Deliverable

D4.7 DUET visualisation components v2

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Revision History

Revision	Date	Author	Organisation	Description
0.1	24.03.2022	Thomas Adolphi	VCS	Initial structure
0.2	30.03.2022	Thomas Adolphi	VCS	saving case
0.3	08.04.2022	Thomas Adolphi	VCS	added content
0.4	19.04.2022	Thomas Adolphi	VCS	added user feedback, Sensor measurement, introduction
0.5	20.04.2022	Thomas Adolphi	VCS	added epic relation, pre-final version ready
0.6	20.04.2022	Thomas Adolphi	VCS	opened for internal review
0.7	24.04.2022	Philippe Michels	IMEC	internal review
0.8	23.04.2022	Gert Vervaet	AIV	internal review
1.0	31.5.2022	Thomas Adolphi	VCS	Final version

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Executive Summary

This Demonstrator deliverable gives an overview about the implemented and integrated visualisations and tools for future versions of DUET visualisations.

The described functions, tools and visualisations of this document are integrated here, in the development version[1] and here in the live version[2]

This document is the second version of the DUET visualisation component description for the DUET solution. Generic tools as well as provided functionalities from VCS for VC MAP users were described in the previous document "*D4.4 DUET visualisation components v1*". The visualisations described in this document are made and implemented for DUET explicitly.
Pilot tests using part of the components were taking place in February / March 2022 and are reported in "*D6.4 Pilot Testing Cycle Report 2*". The results of such have to be taken into account for further developments and improvements of the UI within the following version.

Here the components developed for analysis and visualisation in the current DUET visualisation client will be described. Visualisation components for use in reports were described in D4.5 and for use in dashboards and other UI components were part of D4.6 - "*Implementation of the DUET UI/Dashboarding platform*". D4.6 includes some general ideas for sensor measurement display, which are partly integrated into the visualisation client.
Therefore other visualisations beyond 3D will be described in those documents. Of course further improvements to a more generic way of styling and visualisation of attributes, properties and features will be done in upcoming versions of DUETs visualisation component.

[1] https://platform.citytwin.eu/dev/map#/legend
[2] https://platform.citytwin.eu/app/map

1. Introduction

Since Version 1 of the Duet visualisation components (D4.4 DUET visualization Components v1) several UI components have been developed completely new or were redesigned and redeveloped. The new / redeveloped components have taken user feedback and user stories into account.
Especially the chapters:

- Saving a case / scenario / experiment
- Triggering a model run / doing a change
- Delta creation & visualisation

describe redevelopments of already existing components, whereas the chapters:

- User Feedback
- User help
- Sensor measurement visualisation

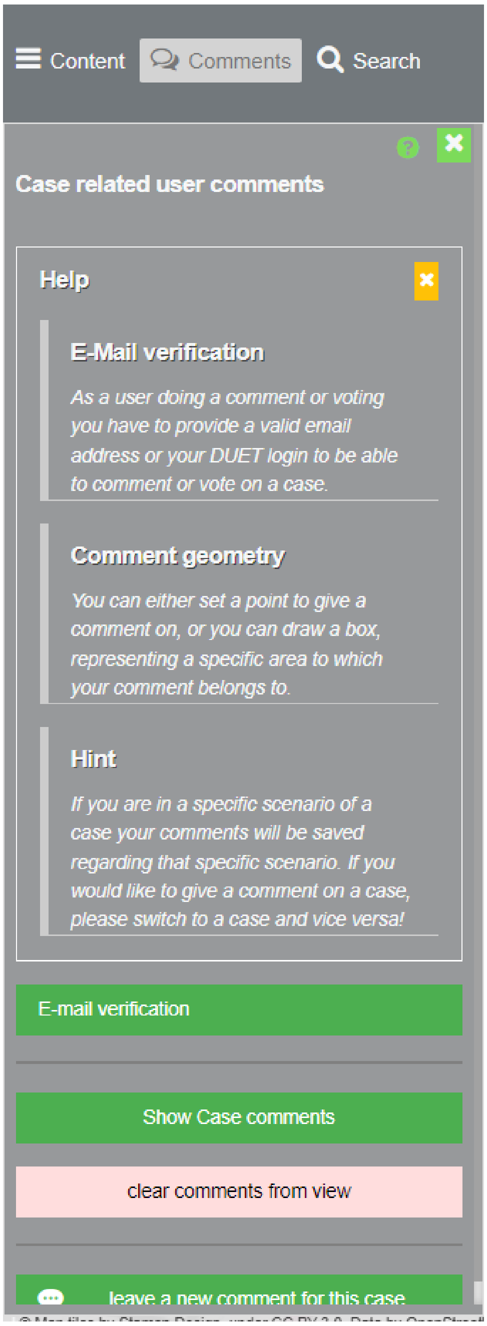
give overview on new UI components based on user stories and user feedback.

Relation of components to DUET epics:

		Epic	chapter
Epic	G1	**As a** public servant of a relevant department (mobility, spatial planning and environmental department,...) **I want to** see the difference in density of traffic in the area of interest of a scenario where I closed traffic in a set of roads versus the base density, **so I can** assess the impact of changes to the local situation on the traffic in my area of interest	**Triggering a model run / doing a change** **Delta creation & visualisation**
Epic	G2	**As a** public servant of the mobility or environmental protection department, **I want to know** the level and impact on air pollution when certain roads would be closed **so I can** discover causes of air pollution and the impact on citizens well-being in the city	**Delta creation & visualisation**
Epic	G3	**As a** public servant of the mobility or environmental protection department, **I want to know** the level and impact of noise pollution when certain roads would be closed, **so I can** discover causes of noise pollution and the impact on citizens well-being in the city	**Delta creation & visualisation**
Epic	G4	**As a** citizen, **I want to** understand the predicted impact of different scenarios related to new city developments, calculated using functionality used for what-if analysis, **so I can** give feedback about scenarios	**User Feedback** **Saving a case / scenario / experiment** **Delta creation & visualisation**

Epic	G5	**As a** citizen, **I want to** be able to vote and give feedback about scenarios related to new city developments,calculated using functionality based on other epics, **so I can** participate in those designs	User Feedback
Epic	G6	**As a** citizen, **I want to** see the current traffic flow in the city based on ~~the model and~~ available sensors **so I can** inspect the current traffic density	Sensor measurement visualisation
Epic	G8	**As a** citizen, **I want to** see the current air pollution in the city based on ~~the model and~~ available sensors **so I can** inspect the current level of air pollution	Sensor measurement visualisation
Epic	P1	**As an** urban planner **I want** to see all existing attributes for buildings and objects in 3D representation of the city **so I can** work with different data sources in a single environment	Object information
Epic	P2	**As an** urban planner **I want** to see all existing attributes for public space such as surfaces, public green, tree informations (tree type, height, diameter of trunk, diameter of treetop) **so I can** work with different data sources in a single environment	Object information
Epic	P3	**As an** urban planner **I want** to see Z dimension for all objects and surfaces (streets, pavements etc.) **so I can** work with the z dimension as it is not supported by current GIS solution used by city.	Object information

2. User Feedback



Case related user comments

Help

E-Mail verification

As a user doing a comment or voting you have to provide a valid email address or your DUET login to be able to comment or vote on a case.

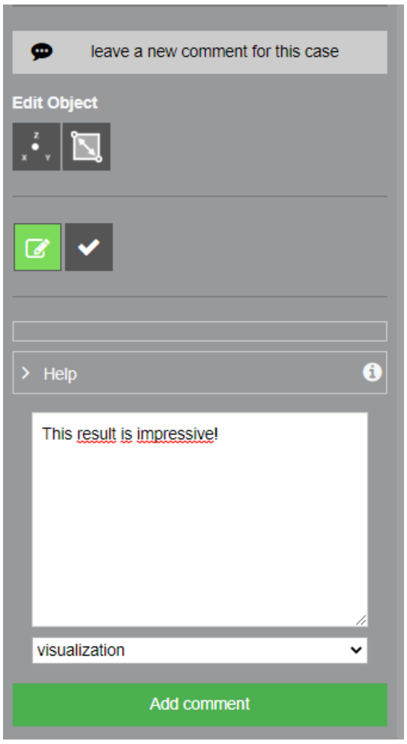
Comment geometry

You can either set a point to give a comment on, or you can draw a box, representing a specific area to which your comment belongs to.

Hint

If you are in a specific scenario of a case your comments will be saved regarding that specific scenario. If you would like to give a comment on a case, please switch to a case and vice versa!

© Map tiles by Stamen Design, under CC BY 3.0. Data by OpenStreet

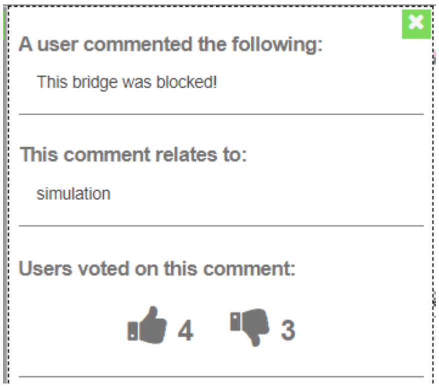


This result is impressive!

visualization

Every user type is able to see feedback / comments to every case or scenario. To be able to provide feedback, users have to be registered (**at the moment**) in the DUET environment.

As shown to the left, a small help section provides some hints regarding the usage of the comment tool. To be able to provide comments a user has to verify his / her email address against the existing account in the DUET environment. If the verification is successful, a user can create a new comment by clicking on the "*leave a new comment for this case*", as shown to the right. A user can select a point or box geometry to spatially locate the comment. In addition to that the user has to provide a textual description of his comment and has to provide a category of his comment.



A user commented the following:

This bridge was blocked!

