



MOBLAB



Imagine the world of  
today's mobility

Is a world with  
almost no traffic?

A wide-angle photograph of a city street during a marathon. The street is filled with runners and cyclists. In the foreground, several runners are visible, some wearing orange t-shirts with the slogan "IMAGINE A WORLD WITHOUT CANCER". Cyclists are also present, some wearing helmets. The street is lined with tall buildings, and various signs and traffic lights are visible. The overall scene is one of a busy, active urban environment.

Is a world with almost  
no traffic jams?

An aerial view of a multi-lane highway with several lanes in each direction. The highway is filled with various vehicles, including cars, vans, and trucks. A blue digital network overlay is superimposed on the highway, consisting of numerous nodes (small blue squares) connected by thin lines, representing a network of connected vehicles or infrastructure. The background shows a cityscape with several tall, modern buildings under a clear sky. The overall color palette is dominated by blues and greys, giving it a futuristic and technological feel.

Is a world with  
connected mobility?

Imagine a world with  
simple solutions for  
complex systems

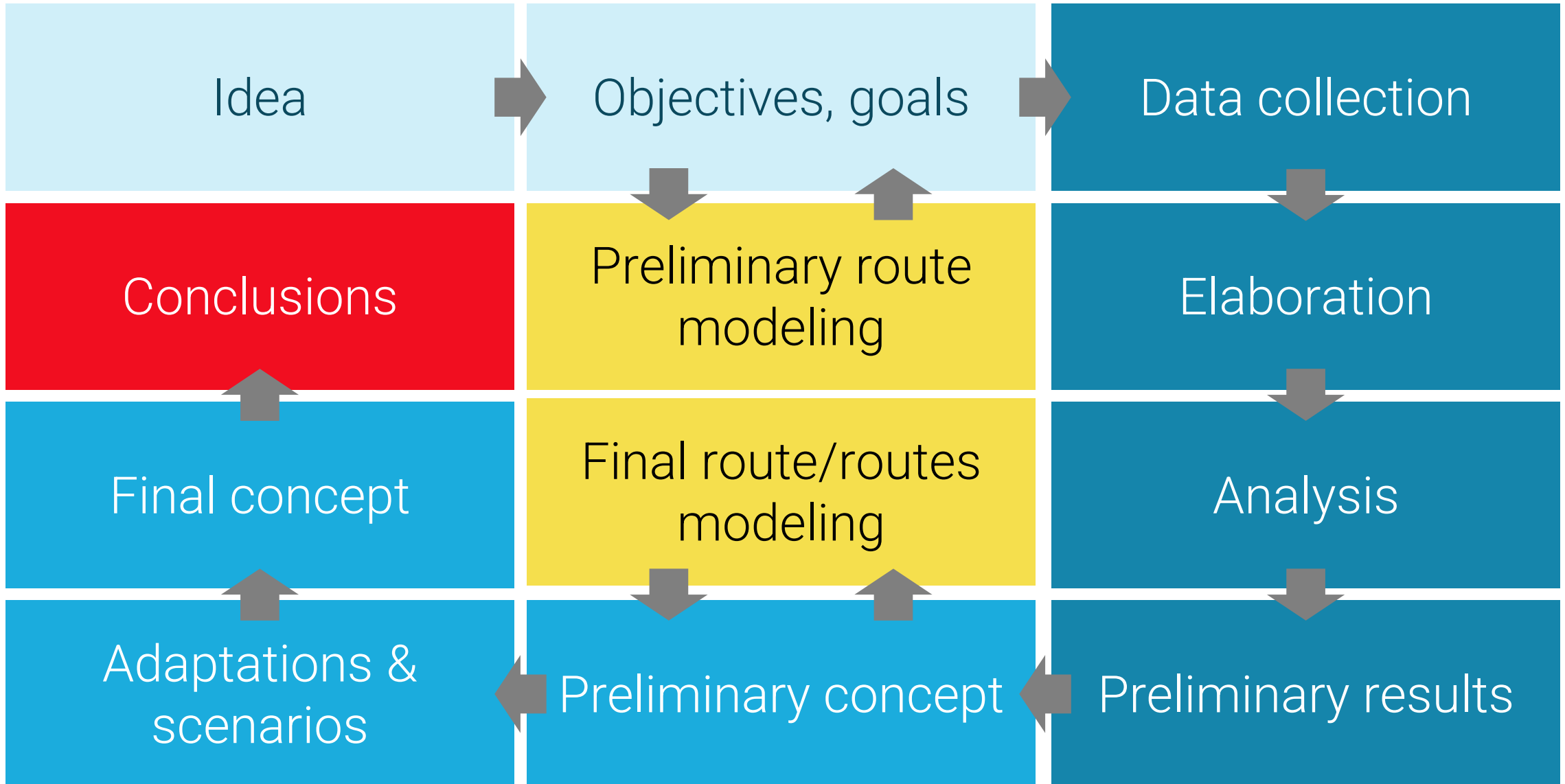
This is how we  
approached the  
development of this  
feasibility study



# Mobility Redefined: A Disruptive Concept for Public Transportation



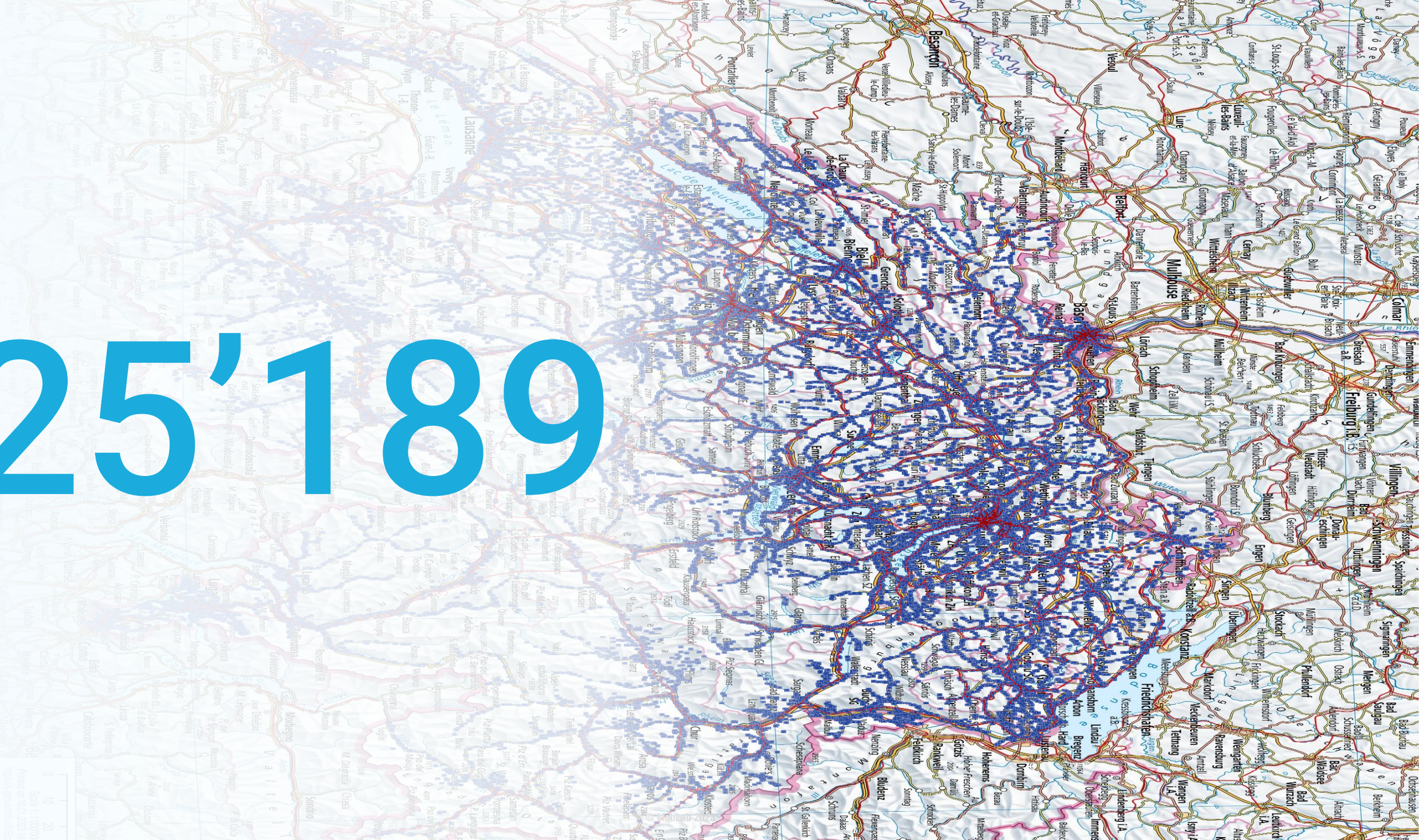
# Approach



How many public transport stations and stops are to be found in Switzerland?



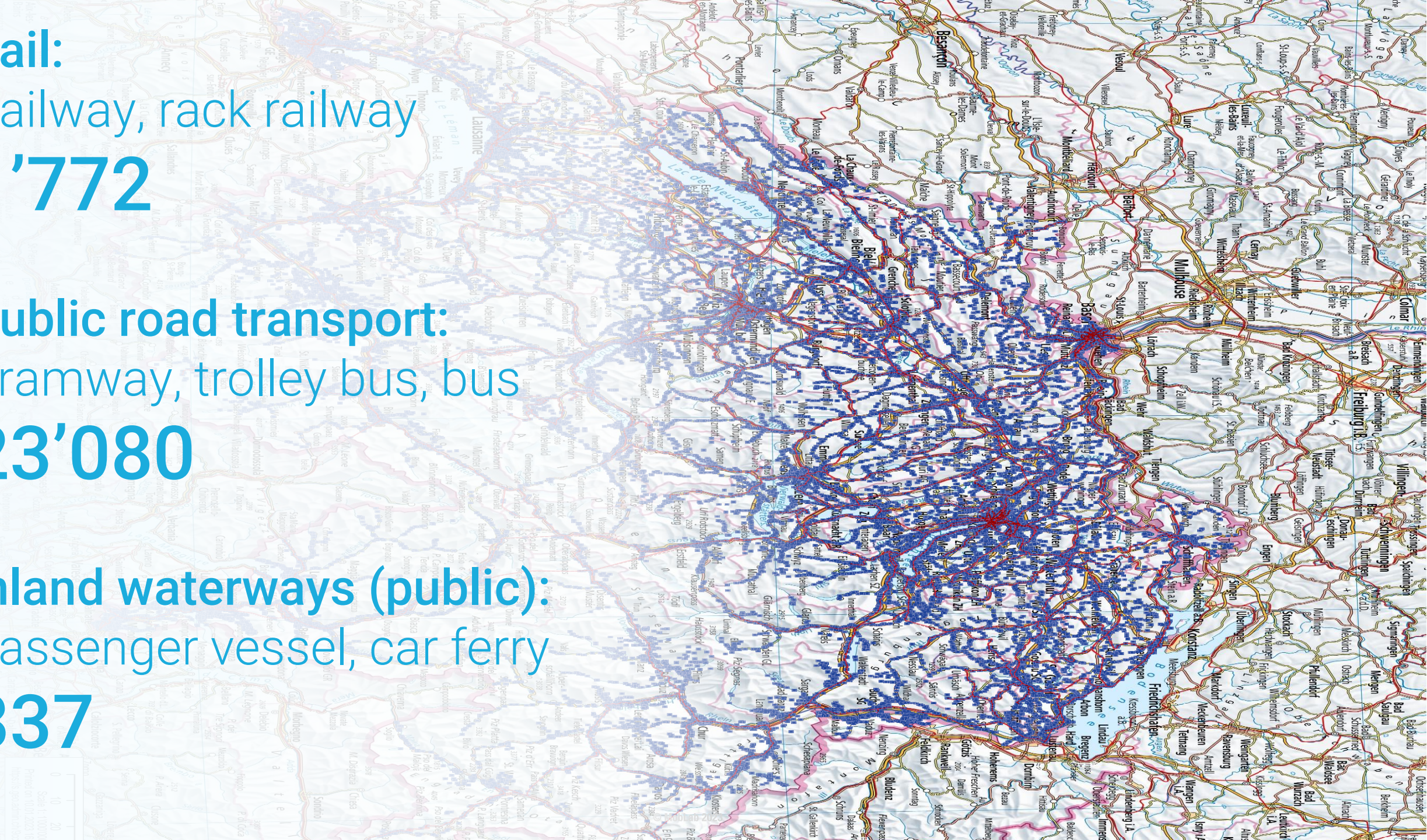
# 25,189



**Rail:**  
Railway, rack railway  
**1'772**

**Public road transport:**  
Tramway, trolley bus, bus  
**23'080**

**Inland waterways (public):**  
Passenger vessel, car ferry  
**337**



# Introduction

## Facts

- We plan public transportation since ages to cover the passenger demand for peak hours
- We always use standard product for almost all routes in urban and suburban areas

