European data space
for smart communities

Deliverable 3.6

Ethical Assessment report on models

WP 3 – Model Usage phase

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Abbreviations

Abbreviation	Definition	Abbreviation	Definition
DS4SSCC	European data space for smart communities (DS4SSCC)	DT-aCoGo	Digital Twinning as Common Good
OASC	Open & Agile Smart Cities & Communities	OUP	Open Urban Platform
WP	Work Package	PC	Pilot Coordinator
BIM	Building Information Modeling	WFS	Web Feature Service
OGC	Open Geospatial Consortium	ETL	Extract, Transform, Load
LOD	Level of Detail	UMG	Unreal Motion Graphics
PPB	Purple Polar Bear (company)	FI	Future Insight (Company)

Table of Contents

Executive Summary 4
1 Introduction 5
2 Ethical Assessment of Rana calculation model (Flooding) 6
2.1 General introduction 6
2.2 What is the model based on? 6
2.3 Is the model understandable? 6
2.4 How prone to errors is the model? 7
2.5 What assumptions are included in the model? 7
2.6 What data is used / what is the key input? 8
2.7 Experience 8
3 Ethical Assessment of Tygron calculation model (Heat stress) 9
3.1 General introduction 9
3.2 What is the model based on? 9
3.3 Is the model understandable? 10
3.4 How prone to errors is the model? 10
3.5 What assumptions are included in the model? 10
3.6 What data is used / what is the key input? 10
3.7 Experience 11
4 Ethical Assessment of Dat.mobility calculation model (traffic congestion) 12
4.1 General introduction 12
4.2 What is the model based on? 12
4.3 Is the model understandable? 13
4.4 How prone to errors is the model? 13
4.5 What assumptions are included in the model? 13
4.6 What data is used / what is the key input? 13
4.7 Experience 13
Appendix 1 Tygron Heat Stress module background 15
Appendix 2 Sources of Tygron Heat Stress model 16
About the European Data Space for Smart Communities 18

Executive Summary

This deliverable presents an ethical and functional assessment of the three calculation models utilized within the DTaCoGo project. As municipal and regional authorities increasingly rely on digital twins and predictive simulations to guide policy, infrastructure investment, and climate adaptation strategies, verifying the integrity of these underlying systems is paramount. The primary objective of this document is to evaluate whether the calculations performed by the respective model providers are strictly fit for purpose, thereby validating the reliability, transparency, and trustworthiness of their outputs.

To establish this foundation, the DTaCoGo project evaluates environmental and urban stressors across three distinct temporal horizons: the current baseline, 2030 (reflecting mid-term progress and partial plan completion), and 2040 (representing full project implementation). By ensuring complete interoperability with established, industry-standard models, the project guarantees that its long-term trajectories are rooted in proven methodologies.

In the DT-aCoGo project three excising simulation models are deployed, from three very experienced suppliers (founded respectively in 1998, 2019 and 2014). Within the project their aren't new models created only adjustments are made in order to make the models interoperable and the ecosystem scalable.

These models are scientifically routed, build upon physics and mathematics. They have proven their value in large amounts of projects, but they are all vulnerable to errors, from four aspects:

- Data quality, like input data errors (Garbage in = garbage out)
- Model Structure Constraints (Simplification vs. Reality) A model can never perfectly capture every physical process
- Parameter Uncertainty (The "Equifinality" Problem) models contain numerous parameters that cannot be directly measured
- Human and Software Update Glitches Even verified frameworks are susceptible to technical updates

By ensuring interoperability with these established and proven models, the resulting calculations are inherently reliable.

1 Introduction

In the DTaCoGo project three primary calculation models were employed. Focus was on respectively the impact of heavy rainfall (flooding), Heat stress and on traffic congestion.

All models have been used by the three participating cities (Tampere, Rotterdam and Den Bosch) and all have been used to do calculations on specific physical areas within these cities. These areas are planned to be developed (urban planning) during coming years and it is of upmost interest to see what the impact of flooding, heat stress and traffic would be on future situations. If results of those model calculations would show (big) issues, Urban plans can now be changed easily, preventing costly and time consuming rework in future after construction is already finished.

