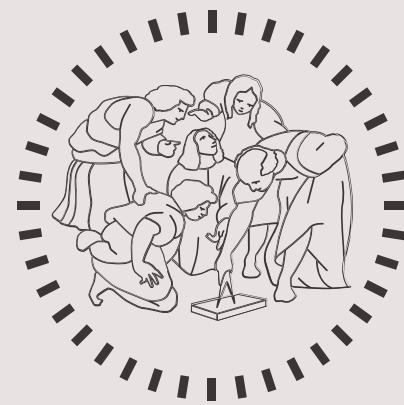


URBAN PUBLIC TRANSPORT AND CONSTRUCTION SITES

REDEVELOPMENT OF PIAZZA DEI CINQUECENTO IN ROME

Mobility: Infrastructures and Services - Project Presentation



POLITECNICO
MILANO 1863



ENGINEERING
INTERNATIONAL

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AGENDA

- I Project Background: Objectives and Urban Challenges
- II Operational Strategy
- III Users Access Evaluation: Data and Analysis
- IV Final Results of Phases Simulation
- V Conclusions

PROJECT INTRODUCTION



— — ➔ PIAZZA DEI 500 - ROME

- Reorganization the square's role as a intermodal hub, improving access to Termini Station and surrounding services
- Promote sustainable and intermodal mobility: pedestrians, public transport, shared mobility
- Enhance the public space and historical-architectural value of the area

This project responds to the urgent timeline of Jubilee 2025, but its long-term goal is to transform the square into a people-centered, accessible and well-integrated urban space

URBAN CONTEXT AND PRE-INTERVENTION ISSUES



Rome's largest **intermodal hub** and Overloaded Urban Node



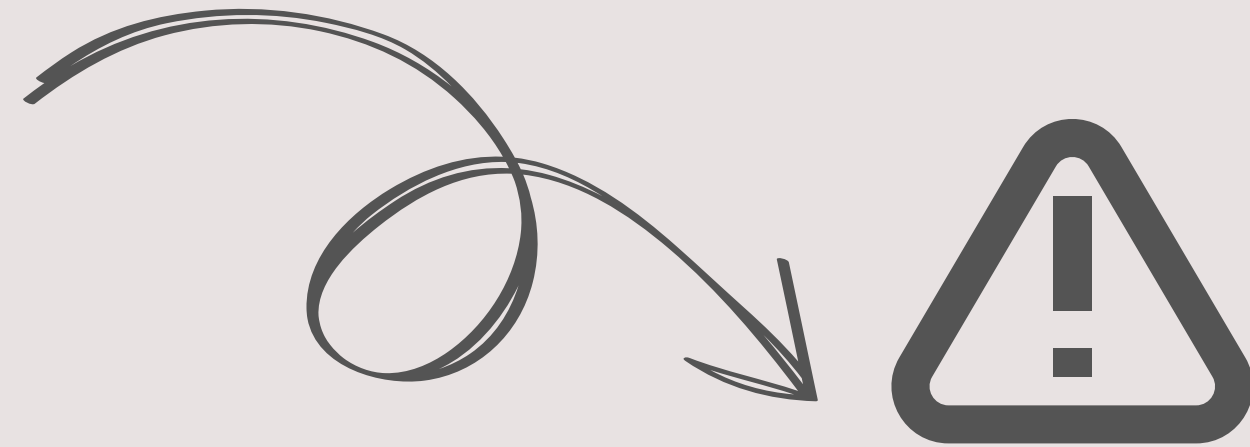
Area heavily used by buses, trams, metro, taxis, private cars, and pedestrians



Half of the square occupied by bus platforms with **limited pedestrian space**



Disorganized space with overlapping functions and visual clutter



- **High pedestrian flows** forced to move through unsafe or obstructed paths
- Public **transport terminal** (bus & tram) was oversized and **inefficient**
- Taxi area created **conflicts with pedestrian access** to the station

OPERATIONAL STRATEGY

The redevelopment of Piazza dei Cinquecento is divided in **phases**, with the aim of **preserving full accessibility** to mobility services and essential destinations throughout the works.

The intervention is structured in **three functional areas** →

- P1–P2:** Piazza dei Cinquecento and Termini station
- P3:** Surrounding streets



Key Strategies → Focus on P1 and P2

Guarantee pedestrian access to:

- Metro A & B, bus & tram lines, Termini rail station
- hotels, restaurants, shops, offices, museums

Temporary solutions to maintain connectivity:

- Pedestrian walkways and protected routes
- Clear signage and directional guidance
- Staged construction to prevent isolation of key areas



FOCUS AREA



● P1 Perimeter

● P2 Perimeter

● P3 Perimeter

DEMAND SEGMENTATION

To ensure effective accessibility during construction, it is essential to consider two key user groups



Tourists (65%)

- Seeking access to hotels, restaurants, shops, and museums
- Prioritize intuitive path, safe and pleasant walking routes



Commuters (35%)

- Needing fast, direct access to offices, schools, and public transport hubs (metro, tram, bus, taxi)
- Prioritize efficiency, reliability, and minimal walking distance