This comment relates to:

simulation

Users voted on this comment:

If a user just wants to see existing comments a click on "*Show Case comments*" loads already existing comments to the view. By clicking on one of the added items in the map - a user votes on a comment, by clicking on the up- or downvote icon. The information tab provides information:

- about the comment itself,
- about the category to which it belongs to (simulation, visualisation, planning, other)
- current number of upvotes and
- current number of downvotes

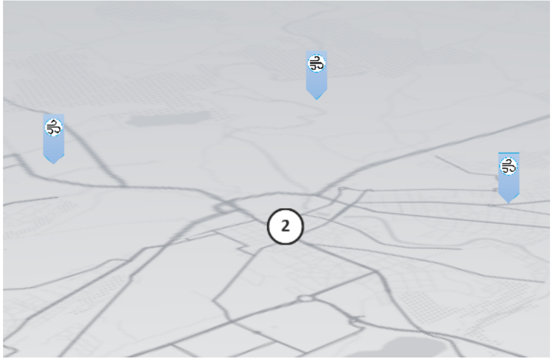
A user cannot:

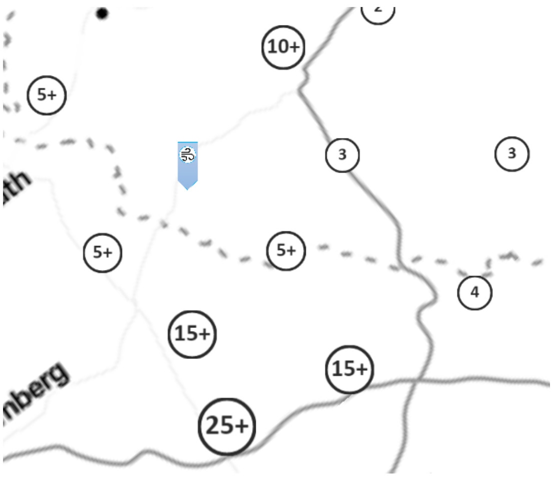
- get information about the user providing that comment
- comment on a comment

3. Sensor measurement visualisation

Several sensor datasets are available in DUET's data catalogue measuring different types of phenomena, such as:

- traffic flow separated by lanes and vehicle type (AWVRT[3] in Belgium region)
- air quality (CO^2, NO^2, SO^2, PM25, PM10, etc)
- weather conditions (temperature, pressure, humidity, etc)





Since measurements can take place at the same spatial location using different sensor platforms, the availability of such are visualised as clusters within the visualisation client, as shown to the right. A white circle with a number indicates the availability of sensor measurements at the same spatial location and its number indicates the number of sensor platforms. Depending on the current zoom level the cluster distance varies and more sensors are taken into the cluster. If more than:

- 5 sensors are clustered, the cluster circle shows **5+**
- 10 sensors are clustered, the cluster circle shows **10+**
- 15 sensors are clustered, the cluster circle shows **15+**
- 25 sensors are clustered, the cluster circle shows **25+**

Single sensors will have a single icon indicating the main phenomenon observed by the sensor platform, thus:

- air quality is displayed as
- weather data is displayed as

Since traffic flow measurements from AWVRT do not occur individually, there is no single icon available at the moment.

Users can get information on current measurements from sensors by clicking on an icon. Depending on the fact if it is a cluster icon or an individual sensor the visualisation client behaves differently.

[3] https://opendata.vlaanderen.be/dataset/meten-in-vlaanderen-minuutwaarden-verkeersmetingen1

3.1 Individual sensor information

A click on a single sensor icon opens a new information tab on the left hand side of the visualisation client, showing some helpful information to the user regarding the measurements of the sensor.

The selected sensor is marked in 2D / 3D map by the well known red marker.

The following two screenshots show sensor information examples for

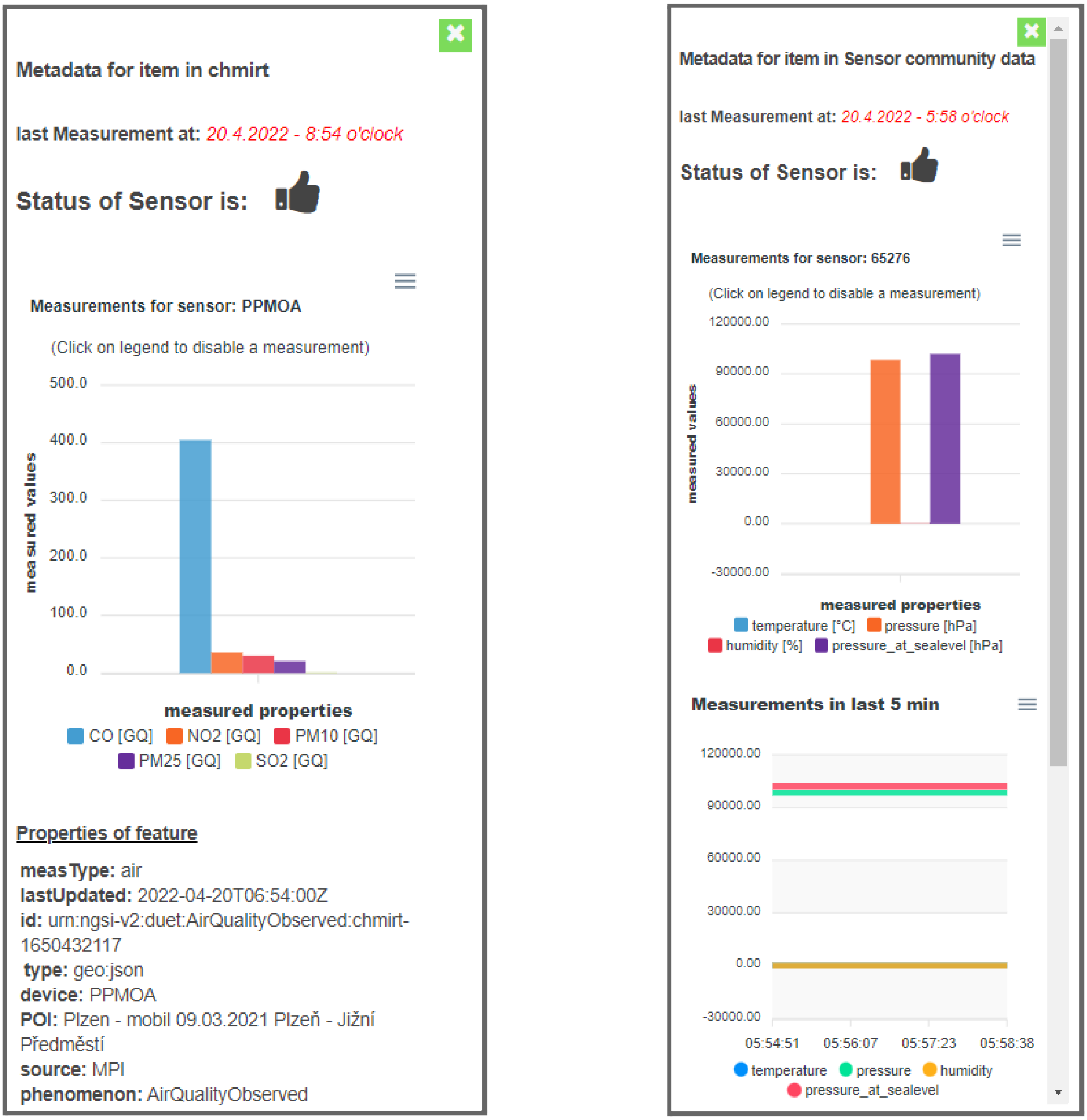
- a air quality sensor form CHMIRT[4] dataset in Plzen
- and a weather condition sensor from Sensor community dataset

As proposed in D4.6 - "*Implementation of the DUET UI/Dashboarding platform*" chapter 5.1 a data quality status of the sensor is given first by showing the data of last measurement and a feedback icon.

This is followed by a chart showing all measurements of the sensor in a bar chart. Each measured property gets its own colour and bar inside the bar chart. Properties can be selected and deselected from the chart individually. Depending on the availability of further time periods a second chart is shown (see temperature measurements below) or some sensor information will be displayed (see air quality sensor information

[4] https://www.chmi.cz/aktualni-situace/stav-ovzdusi/aktualni-data

below).



Metadata for item in chmirt

last Measurement at: 20.4.2022 - 8:54 o'clock

Status of Sensor is:

Measurements for sensor: PPMOA

(Click on legend to disable a measurement)

Properties of feature

measType: air
lastUpdated: 2022-04-20T06:54:00Z
id: urn:ngsi-v2:duet:AirQualityObserved:chmirt-1650432117
type: geo:json
device: PPMOA
POI: Plzen - mobil 09.03.2021 Plzeň - Jižní Předměstí
source: MPI
phenomenon: AirQualityObserved

Metadata for item in Sensor community data

last Measurement at: 20.4.2022 - 5:58 o'clock

Status of Sensor is:

Measurements for sensor: 65276

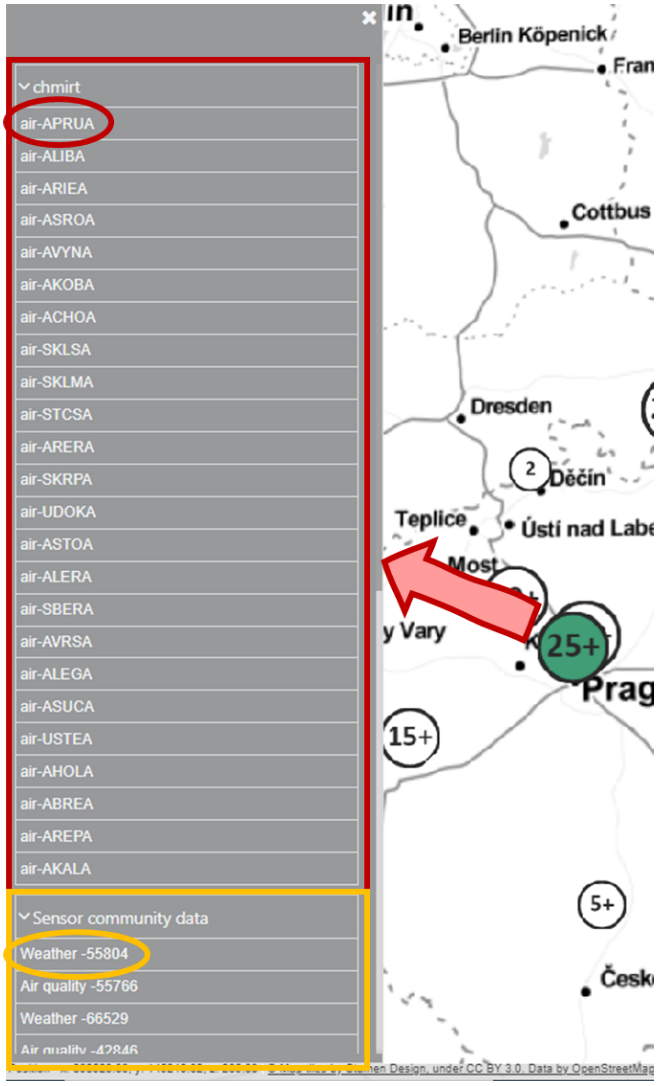
(Click on legend to disable a measurement)

Measurements in last 5 min

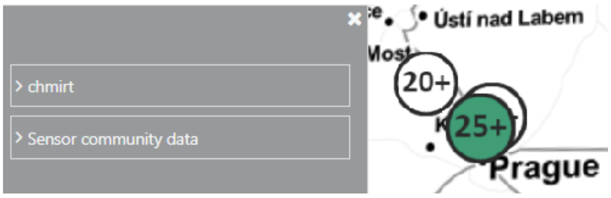
Figure: sensor information for air quality (LEFT) and weather sensor information (RIGHT)

If further measurements are available, as shown to the right in the above figure, the measured values are displayed as lines per measured property. Thus the chart shows the trend of each measured property in the given time period. Again each property can be selected or deselected from the chart by clicking on the respective entry in the chart legend.