The participating cities conducted calculations across three specific time horizons: current situation, situation in 2030 and the situation in 2040. Modelling these three distinct intervals captures both the mid-term progress in 2030, as initial initiatives are completed, and the final projected outcomes upon full project realization in 2040.

This Deliverable presents an ethical assessment of the three models, to see / show whether the calculations that have been done by these model providers are fit for purpose and therefor the results of these calculations can be trusted.

> *Note that the starting point is that cities share reliable and fit for purpose datasets with the model providers as input (garbage in = garbage out).*

2 Ethical Assessment of Rana calculation model (Flooding)

2.1 General introduction

Rana is a platform for data driven water analysis. One of its core capabilities is the ability to execute hydrodynamic simulations. These simulations provide a clear and accurate view of how water behaves and flows. This includes rivers, rainwater runoff, and flood events.

The software models water movement using physical laws such as fluid dynamics and gravity. By applying these principles to a specific area, it can calculate how water will move under different conditions. This helps users better understand risks and make informed decisions.

These calculations are comprehensive: they take multiple factors into account simultaneously – such as rainfall, soil type, elevation differences, wind, and even the operation of pumping stations and sluices. This creates a complete picture of the water system.

The major advantage? We can explore scenarios before they occur in reality. Think of simulating a severe storm to see where water accumulates, or how interventions in the landscape can better manage water.

2.2 What is the model based on?

This approach is based on physics and mathematics, not artificial intelligence. This means that creating a simulation sometimes requires more work than with a trained AI model. The major advantage is that you do not need large amounts of data to still achieve an accurate result. Moreover, the outcomes are easier to understand and verify. This algorithm is particularly suitable for calculating water systems on land and in the city. It is less suitable for oceans, deep groundwater, or drinking water pipelines.

2.3 Is the model understandable?

A hydrological model is a mathematical and physical simulation of the water cycle. It forms the basis of water management and spatial plans.

The underpinning of hydrological models rests on the following core components:

1. Physical and Mathematical Principles. The models are based on fundamental laws of physics, such as:
    a. Law of conservation of mass (water balance: inputs must equal outputs plus change in storage).
    b. Fluid dynamics (e.g., Darcy's Law for groundwater flow and the Saint-Venant equations for open surface water).
2. Systems Analysis. A reliable model divides the landscape into realistic subsystems, distinguishing between:
    a. Fast-responding systems: Paved surfaces, sewer networks, and streams where rainfall leads directly to runoff.

   b. Slow-responding systems: Sandy soils, infiltration areas, and deep aquifers that retain water and release it gradually.
3. Integrated Datasets. Models only function accurately when fed high-quality data about the physical landscape:
   a. Meteorological data: Precipitation and potential evapotranspiration.
   b. Soil and geology: Soil type, hydraulic conductivity, and phreatic storage capacity.
   c. Topography and land use: Digital elevation models (such as the AHN in the Netherlands) and vegetation cover.

2.4 How prone to errors is the model?

While the mathematical core is analytically sound and validated against benchmarks in the UK and the Netherlands, hydrological models remain sensitive to errors and uncertainty. They simplify complex natural systems into mathematical representations, which means absolute accuracy is not achievable.

In practice, unmanaged uncertainty can significantly affect results. Depending on the application, predictions of water availability or drought risk can deviate by 15% to more than 50%. This makes systematic handling of uncertainty essential for reliable outcomes.

The vulnerability of these models to errors stems from four main pillars:

1. Input Data Errors (Garbage In, Garbage Out) Models rely entirely on external data measurements. Small discrepancies in input data can compound significantly throughout simulation runs:
   a. Precipitation Spatiality: Rain gauges measure at a single point, but rain falls unevenly over a catchment. Representing spatial rainfall variations poorly creates immediate runoff discrepancies.
   b. Historical Mismatches: Using historic datasets to simulate future climate change often fails because vegetation dynamics and evaporation change under altered temperatures—factors standard calibration profiles might miss.
2. Model Structure Constraints (Simplification vs. Reality) A model can never perfectly capture every physical process:
   a. Grid Resolution: A large-scale model (like the Dutch LHM) may use a grid size of 250 × 250 meters. While highly effective for regional trends, it lacks the resolution to capture small ditches, local seepage, or elevation differences within a town.
   b. Process Omissions: Interventions like local pumping stations operated by individual farmers, illegal extraction, or temporary water diversions are rarely completely documented in regional model configurations.
3. Parameter Uncertainty (The "Equifinality" Problem) Hydrological models contain numerous parameters that cannot be directly measured (e.g., precise sub-soil resistance or soil moisture retention characteristics).
4. Human and Software Update Glitches Even verified frameworks are susceptible to technical updates. For instance, during the release of the Dutch national model update (LHM version 4.3), unexpected output deviations occurred due to a mix of input errors and structural adjustments. This required the rapid development of a patch (LHM 4.3.3) to recalibrate and restore the model's reliability for policy-making.