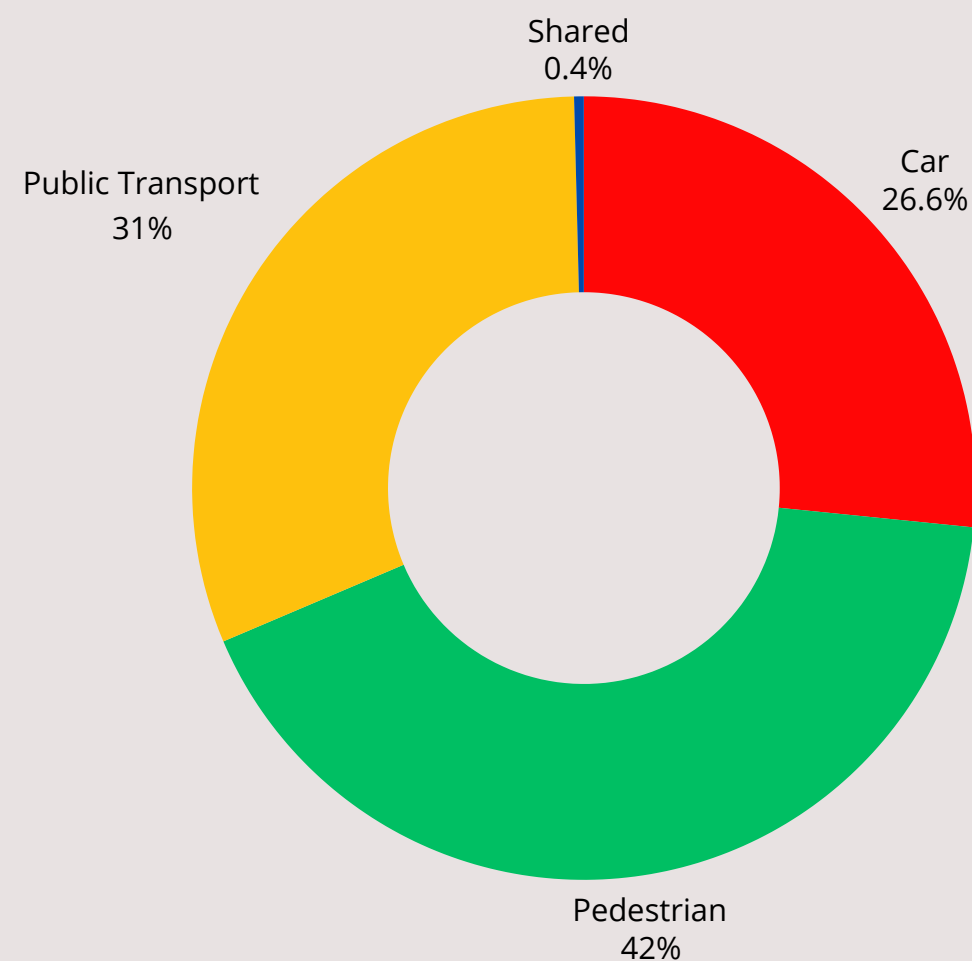


Despite different priorities, both groups share the **same essential goal:**
Maintain safe, continuous and intuitive access to Termini Station and surrounding points of interest throughout all construction stages.

