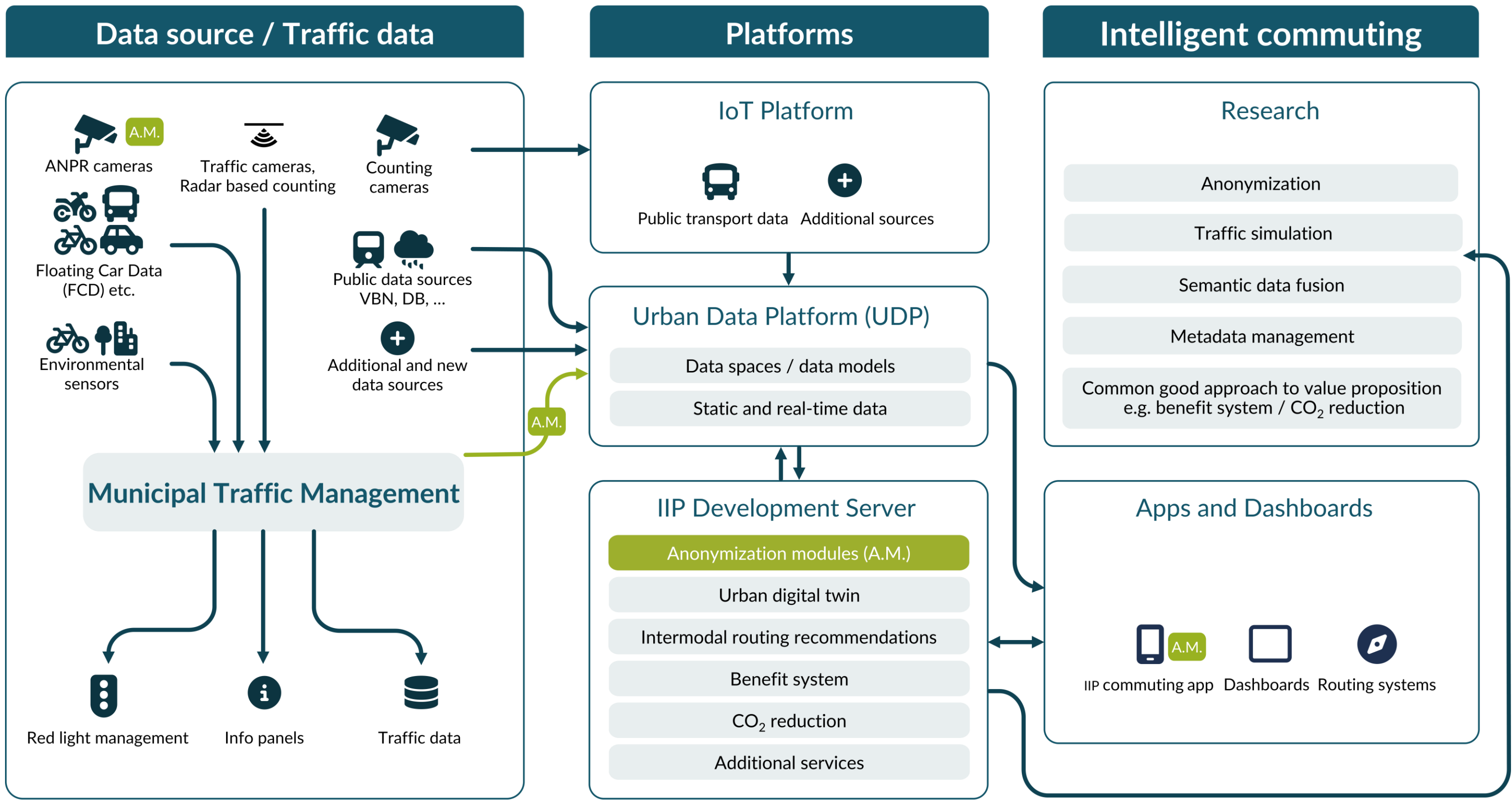


Usage of anonymized traffic data

IIP system architecture



ANPR = Automatic Number Plate Recognition | VBN = Verkehrsbund Bremen & Niedersachsen | DB = Deutsche Bahn