2.5 What assumptions are included in the model?

The quality of the model's prediction depends heavily on how well physical reality is modeled as input for the calculation.

2.6 What data is used / what is the key input?

To build a Rana hydrodynamic model you need a few types of input that describe the real world in simple terms.

First are the static data layers.

- Digital elevation data shows the height of the ground and tells where water can flow or accumulate.
- Land use describes how the surface is covered, for example roads, grass or buildings, which affects how fast water runs off or infiltrates.
- Soil type explains how easily water can soak into the ground and how much it can store.
- Network data such as sewer systems or channels shows where water can be transported through pipes and structures.

Second are the dynamic inputs.

- Precipitation is the rainfall over time that drives the system.
- The initial state defines the starting conditions, such as how much water is already in pipes or how wet the soil is.
- Finally, controlled structures like pumps, weirs or valves define how water can be actively managed during the simulation.

Together these inputs allow the model to simulate how water moves through an area in a way that is understandable and realistic.

2.7 Experience

The creation of the Rana Calculation model starts back in 1998 when the company ‘Nelen en Schuurmans’ was founded. In 2003 they started ‘hydroinformatics’ as a solution to execute simulations and develop calculation software.

Nelen & Schuurmans is now a leading consultancy and IT firm specializing in water management and the physical environment. They are primarily known in the sector for their innovative software solutions for climate adaptation and water safety. It has around 65 employees.

3 Ethical Assessment of Tygron calculation model (Heat stress)

3.1 General introduction

The Tygron DPRA Heat Stress Module for the Heat Stress Overlay can be used for heat stress calculations, based on geographical features and locale parameters.

The final result is the physiological equivalent temperature, which is a measure of temperature which takes into account factors which can change the experience and effects of temperature. The module performs these calculations in accordance with the DPRA Heat stress report.

The calculation of the Heat Stress Overlays takes into account:

- Meteorological circumstances such as:
- Sun angles, altitude and azimuth, dependent on date and time of day and project location.
- Air temperatures, (hourly, daily minimum and maximum);
- Global radiation, (hourly and average);
- Relative humidity (hourly);
- Wind speeds (hourly and daily average).
- Wind direction (hourly)
- Spatial situation, such as:
- Land use, for fraction vegetation and rate of evaporation (Bowen ratio).
- Terrain, foliage and building heights

3.2 What is the model based on?

The Tygron DPRA Heat Stress Module is based on the DPRA (The Delta Plan on Spatial Adaptation). This is a collective plan at various levels of dutch government, intended to expedite and guide work meant to alleviate heat stress, drought, waterlogging, and urban flooding. As part of its overall work, a standard was established for heat stress tests.

The DPRA guideline was published[1] in 2019, by the dutch National Institute for Public Health and the Environment (RIVM).

The calculation prescription of the DPRA report is implemented as followed:

At the start of the calculation, the following data is pre-calculated for each cell:

- The foliage height calculation model is used to calculate the foliage height (if applicable).
- The sky view calculation model is used to calculate the sky view factor.
- The average calculation model is used to calculate the averaged vegetation fraction and the averaged sky view factor.
- The urban heat island formula is applied to calculate the urban heat island effect value.

Then, for each timeframe, the following data is calculated per cell:

- The temperature formulas are applied to calculate the atmospheric temperature, and the Wet-bulb temperature.
- The shade calculation model is used to determine whether the cell is shaded.
- The wind calculation model is used to determine the wind speed (using weather station data).

