



Data Driven Policy Cluster

Co-creating digital tools for better governance

Innovative Tools for Evidence Based Policy

Track 2: Policy prediction

Forging the future with policy impact analysis & prediction

10 December 2021



Data Driven Policy Cluster is a group of 5 projects that have received funding from the European Union's Horizon 2020 research and innovation programme. Policy Cloud - GA #870675, Decido - GA #101004605, AI4PublicPolicy - GA #101004480, DUET - GA #870697, Intelcomp - GA #101004870.

Agenda

- **Introduction. Forging the future with policy impact analysis & prediction –**
Zach Smith (Trust-IT, Policy Cloud)
- Joseba Sanmartin (Fecyt, IntelComp)
- Ricard Munne (Atos, Policy Cloud)
- Francesco Mureddu (The Lisbon Council, DECIDO)
- Jurgen Silence (AIV, DUET)
- **Panel Discussion** on forging the future with policy impact analysis & prediction



Co-organised by:



Policy Cloud
Cloud for Data-Driven Policy Management

Decido



intelcomp

9-10 December 2021

EVIDENCE BASED POLICYMAKING IN EUROPE 2021

USE CASES AND DIGITAL TOOLS
FOR IMPROVED DECISIONS

Innovative Tools for Evidence Based Policy

Track 2: Policy Prediction

The wealth of data at our disposal should not only be used to understand the areas where new policy or change in policy is needed, but also to predict the impact of those policies, giving realistic KPIs on which they can be judged.

This track will explore how policy impact prediction and analysis will lead to measurable outcomes and further policy refinement.



Evidence Based Policymaking 2021

Session: Evidence Based Policy Cases
from data to decision making

Track 2 - Policy Prediction

Join us:

10th December 11:30 am CET



Ricard Munné

Atos Reseach
PolicyCloud



Francesco Mureddu

Lisbon Council
DECIDO



Jurgen Silence

Flemish government
DUET



10/12/2021

Data Analysis and Simulation

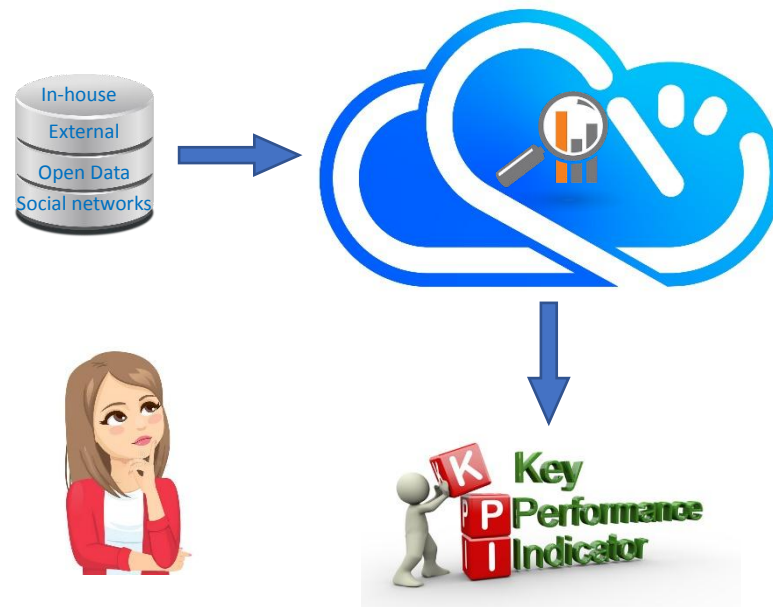
Ricard Munné, ATOS
PolicyCLOUD Coordinator

Evidence Based Policy Making in
Europe Conference 2021



About PolicyCLOUD

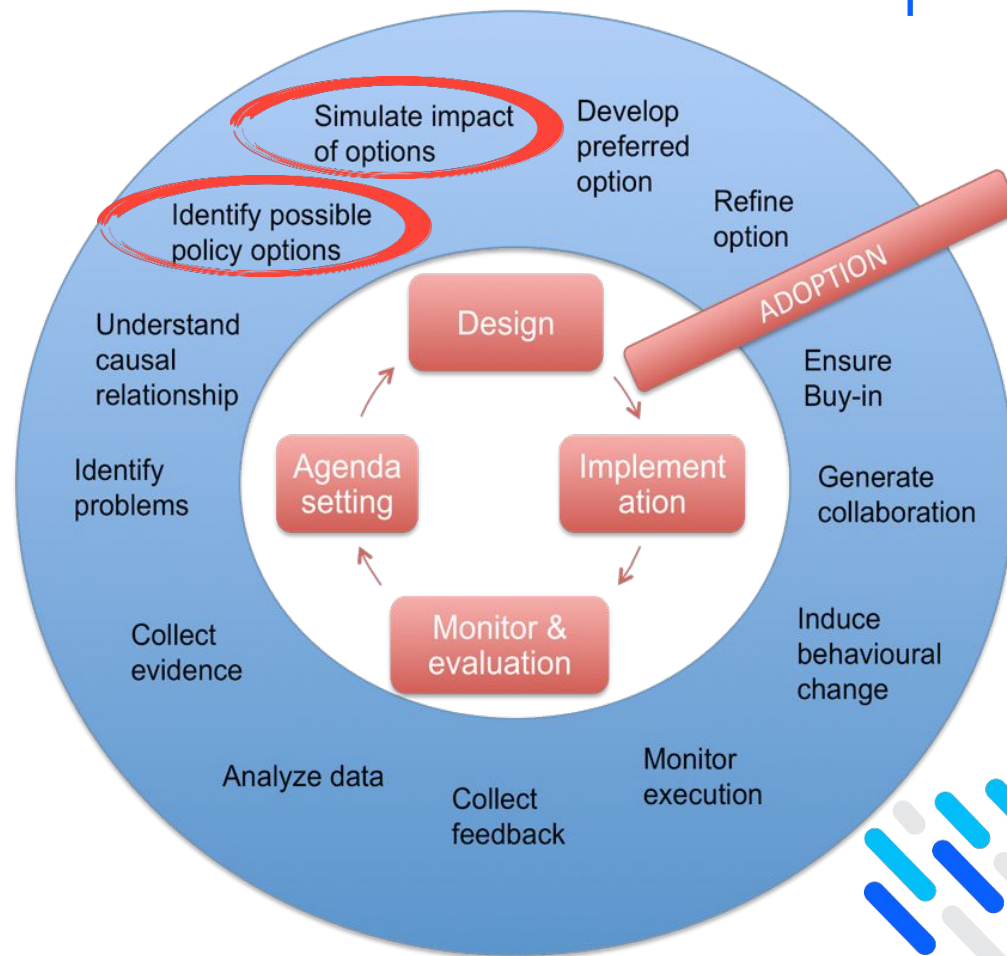
- Standard data gateways
- Data pre-processing
- Turning data into actionable knowledge through analytics
- Providing flexibility on the cloud



Policy Management

Policy Cycle and Related Big Data Activities

(Source: Big Policy Canvas project)



Simulation through social dynamics



Policy Cloud

Cloud for Data-Driven Policy Management

+ Politika tool^(*)

(*) Developed by PolicyCLOUD partner UPRC



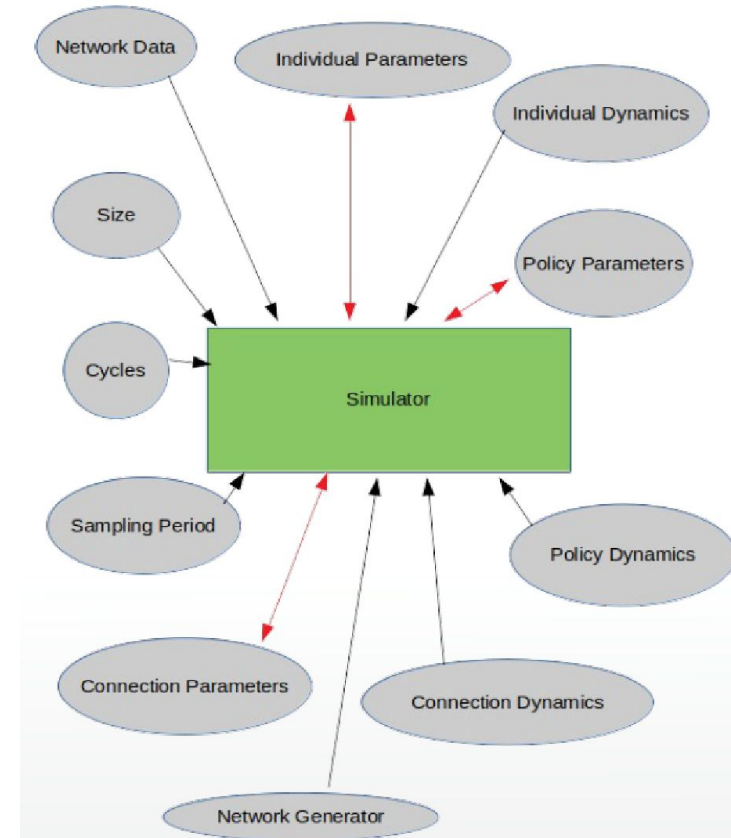
Policy Cloud
Cloud for Data-Driven Policy Management

10/12/2021



Meta-Simulation Methodology for Public Policy Design

- Exploit the power of simulations as analytical tools to estimate the outcomes of different policy alternatives.
- Base the simulations of all alternatives on a common modeling, execution and analysis environment that facilitates their side-by-side examination and comparative analysis of their assumptions, mechanics and outcomes.



