

Pilot Action: DEBRECEN

Improving public transport and city traffic management using Open Data

How Debrecen is using Open Data for improving sustainable mobility in the city and the quality of the public transportation service

 **Location:** Debrecen, Hungary

 **Project partner:** DKV Zrt, Debrecen Public Transport Company

 **Focus:** traffic management, public transport service development, smart urban mobility

 **Data:** road traffic data, public transport operation data, climate and weather data

 **Tools:** IoT magnetometers (wireless, autonomous magnetic traffic flow detectors), LoRaWAN gateway network, Grafana dashboard, ArcGIS dashboard, weather and air quality sensor network

 **Stakeholders:** Debrecen University, City of Debrecen (local authority, city operator company), Debrecen Economic Development Centre, Debrecen Environmental Monitoring System, Agora Science Center, Hungarian Roads Ltd, Hungaromet Ltd, Future of Debrecen, local SMEs, CityOne Srl, Citiq Srl

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the European Union

EnCLOD

CONTEXT

Driven by rapid industrial development and population growth, **Debrecen is facing increasing mobility demands**, heavy traffic, and daily congestion. The city aims to strengthen data-driven territorial governance by improving the collection, integration, and analysis of mobility-related data. A better understanding of traffic patterns supports **evidence-based public transport planning**. These efforts contribute to the city's broader objective of promoting sustainable mobility, reducing private car dependency, and developing innovative digital solutions that improve accessibility and quality of life for citizens.