- The diffuse radiation formula is applied to calculate the diffuse radiation.
- The physiological equivalent temperature formulas are applied to calculate the final physiological equivalent temperature (PET).

In Appendix 1 the links are added to the details of all pre-calculations and all timeframe calculations.

3.3 Is the model understandable?

A 3D digital twin is being constructed. Based on established formulas, calculations are made regarding an area's ability to retain and radiate heat, the effects of weather conditions and shading, and how hot places feel as a result (feels like temperature). Shade and wind have the most significant effect across varying parameters.

3.4 How prone to errors is the model?

The better the data, the better the results. Tree data/canopy data is important for shading effects, which in turn is of great importance for the perceived temperature. It is also important to have a sufficiently large area calculated so that wind and surrounding vegetation are properly taken into account.

An important addition is that small calculated effects may be mathematically correct but are not necessarily noticeable in practice. (For example, 1 tree casts shade but slows down the wind slightly in the surrounding area. This results in spots with a mathematically 0.1 degree higher perceived temperature, which may appear to be a deterioration but is not necessarily significant in reality.)

3.5 What assumptions are included in the model?

For this, we refer to the original report for the substantiation of the calculation methodology and the parameters and values included (3.2). An important implicit point, however, is that this concerns a calculation methodology for an urban environment. This methodology is not, or less, applicable in rural areas.

3.6 What data is used / what is the key input?

Building heights, public space design (greenery, water, paving), canopy, (KNMI) weather data

All spatial data is retrieved from public data sources. For Dutch projects, this data is generally "good", but not necessarily error-free. KNMI weather data is derived from historical KNMI datasets and can be set to current, historical, or hypothetical/composite weather conditions, at the discretion of the expert performing the calculations.

A list of sources is added in appendix 2.

3.7 Experience

The Tygron Heat Stress Module (part of the Tygron Platform) is used by spatial planning professionals to perform hyper-detailed calculations of the living environment for heat and shade. It is in use since 2019 and the main users are:

- Municipalities and urban planners: They use the module, based on the DPRA Heat Stress Module, to map local perceived temperatures, shading effects, and the distance to cool spots (such as cities of Amsterdam, Deventer, Nieuwegein and Terneuzen).
- Water boards and regional water authorities: These authorities use the software in combination with flood analyses to design climate-resilient neighborhoods.
- Climate and environmental experts: Engineering firms (such as Arcadis, Sweco, or Witteveen+Bos) use the Climate Resiliency tools to simulate the effects of new construction or greening on heat stress.
- Researchers: Scientific institutions and data analysts, such as those involved with the RIVM, use the software to calculate reliable heat maps and apply AI for tree canopy recognition. It is also used in EU project GENeCity by cities of Athens and Amsterdam.

4 Ethical Assessment of Dat.mobility calculation model (traffic congestion)

4.1 General introduction

Dat.mobility was founded in 2014 by Goudappel, the leading mobility consultancy in the Netherlands. Goudappel considers it important to be able to base its advice on high-quality mobility data. That is why Dat.mobility transforms data into information that leads to insight and knowledge. We do this by processing, enriching, linking, visualizing, and making data accessible, using state-of-the-art algorithms and applications, and an innovative attitude to follow the latest developments, or even create them ourselves.

Goudappel was founded in 1963 and focusses on Integrated mobility solutions. Henk Goudappel started as a traffic engineer, and together we grew into the mobility consultancy we are today with over 300 employees.

Through the collaboration with Goudappel-adviseurs, Dat.mobility software developers can optimally align products and services with client needs. Dat.mobility data analysts know exactly where the data gaps exist, where it needs to be enriched, and which tooling is best suited for this. In this way, within the Goudappel Group, we work from two organizations on the triptych of advice, data, and modeling & software, helping our clients make the best possible decisions in the field of mobility.

4.2 What is the model based on?

The dat.mobility traffic model is based on The Mobility Spectrum. This is the first and only mobility data source consisting of spatial data and mobility patterns for the entire Netherlands.

This data source provides insight into all aspects of mobility; from traffic destinations from a specific area, to accessibility by mode of transport from a particular neighborhood, and traffic intensities on every road segment in the Netherlands, for cars, bicycles, and public transport.

