



Deliverable

D2.5 Policy Network Canvas – Stage II

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Executive Summary

This deliverable provides an updated overview of the policy value network in each of the DUET pilot regions (Athens, Flanders, and Pilsen). This is the final deliverable of WP2 which concludes the process of understanding the user stories for each pilot, and reflects on how the datasets available were used, and implemented in each developed use case.

Building on the first version of this deliverable, D2.1, which identified the key stakeholders affecting data driven policy making in the DUET pilots, this document incorporates the insights and lessons learned of the DUET project on the matter. By doing so, this deliverable aims to reveal DUET's role in overcoming challenges of using big data for policy making. More specifically, attention is given to the key points identified in D2.1, namely: the availability of the relevant data identified as a critical element for Athens; the diversity of stakeholders that needed to be engaged for Pilsen; and the large number of cities to be engaged in Flanders.

Following the Introduction, Chapter 2 details the methodology followed to complete this task. Chapter 3 details the results on the level of each pilot, providing an update on the stakeholder network and datasets that were first identified in D2.1. Each pre-identified organisation and dataset is described, and an explanation is provided regarding their status in each pilot. If relevant, additional organisation and datasets that were included in the project since then are described as well, together with their relevance for the pilots.

1. Introduction

The goal of this deliverable is to provide an update of the result reported in D2.1 “*Policy Network Canvas – Stage I*” which identified the key stakeholders that affect data-driven policy making in Athens, Pilsen, and Flanders, and explored the links between them in the policy making lifecycle. This first version of the deliverable was key to understanding the local landscape of relevant actors, as well as the datasets and models that were currently present, required and lacking to support those user stories. This inquiry revealed that while there were strong local networks of actors present in each pilot region, together with a base number of relevant datasets, there were also some challenges, mainly related to availability of the relevant data. This deliverable offers an actualisation of the landscape of relevant actors, as well as the datasets and models used in each pilot of the DUET project, together with explanation on why and how modifications (if any) were made to the original repositories. By doing so, this document intends to provide a brief overview of the evolution of the DUET ecosystem.

2. Methodology

This section gives an overview of the methodology that was used to gather the required input from the different DUET pilot regions. As a reminder, D2.1 provided the pilot regions with a template structured around seven categories: (1) domain of the epic (mobility, environment, health); (2) epic itself, or goal of the activity (“How might we ...?”); (3) user story (“As a ..., I want to ..., with the goal of ...”); (4) stakeholder involved (“We need ... to join because ...”); (5) data available today; (6) data available soon; (7) data opportunities. From there, several organisations were identified as potential relevant stakeholders for each pilot of the DUET project. Likewise, a number of datasets was identified as potential relevant sources of information for the development pilot-specific use cases.

This document provides an update in regard to the datasets identified in that first stage, together with the organisations identified as potential stakeholders for each pilot. To do so, a template containing the list of pre-identified datasets and organisations was provided to each pilot partner. The partners were asked to indicate any modifications that took place since their first input. A follow-up semi-structured online interview was organised with them to investigate these modifications more in depth. An online meeting took place on the 31/03/2022 with DAEM and GFOSS, on the 06/04/2022 with Digital Flanders - DV (previously AIV) and on the 08/04/2022 with PLZ and ISP. The results are reported in the following chapter.

The update provided in this document is also informed by “DUET Dataset inventory” that was created following the recommendation in D2.1, and which was kept up to date throughout the project.

3. Updated Policy Network

This section gives an update on the overview of the primary stakeholders and relevant datasets for each of the DUET pilots. While D2.1 provided a preliminary state of play, this version can be considered as an updated overview of stakeholders and relevant datasets, and reflects the application of the high-level epics and user stories in the pilots. When providing updated information on the datasets in each pilot, we refer to the epic number for which the datasets were used (see Table 1).

Table 1: List of generic DUET epics

n°	Epic
G1	As a public servant of a relevant department (mobility, spatial planning, and environmental department, ...) I want to see the difference in density of traffic in the area of interest of a scenario where I closed traffic in a set

