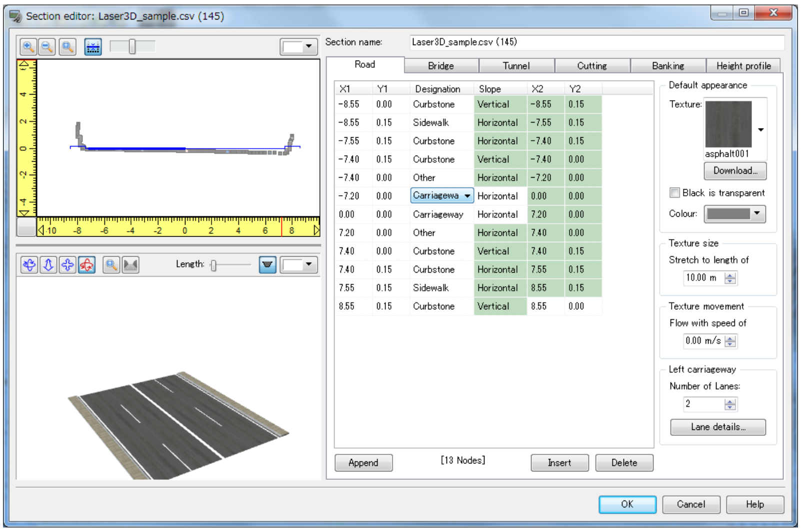
(5) The definition of the road section

When defining the road section, first, using the slide bar in the Center Line tab in the Cloud point Modeling plug-in, move the plane to define the road section and to add the new road section and open the road section editor.

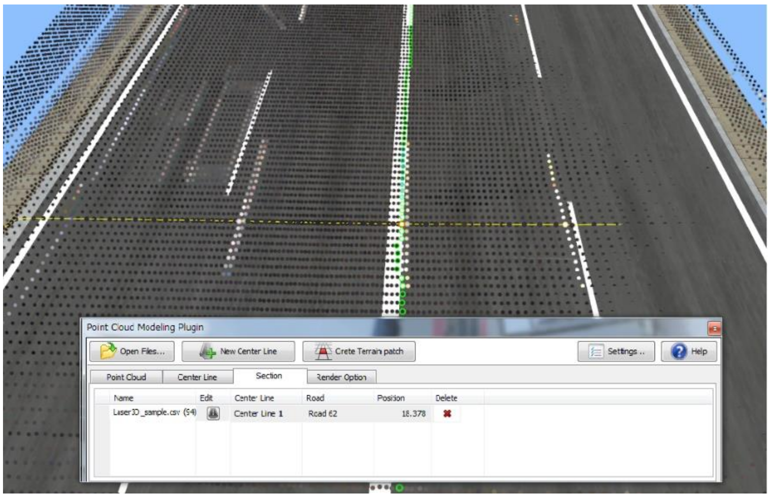
■Section tab



In the Road Section Editor, the point cloud data is shown in the left top drawing area. Create the section with reference to the data



The button above can change the position for the display of point cloud.



Render Option

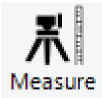
The size of the points can be changed from Options menu or 

.

Size：5

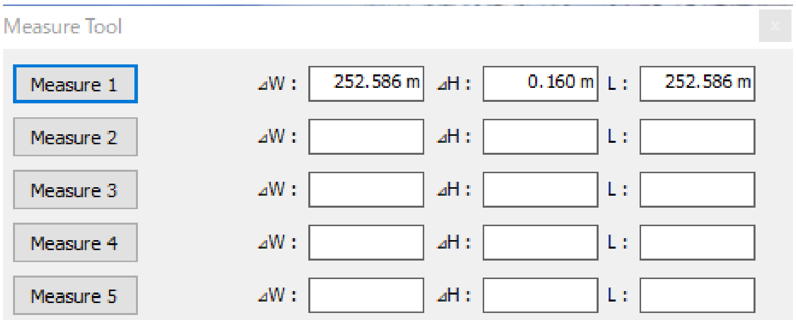
Size：20

Measure Tool

Click 

 to measure the distance between 2 point cloud data groups.

Click Measure n and choose 2 point cloud data positions from the Main windowl. The distance between 2 points are automatically measured as width, height, and length.



Clicking on Mesure 1 and the on the first and second point displays the distance between the two points in three values: width, height, and length.

VR-Cloud® Plug-in

VR-Cloud® has been integrated on UC-win/Road Ver. 11. VR-Cloud® Plug-in which is installed as default on UC-win/Road Advanced, Driving Sim and Ultimate version. It is possible to show the project under consideration to interested party in faraway place. VR data can also be shown on smart phones and tablets with Android, so that it is possible to check the scenery of after design while walking the site actually.

What is VR-Cloud® Plug-in?

VR-Cloud® Plug-in activates UC-win/Road on server, so that it is possible to operate it remotely in VR space on Web browser. This is not just video streaming and it can provide interactive real-time VR. A variety of operation functions of UC-win/Road such as walking, traveling, driving and flying as well as comparative study of before and after design, and running of scenarios.
And communication tool feature between clients are equipped as default to Advanced or greater version. It is possible to write comments in VR space, communicate on 3D bulletin board, and paste photos.

VR-Cloud® Client (Windows version) VR-Cloud® Client (Android version)

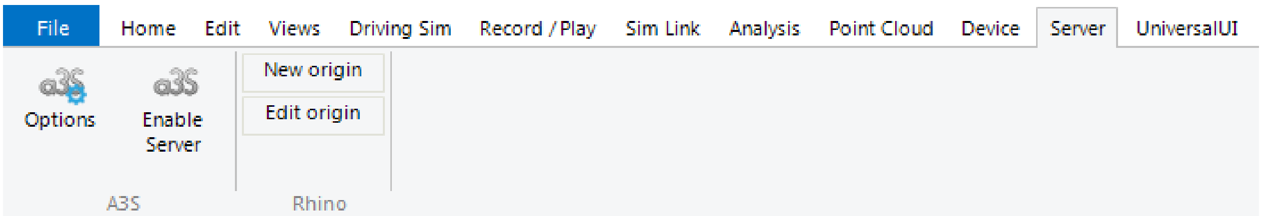
Workflow

1. Cloud server construction

It is possible to use the own server or FORUM8 servers. Please ask for details.

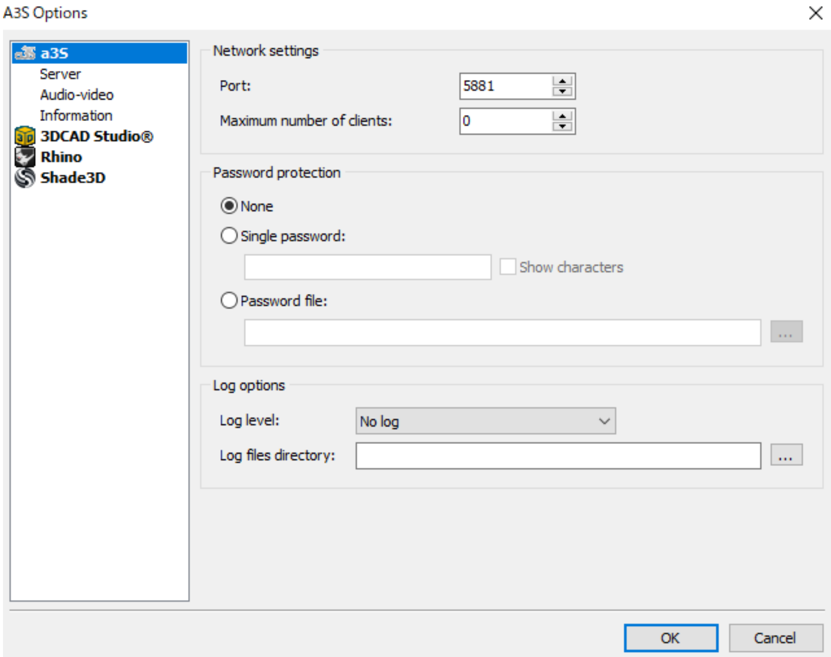
2. Authenticate VR-Cloud® Plug-in

From "File" Ribbon - "License Manager" and check VR-Cloud® Plugin, VR-Cloud® Collaboration Plugin, and VR-Cloud® Script Plugin to open "Server" Ribbon and "A3S" menu. For UC-win/Road Ver. 11 Advanced or greater version, install the plugins. Click "Options" icon to open A3S Options window.



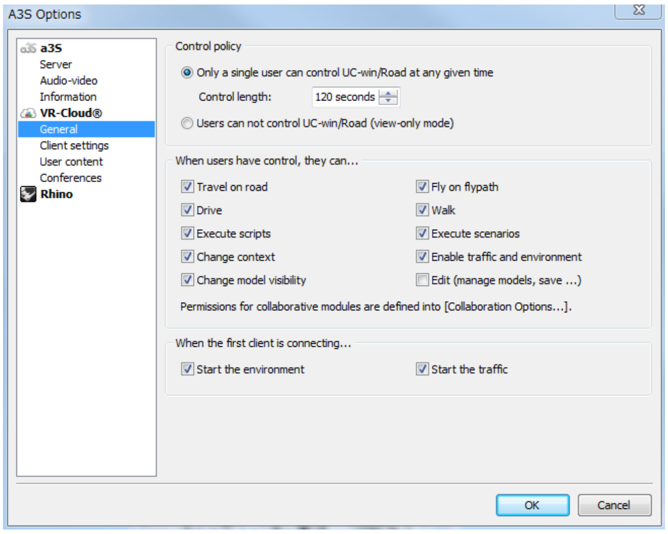
3. Server setting

Set up TCP server on "Server" setting form. Input port number, maximum number of clients and password protection. A port number must be used only for a3s server. And set up the"Audio-video". As for audio settings, it is possible to switch enable/disable audio and set bit rate value.



4. General setting of VR-Cloud® server

Check actions that can be performed by clients.
Check “Start the environment” or “Start the traffic” to automatically start the environment and/or the traffic.



On the client setting tab, select a user interface which will be shown to other users.
When VR-Cloud® Scripting plugin is loaded, it is possible to use custom scripts on the client machines. It does not require high level programming skills and can be done with a simple text editor. It is possible to set some constants used by the archived scripts and the custom scripts.

5. VR-Cloud® User content / conference setting

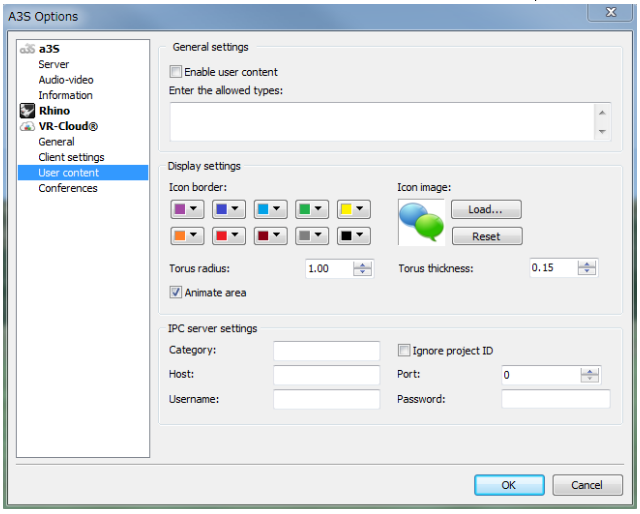
VR-Cloud® supports the creation, display and edition of collaborative contents, which are useful to share information at a specific point in the 3D virtual world. These contents can be fully customized by creating a new script (see above). To use the collaborative features, Install the a3S Collaboration plugin. These features are supported by only VR-Cloud® version 6.1.

- User content option

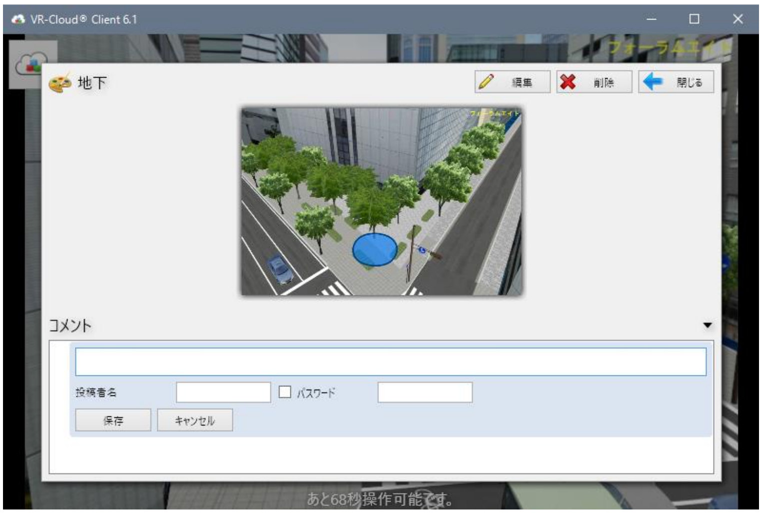
By default the following contents are available.

- Discussions: Text discussion can be created by any user.
- Opinions: Express own opinions by rating a 3D position.
- Annotations: Show explanations at a specific point, which is composed of various shapes and lines
- Photos: Upload and share photos.

All collaborative contents can be commented, and users can reply to it.



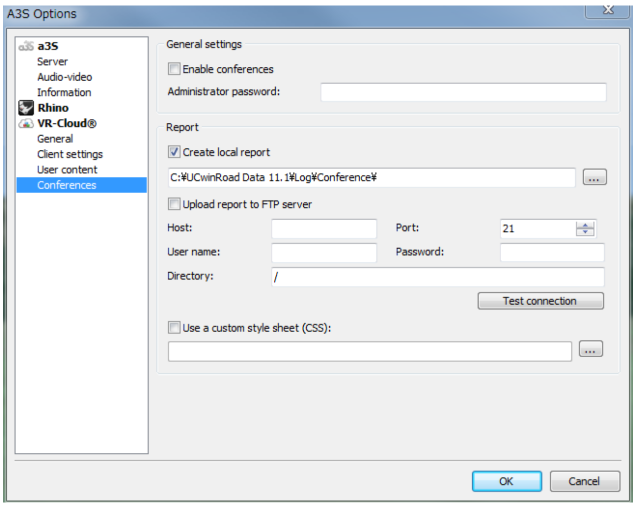
VR-Cloud® user contents setting



VR-Cloud® annotation feature

- Conference

It is possible to chat via text messages by organizing in conferences in the virtual world.
Install the VR-Cloud® Collaboration plugin. It is supported by only VR-Cloud® version 6.0.
It is possible to specify an administrator password to start a conference. Moreover the conference report can be exported to local or FTP in HTML using a default CSS. If checking FTP server, specify the server information.



VR-Cloud® conference setting

6. Enable a3s server

Click "Enable Server" in Server Ribbon to launch a3s server and start cloud service. 3D images are displayed. Click "Disable Server" to disable. Settings can be changed after disabling it.

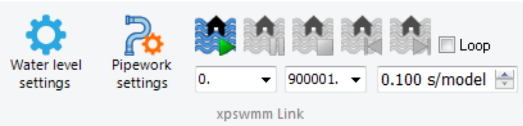
Xpswmm Plug-in

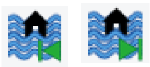
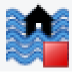
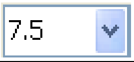
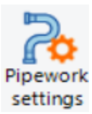
It is possible to exchange data between flood analysis software Xpswmm and UC-win/Road.
Importing the result of flood analysis, drawing the surface flood, drainage system, pipe work are available as well as simulation expression in 3D-VR based on time.

Activate the license by checking "Use" the plug-in in the License Manager from File – License Manager. Operation is not available when there is no project or no imported data.

Xpswmm ribbon

Go to Analysis – xpswmm Link.

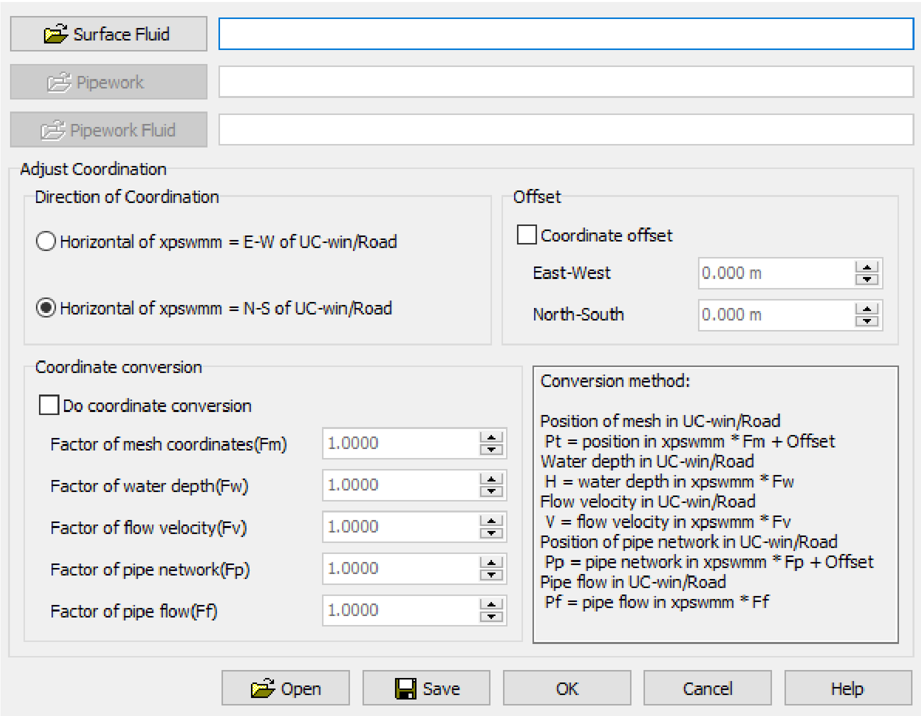


	"Prev" "Next" Button	Load the previous / next analytical result. After "Temporary stop" button is pushed, water data import settlement and the toolbar become effective.
	"Play" button.	The simulation starts. Check Loop to repeat the simulation.
	"Pause" Button	The simulation stops temporarily.
	"Stop" Button	The simulation stops, and the state parameter is reset.
 7.5	"Setting at start of the simulation time"	Specify the start time of the simulation.
 99999.	"Setting at simulation end time"	Specify the finish time of the simulation.
 0.100 s/model	"Simulation speed setting"	Specify the speed of the simulation.
 Water level settings	Edit flooding option	Open to the option of flood water. It becomes effective with data import settlement.
 Pipework settings	"Pipework drawing option"	Open the pipework Display Options screen.

Import Xpswmm data

Go to File- Import – Import xpswmm data.
On this screen it converts the value in the horizontal direction of the Xpswmm terrain data into the value for the direction of east to west or north to south with the coordinate adjustment.

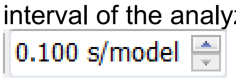
Import xpswmm data

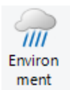


Play data

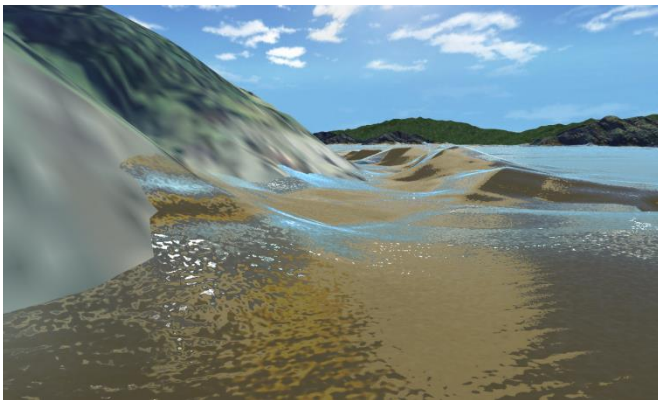
UC-win/Road can visualize tsunami analysis result using xpswmm plug-in.
Before starting the Tsunami simulation, set the start time and the finish time of the simulation in the "Start time" and "Finish time" drop down menu on the ribbon. Set it that was set when exporting the result of analysis in xpswmm.

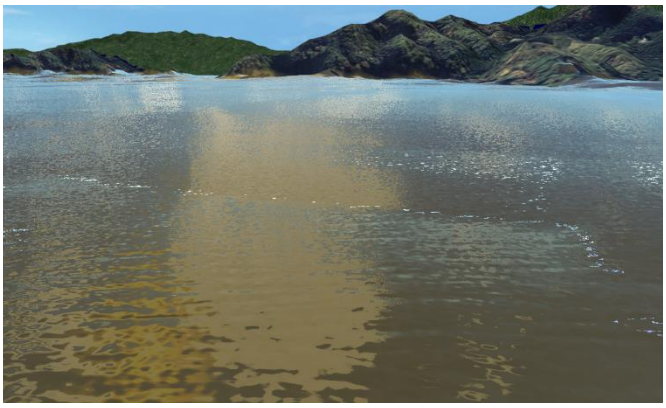
Then, set the time interval of the simulation using the "Water surface display speed" drop down on the toolbar. Here, set the time interval of the analyzed data in seconds. In the case of tsunami simulation, set the actual time interval of the analyzed data in order to do simulation in real time.

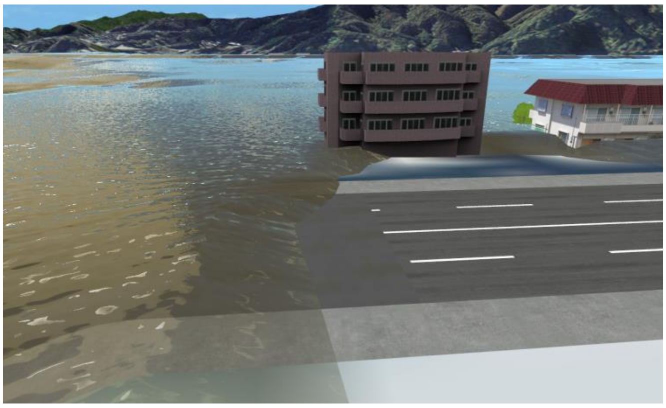
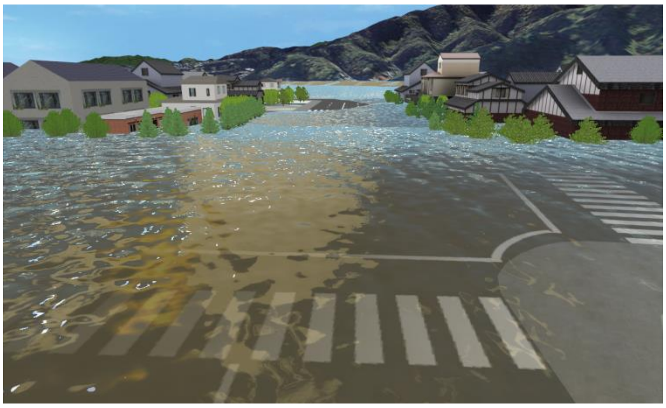


Lastly, click the "Environment" 

button on the ribbon, Home – Simulation and "Play" button in xpswmm plug-in to start the simulation based on the result of analysis by xpswmm.