## Information from other studies

- Customers value comfort, speed, on-time performance, security and safety (2022)

## Idea

- Select a specific public transport route operated by Bus in a Urban/Suburban area
- The route must have different demand requirements over the route
- The average load factor must be <50%

# Objectives

- Optimization of the offer in terms of capacity
- Improvement of the route sustainability
- Higher technical availability

## Selected route

### Key route data

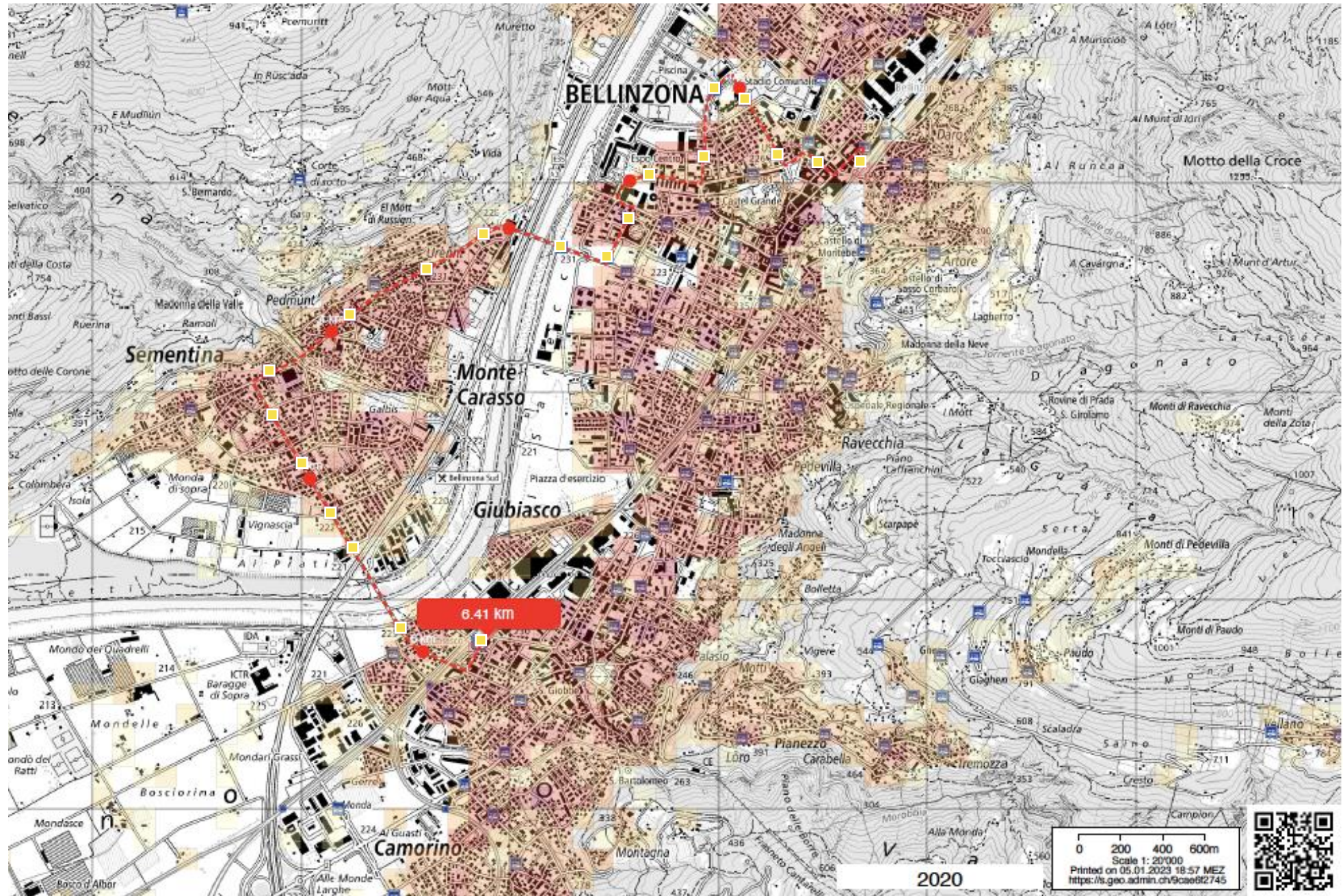
- 6.41 km
- 20 stops
- 2 stops in national / regional hub
- 4 stops deserves SME centers
- 6 stops are close to schools (K6, K12, HS)
- Total distance traveled: 164'508 km

### Key vehicle data

- Max. 71 PAX capacity
- Volvo 9700 Hybrid
- Average consumption 37.2 l/100 km
- Fleet of 4 vehicles