	of roads versus the base density, so I can assess the impact of changes to the local situation on the traffic in my area of interest
G2	As a public servant of the mobility or environmental protection department, I want to know the level and impact on air pollution when certain roads would be closed so I can discover causes of air pollution and the impact on citizens well-being in the city
G3	As a public servant of the mobility or environmental protection department, I want to know the level and impact of noise pollution when certain roads would be closed, so I can discover causes of noise pollution and the impact on citizens well-being in the city
G4	As a citizen, I want to understand the predicted impact of scenarios related to new city developments, calculated using functionality used for what-if analysis, so I can give feedback about scenarios
G5	As a citizen, I want to be able to vote and give feedback about scenarios related to new city developments, calculated using functionality based on other epics, so I can participate in those designs
G6	As a citizen, I want to see the current traffic flow in the city based on the model and available sensors so I can inspect the current traffic density
G7	As a citizen, I want to see the current noise pollution in the city based on the model and available sensors so I can inspect the current level of noise pollution
G8	As a citizen, I want to see the current air pollution in the city based on the model and available sensors so I can inspect the current level of air pollution
G13	As a citizen, I want to express interest as a volunteer tester of green routes proposed by the city so I can validate the expected results and contribute prior to the actual implementation.
G15	As a DUET admin, I want to be able to connect datasources so I can be sure that the necessary data and information is available
G16	As a DUET admin, I want to be able to restrict the access to datasources so I can be sure confidential data is not made publicly available
G17	As a citizen, I want to see only the datasources that are relevant so I don't see confidential information
G18	As a DUET admin, I want to be able to monitor platform status so I can adjust resource allocation and investigate logged errors or misuse

Further, this document includes the insights that were gained by the pilots in overcoming the challenges identified in D2.1, namely:

- For Athens, only a limited number of available datasets were identified at that stage. The project has therefore explored how other datasets, for example gathered through European initiatives or community initiatives like OpenStreetMap could be used to complement this, which is described in chapter 3.1.

- Regarding the Pilsen pilot, the main challenge concerned the diversity of stakeholders that needed to be engaged with during the course of the project. The pilot successfully identified the relevance of each organisation for the project and involved each in a timely and consistent manner, as described in chapter 3.2.
- Finally, for Flanders, a point of attention was the vast number of cities involved and more so how to best engage with them. Chapter 3.3 describes how the pilot successfully engaged with the cities and how their involvement was beneficial to the pilot.

In the following tables we indicate whether the datasets and stakeholders were effectively included in the pilots or not by including the following symbols:



Included



Not included




New entry








3.1. Athens

3.1.1. Stakeholder network

The main actors in the Athens stakeholder network have remained similar over time: the department of the city, most specifically, has been thoroughly engaged with the activities of the DUET project and was briefed on any updates related to the platform. Citizen groups were involved in the testing activities of the project and provided relevant input to improve the platform. In the first stage of the project, several other organisations were identified as potentially relevant stakeholders for the Athens' pilots, however due to a strategic choice regarding the type of use case implemented on the DUET platform, some organizations were not involved in the activities, e.g., the Municipal Police and the Social Solidarity Agency as their involvement was linked to a use case that has not yet been implemented on the platform (i.e., use case on parking data). On the other hand, some additional organisations were involved in the DUET project such as the Ministry of Digital Transformation (Attica) which took part in the testing of the platform, and which will be further involved in the Athens dashboard due to their recently installed fleet of sensors. Another project implementing the digital twin of the whole region of Attica, [IMPETUS](#), was also involved in the testing activities through their local partners the National Technical University of Athens, and contacts will be maintained to try and find a synergy between the two projects. Finally, as the EU Mission Programme approaches, the Athens pilot foresees to take contact with the selected cities located in Greece.

Table 2: Updated stakeholder network for the Athens pilot

Status	Organisation name	Organisation Type	Relevance to DUET	Modifications or updates?
	Municipality of Athens	Public organisation	Elected representatives or high-level managers of the city who decide on policies: <ul style="list-style-type: none"> • Mayor • Deputy mayor • Director of city organisation • Director of city department 	Engagement since the beginning of the project via regular meetings when the DUET platform is updated.


	City of Athens - Municipal Police	Public organisation	Police force working for the city of Athens on regulations that refer to traffic management.	Not involved as the use case correlating traffic and parking data was not implemented.
	City of Athens - Department of Resilience and Sustainability	Public organisation	Agency of the city including officials and public employees focusing on the definition and execution of the Athens Resilient Strategy framed by 4 pillars, 65 actions and 53 supporting actions. The pillars refer to transforming Athens in an open, green, vibrant and proactive city.	Engagement since the beginning of the project via regular meetings when the DUET platform is updated.
	City of Athens - Social Solidarity Agency	Public organisation	Agency of the city including officials and public employees focusing on the services that target diverse social groups (vulnerable population, homeless, women, migrants, seniors etc).	Not involved as the use case correlating socio-economic data and parking data was not implemented.
	City of Athens - Urban Planning Agency	Public organisation	Agency of the city focusing on urban planning of the city, on planning regulations and sustainable mobility.	Engaged and ongoing communication with them.
	Athens Digital Lab	Private Organisation	Athens Digital Lab is a venture aiming at introducing innovation into the municipality of Athens structures and supports youth entrepreneurship.	ADL has been integrated with DAEM, they are therefore always engaged.
	Bike Associations, Shared vehicles associations (Lime, Uber etc)	Private Organisations, NGOs	Profit or nonprofit organisations focusing on proposing alternative means of transport and moving within the city.	Not engaged so far as they were linked to the newly developed traffic model. Foreseen to engage them in the phase of testing.
	Public Transport Means Associations (OASA, STASY, Athens Metro)	Private Organisations	OASA is responsible for the public buses and trolleys in Athens, STASY for the urban rails, the metro and tramway.	Not engaged so far as they were linked to the newly developed traffic model. Foreseen to engage them in the near future.