3.2 Cluster sensor information



A click on a cluster icon selects the respective cluster and shows the list of all available sensors of that cluster. Sensors are organised with respect to their origin = the layer / dataset they belong to. Each group can be opened or closed as shown in the figure below and to the left.



Each cluster group contains all sensors being part of that cluster and being part of that respective group dataset and can be selected individually by the user.

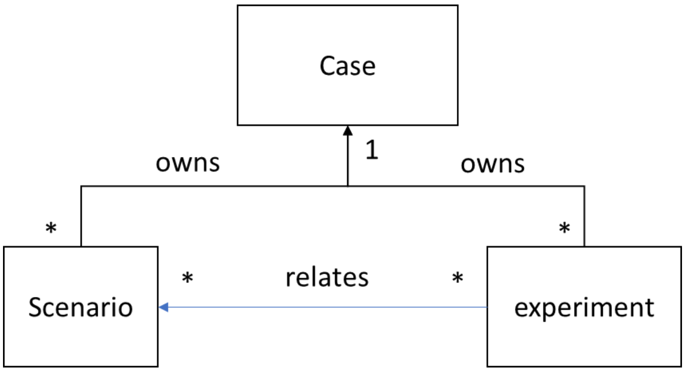
The name of each cluster item is a concatenation of the **sensor category** and its **ID**. Thus a user is able to identify by the name the overall phenomenon type of the sensor. Especially for datasets like "*Sensor community data*" this is very helpful, since such provide information for different sensor categories.

A click on one of the listed elements enforces the visualisation client to zoom to the spatial location of that specific sensor and an additional window pops up to the right showing the respective sensor information as described in 3.1 Individual sensor information.

Due to the current development only one sensor information window can be displayed in the viewer at one point in time.

4. Saving a case / scenario / experiment

Within the Duet visualisation client we differentiate between cases, scenarios and experiments.
The role of cases, scenarios and experiments are described here from a visualisation point of view. Dedicated especially for users and administration purposes to be able to present a Digital Twin model with a specific purpose.



Case:

A case is defined by its Pilot region and mainly by its challenge to be solved with the Digital Twin.
A challenge or use case could be:

"The traffic in city XXX should be reduced to reduce carbon dioxide emission"

A case may relate to zero or more scenarios AND to zero or more experiments.
A case may be public or private.

Scenario:

A **visualisation** scenario belongs to a parent case. Thus a scenario shall represent a part or portion of the top case challenge, defined by its Pilot region and mainly driven by the case challenge. Thus some exemplary scenarios belonging to the case above could be:

a. *"Reduce traffic in city center and evaluate the effects*"
b. "*Blocking road YYY to reduce traffic*"
c. "*Reduce speed limit from 50 to 30 km/h in city center*"

A scenario may relate to zero or more experiments.
A scenario relates to exactly one case.
A scenario may be public or private.

Experiment:

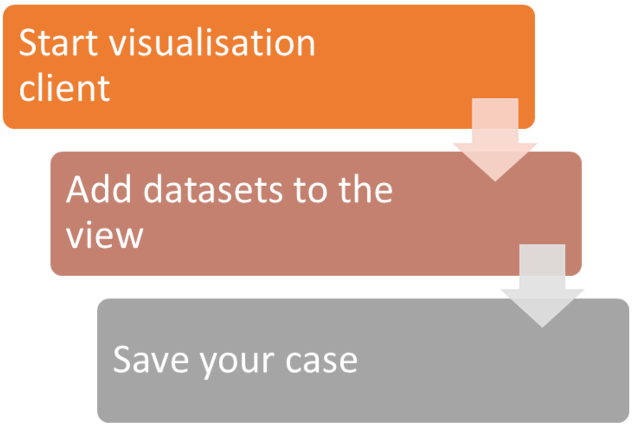
An experiment belongs to a parent case. An experiment is independent from a specific model or simulation. It simply holds the result(s) of model runs. Either as a package - including multiple results from different model runs based on the same change of a road segment(s) or as a single pointer to exactly one model result based on a change of a road segment or multiple segments. An experiment consists of one model run result or of multiple model run results, related to a specific change defined by the experiment user. An experiment may consist of:

a. Traffic results only, or
b. Air pollution results only, or
c. Noise pollution results only, or
d. Traffic and Air pollution and Noise pollution as experiments package.

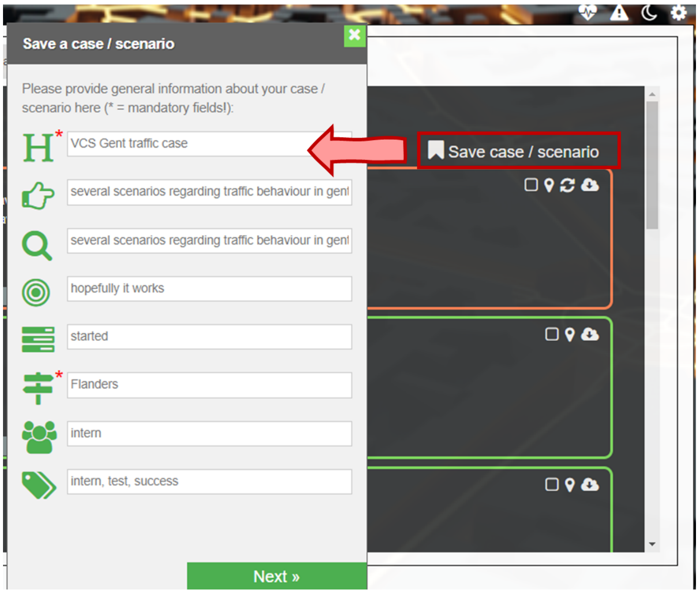
An experiment relates to exactly one case.
An experiment may relate to one or more scenarios. Or to be more precise experiments can be referenced by many scenarios of the top case.
An experiment is always private.
An experiment can be made public by referencing it in a public case or public scenario.

Currently only noise and traffic results for Plzen can be stored as an experiments package, due to the lack of a valid mechanism to save urls inside the experiment package. But this will follow within the next development steps.

4.1 Workflow - Save a case / scenario


Start visualisation client
Add datasets to the view
Save your case

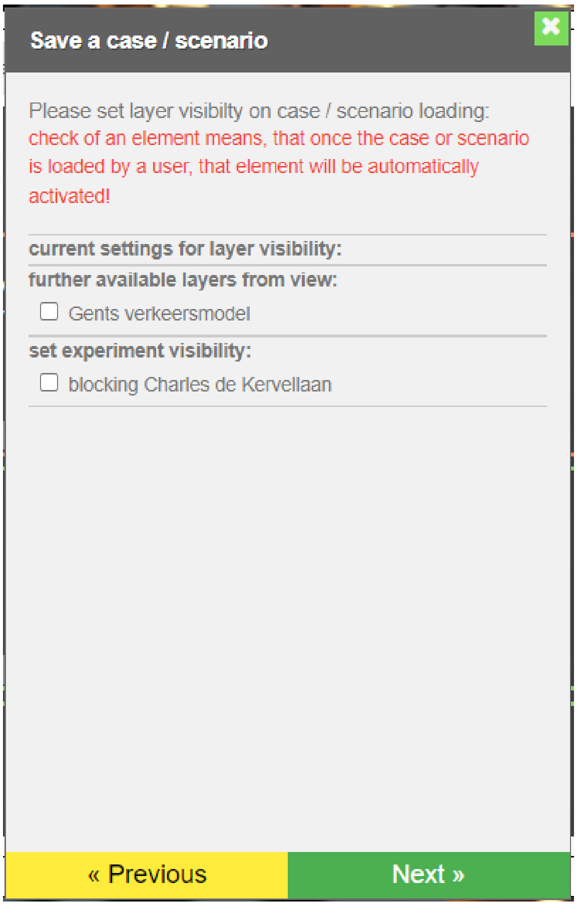
1) At first the User with respective DUET role (NON-GUESTS) starts the client empty.
2) Afterwards the user selects the datasets fitting to his/her case challenge from data view and thus adds them to the visualisation client.
3) Then the user can save the case / scenario and thus registers the settings in the respective manager api. In case of saving a case the base is set for saving experiments.


Save a case / scenario

Please provide general information about your case / scenario here (* = mandatory fields!):

VCS Gent traffic case
several scenarios regarding traffic behaviour in gent
several scenarios regarding traffic behaviour in gent
hopefully it works
started
Flanders
intern
intern, test, success

Since “*D4.4 - Duet Visualization components v1*” the mechanism to save a case has changed due to more functionalities of the DUET visualisation client. The whole process is now arranged as a kind of wizard, where the user has to set several titles, settings in order to save or update either a case or scenario.
By opening the case tab in the data view the user can open the wizard by clicking on “Save case / scenario”, as it is shown to the left.
A floating component appears starting with some initial descriptions of the case / scenario.
If a case / scenario is already loaded the fields are filled with values given by the case or the scenario. Thus the user can either leave them as they are or update them.


Save a case / scenario

Please set layer visibilty on case / scenario loading: check of an element means, that once the case or scenario is loaded by a user, that element will be automatically activated!

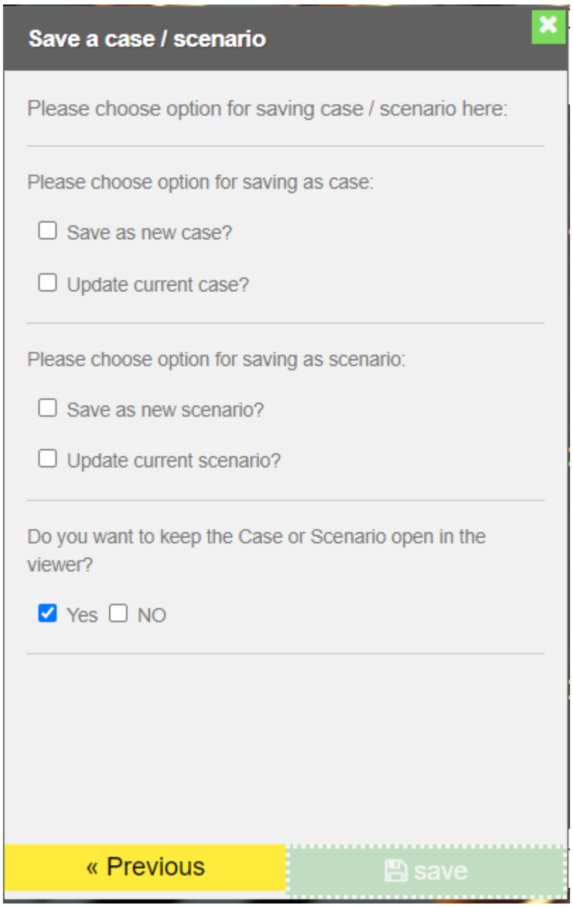
current settings for layer visibility:

further available layers from view:

☐ Gents verkeersmodel

set experiment visibility:

☐ blocking Charles de Kervellaan


Save a case / scenario

Please choose option for saving case / scenario here:

Please choose option for saving as case:

☐ Save as new case?

