KPO pilot plugin - User Guide

Introduction

The Knooppuntenontwikkeling data system project aims to provide a demonstrator for a database and a user interface that explore the possibilities and consequences of implementing Transit Oriented Development (TOD) policies taking the province of Noord Holland as an example. The project revolves around three leading questions formulated by the project partners: Vereniging Deltametropool, the Provincie Noord Holland, the Ministerie van Infrastructuur en Milieu, and the College van Rijksadviseurs.
The data and analysis in this pilot project serve demonstration purposes of the potential use and benefits of such an integrated planning support framework. The data and maps should not be considered final or accurate, and should not be used for production of plans or decision making.

Installation

The 'KPO pilot' plugin is an extension for QGIS, an open source GIS package available from: http://qgis.org/en/site/
The recommended version of QGIS for installation is 2.14 LTR (Long Term Release).

The 'KPO pilot' plugin is not available from the official QGIS plugins repository and must be downloaded from this page:
https://github.com/jorgegil/kpo-pilot/releases
After downloading it, you must install the plugin in the QGIS plugins folder, located under your user profile in: .qgis2/python/plugins. Simply unzip the KPOpilot.zip file and move the folder into this folder. Then (re)start QGIS and load the plugin 'KPO pilot' from the 'Plugins Manager' window.

Starting the plugin

The plugin is self-contained and does not require any additional download or configuration. To start the plugin simply click the toolbar button or 'KPO datasysteem pilot' entry in the 'Plugins' menu.

When the plugin starts, it automatically loads the data system and the user interface provided to interact and explore the data (figure 1).
On the left hand side of the QGIS window is the 'Layers panel' that shows the currently active legend of the map, displayed in the centre of the window. On the right hand side of the QGIS window is the 'KPO pilot' panel to explore the data system. This will be the user's main

area of interaction with the tool and you do not need to learn additional QGIS features to fully test the plugin.
If required, the user can also expand and switch on and off any of the layers available using the ‘Layers panel’. However, subsequent interaction with the ‘KPO pilot’ panel will override those changes.

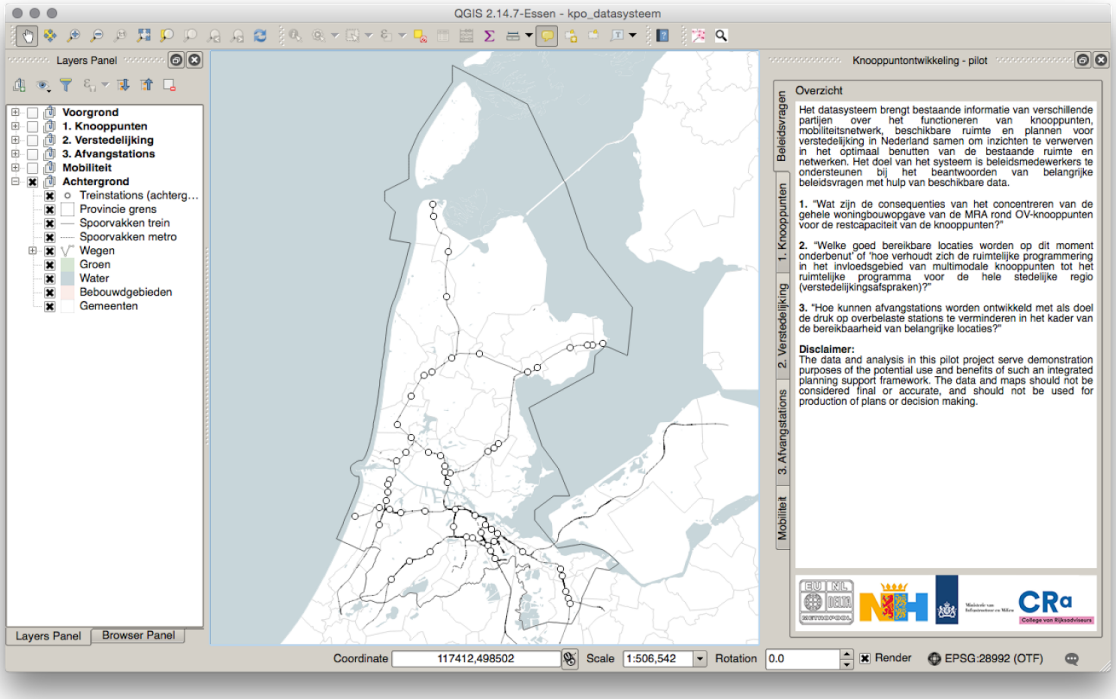

Figure 1 - QGIS main window when the tool starts, with KPO plugin panel on the right hand side.