The Mobility Spectrum was developed in-house by Dat.mobility and Goudappel. The Spectrum is recalculated annually using a large set of traffic engineering algorithms. Various types of local models are in circulation. All are so-called four-step models, which are based on a solid scientific foundation. Such models are used for formal planning procedures. Authorities base which infrastructure is constructed where on these models.

For the calculation of scenarios before, during, and after projects within a municipality, Dat.mobility uses their ‘what-if analysis tooling’. These are not full-fledged four-step models, but the methods employed for this purpose also rest on traffic engineering principles and internationally accepted guidelines. What they directly deploy as a ‘calculation module’ within DT-aCoGo is adjusting traffic based on time, temperature, weather conditions, and travel motive. To convert the number of vehicles per 24 hours to vehicles per hour, given the conditions, Dat.mobility uses the NVP (Dutch Mobility Panel). This is a panel specifically set up for research, and privacy is guaranteed.

4.3 Is the model understandable?

A four-step model consists of these modelling steps:
1. Determining traffic production and attraction,
2. Calculating distribution (who goes where),
3. Modal split (transport mode choice),
4. Allocation of traffic on the road network.

The outcomes of the traffic model include the number of vehicles on a road segment, counted over, for example, a full 24-hour period or during peak hours. We use derived indices from the NVP (traffic under conditions) to adjust the 24-hour figure to the figure per hour under conditions. Holidays are for example also taken into account.

4.4 How prone to errors is the model?

Dat.mobility has determined the indices based on many years of data (millions of records); it is therefore a good reflection of our mobility behavior. Additionally, we rely on the results of the traffic model. A model is a simplification of reality, but the results of local models are compared against counts to calibrate the model.

4.5 What assumptions are included in the model?

Mainly that we continue to travel as we have done in the past

4.6 What data is used / what is the key input?

- Traffic networks (from the municipality or from our national model, Spectrum),
- Socio-economic data (SEG, in the Netherlands mainly available via CBS, CBS publishes new figures annually),
- NVP (Nationaal Verkeersbeeld / Verkeersplatform) They continuously collects new information.
- Any excerpts from the Spectrum: this is recalculated annually based on the latest published data (including CBS, NDW, CROW).

4.7 Experience

Dat.mobility was founded in 2014 by Goudappel, the leading mobility consultancy in the Netherlands.

Goudappel not only collaborates with fellow organizations and strategic partners but is also active in various networks. For instance, we participate in the City Deals Ruimte voor Lopen and Over AI, and are members of Connekt, Rai Automotive Industry NL, AET, Railforum, Dutch Cycling Embassy, Geobuzz, and DNWS.

Additionally, Goudappel employees are active in professional organizations and knowledge networks such as CVS, Nationaal Verkeerskunde Congres, Vexpan, Fietsersbond, and NM Magazine. In this way, we promote the exchange of knowledge and contribute to the development of our field.

Goudappel possesses a complete overview of available data sources that can be used to determine indicators. In addition, they develop our own data sources and tooling with which they generate unique (mobility) data ourselves, such as the Mobility Spectrum and the Dutch Travel Panel.

Within Goudappel, 50 specialists work on optimal traffic flow on our road networks. We achieve this by generating reliable traffic forecasts and by guiding traffic into optimal lanes using traffic management and well-designed traffic signal systems. Our goal is to deploy existing and future networks as sustainably, efficiently, and safely as possible.

Goudappel has in-house experts who can build a custom mobility dashboard based on selected data sources, in real-time and web-based. Some examples include the mobility dashboard of the Province of North Brabant, the A27 monitor, and MVVS Groningen.

Appendix 1 Tygron Heat Stress module background

The calculation prescription of the DPRA report is implemented as followed:

At the start of the calculation, the following data is pre-calculated for each cell:

1. The foliage height calculation model is used to calculate the foliage height (if applicable).
2. The sky view calculation model is used to calculate the sky view factor.
3. The average calculation model is used to calculate the averaged vegetation fraction and the averaged sky view factor.
4. The urban heat island formula is applied to calculate the urban heat island effect value.