<input checked="" type="checkbox"/>	Citizens groups (Atenistas etc)	NGOs, unofficial initiatives	Citizens communities, groups, associations, and other initiatives that focus on the improvement of Athens in several domains.	Community engaged, specifically in the testing activities. There are plans to include other initiatives on citizen science (environmental domain).
+	Ministry of digital transformation, Attica	Public organisation	Office of Digital Governance and simplification of procedures.	Involve in the testing activities, and foreseen involvement in the Athens dashboard. Their collaboration is also foreseen regarding newly installed sensors for the traffic dashboard. General secretary was notified about the DUET project and the activities and collecting datasets and trying to contribute to developing the Athens city twin pilot.
+	IMPETUS project	Private organisation	H2020 project that will implement the DT for Region of Attica	Involved in the testing session, they would like to foresee a synergy in the future.
+	EU Cities Missions program	Public organisation	Horizon Europe program. Athens, Thessaloniki, Kalamata, Ioannina, Trikala and Kozani have been selected from among 377 European cities by the European Commission to participate in its program for 100 climate-neutral and smart cities by 2030	Foreseen engagement with them.

3.1.2 Datasets and simulation models

A specific point of attention for the Athens pilot during the first iteration of this activity was that only a limited number of datasets were identified. It was recommended that the pilot seek the integration of OpenStreetMap and other European initiatives, which has been the case, with the addition of eight new datasets such as road plan, road traffic and daily ridership of public transport datasets.

Table 3: Updated datasets list for the Athens pilot

Status	Name	Type	Organisation and location	Description	Modifications or updates?
	Atmospheric measurements	database	ESA, Greece		Implemented in G2, G8
	Air quality measurements	database	Greece	PM2.5 particulate concentration monitoring network by placing measurement stations in the major Greek urban centres	Not implemented (not linked to a current use case)
	Air pollution data	database	DRAXIS ENVIRONMENT AL S.A Greece	Air Quality Map	Not implemented.
	Measurements of air pollution	database	Ministry of Environment and Energy Greece		Not implemented.
	Daily Report of Air Pollution Levels	database	Ministry of Environment and Energy Greece		Not implemented.
	Air quality	database	Greece	Athens air quality and air pollution	Not implemented.
	Urban Transport	database API	OASA Greece	Locations of stations of Athens urban transport and timetables	Implemented in G1 - G6
	Geospatial Information Portal	database	Ministry of Environment and Energy Greece	Data on the natural and urban environment	Implemented in G4
	Boundaries of Municipal Communities of the City of Athens	database	City of Athens Greece	Boundaries of the residential structure of the City of Athens in the seven municipal communities according to the General Urban Plan of the City of Athens	Implemented in G4, G6, G13
	Road plan for City Athens	database	City of Athens Greece	Beta version. Information with the names of the road network for the City of Athens	Implemented in G1, G4, G6, G13
	Historical Centre of City of Athens	database	City of Athens Greece	Geographical determination of the traditional part of the city of Athens (Historical Centre)	Implemented in G1, G4, G13
	Services of the City of Athens	database	City of Athens Greece	Points of services of the City of Athens such as Administration, Finance, Technical, Cultural Services and also Clinics, Citizens' Service Centres etc.	Implemented in G1
	Road Traffic for the Attica region	database API	Region of Attica Greece	Measurements of Attica traffic by stations in the monitoring network	Implemented in G1, G6, G13

+	Daily Ridership of public transportation in Athens	database API	OASA Greece	Ticket validations per hour for Urban Rail Transport S.A stations and bus lines	Implemented in G2, G8
+	Air quality sensor data	database API	Multiple providers Greece	Collection of data that aggregate PM2.5, PM10, ozone (O3), sulphur dioxide (SO2), nitrogen dioxide (NO2), carbon monoxide (CO), and black carbon (BC) measurements.	Implemented in G2, G8