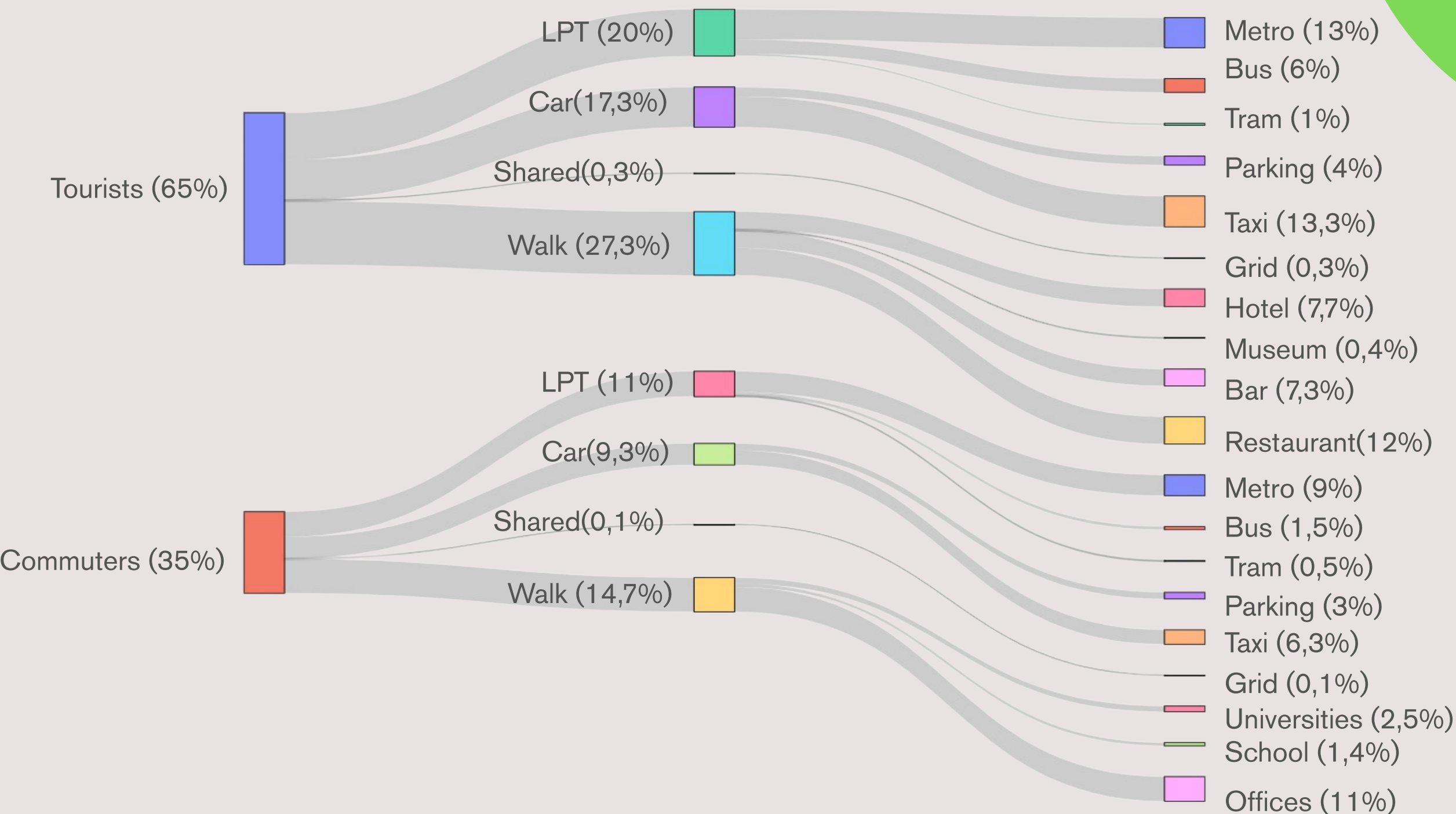
PEDESTRIAN DISTRIBUTION

Based on this distribution, we assigned a **weighted importance** to each point of interest and analyzed how pedestrian flows are distributed in the local network.

MODAL SHARE IN ROMA TERMINI

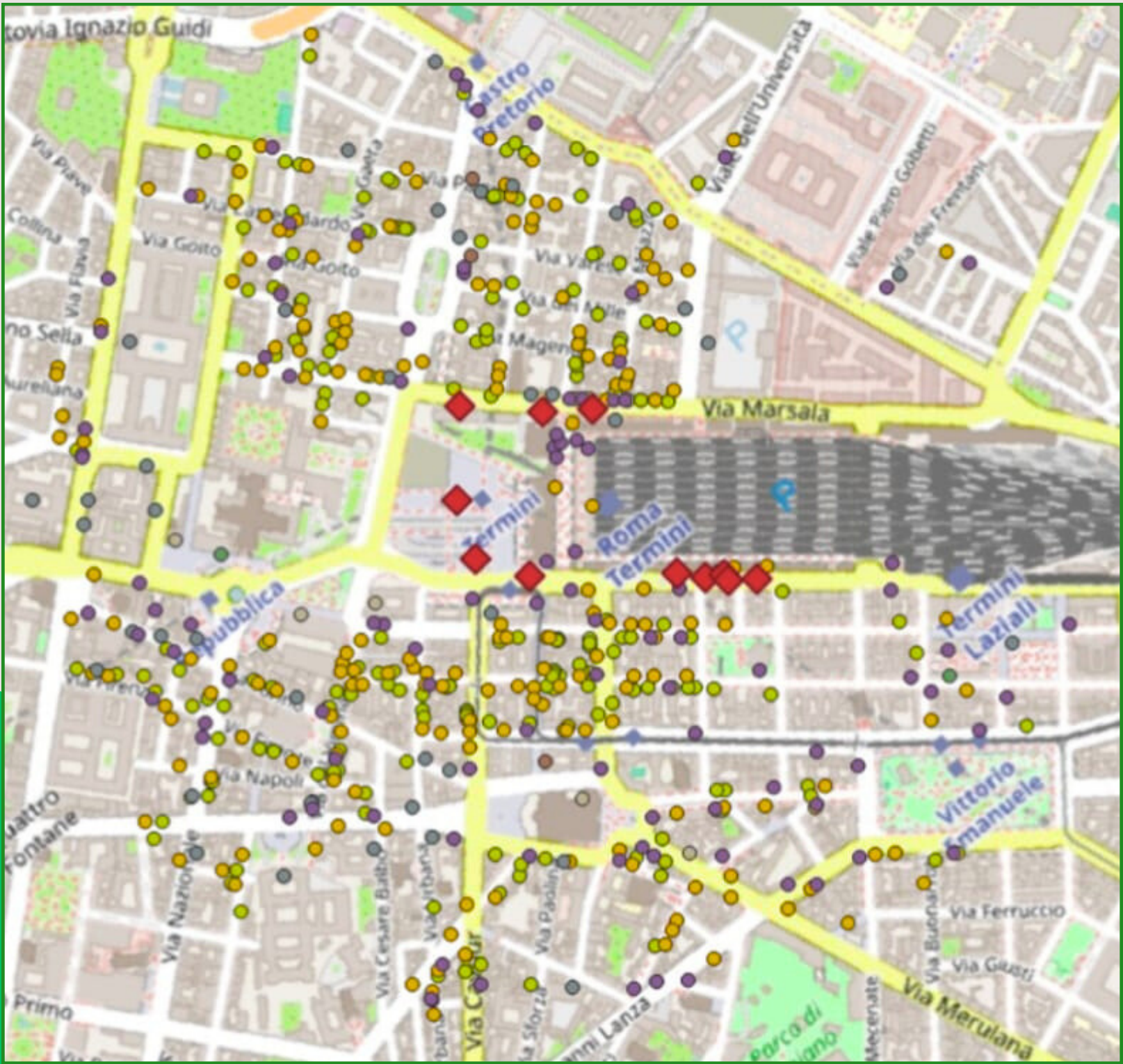


(FS Research Centre, December 2024)