The interaction with the map area is automatic, but you can also use the typical mouse interaction available in other maps: left click and drag to pan the view, roll the mouse wheel forward and backward to zoom in and out, respectively. Next to the plugin’s toolbar button is an additional zoom button to expand the map view back to the entire project area, the Noord Holland province borders.
The rest of the user guide explains the use of all the features available in the ‘KPO pilot’ panel. Other documents describe in detail the data sources used, the data layers included in the data system, and what calculations were carried out to produce them.

Using the KPO plugin

The first panel simply states the project objectives and the three leading questions put forward by the project partners, related to different aspects of TOD policies and planning in the province of Noord Holland. The KPO plugin is organised in a series of tabs that correspond to those questions, which the plugin allows to explore and find answers to. These are:

1. Knooppunten;
2. Verstedelijking;

3. Afvangstations.

In addition there is a Mobiliteit tab that covers general information about public transport mobility and accessibility in the region.

Clicking each tab will open a different panel and load the relevant data layers on the map for exploration. The features of each tab are described next.

1. Knooppunten tab

The ‘Knooppunten’ tab loads layers related to housing forecast scenarios in the Noord Holland province, and presents the characteristics of the train stations, present and future, depending on the number of households that exist within walking (800m) and cycling distance (3000m) of the station. These layers are the housing scenario, the isochrones (area of influence of the station), and the station nodes (Figure 2). Each layer can be switched on or off individually in the corresponding check box.

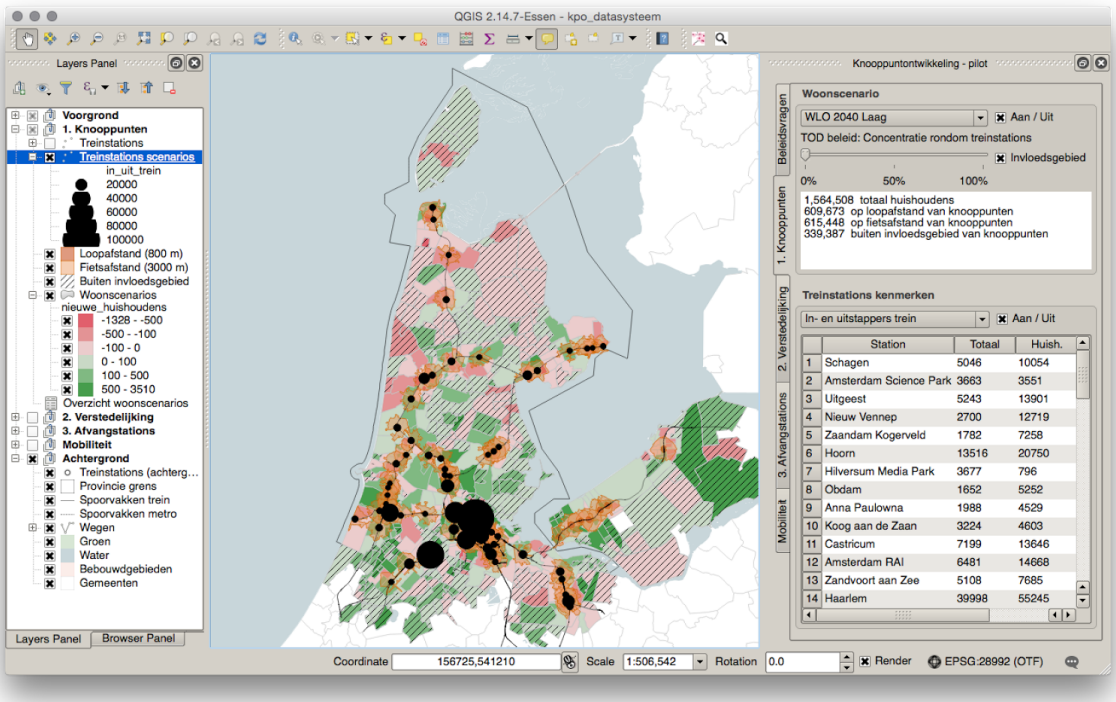

Figure 2 - Knooppunten tab and map

The top group of controls deals with the housing scenarios (Figure 3). There the user can select the present day situation or a future scenario based on a forecast model (WLO 2040 Laag, WLO 2040 Hoog). Moving the mouse over a scenario zone gives a summary of the zone’s households distribution.