Simulation models

Table 4: Updated simulation models for the Athens pilot

Status	Name	Model Type	Description	Modifications
<input checked="" type="checkbox"/>	Air quality model of TNO	Simulation model	Model derives the air quality from the traffic information and a 3D model	Used in G2, G8, G11 and G12
<input checked="" type="checkbox"/>	Noise model of TNO	Simulation model	Model derives the noise pollution from the traffic information and a 3D model	Used in G3
<input checked="" type="checkbox"/>	Athens Traffic model	Simulation model	Model derived from OSM data	Implemented in G1, G6 and G9

3.2. Pilsen

3.2.1. Stakeholder network

Most of the foreseen organisations identified as potential stakeholders for the pilot of Pilsen were engaged with the DUET project. The main challenge identified for this pilot in the first stage was regarding the diversity of the organisation identified, but this challenge was overcome by a timely involvement of each organisation and such at different stages of the project depending on the type of input they could provide/receive. Some other organisations were not involved in the project, mainly due to the fact that some use cases they were related to were not implemented or due to the readiness level of the platform.

As a lesson learned, the Pilsen pilot reports that although there is a general interest in the concept of the digital twin and the services it can provide, it was sometimes challenging to engage some specific groups as the front-end interface was not yet fully functional. Preliminary versions of the final Candidate Version show that this is being tackled.

Table 5: Updated stakeholder network for the Pilsen pilot

Status	Organisation name	Organisation Type	Relevance to DUET	Modifications or updates?
<input checked="" type="checkbox"/>	City of Pilsen Policy makers	Public Organisation	Elected representatives or high-level managers of the city who decide on policies: <ul style="list-style-type: none"> • Mayor • Deputy mayor • Director of city organisation • Director of city department 	The city signed a statement of support and is continuously engaged in the activities of the project.

<input checked="" type="checkbox"/>	City of Pilsen - urban planning unit (ÚKRMP)	Public organisation	Urban planners who work primarily with city basic structure, i.e., buildings and public space, with the purpose of spatial analysis and regulation (parameters such as area of built space, area of public space, green areas, roads, and traffic areas, building height). Other requirements include land use and function analysis (Proximity, space syntax, accessibility of public services, etc.) and mobility. Environmental parameters such as air pollution and noise levels are also within the urban planning competence of ÚKRMP.	Representatives took part in workshops and testing clinics.
<input type="checkbox"/>	City of Pilsen - unit responsible for energetics & heating	Public organisation	To provide data on air pollution generators.	Not involved due to the scope of DUET: the DUET project deals with air pollution generated from transport and not industrial and households generated air pollution.
<input checked="" type="checkbox"/>	City of Pilsen - Public Property Management unit (SVSMP)	Public organisation	City managers who maintain public infrastructure of the city and use the related data management and visualisation tools.	Representatives took part in workshops and testing clinic
<input checked="" type="checkbox"/>	City of Pilsen - 3D Experts (GIS unit SITmP)	Public organisation	3D expert creating 3D models of selected public buildings in high resolution.	The City Urban planning experts were involved regarding the use of 3D data and took part in the testing activities.
<input type="checkbox"/>	Tech enthusiasts, 3D data enthusiasts, students	Public or private, community	E.g., Techmania, ZČU university students - community of 3D enthusiasts.	Not involved due to the readiness level of the platform.
<input type="checkbox"/>	Technical education financed or supported by the city (technical elementary schools, tech high schools, Centrum Robotiky etc.) + city organised/ supported hackathons	Public	Schools or Centrum Robotiky could together with the City create courses on working with 3D data. Use of augmented reality technology.	Not involved. VR Hackaton which was planned for 11/2021 was cancelled due to COVID. Hackathon planning on an alternative date in the fall of 2022. The results will no longer be included in this project.
<input checked="" type="checkbox"/>	nVias	Non-profit	Technical education of children, free-time activities, tech competitions for kids.	The results of the DUET project are continuously presented at festivals and exhibitions organized by the city

				with the participation of students and innovators (eg http://www.inovujemeplze.n.cz/)
✓	Experts and entrepreneurs	Private and public sector	Experts and businesses using 3D to provide their services.	DUET was presented to real estate agencies (The Real Estate Market Spring 2022 conference in Prague focused on cities and municipalities as investors in the digital age. The issue of digital twins was presented on the DUET project with a demonstration of one of the use cases..
⊘	BIM Experts	Private sector	Unicorn - extended reality glasses, BIM focused.	Not involved yet. SITMP monitors the city's activities in search for BMI solutions.
⊘	Investors	Private business	Investors of major development projects that could be motivated to provide the 3D data of their projects.	Not actively involved yet, but the project was presented at different conferences.
✓	Citizens		People will be the final beneficiaries of better private and public services created on top of 3D data.	Informed via media (web pages, newspapers, TV spots).
+	Pilsen urban transport company, Inc. (PMDP)	Public organisation	Transport company managers who manage the city's public transport infrastructure and use related data management and visualization tools.	Representatives took part in workshops and testing clinic









3.2.2 Datasets and simulation models

The datasets identified at the beginning of the project by the Pilsen pilots proved to be of high relevance for the DUET platform, with several of them providing input on eight of the use cases developed and implemented on the DUET platform. Due to strategic choices regarding the type of use cases included on the platform, this has also led to some pre-identified datasets to be left out of the platform, as they were no longer relevant to the scope of the project (e.g., datasets focusing on noise, heating, and energy).