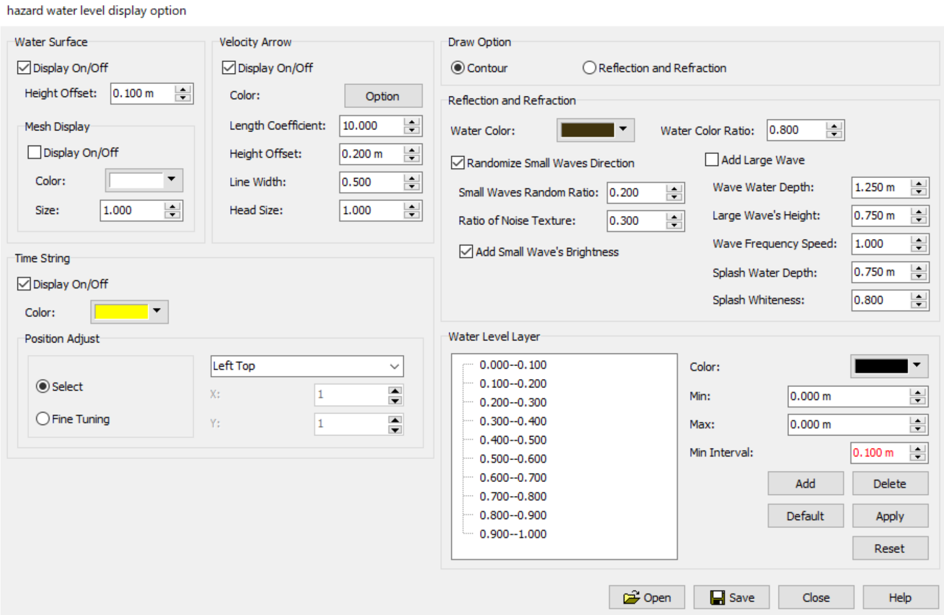
*The Visualization of the Level of Damage to Buildings (Under Development)
The drag acting on buildings by the tsunami is calculated and a function that visualizes the degree of building damage is implemented.
The degree to which each building is damaged is calculated from the 'suction power' parameter of energy (in kJ) set for each drag of the tsunami and the target building. This is shown within the software through the changing of its color depending on the tsunami's power, below. Moreover, though the damages caused on buildings are commonly considered in terms of the water height, this plug-in calculates the damages on buildings using the information obtained from xpswmm (the depth, speed, waterpower calculated from the building shape and resistance to the waterpower), thus, making the result more accurate.
・Example of contour color based on the levels of damages on buildings

Minimum (kJ)	Maximum (kJ)	Color	Sample color	Level of energy and breaking	Height of wave (m)
0.00	0.50	Blue		No-swimming warning issued	0.00～0.25m
0.50	1.25	Green		Adults unable to stand	0.25～0.50m
1.25	2.50	Yellow			0.50～0.70m
2.50	5.00	Orange		Wooden structures partly damaged	0.70～1.00m
5.00	10.00	Dark orange			1.00～1.50m
10.00	20.00	Red		Danger of complete collapse	1.50～2.00m
20.00	30.00	Dark red			2.00～2.50m
30.00	100.00	Purple			2.50～5.00m
100.00	-	Black			5.00m～

Water level settings

Click 

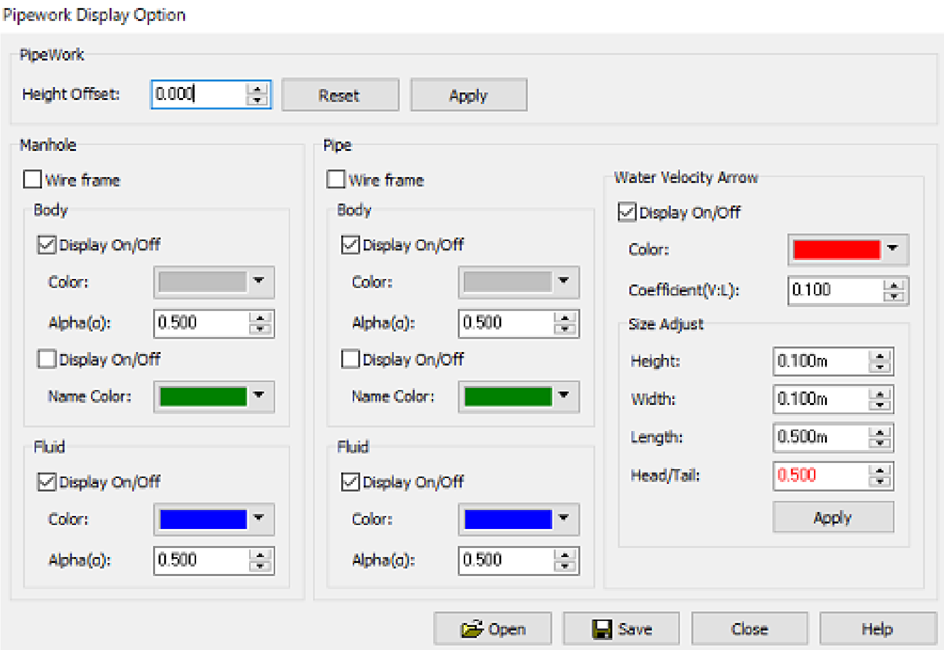
to set up the water surface, water velocity arrows, time characters, water surface layer.

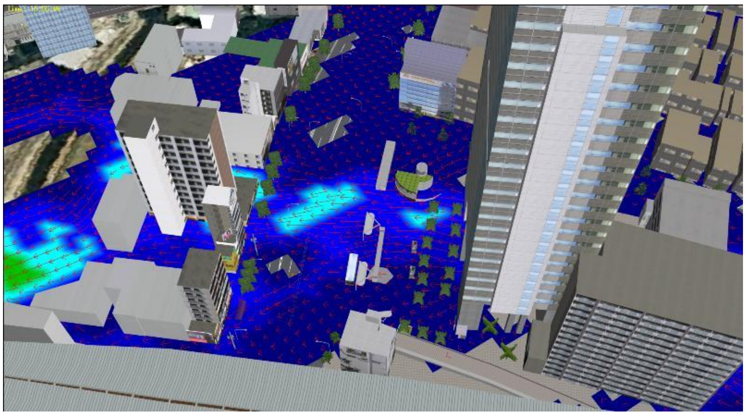


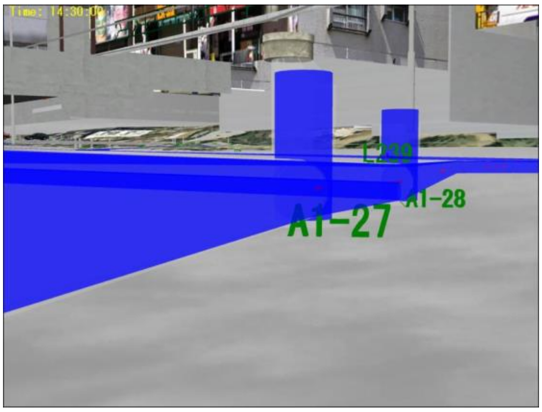
Pipe work settings

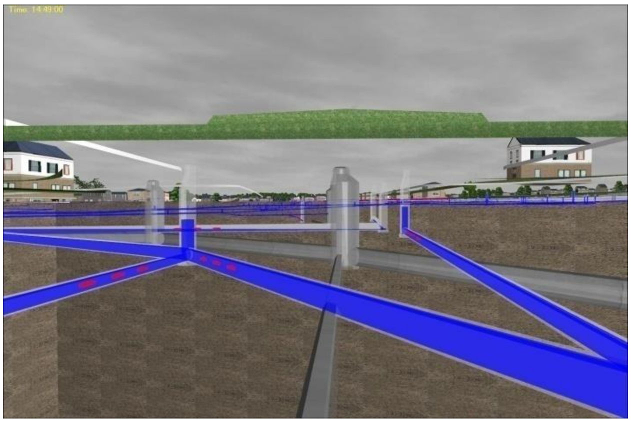
Click 

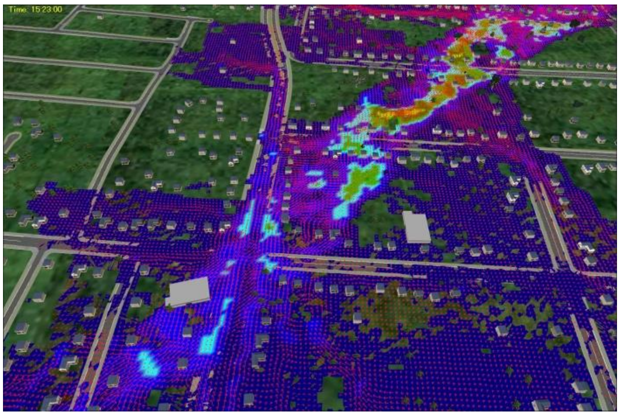
to set up the pipework, manhole and pipe.






A1-27
A1-28





Tsunami Plug-in

This plugin simulate tsunami using programs developed by research institutes or commercially available software. The result can be imported into UC-win/Road and visualized. There are 3 features.

1. FORUM8 unique open format makes it easy to transform one format into the one recognized by UC-win/Road, allowing the visualization of a variety of different tsunami analysis data.

2. Importing of the terrain mesh used for the analysis.

3. Other than the fundamental elements such as water depth contour map, flow speed, wave force strength, it is possible to optionally enable water surface reflection and water ripples for a realistic presentation.

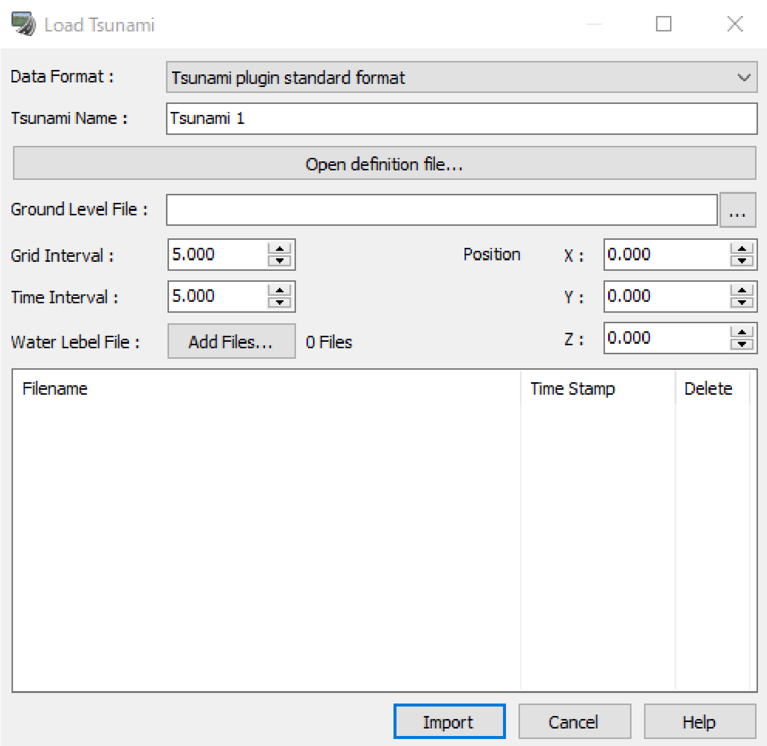
1. Load Tsunami data

The supported format is as follows.

・Tsunami Plug-in standard format
・Other tsunami data format 1 (combination of DEP file and SUP file)
・Other tsunami data format 2(combination of DEP file and Z file)

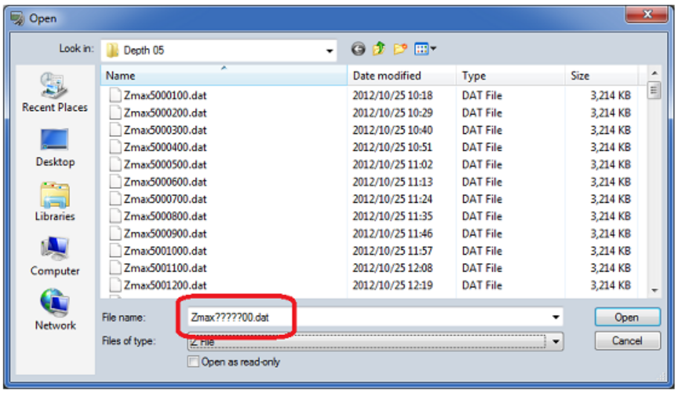
- Standard tsunami data format

Go to File – Import - select Load Tsunami... Select Tsunami plugin standard format as Data format.



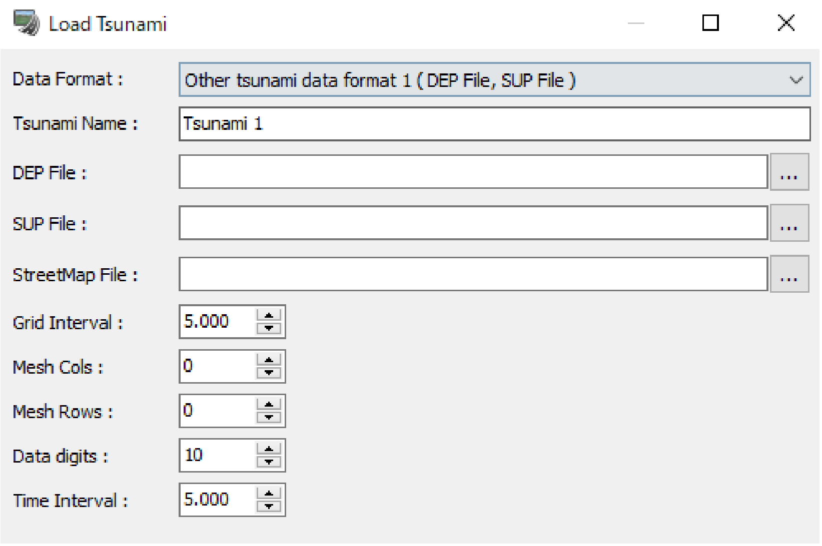
Tsunami Name： Input a name. Default is 'Tsunami 1'.
Open definition file：Select tsunami definition file.
Ground Level file：Ground height above sea level. Click on "・・・" to specify a file.
Grid Interval：Mesh interval of the terrain data. The default value is 5 m (5.000).
Time Interval：Time elapsed between each step. The default value is 5 seconds (5.000).
Position X, Y, Z： Origin of the data.
Water Level File： Water height. Click on "Add Files" and specify multiple files that contain the analysis results over the water level.

Reading too many files will take more time to process. It may be better to skip or thin out data. Thinning out data is easily achieved by specifying the “wildcard” to read only a certain range of data that fits the criteria. For example, typing “Zmax?????00. dat” into the File name box and press Enter will search for only the data that ends with 00. The files selected are displayed in the box in the bottom half of Load Tsunami window.

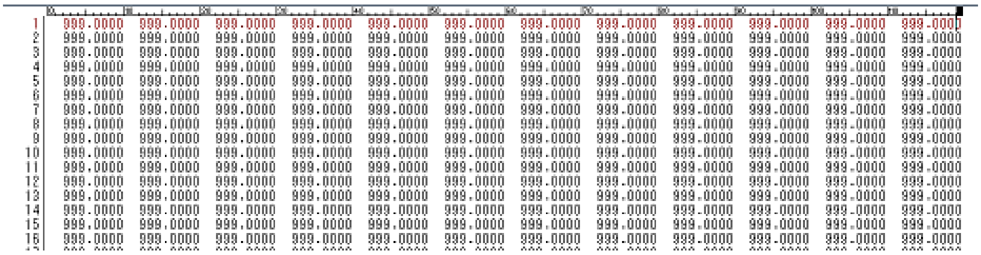


- **Other tsunami data format (DEP, SUP files)**

Go to File – Import - Load Tsunami... Select “Other tsunami data format 1 (DEP File, SUP File)”.



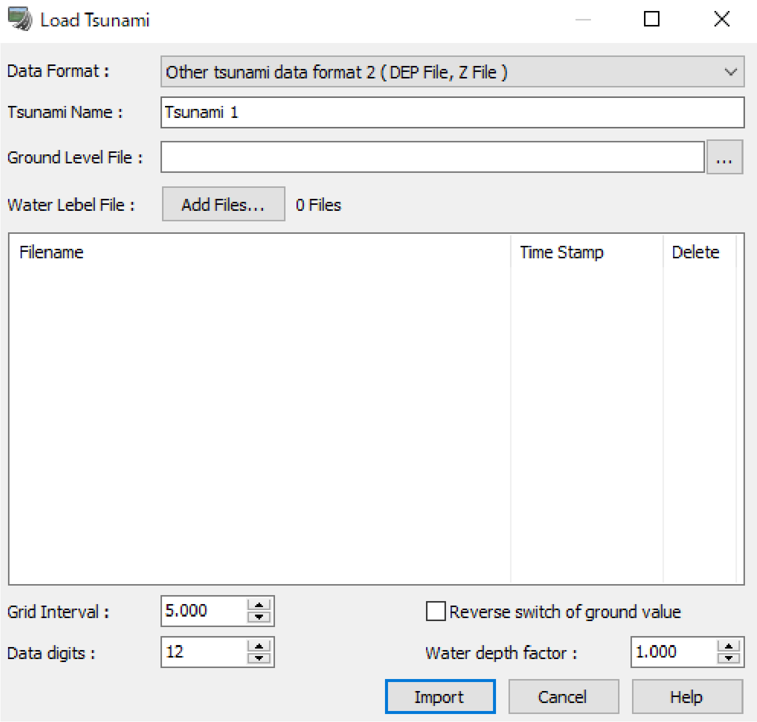
Tsunami Name: Enter a name. By default it is “Tsunami 1”.
DEP file: Specify terrain file. Click on the “･･･” to open file directory.
SUP file: Specify water level data file.
StreetMap File: Currently not available.
Grid Interval: Grid interval of terrain mesh data. The default value is 5.000 m.
Mesh Cols
Mesh Rows
Data digits: Data digits that define one datum written in the SUP file. For example, the following data set contains another datum for every single 10 digit interval.



Time Interval: Time elapsed between each step. The default value is 5 seconds

Click Import to load the data. Once loading is completed, go to Tools - Tsunami to open the Tsunami Plugin window and check that the Tsunami is properly loaded. It will appear with the specified name (Tsunami 1 by default).

- Other tsunami data format (DEP, Z files)



Tsunami Name： Enter a name. By default it is “Tsunami 1”.
Ground Level File： Specify a round level file.
Water Level File： Specify the analysis result water level file. Click on Add Files to select the file(s).
*The more data loaded, the longer it takes to process. Refer to (1) Reading standard tsunami data format on how to perform wildcard selection.
Click Import to load the data. Once loading is completed, check that the Tsunami is properly loaded. It will appear with the specified name (Tsunami 1 by default)

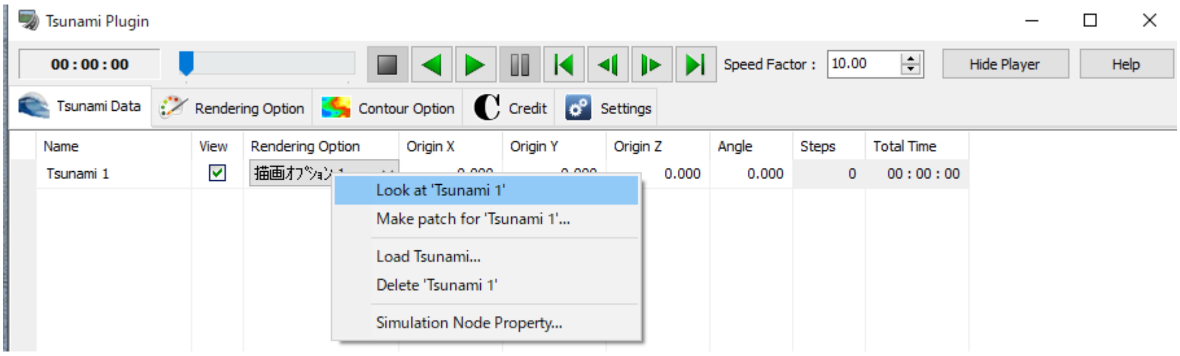
2. Tsunami settings

(1) Aligning the tsunami analysis data to the terrain

Since the analysis result data loaded does not have any positional information such as latitude and longitude, the loaded data is placed at the center of the project topography. In order to display the results in accordance with the actual topography, the analysis result data is aligned.

Go to Analysis – Tsunami Link - 

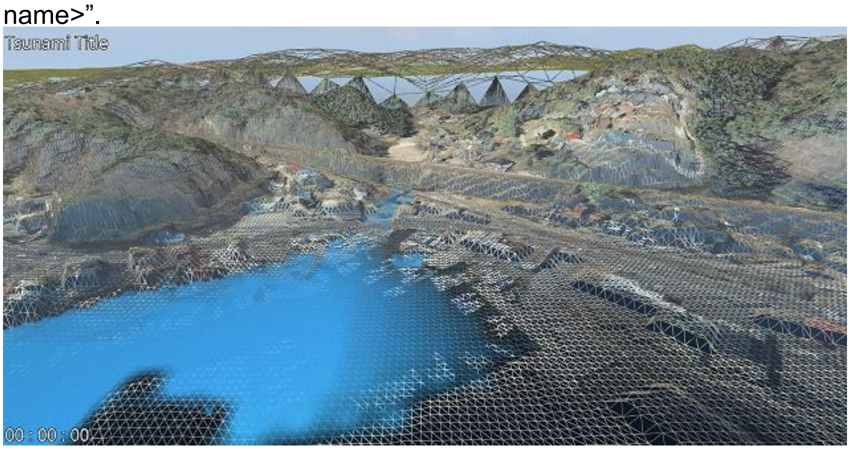
.
Right click on the tsunami data in the Tsunami Plugin window. Select “Look at <Tsunami name>” from the pop-up menu to center the camera.



*Normally, Origin Y is 0 m. When aligning, it is easier to do it from a bird’s eye view.
The blue part of the following picture is the tsunami water surface. However, for easier reference, the following purposely set Origin Y to 50m to ensure the water is not hidden underground. When making terrain patches, ensure that Origin Y is 0 before proceeding.

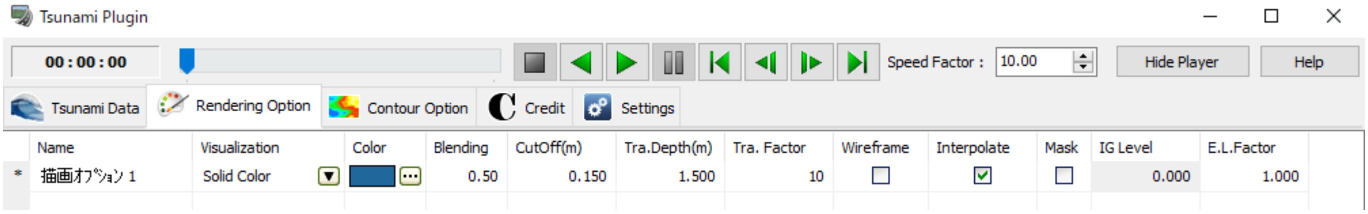
(2) Making terrain patch for the tsunami plugin

If the tsunami data contains terrain data, the data can also be read to display a more detailed terrain. After position alignment, right click on the tsunami from the Tsunami Plugin window, and select “Make patch for <tsunami name>”.

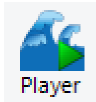


(3) Tsunami Rendering Option

Set visual effects parameters.



3. Tsunami Visualization Animation

The loaded tsunami animation can be played with the “Tsunami Player”, which is can be opened from .