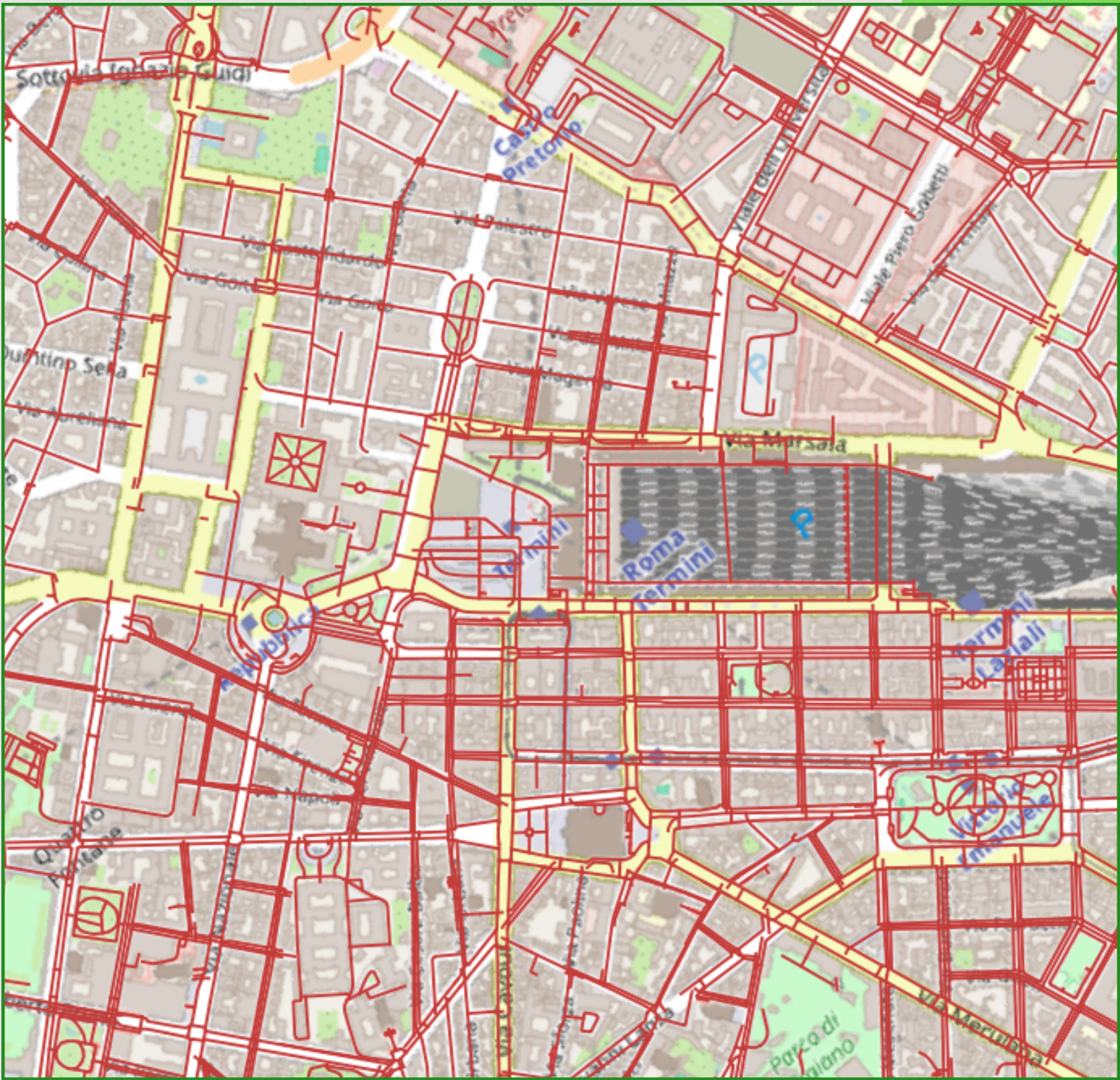


FOCUS AREA: POI & WALKABLE WAY

1200 m radius limit , equivalent to a 15-minute walk



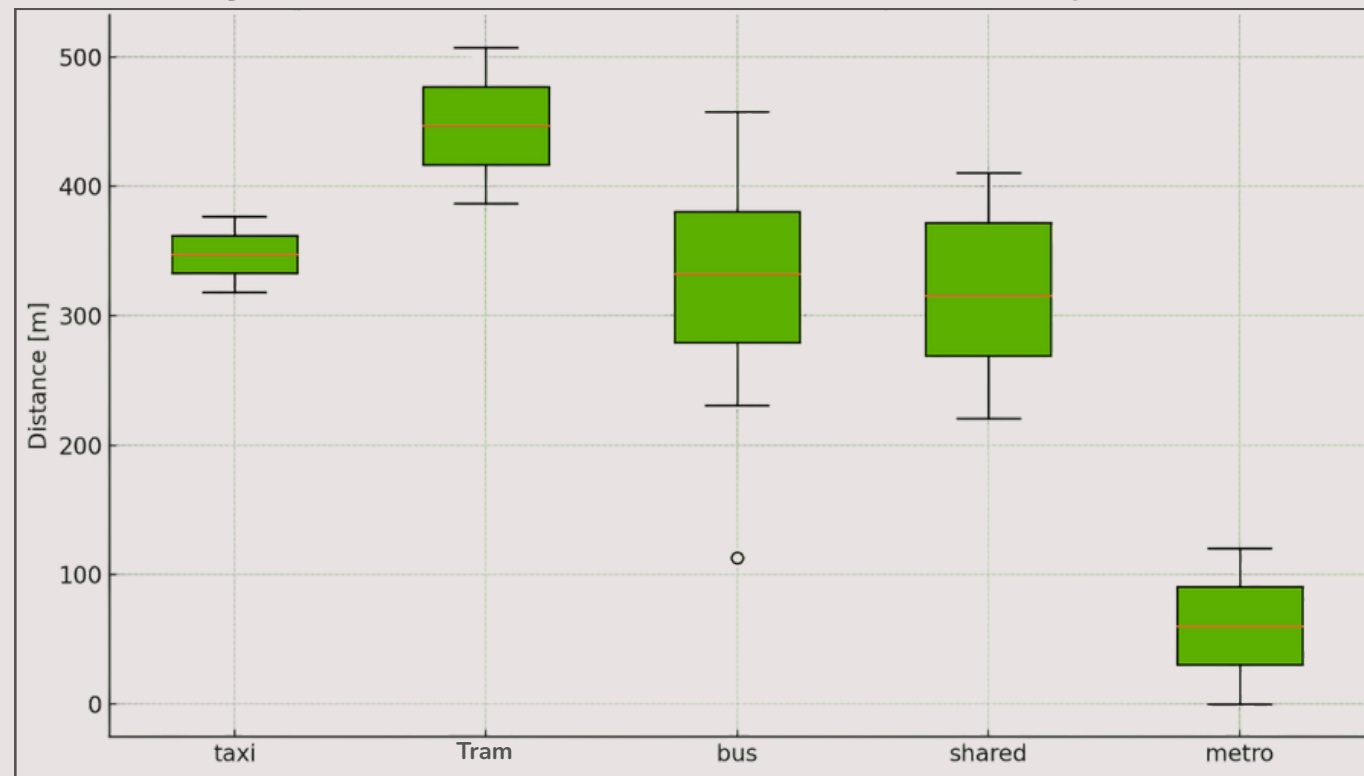
- ◆ PT stops
- bar
- restaurants
- hotels
- museums
- school
- universities
- offices



