Simulation of Urban Mobility – SUMO

The microscopic transport simulation in a nutshell
SUMO – what is it?

- DLR’s open source microscopic transportation system simulation software
- Current version 0.30.0
- Under development since 2001, with the explicit goal to simulate even large cities / areas in real-time
- Current limitation: the city of Berlin
- SUMO comes with a full-fledged suite of helper programs that do setting up, running, and controlling such a simulation
- Most important of those tools is TraCI which allows to control a running SUMO simulation from outside via programs in various languages
- Active community with roughly 30,000 downloads annually, and about 1,000 requests on the mailing list.
SUMO – distribution

- Used world-wide, especially in the scientific community
- 15k hits on Google Scholar for 'sumo traffic'
- Downloads 2016

- Source: sourceforge.net
Exaggeration: any moving object in a city can be simulated with SUMO

But we are close:
- Cars,
- Busses,
- Passengers,
- Bicycles,
- Pedestrians,
- Ships,
- Goods traffic,
SUMO – what can be done?

- Planning and evaluation / assessment
  - Traffic management
  - Infrastructure changes
  - Public transport
  - New technologies (e.g. vehicular communication, automated transport systems)
- But it needs travel demand from external sources
- Optimization
  - Traffic lights
  - Routing
- Traffic forecast (short-term mostly)
- Data fusion for traffic surveillance
Traffic / transport system simulation – what is needed?

Three ingredients desperately needed:

• Networks (vehicle, bus, train,…) where movements take place
• Infrastructure (traffic lights, toll stations, bus stops,…) and, related, rules that govern traffic behavior
• Demand for transport
SUMO – Building a simulation scenario with ~3 clicks

- `tools/osmWebWizard.py`
- Select region, traffic modes and volume
- Instant scenario have limitations:
  - Network quality
  - No Traffic Light data
  - Random traffic