For each future scenario the user can change the degree to which the TOD policy could be implemented (0%, 50% or 100%). This determines how many of the future households will

concentrate in the area of influence of the nearest station to the scenario zone. The result is updated in the summary text, giving the total number of households, as well as those within walking distance, cycling distance and outside the influence of station nodes.

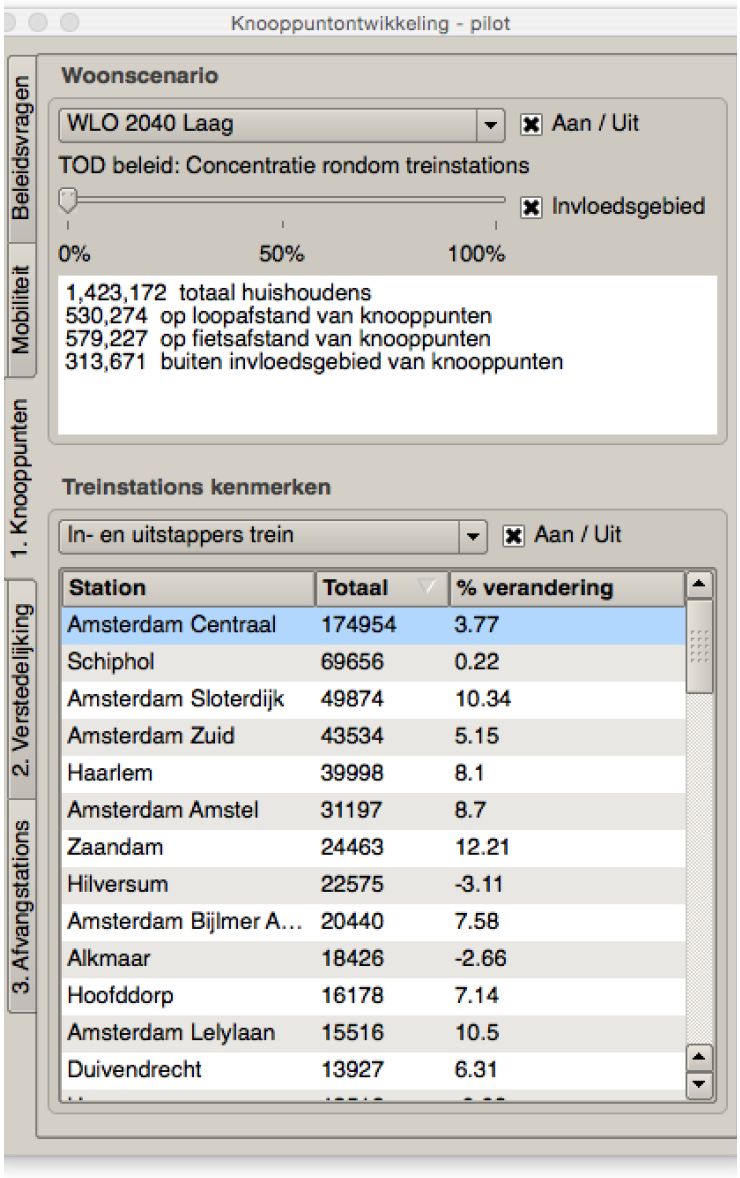

Figure 3 - Detail of the Knooppunten tab

The next group of controls deals with the characteristics of the station nodes. The number of households in the area of influence of a station has an impact on its characteristics (see document on calculations):

- passenger arrivals/departures,
- arrivals by public transport,
- use of bicycle parking spaces
- use of park and ride spaces.

The map is updated according to the user selection of station characteristic, and moving the mouse over a station node gives a summary of its characteristics. The table lists the 60 station nodes of the province, the current or future value of the selected characteristic, and the percent change in this characteristic (for example passengers number) in relation to the current situation, based on the scenario and TOD policy level. It is possible to sort the table by any of its columns to help locate specific cases. Clicking on a row zooms to the selected station node.