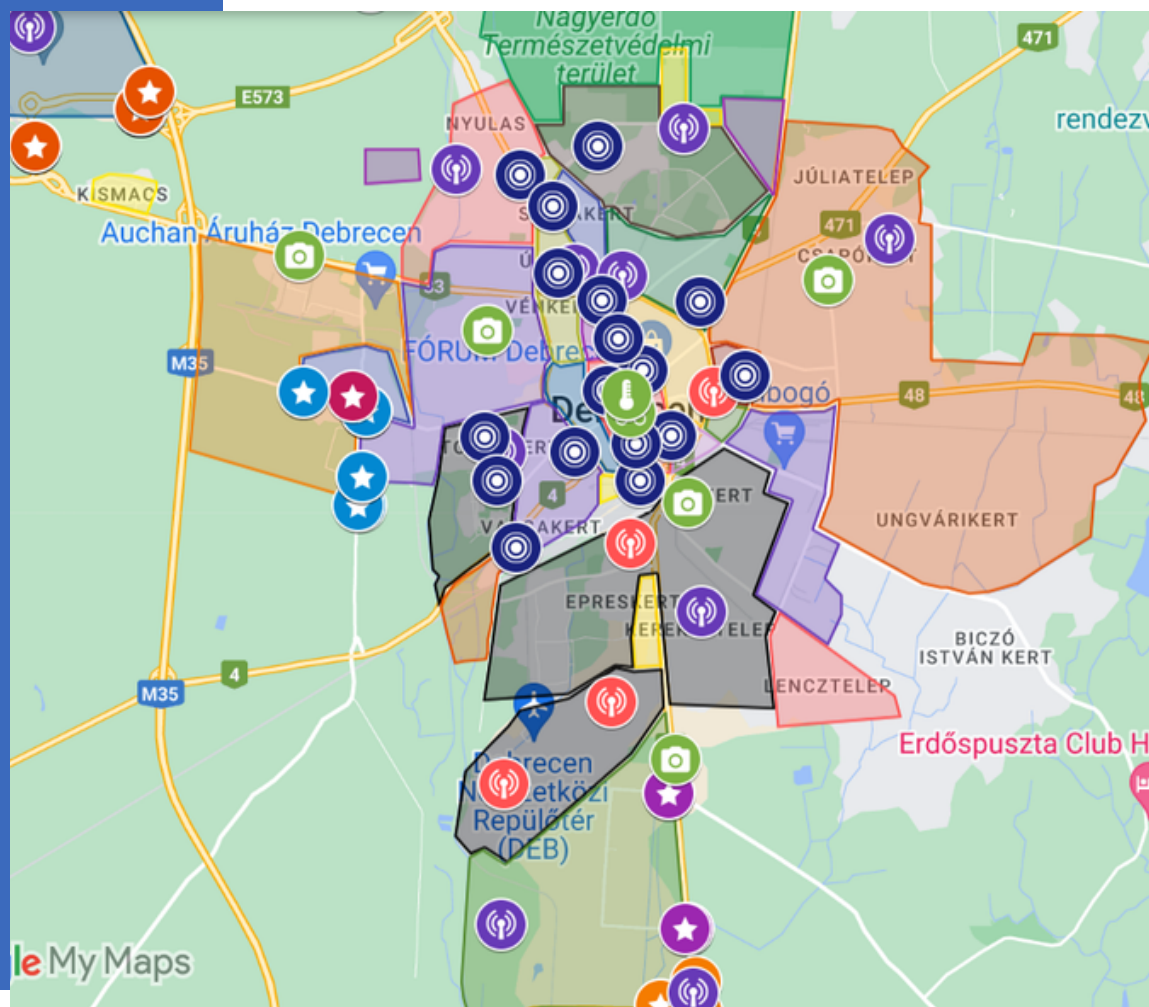
WHAT WAS IMPLEMENTED

To **better understand traffic patterns** in newly developed areas and **support data-driven mobility planning**, DKV Zrt. complements public transport data with traffic sensor data, enabling more informed decisions to improve service quality and promote a shift towards sustainable mobility.

To do so, the pilot successfully implemented a **sensor network of 42 new EnCLOD traffic counter sensors**. The network provides near real-time data on vehicle counts, classifications, and speeds, which are made available through the project's analytical platform under an **Open Data license**. These datasets form the basis for the development of the **Traffic Management Tool**, designed to enhance the quality of services provided by DKV Zrt. In the future, the tool could also be integrated with the City Traffic Operation Centre, an initiative led by the City of Debrecen.