4. Saving tsunami plugin data

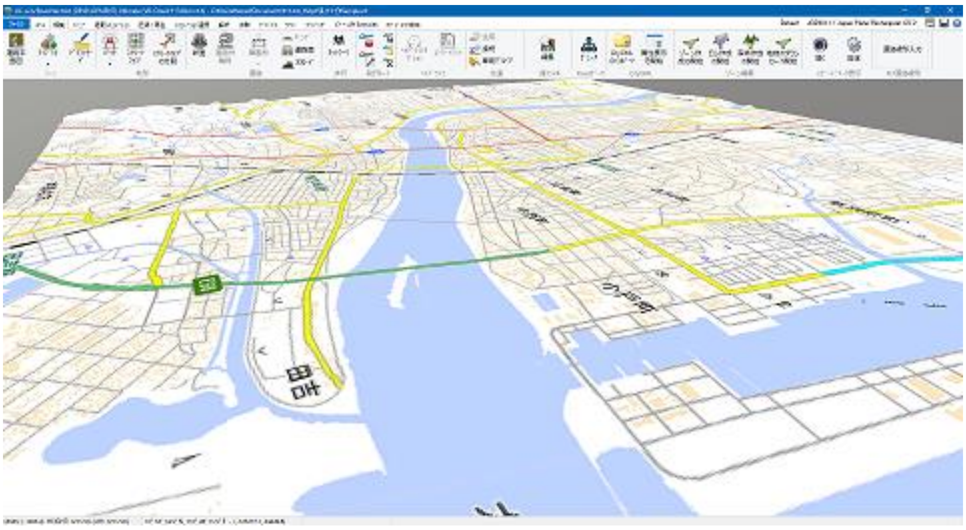
All entries within the Tsunami Plugin Window are saved inside the .rd data. However, the analysis data remains an external source of reference, and its relative directories will be saved inside the .rd file.

5. Loading Flood Navi Data

Downloading data from the Flood Navi system of the Ministry of Land, Infrastructure, Transport and Tourism (https://suiboumap.gsi.go.jp/) and importing it into UC-win/Road, a visualization simulation of inundation is possible.

(1) Create a project

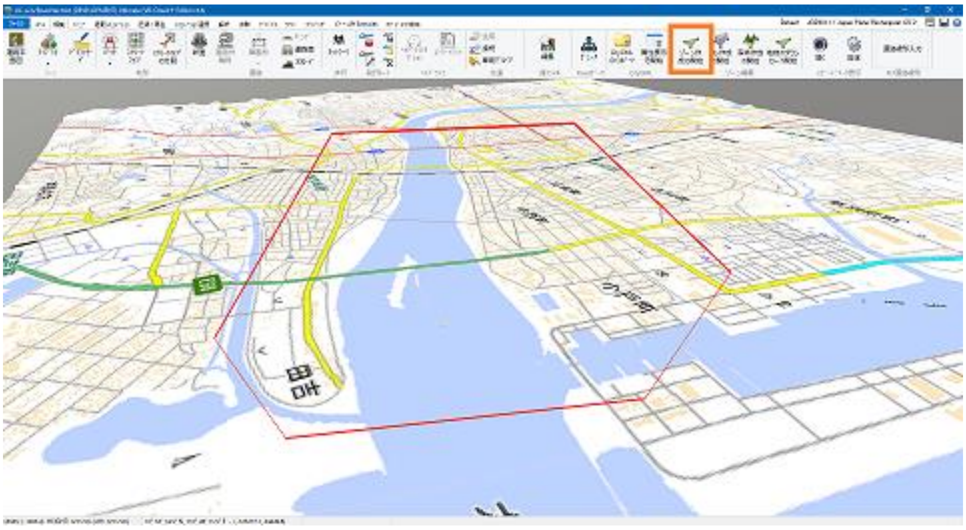
Create a project for the area.



(2) Create a zone

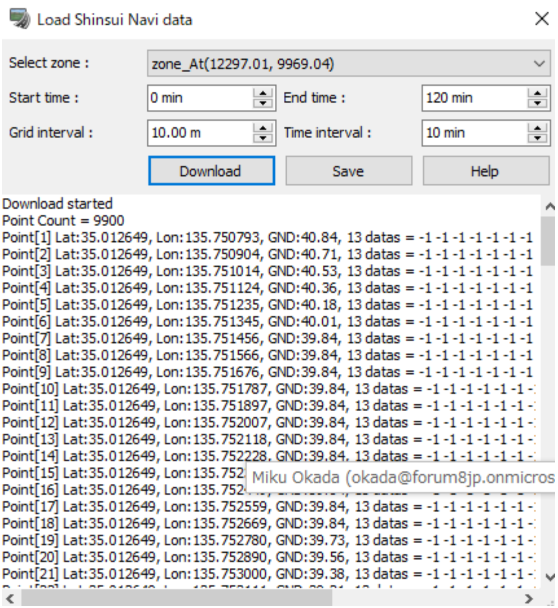
Select the target area for flood navi data by zone from Edit - Zine Editing - 

.



(3) Load data

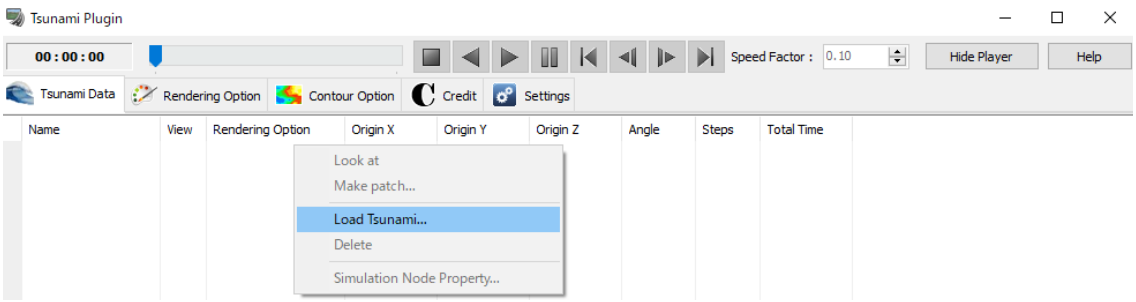
Go to file – Import – Sinsui Navi data. Select the zone and set up start time, end time, grid interval and time interval. Click Download to start downloading the flood navi data.



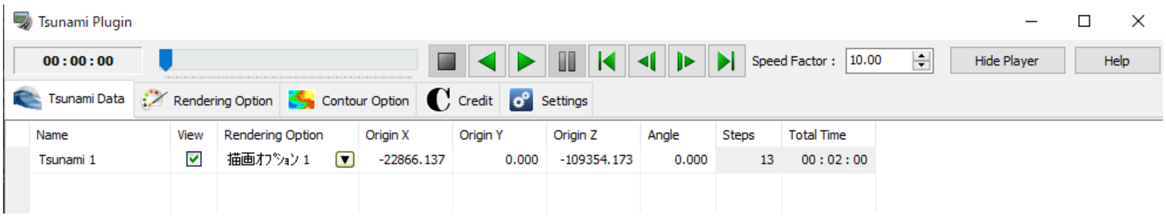
(4) Open Tsunami-plugin

Go to Analysis ribbon – Tsunami and click 

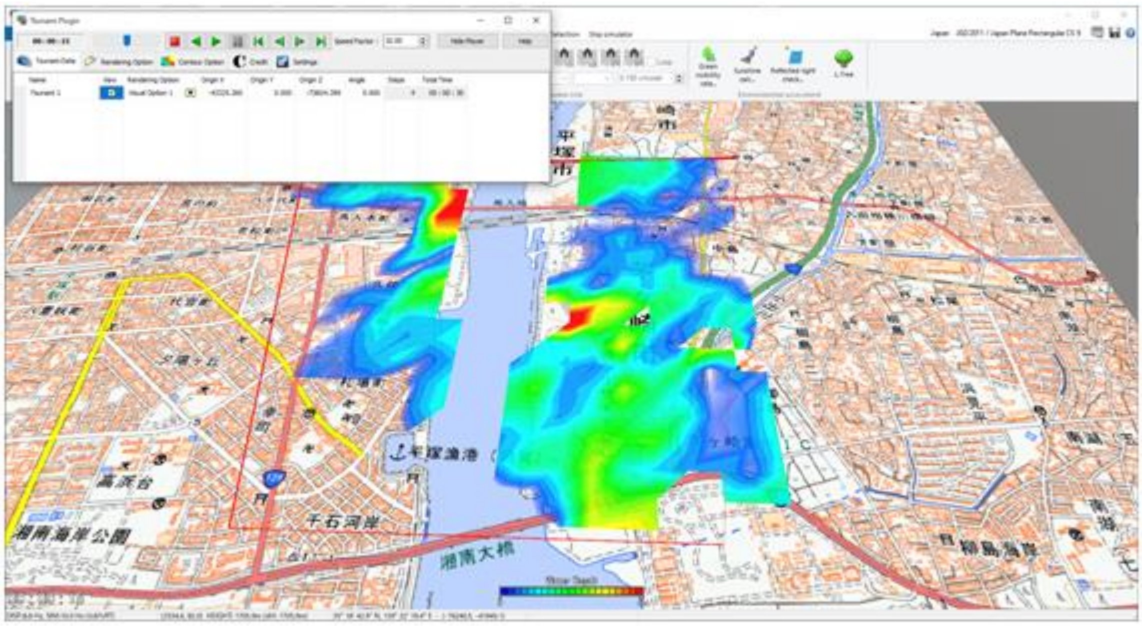
. Right-click on the form and select Load Tsunami…



Then click Open definition file... , select the data just downloaded, and load it.



After loading the data, it is possible to play the simulation in the same way as the tsunami simulation.

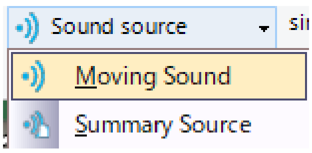


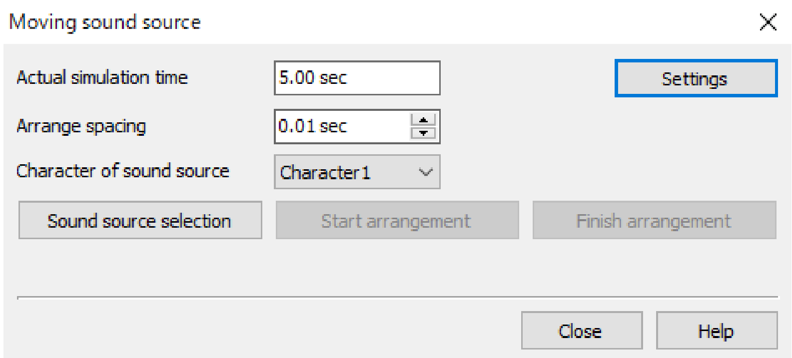
Noise Simulation

Noise simulation option can simulate a general soundscape by arranging the sound source and the sound receiving plane on 3D VR space of UC-win/Road. Considering the influences such as the ground level, structures and buildings etc., and the level of sound pressure on each sound receiving point on sound receiving plane is analyzed.
This option is composed of pre-processor (Input), main-processor (Analysis) and post-processor (Displaying the result).
The sound source and the sound receiving source can be arranged in the pre-processor, and it is possible to get the result for analytical accuracy which is according to various purposes by abundant analysis option in main-processor. In addition, the sound pressure level can be displayed by contour figure, contour line, grid and spherical configuration etc.
*This option needs "NoisePlugin (Noise Simulation Option)".

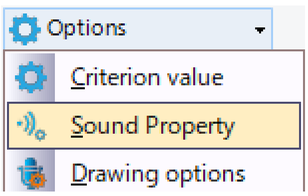
Sound source settings

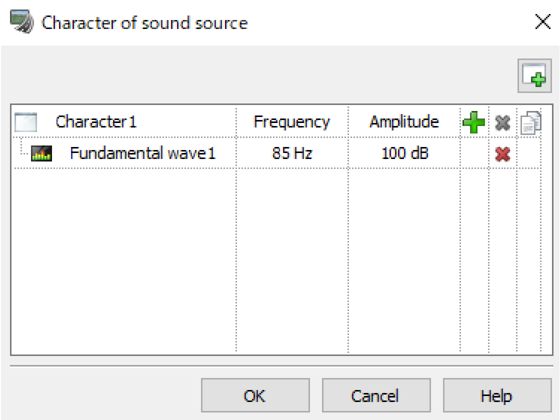
■Moving sound source Form (Plugin)
Go to Analysis Ribbon - Noise propagation - Sound source - Moving Sound.
Select a model as a moving sound source. Multiple sound sources are generated by arranging it separated in time and space to simulate a moving sound source. It is recommended to use Automatic placement.





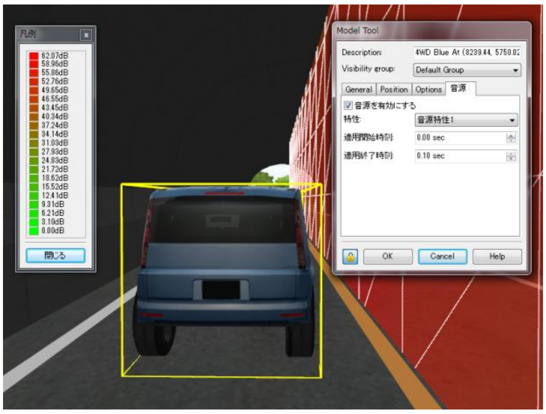
■Character of sound source
Set the characteristic value of sound source from Analysis - Noise propagation - Options - Sound property. Up to 5 base waves for 1 character can be set. Click  to add a caracter.





Hint about amplitude:
Audio power level is the total sound power that the source radiates.
Generally, it seems 40 - 60dB (decibel) is the best value, and that the sound can be dissonant at higher values.

*Note
After deleting a characteristics set, check the value of the set in the sound source models in the Sound source tab in the Model Tool. If a set is deleted, the models using it will use the initial value.
Click a 3D model or a FBX scene model to enable sound.

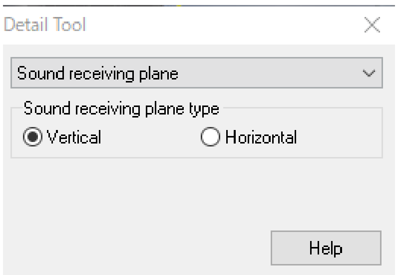


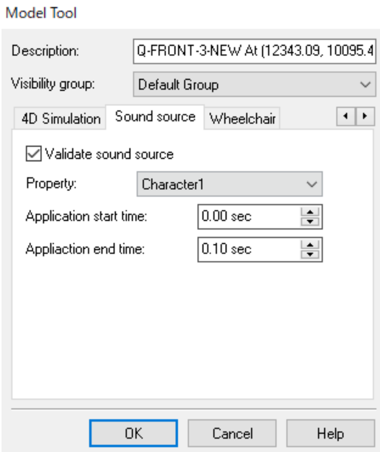
Setting of the sound receiving plane

■Setting individually

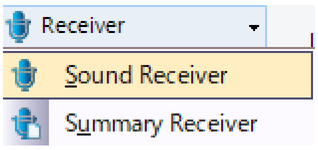
Select "sound receiving plane" from Edit - Library - ▼-A dd details 

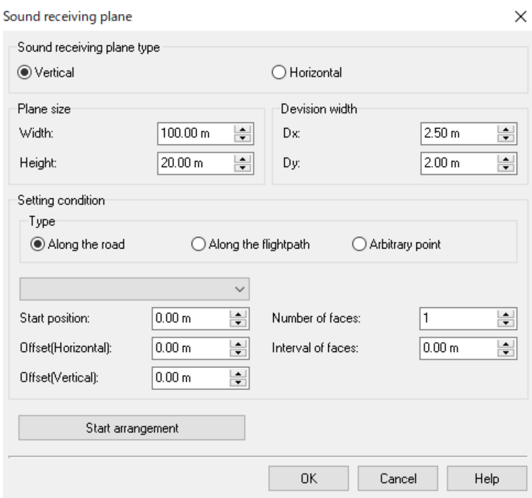
- Sound receiving plane, then click on the main screen. A sound receiving plane will be placed at this position.





■All at a time
Set up the size of the sound receiving plane from Analysis Ribbon - Noise propagation - Receiver - Sound Receiver

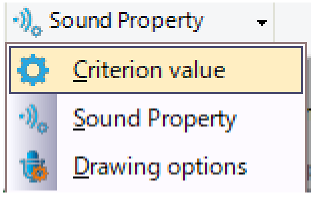


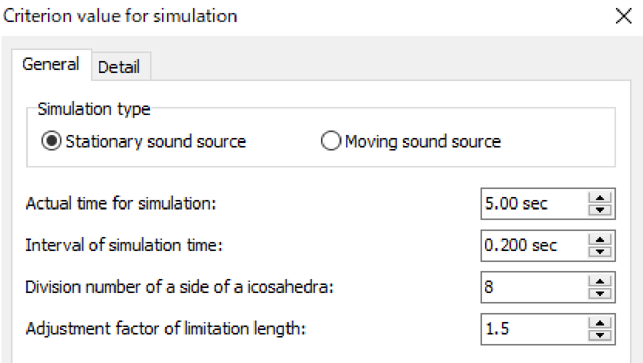


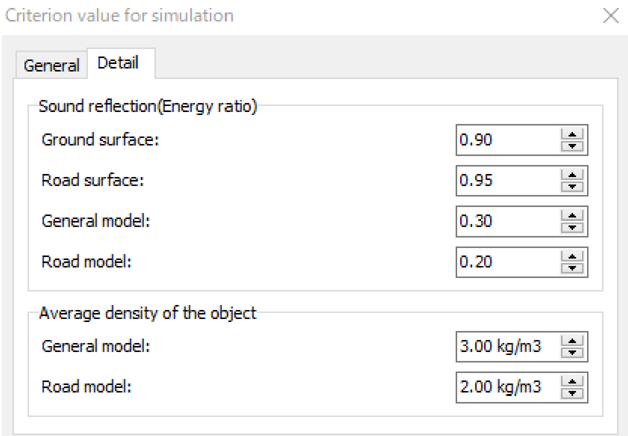
Setting of analysis condition

■Criterion value for simulation

Go to Analysis - Noise propagation – Sound Property - Criterion value or click "Change setting" button of "Actual time for simulation" in "Movement of sound source" form.





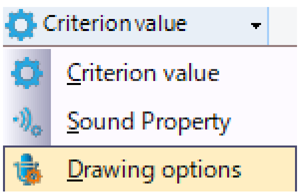


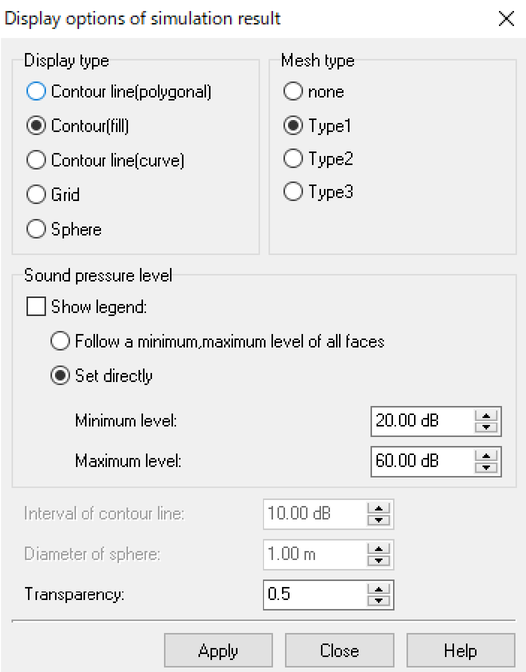
Click Run simulation or 

to start the simulation.

Simulation results

Display option form is opened from Analysis Ribbon - Noise propagation – Criterion value - Drawing options.





Activation and save of the result

Set a destination folder of results fromRibbon, Analysis － Noise propagation - Run. 

Right click the existing folder, and select "New" to create a new folder. Click [OK] to execute simulation.
Note: All file (.txt) might be deleted when selecting a folder in which contains result files (*.txt).Change the destination folder or save the existing results into the other folder in advance.

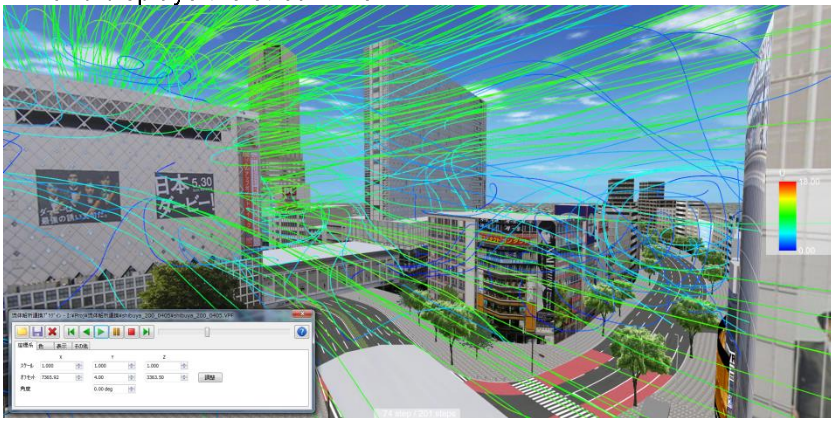
Importing the result

Import the result from Analysis Ribbon - Noise propagation - Load simulation. 

Specify the data (.rd) of UC-win/Road which accords with the current data.

Fluid Analysis Plug-in

The Fluid Analysis Link Plug-in is a plug-in that takes the CFD analytical result analyzed with general-purpose fluid analysis tool 'OpenFOAM' and displays the streamline.



1. Flow of analysis

The work flow starts from the definition of the analysis condition to visualizing the result. However, in case of VTK file, it is exception.

1. Create model

Create the terrain, roads and arrange the structure such as buildings and various models on the terrain.

2. Create STL file

Export VR space of UC-win/Road in POV-Ray format, import it into 3ds Max and export it in the STL (Standard Triangulation Language) format.

3. Analysis with OpenFOAM

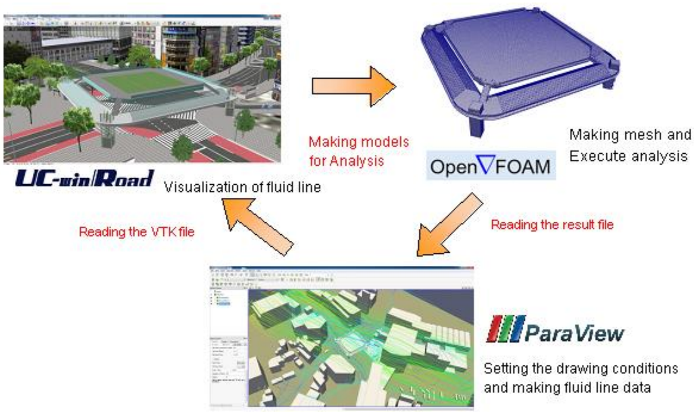
After importing the file with OpenFORM, create meshes, define analysis conditions and execute the analysis

4. Create VTK file

After importing the analytical result using the ParaView bundled in the OpenFORM, generate the file of each time step in VTK (Visualization Tool Kit) format.

5. Visualization on UC-win/Road

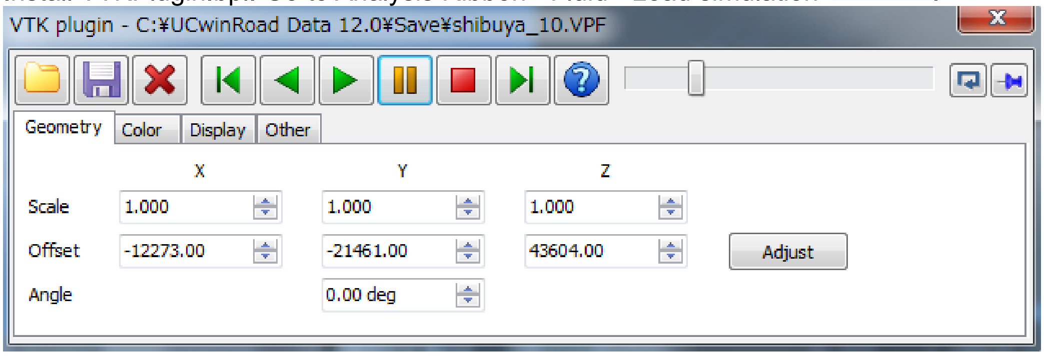
Import the VTK file into the UC-win/Road with the Fluid Analysis Link plug-in and visualize it.