☐ Update current case?

Please choose option for saving as scenario:

☐ Save as new scenario?

☐ Update current scenario?

Do you want to keep the Case or Scenario open in the viewer?

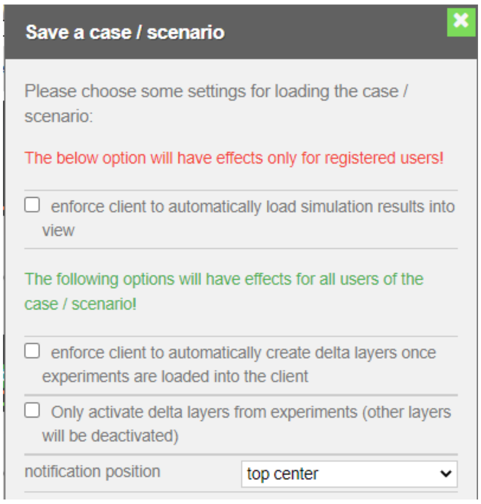
☑ Yes ☐ NO

The above pictures show the relevant wizard parts for saving a case / scenario.

The left one shows settings for layer visibility. Means the user can set specific layers to be activated directly on caseload and others to be loaded, but not set to be visible on start.
The right one shows the last dialog of that wizard where the user is able to:

1. save the current view and settings as new case
2. use the current view and settings to update the already loaded case
3. save the current view and settings as new scenario
4. use the current view and settings to update the already loaded scenario

If one of the above choices are enabled, the user is able to save and depending on that choice the settings will be sent to the case manager api or the scenario manager api.


Save a case / scenario

Please choose some settings for loading the case / scenario:

The below option will have effects only for registered users!

☐ enforce client to automatically load simulation results into view

The following options will have effects for all users of the case / scenario!

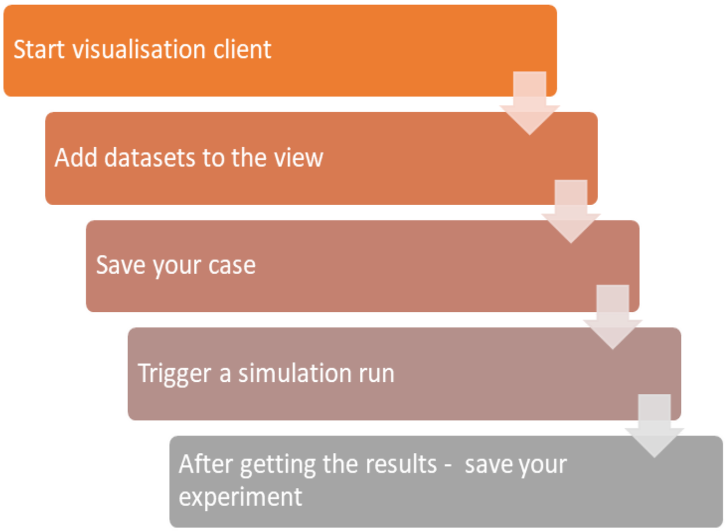
☐ enforce client to automatically create delta layers once experiments are loaded into the client

☐ Only activate delta layers from experiments (other layers will be deactivated)

notification position: top center

Besides that, the user is able to define via the wizard how the client should behave on case / scenario load and during the work inside the case / scenario.
The option to automatically load simulation results into the viewer affects only NON-GUEST users, which are able to trigger simulations / model runs.
The last two options are valid for all users. Here settings can be made to automatically create the delta layers and the visibility of them. See section Delta creation & visualisation for more information.

4.2 Workflow - Save an experiment



Start visualisation client

Add datasets to the view

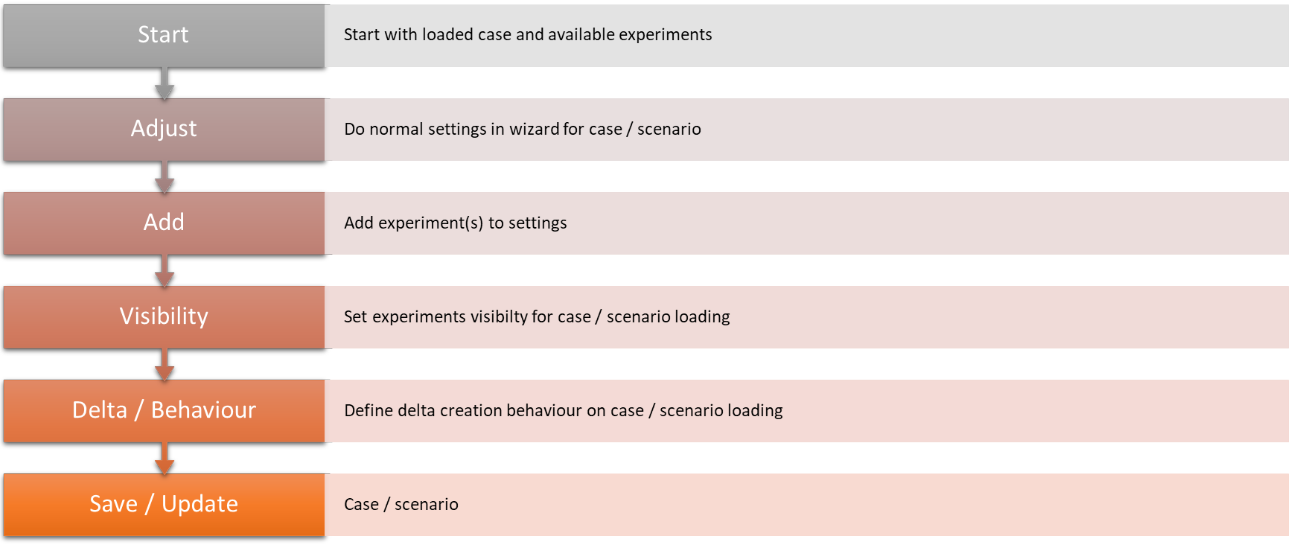
Save your case

Trigger a simulation run

After getting the results - save your experiment

1) At first the User with respective DUET role (NON-GUESTS) starts the client empty.
2) Afterwards the user selects the datasets fitting to his case challenge from data view and thus adds them to the visualisation client.
3) Then he can save the case and thus registers the case in case manager and creates the base for saving the experiments.
4) Now the user can trigger a model run by applying a change to a road segment.
5) After getting the result into the view, the user is able to save the result as an experiment.

4.3 Workflow - Add an experiment to a case / scenario

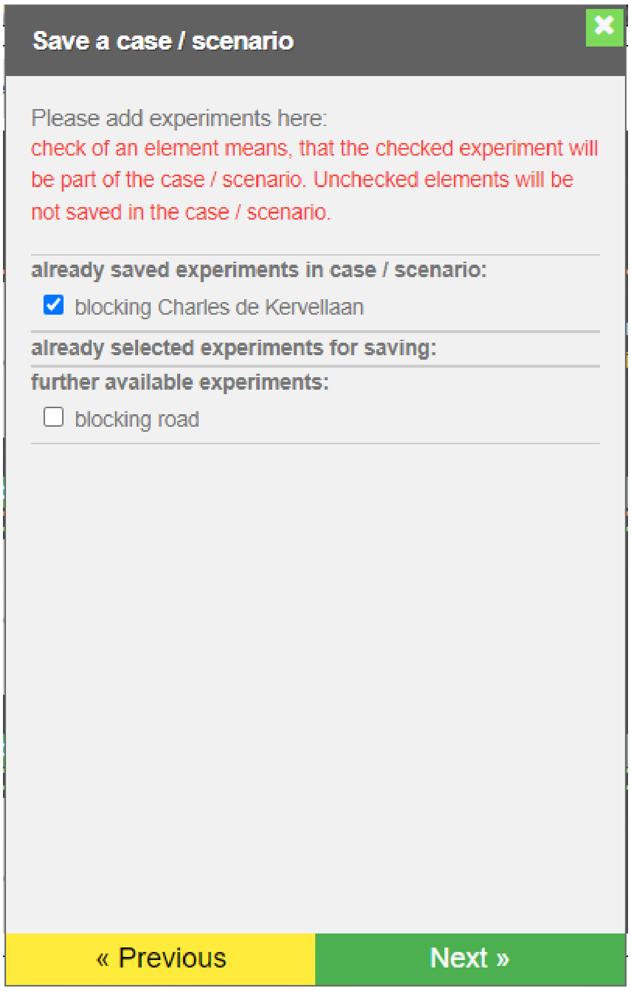


Start	Start with loaded case and available experiments
Adjust	Do normal settings in wizard for case / scenario
Add	Add experiment(s) to settings
Visibility	Set experiments visibilty for case / scenario loading
Delta / Behaviour	Define delta creation behaviour on case / scenario loading
Save / Update	Case / scenario

Once experiments are saved in relation to a case, the Case Scenario saving wizard will show them and the user is able to add the one or more experiments to a case / scenario. A case manager has now the possibility to create / save a case / scenario with included experiments. Such will be loaded on the start up of the respective case or scenario. This is relevant, especially for providing results of experiments to Guest users. But also for Non-Guest users those new components are helpful due to the fact that experiments can now be saved persistently and be used to create comparing scenarios, see introduction of chapter 4.

The both following pictures show the both UI components for

1. adding an experiment to a case / scenario
2. setting the visibility of such on start-up



Save a case / scenario

Please add experiments here:
check of an element means, that the checked experiment will be part of the case / scenario. Unchecked elements will be not saved in the case / scenario.