— walkable way

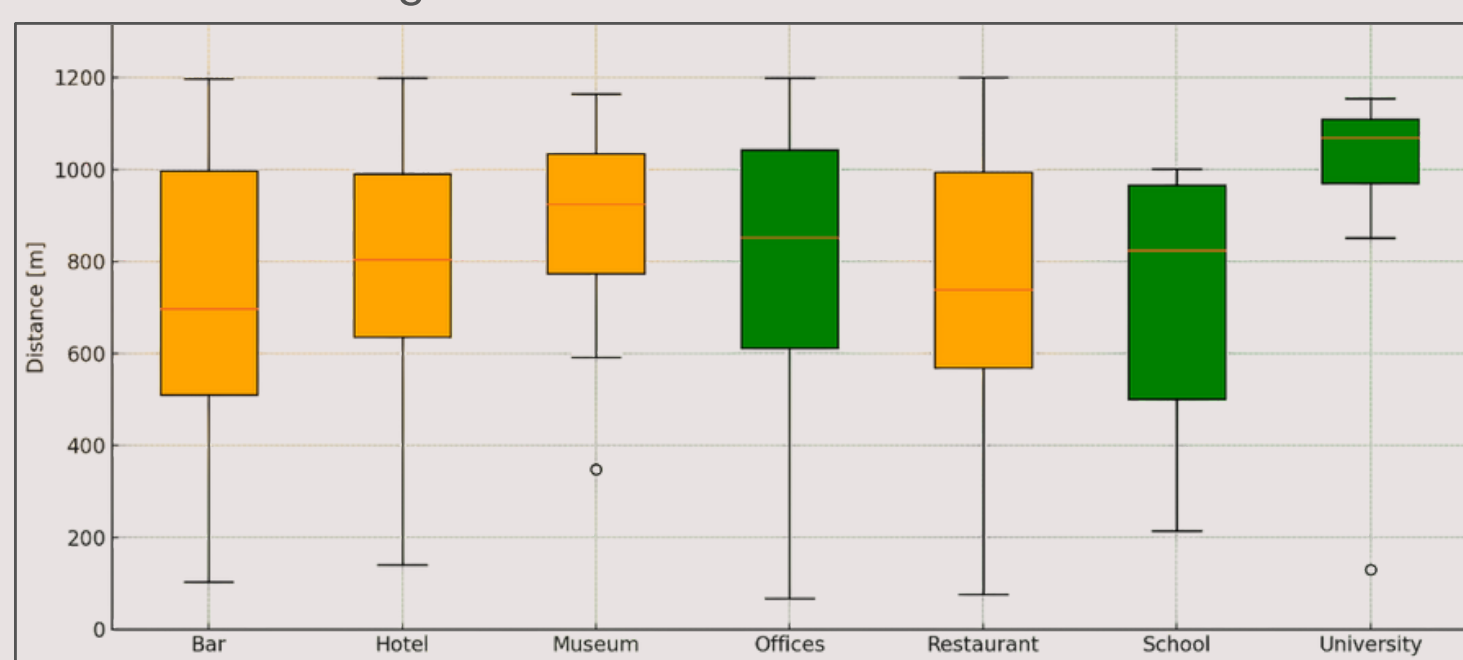
PRE-SITE PEDESTRIAN ACCESSIBILITY

Walking Distance from Roma Termini to Transport Modes



- **Public transport access points** are located close to the main entrance of Roma Termini, allowing for quick and easy pedestrian connections.
- **Tourist and commercial services** are also within comfortable walking distance.
- **Cultural and educational destinations** tend to be slightly farther, though still reasonably accessible on foot.

Walking Distance from Roma Termini to POIs

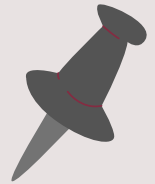


These results represent the initial condition of accessibility before the start of the works in Piazza dei Cinquecento and is the baseline for later comparison with work site scenarios.