2. How to use fluid analysis plug-in

Install VTKPlugin.bpl. Go to Analysis Ribbon - Fluid - Load simulation 

.



■Tool Button

	Import VTK or VPF file. When importing VPF file, specify VTK Plugin Data Files as "Category of file".

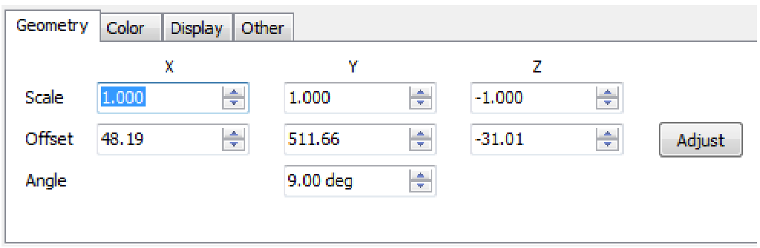
*.VTK: it is the analysis result of [OpenFOAM]. To display all the steps, select all files subject in the window.
.VPF: it is the file(.VPF) saved by this plug-in. This file contains the information on coordinates.

	After loading the VTK file and setting the coordinates, the extension changes to *.VPF.
	Delete all current data.
	Return to the first step.
	Play steps in reverse.
	Play steps.
	Pause.
	After stopping it, the steps will be played from the first step when Play button is clicked again.
	Jump to the last step.

	Play steps in any time frame by moving the scroll bar.

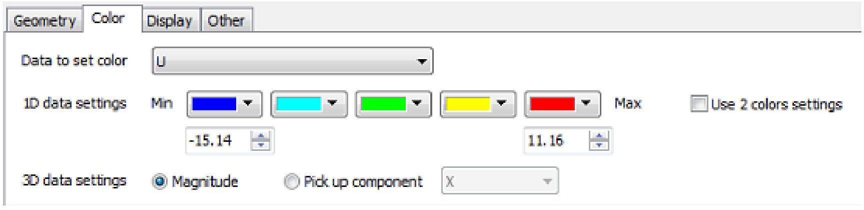
	Open Help.
	Repeat the playback.
	Pin the toolbar item.

■Geometry tab
Settings of geometry.



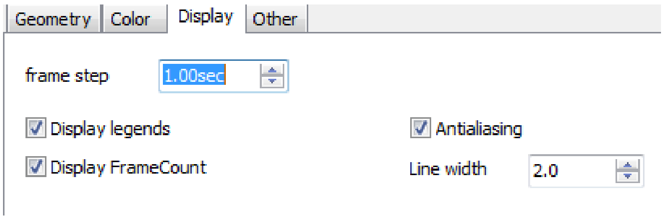
■Color tab

Settings of display color.



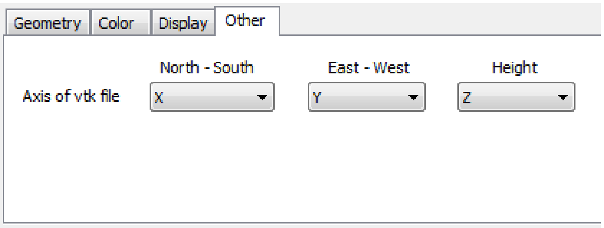
■Display tab

Settings of display.



■Other

Settings of axis of vtk file.

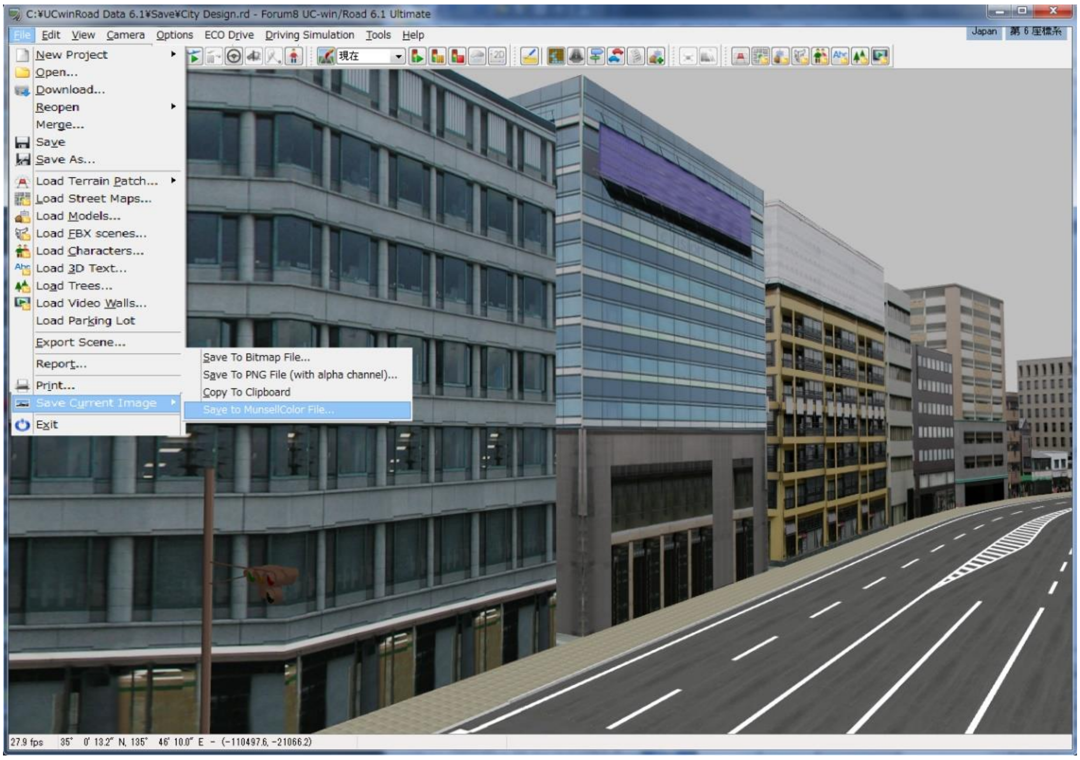


Munsell Color Space Export Plug-in

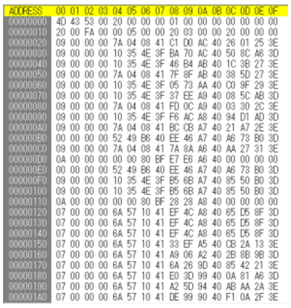
The Munsell Color Space Export Plug-in is a plug-in to visualize the scenery displayed on the main window by the Munsell color system, and exports the scenery to the Munsell color file (the extension: mcs). This file can then be used in the design or research based on Munsell color.

■Execution Method
Select File - Export - Save to MunsellColor File...

* In case of cutting out unneeded things for munsell value like street tree, road sign etc. for output uncheck the element to cut out in "Display" tab of Home Ribbon - Visual Options, and then it is possible to execute in the state of displaying only building. It is possible to execute in a state of hiding the street tree and road sign like the following example.



Example of Munsell color file opened by binary editor.



SfM (Structure from Motion) Plug-in

1. What is SfM (Structure from Motion) plugin?

SfM Plug-in creates a 3D point crowd model of the objects in the space from plural photos. It also estimates the positions of cameras and displays the models on UC-win/Road. The point cloud and the camera positions are obtained by applying the SfM method for the loaded photo images.
*SfM (Structure from Motion): The technology that estimates 3D location of the feature point in the picture and the camera position and orientation through analyzing plural photos.

2. Main functions of SfM plugin

SfM plugin has the following functions.
●Create point cloud from photo
Export a space based on image extracted from photos and videos which taken with a digital camera as point cloud.
●Point cloud display adjustment
Adjust to display appropriately the exported point cloud on UC-win/Road. By adjustment, VR model can be rotated and displayed over the point cloud data.
●Create camera calibration files
Create a revision file to eliminate the distortion of image by taking photos of a chess board with digital camera and analyzing focus distance and lens distortion properties of the camera
●Create VisualWords files
Create and export VisualWords file needed for creating point cloud.

3. Operation flow

1. Take photos

Take photos of space with a digital camera. The photos are at least 2 that are moving little by little. And if EXIF information is not added on the photos, take photos of chess board pattern because SfM analysis needs the characteristics of digital camera.
*Exif (Exchangeable image file format)： An image file format that can be add the information about the shooting conditions to the digital camera photo data. Metadata such as shooting date, model name, resolution, exposure time, diaphragm value, focal length, ISO speed, and color space are saved with the image.

2. Create camera calibration files

Create camera calibration file from photos of chess board pattern.

3. Create Visual Words files

Create Visual Words file for SfM analysis. It takes a long time to create Visual Words file. So, it is recommended to use the sample file prepared in Plug-in.

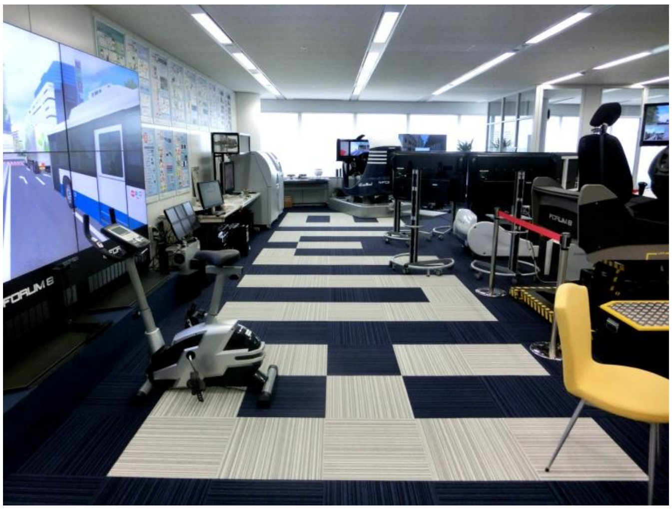
4. SfM Analysis

Load the photos and the camera calibration file and Visual Words file. After settings, the analysis starts.

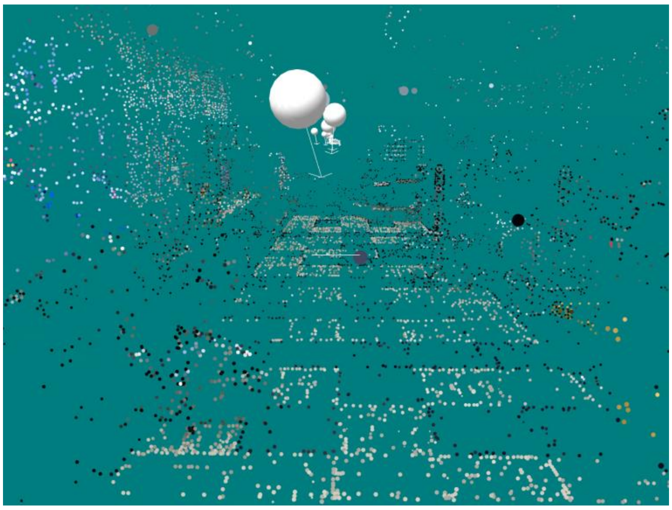
5. Visualization on UC-win/Road

Starting SfM analysis, Point cloud data and camera position are displayed on UC-win/Road.

Photo



After analysis



4. Analysis methods

Select Real-time analysis or Batch analysis as an analysis method by SfM engine.
Real-time analysis mode monitors folder of photos, analyzes the added photos immediately and exports point cloud, but it consumes much memory.
Batch analysis mode analyzes only target photos which are set before analysis and outputs point cloud. Advantages are a little memory consumption and to be able to analyze more photos than Real-time analysis. However, the analysis result cannot be obtained if the discontinuous photos are entered because this analysis processes only continuous photos.

■Batch Analysis

Select photos to be analyzed and set analysis conditions. After starting the analysis, view positions of each selected photos are calculated and displayed on the 3D space. As the analysis progresses, the number of point clouds increases and gradually the structure is clarified. Check the point clouds in the space when the all image analyses have finished. If the point clouds are few, select "give priority to the number of the point clouds" in the analysis condition and perform the analysis again. In the case that the analysis stops in the middle, perform it again after altering the starting image or removing the one where the analysis stops.

■Feature point detection algorithm

Select SIFT or SURF as featured point detection algorithm.

・SIFT(Scale Invariant Feature Transform)

This algorithm detects featured points and describes the amount of featured points, used in fields such as image recognition. Transaction speed is slower than SURF, but the recognition precision is high.

・SURF(Speed Up Robust Features)

This algorithm is a modification of SIFT and its transaction speed is faster than SIFT. But the recognition precision is lower than SIFT.

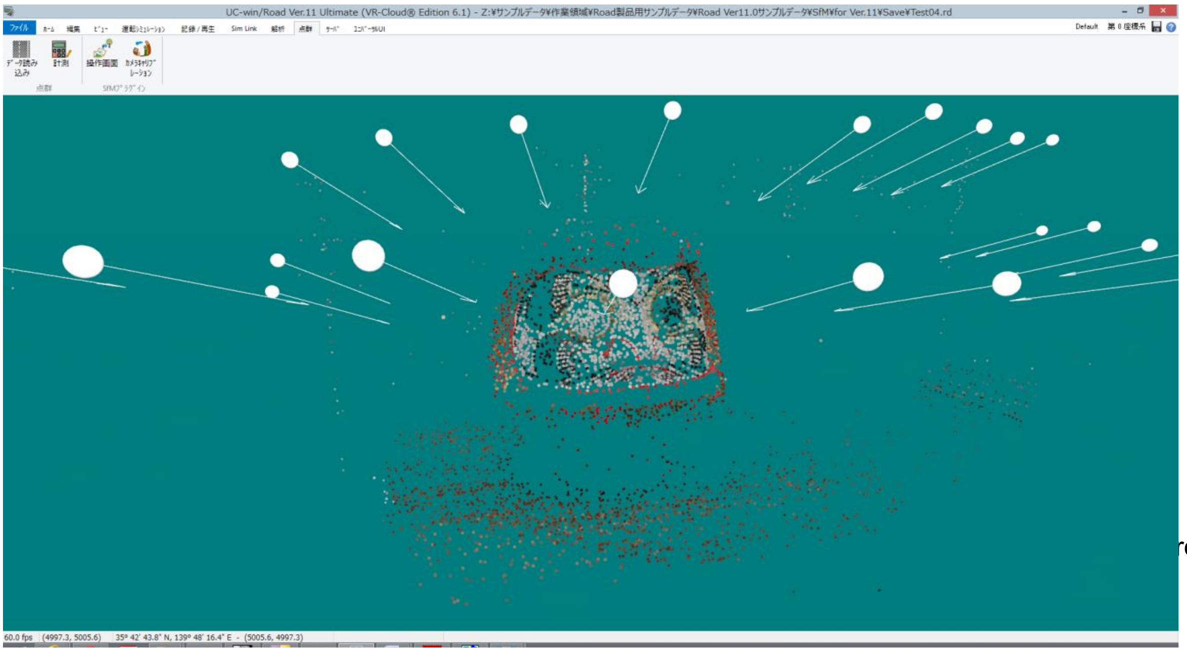
5. Tips on using SfM plug-in

・Shoot photos so that the objects in ones already shot will be included. If not, no point cloud will be created because the positions in the space are unrecognized. (For the batch analysis, the objects in the last 4 photos must be included.)

・Brightness should be constant because the recognition of the objects is difficult if the brightness changes greatly than the last analyzed photo. For example, indoor shooting should be done in the room lighting with curtains closed to block the outside light. In the case of the outside shooting, cloudy weather is desirable because brightness changes between sun and shade. If with both of these photos, analyze them separately and connect them in VR space by using the point cloud adjustment function.

・The first 2 pictures for the analysis affect the number of the point clouds output after that. If the point clouds are not output properly, it may be improved by changing the order of the photos to input to SfM plug-in.

・If the analysis stops immediately, set the "give priority to the number of the point clouds" in the priority content of the feature detection algorithm. This has lower point cloud precision but has higher detecting ratio of the camera position



rows)

Assessment Plug-in

1. Overview

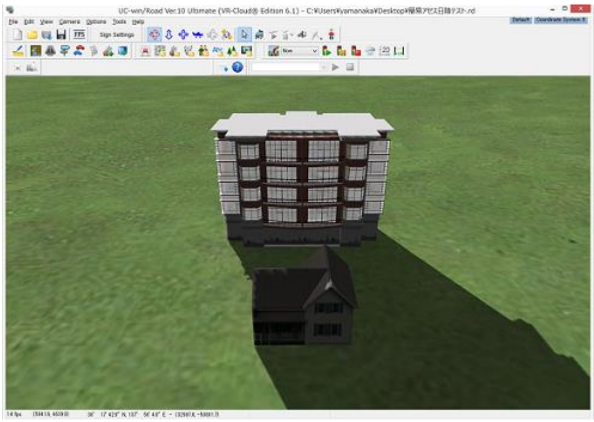
It is possible to assess 4 environmental items.

- Green coverage rate calculation

Evaluate the green coverage rate of the scene captured from different angles.

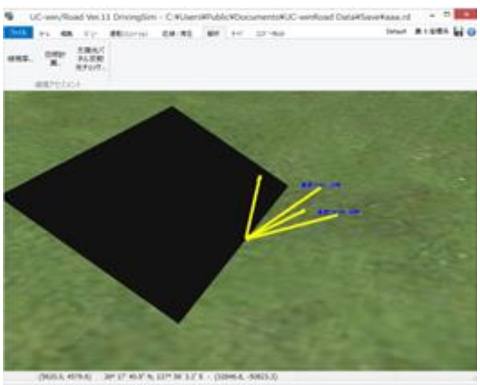
- Sunshine calculation

Evaluate the sunshine for certain time in details.
The default calculation date is set to the day of the winter solstice. The daylight calculation is hourly, but more detailed time conditions can also be visually confirmed.



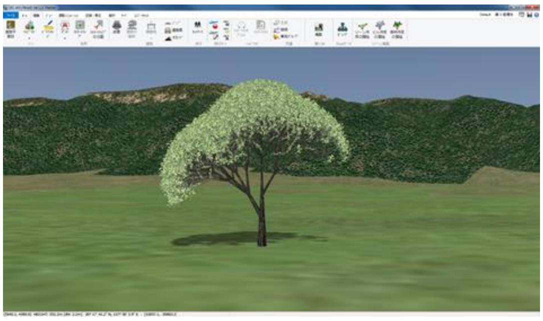
- Reflected light check

Check visually the reflected lights on solar panels.
The size, location, and orientation of solar panels can be easily changed, allowing different conditions to be studied in a simplified manner.



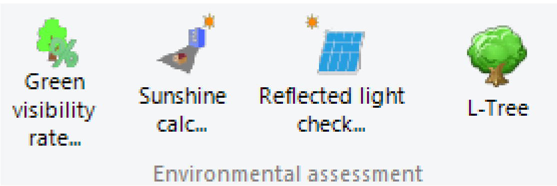
- L-Tree

Generate L-trees, which are 3D trees generated by L-System.



2. Operation flow

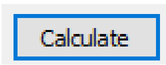
Start UC-win/Road and enable Assessment plugin from File - License Manager.
Go to Analysis – Environmental assessment.



(1)Green coverage rate

Click Green coverage rate to open "Green coverage rate calc" form. Load a (*.rd) file in advance.
The pixels whose H value is within the specified range and whose S and V values are larger than the selected value are considered as green, and the ratio to the whole capture is calculated in percentage.
This screen is used to set up and evaluate the green coverage ratio calculation.

Click 

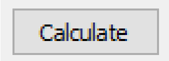
to caputure the current screen, and click 

to calculate the percentage of green visibility.

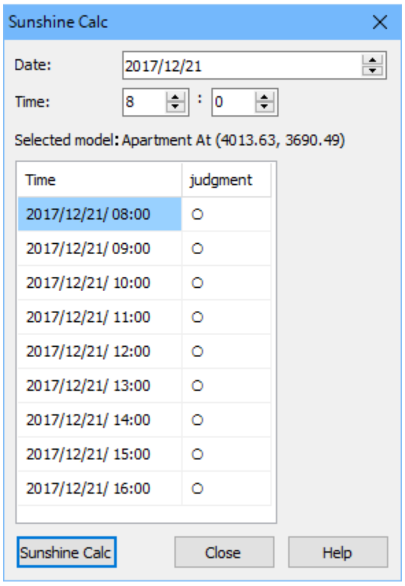
(2) Sunshine calculation

Click 

to open the Sunshine Calc form. Load a (*.rd) file in advance.
After entering the time and time to start the calculation, click on the model to be calculated.

After clicking 

, the result of the sunlight judgment will be displayed as ○ ×, or × if the model is in the shade. Judgment is made at the top center position of the model.



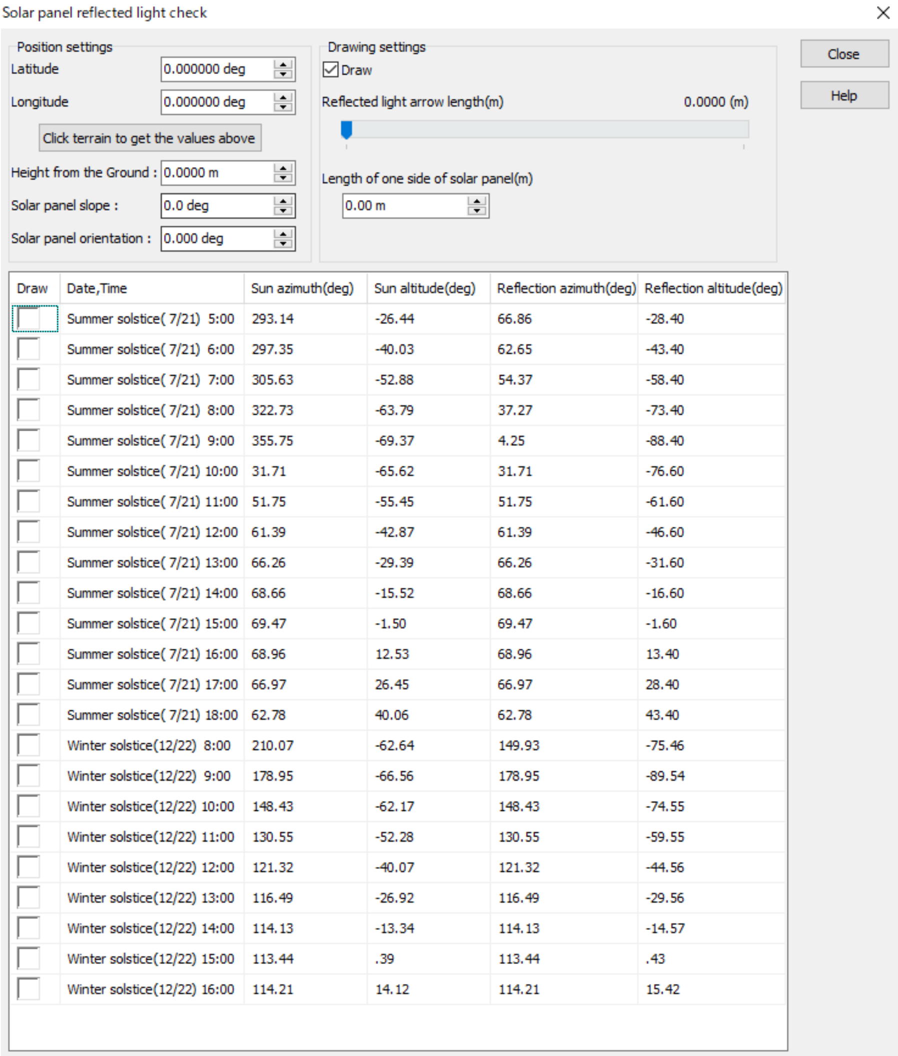
Example

Target time 12:00	Target time 16:00
	

(3) Solar panel reflection light check

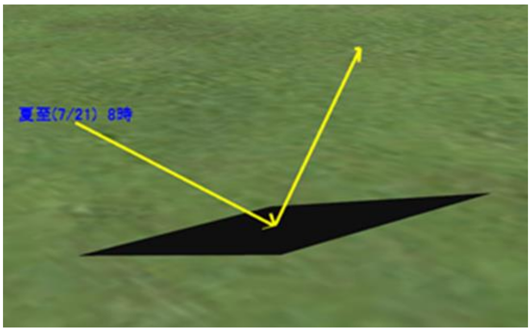
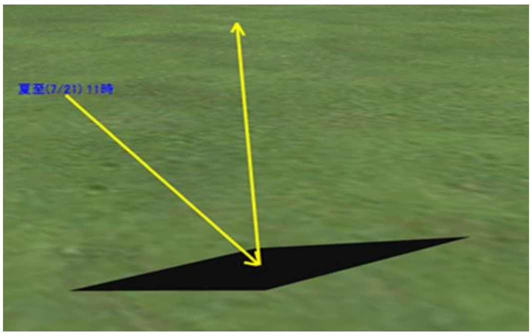
Click 

. Load a (*.rd) file in advance.
Set up the position and drawing settings.



Draw	Date,Time	Sun azimuth(deg)	Sun altitude(deg)	Reflection azimuth(deg)	Reflection altitude(deg)
	Summer solstice(7/21) 5:00	293.14	-26.44	66.86	-28.40
	Summer solstice(7/21) 6:00	297.35	-40.03	62.65	-43.40
	Summer solstice(7/21) 7:00	305.63	-52.88	54.37	-58.40
	Summer solstice(7/21) 8:00	322.73	-63.79	37.27	-73.40
	Summer solstice(7/21) 9:00	355.75	-69.37	4.25	-88.40
	Summer solstice(7/21) 10:00	31.71	-65.62	31.71	-76.60
	Summer solstice(7/21) 11:00	51.75	-55.45	51.75	-61.60
	Summer solstice(7/21) 12:00	61.39	-42.87	61.39	-46.60
	Summer solstice(7/21) 13:00	66.26	-29.39	66.26	-31.60
	Summer solstice(7/21) 14:00	68.66	-15.52	68.66	-16.60
	Summer solstice(7/21) 15:00	69.47	-1.50	69.47	-1.60
	Summer solstice(7/21) 16:00	68.96	12.53	68.96	13.40
	Summer solstice(7/21) 17:00	66.97	26.45	66.97	28.40
	Summer solstice(7/21) 18:00	62.78	40.06	62.78	43.40
	Winter solstice(12/22) 8:00	210.07	-62.64	149.93	-75.46
	Winter solstice(12/22) 9:00	178.95	-66.56	178.95	-89.54
	Winter solstice(12/22) 10:00	148.43	-62.17	148.43	-74.55
	Winter solstice(12/22) 11:00	130.55	-52.28	130.55	-59.55
	Winter solstice(12/22) 12:00	121.32	-40.07	121.32	-44.56
	Winter solstice(12/22) 13:00	116.49	-26.92	116.49	-29.56
	Winter solstice(12/22) 14:00	114.13	-13.34	114.13	-14.57
	Winter solstice(12/22) 15:00	113.44	.39	113.44	.43
	Winter solstice(12/22) 16:00	114.21	14.12	114.21	15.42

Examples

8:00	11:00
	

(4) L-Tree

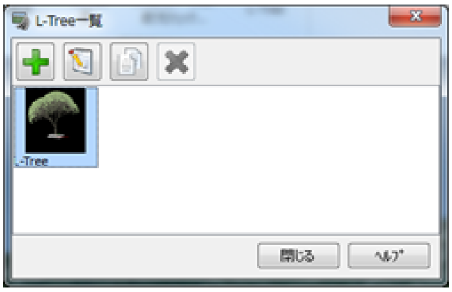
L-Tree is a 3D tree model created by L-System, which is a system to simulate objects naturally by changing only the size and repeating it.

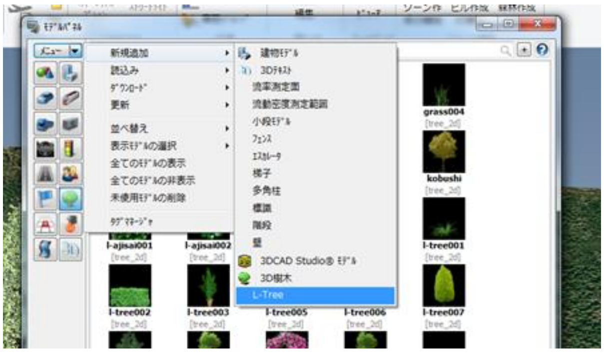
*L-System (G) is calculated as G = {V, S, ω, P}.
V: Variables which are replaced in order based on the replacement rule (=P). As the calculation proceeds, objects grow up by the strings of V.
S: Numerical constants
ω: Strings composed of V.
P: Replacement rule to change V. Each element is written with the combination of strings.

1. Create a new L-Tree

Click 

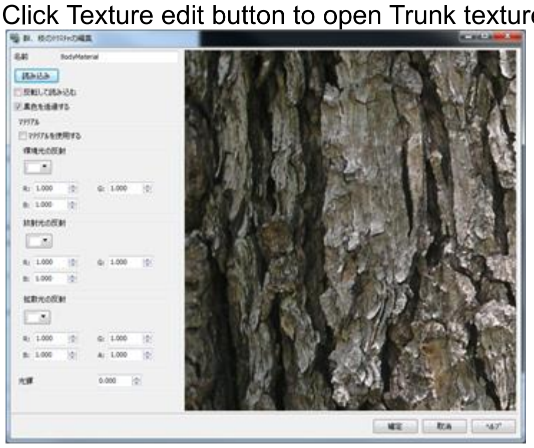
or go to Model Panel, New – L-tree.



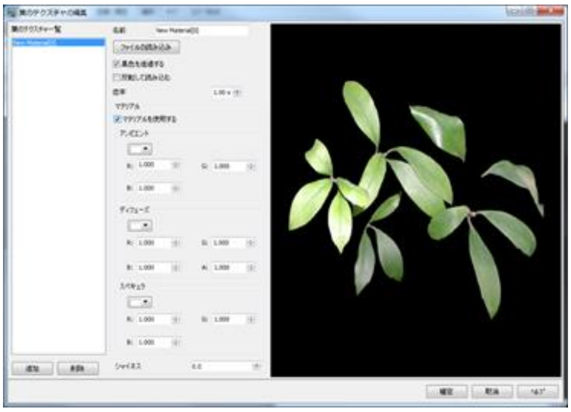


2. Settings on the Default tab
Set up the length, thickness, rotation angle, type of the trunk and growth rules.

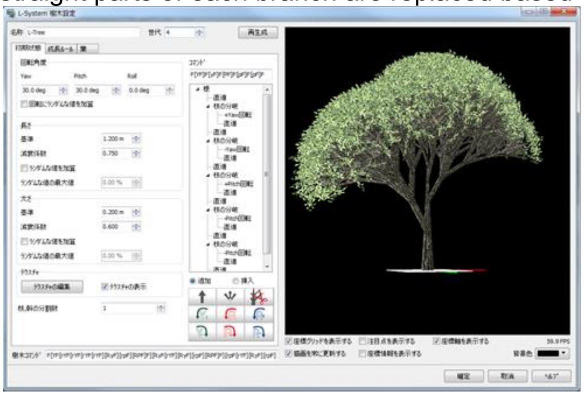
3. Settings for the texture and material of trunk
Click Texture edit button to open Trunk texture edit form.



4. Settings for the texture and material of leaves
Go to the Leaves tab on L-Tree Edit form and click Texture edit button.
Leaves are added to the points of each unbranched branch.



5. Settings for generations
Set up the generations, which means the growth stage by the generation number. As the generations increase, the straight parts of each branch are replaced based on the growth rule.



Note: This process will take time to complete depending on the tree shape.

6. Arrange
Arrange the L-Tree.

UAV Plug-in

1. Safety Guidelines

This system is intended to be used under the following general conditions:
- Please fly in an open area, with nothing that could potentially obstruct the flight (buildings, trees, power lines …) or get caught in the propellers
-Weather conditions: no rain, no wind (the maximum allowed wind speed is 4 m/s for optimal flight experience)
- Please keep a safe distance from sources of possible electromagnetic interference (radio transmission towers, high-voltage wires, cell towers…)
- Please always keep direct sight of the UAV while flying
- Please keep a distance of at least 30 meters from any persons in the vicinity
- Flying over a crowd is usually not allowed
- Please fly only during the day, between sunrise and sunset, to avoid the UAV being caught accidentally in power lines or electric towers

Also, please check the local flight regulations, usually available at the city hall or prefectural office. These regulations will allow to confirm the locations of restricted areas and under which conditions it is possible to use UAV.
Please be aware that flying a UAV comes with risks that could have heavy consequences. Some UAV distributors offer insurance subscription services that might cover possible damages caused by the UAV. It is recommended that the user consults with the UAV distributor regarding these insurance options.

Forum 8 will not be held responsible for damages resulting from any misuse of the whole system, or any malfunction of the software.

2. Overview

The purpose of the UAV plugin for UC-win/Road is to allow the user to take aerial pictures/videos in a very simple way. It is designed for a wide range of users, from users with few flying experience who wish to take pictures or videos without the stress of controlling the UAV with a remote controller, to experienced flyers who wish to automate the whole process in order to improve efficiency.
Within the Virtual Reality environment, the user creates a 3D path as a series of points (waypoints) connected by lines that will serve as guiding line for the UAV to follow. Upon any of the waypoints, the user can add actions to perform when the waypoint is reached (take picture, start recording a video, stop the video recording, and change the camera orientation…). The combination of the 3D path and actions defines a flight mission that specifies what the UAV should do from take-off to landing. Once the flight mission is defined, the user can start the mission execution simply by pressing a button in the graphical user interface (GUI). The mission will be uploaded automatically to the UAV, which will then take off, fly along the predefined 3D path, perform the required actions and land at the last waypoint. After landing, the user can download the pictures and video taken during the flight simply by pressing a button in the GUI, so the pictures and videos will be available on the PC.
The UAV plugin was developed with the DJI Phantom 3 Professional UAV as it supports autonomous flight functionalities and offers remarkable flight stability, but ultimately, the UAV plugin is designed to extend the support to other UAV platforms offering similar autonomous flight capabilities.

3. Requirements

The most basic control of a UAV is usually made manually through a remote controller. Nowadays, a wide range of UAV’s can execute a flight mission planned beforehand on a separate computer and uploaded to the UAV to be executed autonomously. More recent models of UAV’s allow the connection of a mobile device (mobile phone, tablet) to the remote controller to design a flight mission while on site, upload it to the UAV and monitor its motion during the whole flight through the screen of the mobile device.
Our approach is to use Virtual Reality functionalities of UC-win/Road to simplify the creation of the flight mission and the monitoring of the flight mission execution. Within a 3D virtual environment, it is possible to create a flight mission in a simple way by selecting 3D positions, upload the information to the UAV and launch the execution of the flight mission. While the UAV is flying, its progression is continuously monitored in real time in 3D to confirm that everything is going according to the flight plan.
In order to do so, the mobile device is used as an interface between the actual UAV and the PC, which allows the user to control and monitor the UAV’s flight from a PC through UC-win/Road.
This was achieved by developing an Android interface application named F8 UAV Controller, which is based on the android version of the DJI SDK that communicates with UC-win/Road through Wi-Fi.
The full system is shown in Figure 1: DJI Phantom 3 Professional, remote controller, android tablet (android interface), laptop (UC-win/Road and UAV plugin) and a Wi-Fi router for the communication between UC-win/Road and the android interface.

Note:
Now the application cannot be installed from Google Play. The APK package of the Android application is offered with UAV Plugin from Forum8.

Note:
It is recommended to install the DJI application according to UAV version.

- * DJI Go: For UAVs released before Phantom 4. (For example, Phantom 3 series, Inspire 1 ...)
- * DJI Go 4: For UAVs released after Phantom 4 (For example, Mavic Pro, Phantom 4, Phantom 4 Pro, Inspire 2 ...)

This DJI Go/Go 4 is necessary to activate and set up UAV.

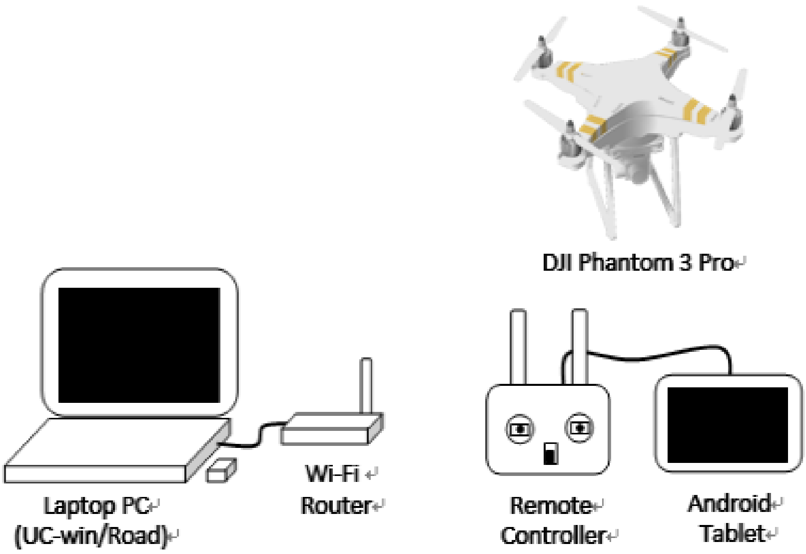


Figure 1: Required devices

UAV

The UAV plugin supports a wide range of models from DJI but only the following ones could be confirmed: Phantom 3 Advanced, Phantom 3 Professional, and Phantom 4 Pro.
The following models should also be supported but we didn't have the opportunity to confirm them: Phantom 4, Mavic Pro, Inspire 1, Inspire 2, Matrice 200/210 series, Matrice 600, and Spark.
The models used in our development are the Phantom 3 Advanced, Phantom 3 Professional (shown in Figure 1) and Phantom 4 Pro.
All these UAV's are equipped with (at least) one camera mounted on a 3D gimbal, which purpose is to stabilize the camera's orientation while the UAV is flying.

Coordinates systems

The UAV plugin uses two types of coordinates systems (Figures 2, 3):
- The UAV's local coordinates system. In this system, the motion of the UAV is given independently of its current location and orientation (for instance, move forward/backward)
- The Absolute coordinates system describes the motion of the UAV's in absolute way, with regards to its latitude, longitude, altitude and heading

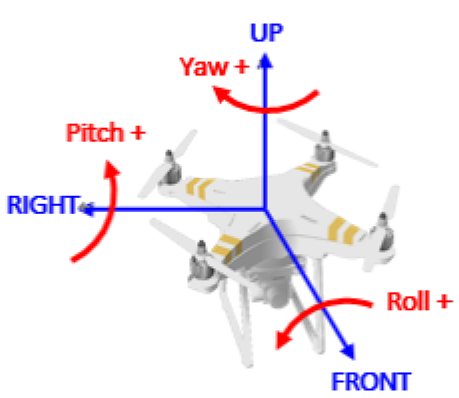


Figure 2: UAV's body coordinates system

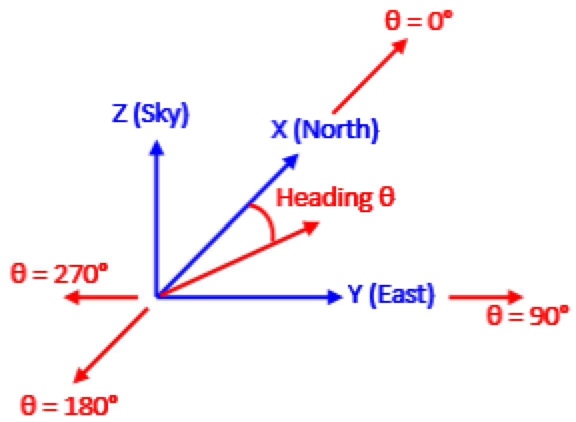


Figure 3: Absolute coordinates system

About gimbal, camera, remote controller, Android tablet, laptop PC, Wifi router and Internet connection, refer to Help document.

4. UC-win/Road and UAV Plugin

Start UC-win/Road. From the plugin manager, make sure the UAV Plugin is authenticated (USB protect key required).

Hint：It is recommended to use the UAV Plugin in full screen mode by either pressing the F10 Key or by a right click anywhere in the 3D environment then select "Full Screen". For the rest of the document, we will be in full screen mode.

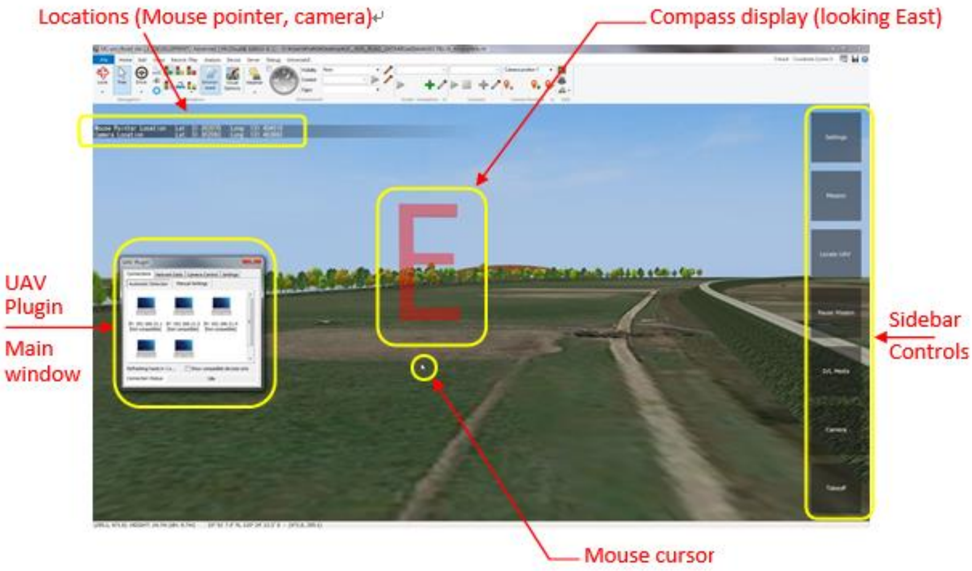


Figure 9.a: Default view of the 3D environment in UC-win/Road

In that view, we can see the UAV Plugin window, on the left side of the screen, the side bar on the right side of the screen, and finally in the top side of the screen, the camera latitude and longitude, and the location pointed by the mouse cursor.

The sidebar buttons include "Mission", "Locate UAV", "Pause/Resume mission", "Download media", "UAV Camera" and "Take off/Land" function.

5. Flight Mission

The autonomous flight capabilities of the UAV are accessible through the definition of a flight mission. A flight mission has two components:

- a flight route created from as a series of 3D positions/orientations (waypoints)
- actions that can be performed when the UAV reaches a waypoint

Once a flight mission is created within UC-win/Road (mission planning), it is uploaded to the UAV through the Android interface and executed autonomously. The UAV will take off autonomously, fly to each waypoint successively and land. Whenever a waypoint contains an action (or a series of actions), the UAV will stop at the waypoint, execute the action(s) and fly to the next waypoint.
After the flight mission is completed, the user can download the media files captured during the mission.
The main steps of a typical use of the system are shown in Figure 17.

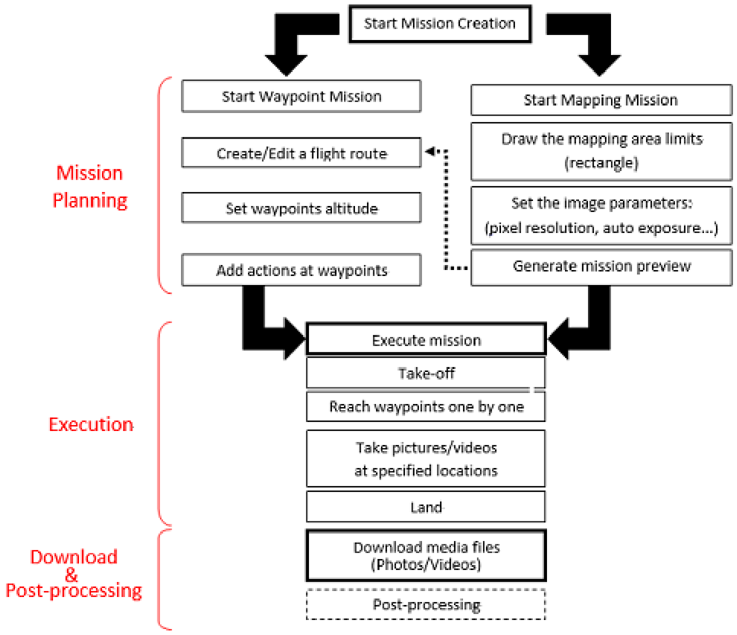
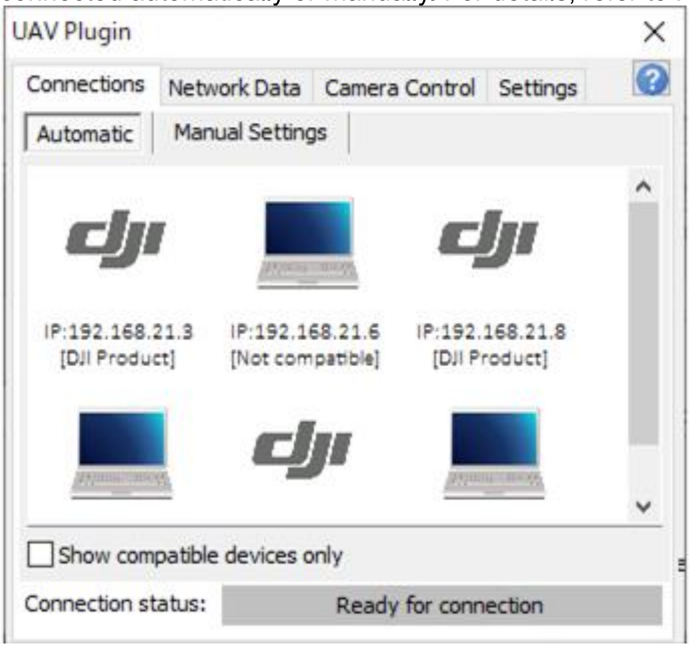


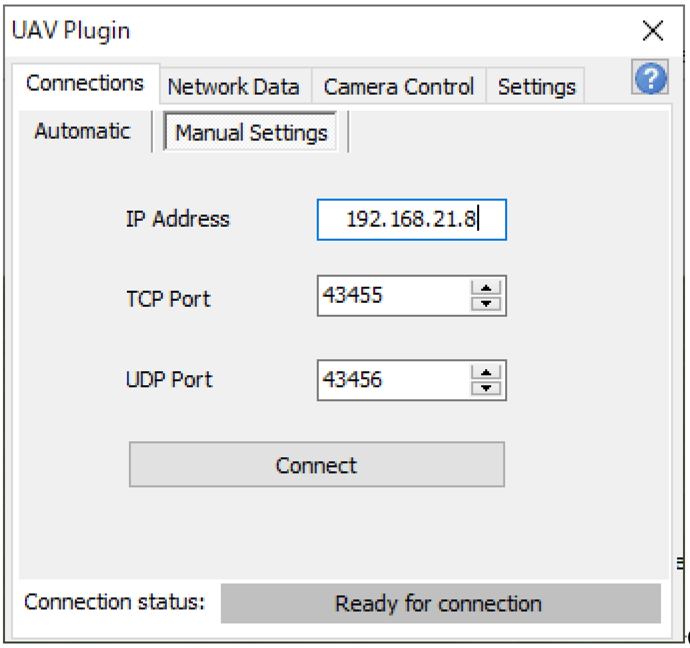
Figure 17: Typical use of the system

Main Window
It has 4 tabs, Connections, Network Data, Camera Control, and Settings.

