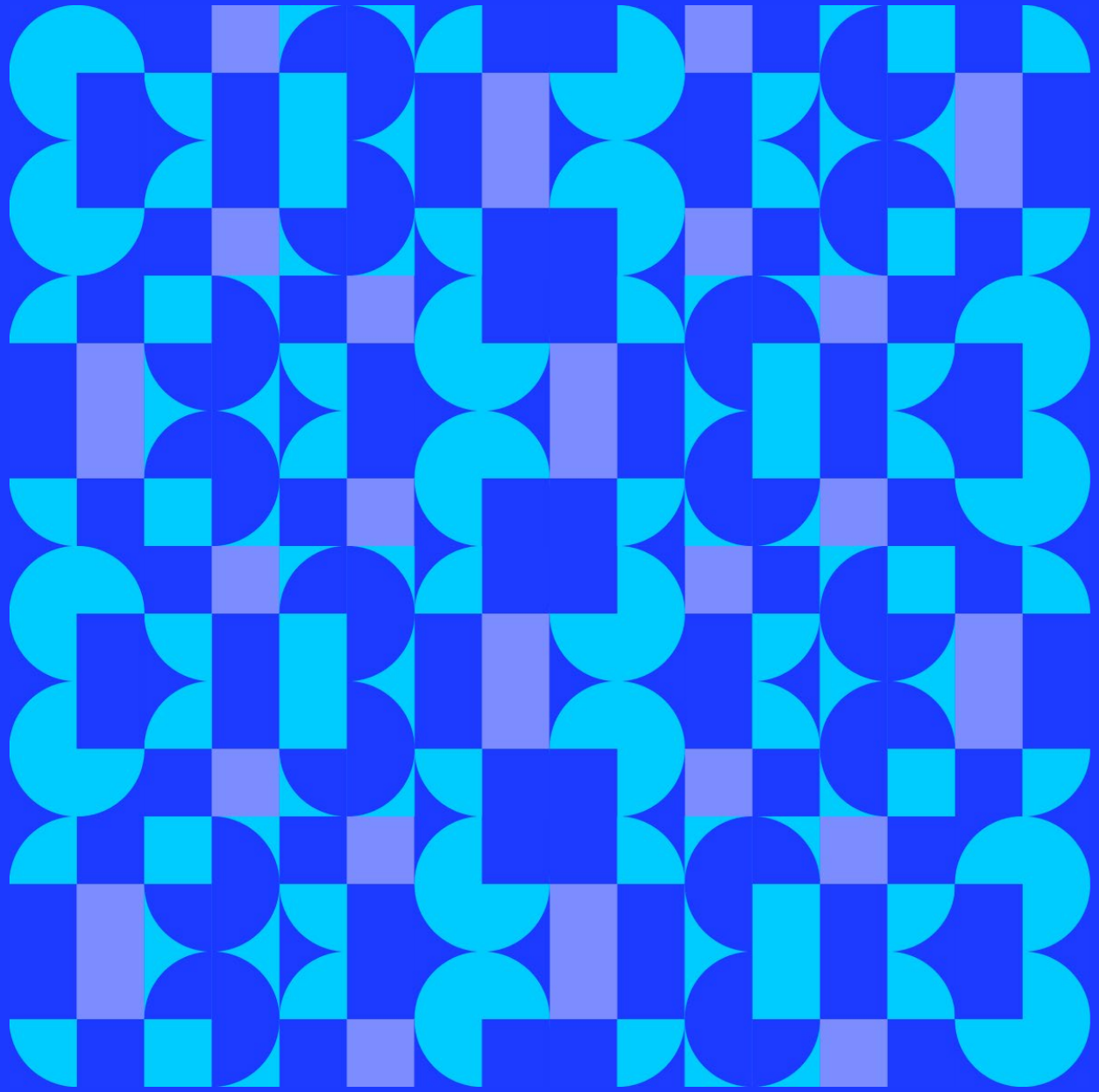
beopen

HERNE pilot

AI-Tools for Street Management Investments

Stadt Herne



Pilot.Herne – Initial situation

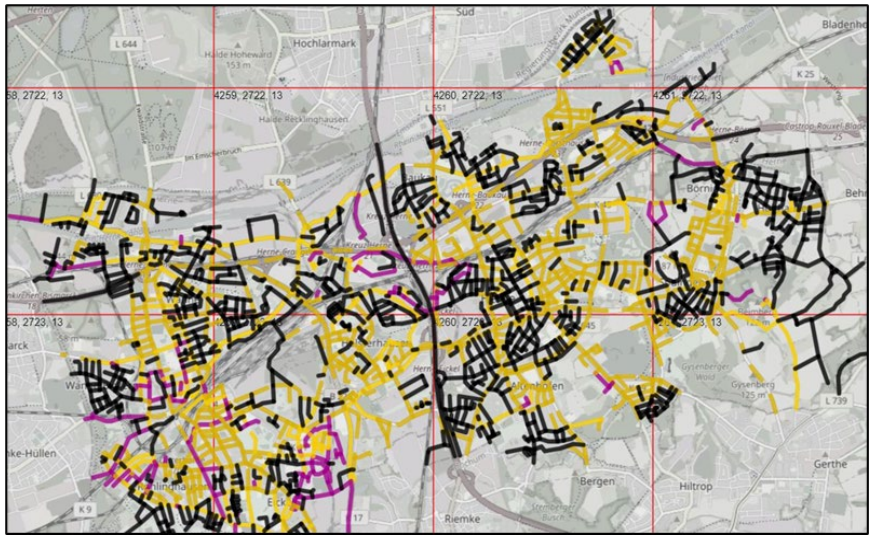
- Extensive Road Network: 400 km of roads to maintain
- Inefficient Traditional Methods:
  - Relies on manual inspection and individual assessments
  - Time-consuming, costly, and slow to adopt
  - No real-time data
- Lack of Real-time Data:
  - Leads to delayed repairs
  - Results in higher maintenance costs