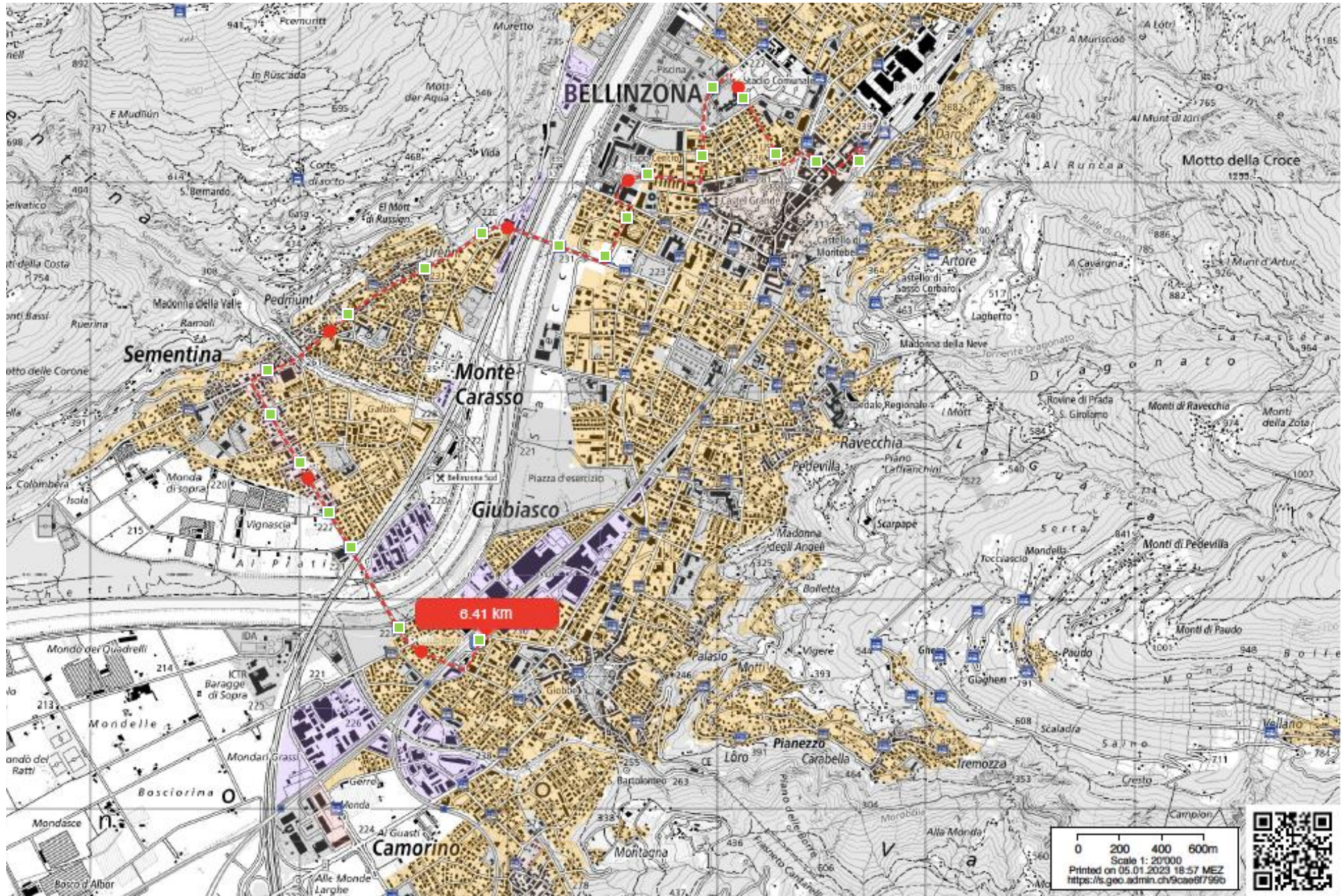
# Selected route – Residents

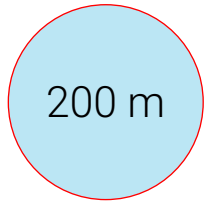




# Selected route – Areas assignment

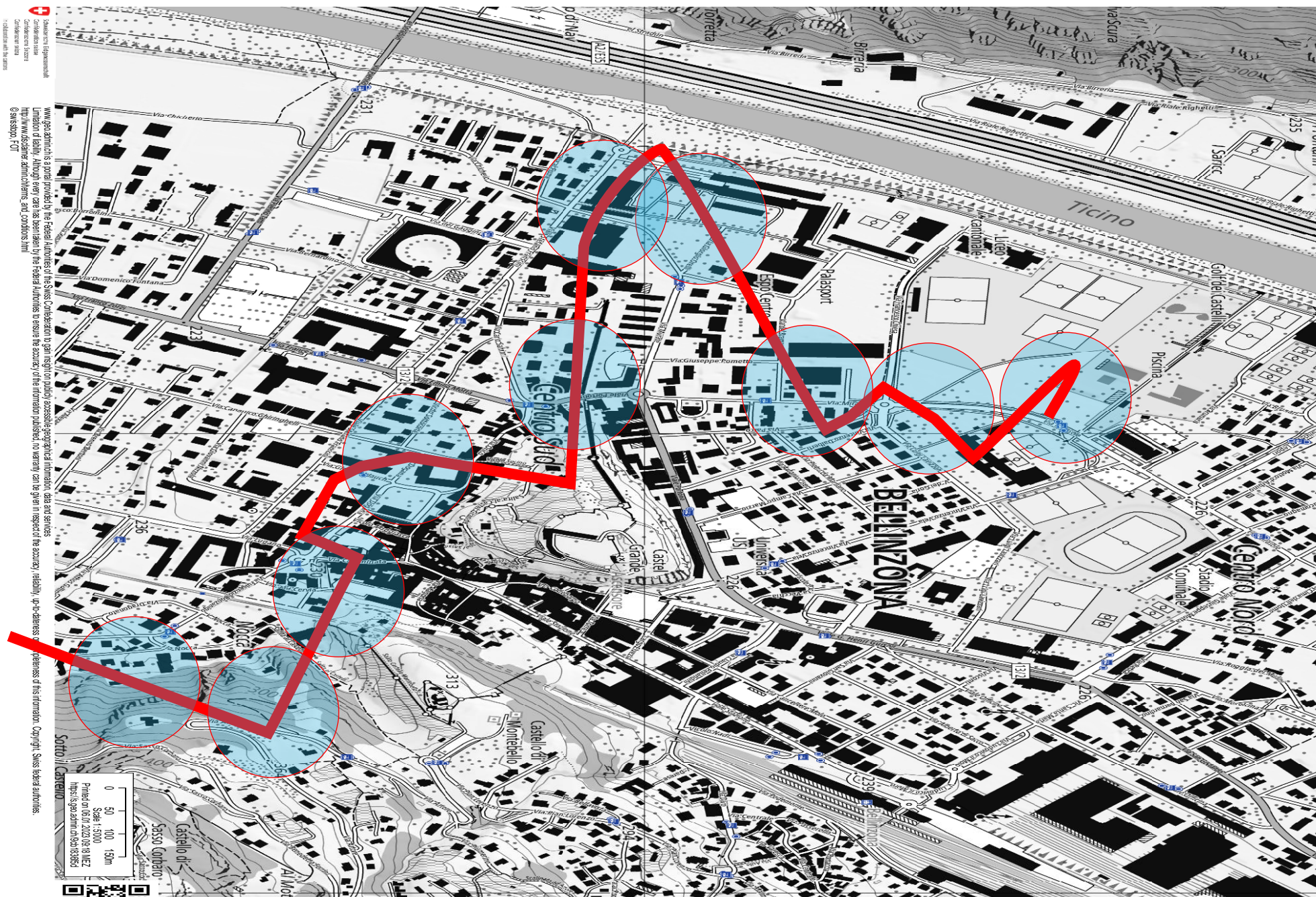
- Industrial / Commercial Area
- Public Utility Area
- Central Area
- Residential Area
- Mixed Area



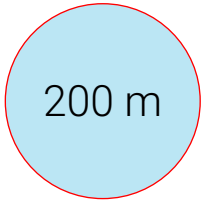


Radius from each Bus stop






# Bus line - Sector 1

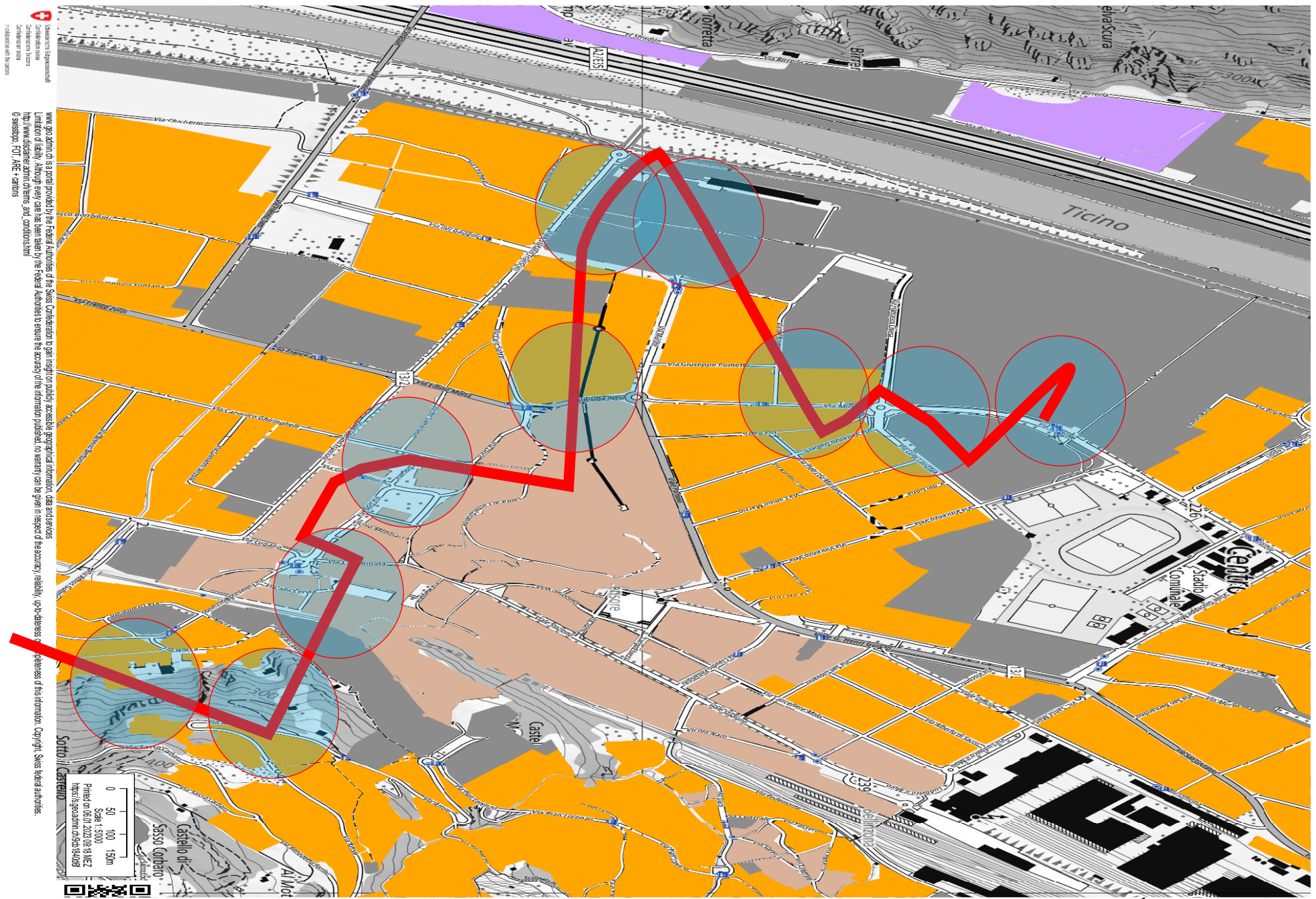


# Bus line - Sector 1 / Building zones

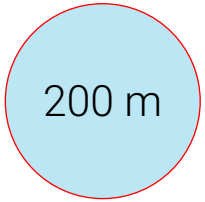


Radius from each Bus stop

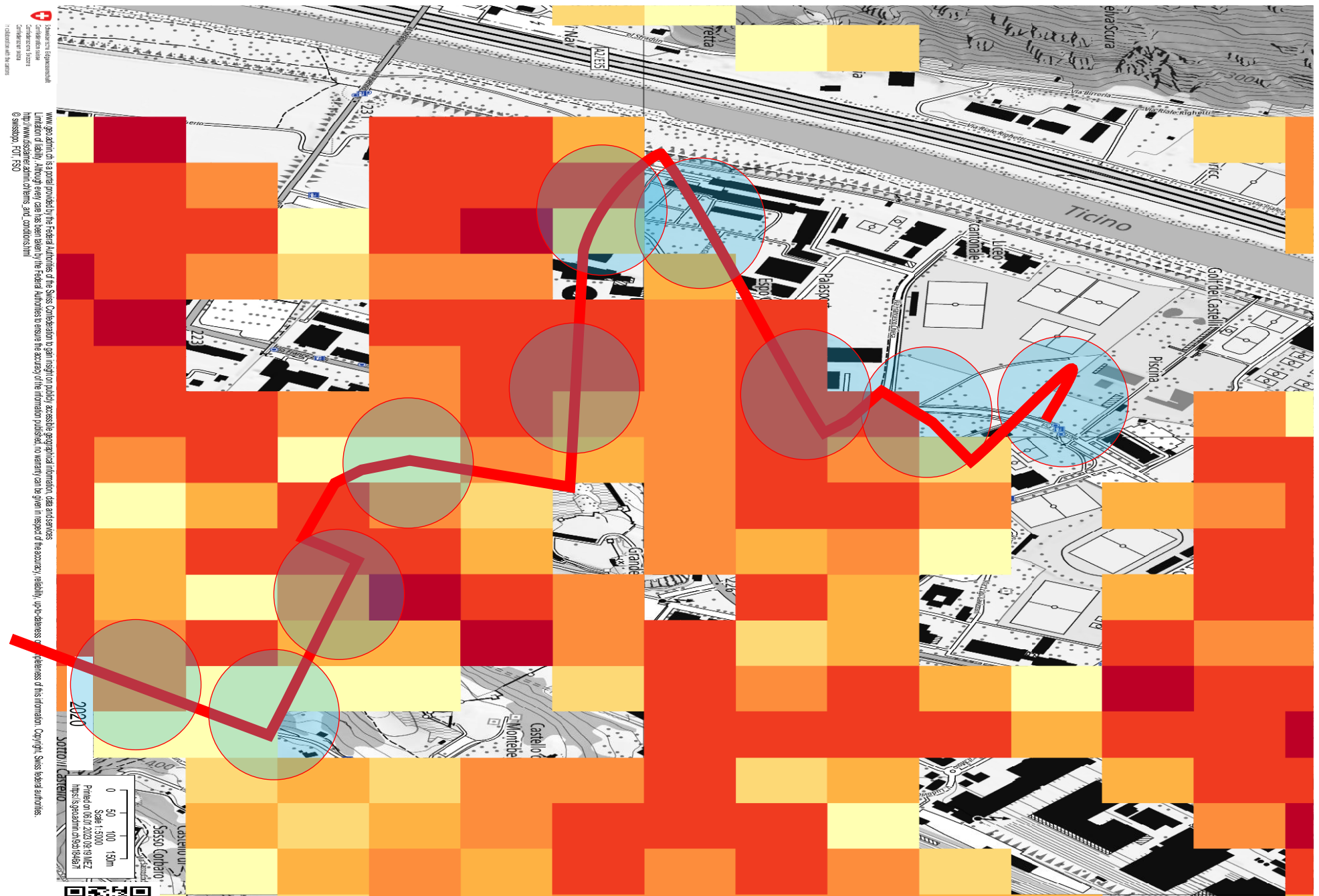
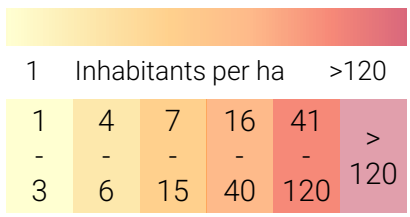
-  Industrial / Commercial Area
-  Public Utility Area
-  Central Area
-  Residential Area
-  Mixed Area



