CHAPTER 72

Joinville

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Joinville Prefeitura Municipal de Joinville (PMJ) (2015) is a mid-sized industrial city in the south of Brazil, with around 550 000 inhabitants. It has a large workforce, including commuters from neighboring cities and an intense industrial activity profile, meaning that companies work often in three shifts, causing peculiar traffic patterns. Many people also have 12-hour daily routines, encompassing work and higher education.

The Joinville traffic model was built as an initial step of a project to simulate the entire northeast region of Santa Catarina state, including air traffic, shipping, state highways and neighboring cities. The project aims to build a complete data base of people and freight movement in the region. The first version of the urban Joinville model is now complete, produced as a graduate thesis at the Federal University of Santa Catarina (UFSC) `http://ufsc.br`, Transportation and Logistics Engineering course `http://transporteslogistica.joinville.ufsc.br`.[1]

The scenario population was generated with data from the 2010 Brazilian census combined with demographic information from the city's travel survey; travel demand was generated from the same survey. Both were designed to fit into the MATSim, using Tutorial classes (with some adaptations).

The network was produced with vector data provided by the local Urban Sustainable Planning Institute of Joinville (IPPUJ) `https://ippuj.joinville.sc.gov.br`. The data came as a shapefile, with numerous connectivity problems. We were able to fix them using scripts in Python with the `NetworkX` module (Hagberg et al., 2008). Information was transformed from vector data into a graph, addressing issues with the help of QGIS and finally writing as the MATSim XML network format. The facilities were produced from land-use data provided by the city government.

For now, the model runs only with cars, using a full sample of the population. From the available data, we inferred 135 652 agents traveling by car; the rest were removed from the simulation. Figure 72.1 shows a screenshot of the Events using Via.

[1] The authors would like to thank their sponsors Federal University of Santa Catarina (UFSC) and Urban Sustainable Planning Institute of Joinville (IPPUJ).

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Figure 72.2 shows the comparison between simulated and count data for 20 links in the morning peak from 7 to 8 am. The count data available for comparison is still sparse and could not be used as effectively as we hoped; we know that calibration is needed for the next model versions. The good news is that the local authorities are installing more than a hundred counting stations throughout the city within the next couple of months and a new travel survey will be conducted this year.

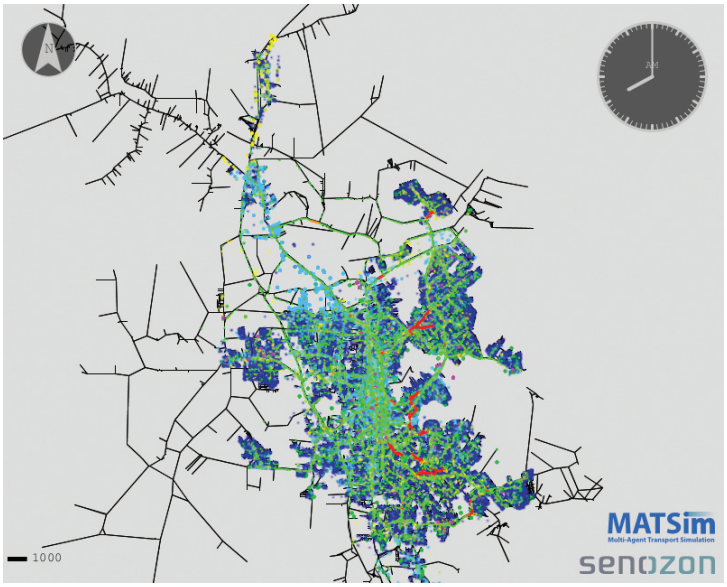

Figure 72.1: Screenshot of the simulation using Via.

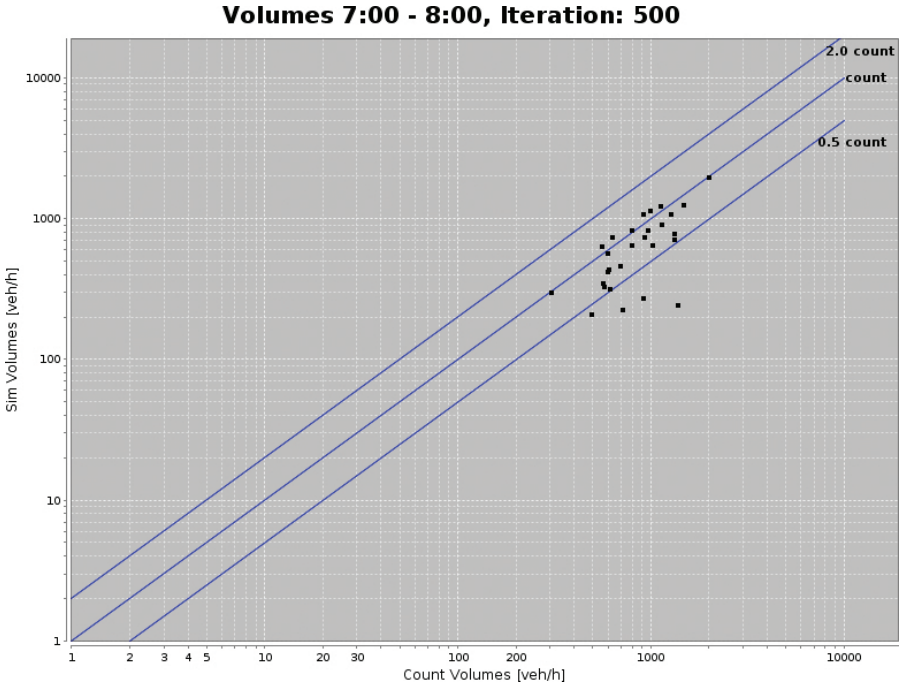

Figure 72.2: Count comparisons for the morning peak at 7-8 am.