2. Verstedelijking tab

The 'Verstedelijking' tab loads layers related to the spatial characteristics of the locations in the region and the location and number of housing units of agreed and existing plans. Once again, the layers can be switched on and off using the checkboxes in the panel.

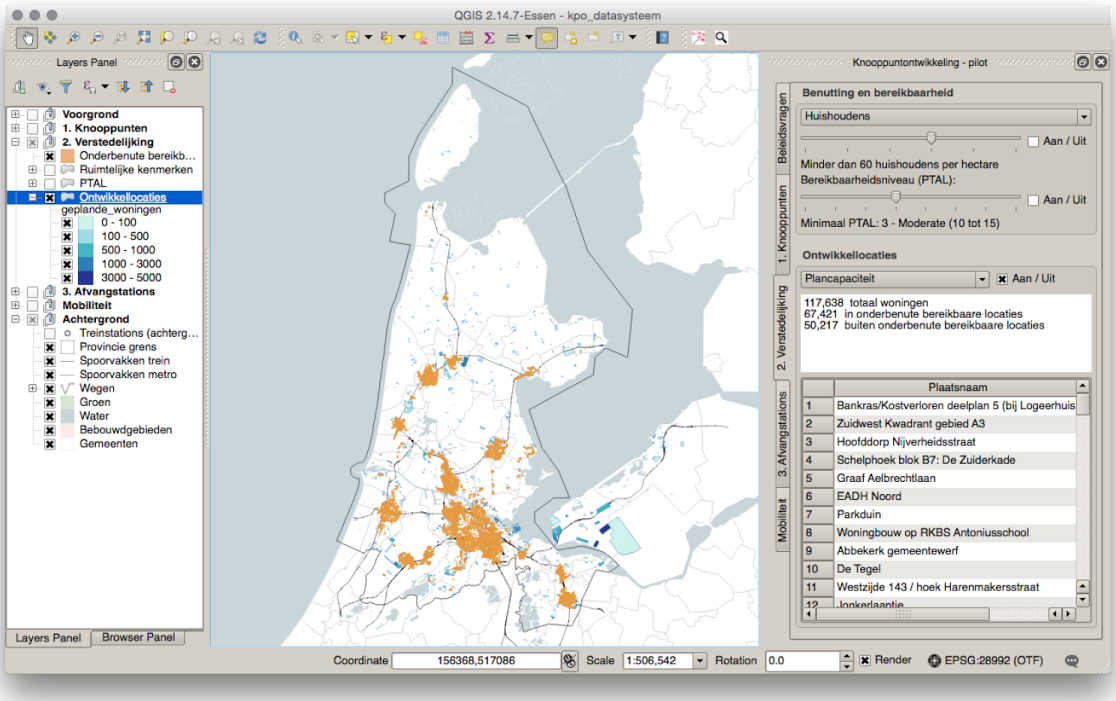

Figure 4 - Verstedelijking tab and map

The first set of controls lets the user define which locations are attractive for densification, defined in the second question as under used and accessible locations. These desirable locations are shown in the map as orange 1 hectare cells. Desirable locations are defined by the level of use as:

- Number of households per hectare
- Intensity per hectare (number of residents, workers plus students)

- Physical density per hectare (FSI)
- Residential property value (WOZ value)

Desirable locations are defined by level of accessibility based on the PTAL index, which is a public transport accessibility index developed for London and here calculated for Noord Holland using the same method.

By moving the sliders, the user sets the maximum level of use desired for new developments, and the minimum level of accessibility acceptable for new developments. As this is changed, the map shows a different set of desirable locations. At the same time it updates the summary of the housing units in the next set of controls.

