

# COORD: On-demand Fleet Orchestration and Coordination with Existing Transit Network Operations

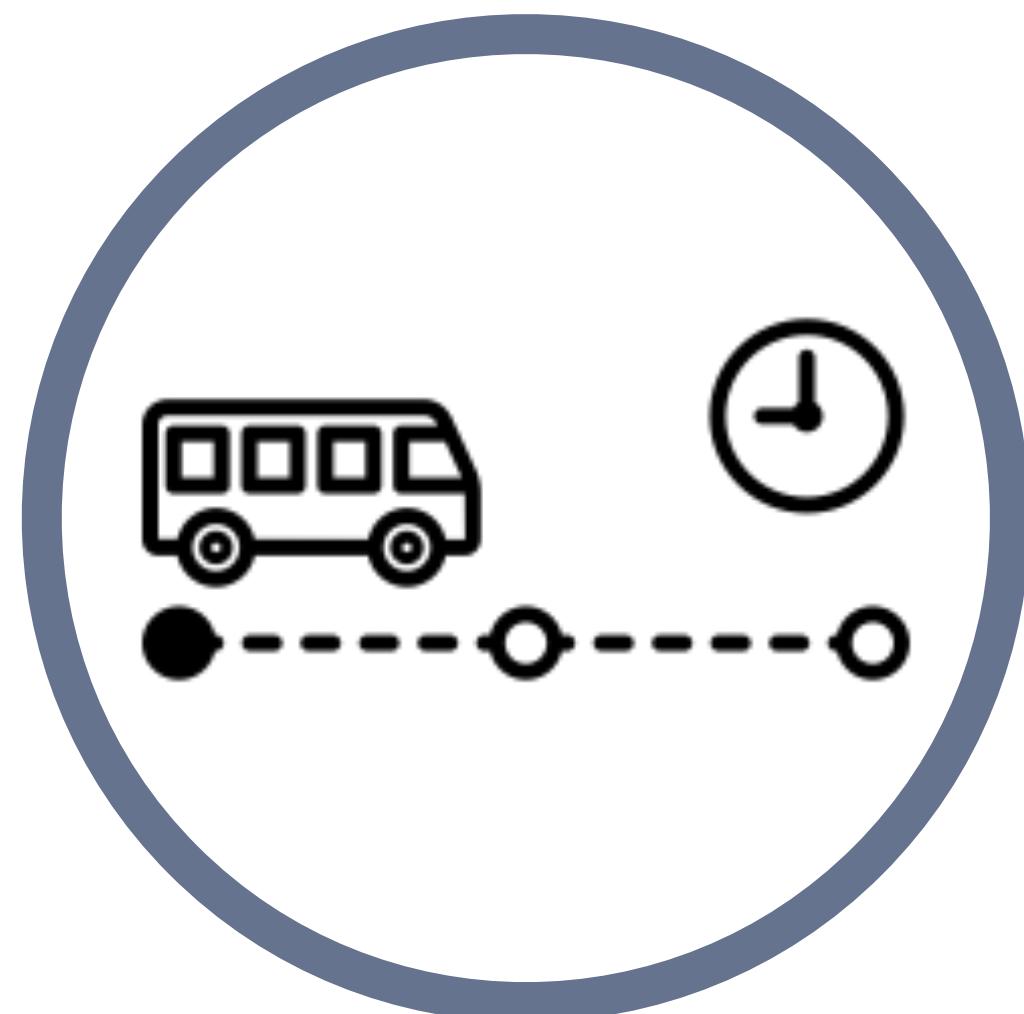
## Project Kick-off Meeting

January 28, 2025



# COORD: PROJECT DESCRIPTION

Bus delays and service deficiencies



Mobility-as-a-service (MaaS)



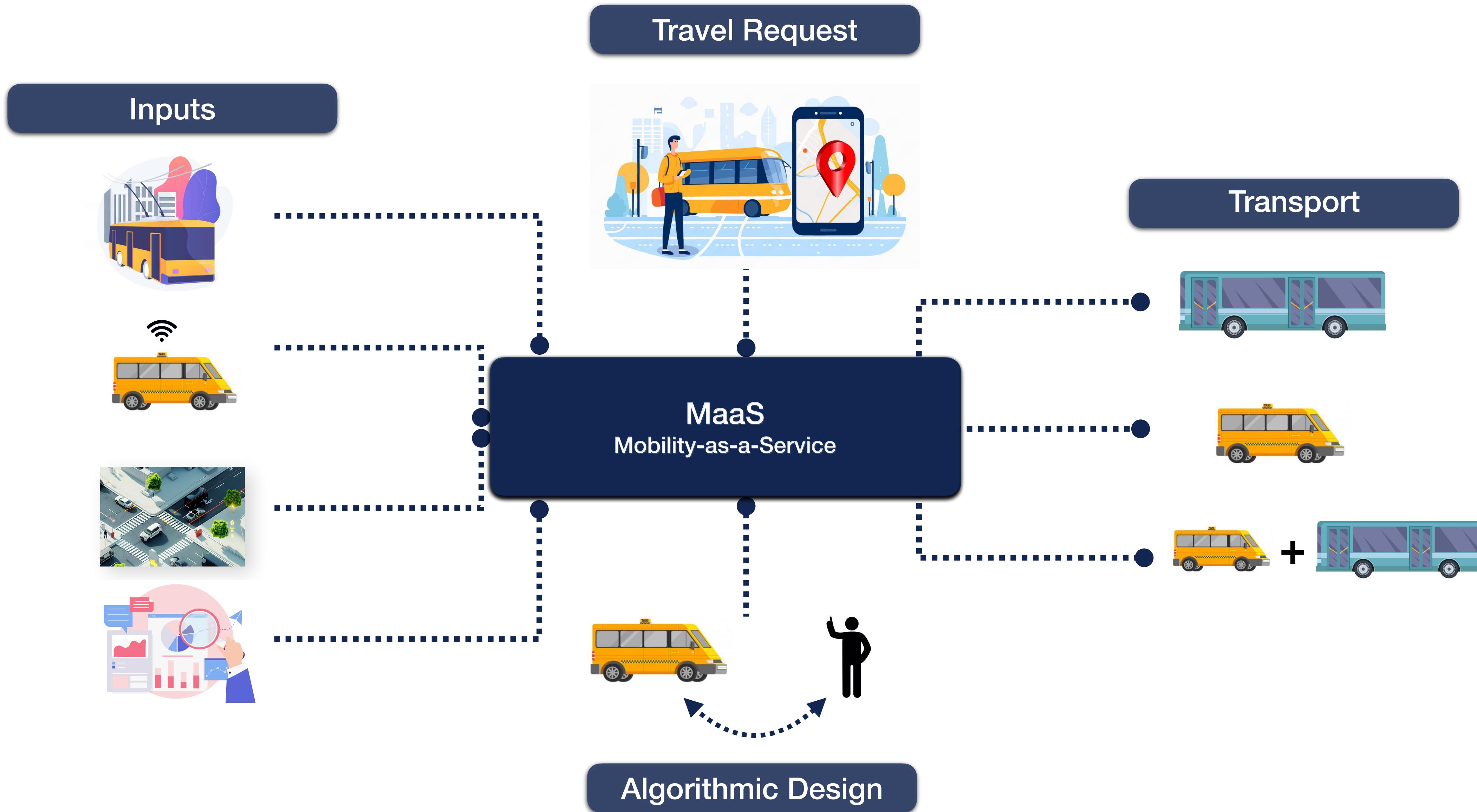
Merge of on-demand and bus services



# PROJECT OBJECTIVES



- Integrates new technologies to improve the efficiency and reliability of public transport operations
- Provides collective transport with increased accessibility, convenience, flexibility, and sustainability
- Creates a tool for high-quality monitoring, prediction, and management of public transportation in the city of Fribourg
- Provides methods, models, and algorithm for multi-modal traffic management



# SERVICE CHARACTERISTICS



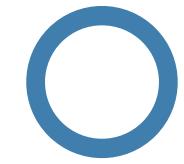
## CONVENIENT

Appealing to service users with low waiting time, low detour, and minimum transfers



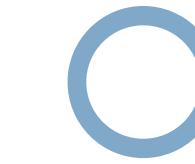
## ROBUST

Suggesting potential alternatives in case the output trip is impeded



## EFFICIENT

Ensuring an optimal utilization of the available resources (buses and infrastructure)

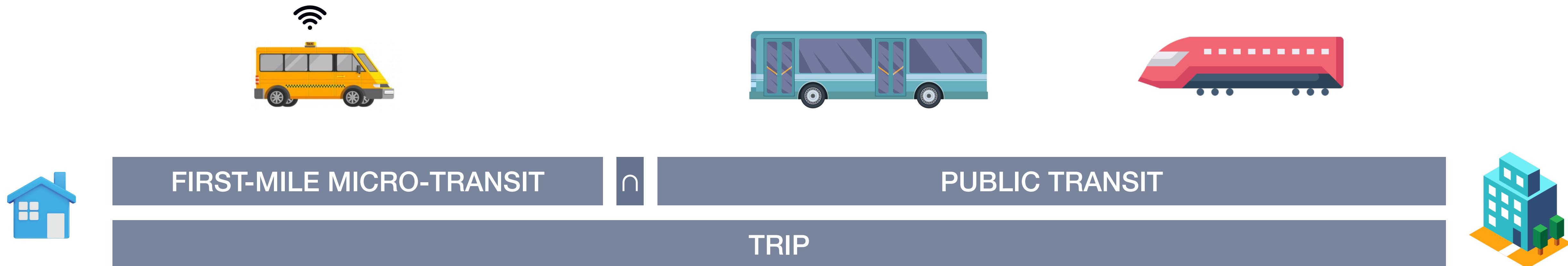


## RELIABLE

Punctual with precise estimation of pick up and drop off time, travel time, and transfer location

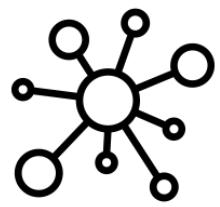
# THREAD 1.

## On-demand Micro-transit as a First- or Last-mile Solution to Public Transit



# OBJECTIVE, DATA, AND OUTPUT

*Thread 1. On-demand Micro-transit as a First- or Last-mile Solution to Public Transit*



## OBJECTIVE

Envision, design, and orchestrate a complementary service to public transit

## DATA INPUT

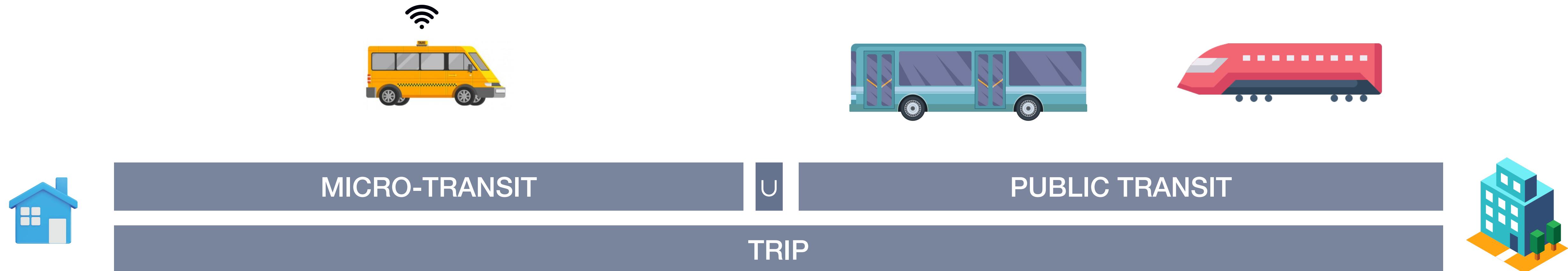
GPS of buses, passenger counts, congestion indices, and current bus network infrastructure

## OUTPUT

Jointly optimized on-demand and public transit service in areas where public transit is deficient or underperforming

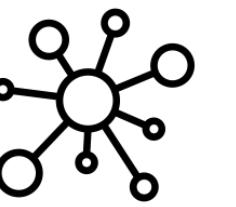
# THREAD 2.

## Interconnected and Coordinated Flexible and Fixed Line Services



# OBJECTIVE, DATA, AND OUTPUT

*Thread 2. Interconnected and Coordinated Flexible and Fixed Line Services*



## OBJECTIVE

Conceptualizing on-demand as an alternative to buses during demand surge or congestion uncertainty

## DATA INPUT

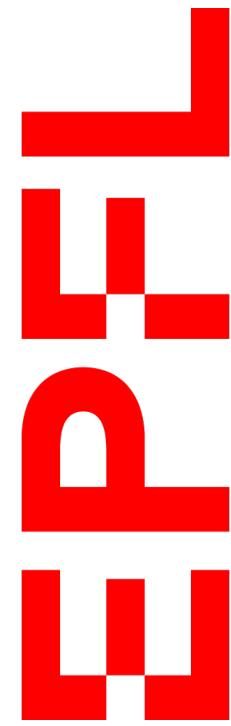
Bus arrivals and delays, bus interruptions, traffic conditions

## OUTPUT

Decision on travel alternatives resulting in improved services in cases of abruptions, non-recurrent events, and delays

# Tasks and Contributions

*Collaboration mechanisms and party contributions*



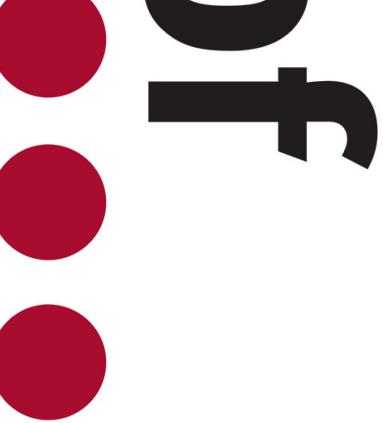
Analyze the travel data, identify sources of disruptions and service deficiencies

Set out the features of the MaaS system by pinpointing the desired quality of service and objectives



Conceive the service-oriented optimization module in the MaaS platform in alignment with the preset TPF objectives

Provision of diversified data revolving around transit sizing and scheduling, bus and train delays, ...



Study the potential of the service integration to achieve reliable and sustainable transport operations

Identify the required quantitative and qualitative Key Performance Indicators (KPIs)

# **COORD: On-demand Fleet Orchestration and Coordination with Existing Transit Network Operations**

Lynn Fayed

[lynn.fayed@epfl.ch](mailto:lynn.fayed@epfl.ch)

Nikolas Geroliminis

[nikolas.geroliminis@epfl.ch](mailto:nikolas.geroliminis@epfl.ch)

## **Project Kick-off Meeting**

---

**Thank you**