

## **MATSim Users Meeting 2022 :: EXTENDED ABSTRACT SUBMITTAL**

Title: Building MATSim visualization dashboards using SimWrapper  
Author: Billy Charlton  
Affiliation: TU Berlin VSP – Transport Systems Planning and Transport Telematics

The VSP department at TU Berlin has been experimenting in recent years with developing open-source, web-based visualization platforms for displaying MATSim results. These have taken different names including MatHub and afterSim, and SimWrapper is the name of the latest incarnation of this research.

SimWrapper is a unique, open-source and web-based data visualization platform intended for researchers who wish to build interactive dashboards that summarize the results of their MATSim runs. Like many other dashboard tools, SimWrapper provides functionality for displaying basic interactive charts such as bar, line, area, pie, and scatterplots.

But SimWrapper is also able to create advanced map-based visualizations of large datasets from MATSim, including link-based plots for road volumes, emissions, etc; and also other types of visualizations such as aggregations of activity locations, transit network data, mode shift diagrams, animations of vehicle positions, and more.

The platform is designed as a standalone website which is configured to access files stored on your local machine, network file storage, or if available, internet-based file storage. For example at VSP, analysts often review run outputs on their local machines, and then publish “good” runs to our departmental public file server. There is a companion “simwrapper” python package available on the Python package library “pip”, which makes accessing files on LAN network servers relatively painless.

The basic workflow is as follows: upon completion of a MATSim run, some post-processing scripts produce summary datasets usually in CSV format. Along with the datasets, the user supplies some configuration for each dashboard, which defines the layout, what visualizations to place where, and any configuration data needed for that panel such as locations of input files, initial color and width specifications, etc. These configurations can be set on a project level or for individual runs, and are stored as “YAML”-format text files along with the run outputs. The SimWrapper website reads these files and generates the dashboards.

Dashboards can be organized into separate pages, be full-screen, or a special side-by-side mode is available for comparison tasks.

SimWrapper is being used by several project teams at VSP and by external researchers as well. It is generic enough to be broadly useful, but it is not intended to supercede or replace advanced GIS tools such as QGis nor commercial MATSim analysis packages.

Some example screenshots follow; but most ideal would be a time slot at the MATSim user’s meeting for a demo of the latest interactive capabilities.

The platform is 100% open-source and the code is available on GitHub. We invite you to see what is possible at

SimWrapper VSP demo site:  
<https://vsp.berlin/simwrapper>

SimWrapper documentation:  
<https://simwrapper.github.io>

Code on Github:  
<https://github.com/simwrapper>

**website**  
 public: /de/duesseldorf/projects/komodnext/website

^ UP    Düsseldorf scenario    Flow capacity    **System-wide effects**    Rollout scenarios    Prospective    Files

### Short- and long-term effects of AVs and ACVs

This page shows the potential effects when introducing automated (AVs) and autonomous connected vehicles (ACVs), together with intelligent infrastructure uniformly and unrestricted to the scenario. We simulated short-term effects by only allowing agents to adapt their plans by re-routing and departure time mutation. Long-term effects also includes mode-choice behaviour.

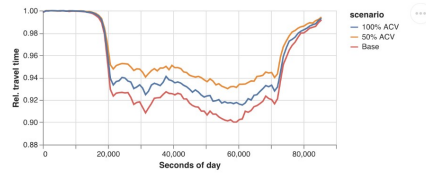
#### Short-term travel time savings

The following table shows the reduction in time spent for traveling in car:

| ACV share     | 50%   | 100%  |
|---------------|-------|-------|
| Vehicle-hours | -4.6% | -8.9% |

#### Relative travel times

Shown are the mean relative travel time over all congested link in the base scenario throughout the day.

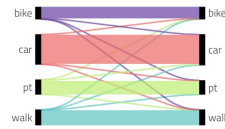


#### Long-term effects with Mode-choice

The following table shows the number of car trips and driven km and hours compared to the base case:

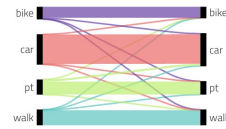
| ACV share     | 50%   | 100%   |
|---------------|-------|--------|
| Car trips     | +3.2% | +11.7% |
| Vehicle-km    | +3.3% | +10.6% |
| Vehicle-hours | +8.2% | +12.2% |

#### Mode-Shift 50% ACVs



534,236 total  
 Only show changes

#### Mode-Shift 100% ACVs



534,238 total  
 Only show changes

**viz**  
 public: /de/hamburg/hamburg-v2/hamburg-v2.2/viz

^ UP    Modal Shift    Modal Split    **Road volumes**    Accidents Costs    Emissions    Files

#### ReallabPlus2030

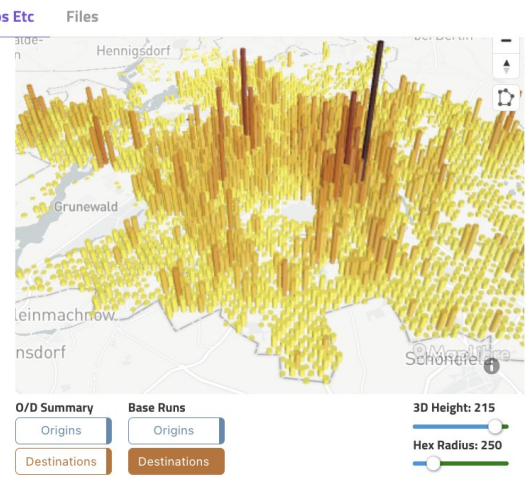
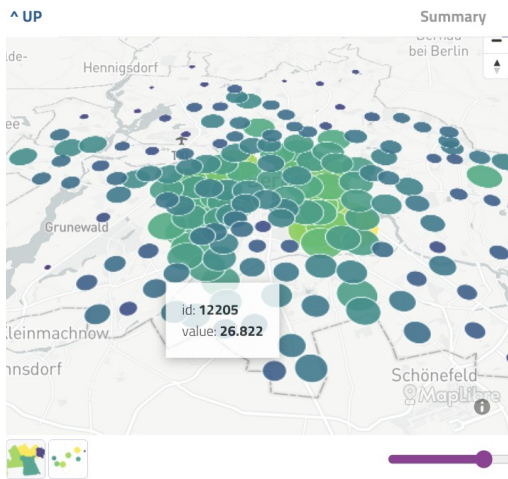


#### DRT2030



**dashboard**  
 local: /every-viz/dashboard

^ UP    Summary    **Maps Etc**    Files



#### Emissions

Traffic-related emissions in g/m