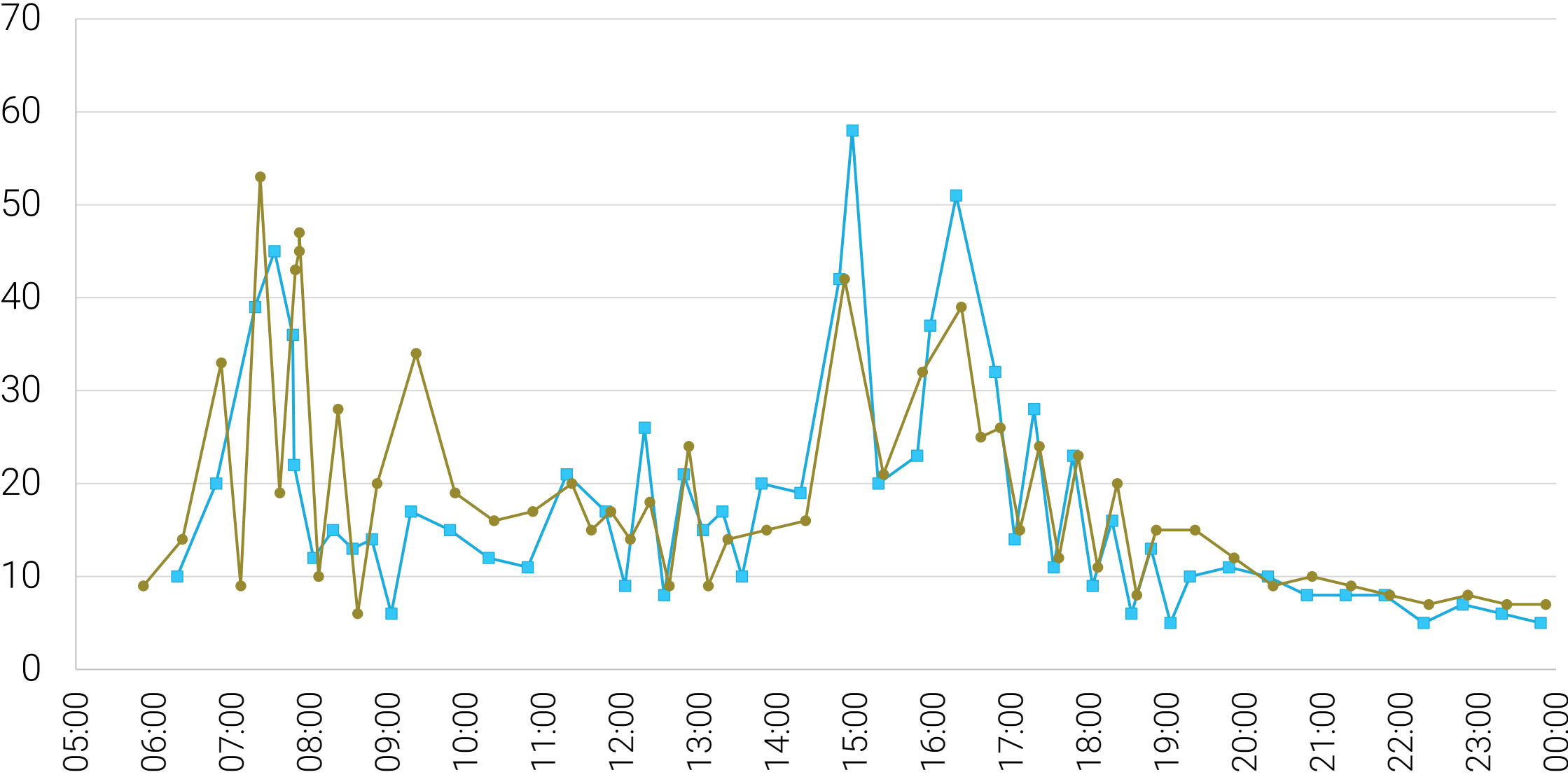
# Bus line - Sector 1 / Residents per ha



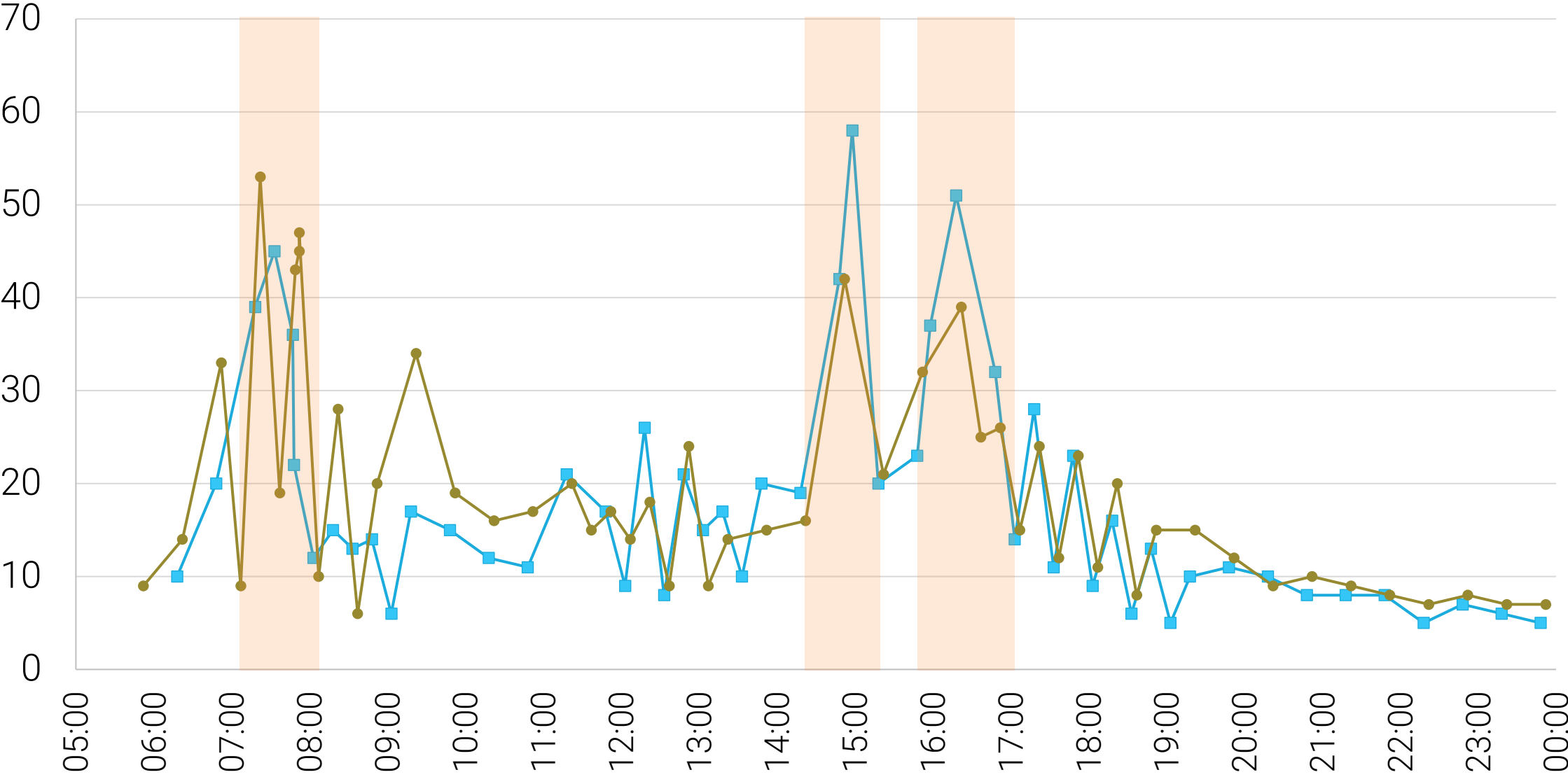
Radius from each Bus stop



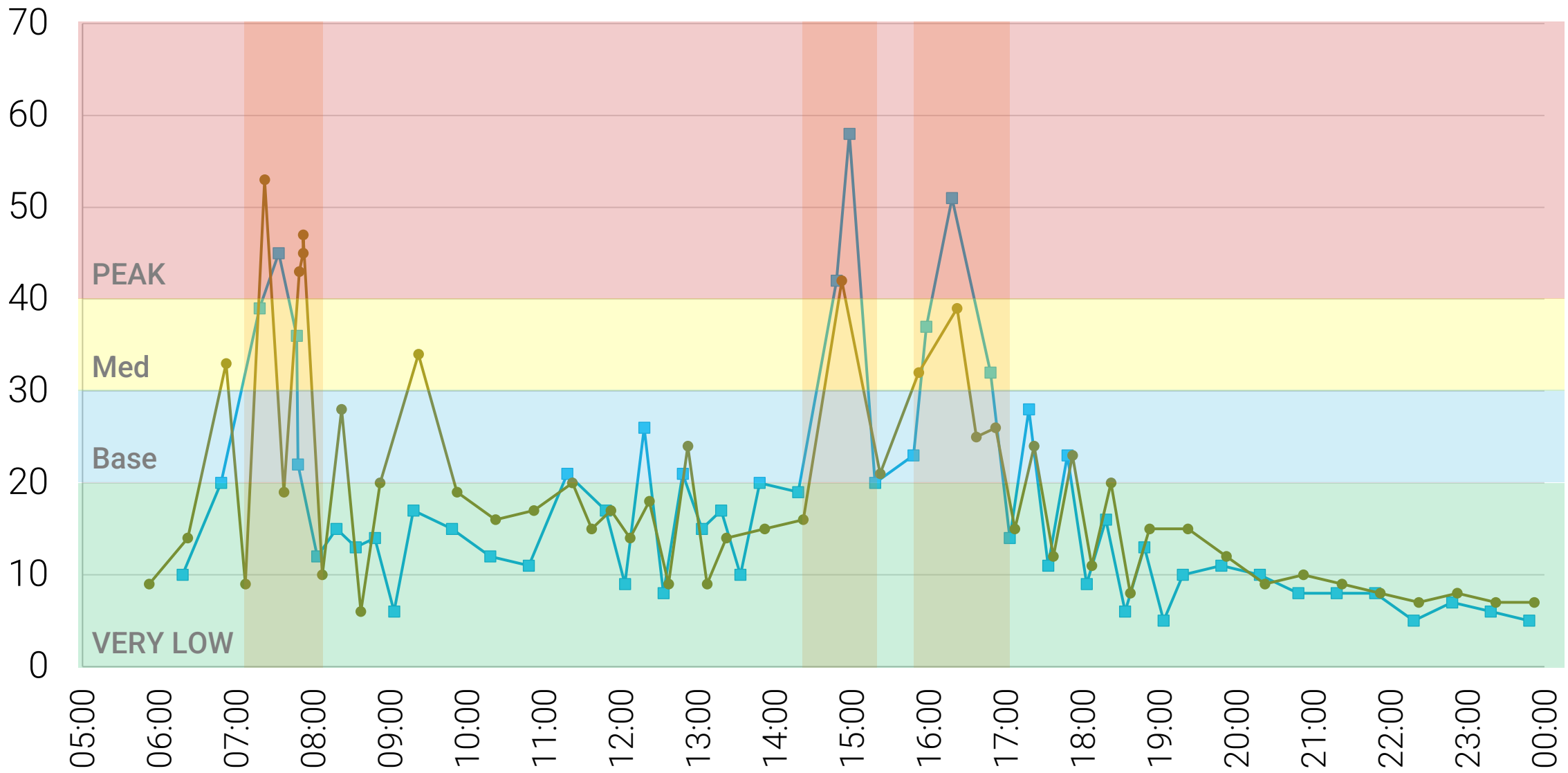
# Average PAX per ride (71 max)