  - Causes inefficient resource allocation

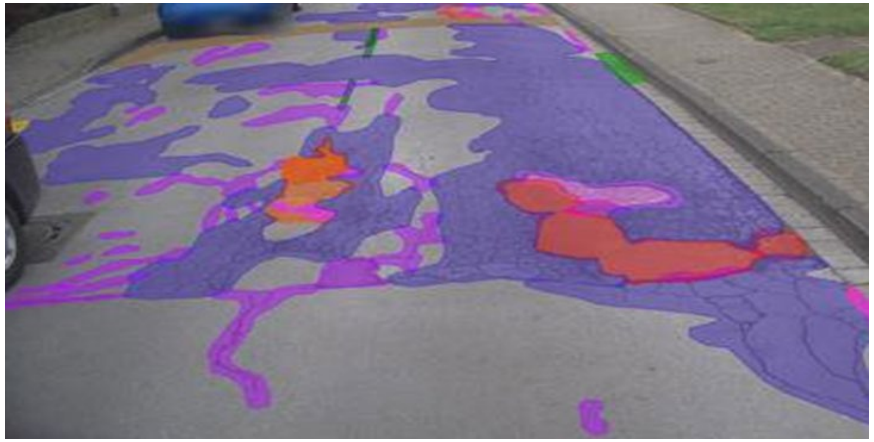
Pilot.Herne – Performed activities

Solution: Development of a Smart Road Condition Management System (SRCMS)

- Data Collection (since September 2023):
  - Vehicles equipped with cameras, sensors, and mini-PCs.
  - Collecting road surface data every 10 meters.
  - Data includes GPS coordinates, images, and timestamps.

- Real-time Analysis:
  - AI is used to detect and classify road damage in real-time.