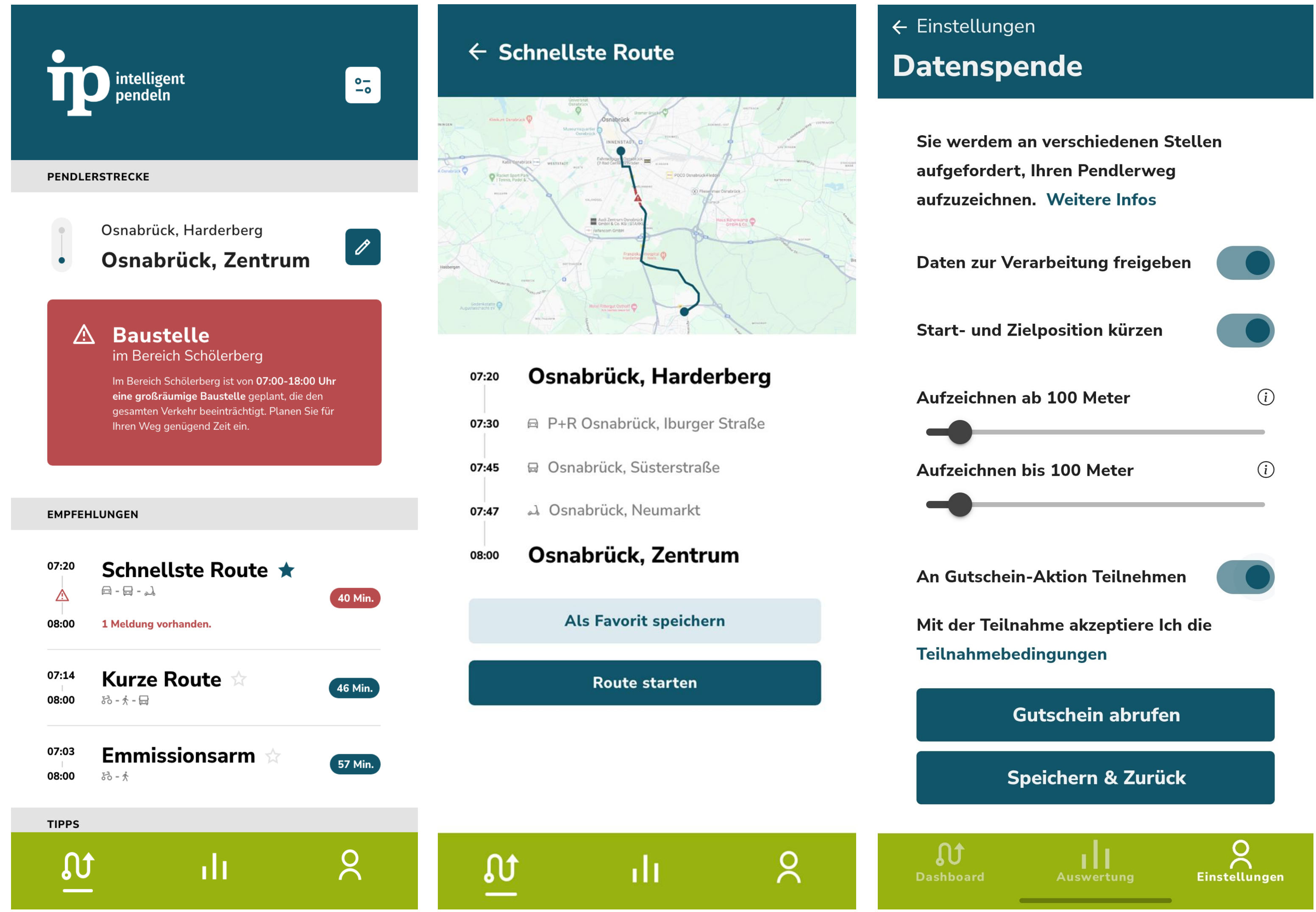
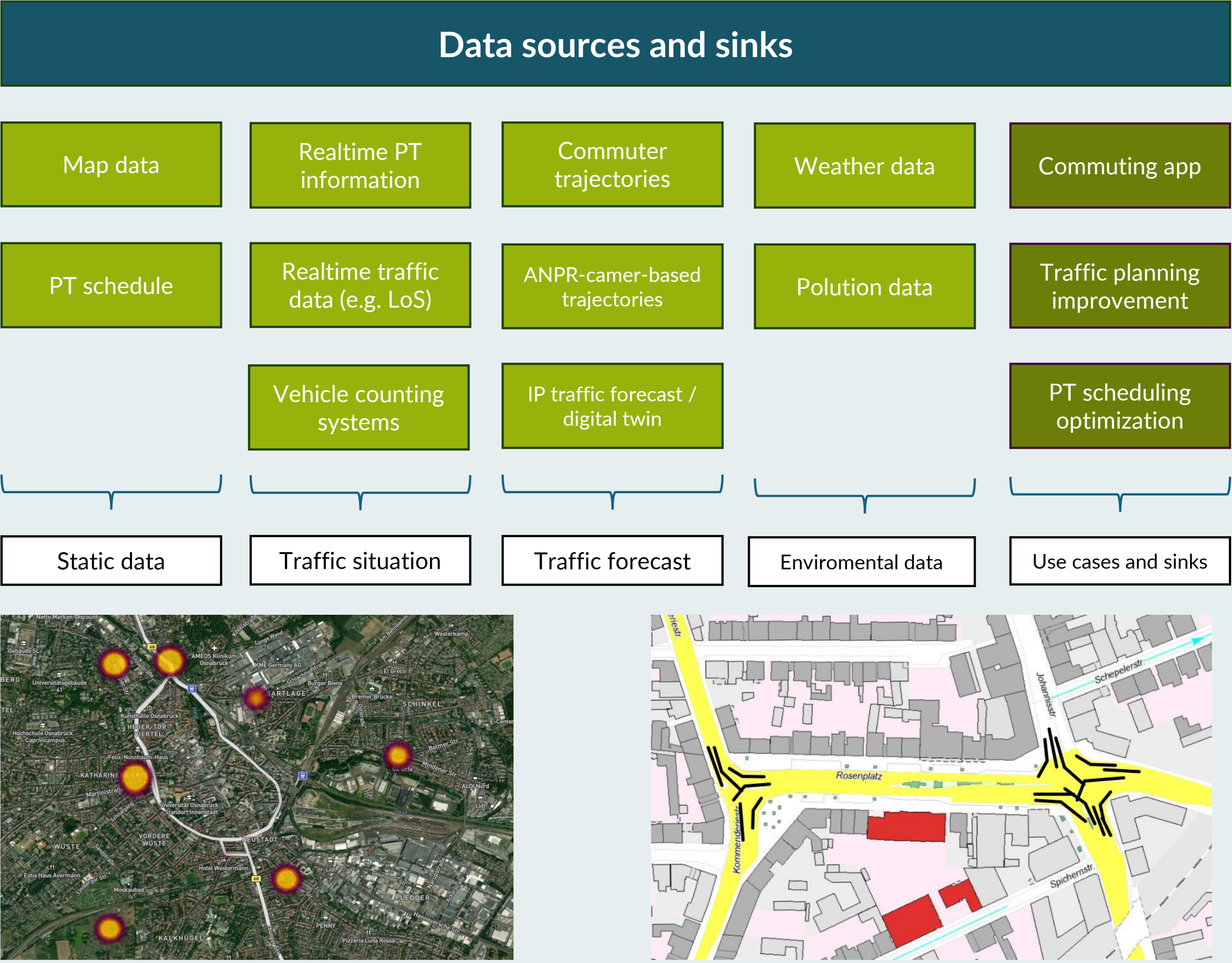
Goal: Using anonymized data for intelligent traffic management