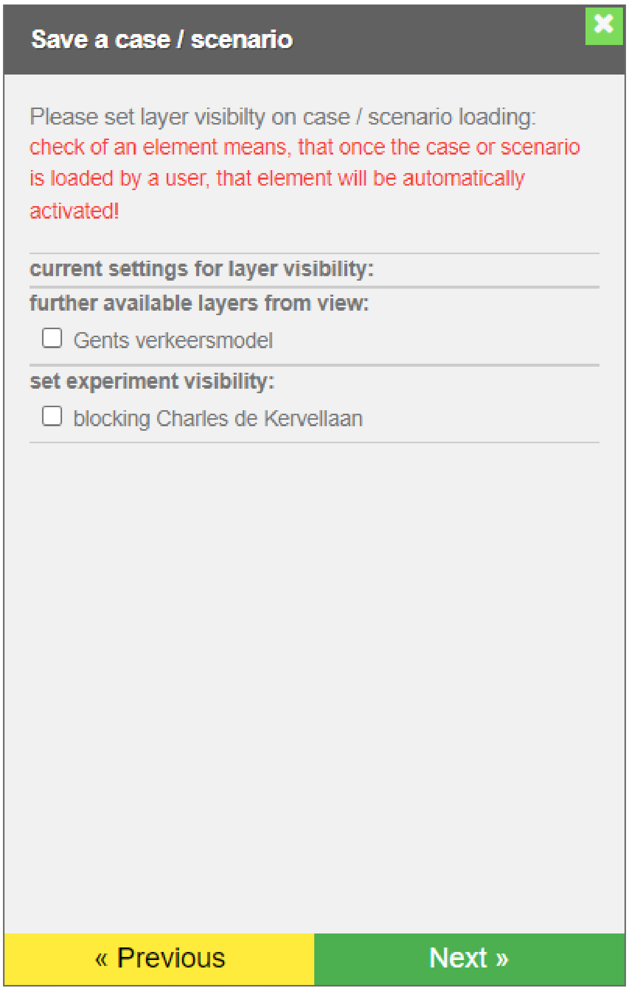
already saved experiments in case / scenario:

☑ blocking Charles de Kervellaan

already selected experiments for saving:

further available experiments:

□ blocking road



Save a case / scenario

Please set layer visibilty on case / scenario loading:
check of an element means, that once the case or scenario is loaded by a user, that element will be automatically activated!

current settings for layer visibility:

further available layers from view:

□ Gents verkeersmodel

set experiment visibility:

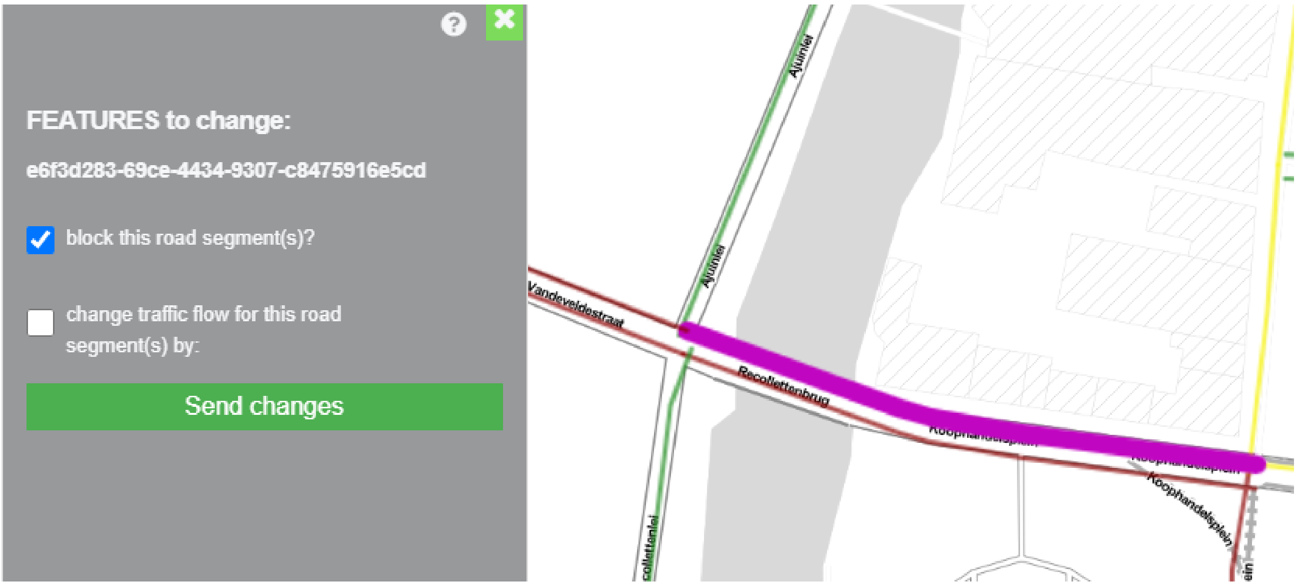
□ blocking Charles de Kervellaan

5. Triggering a model run / doing a change

Since the last version of DUET the capabilities of DUET's visualisation client have matured. Users are able to:

- block multiple roads at once (setting capacity of the respective road segments to 0!)
- reducing the speed of multiple road segments by percent
- reducing the capacity of multiple road segments by percent
- increase the speed of multiple road segments by percent
- increase the capacity of multiple road segments by percent

see two examples below:



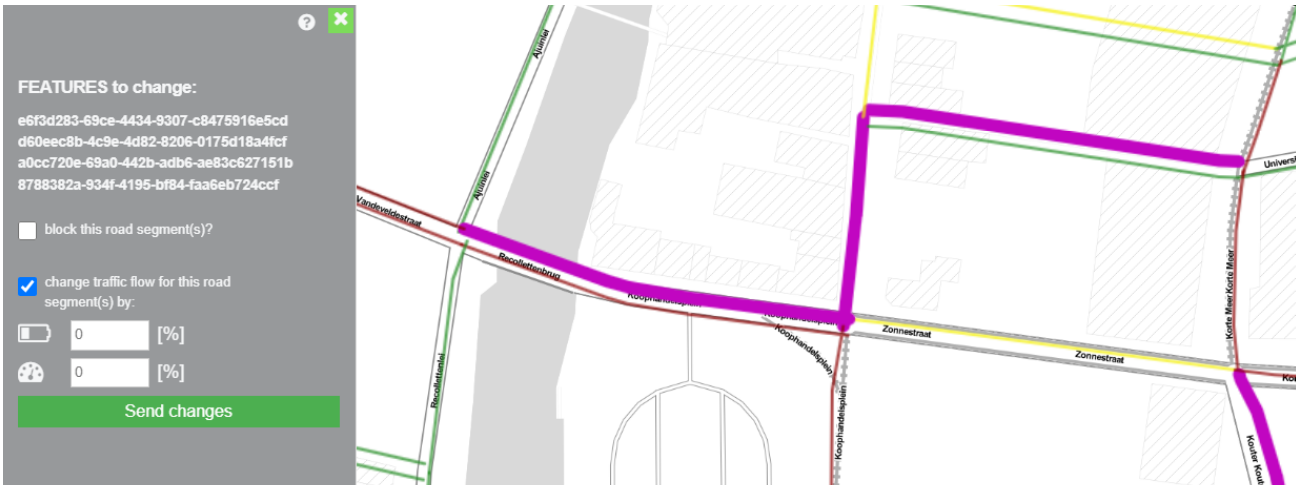
FEATURES to change:

e6f3d283-69ce-4434-9307-c8475916e5cd

☑ block this road segment(s)?

□ change traffic flow for this road segment(s) by:

Figure: blocking one road segment - selected road segment highlighted in purple



FEATURES to change:

e6f3d283-69ce-4434-9307-c8475916e5cd
d60eec8b-4c9e-4d82-8206-0175d18a4fcf
a0cc720e-69a0-442b-adb6-ae83c627151b
8788382a-934f-4195-bf84-faa6eb724ccf

□ block this road segment(s)?

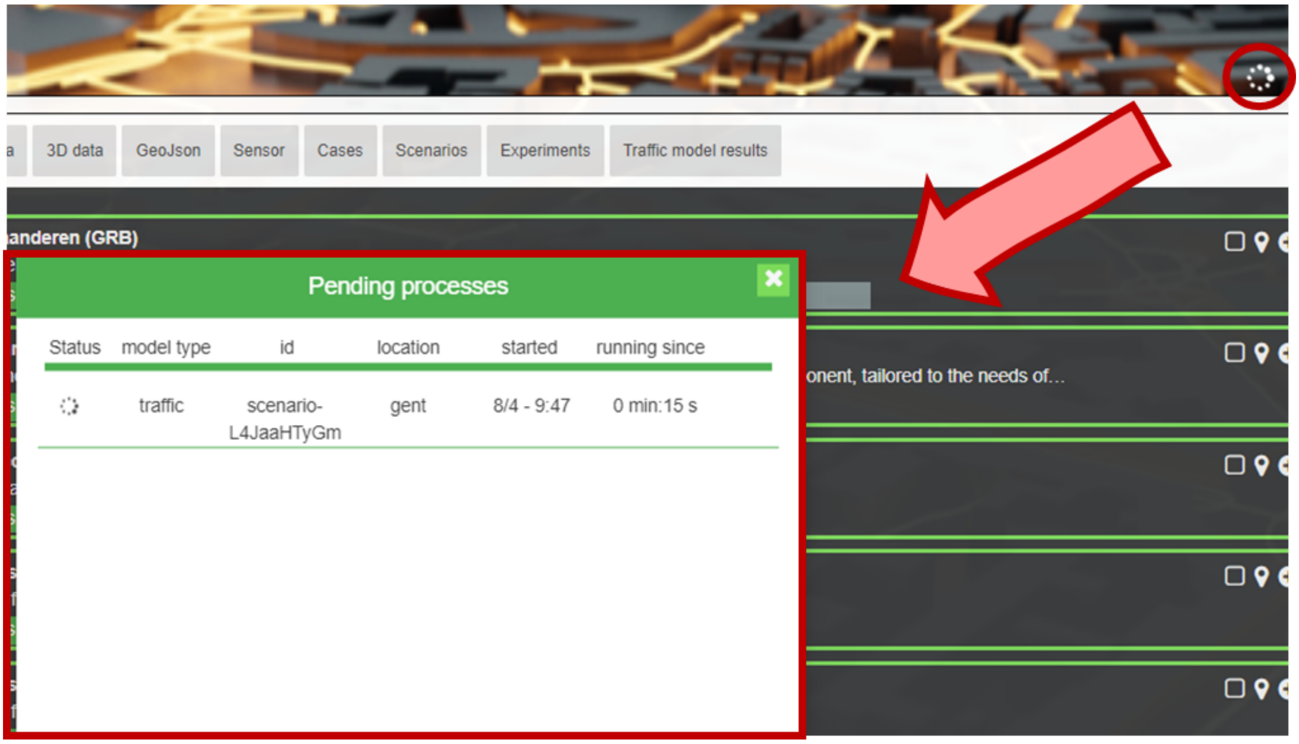
☑ change traffic flow for this road segment(s) by:

0 [%]