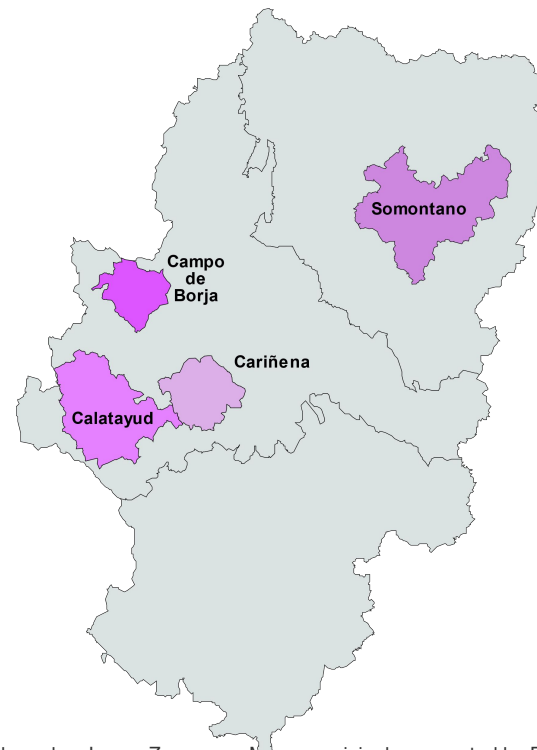
Methodology Steps

- Create and execute transparent simulation models for each alternative.
- Enrich these models with meta-simulation structures and processes that make explicit and ground the assumptions behind each alternative.
- Evaluate alternatives in terms of explicit criteria supplied by the policy makers.



Application

- Currently under discussion the application of the simulation tool in the UC scenario from SARGA.
- The application deals with the different motivations for buying a certain wine, be these the price, the buyer's income, the type of wine and social influence, and the promotional campaigns.
- This is related to the Aragon region policy to promote their wines in different markets.



Té y kriptonita based on Image:Zaragoza - Mapa municipal.svg created by Emilio Gómez Fernández (https://commons.wikimedia.org/wiki/File:Vinos_DO_de_Aragón.svg), „Vinos DO de Aragón“, <https://creativecommons.org/licenses/by-sa/3.0/legalcode>



Outcomes

- A meta-simulation methodology and its implementation for providing insight and improving the quality of debate and critique around policy design has been described.
- Experimental prototype: <http://epinoetic.org:4000>
- Demo video: <https://youtu.be/1lg3FtncyFM>
- Next steps:
 - Integrate Politika implementation to the actual use cases of the PolicyCLOUD project.
 - Develop a UC related to the Aragon pilot
 - Develop GUIs for policy designers with little coding experience.
 - Expand our methodology to the design and analysis of networks of policies
 - Expand reasoning capabilities related to evaluation of policy alternatives in Politika



Acknowledgements

- Professor Nikitas M. Sgouros (sgouros@unipi.gr)
Department of Digital Systems at the University of Piraeus, Greece.
- For additional information, see paper:
 - N. M. Sgouros and D. Kyriazis, "Creating Web-based, Meta-Simulation Environments for Social Dynamics in an Interactive Framework for Public Policy Analysis and Design," 2021 IEEE/ACM 25th International Symposium on Distributed Simulation and Real Time Applications (DS-RT), 2021, pp. 1-4, doi: 10.1109/DS-RT52167.2021.9576158





Policy Cloud
Cloud for Data-Driven Policy Management



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PolicyCloud has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 870675.



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theLisboncouncil

making Europe fit for the future

Data and disruptive technologies for evidence based policymaking

Francesco Mureddu
The Lisbon Council
Evidence Based Policymaking in Europe Summit
December 10th, 2021

Data → Facts → Information → Knowledge → Insight →
Wisdom

Neil deGrasse Tyson, Astrophysicist

Data in the policy cycle

Important points

- Enable **public authorities** to adopt data and cloud technologies (from the PA and research sector) to support **evidence-based policies**
- Facilitate the active **involvement of local actors** in data generation, how it is analyzed and used within the policy making life cycle
- Assess the transformative **impacts, benefits** and **risks** (including ethical) of the deployment of big data tools and methodologies and the use of cloud infrastructure



Data in the Policy Cycle/1

- **Agenda setting:** here, the challenge addressed is to detect (or even predict) problems before they become too costly to face, as well as reaching an agreement of which issues have to be dealt with
 - In this regard, through data governments can identify emergent topics early and to create relevant agenda points collecting data from social networks with high degrees of participation and identifying citizens' policy preferences
- **Policy discussion:** this deals with debating the different options on the table, and identifying which is the most important.
 - In this regard, opinion mining and sentiment analysis can help to inform policymakers about the current trend of the political discussion as well as the changes in public opinion in the light of discussed and proposed changes
- **Policy formation and acceptance:** big data and data analytics solutions can be used for providing evidence for the ex ante impact assessment of policy options, by helping to predict possible outcomes of the different options, by making use of by advanced predictive analytics methodologies and scenario techniques.
 - Robust and transparent predictive modelling and algorithmic techniques can also help in improving the policy acceptance

Data in the Policy Cycle/2

- **Provision of means:** here, the challenge is to improve the decisions on how to most efficiently provide the required personnel and financial means for the implementation of new policies by analyzing in detail past experiences
 - An example is given by use of big data in budgeting to increase efficiency and effectiveness while reducing costs
- **Implementation:** big data and data analytics can help identifying the key stakeholders to involve in policy or the key areas to be targeted by policies. Another way in which data can influence the implementation stage of the policy process is the real-time production of data
 - The execution of new policies immediately produces new data, which can be used to evaluate the effectiveness of policies and improving the future implementation processes
- **Policy evaluation:** the implementation of the policy provides quantitative and qualitative measures to assess performance and impact on users
 - Feedback and data on implementation can be collected and analyzed by mean of disruptive technologies

Outputs of DECIDO

SCOPE

DECIDO will serve as an intermediary between the public sector, the citizen science world and the European Cloud Infrastructure (ECI) through the direct collaboration with EOSC and will provide storage capacity and processing power through EGI infrastructure.

Out 1: RECOMMENDATIONS

Identification of a set of **pathways, recommendations** and **lessons learnt** addressing Public Authorities through the transition towards the use of the European Cloud Infrastructure and the application of evidence and co-creation in the policy lifecycle.

Out 2: WEB PORTAL

An easy to use portal will be released to **define, manage** and **evaluate PA policies** in a collaborative manner leveraging services offered by EOSC (Catalogue and Marketplace), external services/tools to EOSC, data made available by EOSC (mainly through services B2Find and EGI DataHUB) and by other data providers (e.g. European Data Portal), including Public Administrations themselves.

Out 3: BUSINESS PLAN

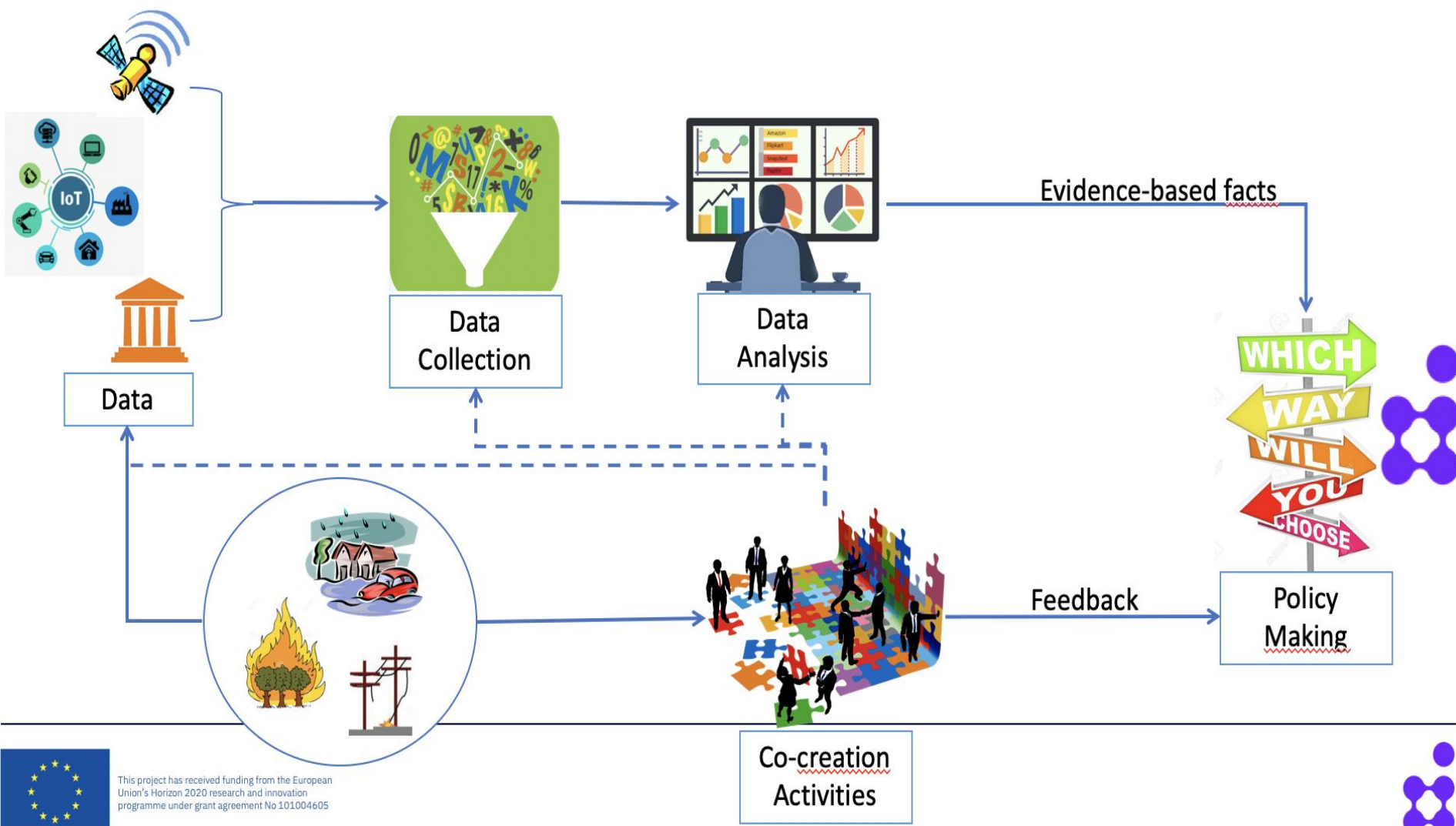
A robust and realistic **business plan** will be developed backed up by a detailed cost-benefits analysis of ex-ante (not using DECIDO results) and ex-post (using DECIDO results).

