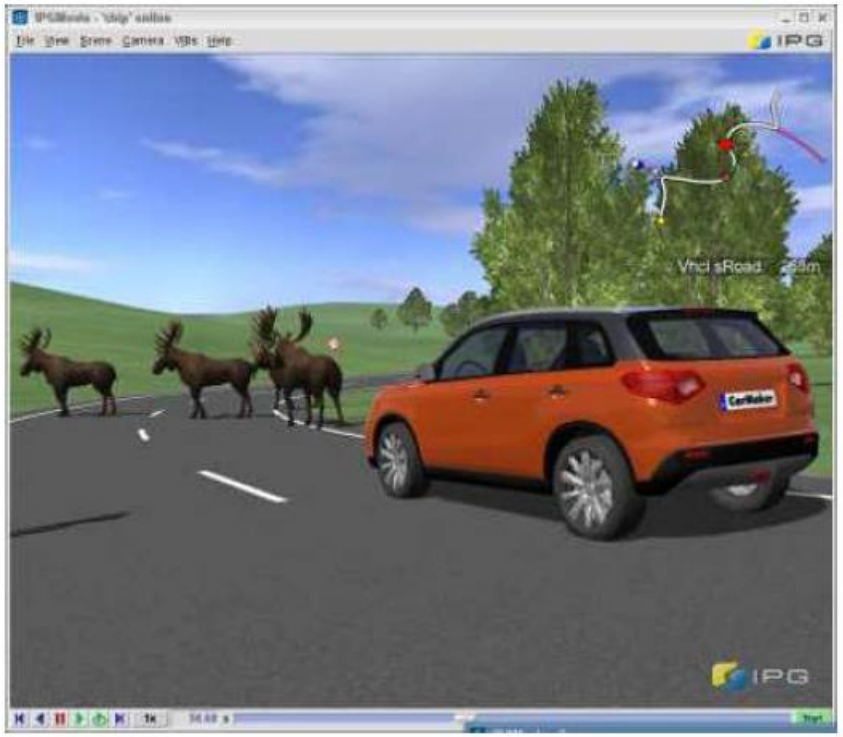
Surprise Detection

- Simulate various traffic scenarios for surprises
  - Lane Change Lateral Motion
  - Pedestrian Motion Model
  - Ball Motion Model
  - Animal crossing (uses pedestrian motion model)
  - Combination of 2 wheelers and 4 wheelers
- Verify if the examples already exist in the Product Examples > Basic Functions > Traffic
- Aggregate/Create the traffic examples and create a scenario of 15 min with various traffic objects at various distances