0 [%]

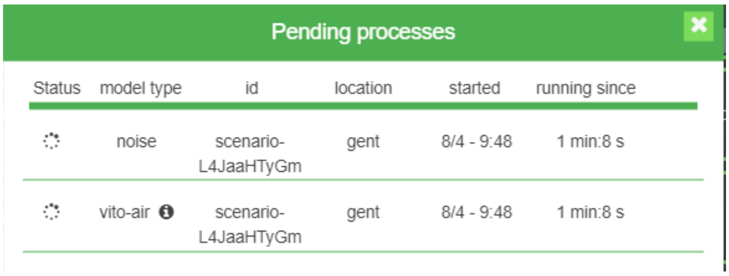
Figure: changing capacity or speed for multiple road segments - selected road segments highlighted in purple

After sending the changes a notification pops up stating that a calculation process is running. A new UI component is integrated into the data view showing pending processes based on the changes the user made. See the figure below:



Pending processes

Status	model type	id	location	started	running since
◌	traffic	scenario-L4JaaHTyGm	gent	8/4 - 9:47	0 min:15 s

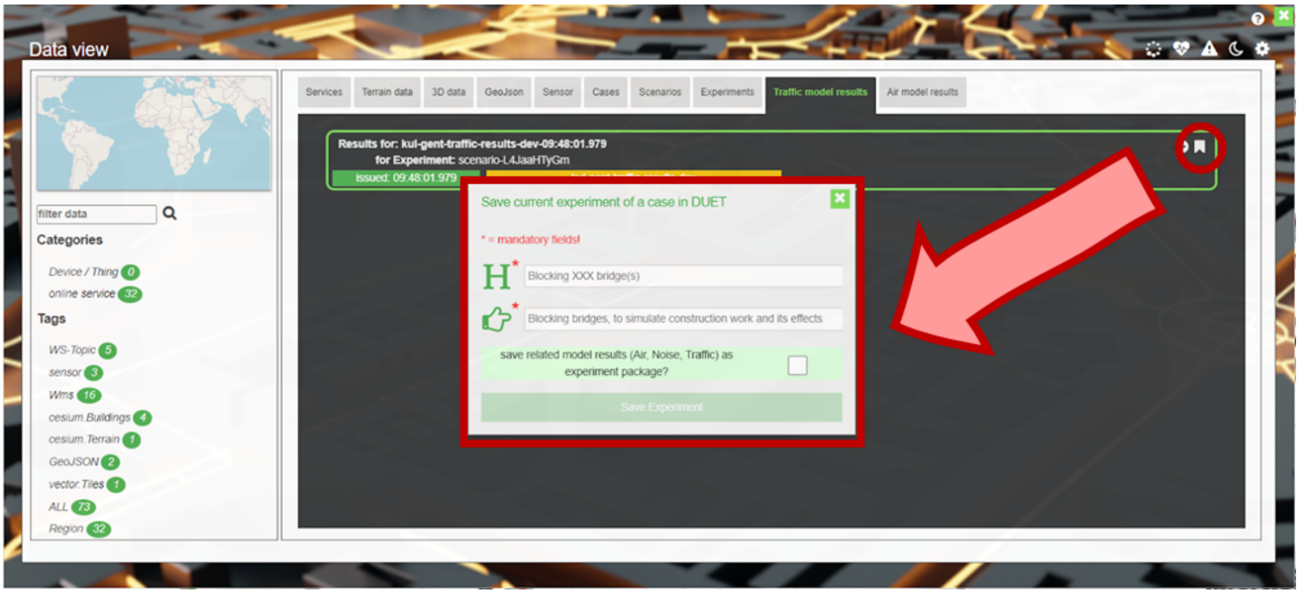


Pending processes

Status	model type	id	location	started	running since
◌	noise	scenario-L4JaaHTyGm	gent	8/4 - 9:48	1 min:8 s
◌	vito-air ℹ	scenario-L4JaaHTyGm	gent	8/4 - 9:48	1 min:8 s

When the traffic model run was successful other models are triggered to run - based on the result of the traffic model run. Thus after the traffic result is available, the pending process dialog shows more processes, usually Air and noise model runs. See the image to the left.

Once the traffic model run is completed, the result is displayed in the "*Traffic model results*" tab. Here all results are listed for each traffic model run.



Results for: kul-gent-traffic-results-dev-09:48:01.979
for Experiment: scenario-L4JaaHTyGm
issued: 09:48:01.979

Save current experiment of a case in DUET

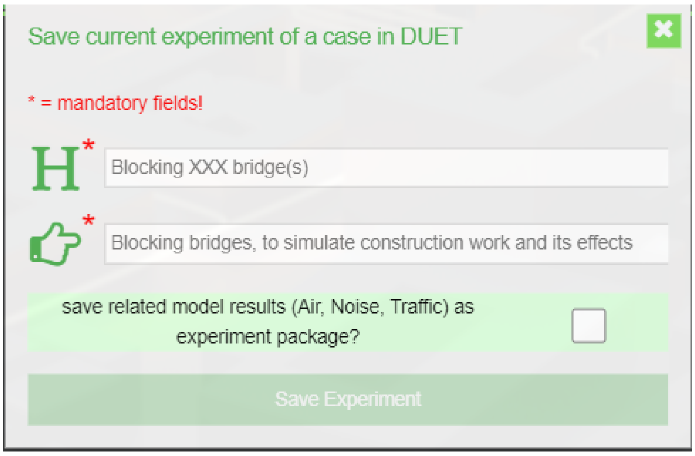
* = mandatory fields!

H* Blocking XXX bridge(s)

* Blocking bridges, to simulate construction work and its effects

save related model results (Air, Noise, Traffic) as experiment package? □

Save Experiment



Save current experiment of a case in DUET

* = mandatory fields!

H* Blocking XXX bridge(s)

* Blocking bridges, to simulate construction work and its effects

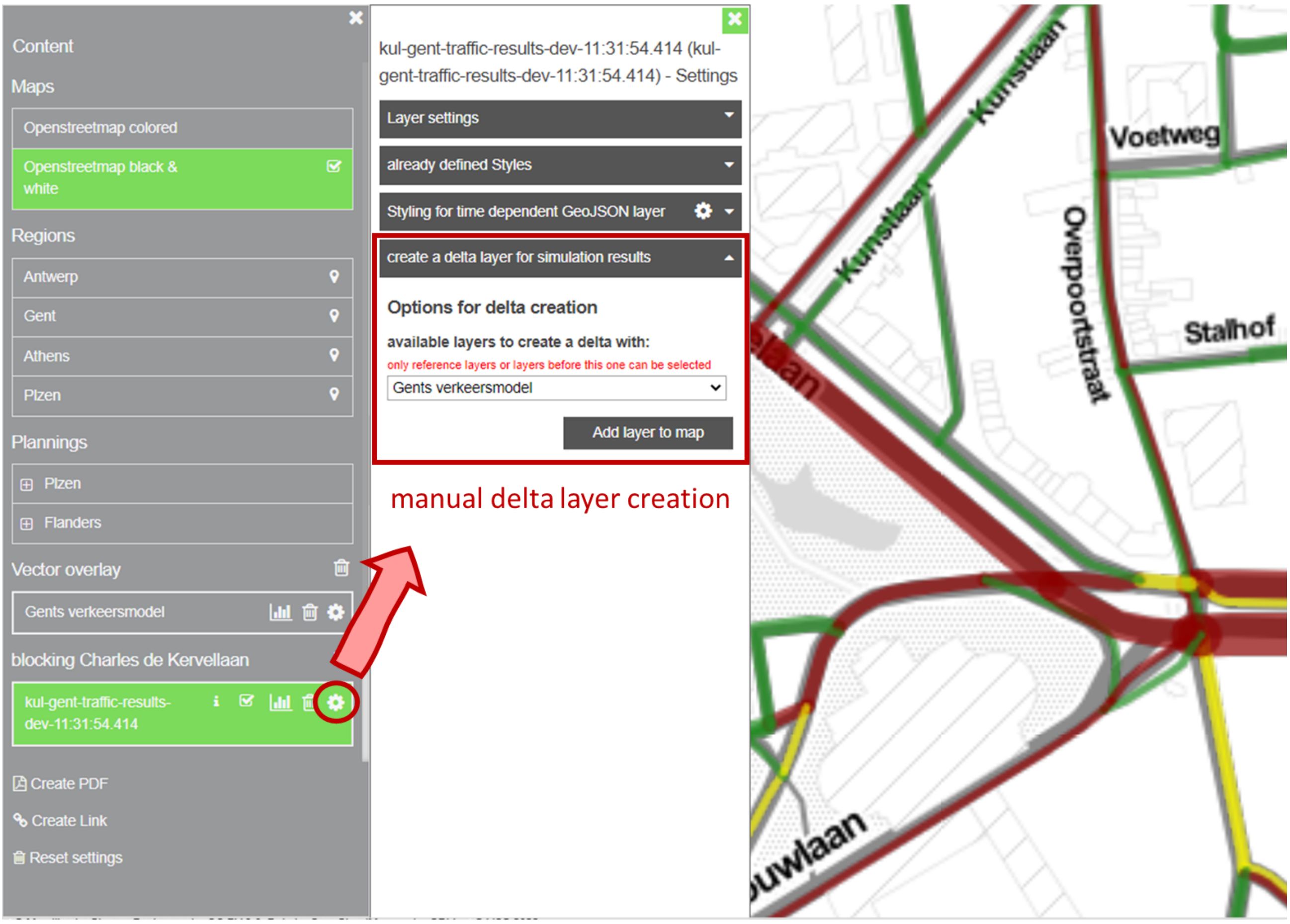
save related model results (Air, Noise, Traffic) as experiment package? □

A new symbol representing a bookmark is integrated into each result list element. A click on it opens a new dialog giving the user the possibility to bookmark or save the model result **persistently** in Duet environment as part of the case. If a user does not bookmark the results, such results will be discarded from view on a browser refresh or reloading the case. To avoid that, a user can bookmark the model result and thus make it persistent in DUET.