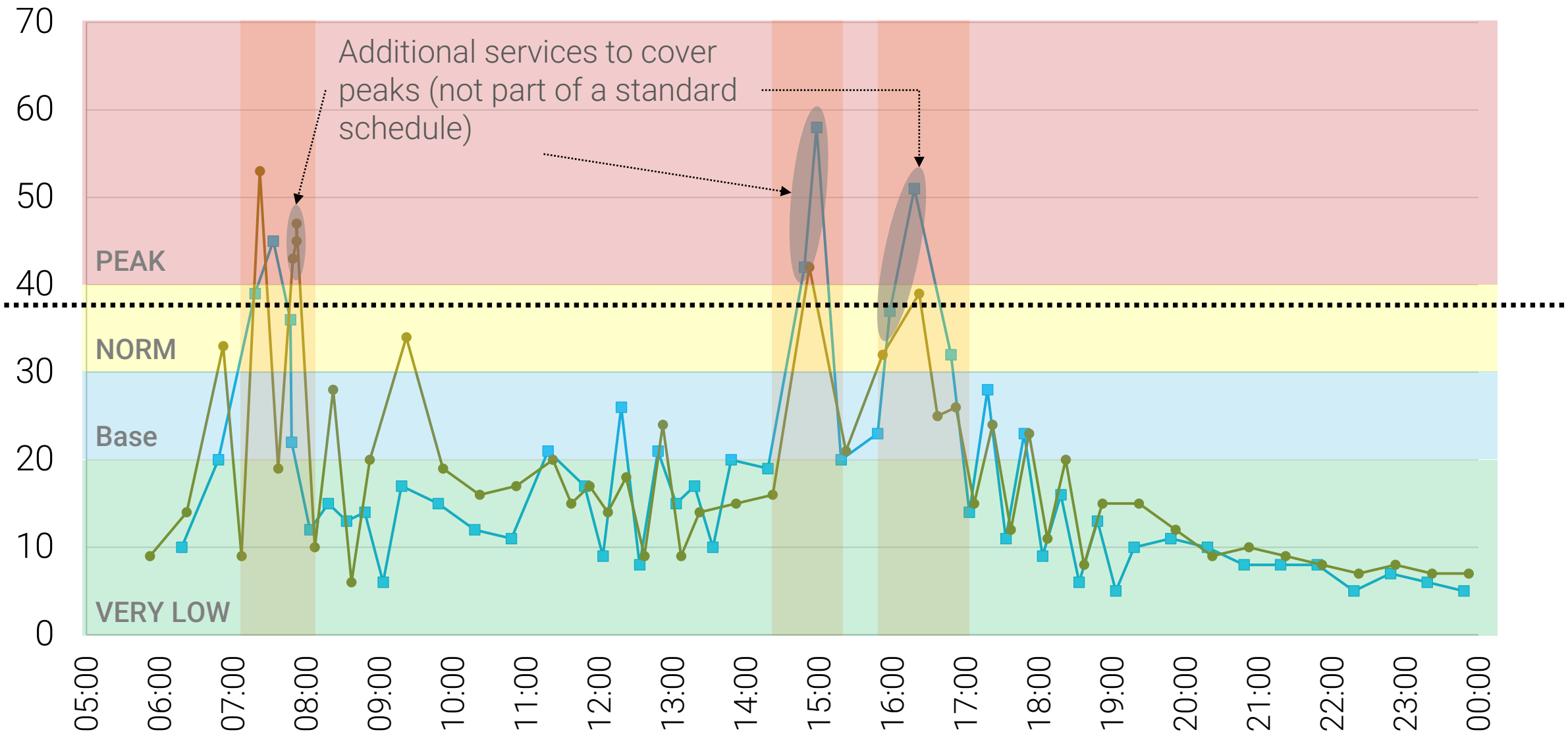
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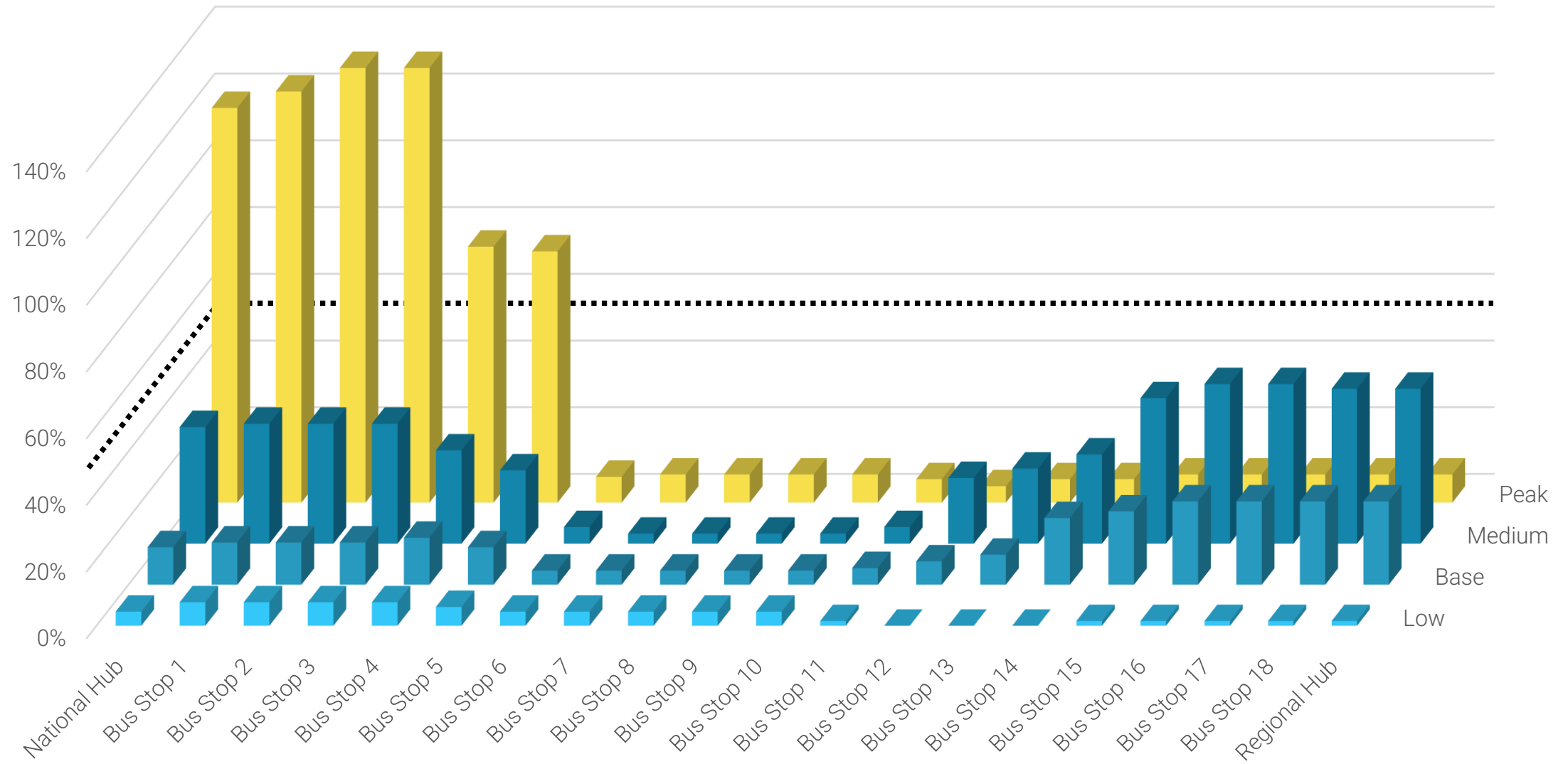


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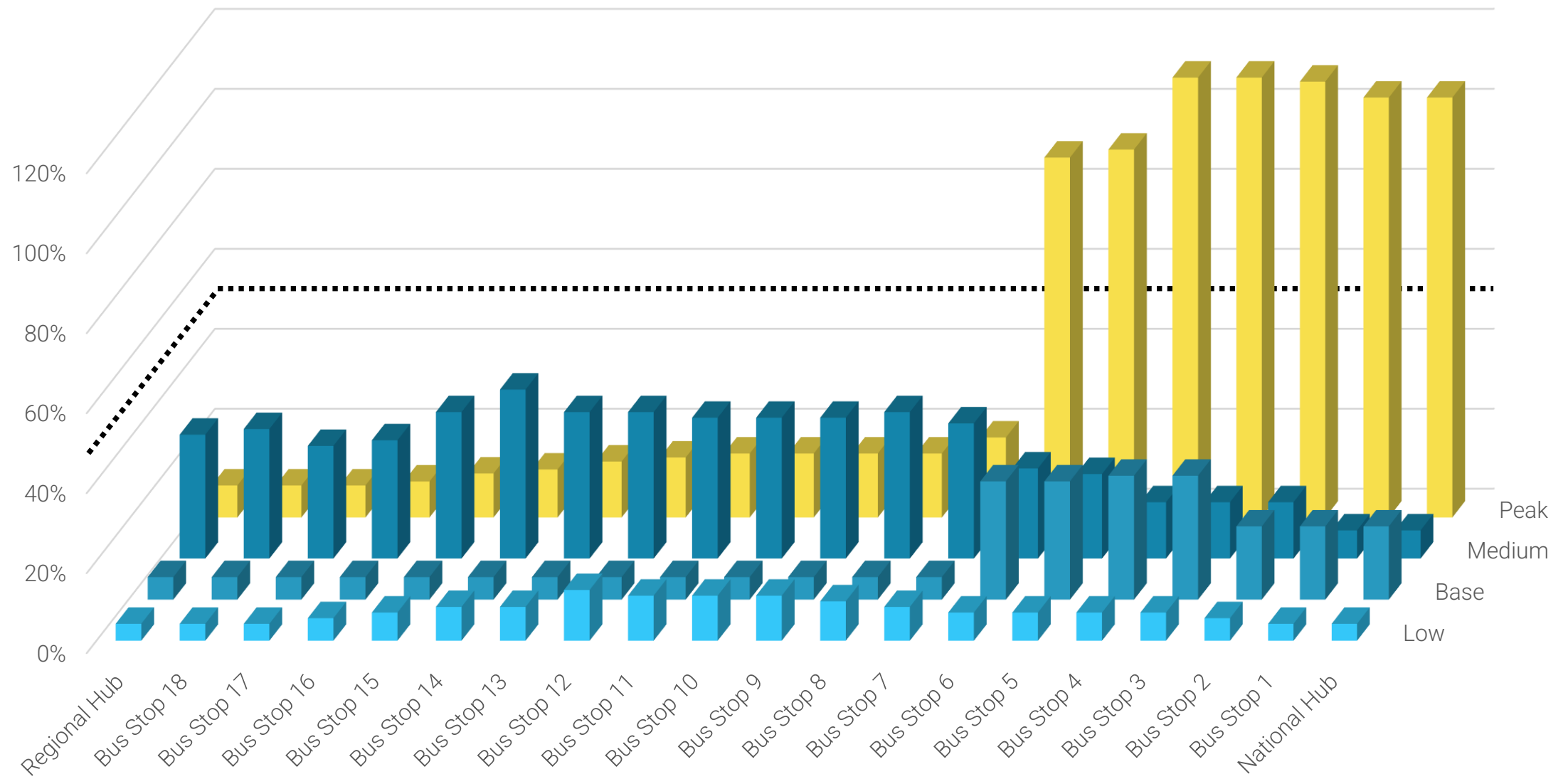