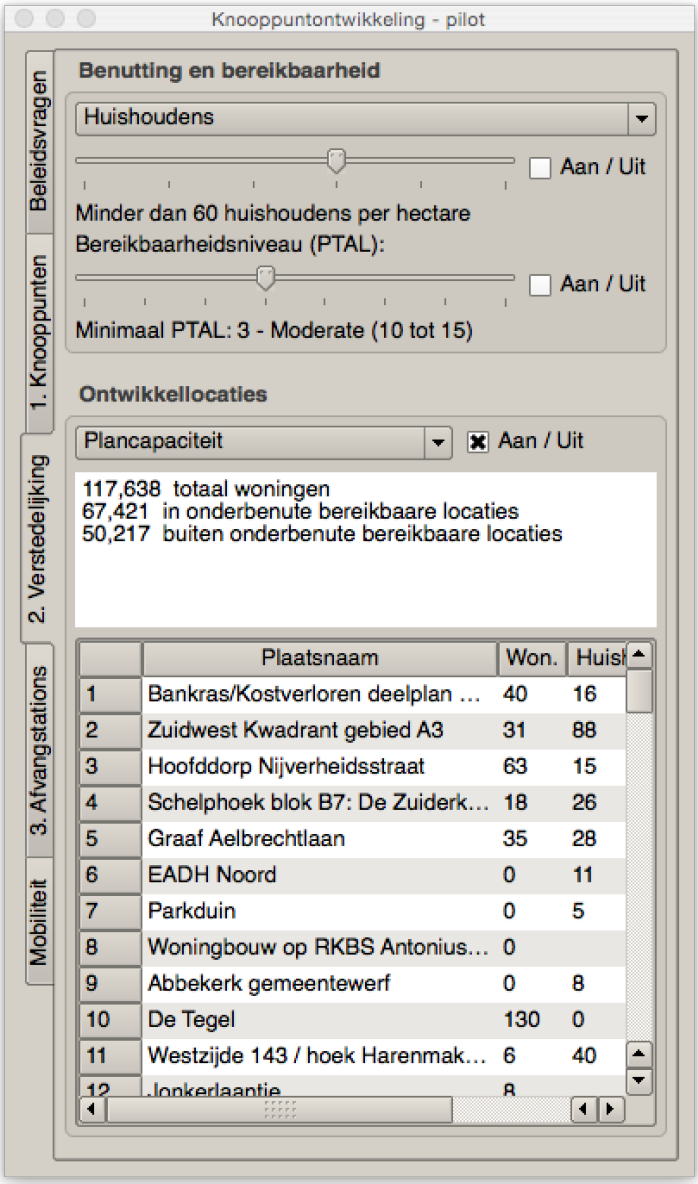

Figure 5 - Detail of the Verstedelijking tab

The second set of controls addresses the agreed or existing plans, accessible in a drop down list. These include:

- Plans for new housing (‘Plancapaciteit’)
- Vacant buildings that can potentially be used for housing (‘Kantorenleegstand’)
- Agreed number of new housing units to be built regionally by 2020 (‘Woningbouwafspraken 2020’)
- The agreed number of housing units minus the new units already built or planned in different municipalities (‘Tekort aan plannen 2020’)

Depending on the set of housing development chosen, the map is updated to display the plan locations coloured according to the number of housing units. In addition, the summary of the plan is updated, indicating the total number of units and those falling inside or outside desirable locations, as defined before.

The attribute table provides a list of the plan locations, the total number of planned housing units, and clicking on a row in this list will zoom to the relevant location. In the case of ‘Plancapaciteit’ and ‘Kantorenleegstand’ it also includes the average accessibility index of the location. In the case of ‘Tekort aan plannen 2020’ the negative numbers show municipalities where the current plans exceed the agreed number of housing units.