Out 4: CITIZEN ENGAGEMENT

The focus for the **involvement of local actors** will be on: (1) the **methodological** side (e.g. co-creation of indicators), (2) the identification of **needs** and priorities, and (3) the **data generation** (e.g. through citizen science experiments where applicable).



Brief example of the use of DECIDO



Pilots in a nutshell



Kajaani
Finland

Forest fire

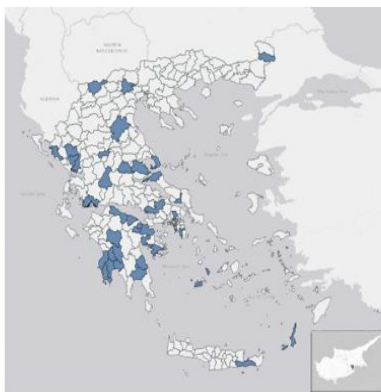
Meisino Park
Italy

Flood



Greek
Municipalities

Power Outage



Aragon Region
Spain

Wildfires

Pilot Overview

1. Finland

Pilot on Forest fires in Kajaani, Finland

Prevention and protection against forest fires; Procedures to mitigate damage to nature, infrastructure and life

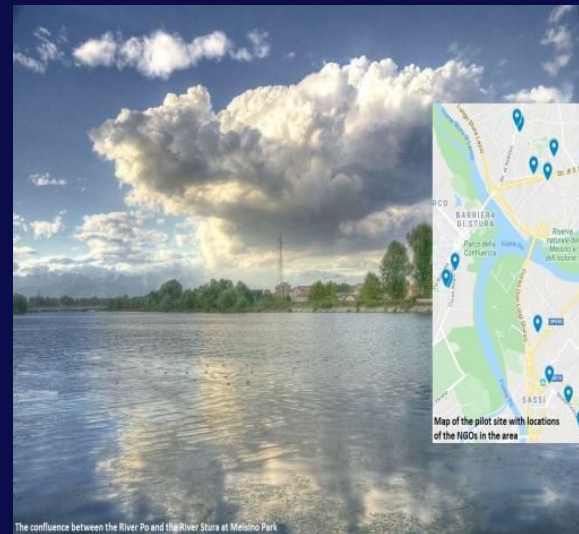


Pilot Overview

2.Italy

Pilot on Floods in Meisino Park, Italy

Improve design of emergency policies related to floods and weather alerts.

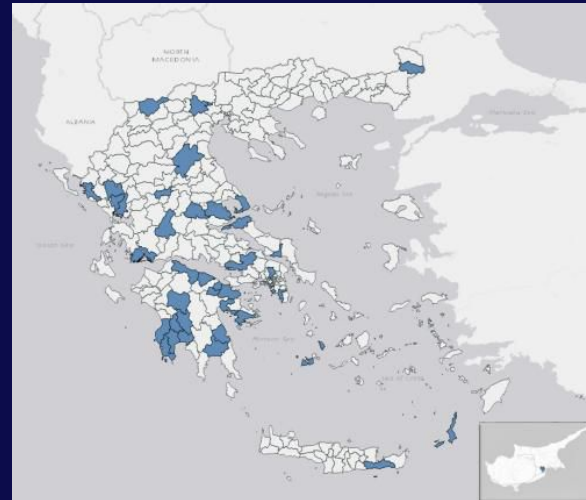


Pilot Overview

3.Greece

Pilot on Power Outage in Greek Municipalities – Greece

Power outage management of public infrastructure and cultural assets of Greek municipalities via emergency response mechanisms.



Pilot Overview

4.Spain

Pilot on Wildfires in the Aragon Region – Spain

Improve the design of emergency policies related to wildfires and management of controlled fires.



Data for AI

AI TYPOLOGY	DESCRIPTION	PHASE IN THE POLICY CYCLE
Natural Language Processing, Text Mining and Speech Analytics	These AI applications are capable of recognising and analysing speech, written text and communicate back. Perform quantitative and qualitative studies, such as surveys and interviews to understand citizens' needs and identify which of those should be (re)addressed with the help of new or revised, AI-enabled policies	Agenda setting
Analysis of policy options	Build rough prototypes to pre-test related ideas for sustainability and scalability, and iterate if needed	Design
Predictive Analytics, Simulation and Data Visualisation	These AI solutions learn from large datasets to identify patterns in the data that are consequently used to visualise, simulate or predict new configurations	Design
Algorithmic Decision Making	Process of decision making facilitation and automatization, which opens the door to ethical and transparency implications.	Implementation
Security Analytics and Threat Intelligence	These refer to AI systems which are tasked with analysing and monitoring security information and to prevent or detect malicious activities	Evaluation
Analysis of contextual factors and real-time produced data	Complement available evidence with e.g. fresh environmental or perception data generated through interacting with the stakeholders who are to be served	Evaluation

Data Economy is the Real Fuel of AI

Interesting recommendations from AI HLEG (2019)

- Set up national and European data platforms for AI that include all necessary tools for data governance, annotation, and storage, next-generation networks, analytics software and, most importantly, datasets through a structural and investment fund
- Consider European data-sharing infrastructures as public utility infrastructures
- Support an EU-wide data repository through common annotation and standardisation.
- Support research on and development of industrial solutions for fast, secure and legally compliant industry data sharing (e.g. encryption) and stimulate sharing of industry data
- Foster the creation of trusted data spaces for specific sectors (e.g. healthcare, automotive and agri-food) where actors in a given value chain accept to share data, yet the rights related to the data rest with end users and/or the stages of the value chain where most of the value is being created
- Develop mechanisms for the protection of personal data, and individuals to control and be empowered by their data, thereby addressing some aspects of the requirements of trustworthy AI.
- Create a data donor scheme, allowing individuals to donate data for specific purposes, surrounded by clear governance and transparency, and safeguards for privacy protection
- Consider the introduction of a data access regime on FRAND terms, namely fair, reasonable, and non-discriminatory.

Thank you for your attention.

francesco.mureddu@lisboncouncil.net



Data Driven Policy Cluster

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DUET - Digital Twin technology for data-driven policymaking

Demo

Jurgen Silence, Digital Flanders



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Demo - Pilsen, Czech Republic

Simulation - closure of a bridge



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Pilsen - model interactions

- Event based simulation of model interaction
- Not in open beta version yet, sneak preview
- Event : closure of a bridge
- Results :
 - impact on traffic (traffic models of P4All and KULeuven)
 - impact on air quality (P4All & TNO model)
 - impact on noise (TNO model)



