Data Model

This document describes the data model of the Knooppuntenontwikkeling datasysteem project. Here you find a simplified list of data tables and attributes, representing the layers distributed with the KPO plugin. These are final analysis and synthesis layers, it does not cover data source layers or any intermediary pre- and post-processing layers used in the production of the final system.

● Housing scenarios

Layer with the number of households in the WLO regions, current or predicted by different demand scenarios (WLO 2040 Laag, WLO 2040 Hoog). It contains an attribute with the number of households for each scenario, and the % change to the current situation. It also indicates if the region is within the walking or cycling distance of a station area, and has associated the nearest station name.
***Attributes**: postcode, place name, scenario name, within walking distance, within cycling distance, nearest station, households, area, density, new households, percent change.*

● Housing scenario summary

Summary of the housing scenarios, presenting the number of households in relation to station areas' influence (walking and cycling), calculated for different levels of TOD policy implementation (0%, 50% and 100%).
***Attributes**: scenario name, policy level, new households, within walking distance, within cycling distance, outside influence.*

● Transit nodes

Layer with the 60 train station areas of the Province Noord Holland, and their current characteristics, namely households (obtained from the current scenario), total users (passanten), in- en uitstappers (train and bus, tram and metro (BTM), overstappers, unguarded bike parking spaces, ov fietsen, park and ride (P+R) spaces, and transport mode share to and from the station, namely for BTM, walking, cycling and P+R. It also includes the id of the various public transport routes that serve the train station.

***Attributes**: station name, scenario name, policy level, households, totaal passanten, in-uit stappers trein, overstappers, in-uit stappers btm, BTM voortransport, BTM natransport, lopen voortransport, lopen natransport, fiets voortransport, fiets natransport, P+R voortransport, P+R natransport, bike parking places, bike parking occupation, OV fietsen, P+R places, P+R occupation, public transport routes.*

● Transit nodes scenarios

Layer with the 60 train station areas of the Province Noord Holland, and their characteristics (see Transit nodes) reflecting the impact of increased housing within their area of influence on their usage, based on the current station usage by local residents (defined as the percent of walking and cycling as 'voortransport'). The numbers are pre-calculated for the different TOD policy implementation levels.

***Attributes**: station name, scenario name, policy level, households, % households change, % local residents usage, % usage change, in and uit stappers trein, in and uit stappers btm, bikes places, bike parking occupation, P+R places, P+R occupation.*

● Spatial characteristics

Layer based on the 100 m grid cells from CBS containing information about social, economic and accessibility characteristics that inform the urbanisation potential of a location. These include the number of households, the intensity (adding number of residents, workers and students), the built density (calculated as floor space index FSI), and the average residential property value (WOZ waarde). It also includes the public transport accessibility of the location, based on the PTAL analysis of London (https://tfl.gov.uk/cdn/static/cms/documents/connectivity-assessment-guide.pdf). This is measured in terms of diversity and frequency of all public transport services, giving a greater weight to rail than to other public transport modes. The accessibility index is a numeric value, while the levels are categories with predefined index values, based on the original PTAL implementation in London (1a for lowest, to 6b for highest accessibility).

Attributes: *cell id, households, intensity, built density, residential property value, public transport accessibility level (PTAL), public transport accessibility index (PTAI).*

- Development plans

Layers that contain existing areas planned for development and intensification, i.e. Plancapaciteit of the Province Noord Holland, empty commercial properties, and regional agreements for development of housing. These areas include the proposed number of dwellings, their area and density. Specific sites also include the mean spatial characteristics of the site (households, intensity, physical density and residential property value), and the mean public transport accessibility value.

Attributes*: plan name, site id, municipality, site name, address, built dwellings, planned dwellings, net dwellings, area, density, mean households, mean intensity, mean FSI, mean residential property value, mean PTAI.*

- Magneten

These are services in the province, associated with public transport routes and the connections that they have with station nodes.

Attributes*: location id, location quality, location name, within walking distance, within cycling distance, within public transport distance, station names, public transport routes.*

- Important locations

These are major attractors in the metropolitan area, such as those related to international travel, business, large leisure centres or research and innovation. The importance that they have is balanced against their public transport accessibility and the connections that they have with station nodes.

Attributes*: location id, location type, location name, within walking distance, station names, public transport routes.*

- Station influence overlap

Layer representing locations within the area of influence (bicycle) of more than one station. This overlap reveals a potential for shifting usage between stations, where they are of similar importance and one is under greater pressure. It also indicates which cycle and public transport routes cross the locations connecting to surrounding stations.

Attributes*: area id, households, intensity, station names, number of stations, public transport routes.*

- Cycle Routes

Individual bicycle links/lanes that are on routes that connect station nodes to influence overlap locations. Each route also has a certain frequency (total number of cyclists over the period of data collection). They are associated with an origin/destination station and with station influence overlaps.
***Attributes**: route id, route name, route intensity, station name, station influence overlap ids.*

- Public Transport Routes

Individual public transport routes of different modes (bus, metro, tram, ferry) that can connect station nodes to important locations in the city. Each route also has a certain frequency (average services per hour during evening peak).
***Attributes**: route id, route name, route mode, route frequency.*

- Isochrones

Distance/time isochrones traveling from the train station nodes by other modes of transport (walk, cycle and public transport) along the street network. The isochrones determine the area of influence of station nodes and are used in other analyses.
***Attributes**: isochrone id, stop id, stop name, stop mode, travel mode, isochrone distance.*

- Public Transport Stops

Layer of public transport stops of different modes, with an indication of average number of services per hour by mode at different times of day. In the case of rail, it also indicates the type of service (i.e. high speed, intercity or sprinter).
***Attributes**: stop id, stop name, stop municipality, transport mode, frequency morning peak, frequency lunch, frequency evening peak, types of rail service.*