3. Afvangstations tab

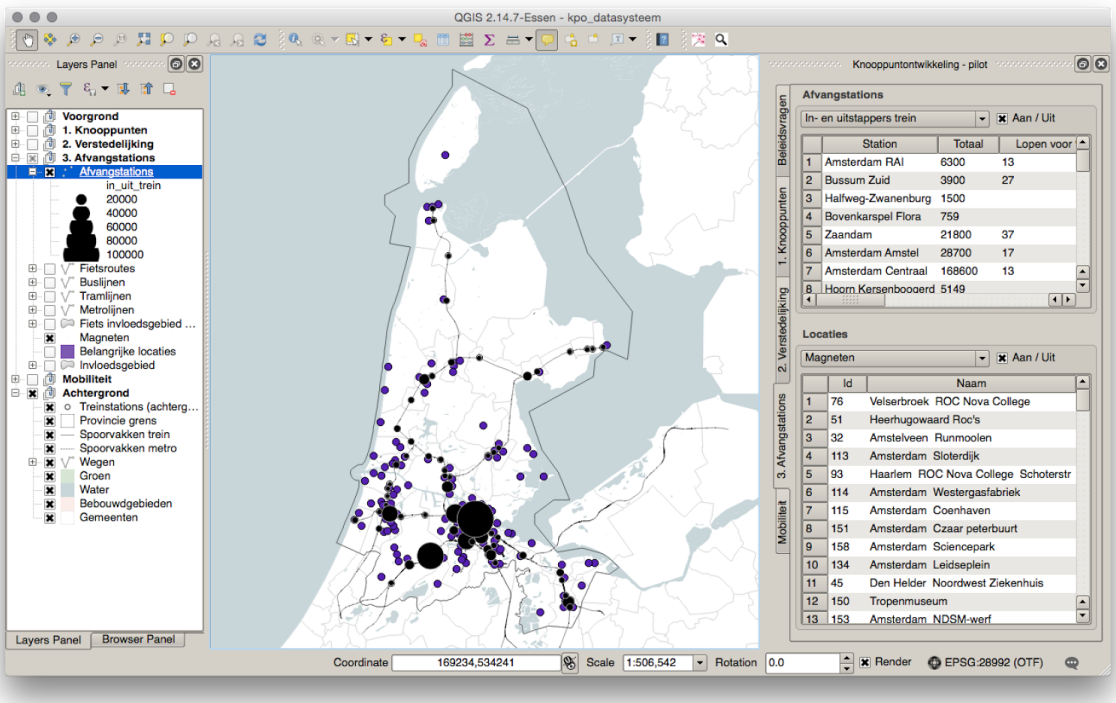

Figure 6 - Afvangstations tab and map

The Afvangstations tab loads layers related to the station areas use characteristics and capacity, the important activity centres in the region, and the possible connections by bicycle and public transport between the two. The aim is to observe the connections to stations, and explore the possibilities of shifting the use to stations that have greater capacity by reinforcing or creating different connections.

The first group of controls allows the user to explore the characteristics of station areas, covering the same characteristics covered in tab '1. Knooppunten' with the addition of 'Passanten' and 'Overstappers', plus shows the transport modes used to access the station.