Table 6: Updated datasets list for the Pilsen pilot




Status	Name	Type	Organisation and location	Description	Modifications or updates?
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<input checked="" type="checkbox"/>	Air quality sensor data	database	CHMI - Czech Hydrometeorological Institute	6 air quality sensors installed in the city	Implemented in G2, G8, G11
<input type="checkbox"/>	Air Quality report	policy document		aggregated air quality measurements for 2000-2014 available in a report, data from ČHMÚ	Not implemented, but used as a reference document in the beginning of the project
<input checked="" type="checkbox"/>	Traffic detectors	database + API, tool (web app)	City of Pilsen - Plan4All	data from 1000 magnetic loop detectors available through API and visualised in an analytical Map of Traffic (created in PoliVisu)	Implemented in G1, G6, G9
<input checked="" type="checkbox"/>	Traffic model	database + API, tool (web app)	City of Pilsen - Plan4All	Traffic model data + traffic modeller backend and web application for real-time traffic modelling	Implemented in G1, G2, G3, G4, G6, G8, G9
<input checked="" type="checkbox"/>	Floating car data	database + API, tool (web app)	Directorate of Roads and Highways, Czech republic	speed of traffic provided from cars via mobile network, data updates every 5', covering 1100km of streets in Pilsen,	Implemented in G1, G6
<input type="checkbox"/>	Strategic Plan of Pilsen - Environment	Policy document		Environmental conception as a part of the Strategic plan of Pilsen	Not implemented.
<input type="checkbox"/>	Noise map (model) 2017	Database, web map		noise model contracted by the Ministry of Health in 2017	Not implemented.
<input type="checkbox"/>	Noise Action plan for main transit roads in Pilsen	Policy document		Noise Action plan for main transit roads in Pilsen	Not implemented.
<input type="checkbox"/>	Heating source of buildings	Map, database		Heating type/source for all buildings in Pilsen	Not implemented.
<input type="checkbox"/>	Energy policy	Policy document		information on heating energy sources	Not implemented.
<input type="checkbox"/>	Digital technical map	Database, web map		technical infrastructure, pipes, energy and water networks etc.	Not implemented.
<input type="checkbox"/>	Cadastr (national register)	Online access		ownership of land and buildings	Not implemented.
<input type="checkbox"/>	RUIAN (national register)	Online access		information on buildings - no of floors, heating, energy sources etc	Not implemented.
<input type="checkbox"/>	Pilsen GIS data	Database		all GIS datasets managed by the city	Not implemented. This is a general data set and some data from the GIS database was used within the DUET project (see above, e.g., 3D data, detectors, etc.)

	Pilsen Urban Plan (land use)	Database, web map		land use regulation for the whole city	Not implemented.
	Sustainability plan for Pilsen mobility	Policy document	City of Pilsen		Not implemented but used as a reference document in the beginning of the project.
	3D model of the buildings	Database	City of Pilsen	data provided from 03/2021	Implemented in G1, G2, G3, G4, G6, G8
	Digital surface model	Database	City of Pilsen	data provided from 03/2021	Implemented in G1, G2, G3, G4, G6, G8
	Digital terrain model	Database	City of Pilsen	data provided from 03/2021	Implemented in G1, G2, G3, G4, G6, G8
	Pilsen Open Data	Database	City of Pilsen	all open data of the city	Traffic profiles and aggregated data from traffic detectors are available on Open data portal or via API.
	Public transport routes	Dataset	City of Pilsen - Pilsen City Transport Company	vector data layer with public transport routes mapped to the street network of the city	Will be integrated in the final version of the DUET platform for G1 epic.
	Public transport stops	Dataset	City of Pilsen - Pilsen City Transport Company	point data layer with public transport stops	Data provided to DUET

Simulation models

Table 7: Updated simulation models for the Pilsen pilot

Status	Name	Model Type	Description	Modifications
	Pilsen traffic model of P4ALL	Simulation model	Traffic model of the Pilsen city implements in Traffic modeler by Plan4all	Implemented in G1, G6 and G9
	Air quality model of TNO	Simulation model	Model derives the air quality from the traffic information and a 3D model	Implemented in G2, G8, G11 and G12
	Noise model of P4ALL/UWB	Simulation model	Model derives the noise pollution from the traffic information and a 3D model	Implemented in G3