Then, for each timeframe, the following data is calculated per cell:

1. The temperature formulas are applied to calculate the atmospheric temperature, and the Wet-bulb temperature.
2. The shade calculation model is used to determine whether the cell is shaded.
3. The wind calculation model is used to determine the wind speed (using weather station data).
4. The diffuse radiation formula is applied to calculate the diffuse radiation.
5. The physiological equivalent temperature formulas are applied to calculate the final physiological equivalent temperature (PET).

Appendix 2 Sources of Tygron Heat Stress model

Default sources

The table below contains the datasets that are automatically accessed, depending on the selected location, to create a new project. When selecting a location outside The Netherlands it is more likely that some Geo Data should be provided manually, which can done using a Template Project with one or more Geo Plugins.

(Open) Dataset	Description	Coverage	(Connection) Source	More information
BGT	Basisregistratie Grootschalige Topografie: Base Register containining the topography of the Netherlands. The dataset is very detailed and contains for instance roads, parks, trees, water surfaces and street objects.	Netherlands	PDOK	https://www.kadaster.nl/bgt; https://www.pdok.nl/introductie/-/article/basisregistratie-grootschalige-topografie-bgt-
BAG	Basisregistraties Adressen en Gebouwen: Base Register containing data about buildings and addresses such as function, construction year, size and the geometry of the buildings.	Netherlands.	PDOK	https://www.kadaster.nl/basisregistratie-adressen-en-gebouwen
BRO	Basisregistratie Ondergrond: Base Register containing detailed subsurface data.	Netherlands	PDOK	https://www.basisregistratieondergrond.nl/
World Imagery	Satellite map used as base map for the height map in the 3D Visualization and used to identify rooftop colors.	Worldwide	ESRI	https://services.arcgisonline.com/ArcGIS/rest/services/World_Imagery/MapServer/0
Ocean Basemap	Basemap with ocean data, including locations of water bodies and their names. Used to determine the location of water bodies worldwide.	Worldwide	ESRI	https://www.arcgis.com/home/item.html?id=67ab7f7c535c4687b6518e6d2343e8a2
Terrain	Digital Terrain Model: the terrain height without example buildings, trees and other objects. Its accuracy depends on the coverage by individual sources.	Worldwide	ESRI	http://www.arcgis.com/home/item.html?id=58a541efc59545e6b7137f961d7de883
AHN	Actueel Hoogtebestand Nederland. By default AHN4 is used. We use the Digital Surface Model (DSM, the terrain height including buildings, trees and other objects) and the Digital Terrain Model (DTM, the terrain height of the bare ground) combined with the Terrain data above. For more information, see elevation model.	Netherlands	Nationaal Georegister	https://www.ahn.nl/
CBS Wijk- en Buurtkaart	The CBS Wijk- en Buurtkaart (2017) contains the geometry of the division in neighborhoods and statistical data related to those neighborhoods.	Netherlands	PDOK	https://www.pdok.nl/introductie/-/article/cbs-wijken-en-buurten
Top10NL	Topographical dataset, used as an addition to the BGT data.	Netherlands	Tygron / PDOK	https://www.kadaster.nl/-/top10nl
NWB	The Nationaal Wegen Bestand is a dataset with the (name of) public roads in the Netherlands.	Netherlands	PDOK	https://www.pdok.nl/introductie/-/article/nationaal-wegen-bestand-nwb-wegen