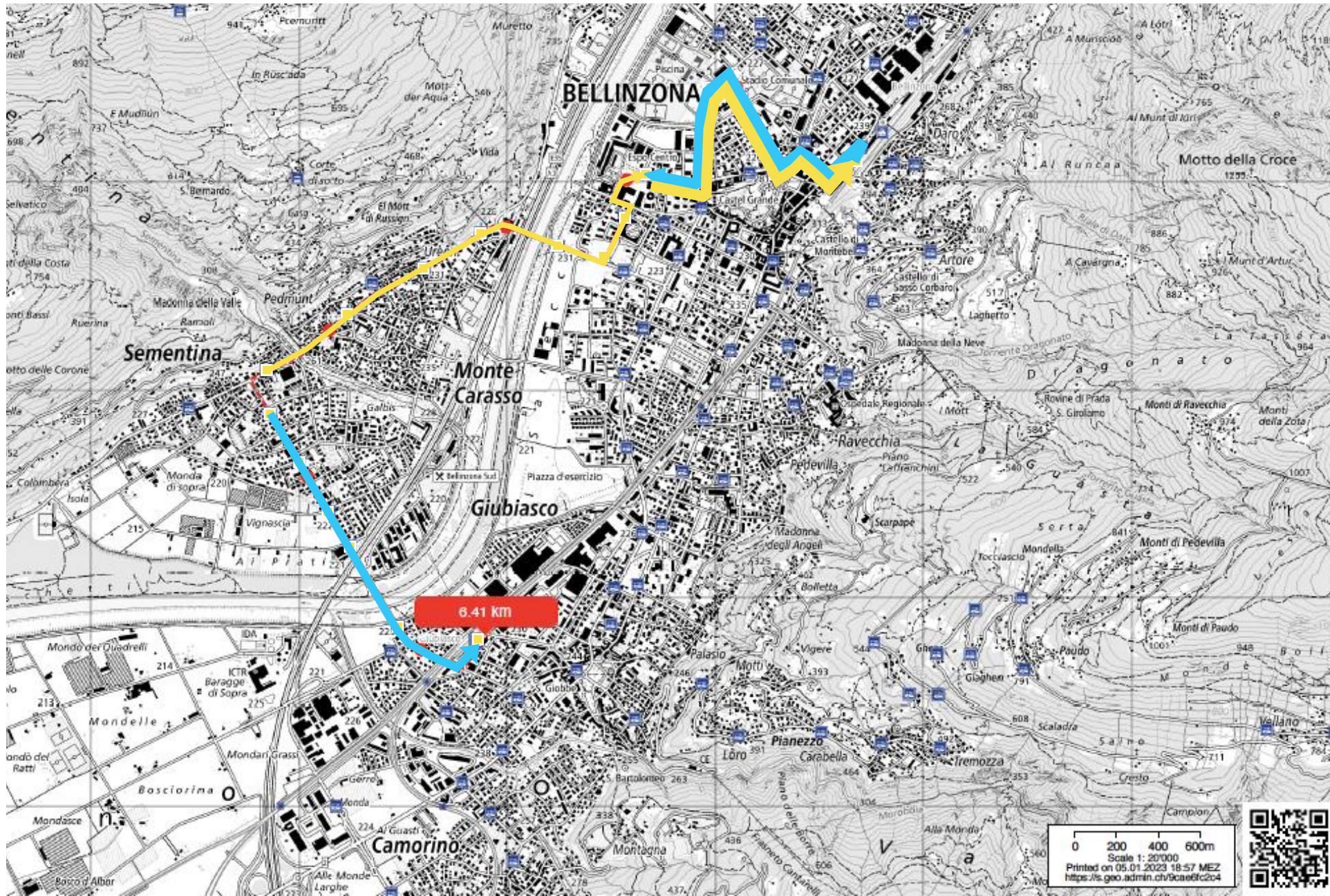


# Load factor of PAX per stop/hub – National to regional hub



# Load factor of PAX per stop/hub – Regional to national hub

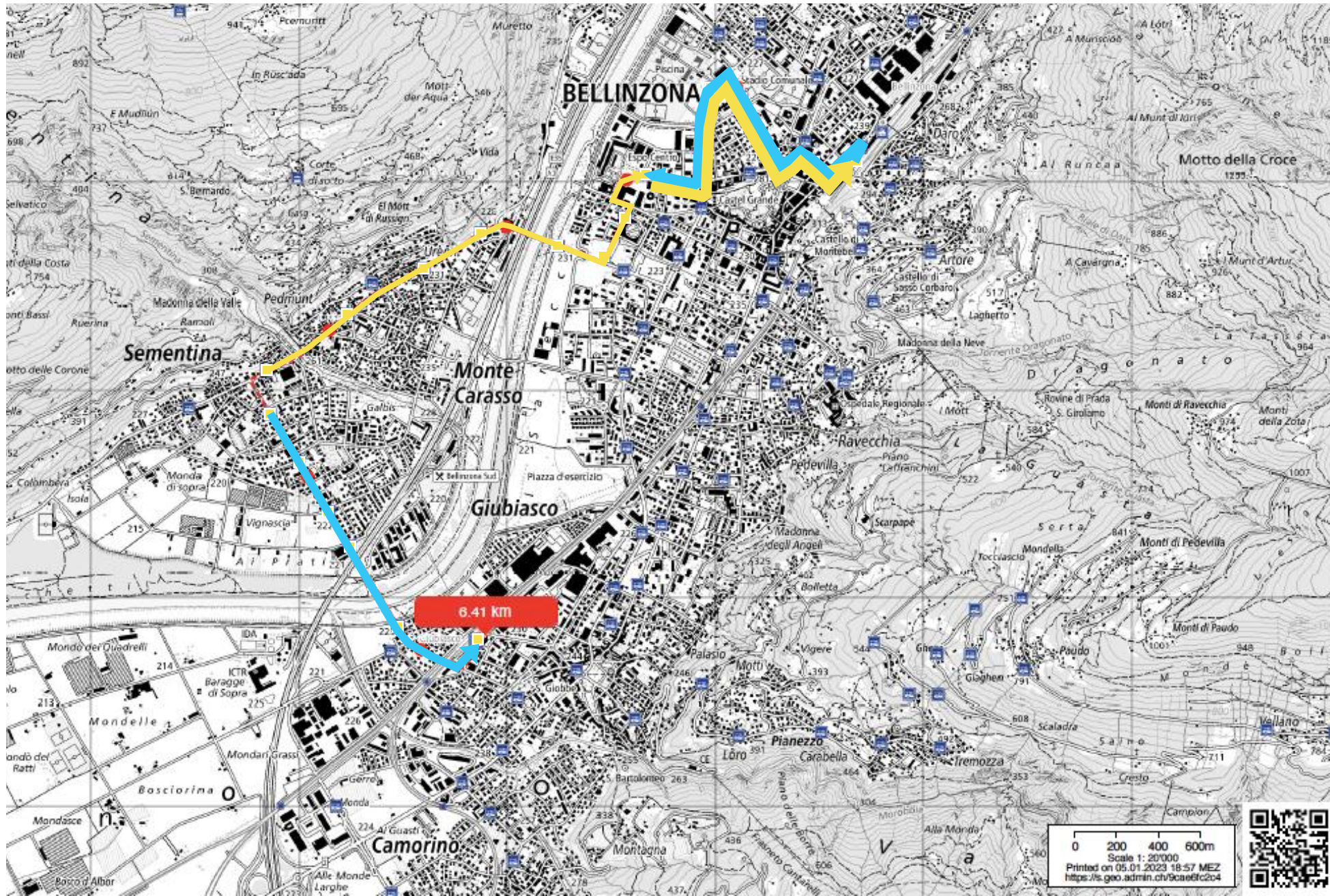




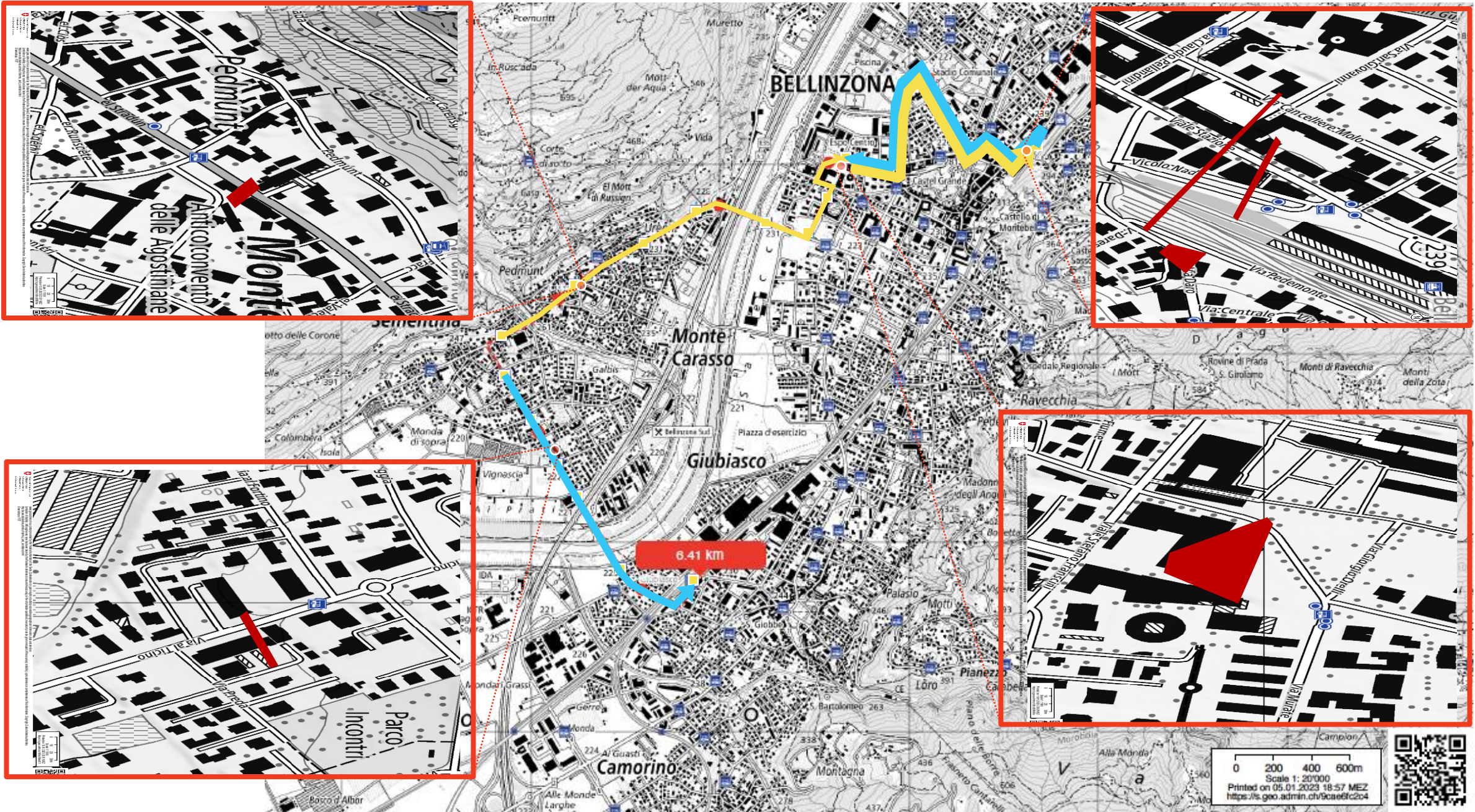
# Proposed solution: Platooning

# Bus Platooning

- Truck platooning is the linking of two or more trucks in convoy, using connectivity technology and automated driving support systems. These vehicles automatically maintain a set, close distance between each other when they are connected for a selected journey.
- In transportation, platooning is a method for driving a group of vehicles together. It is meant to increase the capacity of roads via an automated highway system. Platoons decrease the distances between cars or trucks using electronic, and possibly mechanical, coupling. This capability would allow many cars or trucks to accelerate or brake simultaneously. This system also allows for a closer headway between vehicles by eliminating reacting distance needed for human reaction.