DUET PILSEN CASE

Closure Patton bridge





DUET PILSEN CASE

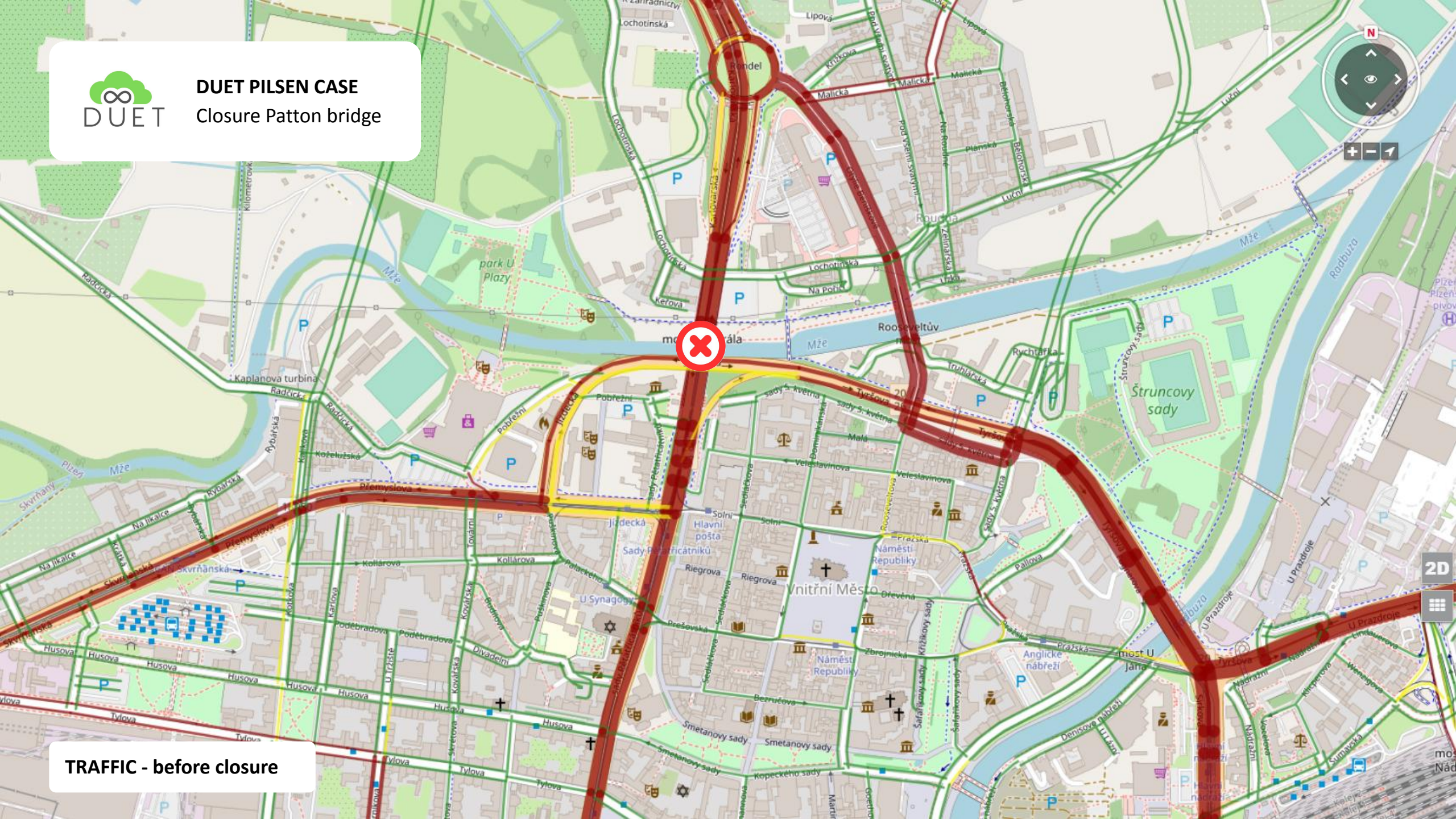
Closure Patton bridge





DUET PILSEN CASE

Closure Patton bridge

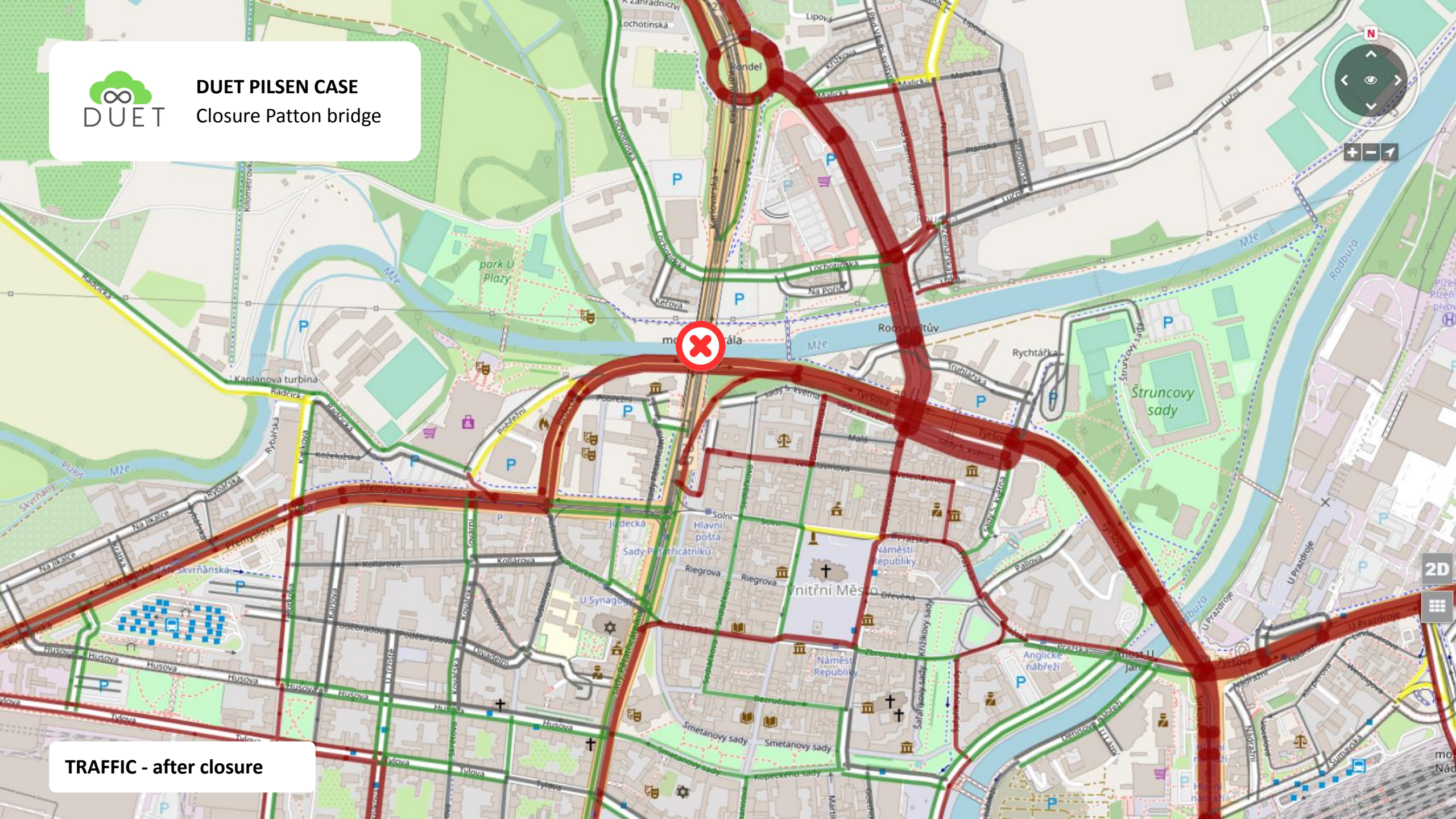


TRAFFIC - before closure

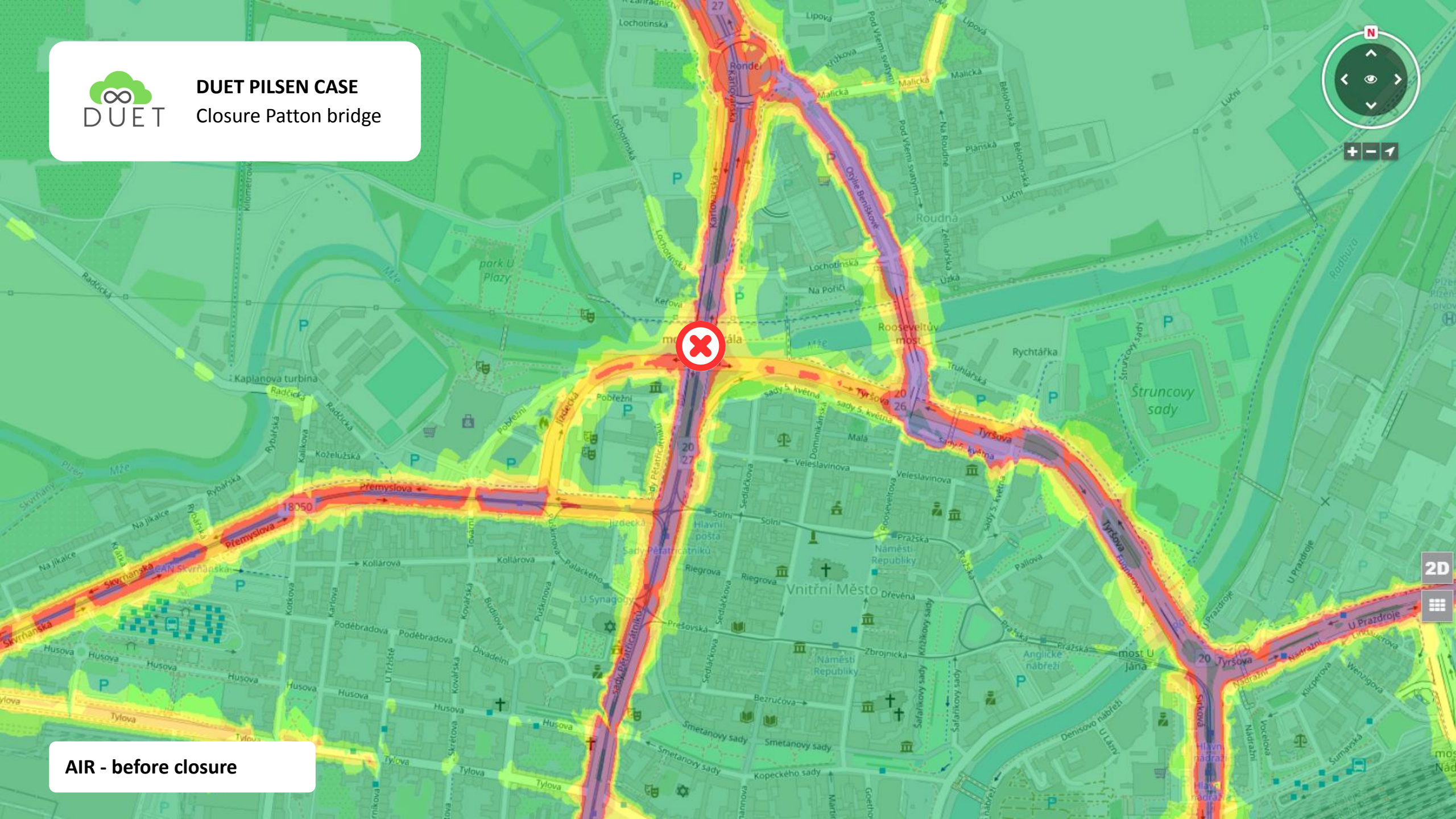


DUET PILSEN CASE

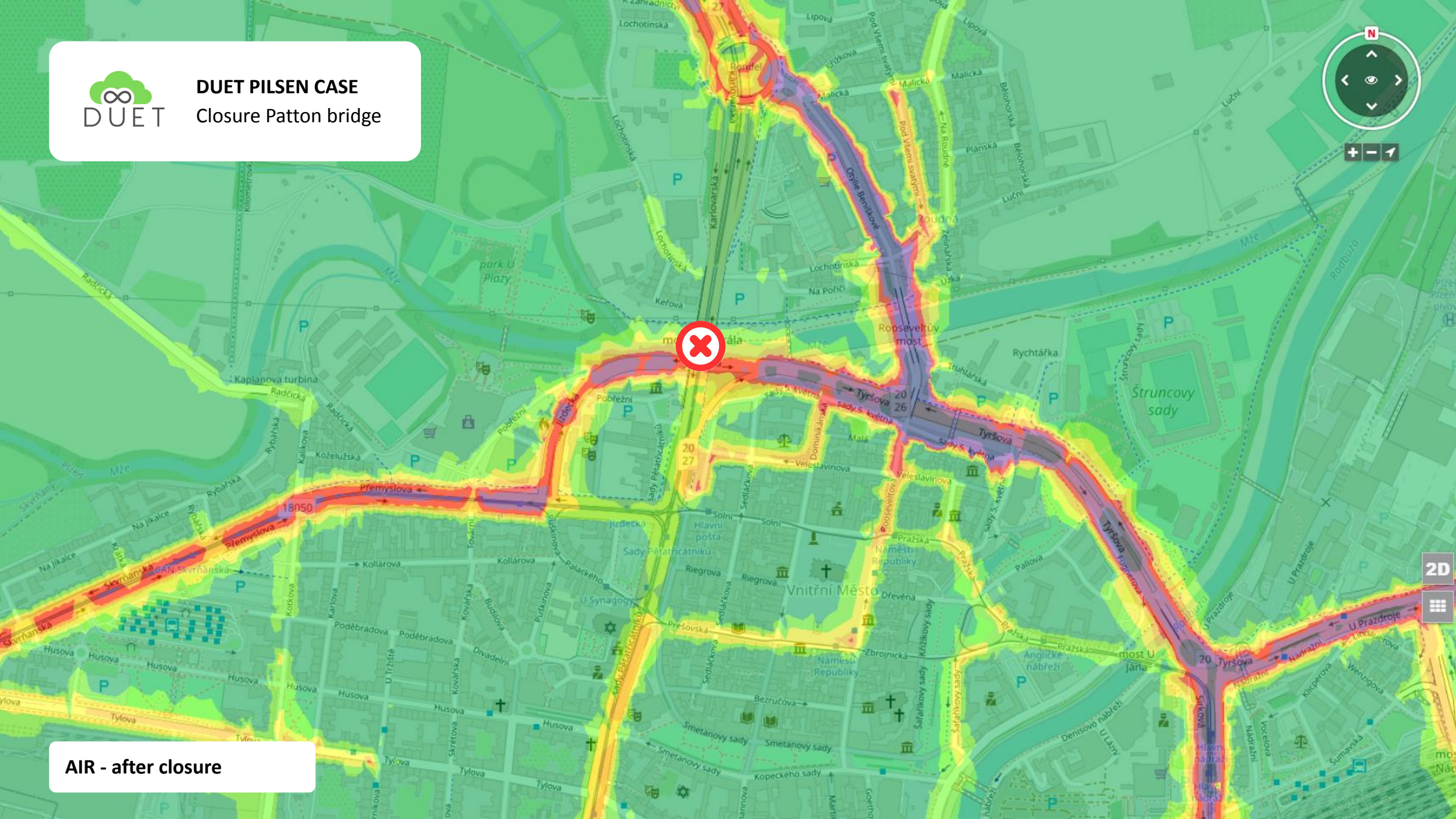