3.3. Flanders

3.3.1. Stakeholder network

Most of the pre-identified organizations were involved as stakeholders in the project and made meaningful contributions to the development of the Flanders pilot within the DUET project. As such, while this was first identified as a challenge for the pilot, the involvement of all 13 of Flanders' cities proved to be a success, in particular strong ties were built with the city of Ghent and Bruges that displayed a specific interest for the Digital Twin concept, while other more regional cases were developed as well. Organisations from the private sector were not involved, mostly due to the current readiness level of the platform, but several lines of collaboration have been identified for the future.

Table 8: Updated stakeholder network for the Flanders pilot

Status	Organisation name	Organisation Type	Relevance to DUET	Modifications
<input checked="" type="checkbox"/>	Information Flanders (AIV)	Public organisation	Owner of the PoliVisu pilot, driving force after the realisation of the Flanders Digital Twin in cooperation with IMEC.	Have been involved, high impact on EU level.
<input checked="" type="checkbox"/>	IMEC	Public organisation	Co-owner of the PoliVisu pilot, driving force as a research institute and a digital innovation hub behind the Digital City Twin concept in Flanders.	Highly involved, continuous cooperation.
<input checked="" type="checkbox"/>	Flemish 13 major cities	Public organisation	Main customers of the Polivisu Digital Twin concept. These cities are: Aalst, Antwerpen, Brugge, Genk, Gent, Hasselt, Kortrijk, Leuven, Mechelen, Oostende, Roeselare, Sint-Niklaas and Turnhout	Updates were given to all 13 cities and test clinics were organised with them. Intense cooperation with Ghent (video for the 27th EU ministers of digitisation) which is also highly involved in the framework of this project, and with Bruges which is also working on a digital twin with IMEC, together with some other cases on the regional levels. Regular project updates and discussions in the frame of the Smart Flanders network steering committee.
<input checked="" type="checkbox"/>	VVSG + Kenniscentrum Vlaamse Steden (knowledge center Flemish cities)	Public organisation	Organisation representing the local communities in Flanders.	Involvement through the steering committee "Smart Flanders".
<input checked="" type="checkbox"/>	VMM - Flemish environmental agency	Public organisation	Flanders Environment Agency (abbreviated VMM) is an agency of the Flemish government working towards a better environment in Flanders. Water, air and the environment. These are the three domains in which VMM is active.	Role as expert in the project (external expert). Especially interested in the air quality, noise model for traffic. VMM is also Involved in the Smart Flanders steering committee.
<input checked="" type="checkbox"/>	MOW/AWV - Flemish public works agency	Public organisation	The mobility and public works department aims at policy making, both for mobility and road safety and for investment, management and operation of the transport and port infrastructure.	Involved in the Smart Flanders steering committee, following meetings and workshops. Working mainly on the Flemish traffic model (combined with the one of Ghent), together with data standardisation.

☑	OMG - Flemish land-use agency	Public organisation	“Omgeving - Environment” aims at the realisation of a qualitative environment and integrated spatial policy in close cooperation with local communities and provinces.	Interested in Digital twin and are interested in DUET as an open solution for the environmental effects reporting (MER procedure).
☑	VITO - Flemish institute for technology research	Public organisation	VITO’s aim is a society where sustainability is the norm. They are working on global projects to promote the transition to sustainability. They create innovative technological solutions and actively share their knowledge with businesses and government bodies.	VITO is one of the model providers for the Flanders pilot. VITO is also interested in Digital Twin as a future solution and a platform for their different simulation models (air quality, water/flooding models, and spatial model for Flanders). The VITO Quark air model was integrated in DUET to prove the extensibility of the platform.
☑	Private sector players	Private organisation	Private sector companies will play a role as data and service providers. The platform will allow private companies to be more involved in a later phase of the Digital Twin development.	Several lines of collaboration are foreseen: <ol style="list-style-type: none"> 1) Technology providers: digital twin as a next step. VCS (virtual city system), on the Flemish market no GIS company involved 2) Data providers: company providing floating car data (e.g., TomTom), strava (data from cycling and running) 3) Public sector model provider: e.g., VITO. 4) Private sector model provider such as e.g., PTV 5) Public involvement/solutions The DUET project reaches out to private sector players via regular communication via events, conferences and participation in regional and international workshops.