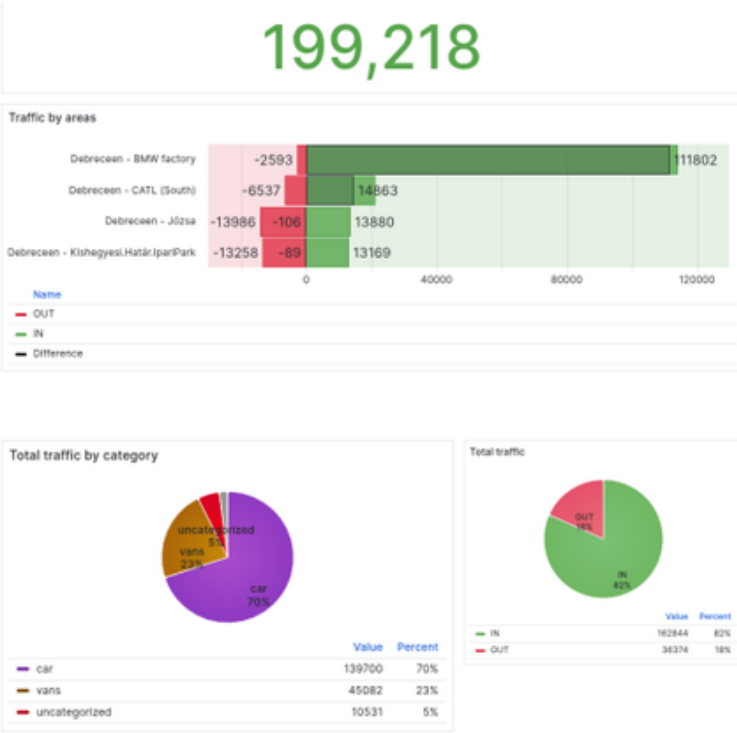
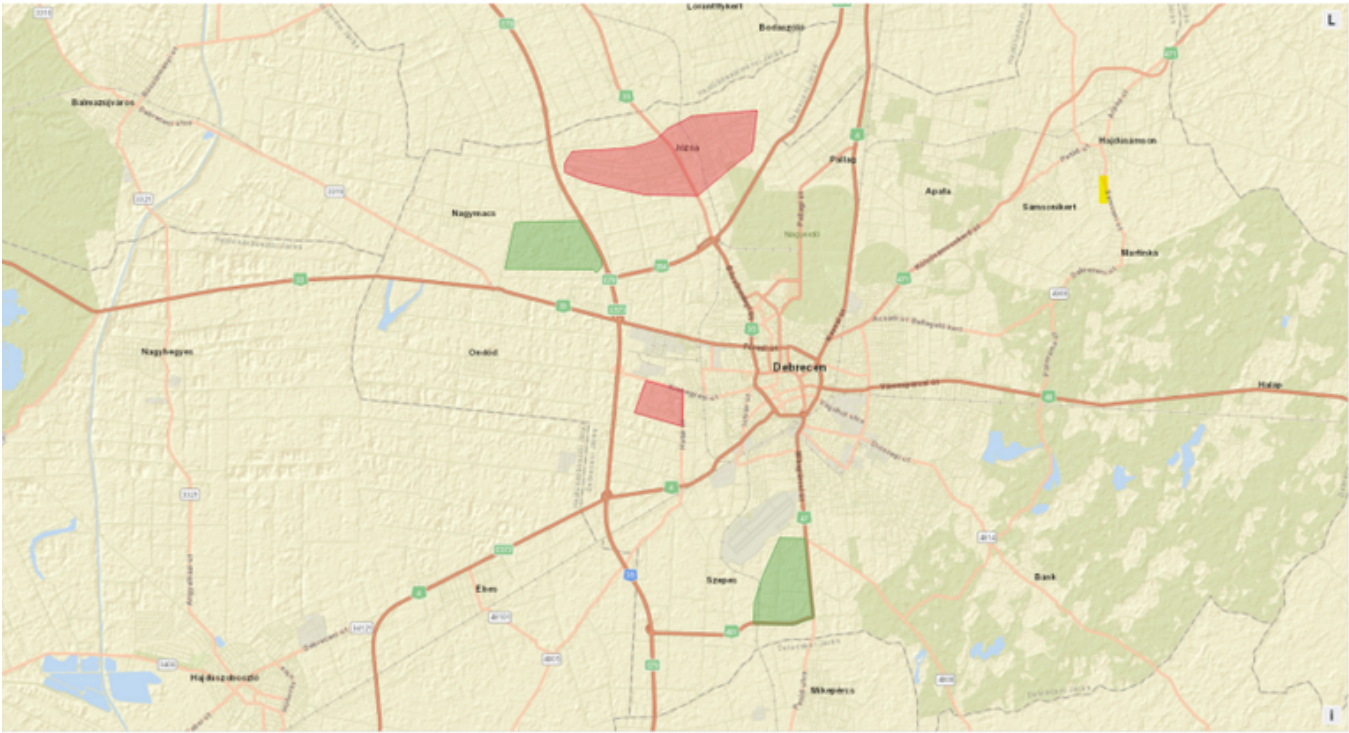
Traffic sensor in Debrecen. Photo credit: DKV