Closure Patton bridge



TRAFFIC - after closure



AIR - before closure



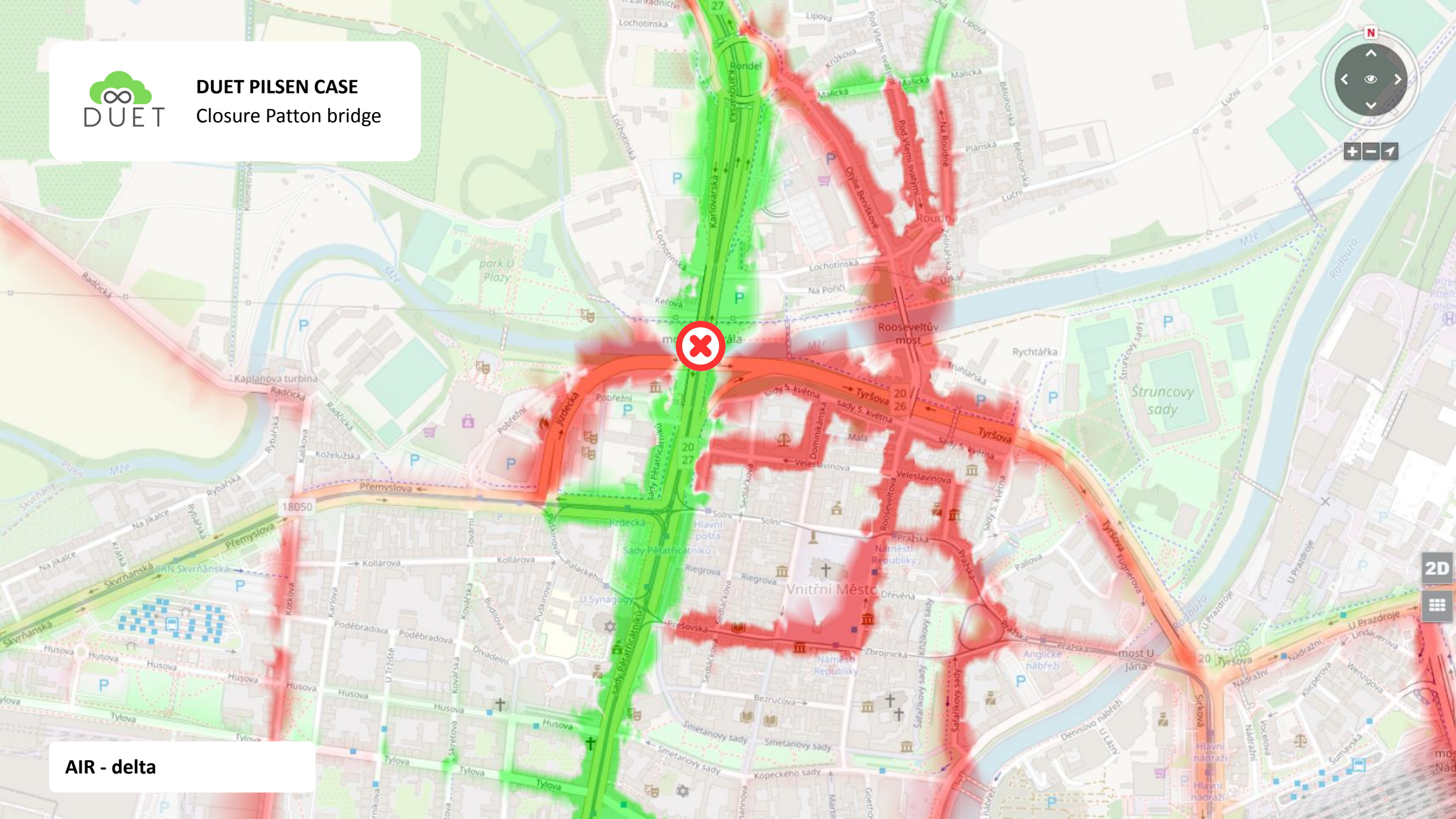
AIR - after closure



DUET PILSEN CASE

Closure Patton bridge

AIR - delta









Data Driven Policy Cluster

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Demo - Antwerp, Flanders Crowd monitoring