3.3.2 Datasets and simulation models










Relevant pre-identified datasets have been successfully implemented on the DUET platform for the Flanders pilot, such as the geospatial datasets and traffic-related datasets. Others, such as parking datasets and road accidents datasets have not been implemented as they were not connected to the developed use cases.





Table 9: Updated datasets list for the Flanders pilot

Status	Name	Dataset Type	Organisation and location	Description	Modifications
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<input checked="" type="checkbox"/>	GRB LOD 1 (Spatial reference database 3D LOD 1)	Geospatial dataset	Digital Flanders	The Large-scale Reference File (GRB) is a geographic information system that serves as a topographical reference for Flanders. It is a common geographical basis on which all users can graft their own data. The GRB only contains geographic and characteristic information of well-defined, conventionally accepted reference data: buildings, plots, roads and their layout, watercourses, railways and the road network. LOD 1 is basically a 3D presentation based on building footprints.	Used in G2 and G3
<input checked="" type="checkbox"/>	GRB 2D Base layer	Geospatial dataset, geospatial webservice	Digital Flanders	Idem. 2D representation.	This is the reference map for Flanders and as such available as background and can be used in all epics to facilitate localisation.
<input checked="" type="checkbox"/>	Digital height model Flanders (1 meter, 5 meter, 25 meter, 100 meter)	Geospatial dataset	Digital Flanders	Digital surface model of the ground level including objects in raster format with a ground resolution of 1 meter. This DSM was derived from LiDAR height data that was collected within the framework of the Digital Height Model Flanders II (DHMV II).	Used in G2 and G3
<input checked="" type="checkbox"/>	Orthofoto high scale (10cm)	Geospatial dataset, geospatial webservice	Digital Flanders	Covering medium-scale orthophoto coverage of the Flemish Region, including the Brussels-Capital Region. This assignment includes the realization of digital photographic aerial shots in the winter flying season with a ground resolution of 17 cm and, subsequently, the production of an orthophoto mosaic with a ground resolution of 25 cm.	No epic really depends on this dataset, but it can be used as a reference dataset for all epics to facilitate localisation.
<input checked="" type="checkbox"/>	Antwerp LOD 2 model	Geospatial dataset	City of Antwerp	Idem GRB LOD 1 description, but also the roof shapes are included	Used in G2 and G3






<input checked="" type="checkbox"/>	Gent LOD 2 model	Geospatial dataset	City of Gent	Idem GRB LOD 1 description, but also the roof shapes are represented.	Used in G2 and G3
<input type="checkbox"/>	Antwerp LOD 3 model	Geospatial dataset	City of Antwerp	Idem GRB LOD 1 description but containing a detailed representation of the shape of the building outside.	Not implemented, this dataset refers to texture which is not relevant at this stage of TR.
<input checked="" type="checkbox"/>	Road Network (Mid-scale) - 2D	Geospatial dataset	Digital Flanders	The Road Register (middenschalig wegenregister) makes the roads in the Road Register available to the user. The Road Register is a medium-scale reference file for roads in Flanders. It contains all roads of Flanders, with associated attribute data.	Implemented as part of the GRB reference database
<input type="checkbox"/>	Central database of postal addresses (CRAB)	Geospatial dataset, webservice		All addresses in Flanders are stored in the CRAB database together with one or more point geometries. Address means: identification of an addressable object with address components such as a municipality name, a street name, a house number, and a sub-address. An address can be linked to a building or a plot. The point geometries can relate to the centroid of the cadastral parcel or the building on which an address is located, as well as refer to the entrance of the building linked to an address. CRAB is also available as a web service.	Partially implemented, as part of GRB: it was therefore judged not relevant to have it as a separate data layer
<input checked="" type="checkbox"/>	Loop-based traffic data (1-minute delay)	Dataset		Traffic loop information - XML file	Used in G6 and G9
<input type="checkbox"/>	Dynamic speed limit and lane indicator signs (RSS) traffic management data	Dataset		Dynamic speed limit and lane indicator signs (RSS) traffic management data - XML/RSS	Not implemented
<input checked="" type="checkbox"/>	Telraam Citizen science - traffic counts and speed counts	Dataset		Citizen science data IOT device that can count pedestrians, cyclists, cars and big vehicles and also vehicle speed.	Used in G6 and G9
<input checked="" type="checkbox"/>	Air quality - HQ sensors (multiple elements)	Dataset		Data from the Flemish environmental agency high	Implemented as part of open AQ