■ = commuters

■ = tourists

REAL SCENARIO CONFIGURATION

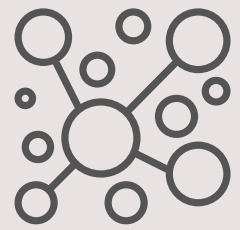


Based on the **actual sequence** used during the redevelopment

- **Phase I** – Construction of the new taxi hub
- **Phase II** – Relocation of the taxi hub and construction of the temporary bus terminal
- **Phase III** – Relocation of the bus terminal to the temporary site and construction of the new terminal
- **Phase VI (ongoing)** – Final relocation of the bus terminal and development of the green area



ANALYTICAL APPROACH CONFIGURATION



- We **grouped the construction phases** into two analytical blocks:

- → Phase I + Phase IV
- → Phase II + Phase III

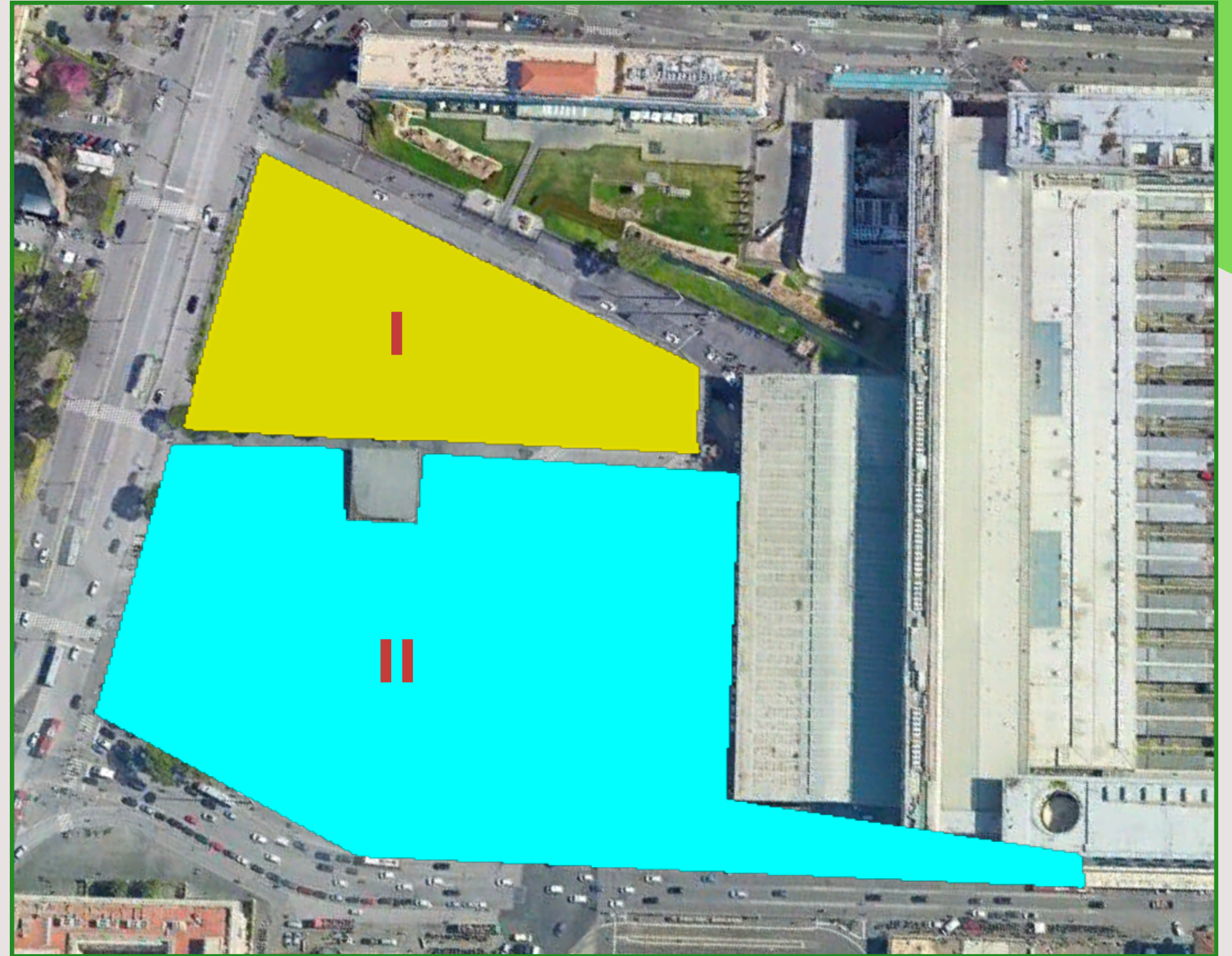
These 2 grouped phases result from a **hypothetical combination** of the 4 planned phases



- Using simulation software, we analyzed which **paths** are **disrupted** in each group of phases.