Here the user has to set a title for that experiment and a description for that specific experiment. Both fields are mandatory to be filled. Furthermore the user can define if the experiment should be created as a package including the other related model results or not. (**Important to know, due to technical limitations only traffic and noise for Pilsen can be saved as an experiment package, but this will be fixed later.**)

6. Delta creation & visualisation

Since not every model is able to provide the model results as a service to the visualisation client and thus can also not provide a delta visualisation between the base reference layer and the resulting layer. Hence, the visualisation client was enforced to create the delta layers for these models. A delta layer can be created by the user (directly after getting the result into the view), see below:



kul-gent-traffic-results-dev-11:31:54.414 (kul-gent-traffic-results-dev-11:31:54.414) - Settings

Options for delta creation

available layers to create a delta with:

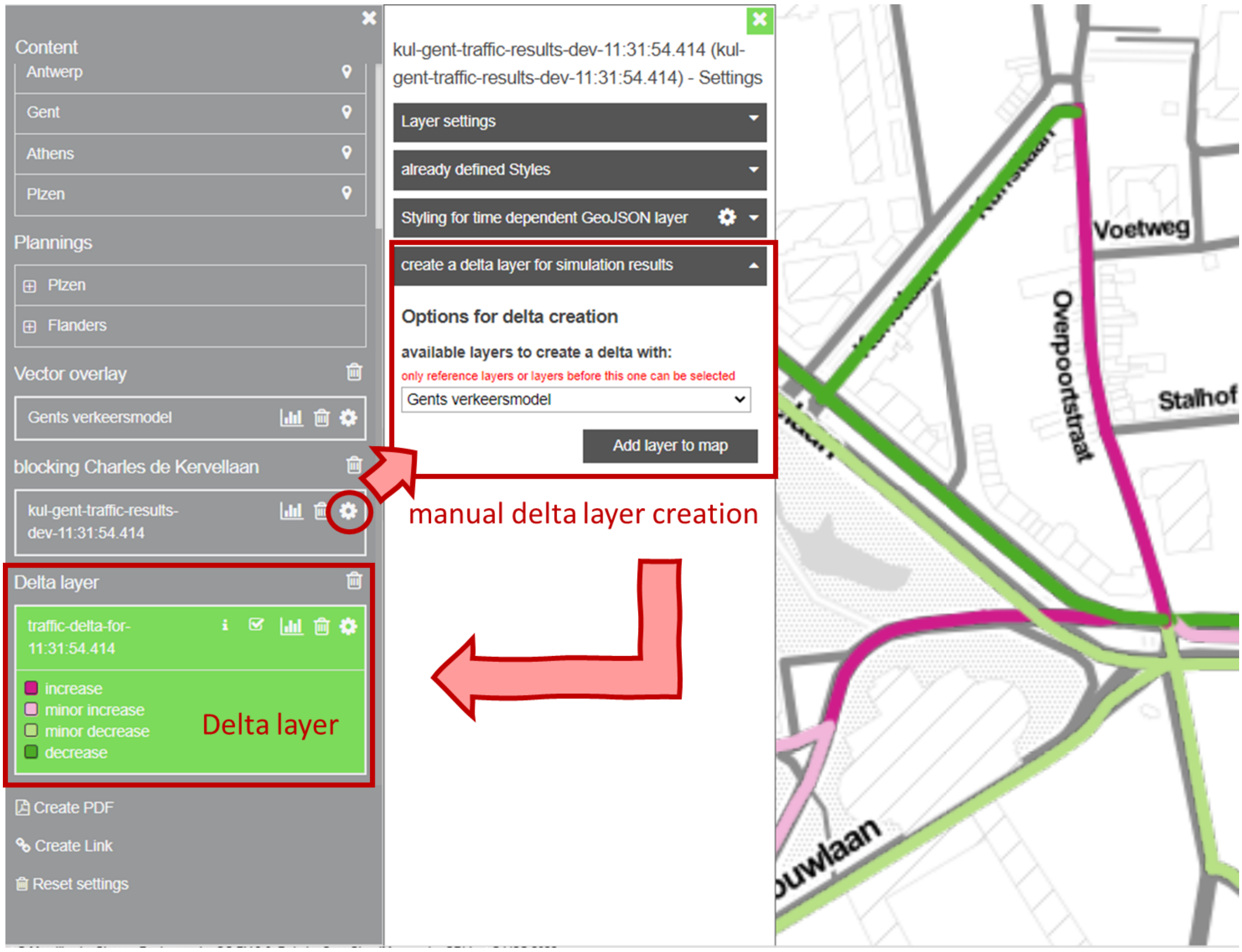
only reference layers or layers before this one can be selected

Gents verkeersmodel

manual delta layer creation

This can be done by any user independent from its role in DUET. Even if a GUEST user is not able to enforce a simulation directly, once a case or scenario has included experiments (see section Saving a case / scenario / experiment), a user is able to create a delta layer **if and only if** a base reference layer or another result layer is available (as depicted above). Due to performance constraints the delta layer creation is currently restricted to traffic layers.

A second option for delta layer creation is given for roles with privileges (NON-GUESTS). Those are able to create cases, scenarios, experiments and are able to trigger simulation runs and thus are able to define in a case or scenario that the client should be enforced to automatically create delta layers on case or scenario loading. Means the client automatically fetches the base reference layer of the experiment once an experiment will be loaded and calculates the delta for each feature and each feature attribute being shared by both datasets. The deltas will be then applied to the base reference layer and integrated into the viewer as a delta layer relating to that experiment. See the workflow for a manually delta creation below.



kul-gent-traffic-results-dev-11:31:54.414 (kul-gent-traffic-results-dev-11:31:54.414) - Settings

Layer settings

already defined Styles

Styling for time dependent GeoJSON layer

create a delta layer for simulation results

Options for delta creation

available layers to create a delta with:

only reference layers or layers before this one can be selected

Gents verkeersmodel

Add layer to map

manual delta layer creation

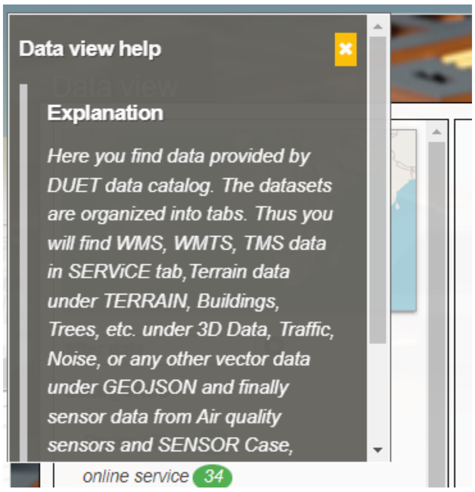
Delta layer

A delta layer will be visualised in colour blind people friendly colours. Means the **pinkish** colour palette depicts **increases** whereas the **greenish** colour palette depicts the **decreases**.

At the moment there is no way to store the results of a delta layer creation in DUET. The only way is to enforce the client to do the delta creation all the time an experiment is loaded either using the automated or manual way.

7. User help

Besides the "normal" integrated help of the vcMap, some small help sections are designed, implemented and integrated into the visualisation client. Two different implementations will appear within the client.



Data view help

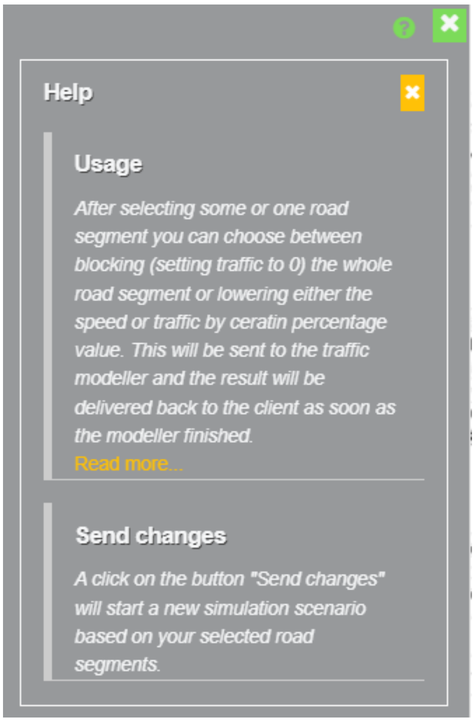
Explanation

Here you find data provided by DUET data catalog. The datasets are organized into tabs. Thus you will find WMS, WMTS, TMS data in SERViCE tab,Terrain data under TERRAIN, Buildings, Trees, etc. under 3D Data, Traffic, Noise, or any other vector data under GEOJSON and finally sensor data from Air quality sensors and SENSOR Case,

A so-called floating component, overlaying another component and besides that - an integrated help section being part of the respective UI element.

The intention of these small help sections is to give users more information on usage or intention of tools or UI elements as tooltips do. Usually the space within UI components is limited, only small information can be provided, but whenever more information could be helpful the user is directed to the "vcMap" help via the "Read more…" link.

As shown to the left the floating help section is overlaid to its parent UI element.



Help

Usage

After selecting some or one road segment you can choose between blocking (setting traffic to 0) the whole road segment or lowering either the speed or traffic by ceratin percentage value. This will be sent to the traffic modeller and the result will be delivered back to the client as soon as the modeller finished.

Read more...

Send changes

A click on the button "Send changes" will start a new simulation scenario based on your selected road segments.

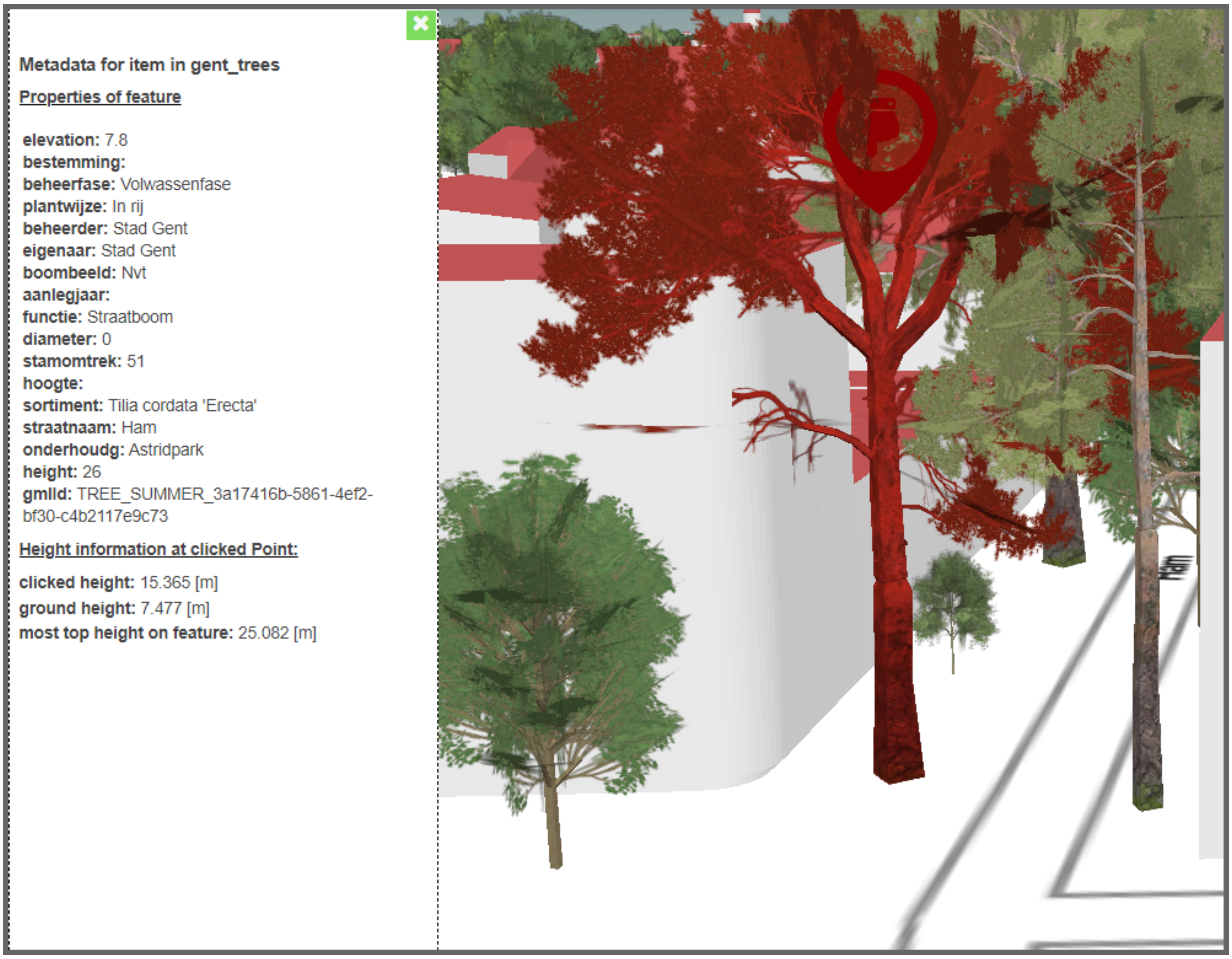
? A white symbol indicates the availability of the help within the UI element, whereas a ? indicates the presence or to be more precise the visibility of a help section within that UI element.