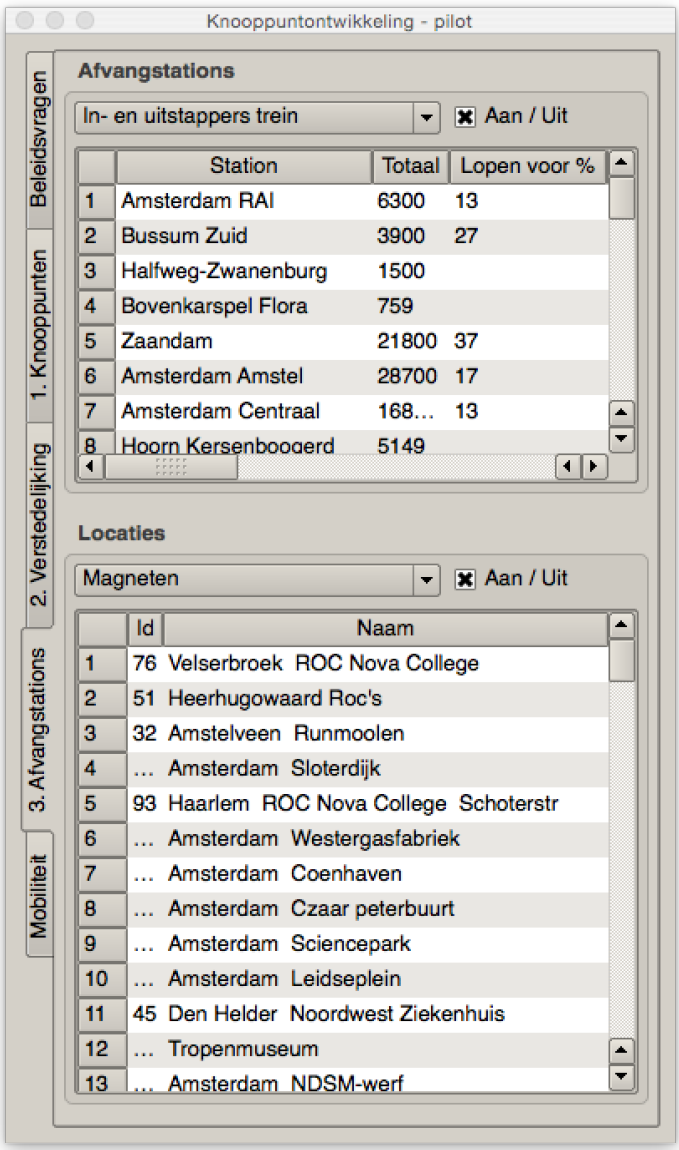

Figure 7 - Detail of the Afvangstations tab

The second group of controls gives access to different sets of relevant locations of activity, and displays how they are connected to the surrounding stations. The relevant locations are:

- Regional attractors (‘Magneten’)
- Important areas of the Metropolitan region (‘Belangrijke locaties’)
- Station influence overlap locations

The station influence overlap locations are zones where the bicycle isochrone of multiple stations overlap, offering the possibility of choosing between different stations. The map includes existing bicycle routes crossing the area, showing their intensity (frequency). When the user selects any of the attractor locations, the map displays the different public transport lines stopping in the area, showing their frequency and mode. If a train station is currently selected, the routes are only those connecting to the station.

Clicking on a row of the summary table centres the map on the location and highlights it in yellow.

Mobiliteit tab

The ‘Mobiliteit’ tab loads different layers related to the mobility and accessibility data available in the system, namely isochrones from the train station, the public transport accessibility maps, and the public transport frequency at every stop or station in the region.

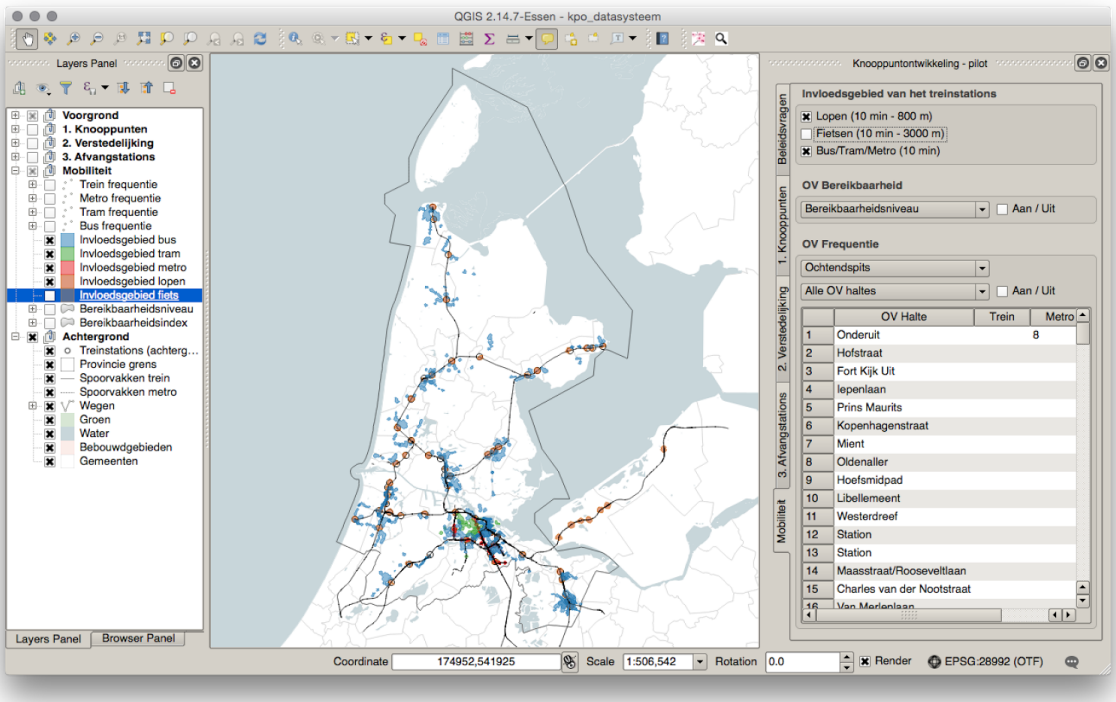

Figure 8 - Mobiliteit tab and map

The first group of controls switch on and off the walk, bicycle and public transport isochrones, with origins in each train station. The public transport isochrones are coloured by transport mode (Bus, Tram and Metro). Individual modes can be switched on/off in the 'Layers' panel.

The second group of controls show the public transport accessibility maps. The user can select either the predefined classification into levels based on the original PTAL implementation in London (from 1a for low access to 6b for high access), or the accessibility index as a continuous scale of values. This allows the visualisation of subtle differences between locations, and differences in the most accessible areas with values above the 6b level.

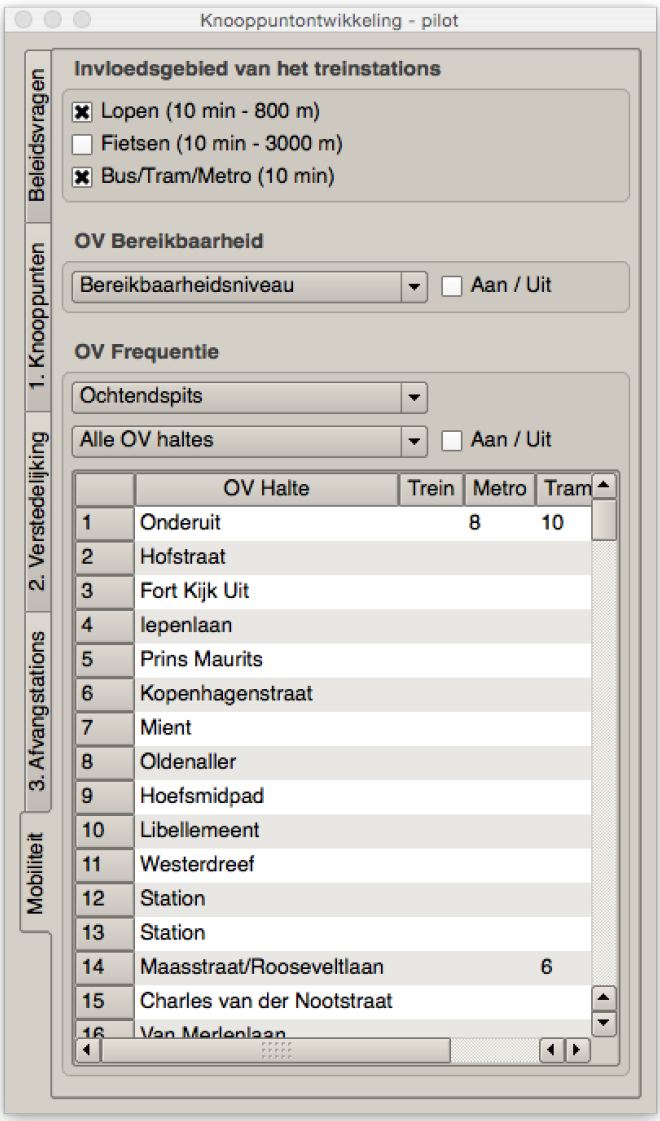

Figure 9 - Detail of the 'Mobiliteit' tab

The last group of controls displays the public transport stops and their frequencies. The user can select what time of day to see, with option for:

- Morning peak
- Day off peak
- Evening peak

In addition, the user can select to see different sets of public transport stations and stops, namely:

- All public transport access nodes
- Train stations
- Metro stations
- Tram stops
- Bus stops

Depending on the selection, the attributes table will show the list of relevant access points, and the frequency values for the selected time of day. The map is updated accordingly, and selecting a row in the table highlights the access point and centres it on the map.

In the case of ‘All stops’, the table includes the frequency of all modes for every stop. It is possible that some stops are shared by different modes, and for trains stations it shows the frequency of all the public transport modes in the station area.

In the case of selecting ‘Train stations’, the table breaks down the frequency by type of train service, namely high speed, intercity and sprinter. The frequencies displayed are on all directions.

Introduction tab

The introduction tab includes a summary of the project and the three leading questions that are at the basis of the data system pilot. At any point the user can switch back to this introduction to review what is the question behind a specific tab. Returning to the tab retains its current settings and does not change the map display. Switching to a different tab (different question) resets the tab and map to their default configuration for the specific question.