Pilot.Herne – Performed activities

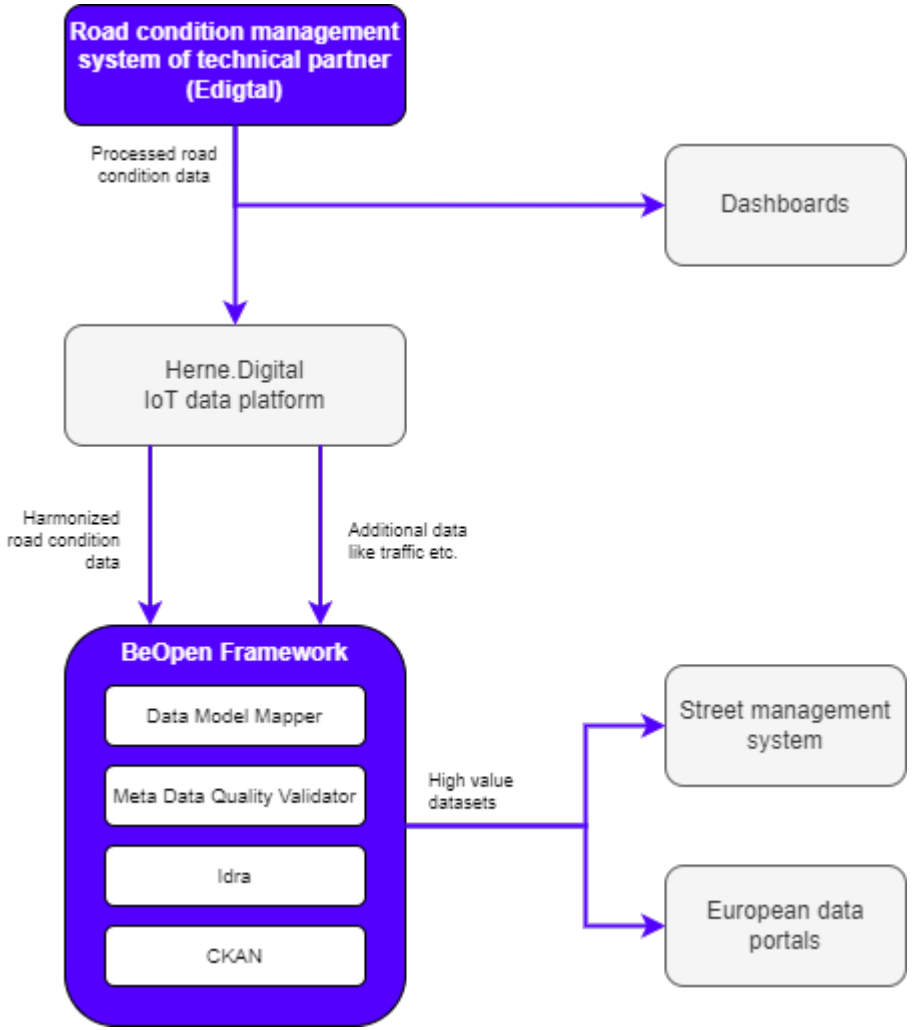
Initial Data Access: Limited, read-only via external data hub

Digital Service & beOpen:

- Retrieves and integrates road condition data with other urban systems
- beopen portal Ensures quality, interoperability, and broader sharing (e.g., EU portals)

Impact:

- Enables comprehensive lifecycle management for infrastructure
- Reduced road repair costs, less traffic disruption



Pilot.Herne – Achieved Results & used HVDs

Dataset	Use	Score Baseline	Score Achieved
Road condition	Development of DS and Demonstrator	22%	100%
Road traffic	Development of DS and Demonstrator	22%	100%
Speed zones V1.0	Development of DS	73%	100%
Main Traffic Routes - Climate Analysis (2017) V1.0	Development of DS	73%	100%
City Boundaries V1.0	Development of DS	73%	100%
Construction Sites V1.0	Development of DS	73%	100%
Areas with High Heat Load and Vulnerability	Development of DS	73%	100%

Pilot.Herne – Stakeholder involvement

- Department of civil engineering and transport
  - Owner of the project
  - Responsible for road maintenance
- Department of digitzation
  - Responsible for the operation of domain-specific applications
- Edgital
  - Technical partner
  - Manufacturer of the road condition management system
- Herne.Digital
  - Implementation of the digital service
  - Operation of smart city infrastructure

Pilot.Herne – Lessons learnt

Pilot Project Challenges

- Ongoing Development: Road condition detection system & the digital service are still under development
- Iterative Adaptations: Requires continuous evaluation and adjustments (e.g., data models, API specs)
- Future Lesson: Avoid basing future pilots/POCs on projects in equally early development stages

Early Stakeholder Involvement

- Diverse Input: Stakeholders offer varied perspectives, experience, and expertise
- Better Understanding: Early engagement clarifies concerns and expectations
- Increased Acceptance: Promotes "buy-in" and reduces resistance to the project

Pilot.Herne – New approach after adopting BeOpen?