To the left an integrated Help section is shown. This help is for instance integrated into the "*change*" UI component. The information provided by the help section is context related and directly binds to the respective UI component. Means every major UI component (except for buttons or icons) is able to get its own help section specifically bound to this component.

By adding such small help sections smaller usage hints can be provided to the user without consulting the overall help of the vcMap. Whenever it is necessary further reading is provided via the above mentioned link to the vcMap help.

8. Object information

Each object in the visualisation client, having a vector geometry provides information to the user and can be clicked to get this information. If the user performs a **LEFT-Mouse click** either in 2D or 3D map on an object a new window will pop up to the left of the visualisation client. The screenshots below are showing some examples of the information tool.



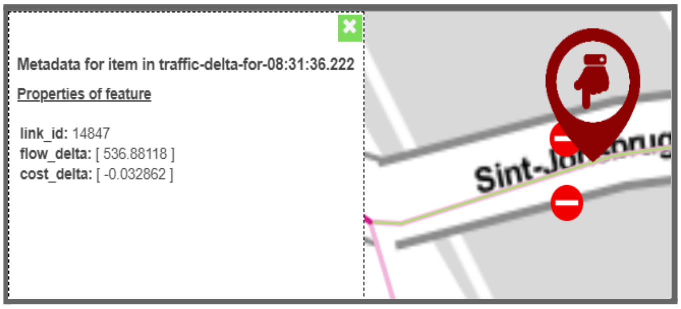
Metadata for item in gent_trees

Properties of feature

elevation: 7.8
bestemming:
beheerfase: Volwassenfase
plantwijze: In rij
beheerder: Stad Gent
eigenaar: Stad Gent
boombeeld: Nvt
aanlegjaar:
functie: Straatboom
diameter: 0
stamomtrek: 51
hoogte:
sortiment: Tilia cordata 'Erecta'
straatnaam: Ham
onderhoudg: Astridpark
height: 26
gmlId: TREE_SUMMER_3a17416b-5861-4ef2-bf30-c4b2117e9c73

Height information at clicked Point:

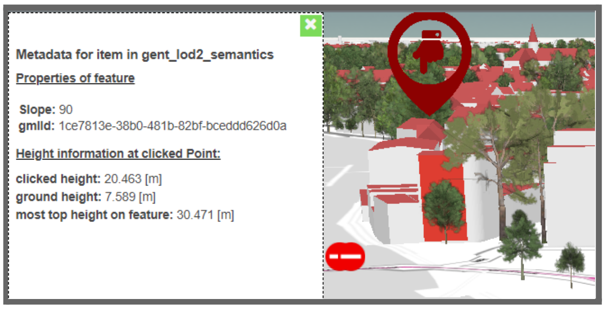
clicked height: 15.365 [m]
ground height: 7.477 [m]
most top height on feature: 25.082 [m]



Metadata for item in traffic-delta-for-08:31:36.222

Properties of feature

link_id: 14847
flow_delta: [536.88118]
cost_delta: [-0.032862]



Metadata for item in gent_lod2_semantics

Properties of feature

Slope: 90
gmlId: 1ce7813e-38b0-481b-82bf-bceddd626d0a

Height information at clicked Point:

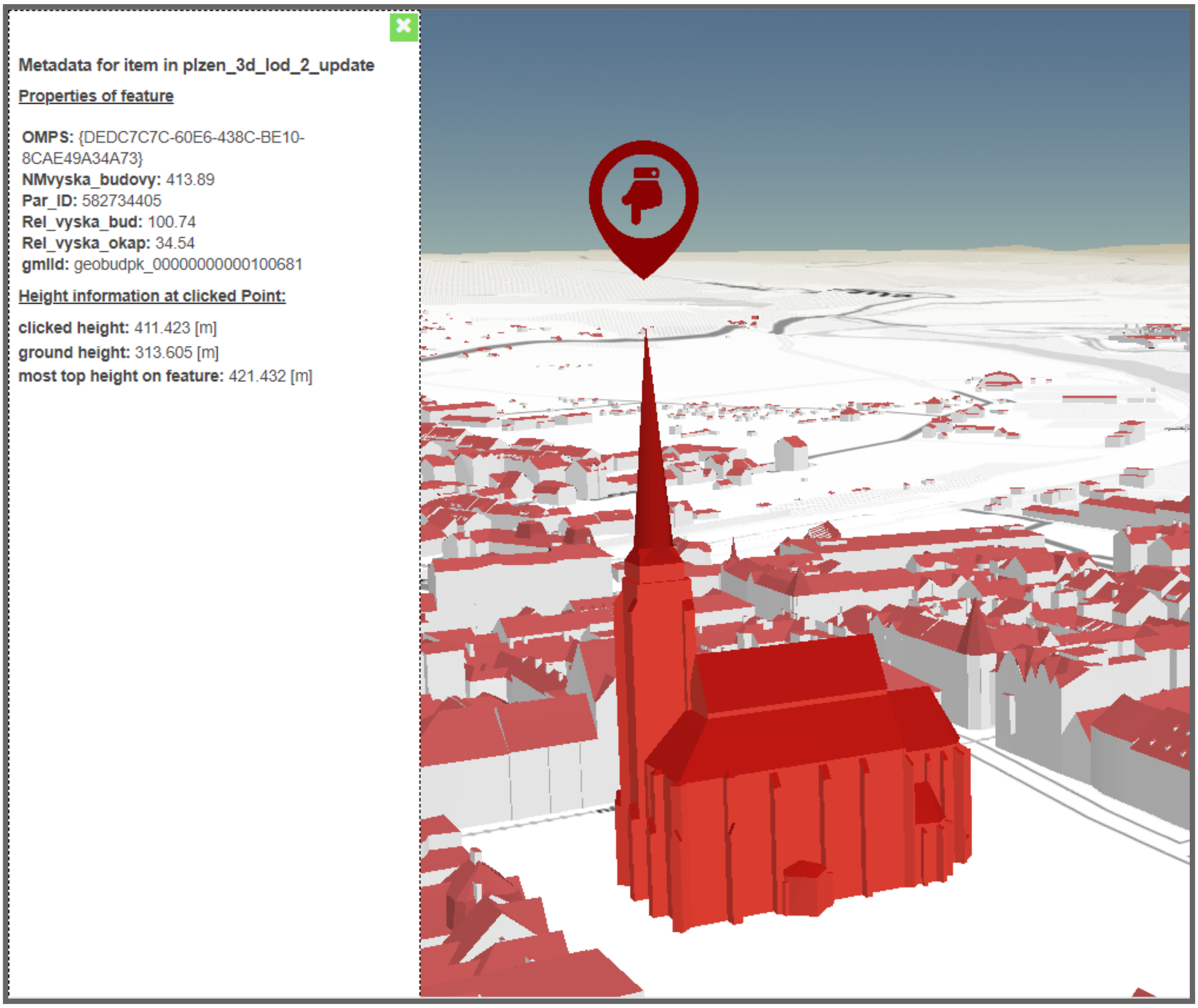
clicked height: 20.463 [m]
ground height: 7.589 [m]
most top height on feature: 30.471 [m]

As shown above, in 2D the height information section is skipped and only the properties section is shown (left), whereas in 3D (right) the height information is present.

The information tool starts every time with a short description to which layer the clicked / selected item belongs to, followed by a dynamic section showing the attribute properties of the clicked item, if some are available.

This section is followed by a height information section. Within this section the user can get the information about:

- the clicked height (especially in 3D relevant, where the user can get the height information of the point the user was clicking at)
- the height of the ground level at the clicked position
- the most top height of the feature at the clicked position, means the highest point at the clicked position of that feature (if a wall is clicked, the most top height represents the height where the wall hits the roof)



Metadata for item in plzen_3d_lod_2_update

Properties of feature

OMPS: {DEDC7C7C-60E6-438C-BE10-8CAE49A34A73}
NMvyska_budovy: 413.89
Par_ID: 582734405
Rel_vyska_bud: 100.74
Rel_vyska_okap: 34.54
gmlId: geobudpk_00000000000100681

Height information at clicked Point:

clicked height: 411.423 [m]
ground height: 313.605 [m]
most top height on feature: 421.432 [m]

9. Conclusion

In this report, an overview of the results of the DUET Digital City Twin frontend components is presented. This report reflects the as-is developments and visualisations in DUET for the Open Beta version to be released at the end of May 2022.

Of course, further improvements and integration of functionalities will be made in the next upcoming months, even if they are not directly epic related.

10. References

previous and accompanying documents:

- D4.4 DUET visualization Components v1
- D4.5 Standard reports and data analysis tools
- D4.6 Implementation of the DUET UI/Dash boarding platform

links to visualisation platforms:

- https://platform.citytwin.eu/dev/map (Development environment)
- https://platform.citytwin.eu/app/map (Production environment)