Connection
Use this to connect UAV Plugin with the UAV via a remote device (Host). It is possible to detect devices to be connected automatically or manually. For details, refer to Help.

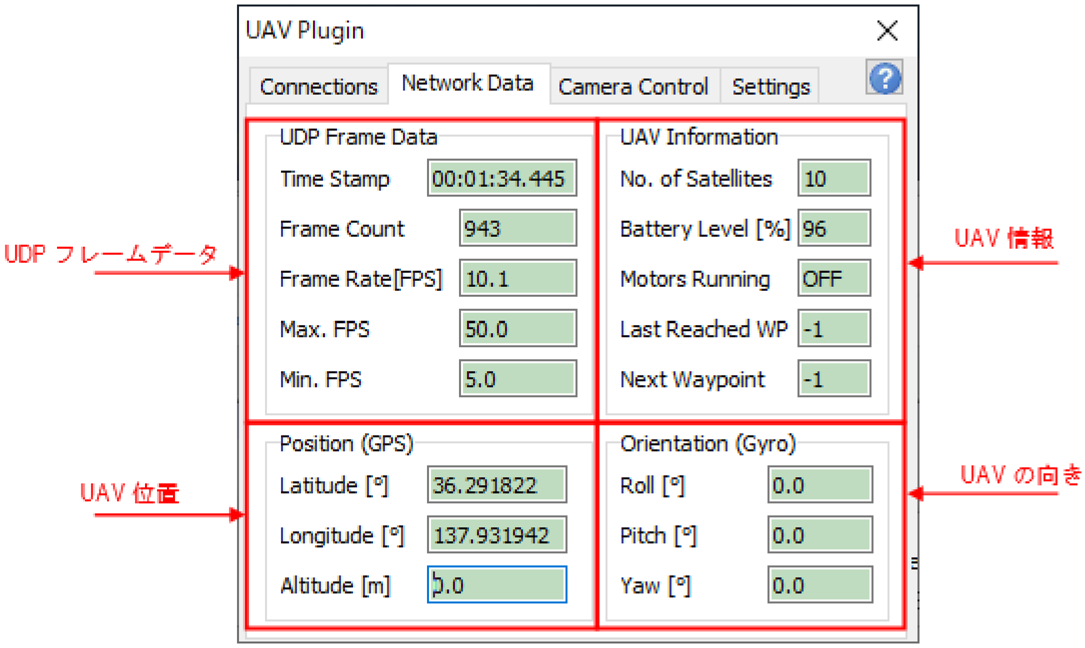


Connections tab, Automatic detection



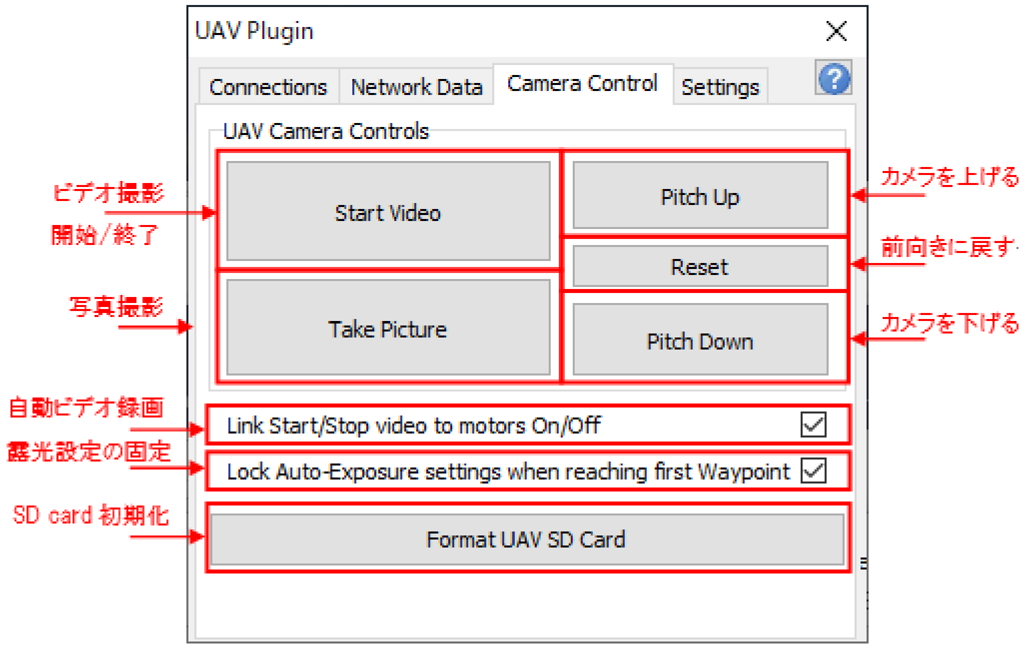
Connections tab, Manual Settings

Network Data tab
On this tab, it is possible to confirm the information about UDP frame data, UAV information, UAV position and UAV orientation.



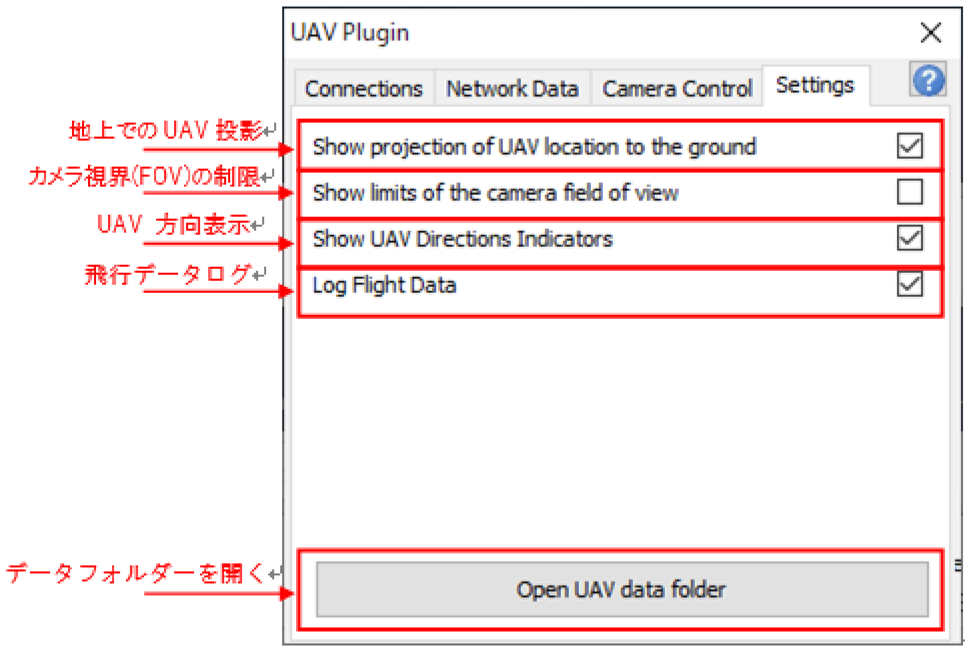
Network Data tab

Camera Control Tab
It is possible to control a camera mounted on UAV.



Camera Control tab

Settings tab
It is possible to set up the options.



Settings tab

Mission Editor: Creation of a Waypoint Mission

5.1.1. Mission Edition Mode

The mission planning consists of the full definition of task the UAV will perform. It starts by creating the path that the UAV will follow. In the current version of the UAV Plugin, once the user opens the mission editor, the camera will automatically move to a top-view position and the mission edition mode will be enabled (Figure 18). From there, the flight route is created in the virtual environment by drawing lines with the mouse.

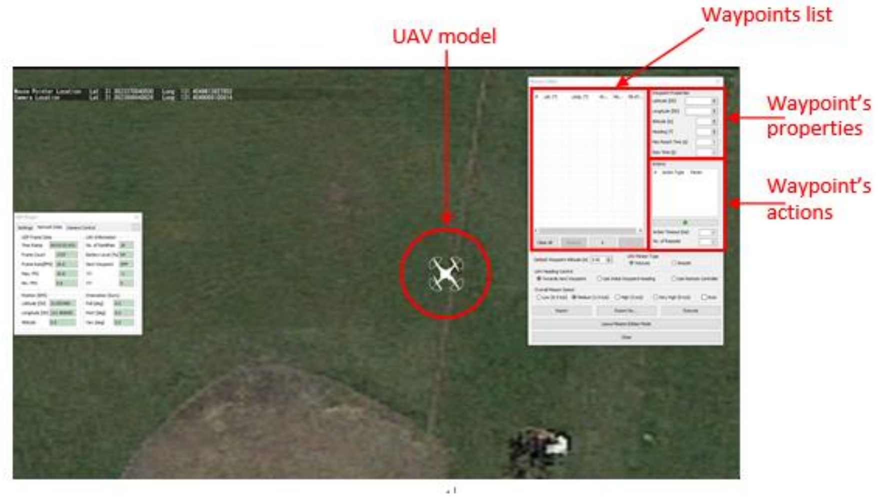


Figure 18: Mission Edition Mode

As the user creates new waypoints, they will appear in the waypoints list, and by selecting a waypoint in the list, its properties will be displayed in the "Waypoint Properties" area, along with the list of actions defined for that waypoint ("Actions" area).
Note: For the DJI Phantom 3, a flight mission should contain between 1 and 99 waypoints, while each waypoint contains between 0 and 6 actions

5.2 Mission Execution

If the user is satisfied with the generated preview, the execution of the mapping mission can be launched by pressing the "Execute" button. Before the mission is executed, a confirmation message will be displayed.
Once the execution is started, the UAV will:
- takeoff automatically
- fly vertically until reaching the altitude of the first waypoint
- fly directly to the first waypoint
- take a picture at each waypoint
- land automatically

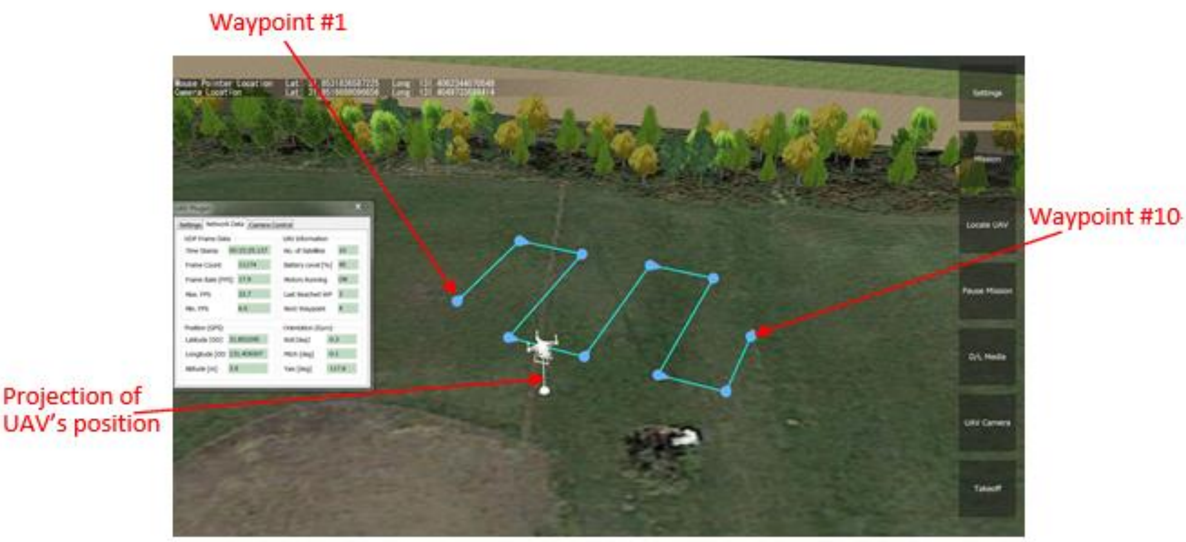


Figure 32: Execution of a flight mission

5.3.Media Files Download and Post Processing

Once the UAV has landed, the F8 UAV Controller application will automatically download a preview version of the pictures recorded during the flight and send them back to the connected clients.

The pictures are stored on the android device and on the PC under the mission's corresponding folder, identified by a unique timestamp.
An example of the file path that picture will be saved to be:
- On the PC:
%userdatafolder%¥UAV_DATA¥20170321@124500¥MEDIA_FILES
With yyyyMMdd@hhmmss being the current date and time defined as year, month, day of the month, hour, minute, second.
(For instance, 20171108@154632 stands for the November 8th 2017, 15 hour 46 minutes and 32 seconds)

- On the android device:
/mainstorage/Forum8/UAV_DATA[PLUGIN_VER_x.x]/yyyyMMdd@hhmmss/MEDIA_FILES/
With x.x being the UAV plugin version (Currently: 3.0)

When the media files are requested by pressing the "Download all available media files" button, and they are not part of a specific flight mission, then they will be downloaded to the default file path as shown below:

%userdatafolder%¥UAV_DATA¥MEDIA_FILES.

Note: In the case of an important number of pictures or videos to download, the wireless download might take a long time to complete, so it is recommended to connect the UAV to the PC with a USB cable and download the media files by using windows explorer, as it will be seen as a digital camera.

6. Starting the UAV and the Android Device

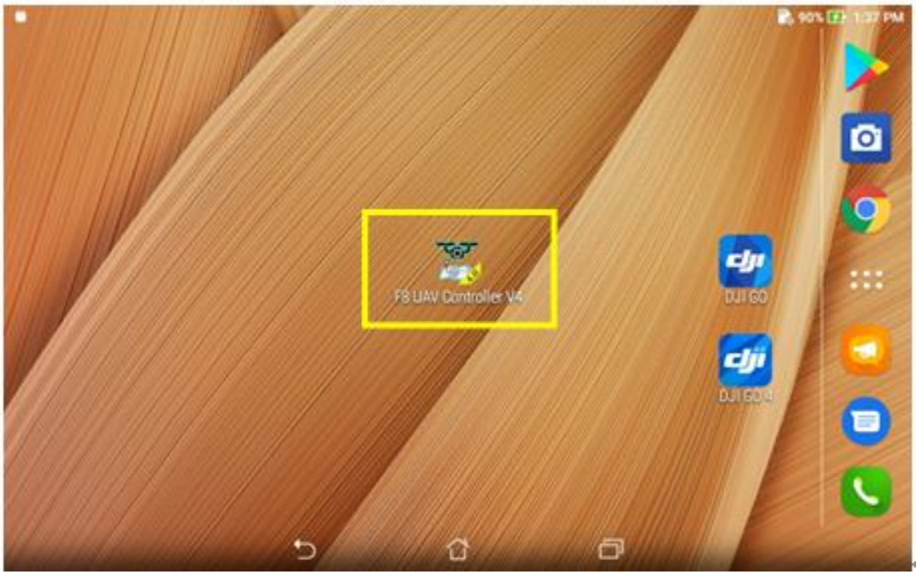
Android Application F8 UAV Controller is used to connect PC with UAV.
It supports the following models.:
Phantom 3 Advanced, Phantom 3 Professional, Phantom 4, Inspire 1, Phantom 4 Pro, Phantom 4 RTK, Mavic Pro, Mavic 2 series (Pro, Zoom, Enterprise), Mavic Air, Inspire 2, Matrice 200/210, Matrice 600, DJI Spark

Note:
It is necessary to use DJI Go application to activate an UAV for the first time. This process requires Internet connection, so it is recommended to activate and adjust calibration in advance.

Quick Connection Steps
- Power OFF the UAV, remote controller and android device.
- Connect the android device to the Wi-Fi network
- Connect the micro USB port of the android device to the USB port of the remote controller by using a micro USB cable (Figure 7)
- Check the Remote Controller battery level (press the ON button of RC shortly once). If the battery indicator shows less than 3 solid white dots over 4, then charge the RC first.
Note: Avoid using the remote controller while charging it, as it will overheat and possibly get damaged.

- Open the F8 UAV Controller Application in the Android device
Note: in the previous version of the application, turning the RC would automatically start the application. Now the application needs to be explicitly launched before turning the RC ON

Note: F8 UAV Controller V2 is started automatically by operating the remote controller. In case of F8 UAV Controller V4, Start the application before turning on the remote controller.



F8 UAV Controller

Note:
The device must have Internet access to start the application for the first time. Once Authentication is completed, it is used offline.

After starting the application, the screen changes to the following.

After initialization is completed, click NEXT. Do not turn on the remote controller yet.

After initialization

Then turn on the remote controller.

Press a power button once, and press it for 2 seconds again. The Android device vibrates and displays the dialog to select an application

Note: If the following dialog is not displayed, repeat turning on and off the remote controller. If it does not still work, close the application and try again from the first process.

Choose F8 UAV Controller, and click Just Once. When Always is selected, it is not possible to access to USB by

other application. Change the setting to Just Once on the Android device settings.
After starting F8 UAV Controller application, the remote controller will be detected. The screen will change to the following.

- Turn on UAV

Push ON button once to confirm the battery level. If the number of green bar is less than 3, charge it at first.
Push the power button short, and then hold down it for a bit and release it to turn on UAV.
The application detects and lists the UAV being connected and all components (remote controller, camera, gimbal, battery...). The screen changes depending on the connected devices.

Click Start.

Now the system is ready to be used outside or inside (with Simulator mode).
Before using it outside, wait for the UAV preheating and GPS lock to finish. The LED light becomes orange, then blinks n green and orange, and finally it becomes green.
If the light does not become green, confirm the number of satellites on the left-side status bar. At least 7 satellites are required to stabilize

7. Android Interface

7.1. Overview

The F8 UAV Controller android application makes the link between UC-win/Road and the UAV. Its purpose is to relay the commands from UC-win/Road to the UAV for execution and retrieve real time navigation data from the UAV and send them back to UC-win/Road.
The android device is connected to the USB port of the remote controller through a USB A cable. The user should always make sure that the android device is fully charged before starting a flight mission.
At this stage, we assume that the UAV has its firmware updated (main controller firmware and remote controller firmware), and that its compass has been calibrated.
If not, refer to DJI website to check the firmware update procedure and the compass calibration procedure corresponding to the UAV in using.

Once the UAV is powered on and the GPS location could be acquired, the android interface should be displayed as in Figure 40.

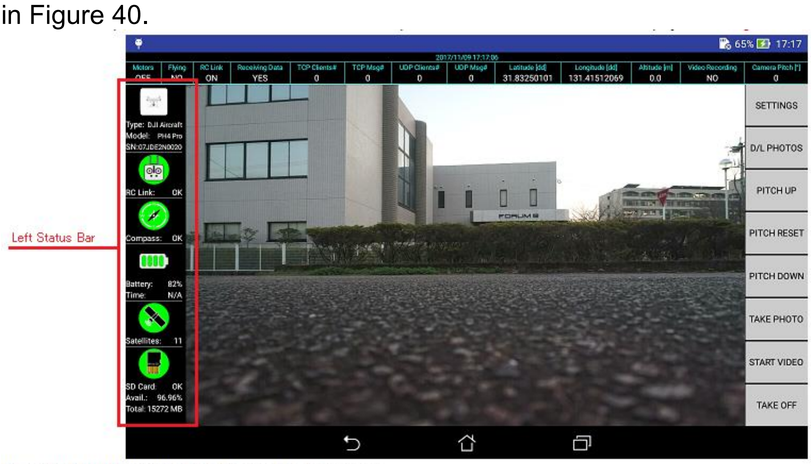


Figure 40: F8 UAV Controller Main Screen (After Connection)

The android interface shows the UAV's camera view so the user can check (almost) in real time what is actually captured when the camera takes a photo or records a video.

Left Status Bar
The left status bar shows the status and information of the main components of the UAV system currently in use: connection to the UAV, model of UAV, remote controller connection, compass status, status of the UAV's battery, GPS status, and status of the UAV's SD card.

Note: In order to accommodate a wide range of android devices display, the status bar can be scrolled vertically by pressing it and swiping down or up.

Real Time Video Stream
The application screen shows the view from the UAV's front camera (Figure 40), so the user can check in real time what the camera is currently capturing. The video streaming is received wirelessly through the remote controller and displayed on the android interface. The streaming usually takes few seconds to stabilize. However, on occasions interferences can occur, for instance when the remote controller is located near a strong magnetic field, causing distortion in the image or even loss of signal. In that case, please move away from possible source of interferences and restart the system.
Although the quality of the video feed doesn't influence the operation of the UAV, we recommend to have a stable video stream and free from interferences before executing a flight mission.

Right Buttons Bar
Located on the right side of the interface, the button bar allows to set the system options and control the UAV with main commands (Figure 41).
All the functions on the right side bar (Figure 41) are accessible as soon as the connection with the UAV is established.

