

Summary

Past decades, the development of road data has accelerated. One result of this development is that some data is publicly available and can be used to create programs or applications.

Most known applications to road data are car route planners. Similar to these route planners is the model for intermodal transportation of Voorend. That model is now using old NWB (Nationaal Wegenbestand) maps which are not freely available. Also because this data is difficult to obtain, this assignment will investigate if other supplier of road data can be used for the Intermodal model.

Before choosing a supplier of road information requirements were set up. Keeping the future use of the model in mind, the new data should most preferably:

- Include all roads in the Netherlands
- Include foreign road information
- Include road information (maximum speed, road types)
- Be available for free
- Convertible to a new structure
- Include railroads and waterways

Three suppliers of road information that were examined are governmental, open source (OS) and commercial suppliers.

Governmental road data is not attractive to use. The information is complete but there is limited road information and it is restricted for commercial use. Also, information (NWB) is limited to the Netherlands and to roads only. Information about waterways and railways can be retrieved but with the same limitations.

The alternative OS and commercial data is better than governmental data. Both alternatives are comparable to each other in the multi criteria analysis. The completeness of commercial data is slightly better than OS data but the OS data is better retrievable. OS data can be retrieved as much as wanted while the number of data requests in commercial data is limited. This availability drawback on commercial data makes OS data as the preferred choice for replacing the NWB data.

From the OS supplier, OSM data was implemented in the intermodal modal by Voorend. Because of the other structure of the data, the OSM data needed to be converted to suit the input of the model. This required a connection between coordinates and ways. The model was adapted in such a way that not only the city of Gorinchem could be loaded by any other area as well.

For the routing algorithms improvements were considered. The extra data from the OSM file was used so that one way roads could be recognized but also a choice between road types could be made. Finally, if available, the maximum speeds are copied from the original data. Otherwise the maximum speed is made based on the road type.

The main question in this assignment is whether NWB data can be replaced by another free data source in the intermodal model. The OSM data can be used as a replacement for the NWB map. All road

information from the OSM file was correctly loaded into the model. However, some extra improvements on the intermodal model are needed.

Cost calculation results based on the track lengths are similar to the results using NWB information. Yet, roads that are linked in reality but not in the source data cause strange results. These so called unconnected roads have to be connected by the map supplier or OSM users for the map to be reliable.

The expensive roads have not indicated their effects on the intermodal versus truck transport results.

For the connection of coordinates and ways a search algorithm was used. Binary search is the most favourable method over linear search. Although theoretically faster, binary search turned out to be slower than linear searching. The binary search algorithm was not working properly, making the simulation model very slow. Therefore linear search is used.

With all the extra information available in the OSM data only the one way road information was found as a very useful improvement. Especially on highways the effect of one way roads is clearly visible and it makes the model more reliable.

Road types and maximum speeds, the other two extra information types, are not sufficiently available in the OSM data. The two types have a high potential advantage and could be used in the future. For now, excluding data will mainly result in a faster model.