EnCLOD traffic sensors and other data sources in Debrecen

MAIN RESULT

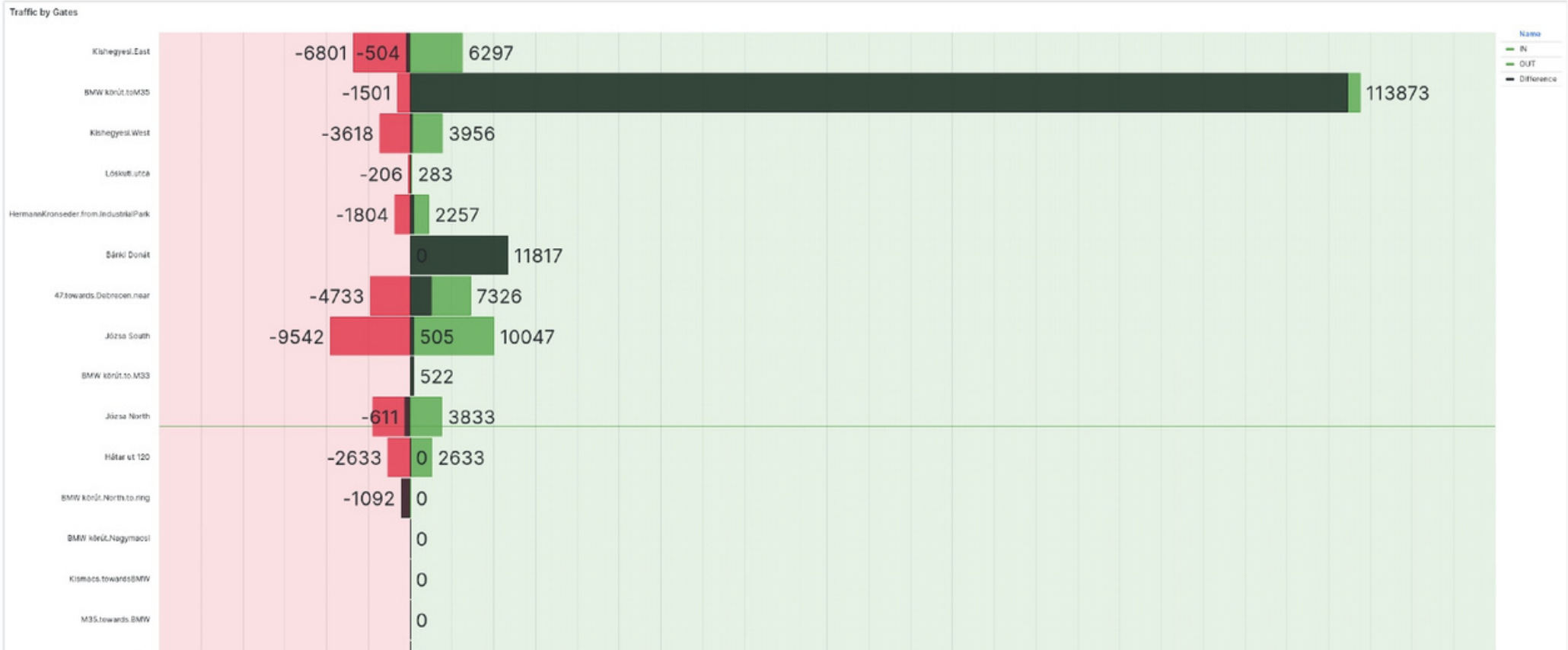
- **Deployment of a sensor network of 42 new EnCLOD traffic counter sensors**
- **Integration of data-driven approaches into governance and transport management.**
- **Publication of EnCLOD traffic Open Data datasets**
- **Organisation of 1 Open Data Hackathon and** adaptation of Hackathon solutions on the city level
- Delivered **training sessions** and **4 public events**
- **Development of a web application** with an open data mapping of Debrecen microzones - with the support of UPOL



Traffic sensor network dashboard. Available [here](#).

Areas daily change test 2/2

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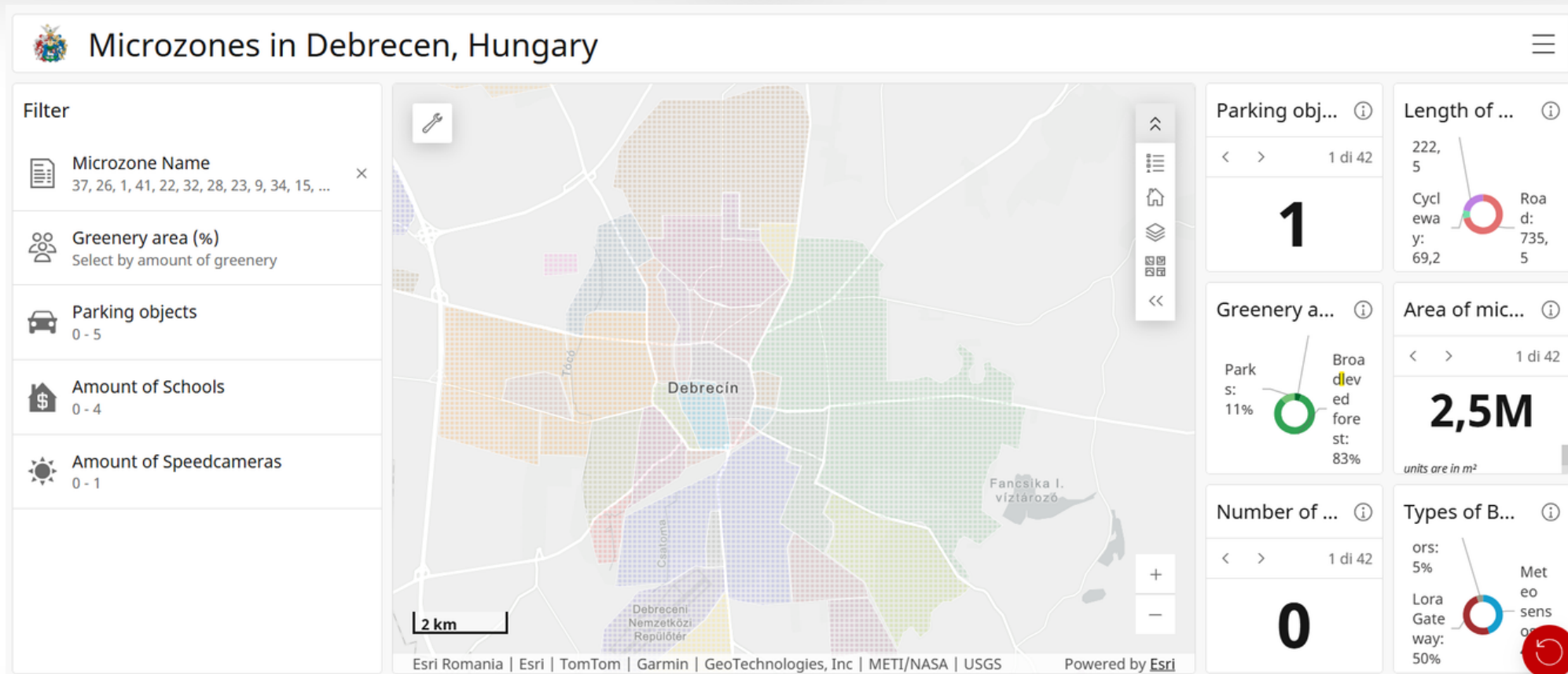
Traffic sensor network dashboard. Available [here](#).