# Positioning of Platooning vehicles



# General consideration

## Vehicles

- There is no such vehicle on the market today.
- If this study will be considered, a pilot project shall be started
- Propulsion shall be sustainable (e or H2 fuel)
- E-propulsion: estimated battery change after 6-8 years (capital investment)



## Operational consideration

- Capital investment might increase if the proposed solution will be implemented only on one route.
- Downsizing of the vehicle reduces the single direct investment and optimizes the load factor.
- With standby vehicles, real-time predictions and resolutions more comfort can be provided to the customers. This with the help of adaptable algorithms and real-time camera surveillance on the bus-stops.
- it is expected a operational cost reduction in the lower double digit percentage.

## Maintenance consideration

- If e-propulsion is selected, less maintenance will be required
- Predictive maintenance shall be implemented in a second stage (missing historical data and experience)
- Smaller Bus = different maintenance

# Conclusions

- In order to be efficient and flexible, with the figures on Load Factor, smaller vehicle shall be used.
- Platooning can “easily” cover the peaks demands.
- If a 38 PAX capacity bus is selected, only 13% of the rides will require Platooning.
- The use on the overall network, will help to increase flexibility and decrease capital investment.

# Who am I?

## Simone Bernasconi Managing Director at MobLab

On the road since more than 20 years in various technical and management positions in the aviation and mobility sector. Innovator, narrator, creative engineer, strategist and responsible leader.

A citizen of the world who actually lives in Uster (Switzerland) since 2018.

Father of one daughter, happily married.

**My mindset:** Simple is simply better – Innovation is not only technology – Sharing emotions is communication – Creativity is enrichment – Respect build longstanding relationships – **Mobility is the lifeline of economy.**



Imagine a world with  
simple solutions for  
complex systems



We believe we have  
one correct answer



MOBLAB

# Document information

**Descrip.:** Mobility Redefined: A Disruptive Concept for Public Transportation

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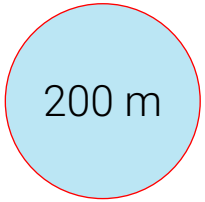
**Date:** 11.01.2023

**Authors:** Simone Bernasconi

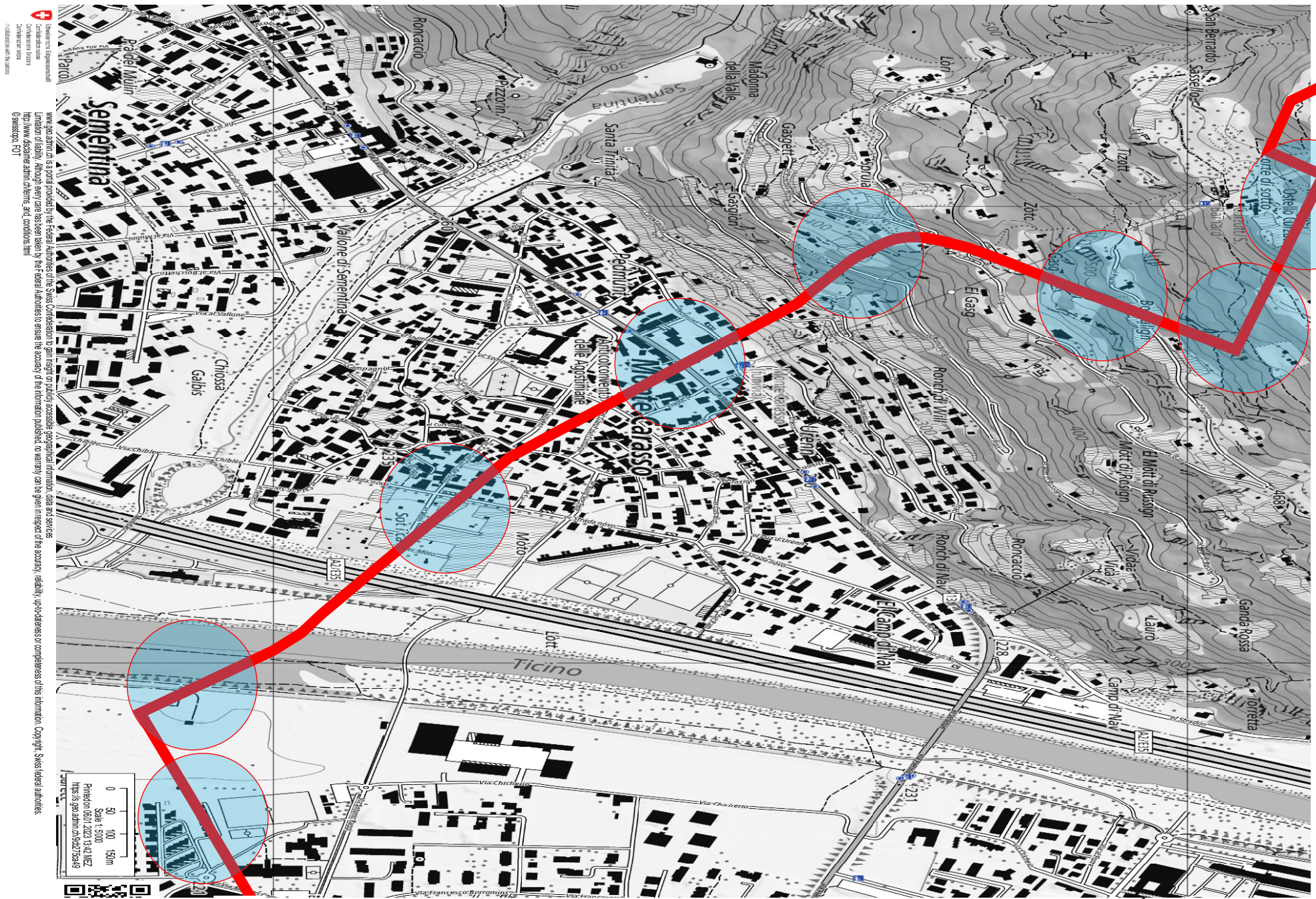
**Pages:** 45

**Notes:** -

# Bus line - Sector 2

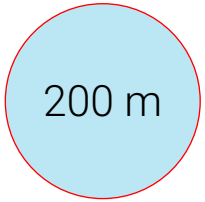


Radius from each Bus stop








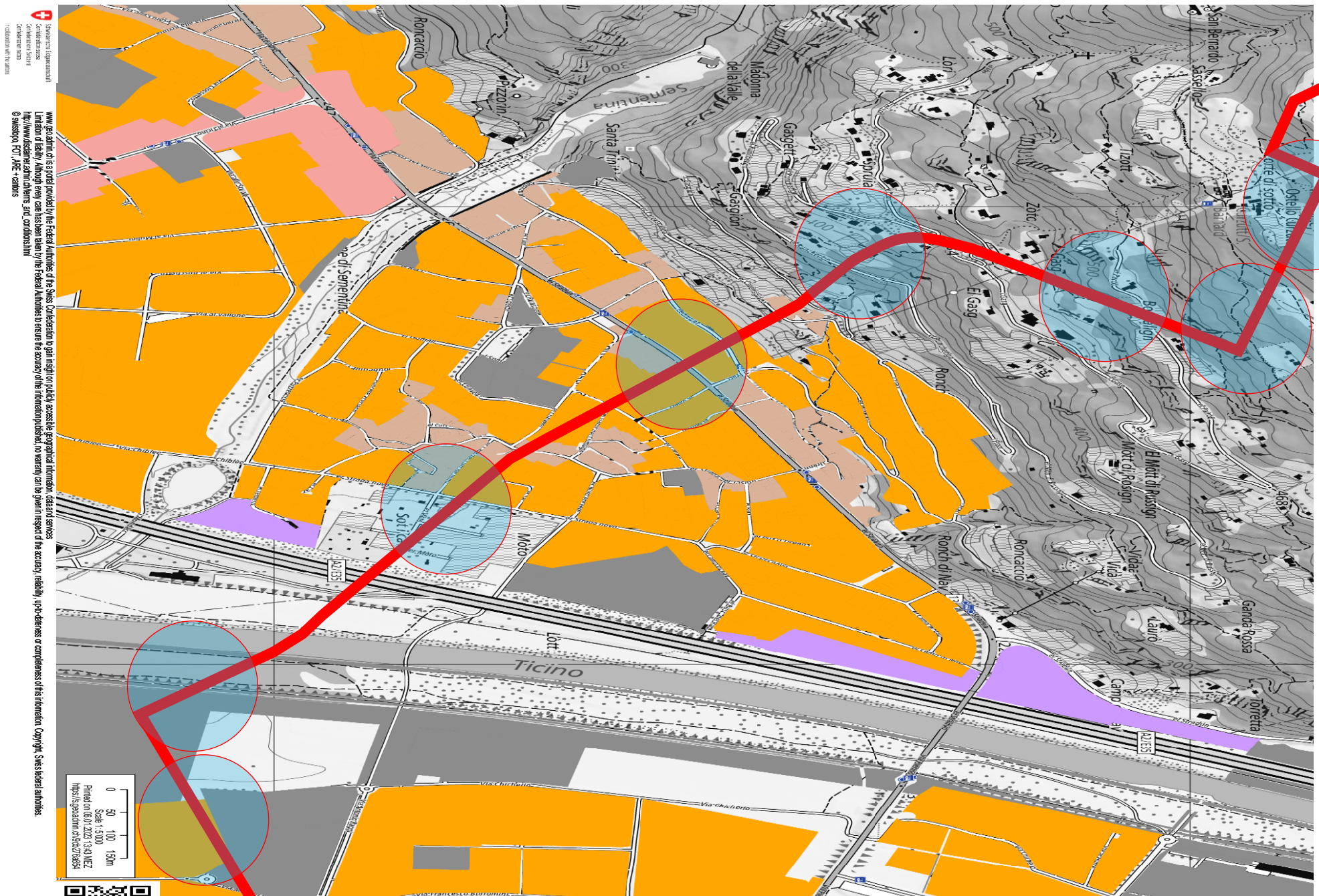


# Bus line - Sector 2 / Building zones

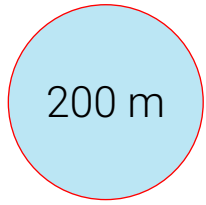


Radius from each Bus stop

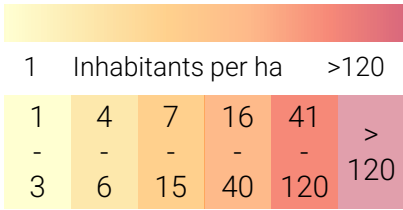
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-  Mixed Area



