Supporting additional elements in a simulation using Netedit

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Abstract

The traffic simulation software SUMO supports the simulation of various kinds of network infrastructure such as bus stops, traffic detectors and variable speed signs. This network infrastructure is configured with various parameters in regard to its location and functionality. So far, the definition and customization of these infrastructure objects required writing custom XML files which is a tedious and error-prone endeavor. To simplify this task the visual network editor Netedit is being extend to support the creation and customization of infrastructure objects. The GUI facilities should provide for an intuitive user experience and the architecture is designed with user-defined infrastructure types in mind.

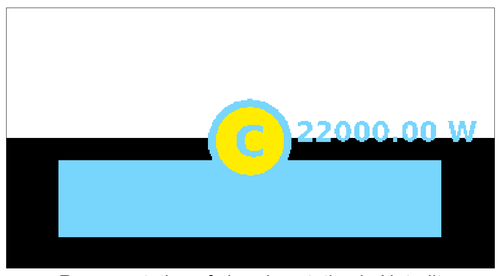
Additionals supported by Netedit

Standard bus stop in Germany. *Source*: wikipedia

Representation of bus stop in Netedit

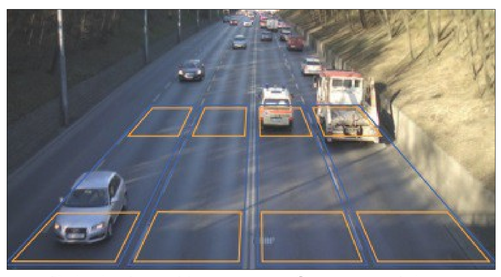
A bus stop is a designated place where buses stop for passengers to board. Netedit allow to place bus stops over lanes, having every their own lenght and bus lines.

Inductiv surface in a highway. *Source*: entravision

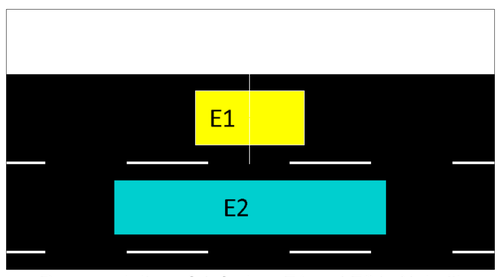


Representation of charging station in Netedit

A charging station is a surface in which a vehicle equiped with a electric battery can charge. This additional elements can be modelled in Netedit in two different ways: As a inductiv surface or as a electric station [1].



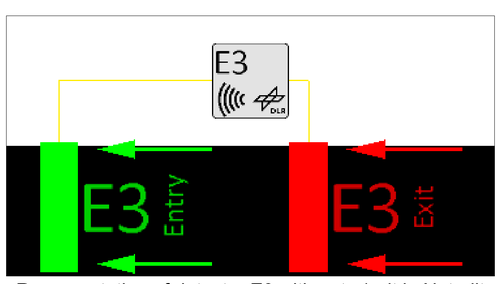
Detector based in cameras. *Source*: modot.org



Representation of defectors E1 and E2 in Netedit

Detectors are devices used to measure traffic flow. Netedit supports detection of vehicles on a specific point of a lane using detectors E1, or vehicle detection over an entire surface using detectors E2. All generated information is saved in XML format.

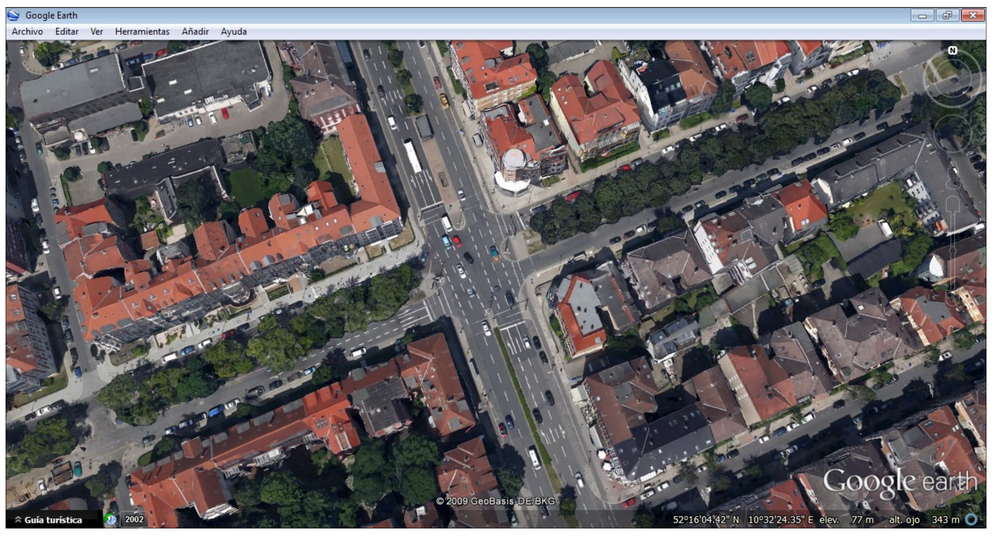
Real E3 detector used in proyect AIM [2]



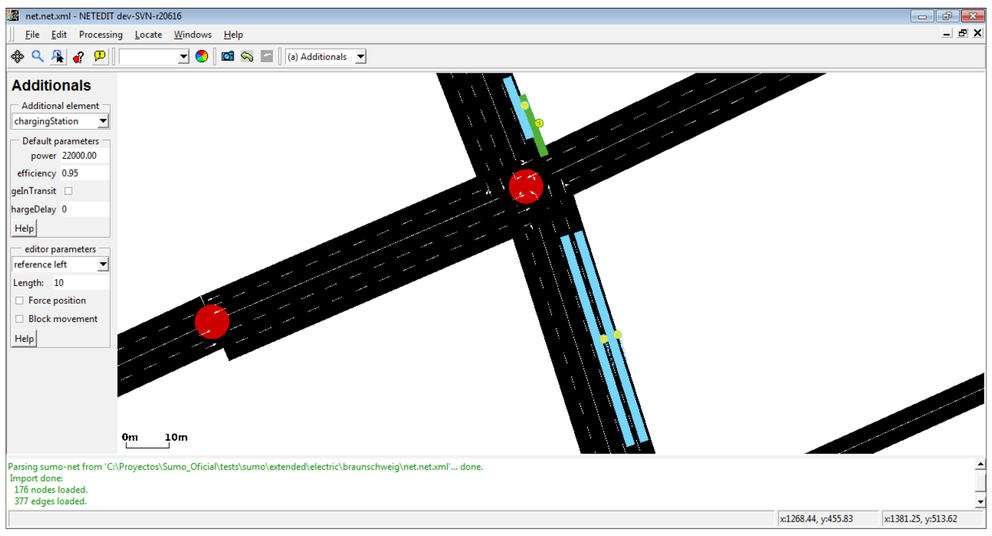
Representation of detector E3 with entry/exit in Netedit

Netedit supports a special kind of detector called E3, that keeps track of vehicles within a larger area defined by a set of lanes and cross-sections. Area is bounded using Entry and Exit detectors.