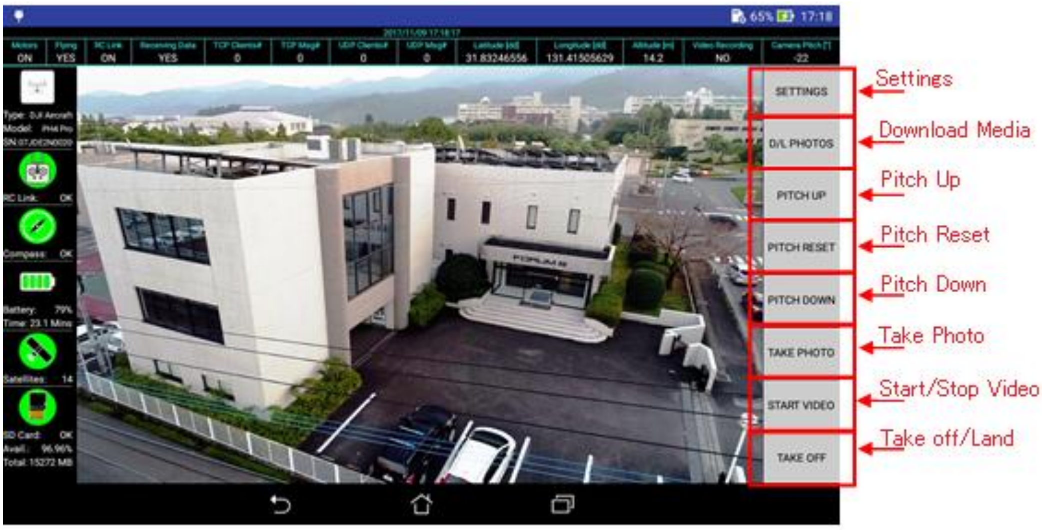


Figure 41: Right buttons bar

Top Status Bar
On the top side of the interface, status indicators as well as warning messages are displayed (Figure 42):

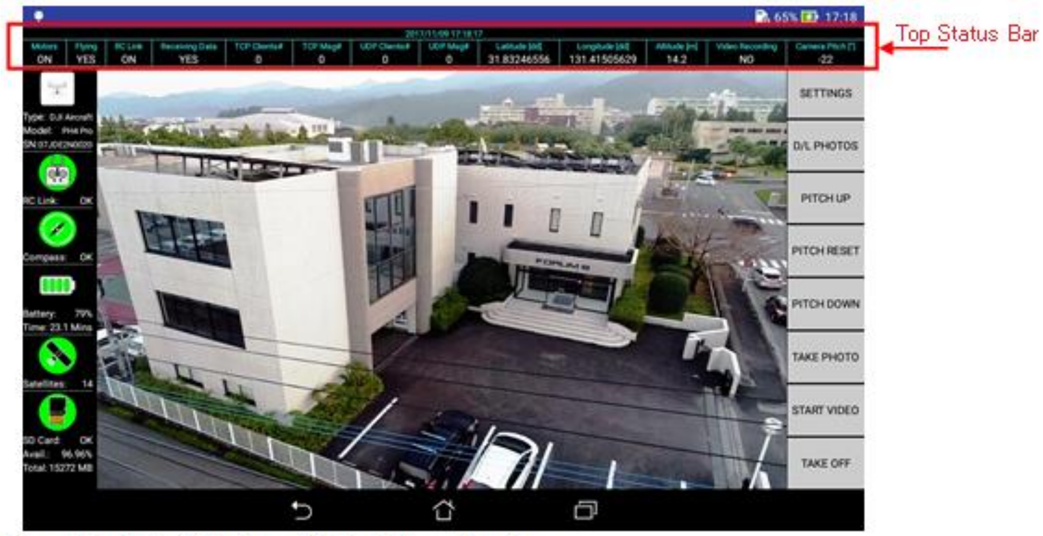


Figure 42: Android device with Android application

7.2. Android Interface Settings

The settings window is shown in Figure 43. It is accessed by pressing the "Settings" button on the main view of the application (Figure 42).

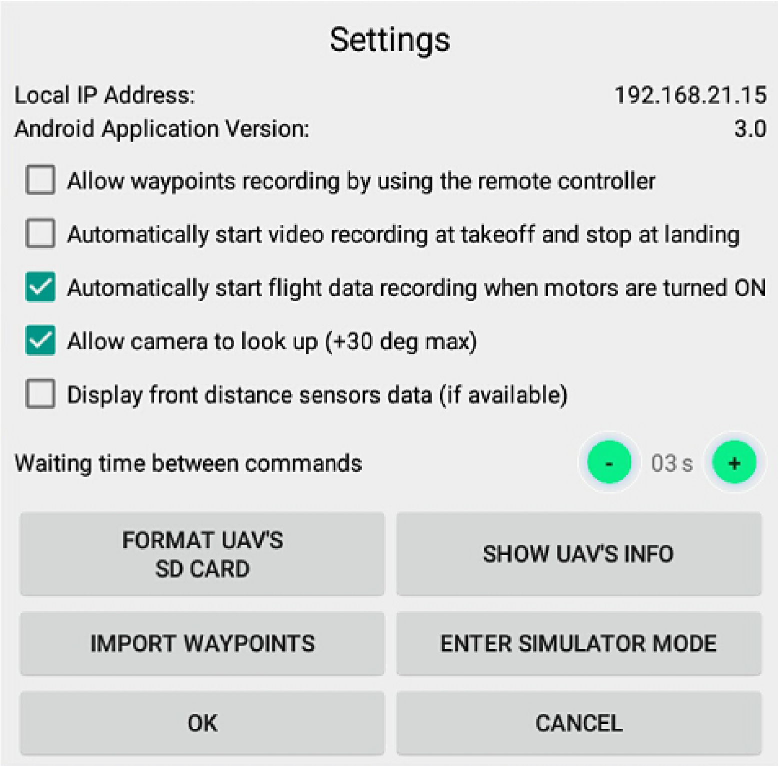


Figure 43: F8 UAV Controller settings

Quest Rift Plug-in

Operation environment
Make sure both requirements of Quest Rift and UC-win/Road are satisfied.
Quest Rift requirements are detailed on Quest website.

Recommended system requirements

OS	Windows10
CPU	Intel i5-4590 / AMD Ryzen 5 1500X or later
Memory	8GB+ RAM
Graphics	NVIDIA GTX 1060 / AMD Radeon RX 480 or higher (NVIDIA GTX 970 / AMD Radeon R9 290 or higher)
Others	HDMI1.3 video output, USB3.0 port ×3, USB2.0 port×1

Necessary system requirements

OS	Windows10
CPU	Intel i3-6100 / AMD Ryzen 3 1200, FX4350 or later
Memory	8GB+ RAM
Graphics	NVIDIA GTX 1050Ti / AMD Radeon RX 470 or later (NVIDIA GTX 960 / AMD Radeon R9 290 or later)
Others	HDMI1.3 video output, USB3.0 port ×3, USB2.0 port ×1

UC-win/Road requirements are detailed on FORUM8 website,

OS	Windows8.1/10 (64bitOS)
CPU	Intel Core i7 Quad-core or more. CPU 3.2GHz or more.
Memory	8GB or more
Graphics	NVIDIA GeForce GTX 950 or higher. 4GB or more of Video memory.

Quest Rift Software
Install Quest Rift software. Quest Rift Runtime installer can be downloaded from http://Quest.com/setup/.

Operation flow
This version is 1.34.0. It may differ depending on version.

1. Install Quest Rift software. Connect Quest following the installer's instructions.
   After setup is completed, run Quest Rift software, mount Quest Rift on the head. The screen is displayed on Quest Rift.
2. Click Settings on the left-side menu and allow Unknown Sources on Quest Rift software setting.

   Click General and allow Unknown Sources.

The window shows a warning message. Check it and click Allow.

3. Run UC-win/Road and enable Quest Rift plugin from Menu File - License Manager.

4. To start displaying scene, click 

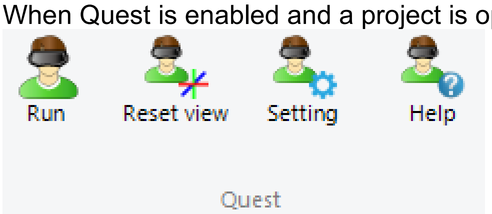
on Device tab of Quest Group.

5. To pause displaying, click 

.

Quest Ribbon menu

When Quest is enabled and a project is opened, the following ribbon menus are added to Device tab.

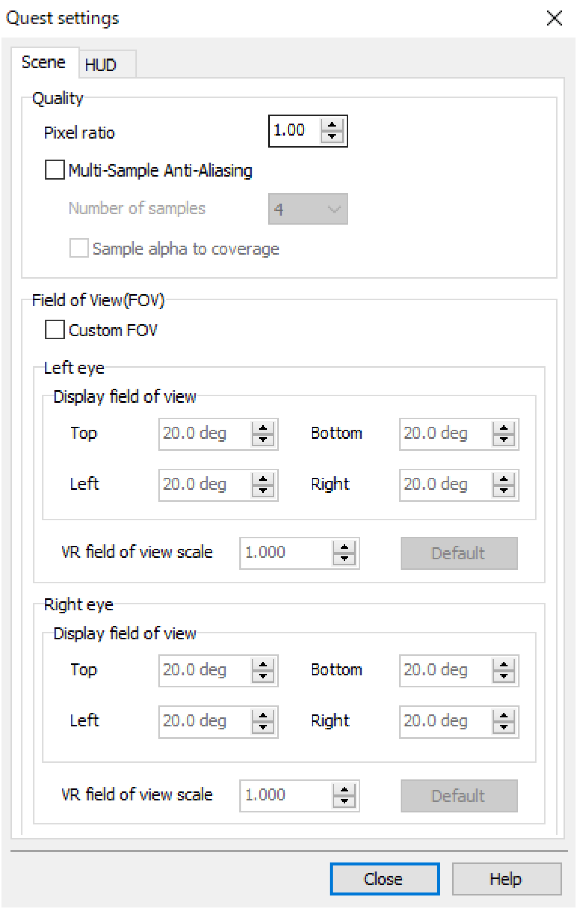


-Run/Stop: Start/Pause displaying scene on Quest.
-Reset view: The coordinate system of the Quest can be initialized so the user can chose the direction of the front view.
However, roll and pitch are chosen according to the direction of gravity.
In navigation mode, the coordinate system behave as follows:

- Free mode, walking mode: Yaw angle is the one of the camera, roll and pitch angle are set to 0.
- Driving mode, flight mode: the coordinate system of the vehicle is used.

-Setting: Display Quest setting form

-**Help**: Open the help menu.



Limitation on Quest Rift

The current version of Quest Rift has the following restrictions.

- **Solar flare and whiteout**
  Solar flare and whiteout are not drawn correctly.
- Windshield(Rain wand wipers)

Windshield wipers and rain on the windshield are not drawn in 3D.

- Jump and rotation with right click
  Jump and rotation with right click functions do not behave correctly.

HTC Vive Plug-in

What is HTC Vive plug-in

HTC Vive plug-in allows to use functions introduced by linking HTC Valve and UC-win/Road with OpenVR SDK. With this plug-in, it is possible to display UC-win/Road scenes on HMD (Head-mounted display) and link its movement with the camera of UC-win/Road using Steam VR (TR) tracking device.

Safety precautions
Follow the next recommendations for a safe experience.

- HMD like HTC Vive may cause 3D sickness. When it occurs, rest the eyes and take a rest in a cool ventilated place.

- Ensure all cables are correctly wired and avoid tripping over the cables.

- Avoid placing obstacles in the play area.

System requirement
To correctly use HTC Vive with UC-win/Road, make sure both systems requirements are satisfied.

HTC Vive requirement are detailed on Vive's website.

<table>
<tr><td>Type</td><td>VIVE</td><td>VIVE Pro</td><td>VOVE Cosmos</td></tr>
<tr><td>OS</td><td colspan="2">Windows 8.1, Windows 10</td><td>Windows 10</td></tr>
<tr><td>CPU</td><td colspan="3">Intel Core i5-4590 or later, or AMD FX 8350 or later</td></tr>
<tr><td>Memory</td><td colspan="2">4GB or more</td><td>8GB or more</td></tr>
<tr><td>Graphics</td><td colspan="3">NVIDIA GeForce GTX 1060 or later or AMD Radeion RX480 or later</td></tr>
<tr><td>Video output</td><td>1 x HDMI 1.4 or higher or DisplayPort 1.2 or higher</td><td colspan="2">Displayport 1.2 or higher</td></tr>
<tr><td>USB</td><td>1 x USB 2.0 port or more</td><td colspan="2">USB 3.0 or higher</td></tr>
</table>

To use HTC Vive, Steam and Steam VR have to be installed. Follow the procedure below to install and configure. Stream VR can be started from the plugin.

1. Installation of Steam

Download the installer from Steam's official site and install according to the installer's instructions.
A Steam account is required. Therefore, create an account and login.

2. Installation of Steam VR

Start Steam and select "Library - Tools". Right-click on "SteamVR" in the list to install.

3. Installation of HTC Vive base station

See Vive's official website for further details.

4. Room Setup

Connect to HMD and start Steam VR, and lunch Room Setup. Select Room Setup from the menu on the top left.
In Room Setting, configure default settings such as origin point.

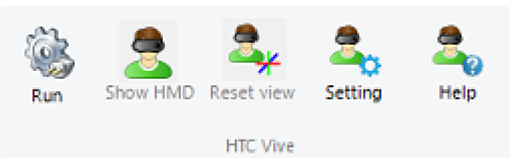
And configure the screen setting.

5. Cooperation with UC-win/Road

The following procedure details how to start Vive plug-in.

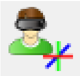
1. Activate HTC Vive Plugin
Start UC-win/Road. From the menu, select File - License Manager and enable HTC Vive Plugin.

2. HTC Vive ribbon menu
Once enabled, the "HTC Vive" group appears in the "Devices" tab of the Ribbon menu.

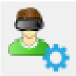


 **Run/Pause:** Start connecting with SteamVR.

 **Run / Stop**: Start/stop cooperation with HTC Vive. This action can be performed only once a project file (*.rd) is loaded.

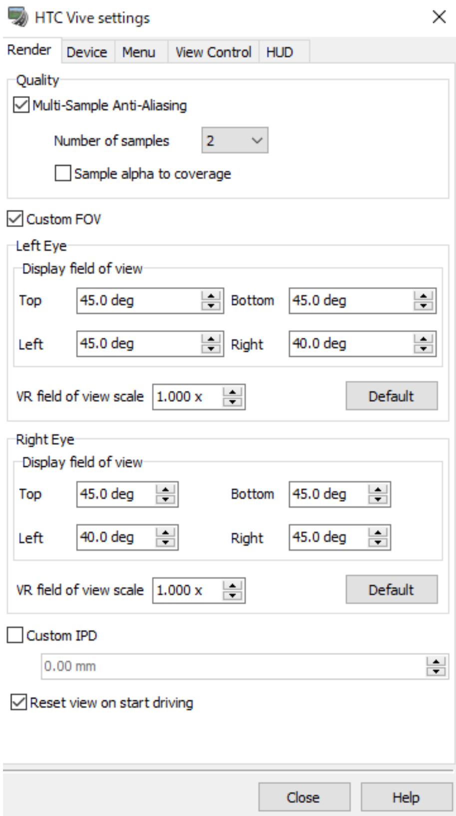
 **Reset view**: The coordinate system of the HMD can be initialized so it is possible to choose the direction of the front view. However, roll and pitch are chosen according to the direction of gravity.
Hint: it is available during connection with StreamVR.

In navigation mode, the coordinate system behave as follows:
- Free mode, walking mode: Yaw angle is the one of the camera, roll and pitch angle are set to 0.
- Driving mode, flight mode: the coordinate system of the vehicle is used.

 **Setting**: Display HTC Vive setting form.

6. HTC Vive Setting Form - HTC Vive plug-in

This form describes how to configure FOV information for HTC Vive, displays and sets the device linked with SteamVR and UC-win/Road and how to display the menu, when using the HTC Vive plug-in.



7. Camera operation function

Camera operation is performed by the controller device. When multiple controller devices are connected, it is possible to do the same operation on all controllers.
Hint: Only when HTC Vive is linked, the camera operation function is effective.

Touch pad Up/Down	Move to up or down.
Touch pad Left/Right	Left to move to the parent menu, right to move to the child menu.
Trigger	Confirm the selection. Start operation.

8. Menu function

When HTC Vive is connected, the menus are displayed. The menu screen is displayed when pressing the application menu button on the controller device. It is also possible to hide it by pressing the same button.

9. Link with Scenario

It is possible to connect HTC Vive with the scenario of UC-win/Road.

Scenario Event Function

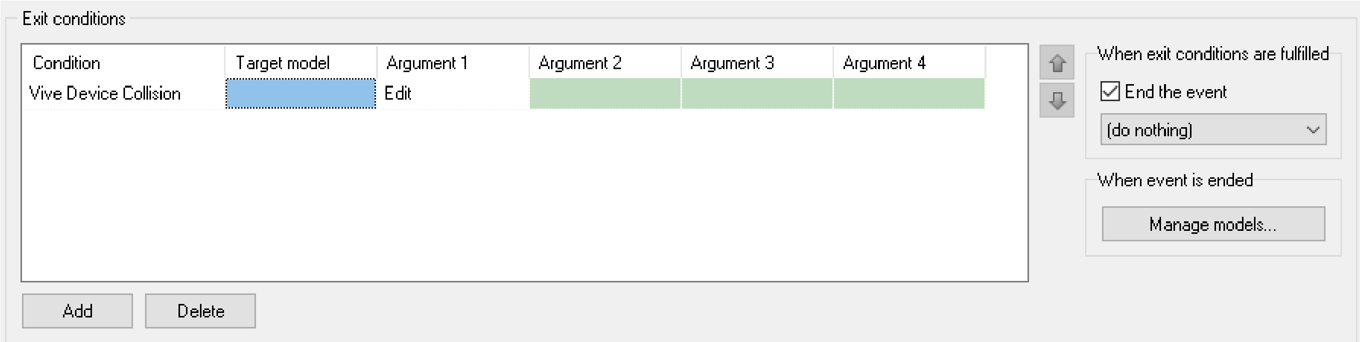
Use the scenario event function in UC-win/Road to set up HTC Vive.
Go to the settings on the Extension tab of Event editor.

Enable HMD: Start diaplaying UC-win/Road scenes on HMD.
Disable HMD: Stop displaying UC-win/Road scenes on HMD.
Reset view: Reset the view.
Controller Vibration: Check it to enable controller vibration.

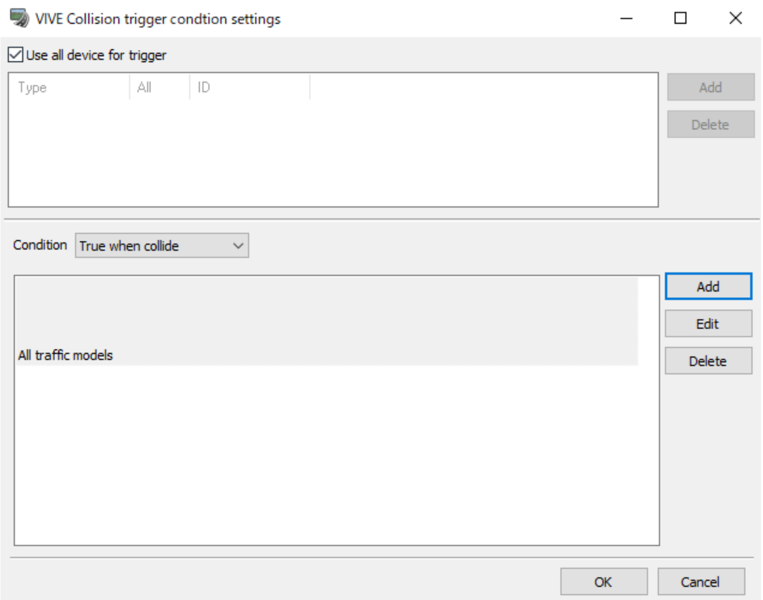
- **All controllers**
  Enable controller viblation for all controllers.
- **Assigned controller**
  Specify a custom number of controller to be enabled vibration.
- **Vibration strength**
  Set up the vibration strength from 100 to 4000
- Duration

Set up the duration time of vibration.

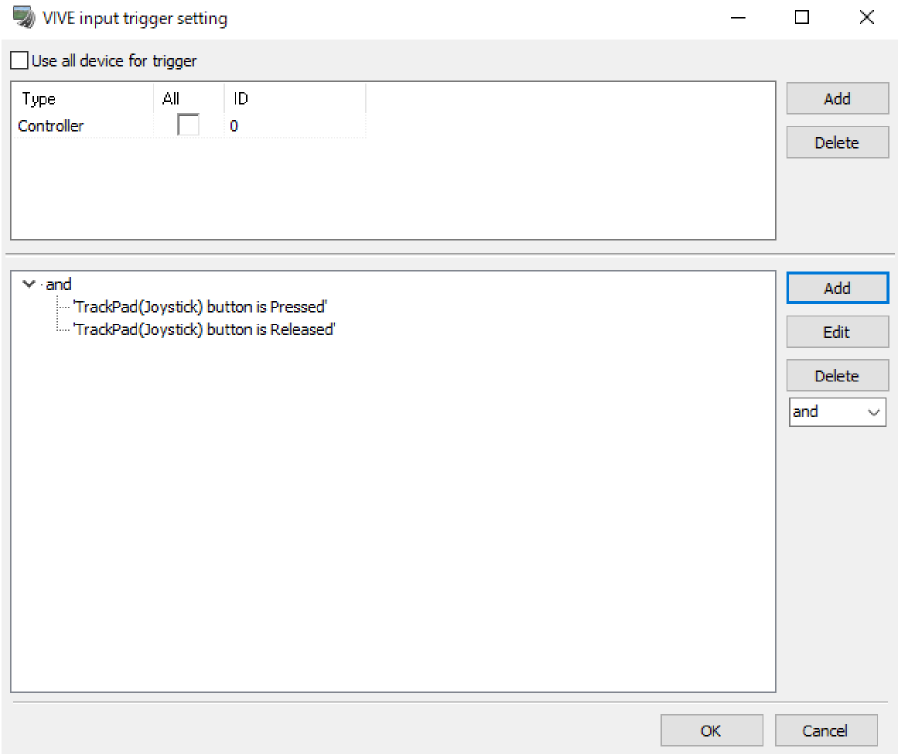
Scenario Trigger Function
It is possible to use scenario trigger function with HTC Vive.
After loading HTC Vive Plugin, the conditions VIVE device collision and VIVE device input are added.



Collusion trigger condition
The collision of a device model and a model in the scene is a trigger. The collision judge is the same as the one of UC-win/Road.



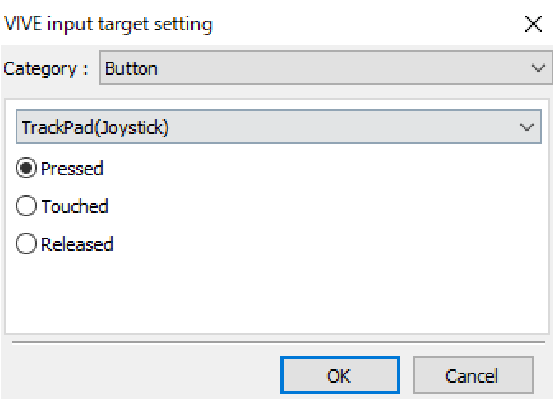
Input Trigger Condition
The operation state of the button of the device is a trigger.



In this case, the controller with custom ID 0 is targeted. And the first trigger condition is that the input of track pad is from -0.5 to 0.5, the second one is that the track pad is touched and the grip button is pushed.

All devices
Check All devices to apply the collision judge to all connected HTC Vive devices. Otherwise, select types to be applied the collision judge to.

- **Type:** Select (a) type(s) of devices from Controller, Tracker, or Sensor.
- **All:** Check All to apply the collision judge to all devices of the type. Otherwise, specify any device models.
- **ID:** Set up the custom ID for the device.
- **Condition:** Condition is displayed in tree. The node displays the condition groups divided by “or” or “and”. Select a group and click Add to add a new condition.
  Use the right conbobox to switch “or” and “and”.
  Click Delete to delete the selected group or condition. The root node cannot be deleted.
  Click Add or Edit button to open the setting form to set up a condition.



Category
Select Button or Shaft.

- Shaft: Choose a target from Track pad X, Track pad Y or Trigger. And edit the formula.
- Button: Choose a target button from Menu, Grip, Track pad, or Trigger. And choose a trigger from pushed, touched or released. Touched can be selected for Track pad or Trigger.

