Traffic simulation workflow

The workflow consists of the following components (please also see the figure below):

- The *Manhattan legacy code* **(Job 0)** is an application to generate inputs for the MadCity traffic simulator: a road network file and a "turn file". The MadCity road network file is a sequence of numbers, representing a road topology of a road network. The number of columns, rows, unit width and unit height can be set as input parameters to this component. The MadCity turn file describes the junction manoeuvres available in a given road network. Traffic light details are also included in this file.
- *MadCity* **(Job 1 and Job2)** is a discrete-time microscopic *traffic simulator* that simulates traffic on a road network at the level of individual vehicles behaviour on roads and at junctions. The simulator models the movement of vehicles using the road network and turn file as inputs. After completing the simulation, a macroscopic trace file, representing the total dynamic behaviour of vehicles throughout the simulation run, is created.
- Finally a *traffic density analyser* **(Job 3)** compares the traffic congestion of several runs of the simulator on a given network, with different initial road traffic conditions specified as input parameters. The component presents the results of the analysis graphically.

The two instances of the simulator executed in parallel branches of the workflow. They are fed with the same input files. However, one parameter, the original traffic density, is different. The analyser component will draw a graph that shows the change of traffic density in time based on the different input parameter values.