IMPACT ON LOCAL GOVERNMENT AND THE CITY

The Pilot Action strengthened local governance by providing reliable traffic data for evidence-based decision-making. It enabled the city to improve the traffic planning, boosting sustainable mobility strategies and improving the quality of the public transportation service.

IMPACT ON CITIZENS/STAKEHOLDERS

Citizens benefit from smarter traffic planning and a better quality of the public transportation service. Local citizens and stakeholders are involved as active players in local events, and they can benefit from the availability of open datasets on traffic and public transportation.



Debrecen Microzoning ArcGIS dashboard . Available [here](#).

FUTURE GOALS

- **Integrate traffic, energy, meteorological, and environmental datasets** to support holistic urban planning and evidence-based decision-making.
- **Incorporate new traffic datasets** into city transport planning, with a particular focus on mobility in newly developed industrial areas.
- **Use meteorological, energy, and environmental data to support sustainability initiatives**, including the Sustainable Urban Mobility Plan (SUMP) and the Green Codex.
- **Increase citizen engagement** by publishing validated datasets through publicly accessible dashboards, enhancing transparency and awareness.
- Strengthen knowledge sharing and capacity building through **collaboration with the University of Debrecen**.
- **Optimize public transport route planning** by combining passenger journey planning data from the DKV Zrt. mobile application with timetable information, route data, and EnCLOD traffic datasets to **enable more dynamic and efficient public transport operations**.

ABOUT THE PROJECT

The project EnCLOD aims at strengthening the governance capacity of 5 local public authorities in Central Europe by promoting the use of Open Data (OD) and the Internet of Things (IoT) sensor networks. This initiative strengthens multi-level governance, promotes civil society involvement, and fosters public-private collaboration. Within the five pilot areas - Vicenza (Italy), Olomouc (Czech Republic), Debrecen (Hungary), Zilina (Slovakia), and Nova Gorica (Slovenia) - a specific challenge related to mobility/transport, environment, or climate change policy area is addressed through the development of 5 local Action Plans for the effective usage of Open Data and IoT opportunities for territorial governance and city-region planning. Furthermore, project activities will significantly increase awareness and knowledge of public authorities on OD and IoT potentialities for territorial governance, through case study collection and capacity building activities. Citizens' engagement will be enhanced through the organisation of events like "hackathons" and raising awareness activities.



PARTNERS INVOLVED IN THE PILOT ACTION OF DEBRECEN



OTHER PROJECT PARTNERS



Disclaimer

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