				quality sensors in Flanders (60 sensors installed).	
	Luftdaten / Leuvenair - air quality sensors	Dataset		Citizen science data IOT device that counts dust particles. The device gives an idea of the air quality.	Implemented as part of the sensor.community AQ data
	Anonymized/Pseudonymized ANPR data - Federal police platform	Dataset		Data from Automatic Numberplate Recognition cameras. The data is anonymized or pseudonymized. The latter provide the possibility to get insight into origin/destination of the traffic.	Not implemented for privacy and legal restrictions
	Anonymized/Pseudonymized ANPR data - Local data platforms (local police or city)	Dataset		Data from Advanced Numberplate Recognition cameras. The data is anonymized or pseudonymized. The latter provide the possibility to get insight into origin/destination of the traffic.	Not implemented for privacy and legal restrictions
	Meteo info (via VMM measuring stations)	Dataset		Meteorological information about wind speed and direction, precipitation, temperature, air pressure, humidity, and sun radiation.	Not implemented
	Kortrijk - Parking data (on-street and public parking spaces)	Simulation model		Parking occupancy data from public parkings and parking spaces in the public domain.	Not implemented, the level of granularity is not relevant at this stage of the platform
	Empty and neglected business premises / Leegstaande en verwaarloosde bedrijfsruimten - Flemish vacancy inventory	Dataset		Empty and neglected business premises / Leegstaande en verwaarloosde bedrijfsruimten - Flemish vacancy inventory - Local communities have to deliver once a year a register containing this data.	Not implemented (no current relevant use case)
	KBO (Cross-road bank of companies - Nace activities)	Dataset		Central database of companies contains information about the Belgian companies. The Flemish crossroad bank of companies also contains the geo-location, CRAB addresses etc...	Not implemented (no current relevant use case)
	Geospatial referenced register of installed cameras on public domain	Dataset		?	Not implemented (no current relevant use case)
	Crime and infringements geospatial register	Dataset		?	Not implemented (no current relevant use case)

	Road signs geospatial register	Dataset		Dataset containing the positioning and content of the traffic signs in Flanders	Not implemented (no current relevant use case)
	Road accidents	Dataset		Dataset containing the official road accident statistics in an anonymized way	Not implemented (no current relevant use case)
	Citizen science air pollution sensors			Sensor.Community is a contributors driven global sensor network that creates Open Environmental Data.	Used in G2, G8, G11
	Road works (ongoing and planned) - GIPOD	Dataset		Overview of ongoing and planned road occupations (roadworks and events).	Used in G1, G6 and G9

The following simulation models were implemented or were considered to be implemented in Flanders.

Table 10: Updated simulation models for the Flanders pilot

Statu s	Name	Model Type	Description	Modifications
	Air quality models of VITO - Flemish Institute for Technological Research	Simulation model	Assessment and forecast models on air quality based on four main factors: Emission resources, Meteo, Chemical processes in the atmosphere and the transport of air pollution.	Used in G2, G8, G11 and G12
	Integrated Flemish and Ghent multi modal traffic model for the Ghent region	Simulation model	Strategic multi modal models of people- and freight transport in Flanders. Based on the BASMAT, MM and RMM instruments built with Cube Voyager.	Implemented in G1, G6 and G9
	Spatial model flanders 2050 including optimisation models for land use and infrastructures	Simulation model	Strategic model up to 2050 providing the long-term land use and infrastructure occupation.	Not implemented, no use case
	Air quality model of TNO	Simulation model	Model derives the air quality from the traffic information and a 3D model	Used in G2, G8, G11 and G12
	Noise model of TNO	Simulation model	Model derives the noise pollution from the traffic information and a 3D model	Used in G3

4. Conclusion

This deliverable gives an updated overview of the local landscape of relevant actors for each pilot of the DUET project, as well as the datasets that are currently being used to support the platform according to the use cases developed during the project.

In doing so, the present document demonstrates the strong local networks that were developed in each pilot during the project, as well as their individual contribution to the development of the Digital Twin platform. In each pilot, the most strongly engaged stakeholders appear to be public organizations and more accurately locally relevant actors such as city or municipality administrations. Private actors were also successfully involved in the development of the DUET platform, more specifically in the testing phases of the project. The relevance of the pre-identified datasets is also shown through their implementation in several of the developed use cases of the DUET platform. The project has also explored how additional datasets could make valuable contributions to these cases, as described in this document. Due to their relevance to the generic DUET epics, datasets linked to air quality and traffic data were implemented in all three pilot cities.

In updating the first version of the Policy Network Canvas, this deliverable also showcases how the pilots overcame the challenges that were identified in this first stage: the pilot of Athens was successful in including a more diverse range of datasets such as OpenStreetMap and other locally relevant datasets; Pilsen was able to involve a wide range of stakeholders in the activities of the Pilot by strategically identifying the relevance of their contribution; and the Flanders pilot manage to tie strong relationships with the 13 cities pre-identified, and most specifically with Ghent and Bruges.