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Antwerp - Cityflows project

- Monitoring crowd
- Interesting for Covid-19 crowd control
- Specific test zone in Antwerp
- Motorised and non-motorised (cyclists and pedestrians)
- Sensor data - telraam, counting loops, smart traffic lights, ...
- Also - telecom data, wifi scanning, floating car data, ...
- Result : visualisation of traffic/crowd per street segment, 24h



Content

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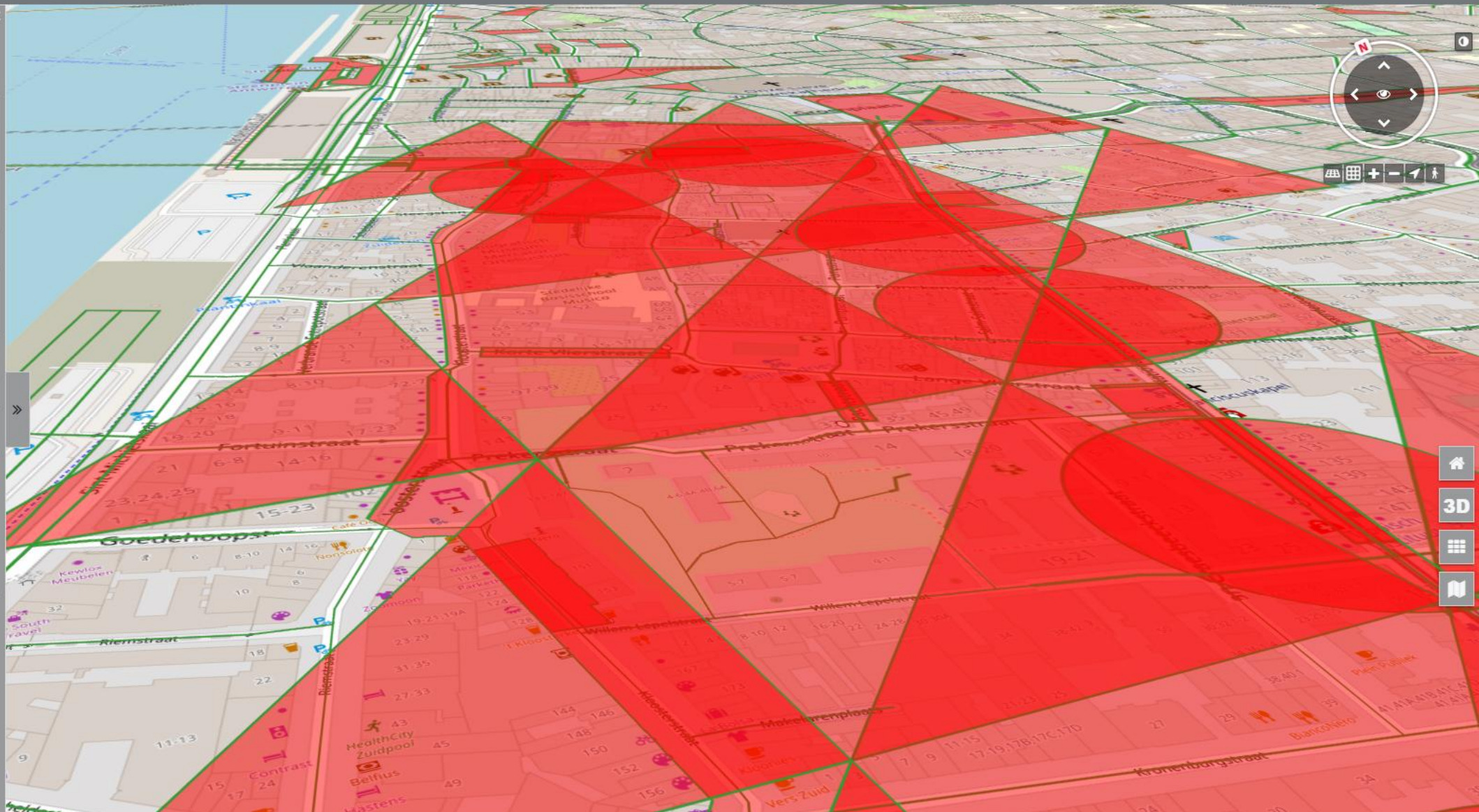
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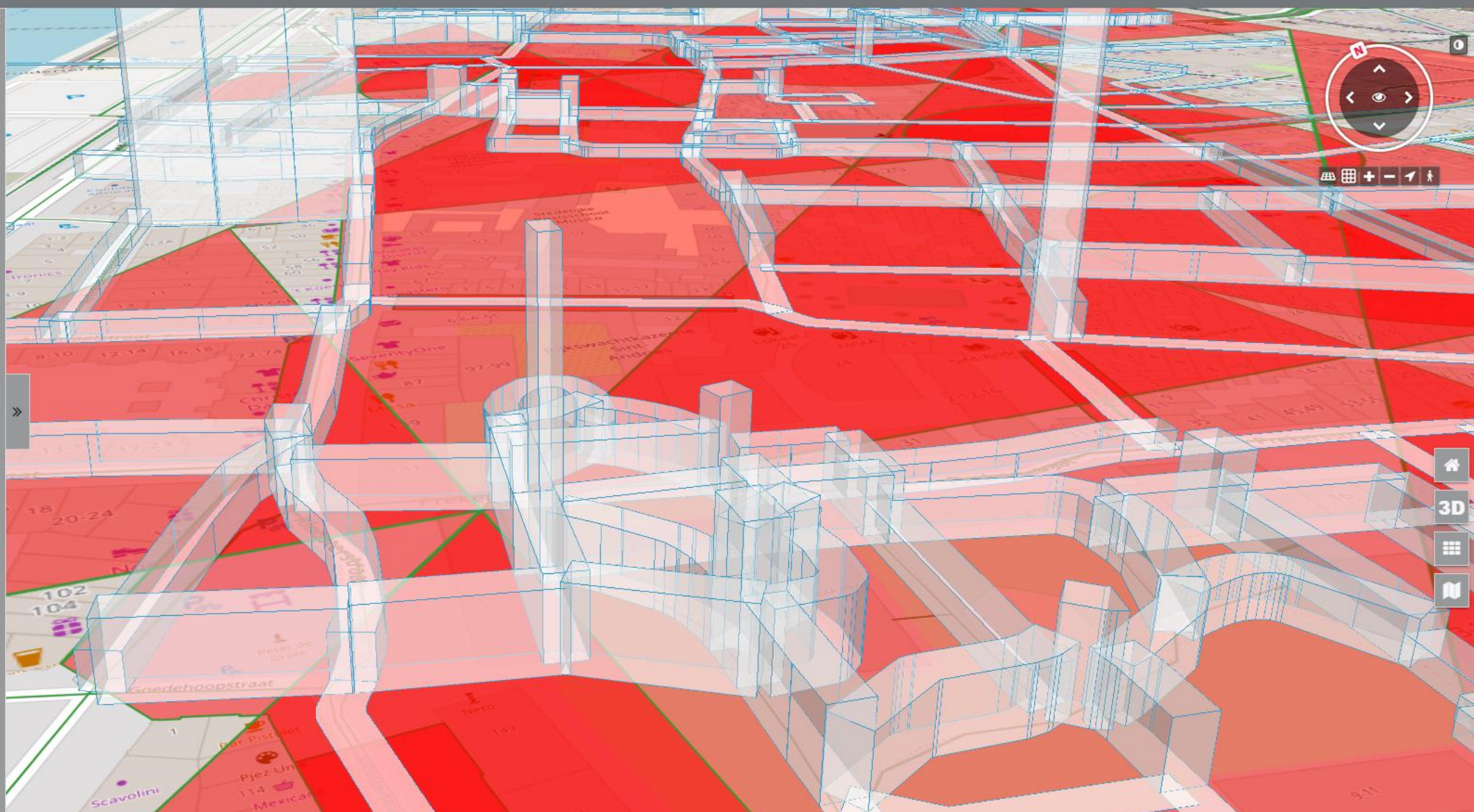
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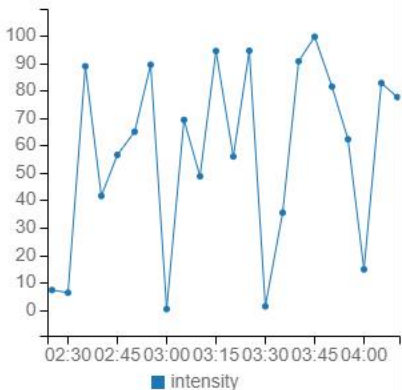
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CityFlows results

