

# A library for City Traffic

Eashan Liyana<sup>1</sup> Simon Lacroux<sup>1</sup> Jean-Baptiste Barbe<sup>1</sup>

<sup>1</sup>Digital Product Simulation, La Celle-Saint-Cloud, France,  
[eashan.liyana@dps-fr.com](mailto:eashan.liyana@dps-fr.com) [simon.lacroux@dps-fr.com](mailto:simon.lacroux@dps-fr.com)  
[jean-baptiste.barbe@dps-fr.com](mailto:jean-baptiste.barbe@dps-fr.com)

City traffic management and reduction of emission of pollutants by vehicles are more newsworthy than ever.

As part of the MODRIO project (MOdel DRiven physical systems Operation), a European project financed by the ITEA2 program and led by EDF, Digital Product Simulation (DPS) created a library targeting city traffic Modeling and Simulation.

This library is designed for the development and evaluation of control strategies, rendered possible when vehicles are able to communicate between each other and with their infrastructure. CityTraffic library allows for the implementation of control strategies by all of the players acting in an urban environment (e.g. located in vehicles, with a global server computing set points for the vehicles, or with a traffic management system setting speed limits and traffic light cycles).

The library is divided in two sections, macroscopic traffic and microscopic traffic. Macroscopic components are used to describe road networks such as highways whereas microscopic components allow for modeling city traffic where interactions between vehicles and their environment are many.



**Figure 1:** Modeling scales for a roundabout intersection.

Connections between environments are available to reduce the simulation time by modeling roads without intersections at the macroscopic scale.

The library uses objects set on a map defined by the user. On this map, intersection types can be changed and vehicles movements can be visualized. Currently, eight intersection models were developed such as yield, right of way or bus stops. Others are currently being created.

The vehicle model includes fuel consumption and CO2 emission functions defining the environmental impact of each type of vehicle (car, bus...).

By using this City Traffic library, cities can decrease the number of traffic jams on their road network, and improve the overall impact of the traffic on the environment.



**Figure 2:** Intersection models developed.