- **Data sources**
 - Municipal Traffic Management of Osnabrück
 - Growing number of traffic counting cameras, environmental sensors and Number Plate cameras (ANPR)
- **Data processing**
 - Transmission via LoRaWAN (SmartCity Network) and IoT platforms
 - Central data management in the Urban Data Platform (UDP)
- **Anonymization**
 - Portable Toolkit with Anonymization modules (A.M.) (see poster 2)
- **Research, Applications, Dashboards for Decision Support**
 - IIP development server: Routing, Urban digital twin (see poster 3)
 - Apps and dashboards for commuters and traffic planners

Data usage and dashboards

Data variety: IIP integrates multiple data types and sources

- **Example:** Intermodal routing and commuting recommendation in IIP app
 - Combines OpenTripPlanner, map services, OSM, public transport schedules, real-time traffic data and weather forecasts
- **Traffic monitoring**
 - Based on Real-time data from newly installed sensors on main roads
 - Early detection of disruptions using road work databases, congestions and VBN real-time public transport data (Lower Saxony, Bremen, partial NRW)
- **Movement data and dashboards**
 - IIP app and ANPR cameras collect anonymized commuter trajectories
 - Used for traffic forecasts and improved traffic management
 - Analysis and dashboards supports decision-making e.g. for city planners



IIP commuting app

Goal: IIP app optimizes daily commuting and serves as a Crowdsensing data source to better understand traffic

- **Crowdsensing by anonymized traffic data donation** including commuting data (trajectories) for better traffic planning
- **Personalization** including fastest, shortest, cost-efficient or eco-friendly alternatives and carbon-footprint calculated for each route
- **Intermodal routing** combines traditional modes like car, bus or bike, with transport modes changes e.g. Park & Ride
- **Route Updates and notifications in real-time** reflecting changes like roadworks, events, accidents, public transit delays and weather

Publications: Gielians, J. Seidel, T. Westerkamp, C. Schaarschmidt, M: „Intelligent Traffic Management Management using Anonymized Trajectory Data for Personal Multimodal Commuting Recommendations“, 2025 7th Experiment@ International Conference (expat’25)