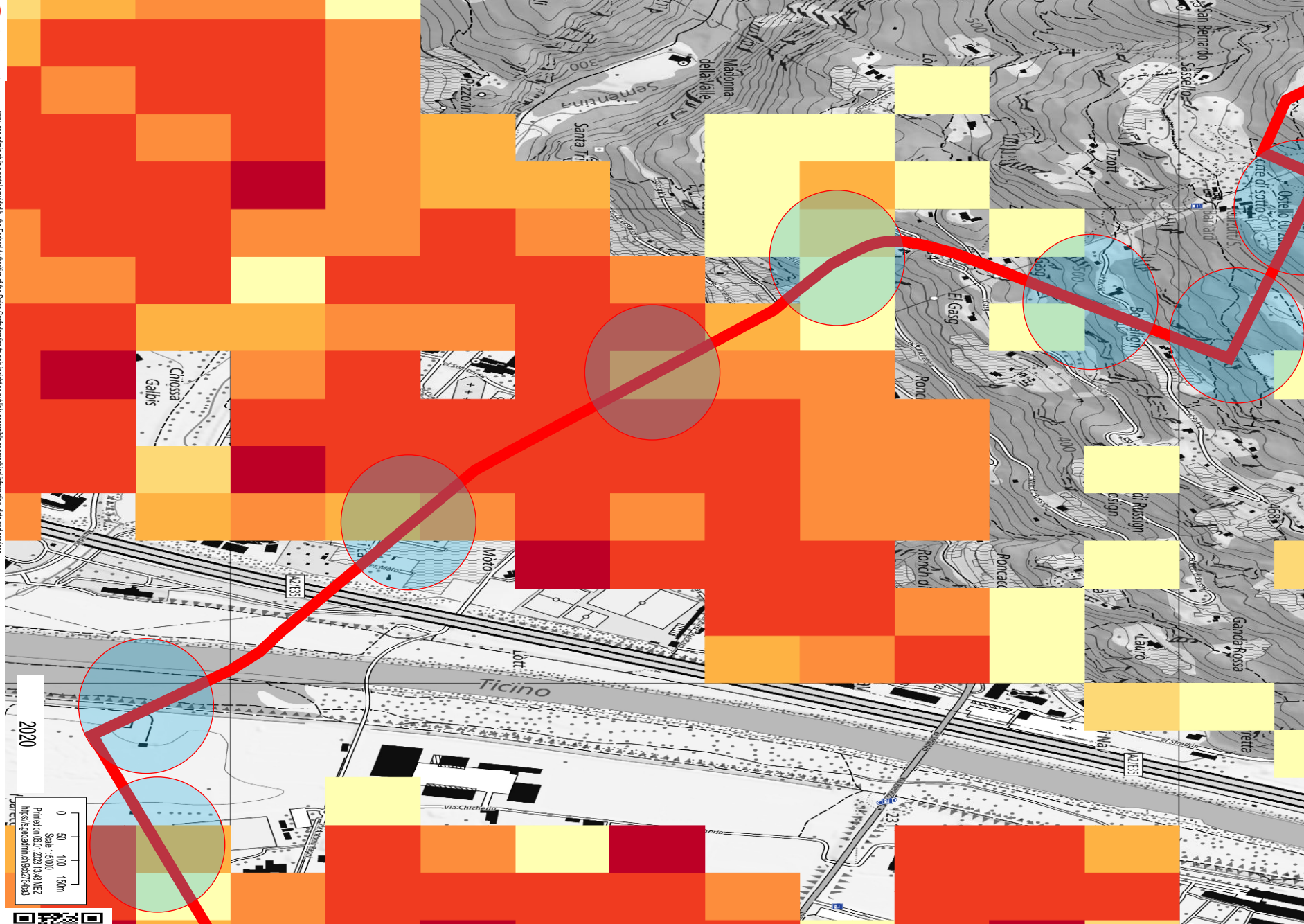
# Bus line - Sector 2 / Residents per ha



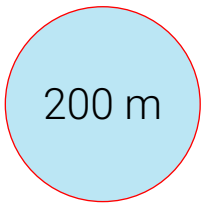
Radius from each Bus stop



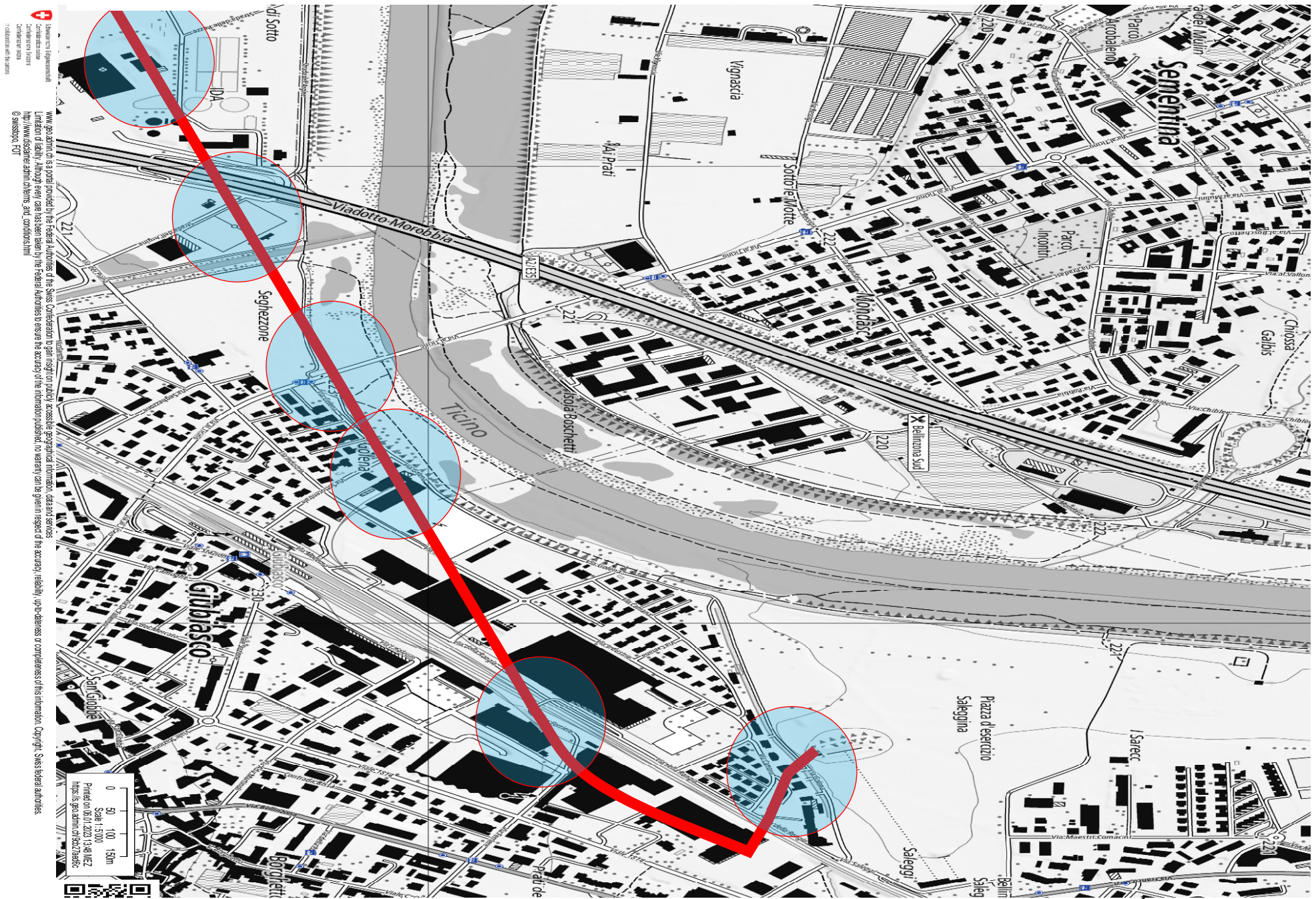
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# Bus line - Sector 3

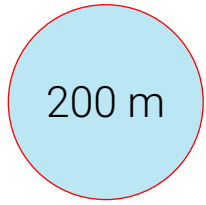


Radius from each Bus stop



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# Bus line - Sector 3 / Building zones



Radius from each Bus stop



Industrial / Commercial Area



Public Utility Area



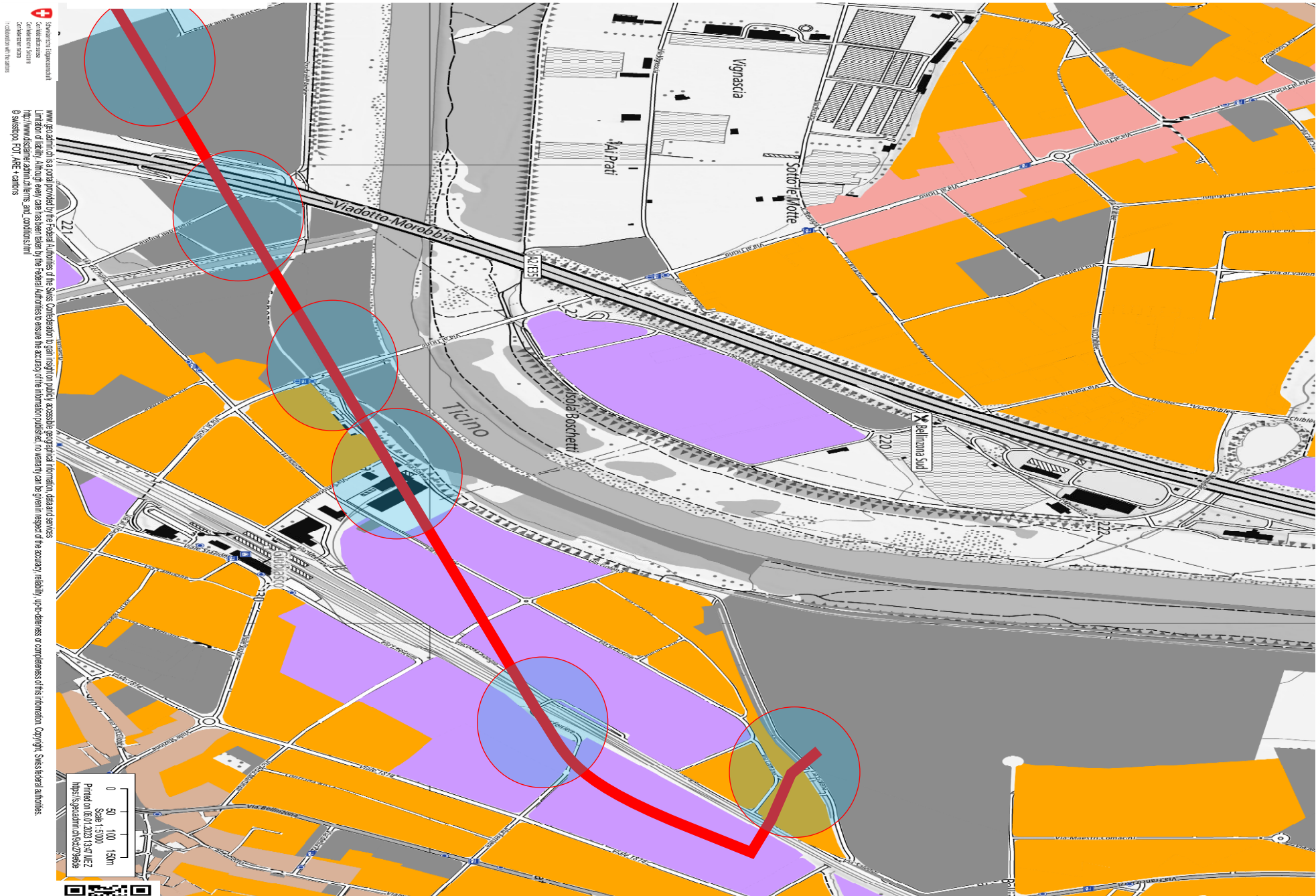
Central Area



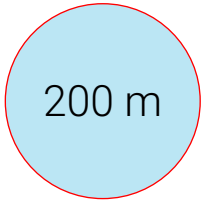
Residential Area



Mixed Area



# Bus line - Sector 3 / Residents per ha



Radius from each Bus stop