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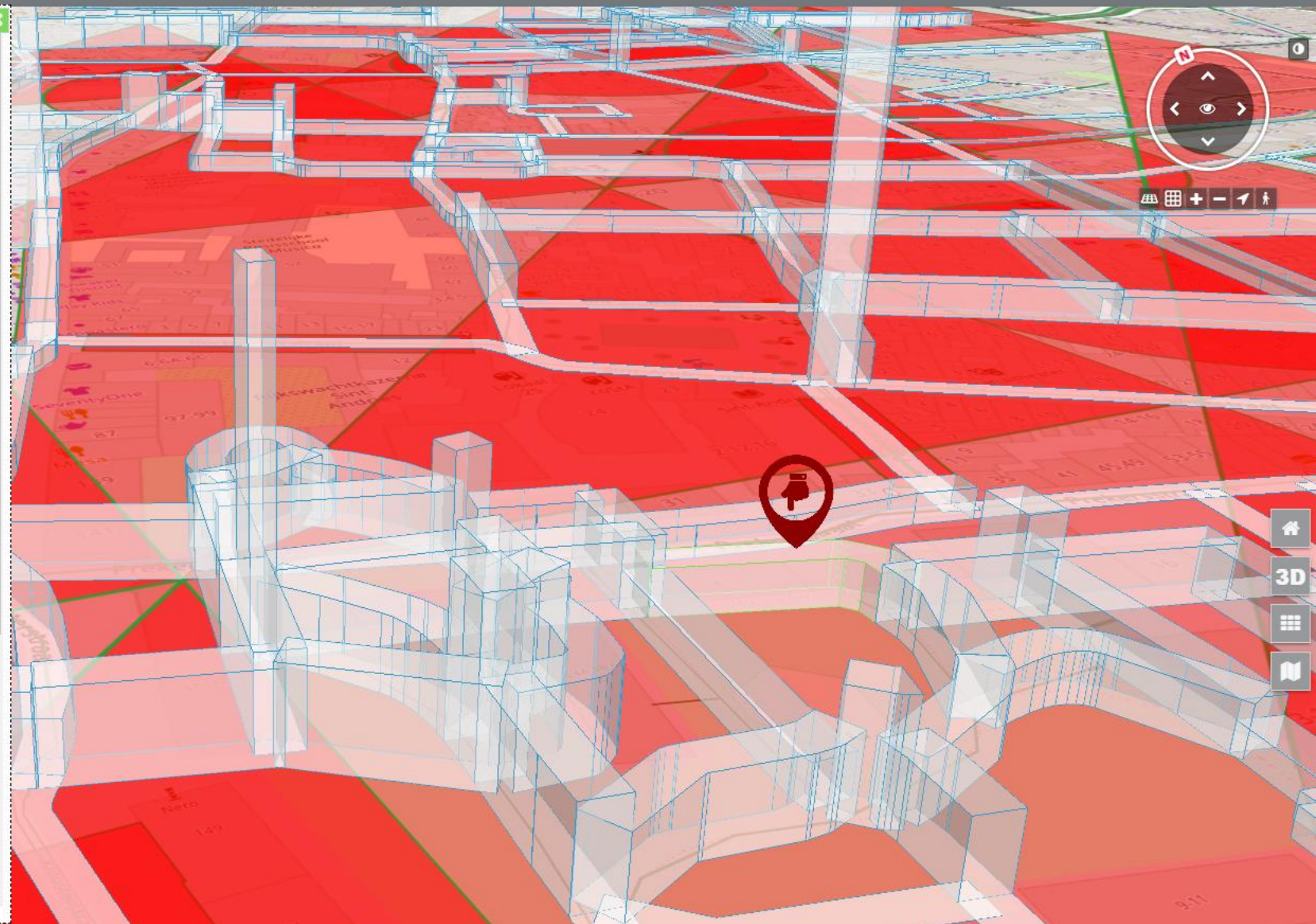
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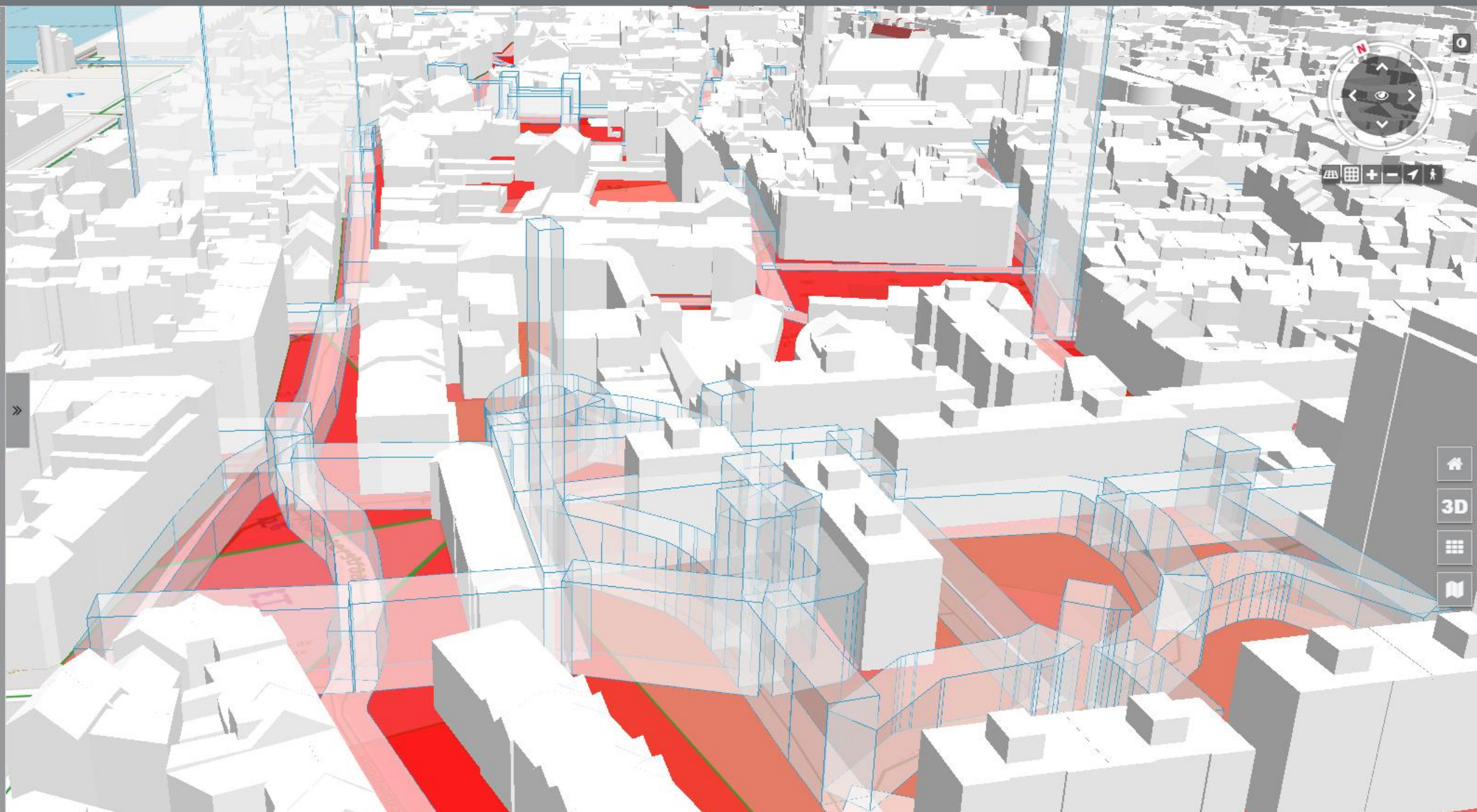
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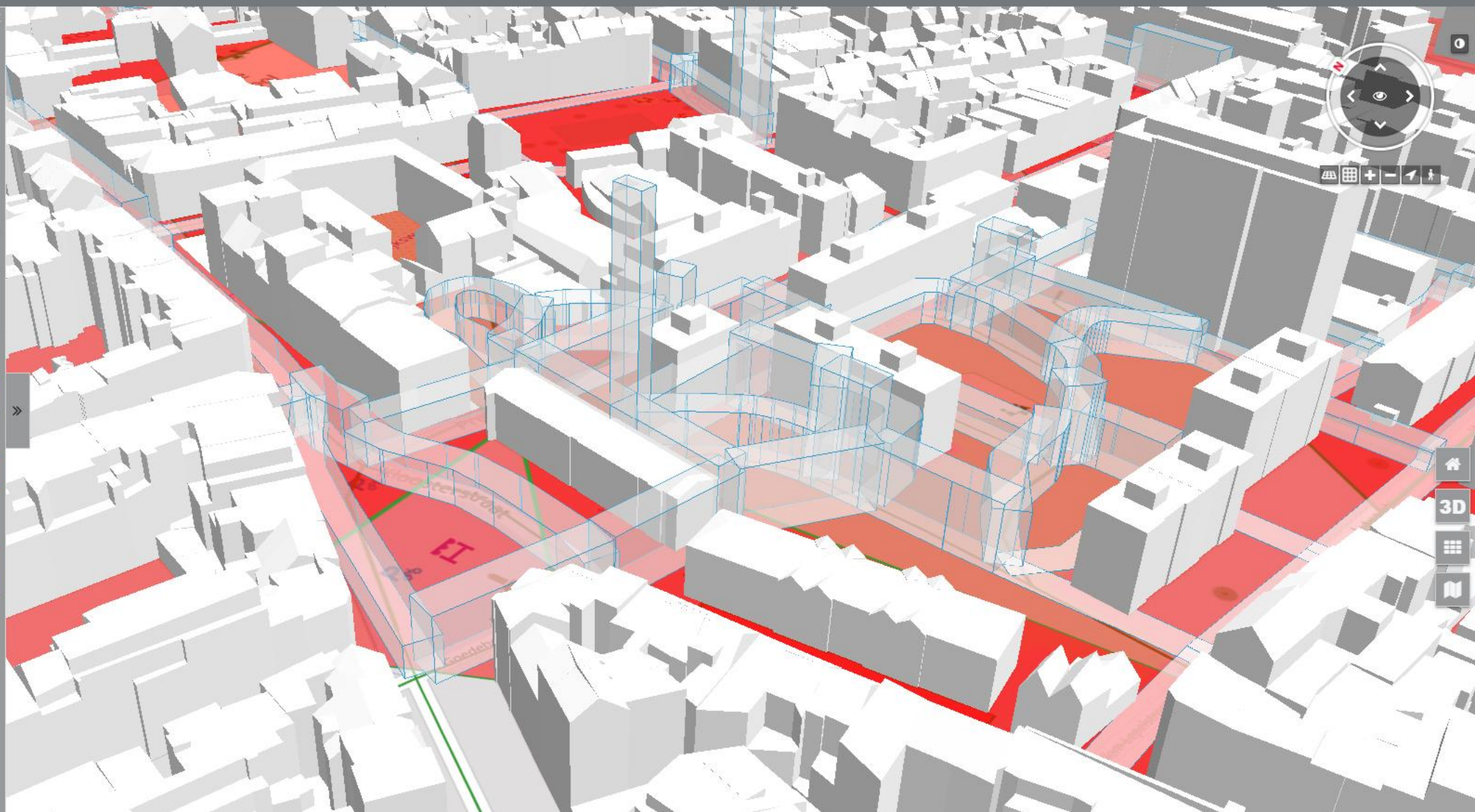
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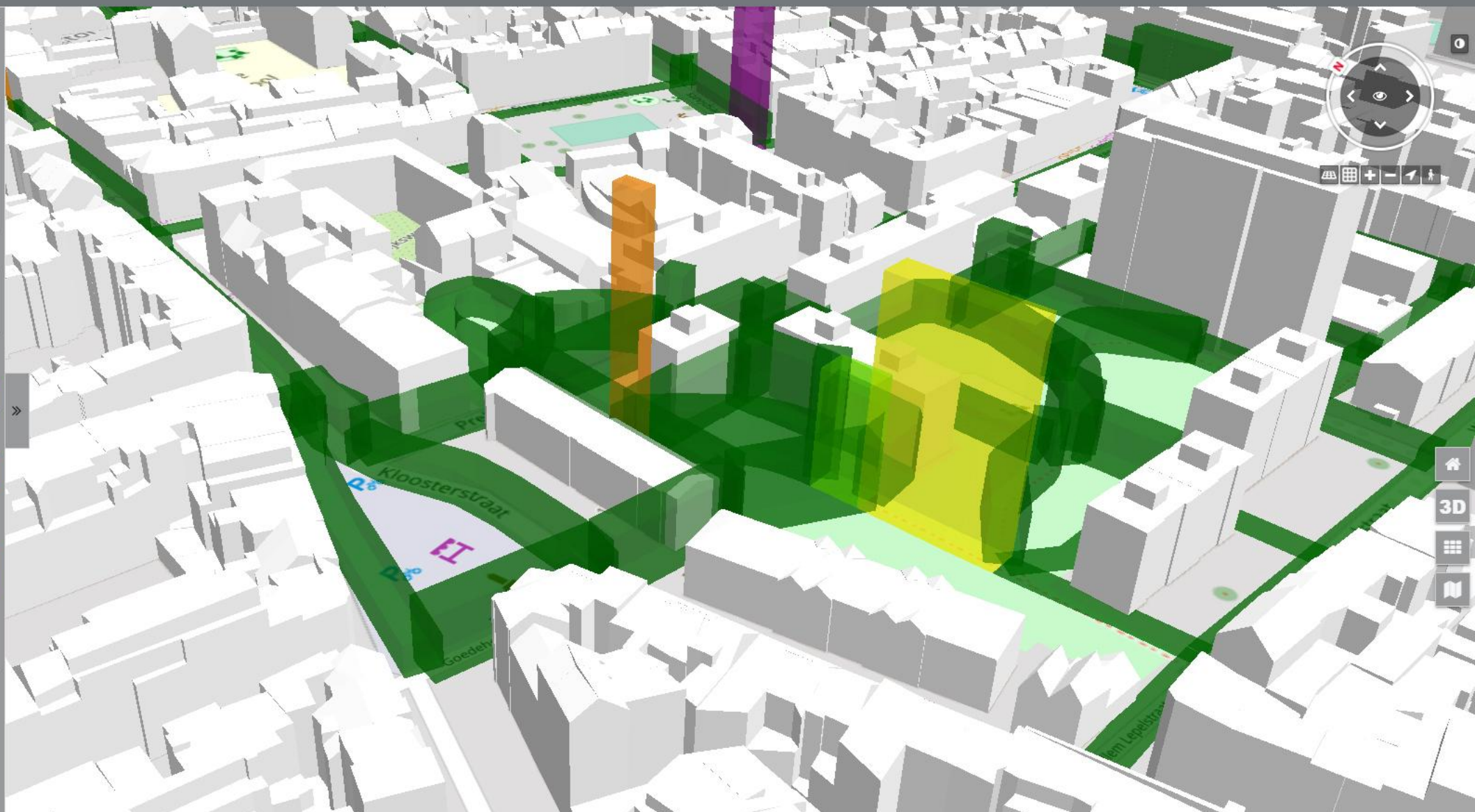
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Using the IntelComp platform in the process of science and innovation policy