Data Utilization:

- Data now available for urban systems
- Basis for future decisions

Data Portal:

- Proven effective for data provision.
- Potential for ensuring EU guideline compliance when publishing High-Value Datasets

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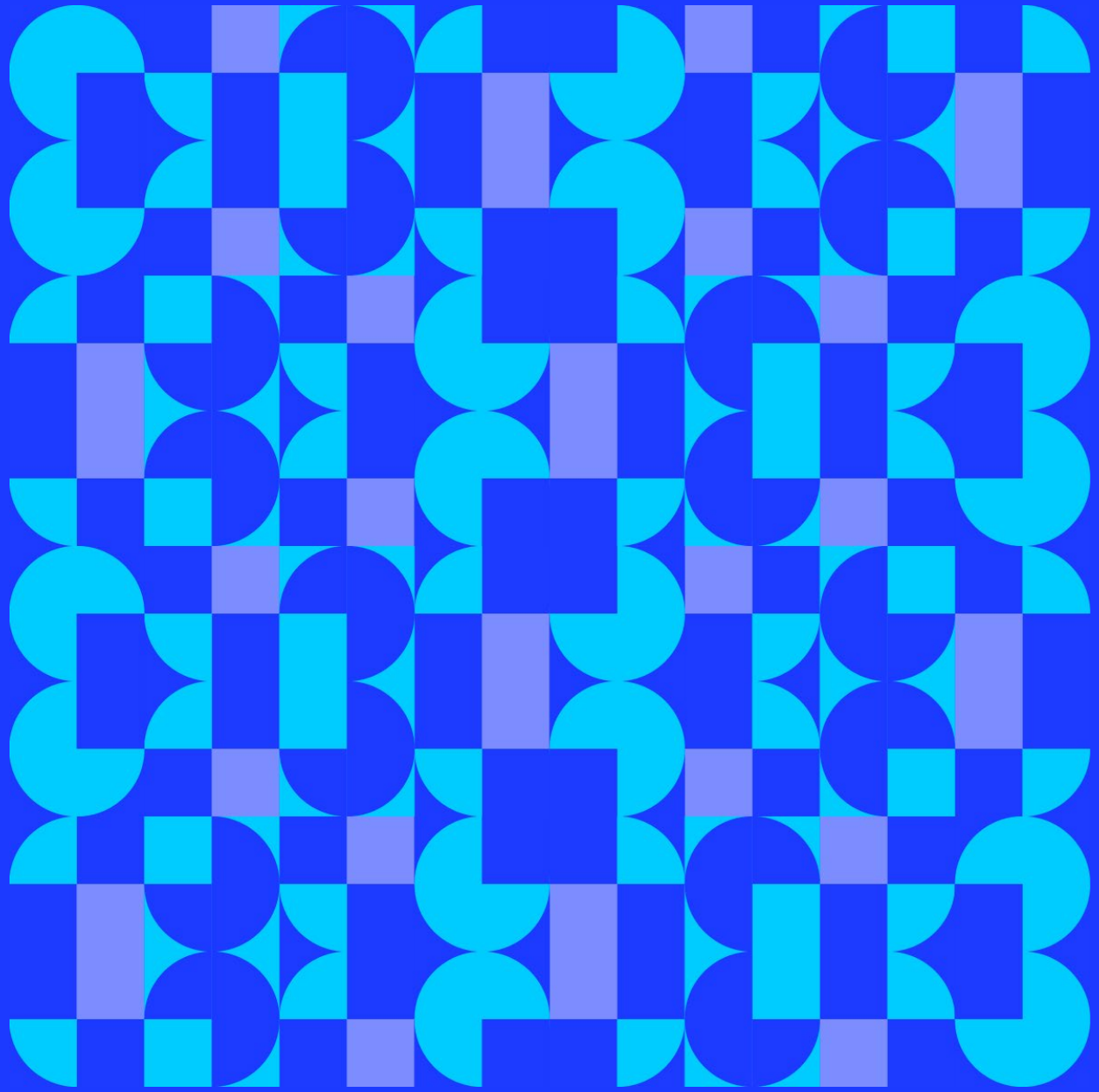
HERNE pilot