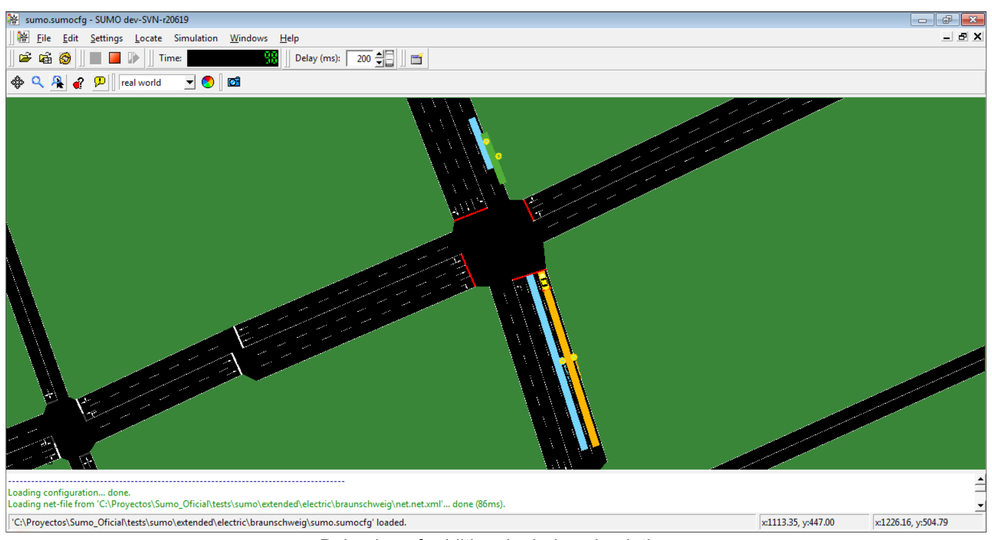
Adding additionals in Netedit



Aerial view of the simulation area [1]. *Source*: googleearth



Adding additionals using Netedit

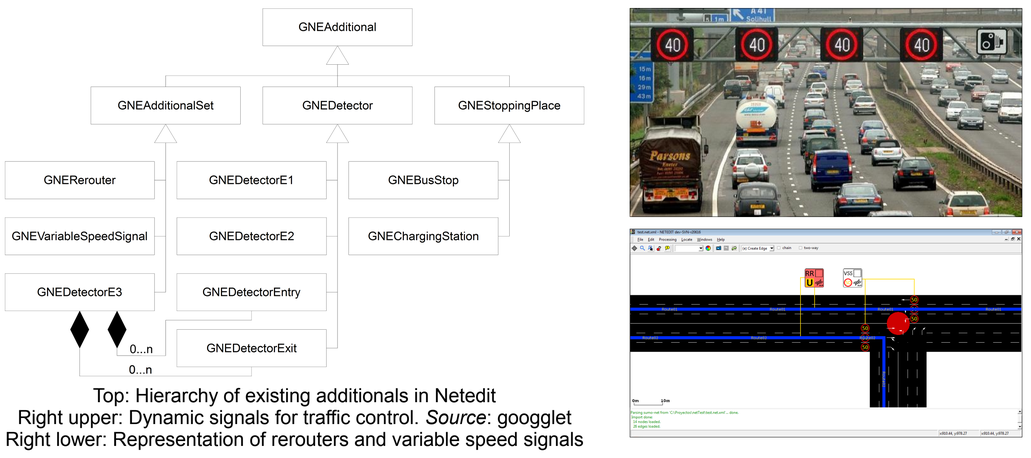


Behavion of additionals during simulation

Future

Future versions of Netedit will support all of SUMO's infrastructure objects including Rerouters, Variable Speed Signals and Calibrators. These objects are used to influence traffic dynamics and are currently hard to use due to their complex XML definitions. A guide and a SDK similar to *MSDevice_Example* will be include, to support the user in creating their own additional elements. Further planned extension to Netedit included editing sidewalks, pedestrian crossings and connection attributes [3]. Support for creating and modifying points of interests (POI) and polygons is also in the works.

References
[1] Kurczveil, T., Álvarez López, P. and Schnieder, E., Implementation of an Energy Model and a Charging Infrastructure in SUMO. Simulation of Urban Mobility, S. 33-43, November 2014. Springer Berlin Heidelberg.
[2] Schnieder, L. and Lemmer, K., Anwendungsplattform Intelligente Mobilität–eine Plattform für die verkehrswissenschaftliche Forschung und die Entwicklung intelligenter Mobilitätsdienste. Internationales Verkehrswesen (64), 4, 62-63.
[3] Krajzewicz, D., Erdmann, J., Härri, J. and Spyropoulos, T. (2014). Including Pedestrian and Bicycle Traffic into the Traffic Simulation SUMO.



Top: Hierarchy of existing additionals in Netedit
Right upper: Dynamic signals for traffic control. *Source*: googglet
Right lower: Representation of rerouters and variable speed signals

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