NSL	The NSL (Nationaal Samenwerkingsprogramma Luchtkwaliteit) contains data delivered by municipalities from their traffic models. For instance data such as road type, the tree factor, number of lanes, direction of traffic and traffic speed.	Netherlands	Rijksoverheid	https://www.cimlk.nl/documentatie/ See also: Traffic Plugin
INWEVA	The INWEVA 2020 data contains traffic intensity data for highways.	Netherlands	Rijkswaterstaat	https://data.overheid.nl/dataset/31225-intensiteit-wegvakken--inweva--2020 See also: Traffic Plugin
Infomil	The infomil excel contains a calculation model to estimate traffic intensities for roads, based on the type of road, nearby parking and bicycle paths and urbanization degree. This excel has been converted into a lookup table in the Tygron Platform.	Netherlands	Rijkswaterstaat	https://www.infomil.nl/onderwerpen/lucht-water/luchtkwaliteit/slag/hulpmiddelen/inschatten/ See also: Traffic Plugin
Infrarood	The 2016 WMS Infrarood is a layer from the aerial photography WMS from PDOK, and is used as example in the Demo Heat Stress Project.	Netherlands	PDOK	https://www.beeldmateriaal.nl/ See also: Demo Heat Stress Project
BRP Gewaspercelen	Basisregistratie Gewaspercelen: contains the location of agricultural land and the cultivated crops.	Netherlands	Nationaal Georegister	https://www.nationaalgeoregister.nl/geonetwork/srv/dut/catalog.search#/metadata/b812a145-b4fe-4331-8dc8-d914327a87ff
BRK - Kadastrale Kaart	Basisregistratie Kadaster. In the Tygron Platform the Kadastrale kaart is used to determine the location of parcels.	Netherlands	Nationaal Georegister	https://www.nationaalgeoregister.nl/geonetwork/srv/dut/catalog.search#/metadata/a29917b9-3426-4041-a11b-69bcb2256904
Risicokaart	This dataset shows the risks in a neighborhood, for example, by showing hazardous- and / or nuisance buildings (for example LPG station) and cables and pipes. Also contains additional information on vulnerable buildings (hotels, hospital, school, etc.).	Netherlands	Risicokaart.nl	https://www.risicokaart.nl/
OSM	OpenStreetMap; this dataset contains the topography of the world and attribute information.	Worldwide	Own instance of Overpass API	https://www.openstreetmap.org/
Waterschapsdata	Several datasets from Water Authorities conforming to the Information Model Water (Informatiemodel water), including hydraulic structures and water-level areas.	Netherlands - dataset does not cover the whole of the Netherlands yet.	Copy of PDOK dataset	https://data.overheid.nl/dataset/45773-waterschappen-kunstwerken-imwa
3D Bag	A dataset of 3D models covering the Netherlands, created by the 3D Geoinformation research group, Department of Urbanism at the Delft University of Technology.	Netherlands	3D BAG	https://docs.3dbag.nl/en/
Energy label data	A dataset of most recently known energy labels per address in The Netherlands.	Netherlands	EP-online	https://www.ep-online.nl/PublicData
Timezone data	A dataset of time zones which is used to determine a project's time zone.	World		

About the European Data Space for Smart Communities

The European Data Space for Smart Communities (DS4SSCC-DEP) initiative is a pivotal deployment following the preparatory action for a Data Space for Sustainable and Smart Cities and Communities (DS4SSCC). Emphasising sustainability aspects and diversity in communities, DS4SSCC developed a multi-stakeholder data governance scheme, created a blueprint for the European DS4SSCC, delivered priority datasets, and developed a roadmap towards a mature DS4SSCC.

DS4SSCC-DEP's vision revolves around creating a well-governed federated territorial, place-based data space for smart communities available for developers and infrastructure providers, aligning with the prospects outlined in Europe's Digital Decade objectives. This approach distinguishes itself from sectoral data spaces by encompassing diverse domains, and underpinning governance across all levels of society. The key objectives of the project are:

- **Objective 1: Establishing a Federated and Innovative Data Space**. This phase focuses on creating a large-scale data space controlled by public data holders, ensuring alignment with the Smart Middleware Platform and broader data space ecosystems. It also aims to offer middleware service solutions facilitating data sharing and management while refining the blueprint based on gained experience.
- **Objective 2: Pilots and Refinement of the Data Space Blueprint**. Through 10-12 cross-sectoral data pilots in various EU communities, this objective aims to validate and refine the data space blueprint. Using common high-value data sets, it seeks to create added value by combining data from various domains, contributing to the sustainability plan, and minimising infrastructure investment.
- **Objective 3: Fostering Innovation and Ecosystem Alignment**. Engaging stakeholders, compliance with sector-specific legislation, establishing links with Horizon Europe missions, creating services available via trusted application catalogues, and enhancing ethical considerations and AI-enabled local solutions constitute the focus of this objective.

DS4SSCC-DEP, building upon established European networks, aims to significantly contribute to the sustainability goals of European citizens. It emphasises co-creation, standardisation, business models, strategies for data spaces, and envisions a federated platform.

DS4SSCC-DEP consortium includes the following partners: