

**Optimizing sewer investments and reducing stormwater overflows through smart network operation**

Bartosz Zaborski



# Company in numbers



**Sewage  
Network**

**Water  
Network**



# Water Network

## **Strefy zasilania w wodę / Water supply zones**

- Zakład Północny  
Northern Plant
  - Zakład Centralny, SUW „PRAGA”  
Central Plant „Praga”
  - Zakład Centralny, SUW „Filtry”  
Central Plant „Filtery”
  - Zakład Centralny, SUW: „Wesola”  
Central Plant „Wesola”
  - Zakład Centralny, SUW: „Wawer”  
Central Plant „Wawer”

 strefa mieszanego  
mixing zone





# Company in numbers



Sewage  
Network

Water  
Network



## Sewage Network





## Sewage Network



## Sewage Network

1

2

3

4



## Sewage Network

1 City growth

2 Flooding

3 CSO

4 Unification and  
Centralization

**Sewage Network**

**Water Network**

## Company in numbers

more than <b>1 mld zł</b> net income	capitalization of circa <b>5.1 mld zł</b>
we operate on <b>4 436,2 km</b> water network	we operate on <b>4 341,5 km</b> Sewage network
We have over <b>20</b> vessels of various sizes (including dredgers, tugs, scarves, etc.)	
<b>In 2020 r.:</b>	we have over <b>45</b> specialist vehicles incl. for monitoring of Water and sewage network
we treated <b>125 mld</b> liters of water	we treated <b>171,5 mld</b> liters of sewage
<b>2 421</b> employees	



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Future  
of Work

Issues and  
challenges

Possibilities

Introduction



# Possibilities



CSO, flooding, city growth and unification and centralization



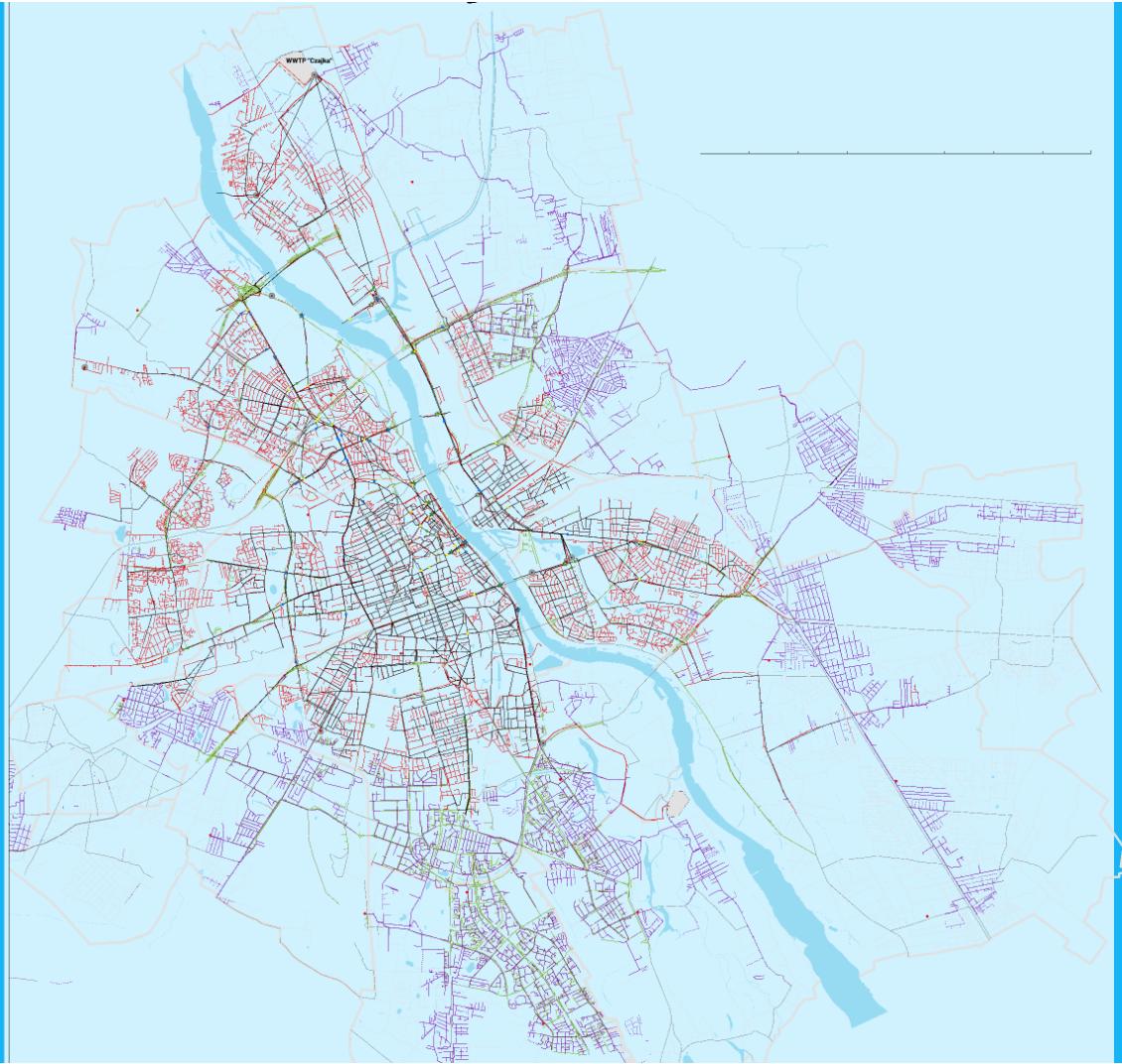
# Possibilities

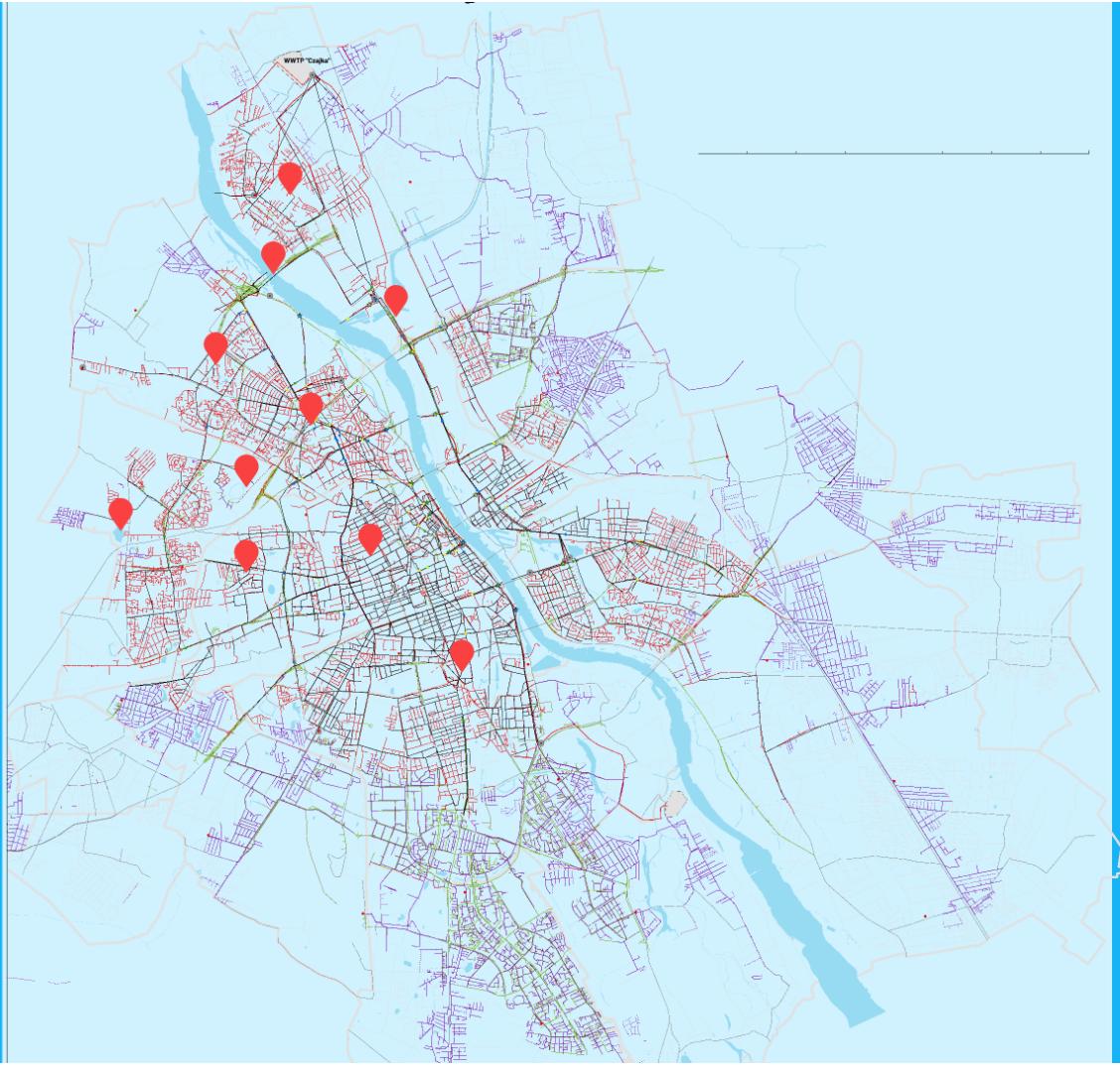


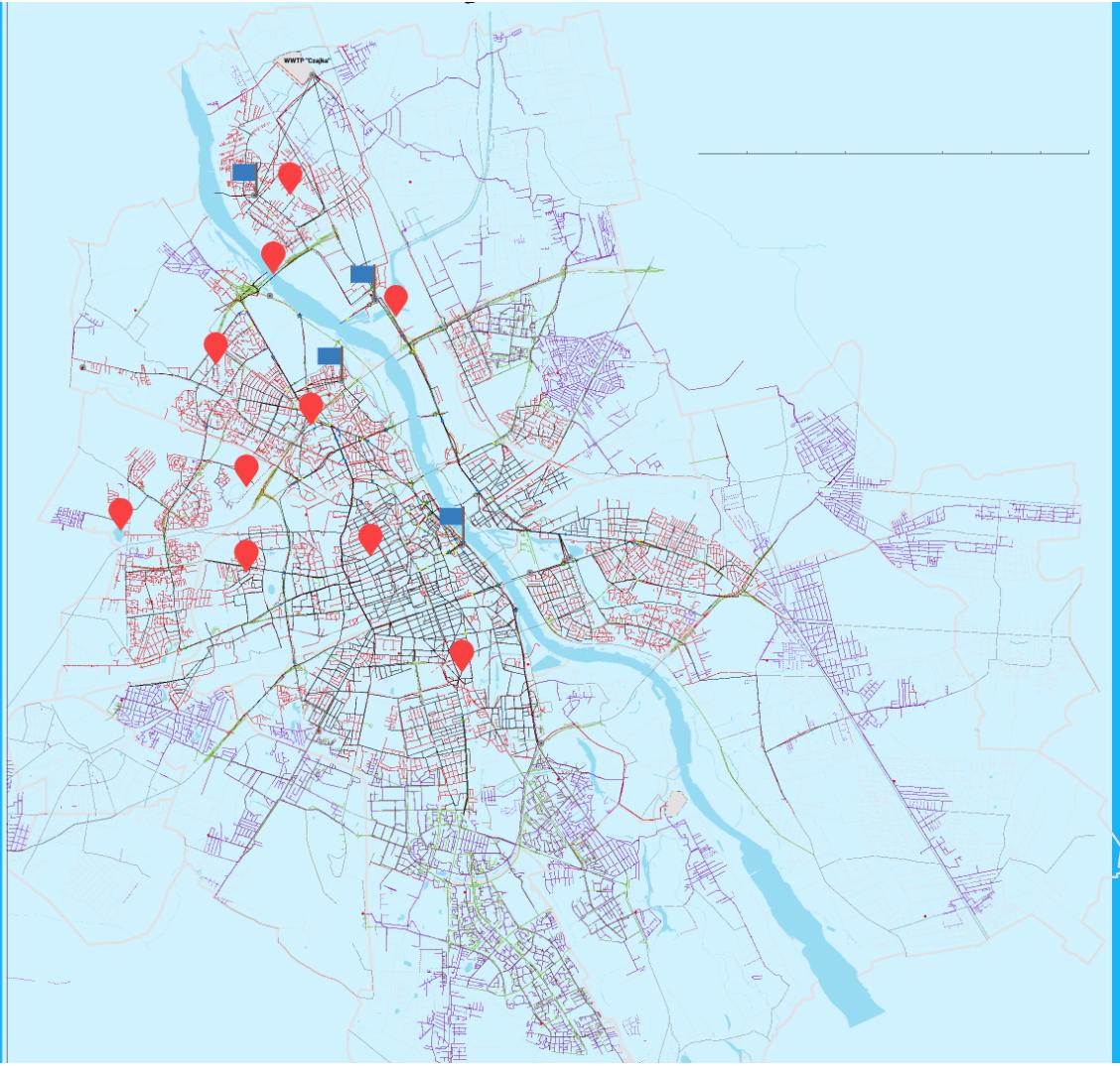
CSO, flooding, city growth and unification and centralization

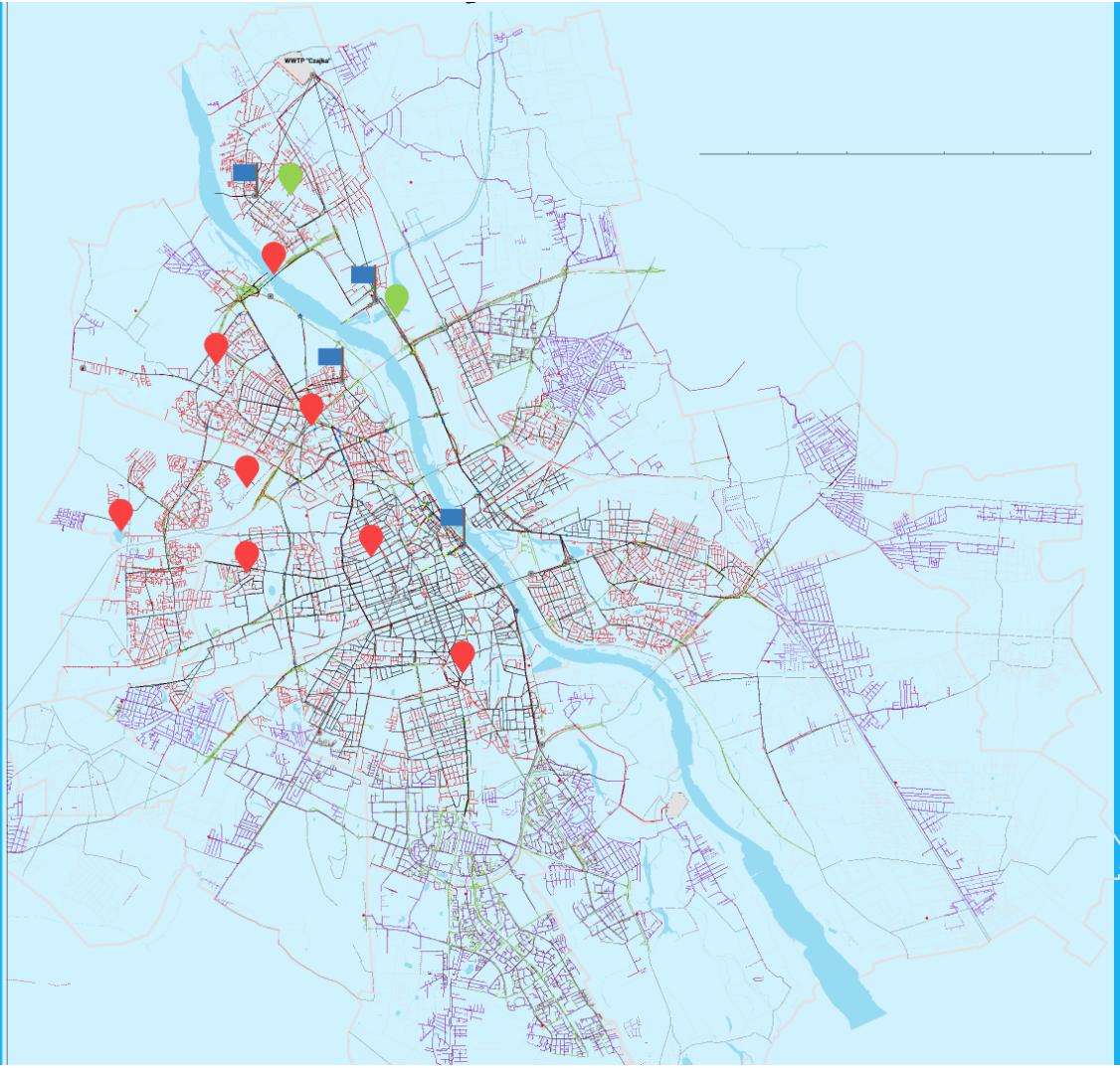
Setting up a model

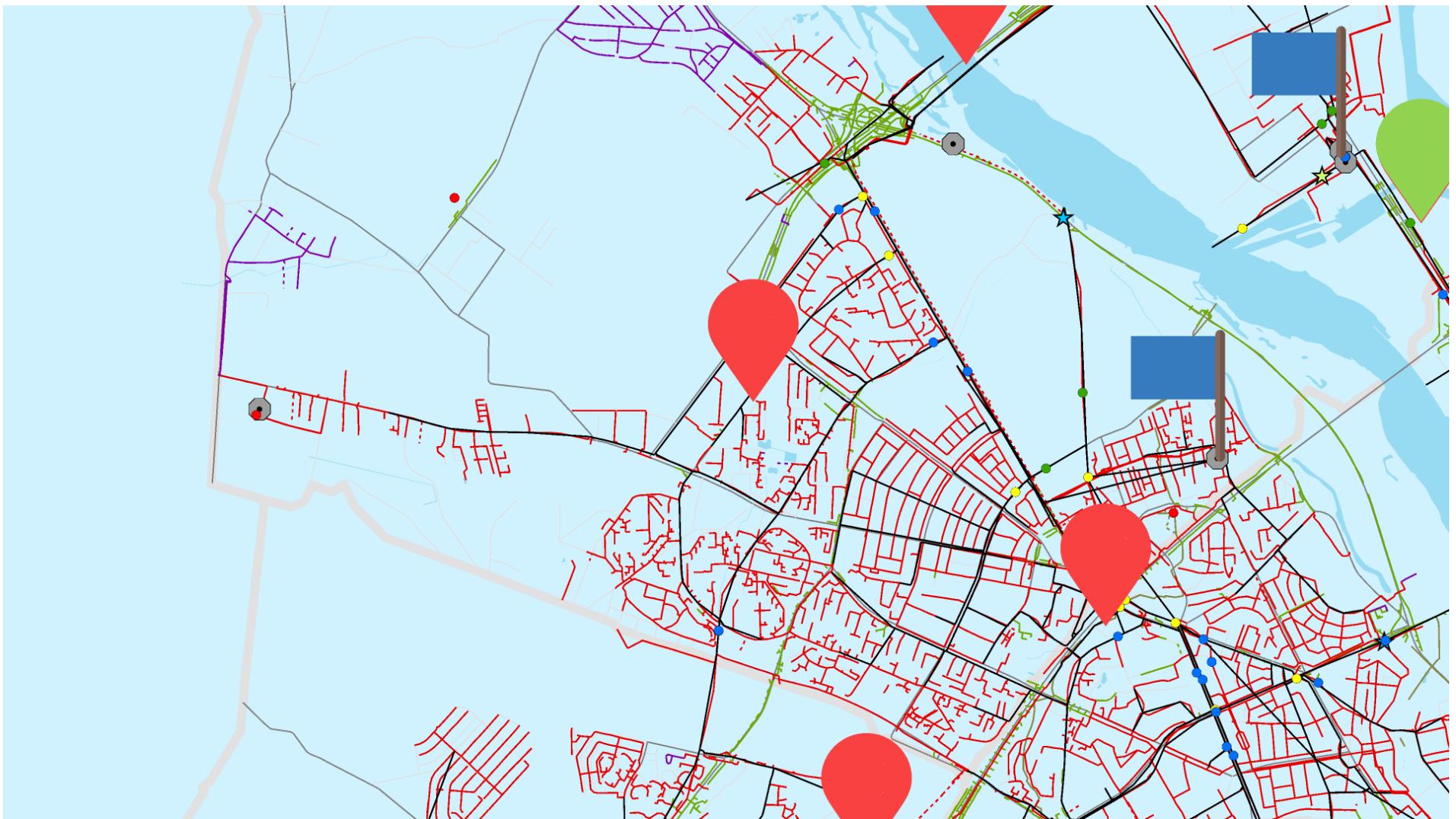




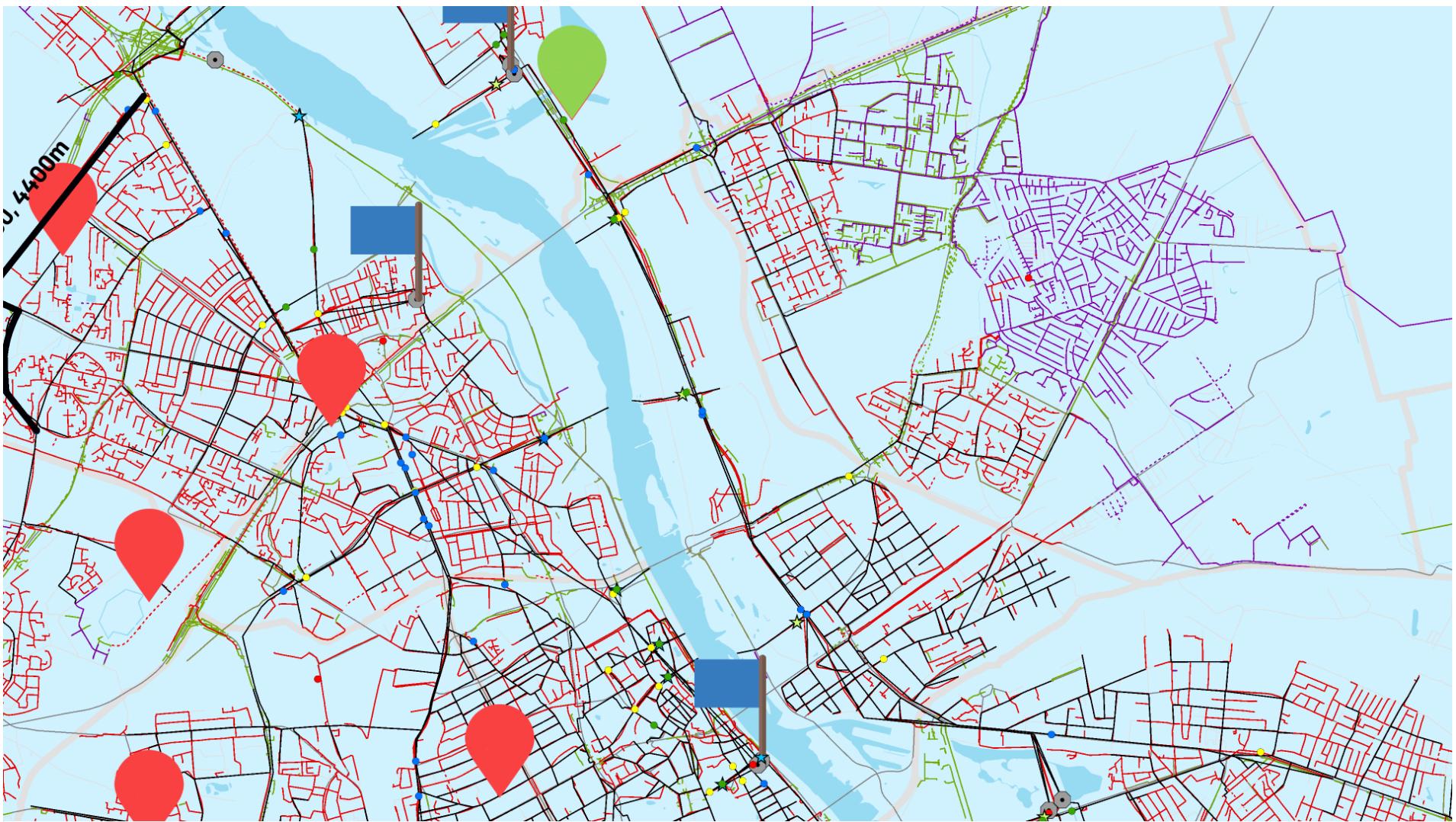


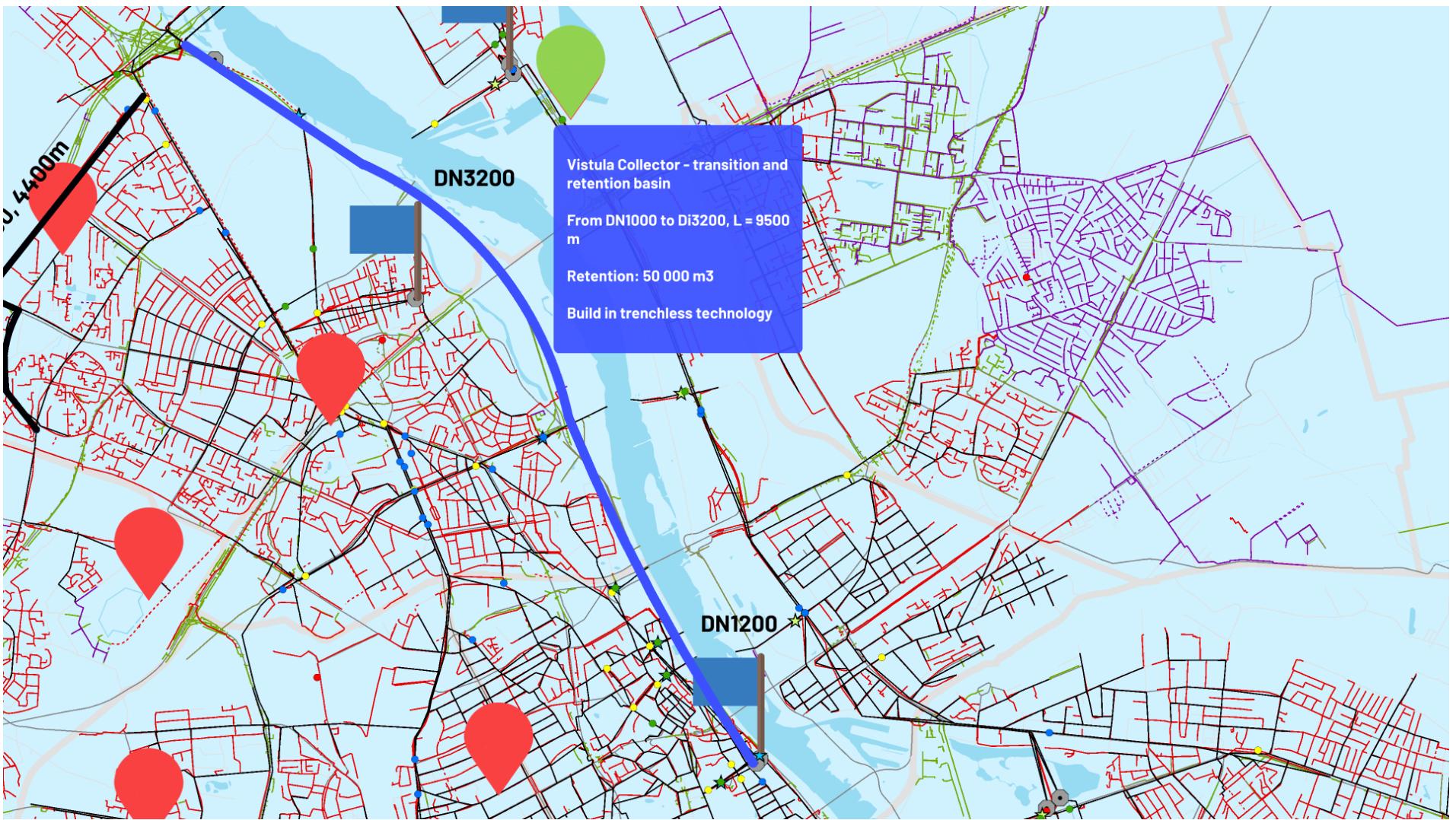


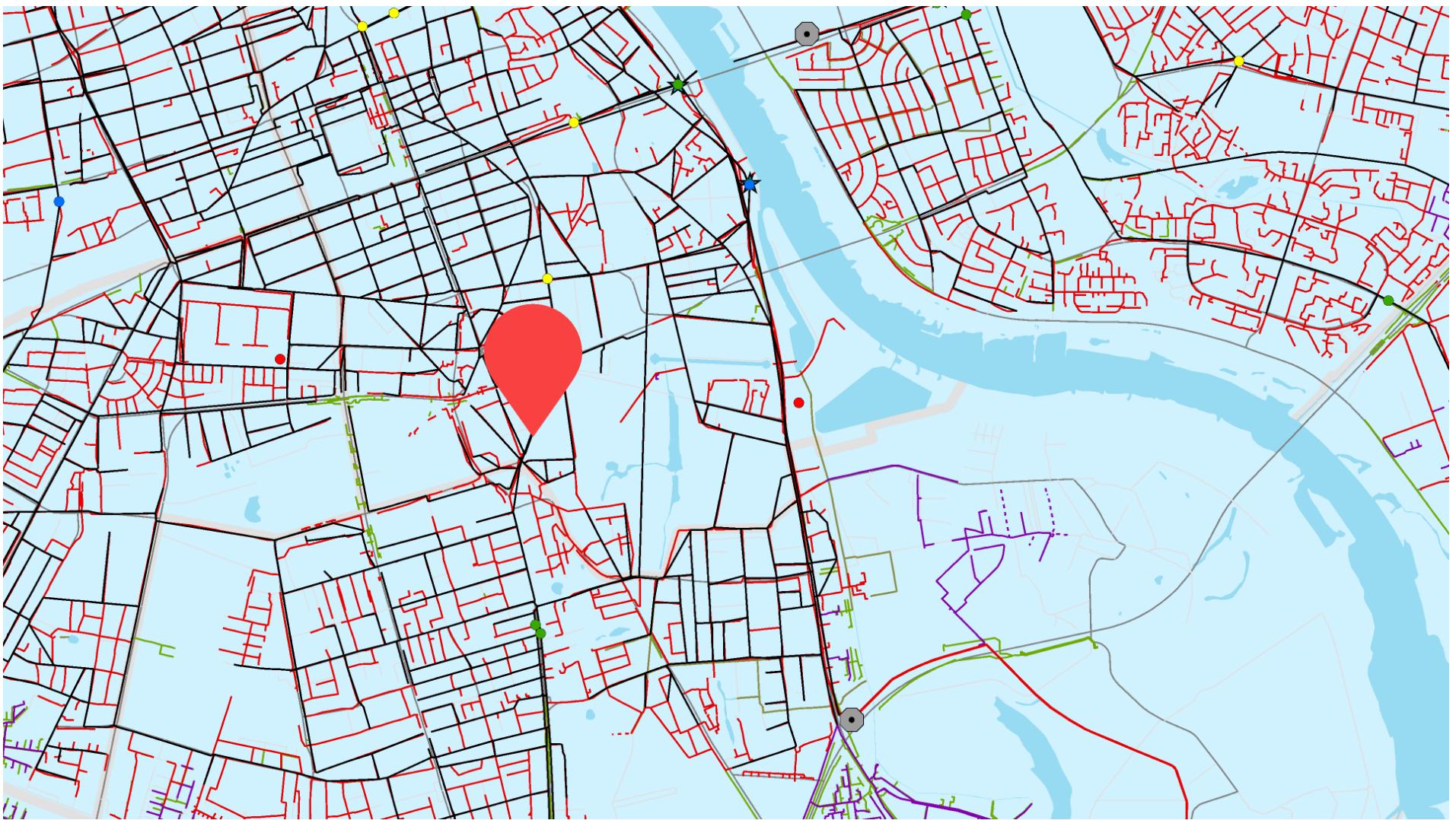


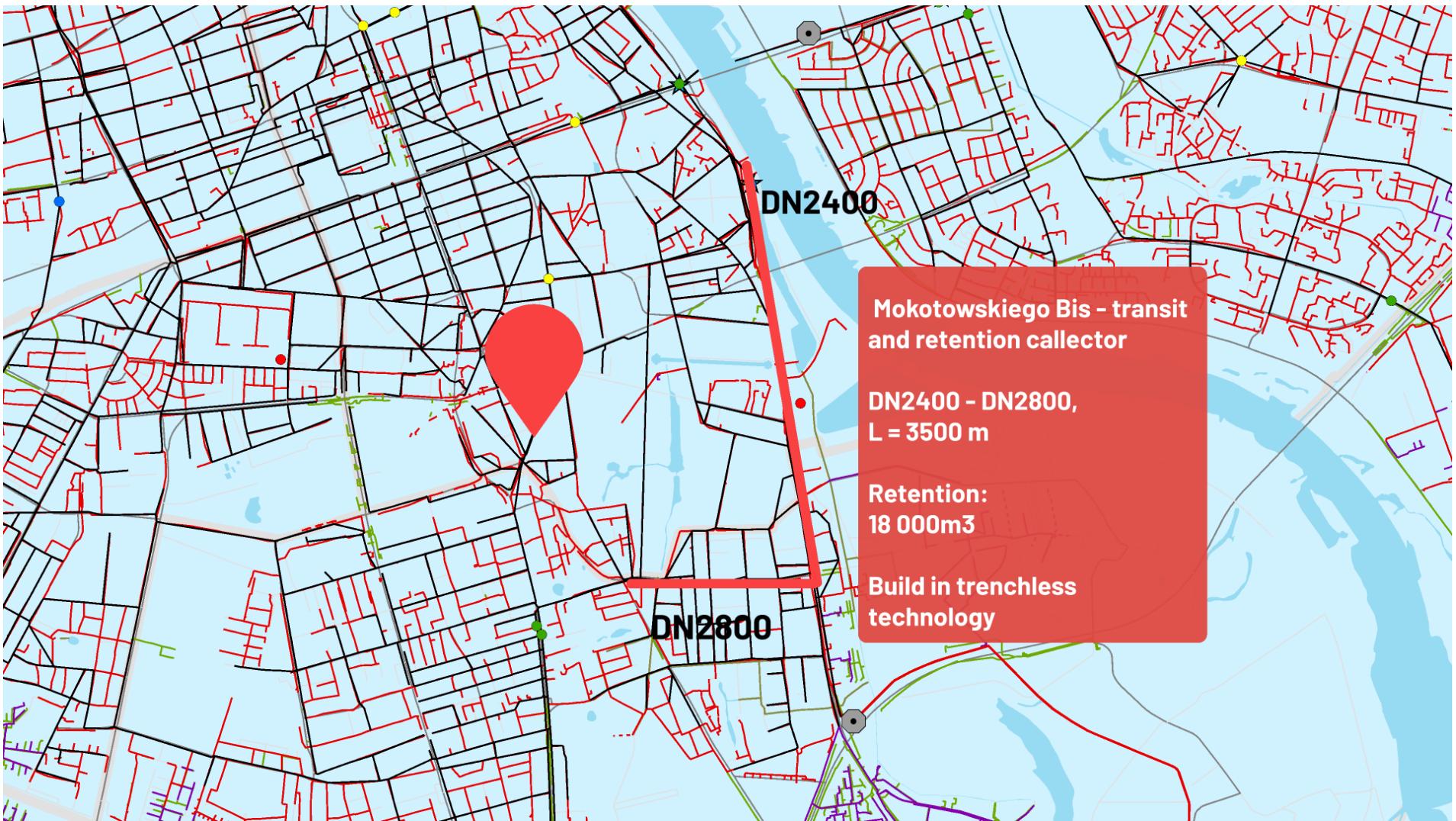


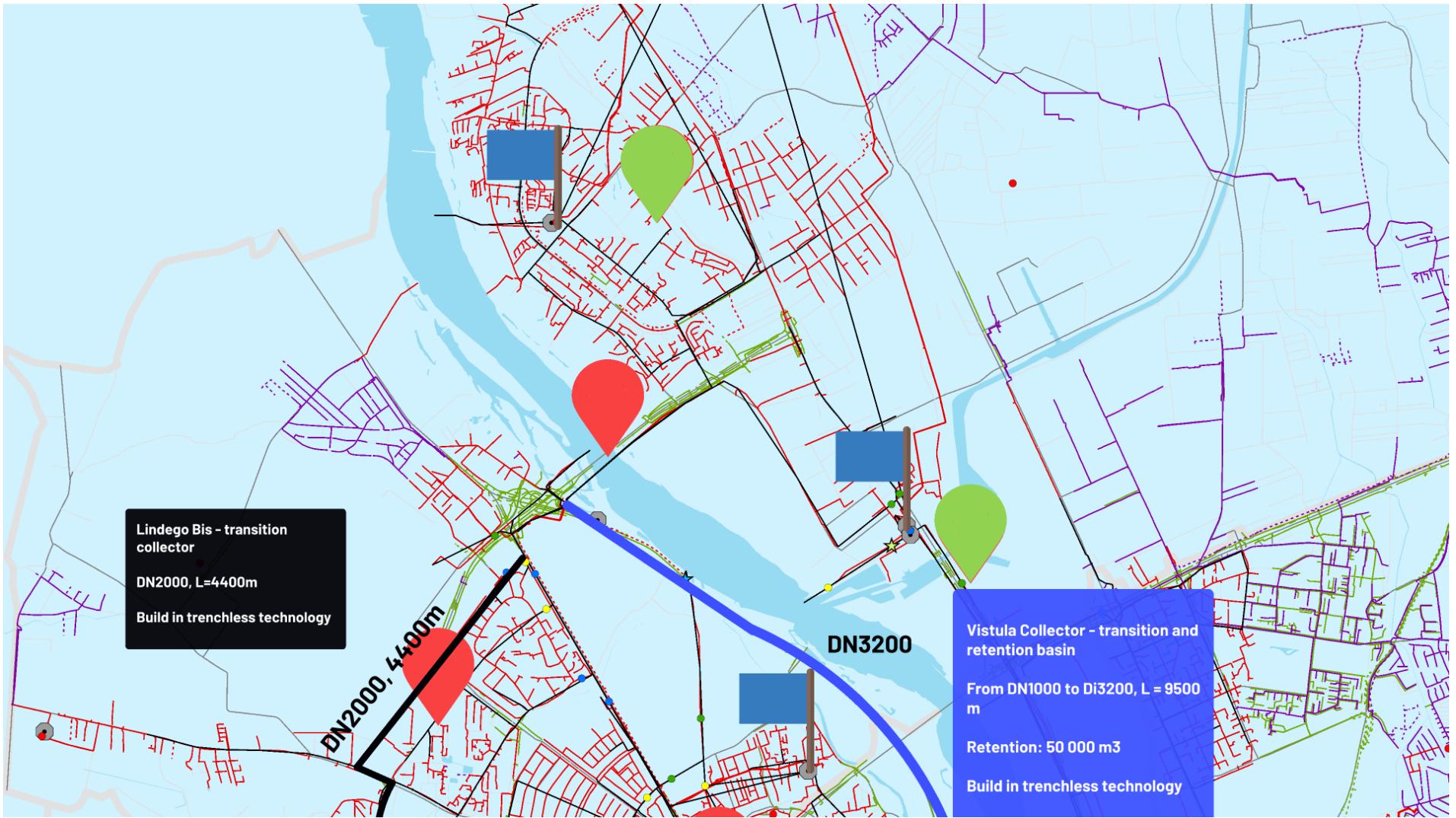


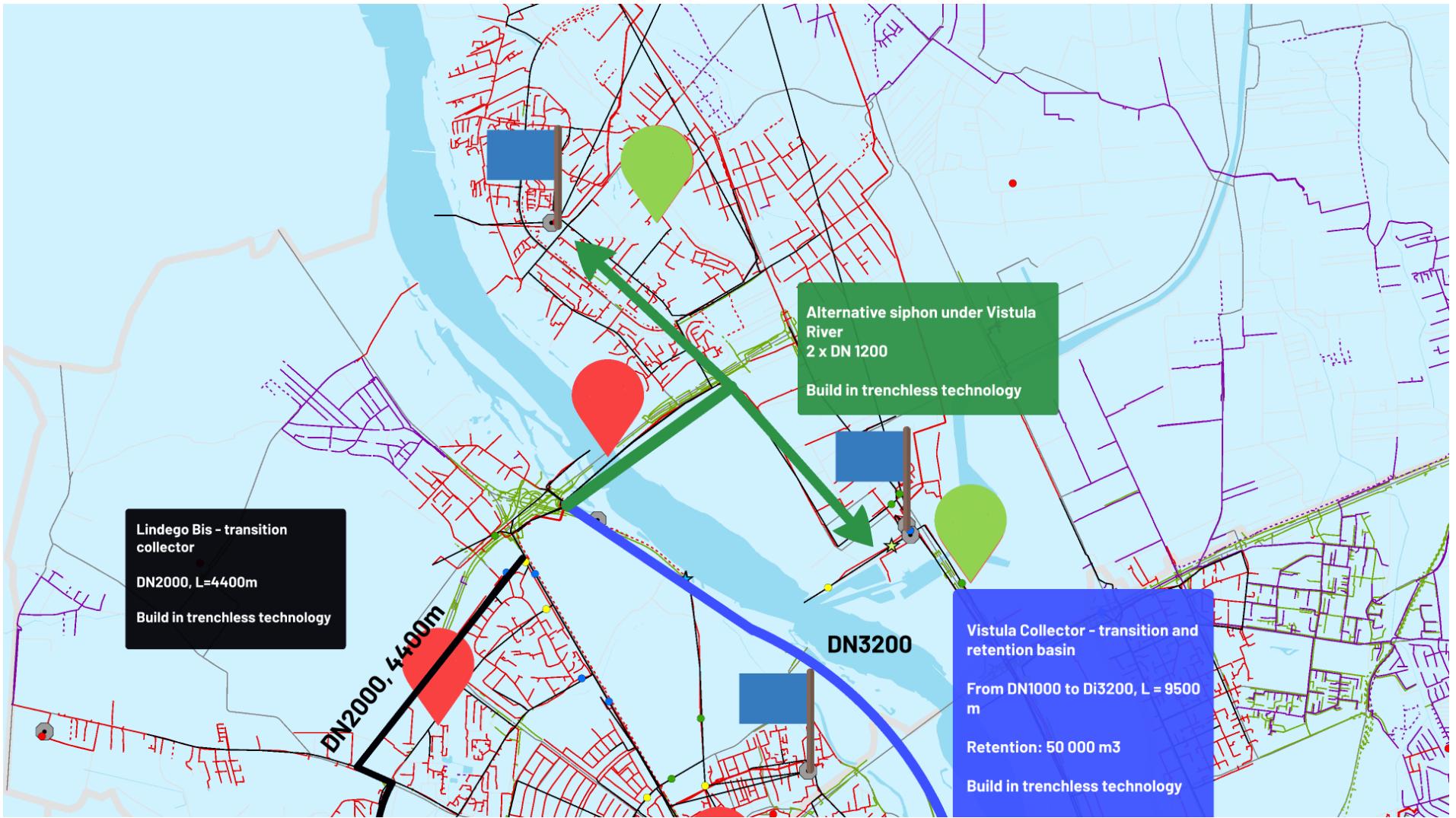


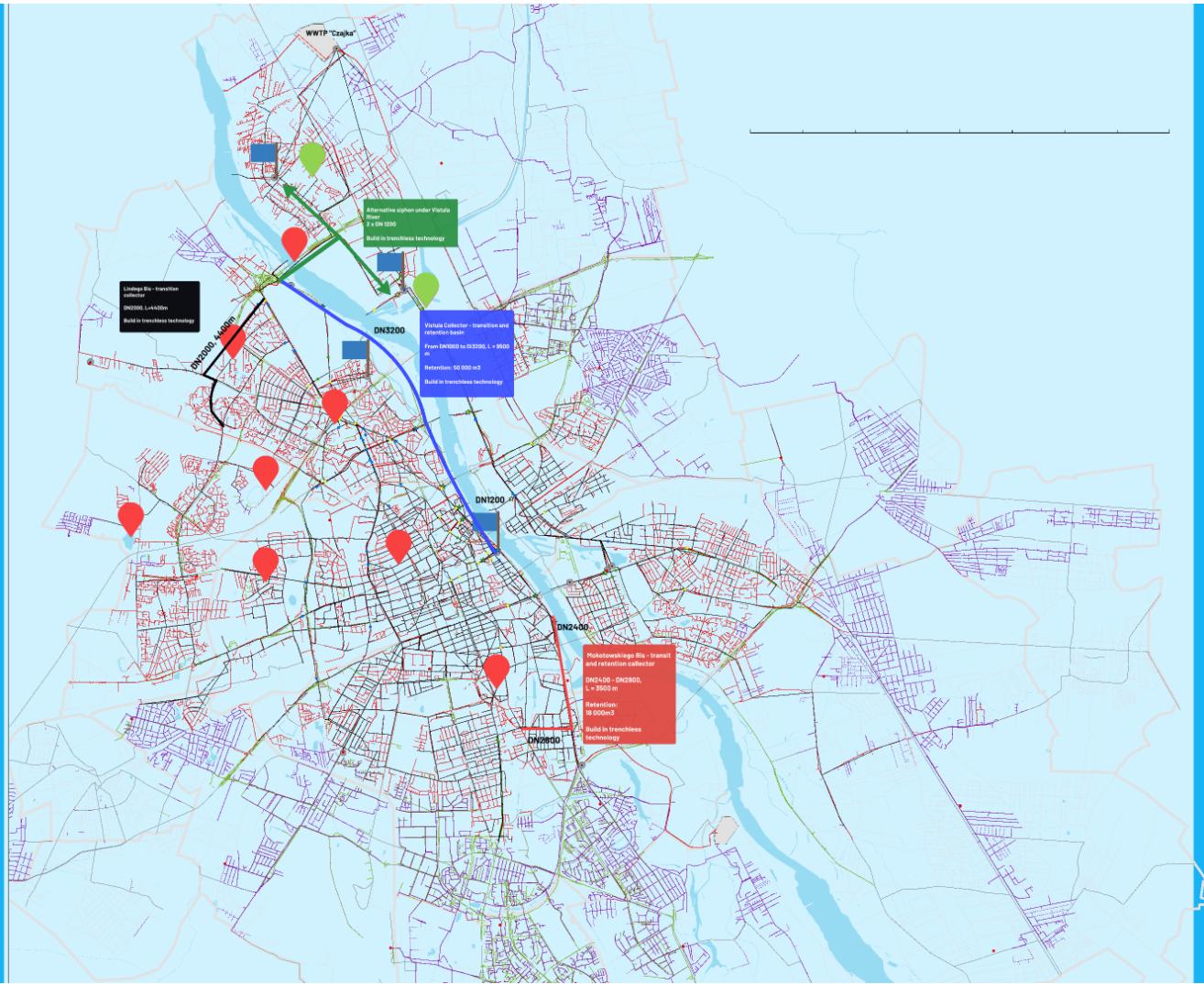






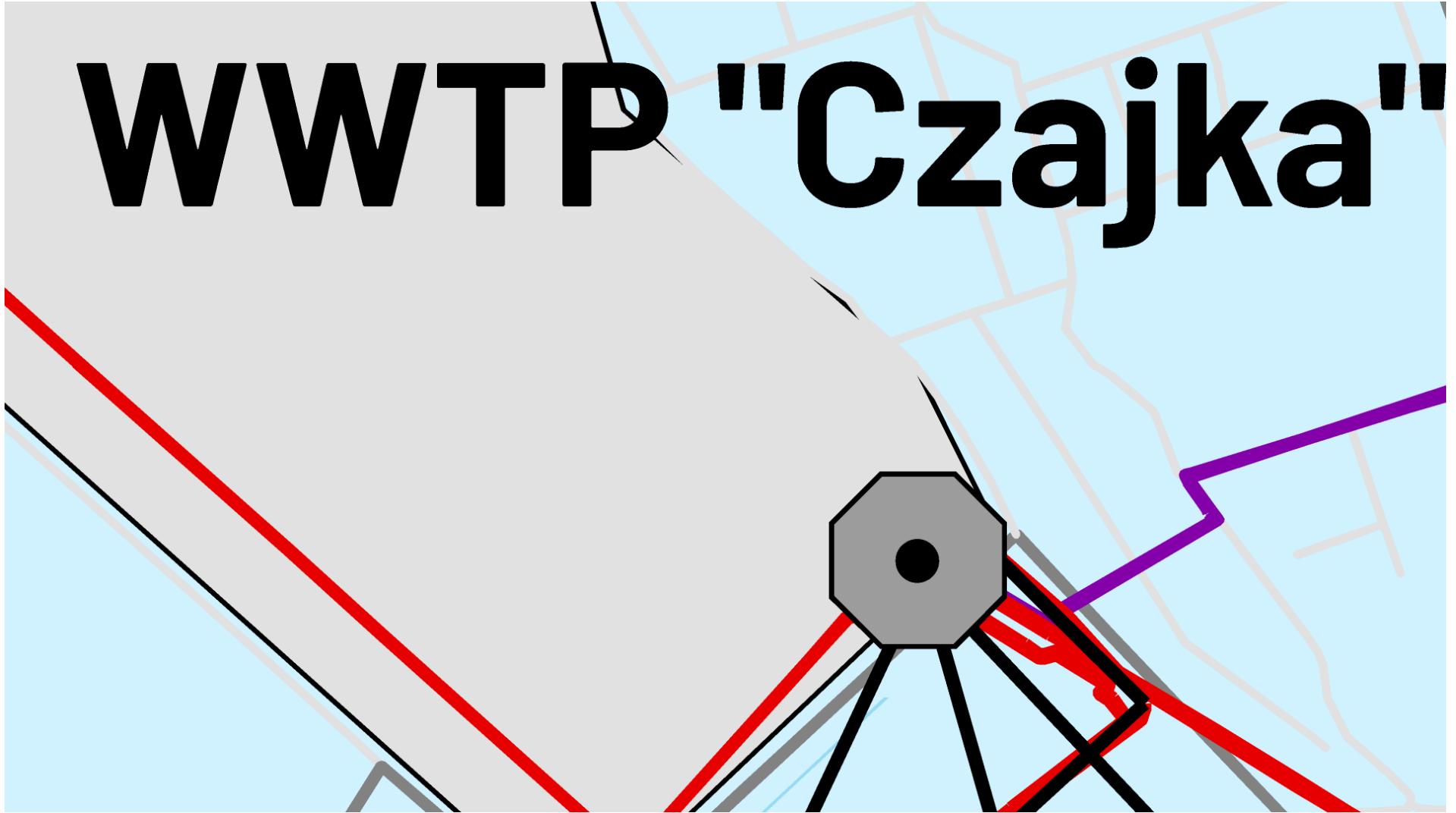




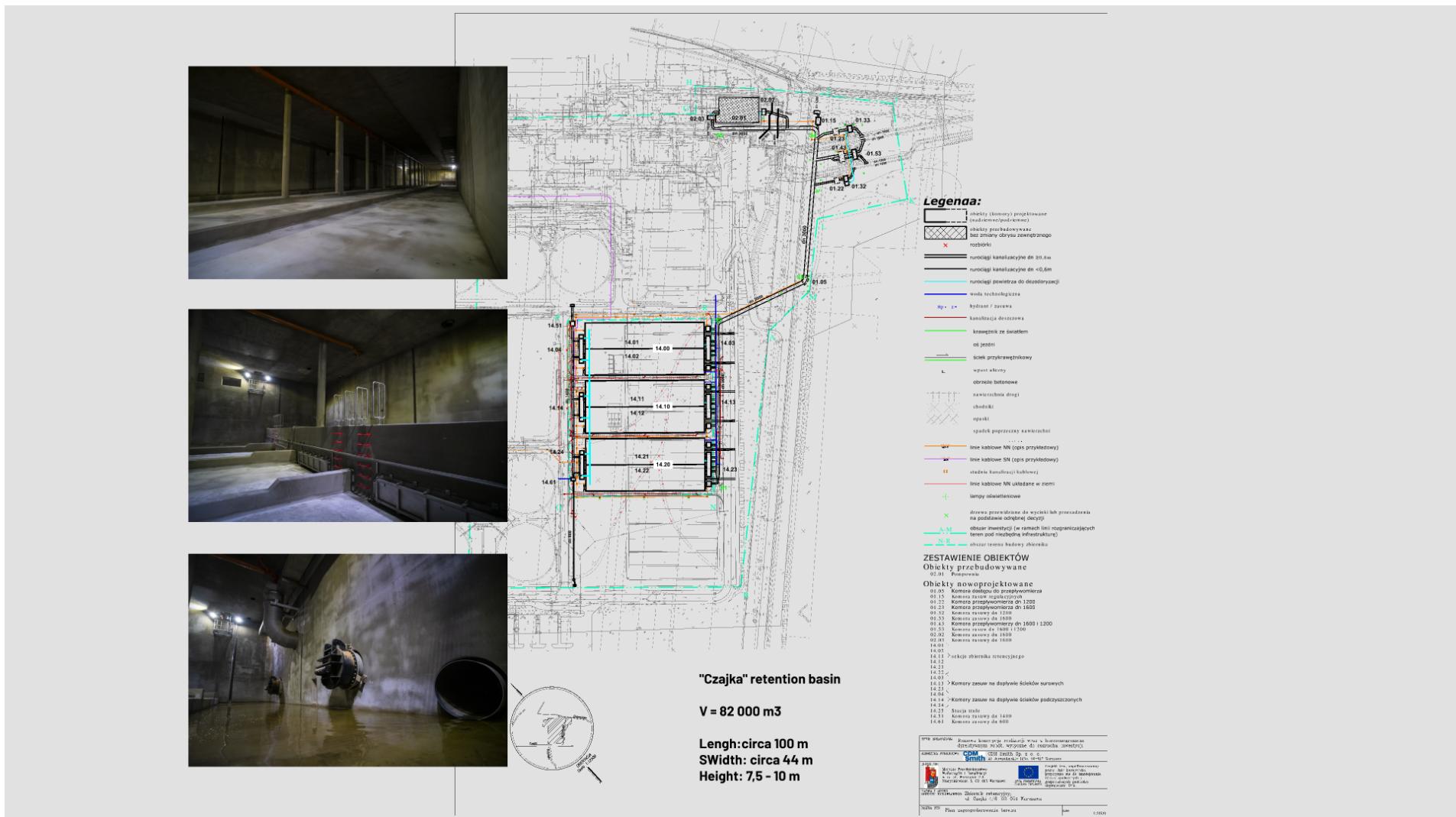


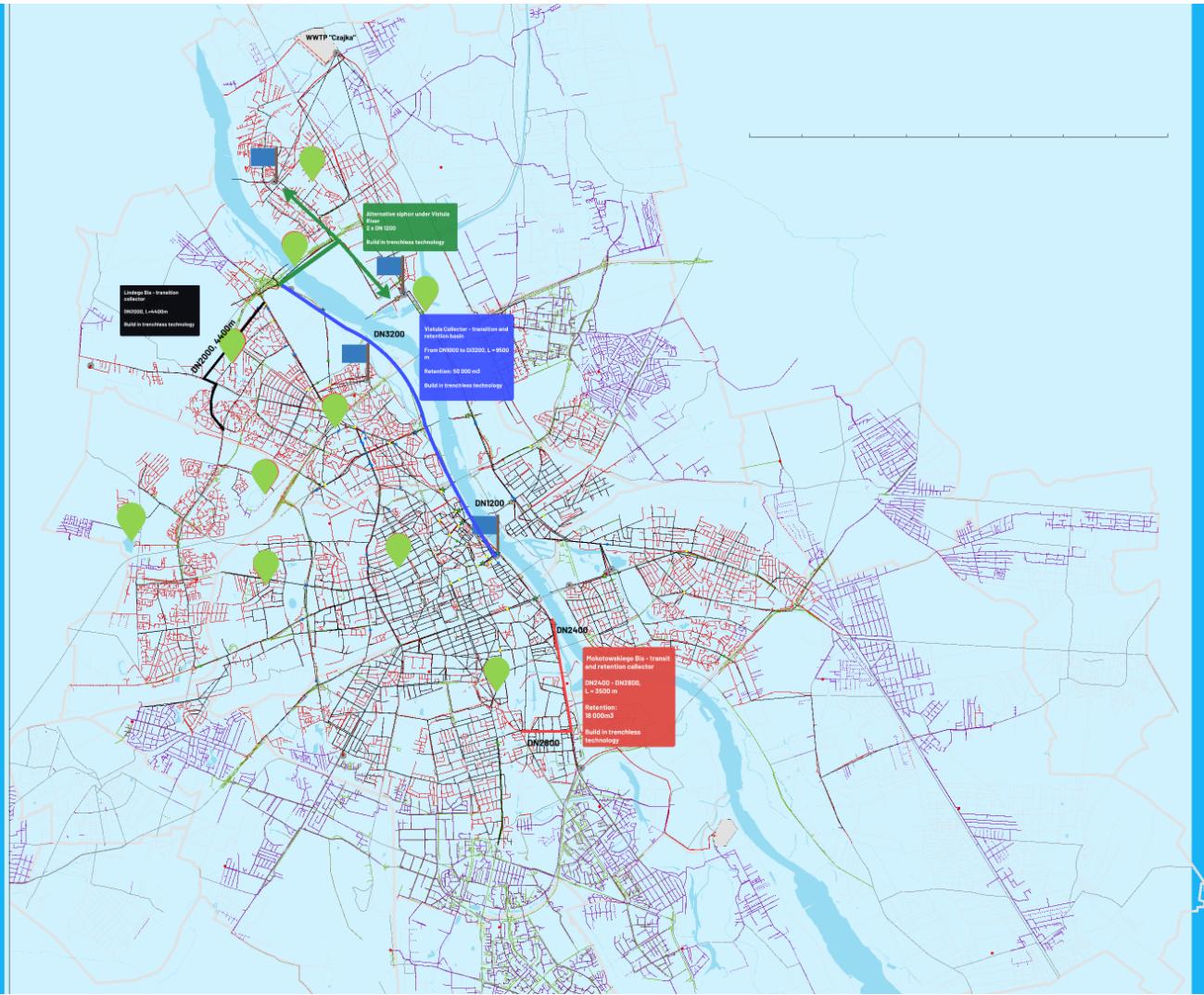


# **WWTP "Czajka"**

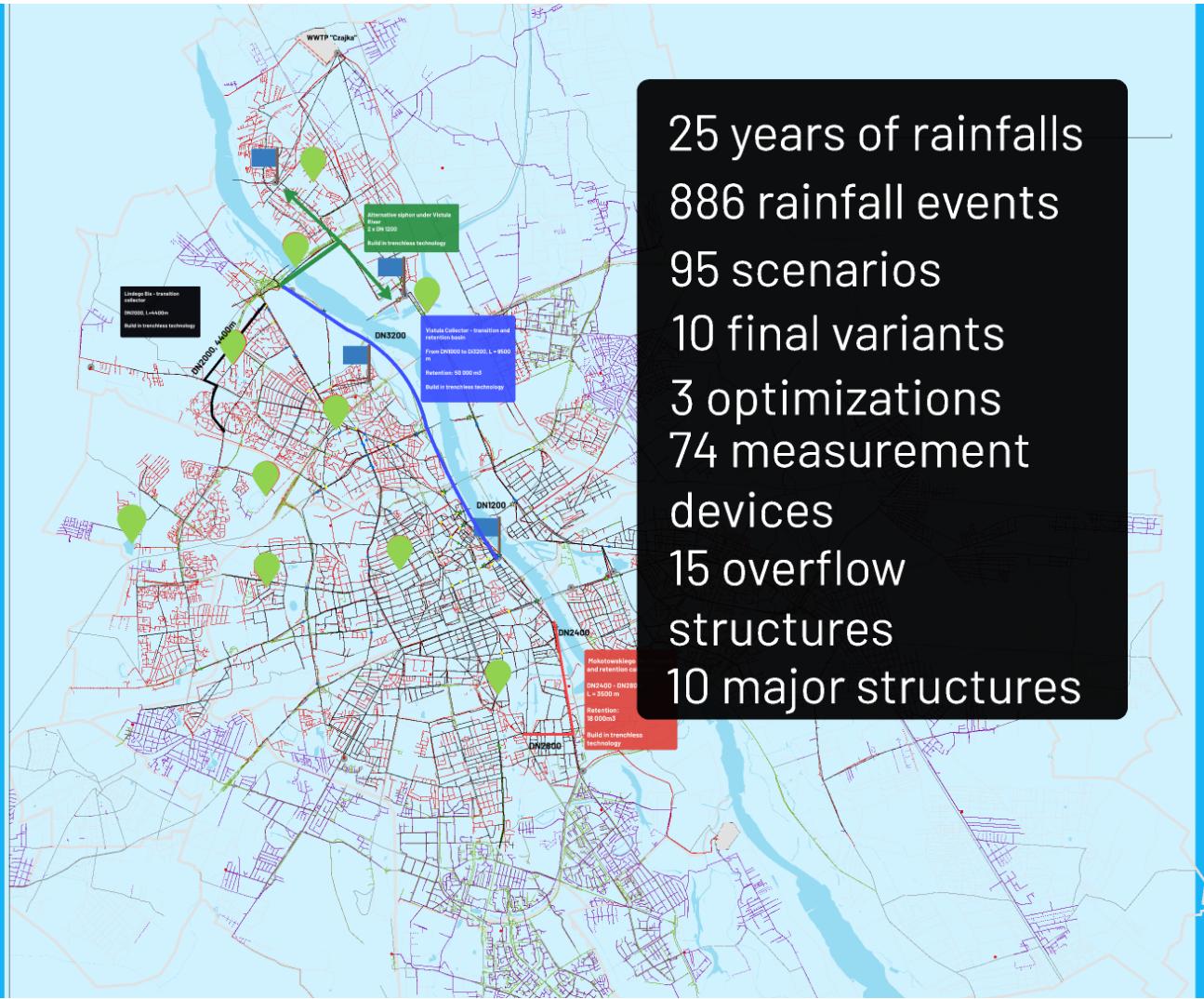








25 years of rainfalls  
886 rainfall events  
95 scenarios  
10 final variants  
3 optimizations  
74 measurement devices  
15 overflow structures  
10 major structures



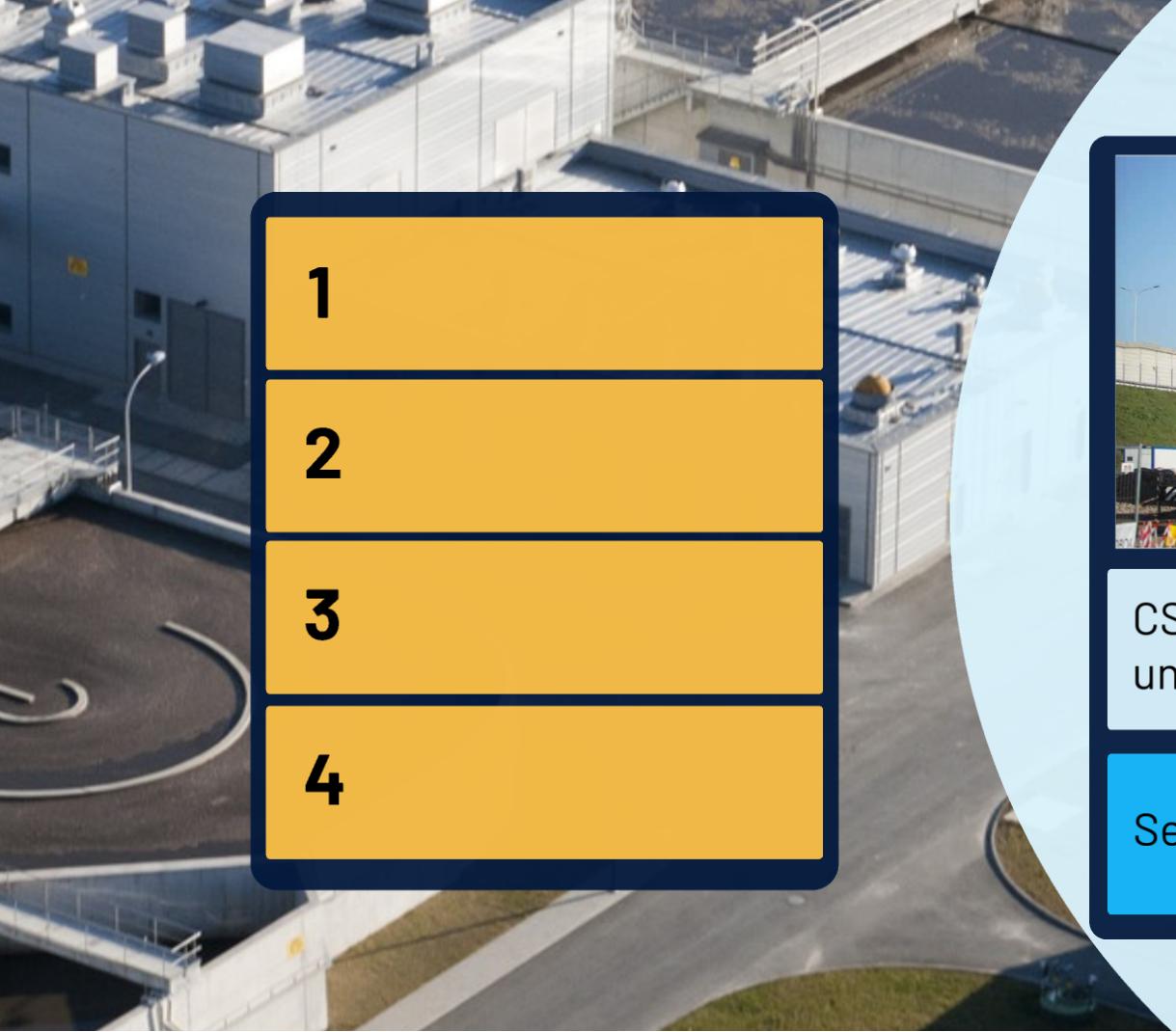


# Possibilities



CSO, flooding, city growth and unification and centralization

Setting up a model



# Possibilities

1

2

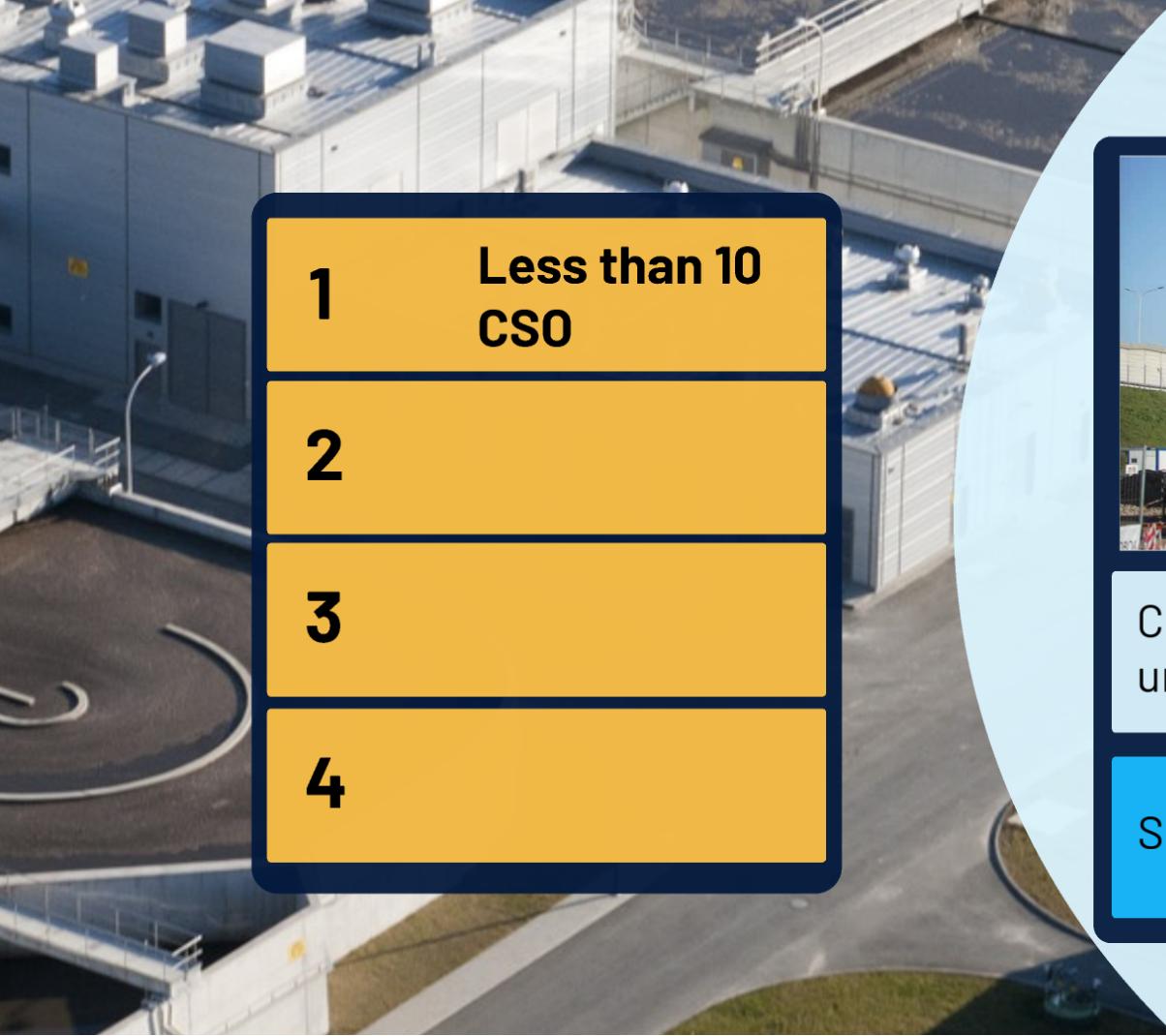
3

4



CSO, flooding, city growth and unification and centralization

Setting up a model



# Possibilities

1 Less than 10 CSO

2

3

4



CSO, floodings, city growth and unification and centralization

Setting up a model



# Possibilities

**1** Less than 10 CSO

**2** More than 30% reduction in CSO volume

**3**

**4**



CSO, flooding, city growth and unification and centralization

Setting up a model



# Possibilities

- 1 Less than 10 CSO**
- 2 More than 30% reduction in CSO volume**
- 3 No flooding**
- 4**



CSO, floodings, city growth and unification and centralization

Setting up a model



# Possibilities

- 1** Less than 10 CSO
- 2** More than 30% reduction in CSO volume
- 3** No flooding
- 4** Unification and Centralization (RTC class system)



CSO, floodings, city growth and unification and centralization

Setting up a model



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CSO, floodings, city growth and unification and centralization

Setting up a model

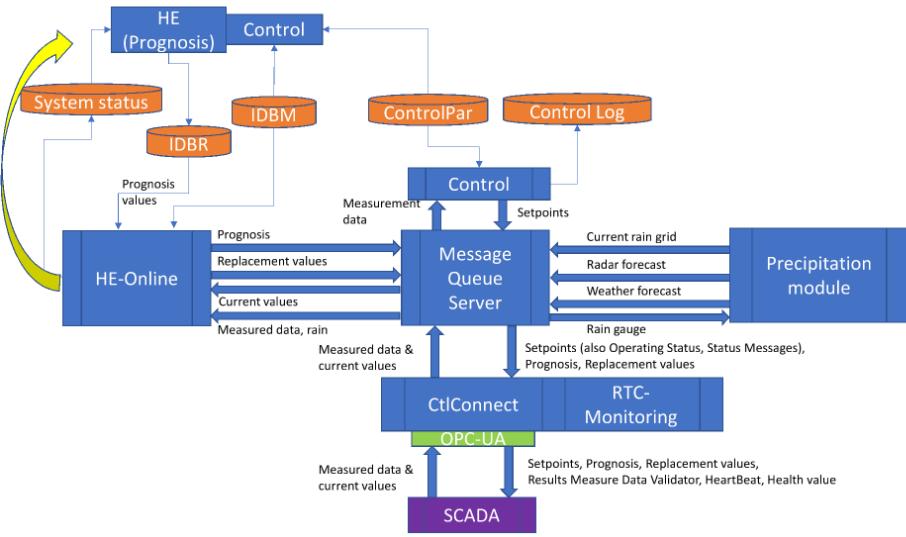


# RTC System

# RTC System

## Modules:

- Control;
- On-line simulation;
- Off-line simulation;
- Weather forecast;
- Self-learning;



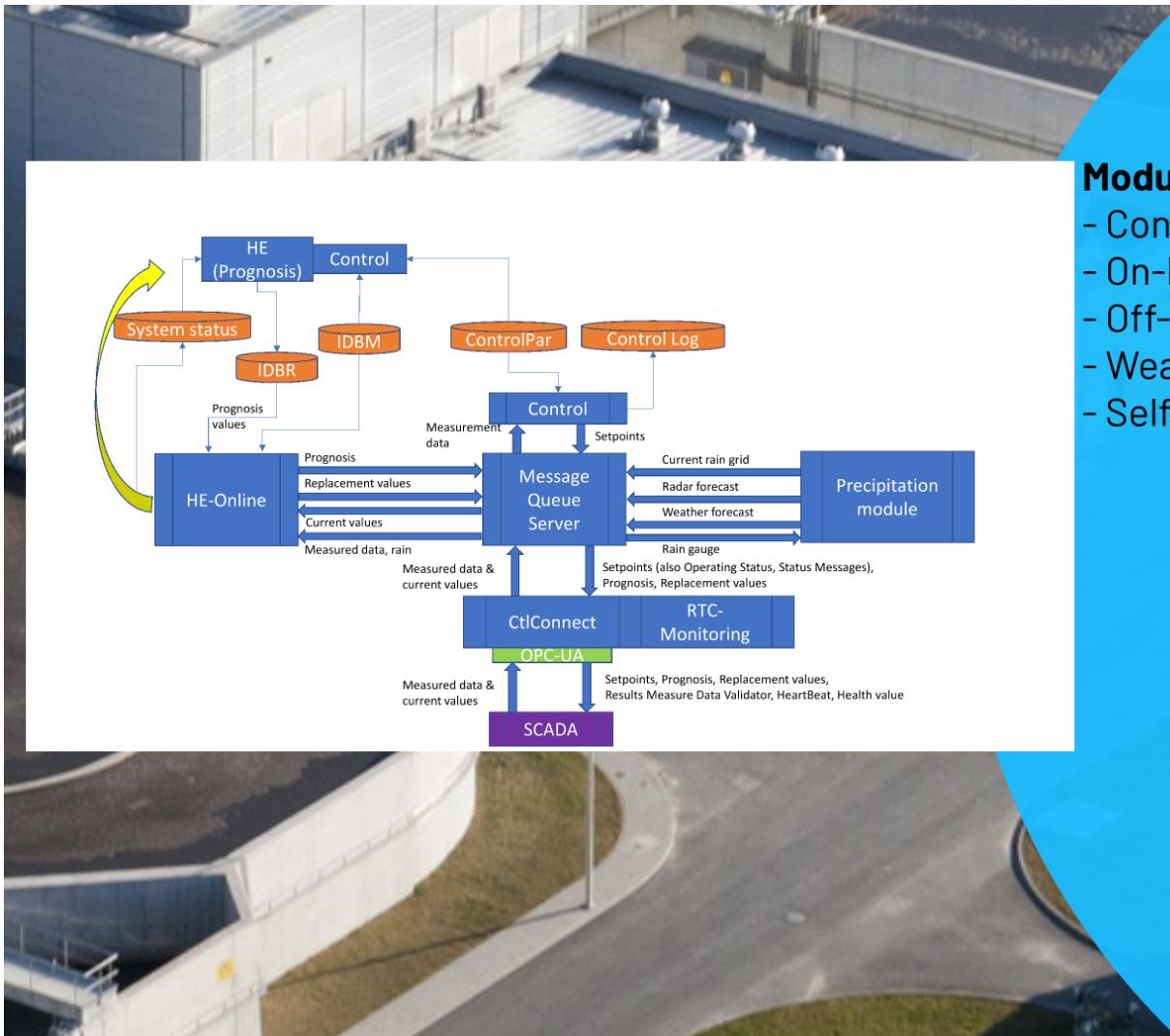
# RTC System

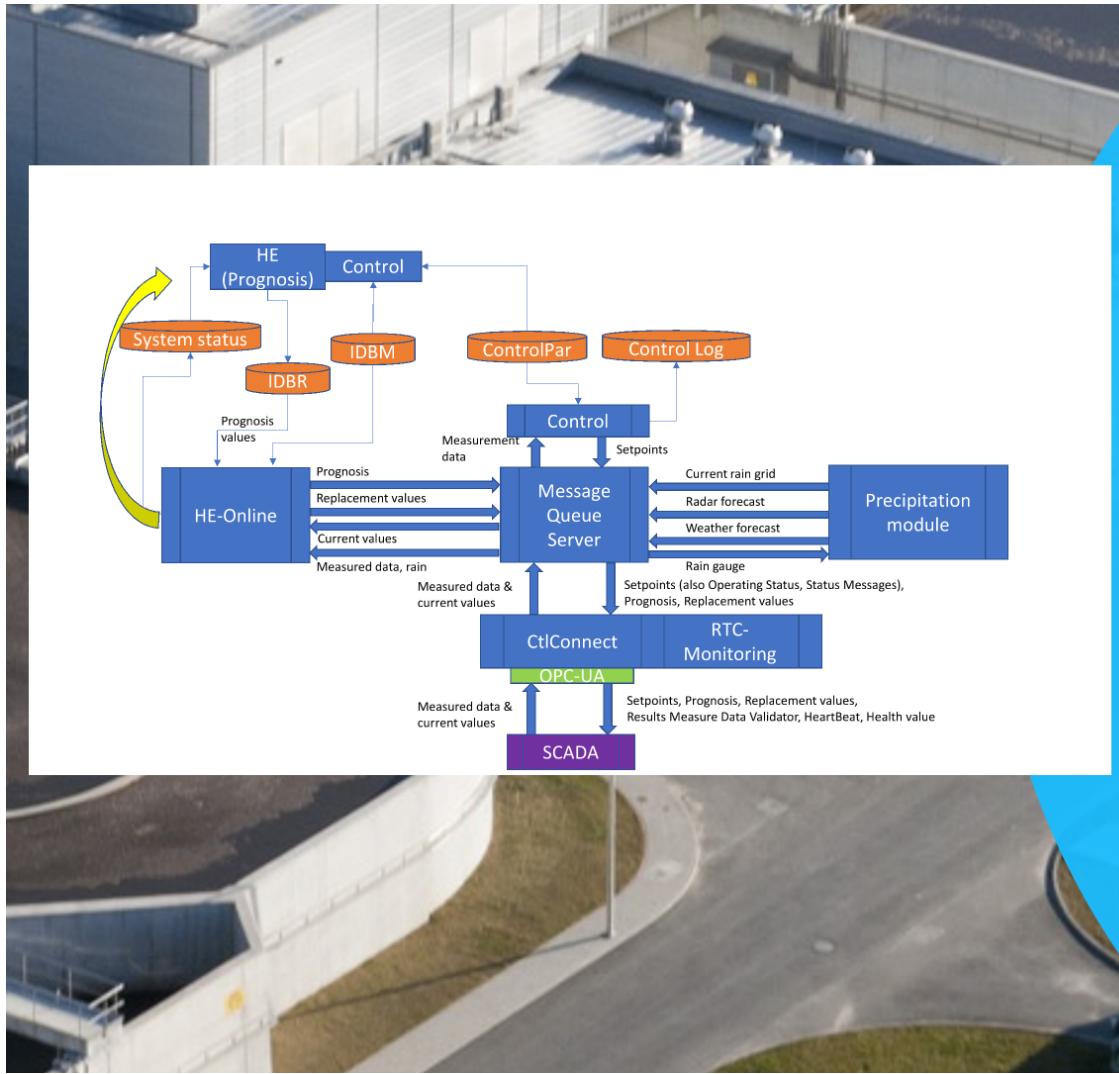
## Modules:

- Control;
- HE (Prognosis);
- IDBM;
- ControlPar;
- Control Log;
- HE-Online;
- Message Queue Server;
- Precipitation module;
- CtlConnect;
- RTC-Monitoring;
- OPC-UA;
- SCADA;

## Basic components:

- 25 rain gauges;
- Disdrometer;
- more than 50 other measurement devices (flow and level meters on the sewer network);
- 4 major pumping stations;
- 120+ minor pumping stations;
- 2 server rooms;
- Control room.





# RTC System

## 1 Modules:

- Control; - 25 rain gauges;
  - On-line simulation; - Disdrometer;
  - Off-line simulation; - more than 50 other
  - Weather forecast; measurement devices
  - Self-learning; (flow and level meters

## **Basic components:**

- 25 rain gauges;
  - Disdrometer;
  - ; - more than 50 other measurement devices (flow and level meters on the sewer network);
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  - 120+ minor pumping stations;
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## **Partners:**





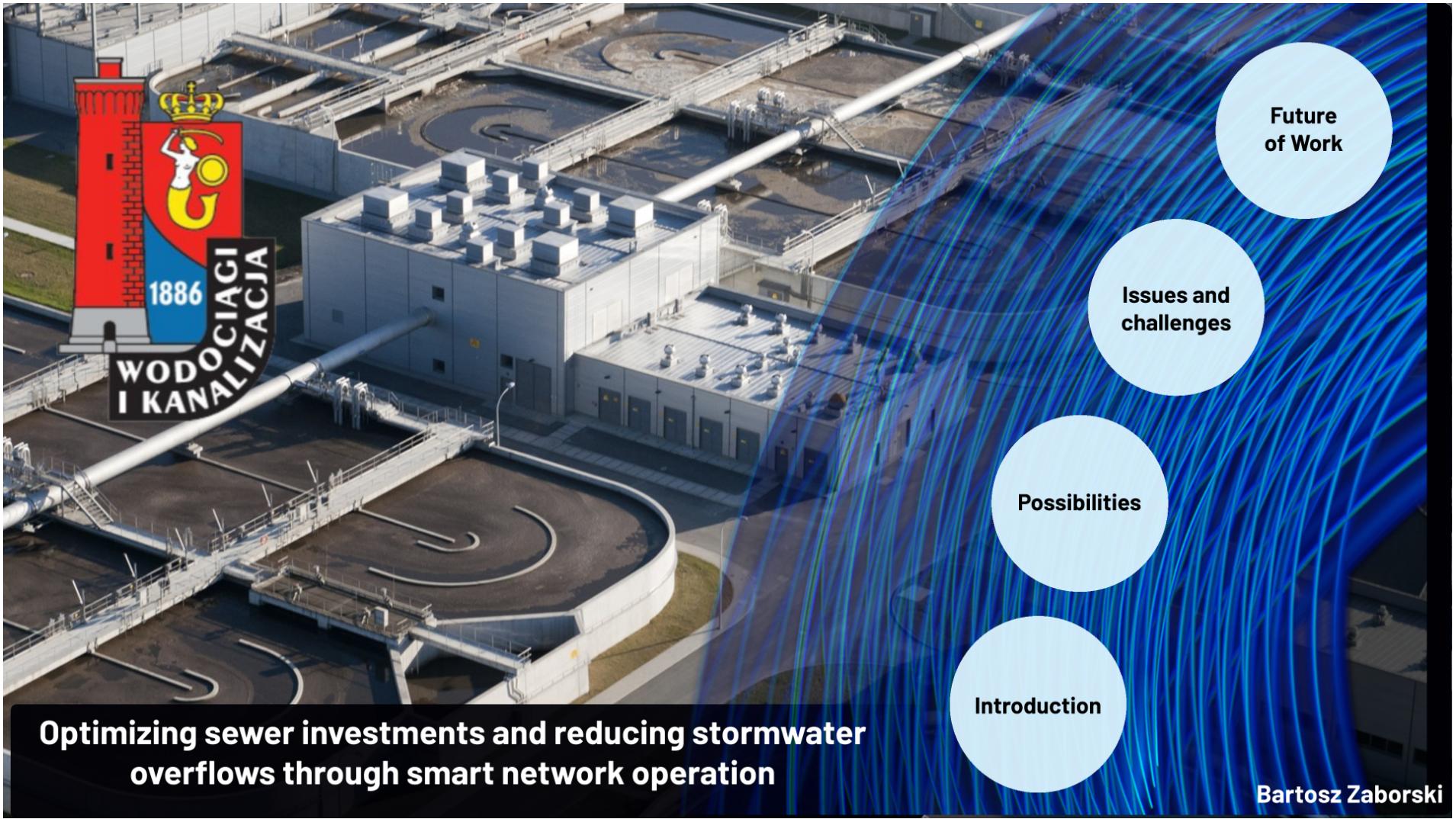
# Possibilities

- 1** Less than 10 CSO
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CSO, floodings, city growth and unification and centralization

Setting up a model





## Issues and challenges



# Major

Issues and challenges

**Data management**

**Climate change**

**Rapid city expansion**

**States of emergency**

**Interdependence**

**Vast measurement  
network**



## Issues and challenges



## Minor

Issues and challenges

Lack of Partners

Infrastructure

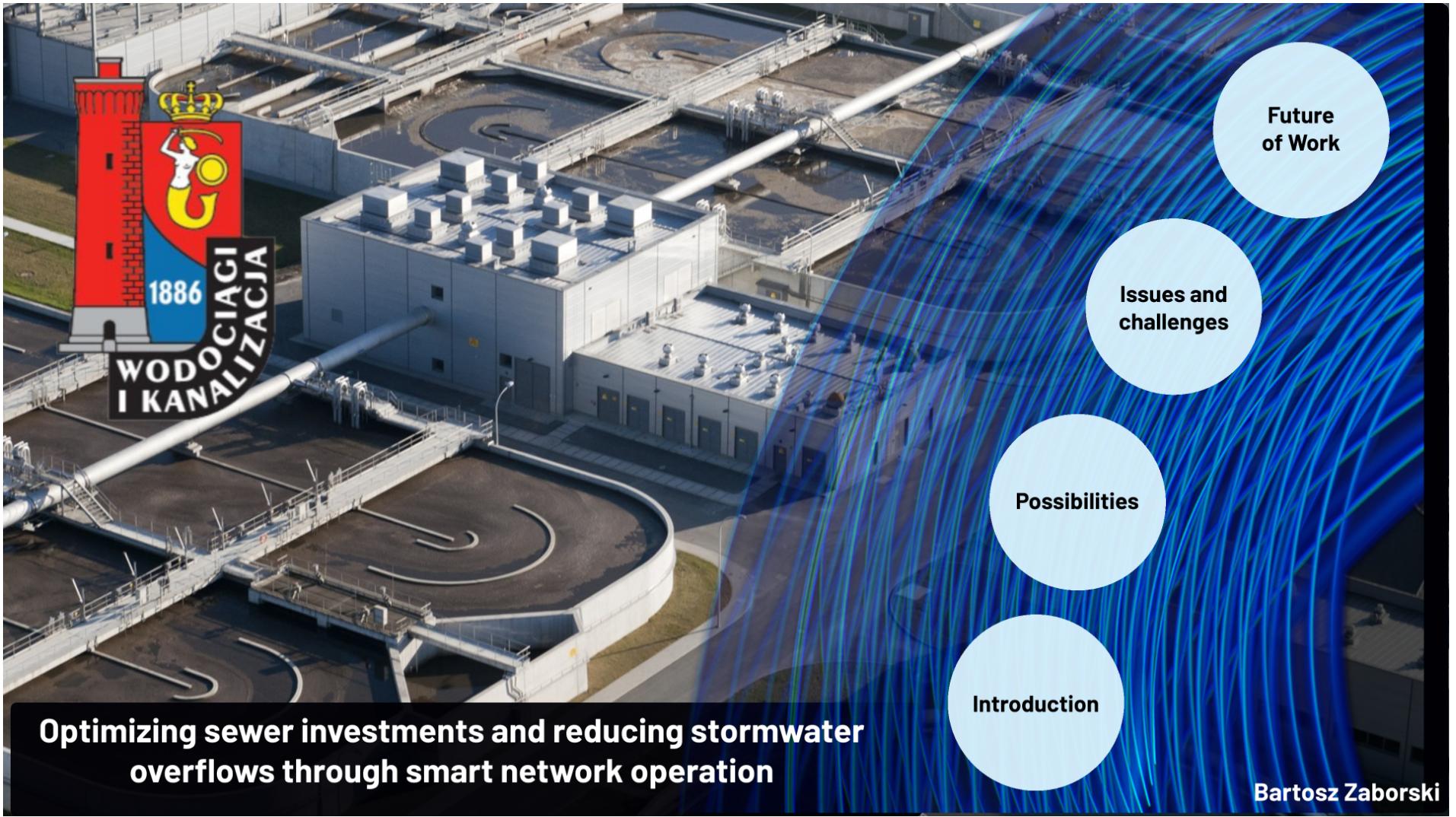
Up to date models

Language

Time



## Issues and challenges



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## Future of Work





# Future of Work

Quality modeling for RTC  
(Umprella Project)



## Future of Work

Quality modeling for RTC  
(Umprella Project)

AI implementation for RTC

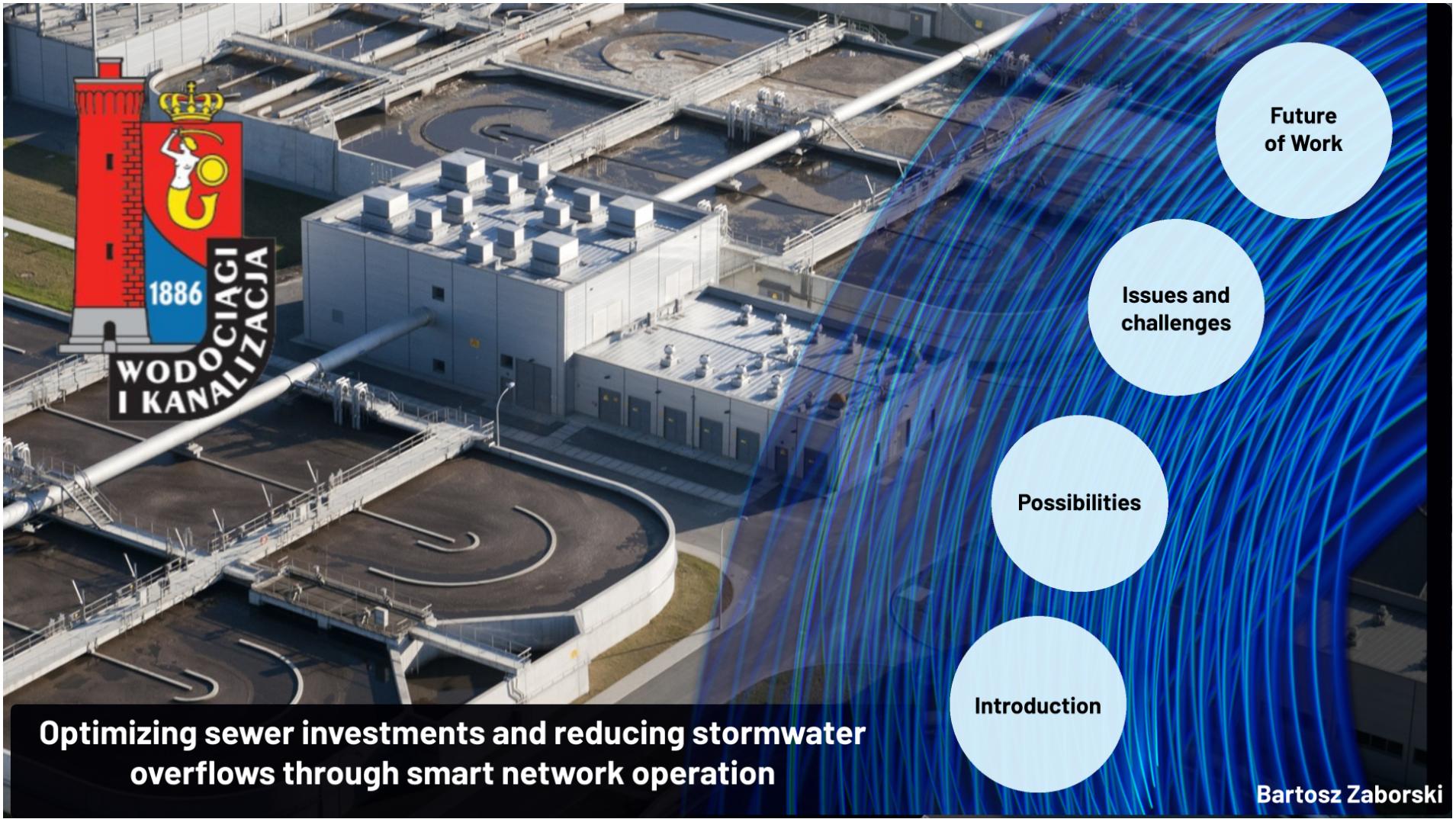


## Future of Work

**Quality modeling for RTC  
(Umprella Project)**

**AI implementation for RTC**

**Full-scale implementations  
of smart networks**



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