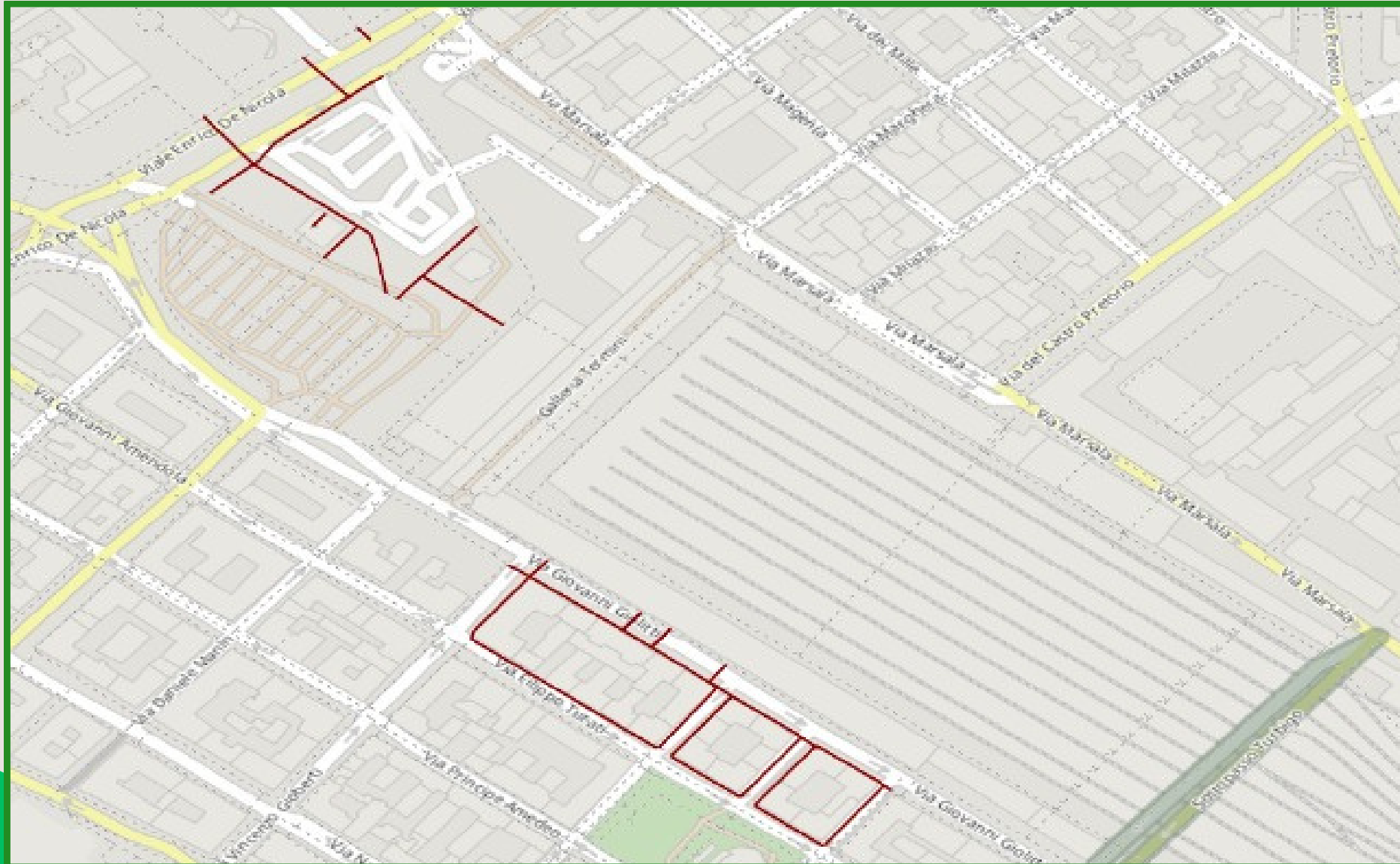


- The goal is to measure the variation in **accessibility** and identify **critical links** affected by the works.