Management of Large-Scale Events and Civil Protection



Stadt Herne

Pilot.Herne – Initial situation

Herne & Cranger Kirmes:

- Herne: large city (150k inhabitants) in the densly populated ruhr area (5m inhabitants)
- Cranger Kirmes: annual major event
  - second largest fair in Germany
  - 4m vistiors in 10 days

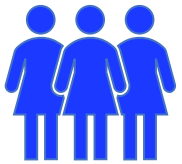
Challenge & solution

- Security problem: dangerous situations are often recognized too late
- Goal of the DS: support authorities in assessing the security situation.

Pilot.Herne – Performed activities

Arrival traffic

Traffic jams on the access roads and the highways



People density

Public area without designated entrances or exits. Very crowded at hotspots

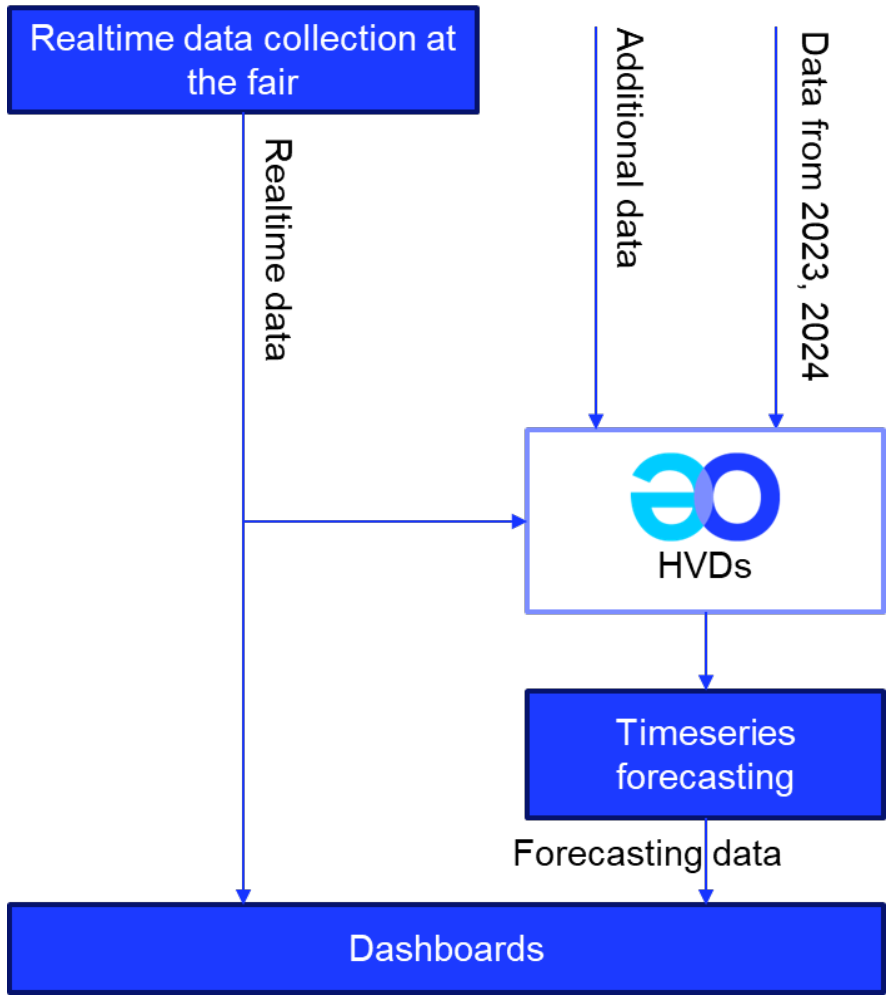
Pilot.Herne – Performed activities

Realtime data collection:

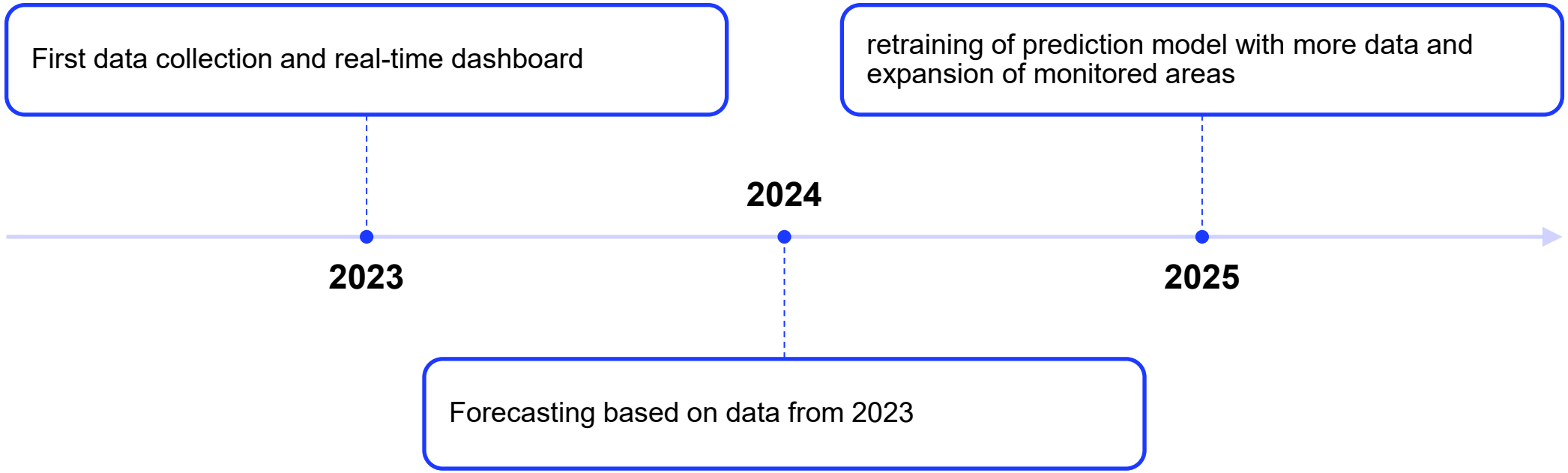
- Radar Sensors: car count & avg. Speed on access roads
- App-based: detection of parking space occupancy
- Edge AI cameras: people density at hotspots on the fairgrounds

Forecasting:

- Harmonisation of historical data and additional data in beopen
- Training of prediction model
- Integration of forecasting data into real-time dashboard



Pilot.Herne – Achieved Results



Status alle Parkplätze

Gesamtanzahl freie aktive Parkplätze

frei gesamt

0 /825

belegt gesamt

825 /825

Verhältnis

gesamt frei

Gesamtanzeige freie Parkplätze

frei gesamt

475 /1445

belegt gesamt

970 /1445

Verhältnis

gesamt frei

Gesamtanzeige belegte Parkplätze (4 panels)

Übersicht Parkplätze

Personen

50 Pers

Anzahl Personen

Personen / m²

0.385 Pers./m²

Personen / m²

Pilot.Herne – Used HVDs

Dataset	Use	Score Baseline	Score Achieved
People density	Forecasting	22%	100%
Road traffic	Forecasting	22%	100%
Parking lot occupancy	Forecasting	22%	100%

Pilot.Herne – Stakeholder involvement

- Department of digitization
  - IT-Infrastructure
  - digitization strategy
- Department of public order:
  - Responsible for security concept
  - Main user
  - Decides on countermeasures
- Herne.Dgital
  - Implementation of digital service
  - Operation of smart city infrastructure
- Involvement
  - Initial requirements
  - Evaluation and Improvement after each fair (iteration feedbacks)
  - Several replicability surves

Pilot.Herne – Lessons learnt

- Workflows must be automated
- The data quality is not as expected
- Peoples behaviour is often unpredictable

Pilot.Herne – New approach after adopting BeOpen?

Digital Service is working well, stakeholders are satisfied.

=> No new approach, but expansion and improvement:

- Monitoring of additional areas
- Retraining of prediction model with new data
- Testing new sensor technology
- Manual processes getting automated

Thank you!

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BeOpen has received funding from Digital Europe Programme
under the Grant Agreement No 101100807

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