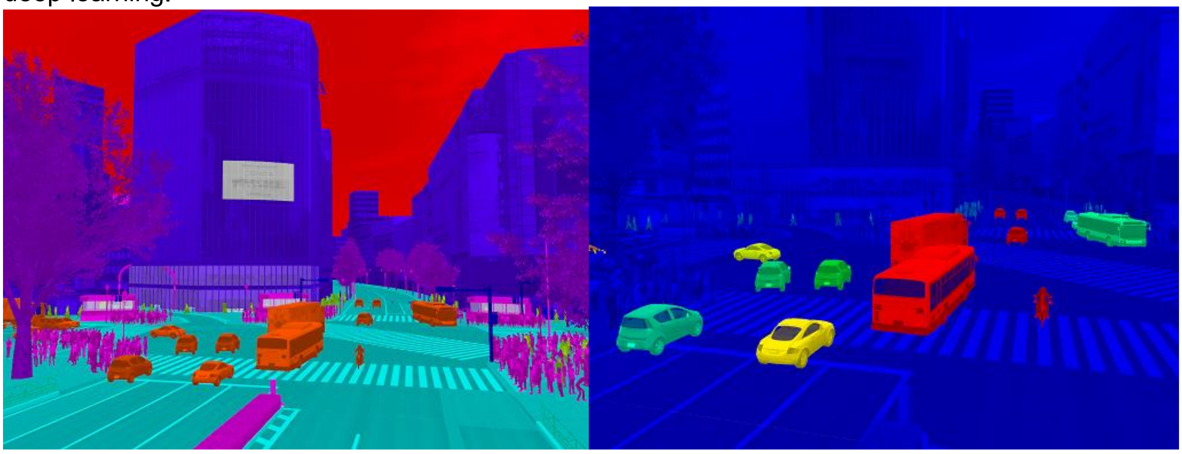
*Current limitation on HTC Vive plug-in

The current version of HTC Vive plug-in has the following restrictions.

- Solar flare and whiteout are not drawn correctly.
-
- Windshield wipers and rain on the windshield are not drawn in 3D.
- HUD display (scenario message, image, speedometer etc.) is not drawn. But in this plugin, only the digital speed meter is supported.
- Jump and rotation with right click functions do not behave correctly.

Custom Shader Sample Plug-in

The modified drawing processing has enabled the customization of rendering process.
- "Custom Shader Sample Renderer" has been added as an example of Shader customization.
- Coloring based on data of object type, drawing normal, depth, object speed, and acceleration, etc.
- Visualization of various information, switching of display methods, generation of segmentation teacher data for deep learning.



Left: Segmentation by object selection, Right: Speed information

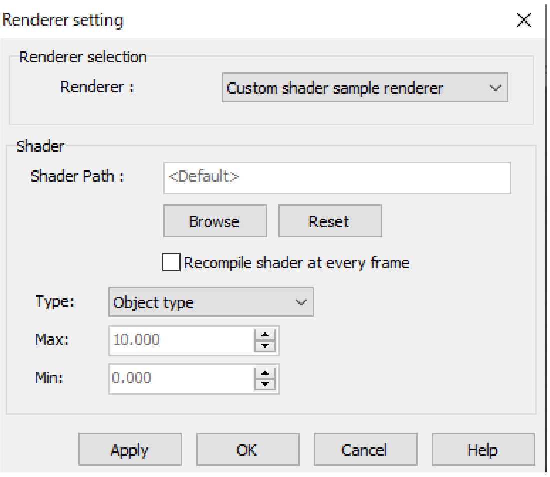
How to use

After installing Custom Shader Sample Plug-in, the Custom Shader sample renderer is added to renderer.
It can be used on the main screen or viewpoint.

Restrictions
1) Semitransparent polygon does not support the segmentation by object selection. It is drawn in the default color (white).
2) Custom shader Sample does not support the reflection of water on road surface.
3) The shader used in some plugins, such as XPSWMM and tsunami plugin, cannot be changed to Custom Shader Sample now.

From Renderer settings of main screen

It is possible to change the renderer as followings.
1. Right click on the main screen, and click Renderer settings.
2. Choose Custom Shader Sample Renderer as renderer.
3. Set up the setting items. Refer to Renderer settings for details.
4. Click OK to confirm the settings. The main screen changes the screen rendered by Custom Shader Sample Renderer.
5. Choose Default Renderer as renderer to go back to the normal screen.

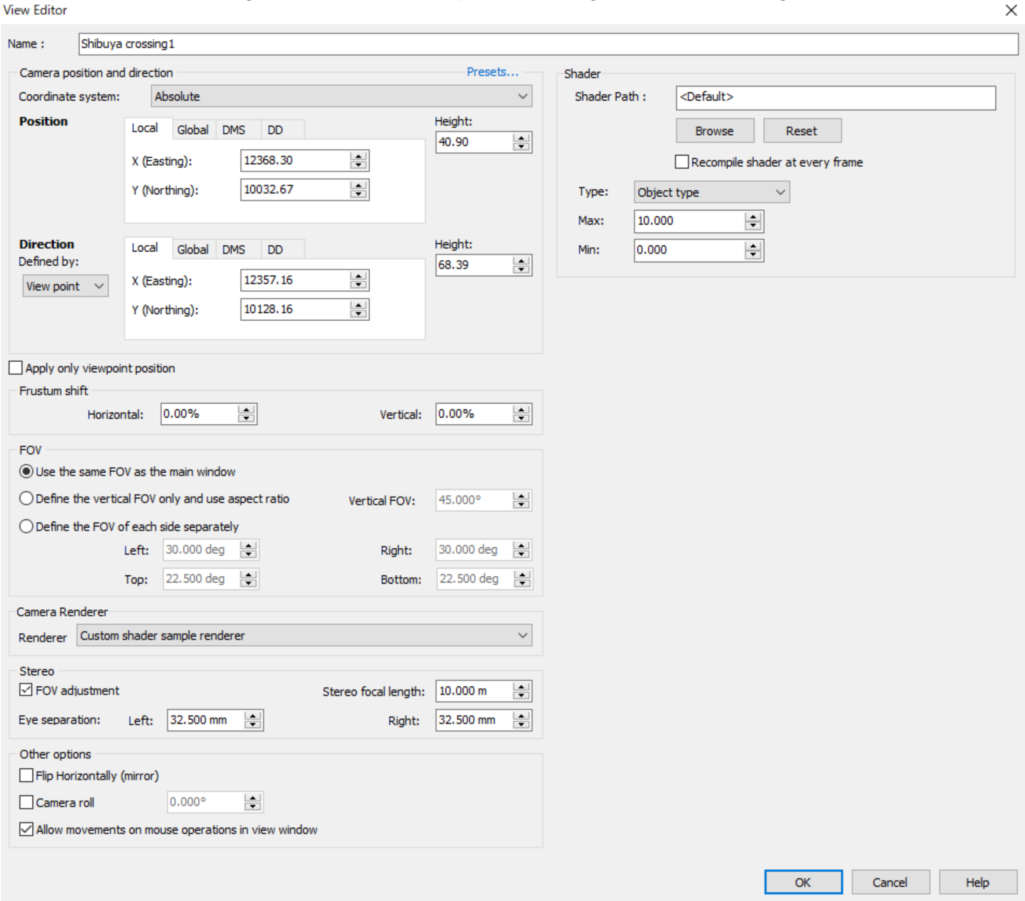


From View Editor

Go to View Editor.

Right-click on the main view and go to Edit Camera Positions…. And select a camera position and click Edit.

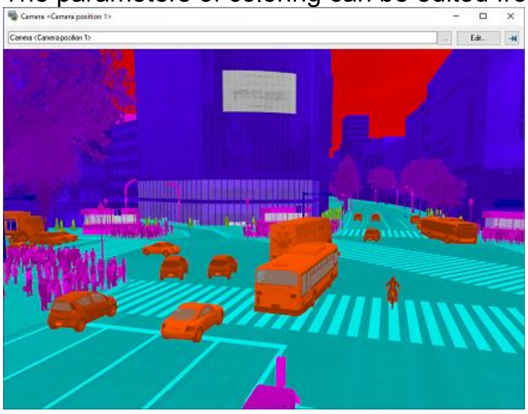
It is possible to change renderer. Set up the setting items on the right.



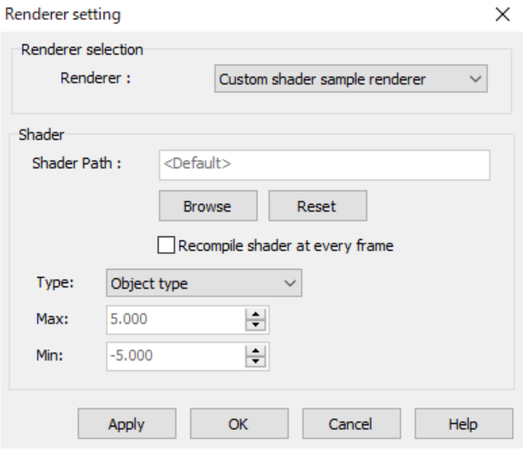
Click OK to confirm the settings.

Apply this view settings from ribbon menu or right click menu to display the screen coloring based on the data.

The parameters of coloring can be edited from the ribbon menu View – Custom Shader Sample – Settings.



Renderer settings



How to open

- Right-click on the main view and go to Renderer settings.
- Select a Current position or Move camera to, and click Edit.

Descriptions

Shader path: Click Browse to select a shader folder.
The default is <Install folder>¥Shaders¥Plugins¥CustomShaderSample.
Click Apply to confirm the settings. Click Reset and then Apply to reset the settings.

Compile shader for every frame
Check it to compile the shader for every frame. If the shader has been edited, check it to reflect the effects.

Type: Choose a coloring type.

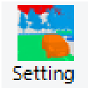
- **Object type**: Coloring based on object type.
- **Vector**: RGB Coloring besed on the absolute values of X, Y, Z of the normal vector.
- **Depth**: Coloring based on depth using the inverse number of depth buffer.
- **Speed**: Coloring based on speed information of vehicles and characters.
- **Acceleration**: Coloring based on vehicle acceleration.
- **Distance**: Coloring based on distance from camera position.
- **Height from ground**: Coloring based on height from ground.
- **Custom**: this is an index to customize a shader.

Max. Min.
Set up the max and min values of colors. Red is for max, blue is for min. And the color between red and blue are drawn in gradation.

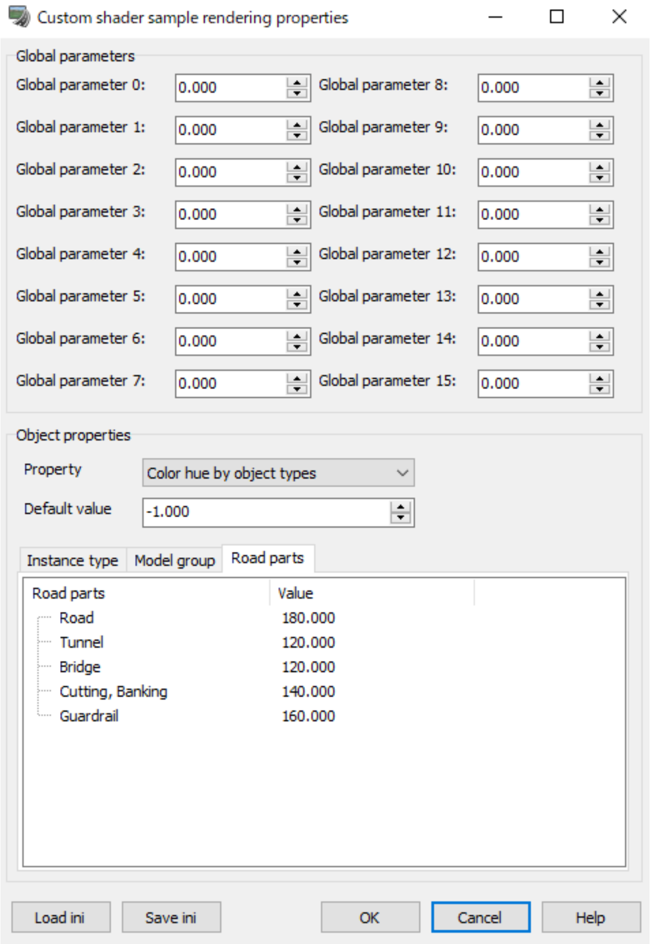
Note: When Object type or Vector is selected as Type, it is not possible to set up max. and min. values.

Custom Shader Sample Property

Set up the properties about Custom Shader Sample Renderer.

Go to View – Custom shader sample - 

.
There are 2 types: Global parameter and Object property.
Hint:Now the first property of Object property is used. Other parameters can be used to customize the shader file.
To edit the colors used in coloring by object selection, choose Color by Object type as Property, set up the values of the default value, model instance type, model group and road parts at the range of -1 – 360.



How to open

Go to the ribbon menu View – Custom Shader Sample – Settings.

Descriptions

Global Parameters

Set up 16 parameters sent to the shader. Now they are not in used for Custom Shader Sample. It is possible to use them for the customized shader.

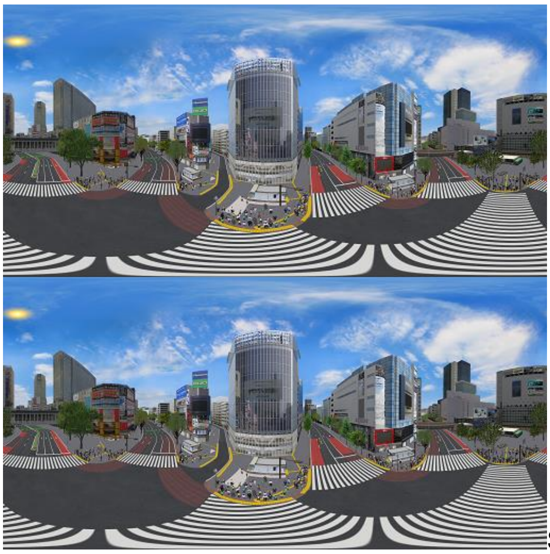
Object properties

Set up 4 properties by object type. One of them is used for coloring by object selection. 1-3 properties are not in use now. It is possible to use them for the customized shader.

Rendering of 360-degree image

It is possible to render 360 degree video with the general Equirectangular projection on UC-win/Road.
By saving as a still image or recording a video, it is possible to create images and videos which are used for explanation with the camera positions changeable in any direction of 360 degrees, and simple VR experience videos that support stereoscopic view.

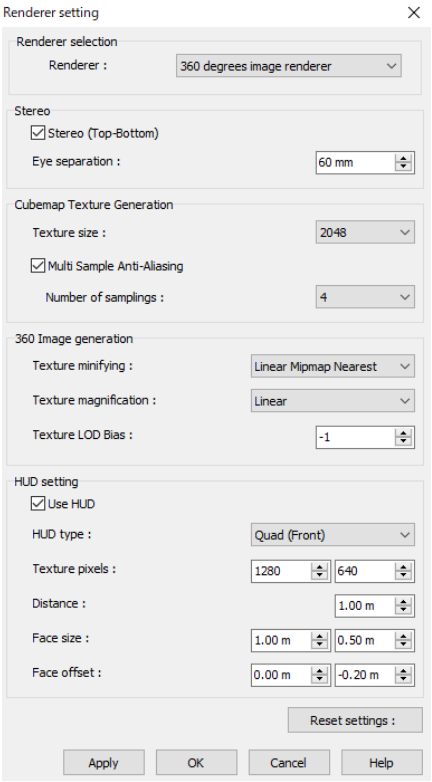

Monocular 360 degree video


Stereo 360 degree video

How to apply 360 degree image

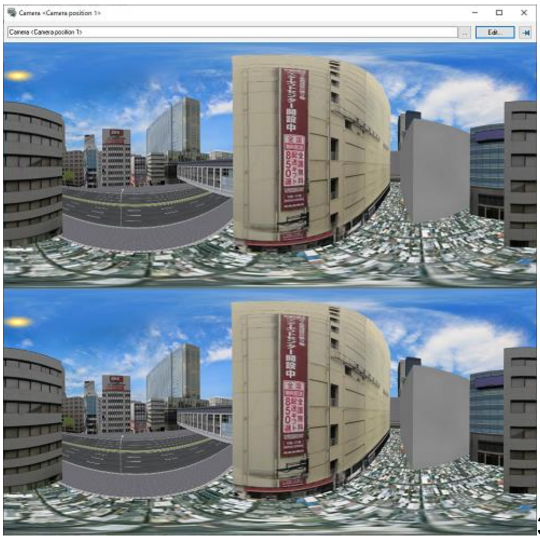
Change the renderer settings to apply 360 degree image.

(1)From Renderer setting on the main screen
1. Right click on the main view, and go to Renderer setting.
2. Choose 360 degree image as a renderer.
3. Set up the setting items. Refer to Renderer setting.
4. Click OK to confirm the settings. The screen changes to 360 degree image.
5. Choose Default renderer to switch to the original screen.



(2)From View Editor
Choose 360 degree renderer as a renderer on View editor to display 360 degree image on the main screen or camera view. Then set up the setting items. Click OK to confirm the settings.

Note:
On the view editor, the renderer settings are not changed as the default from UC-win/Road ver.14.
It means the view, which has not any renderer settings, is applied with rendering of 360 degree image on the main screen or camera view rendered with 360 degree image. Choose Default renderer as a renderer on the view editor not to apply 360 degree image rendering.

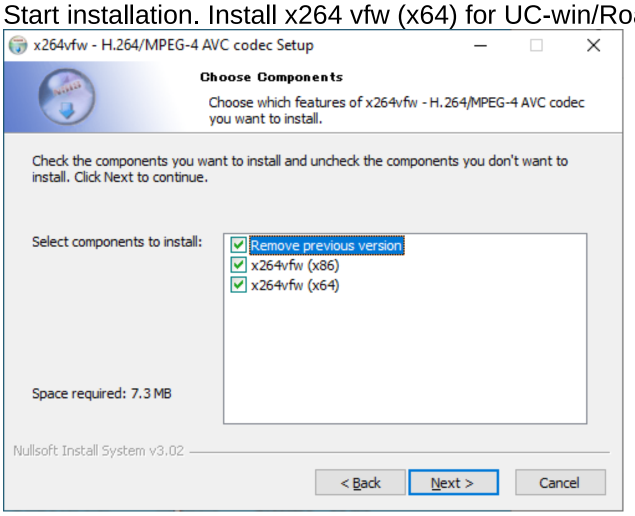

360 degree image for camera view

Output of 360 degree video

360 degree video is output in mp4 file format. Here the open source license x264vfw is used.
Note: it is not necessary to use it for those who have software to convert AVI to MP4

How to download and install x264vfw

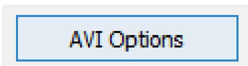
1. Download x264vfw. https://sourceforge.net/projects/x264vfw/files/latest/download
2. Start installation. Install x264 vfw (x64) for UC-win/Road 64bit or x264vfw (x86) for UC-win/Road 32bit.



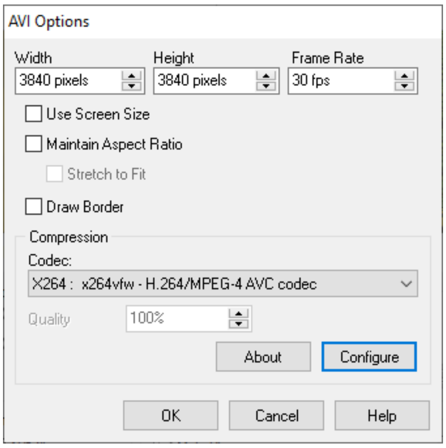
How to download Spatial Media Metadata Injector
Download Spatial Media Metadata Injector v2.1. https://github.com/google/spatial-media/releases/tag/v2.1

AVI settings on UC-win/Road

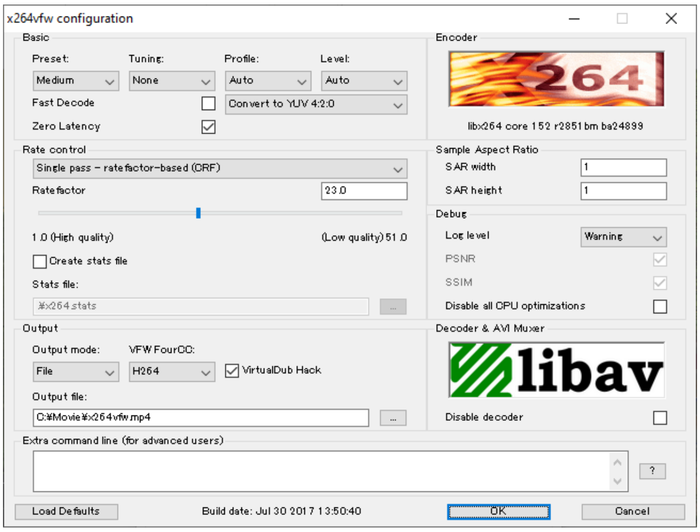
Go to the ribbon Record/Play – Movie – 

, and click 

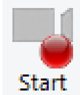
to open AVI Options.
Set up the aspect ratio 1:2 for 360 degree video or 1:1 for stereo. And selectX264 : x264vfw – H.264/MPEG-4 AVC codec as Codec.



Click Configure to open the setting form of x264vfw. Check Zero Latency on Basic.
Select File mode as output and specify the destination of mp4 file.
Check on VirtualDub Hack. And then click OK to confirm the settings.



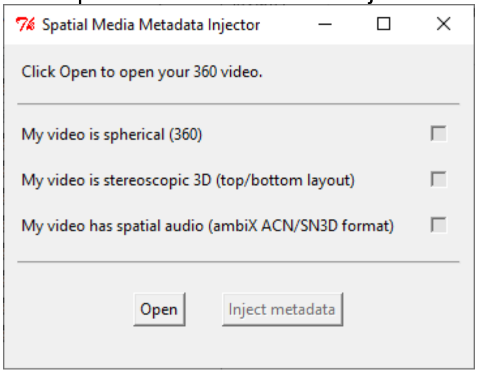
Recording 360 degree video

1. Right-click on the main screen to open the rendering setting form.
2. Select 360 degree image renderer as Renderer. It is recommended to use the default settings, but uncheck Stereo if Monocular 360 degree video will be created.
3. Click OK to confirm the settings. The main screen will change to 360 degree image.
4. Go to the menu Record/Play – Movie –  to start recording.

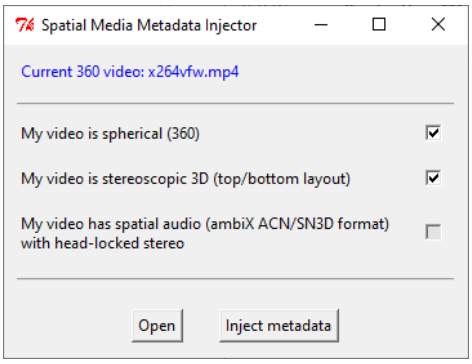
5. To record the script, play it now.
6. Go to Record/Play – Movie – Stop to stop recording.
7. Confirm the mp4 file is output to the destination folder.

Metadata Injector

1. Run Spatial Media Metadata Injector. Click Open to open the 360 video.

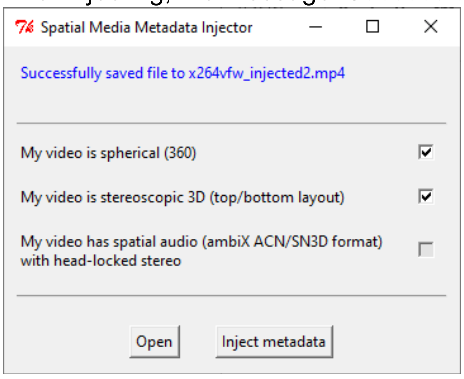


2. After loading, the message 'Current 360 video: ～.mp4' is appeared. When it is output as stereo, check stereoscopic 3D (top/bottom layout).



3. Click Inject metadata.

4. After injecting, the message 'Successfully saved file to ～.mp4' is appeared.



5. It is possible to display it on the viewer. For example, the direction of video can be changed freely with Windows 10 Movie&TV application.

UC−win/Road Ver.17 Operation Guidance

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