Some Pictures, of Example Traffic Objects

- Five different animated models of animals by CarMaker



Children Playing Ball

Figure 8.18: Child playing with a ball on the road

Pedestrian Crossing

Figure 8.34: Pedestrian crossing road

Bicycle Riders

Combination of 2 wheeler and 4 wheelers

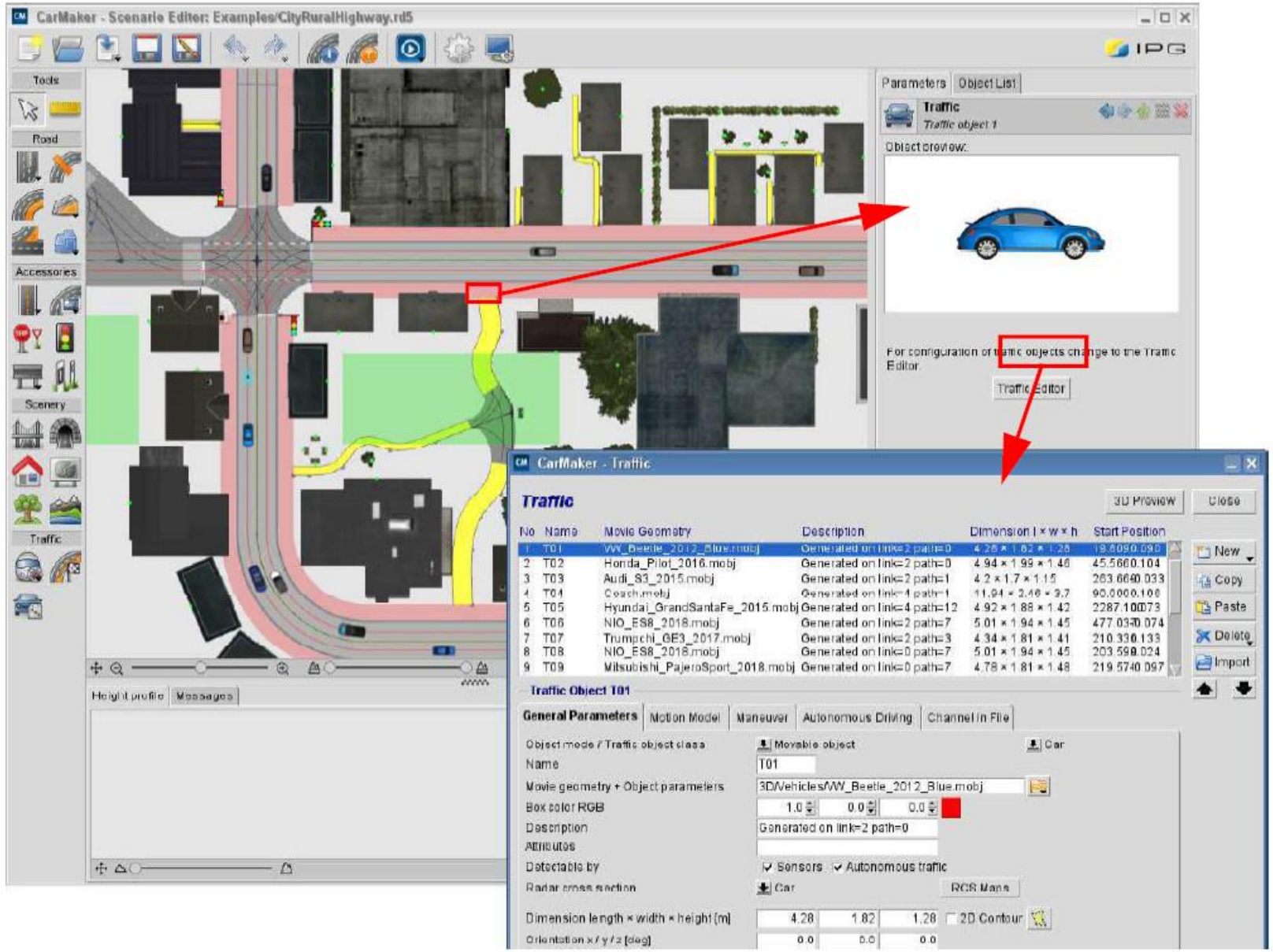


Figure 8.4: Visualization of traffic objects in the Scenario Editor preview

Implementation Considerations

- Either create the traffic objects manually using scenario editor and traffic object editor
- Or feed the input from the file
- Consider creating “movable” traffic objects first. Do not spend time on creating “stationary” objects
- We are considering “surprise” in the context of vehicles. If I get sudden/unexpected thoughts (like "I am not ready with tomorrow's plan, what am I going to do?"), that is not considered as a “surprise” in the driving scenario
- Only “visual surprises” will be taken into account. “Auditory” surprises like “honking” will not be considered as a surprise

Future Work

- Design the surprise scenarios in vehicle simulator. At least 10 surprises in 15 min drive.
- Label them
- Extract epochs around the labels
- Train the network with surprise and no-surprise labels
- Accuracy of surprise detection should be more than 90%

Questions

- I can not force the subject to follow a certain path and forcibly cover all surprises. Could we check if such provision exists where N surprise scenarios are simulated, and we can actually mark/identify the (say N - 3) scenarios which the subject actually covers along the path he/she follows?

- Can we mark the path which the subject has followed? Can we identify all the simulated surprises on that path?

- Can we make each type of surprise as “module”? Can we introduce randomness in introducing “surprises” on the path?

- Can we set triggers for the “traffic object” which can be received by EEGO to capture EEG?

- Has someone in the lab already simulated the “traffic”? Does “Measurement file” for those traffic object already exist?