Joseba Sanmartín (Spanish Foundation for Science and Technology – FECYT)

December 10, 2021

Evidence Based Policy Making in Europe Summit 2021



Content

1. Some ideas on “evidence-based policy-making”
2. IntelComp Platform basics
3. Using the IntelComp Platform to monitor impact

1. Some ideas on “evidence-based policy-making” (Howlett, 2019)

- The concept of “evidence-based policy making” is complex and not yet clearly defined.
- The latest in a series of efforts to enhance the efficiency and effectiveness of public policy-making through the application to policy formulation of an evaluative rationality.
- Evidence-based policy making represents an effort to reform the process of policy formulation in such a way as to minimize non-design spaces.

1. Some ideas on “evidence-based policy-making” (Howlett, 2019) (cont.)

- Evidence? The known relationships between policy instruments and policy goals, e.g. evaluation studies on the results or impacts of specific instruments, or the predictions of the impact of different instruments.
- Some concerns about the increased emphasis on evidence in policy making, e.g. the use of evidence in policy making requires that policy actors have the analytical capacity to carry out those evaluation studies or those predictions.
- The IntelComp platform is not designed to predict the impact of different instruments, but it may modestly help to monitor the impact of specific policy interventions.

2. IntelComp Platform basics

- It will be able to analyze large volumes of unstructured text data, using AI tools in High Performance Computers
- Designed to assist Public Administrations in several stages of the STI policy-cycle: agenda setting, implementation and monitoring
- It will be able to exploit text available in traditional and new sources of (open) data, in order to gather new (complementary) measurements.
- It will provide information for specific tasks and interventions of STI policy, which will not be applicable to other tasks or interventions.

3. Using the IntelComp Platform to monitor impact

- Monitoring? “A continuous and organized process of systematic data collection (or access) throughout the life cycle of an initiative to oversee its progress. Monitoring is necessary to generate information that feeds into future evaluation [...]. Monitoring generally involves tracking progress with respect to previously identified targets or objectives” (EC, 2021)
- Impact? The effects of a policy intervention on its general objectives.
- In order to monitor progress towards the general objectives of an intervention, one has to measure inputs, outputs, results and impacts related to the intervention logic, to the extent of available data.

3. Using the IntelComp Platform to monitor impact (cont.)

- Given a specific intervention logic, the IntelComp platform will use text analysis:
 - *To describe direct links of impact to funding.* For instance, we can analyze the texts of inputs, outputs, results and impacts, related via acknowledgements.
 - *To detect indirect links of impact to funding.* For instance, we can analyze the texts of several collections of documents concerning inputs, outputs, results and impacts, not directly connected.



<https://intelcomp.eu/>

@IntelComp_H2020

Joseba Sanmartín (joseba.sanmartin@fecyt.es)



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 101004870. H2020-SC6-GOVERNANCE-2018-2019-2020 / H2020-SC6-GOVERNANCE-2020

Panel Discussion- Forging the future with policy impact analysis & prediction

- Why is evidence-based policymaking important?
- What are the challenges policymakers face when forging the future with policy impact analysis & prediction?
- What is your recommendation to policymakers when looking to implement impact analysis & prediction tools for evidence-based policymaking?





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