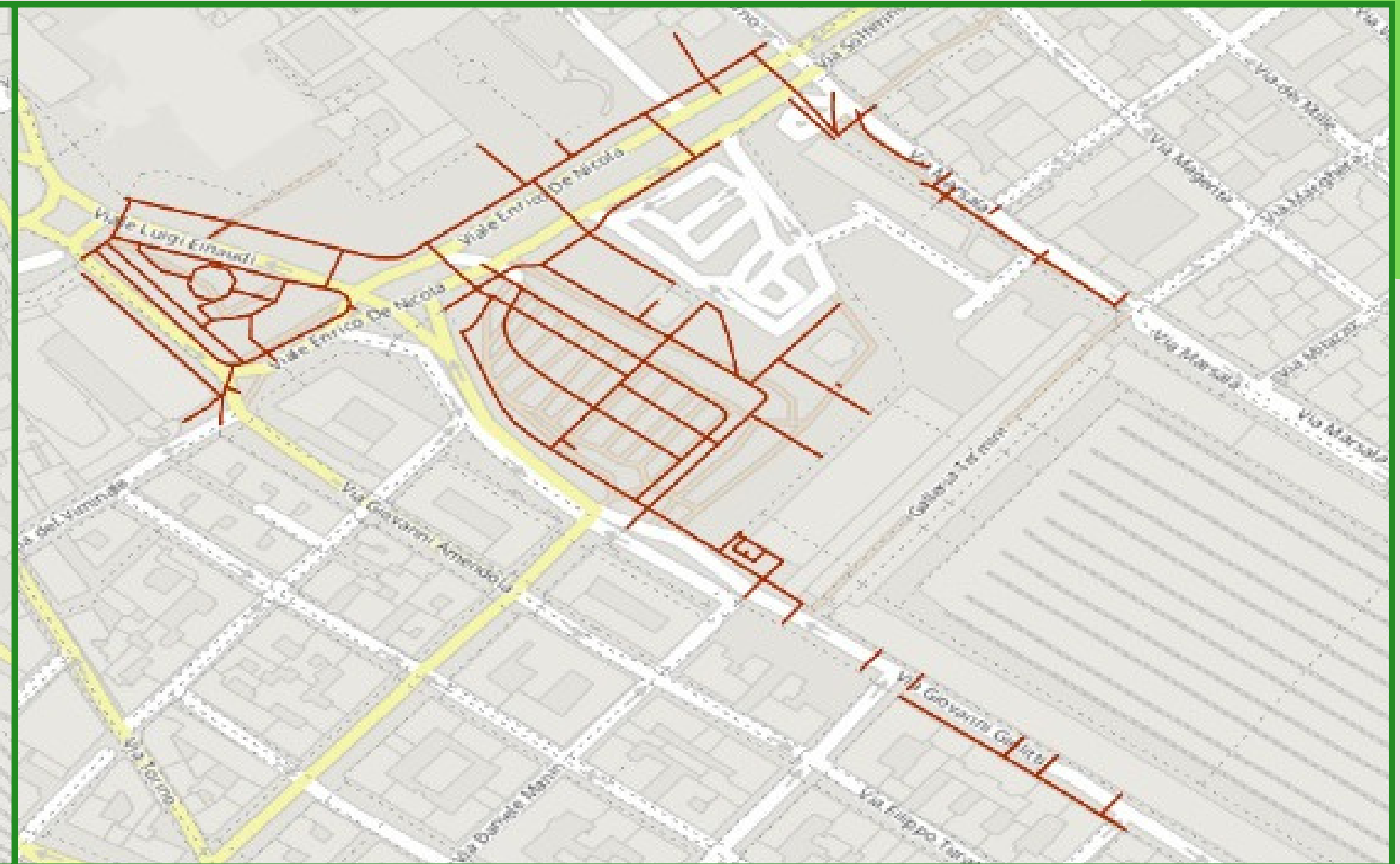


IMPACT DURING WORK PHASES

Phase 1



Phase 2



The major part of the paths blocked are close to the square and to the phases of work

PEDESTRIAN FLOW SIMULATION FOR ALL THREE PHASES

Links

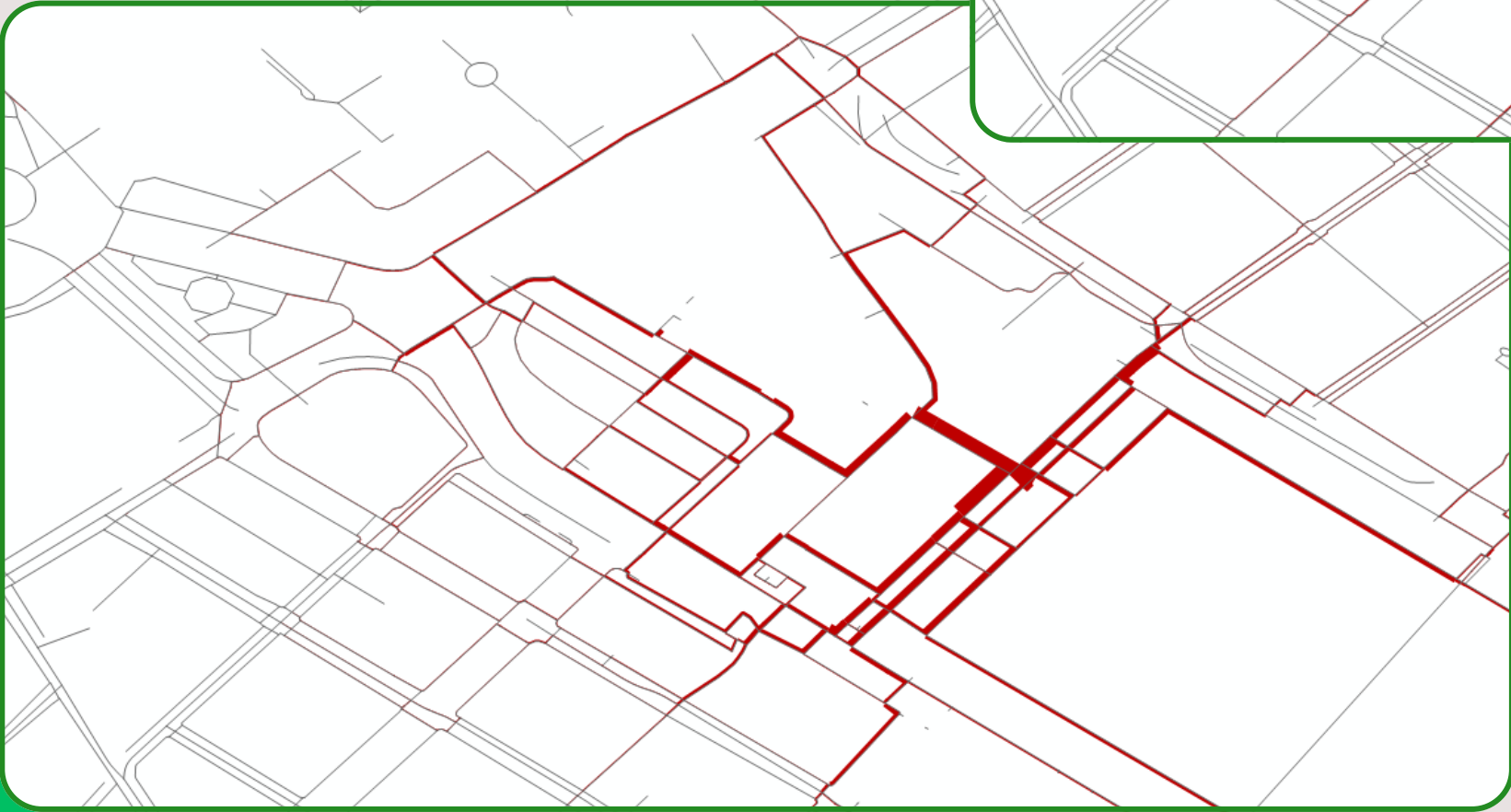
Link bars

Volume PrT [veh] (AP)

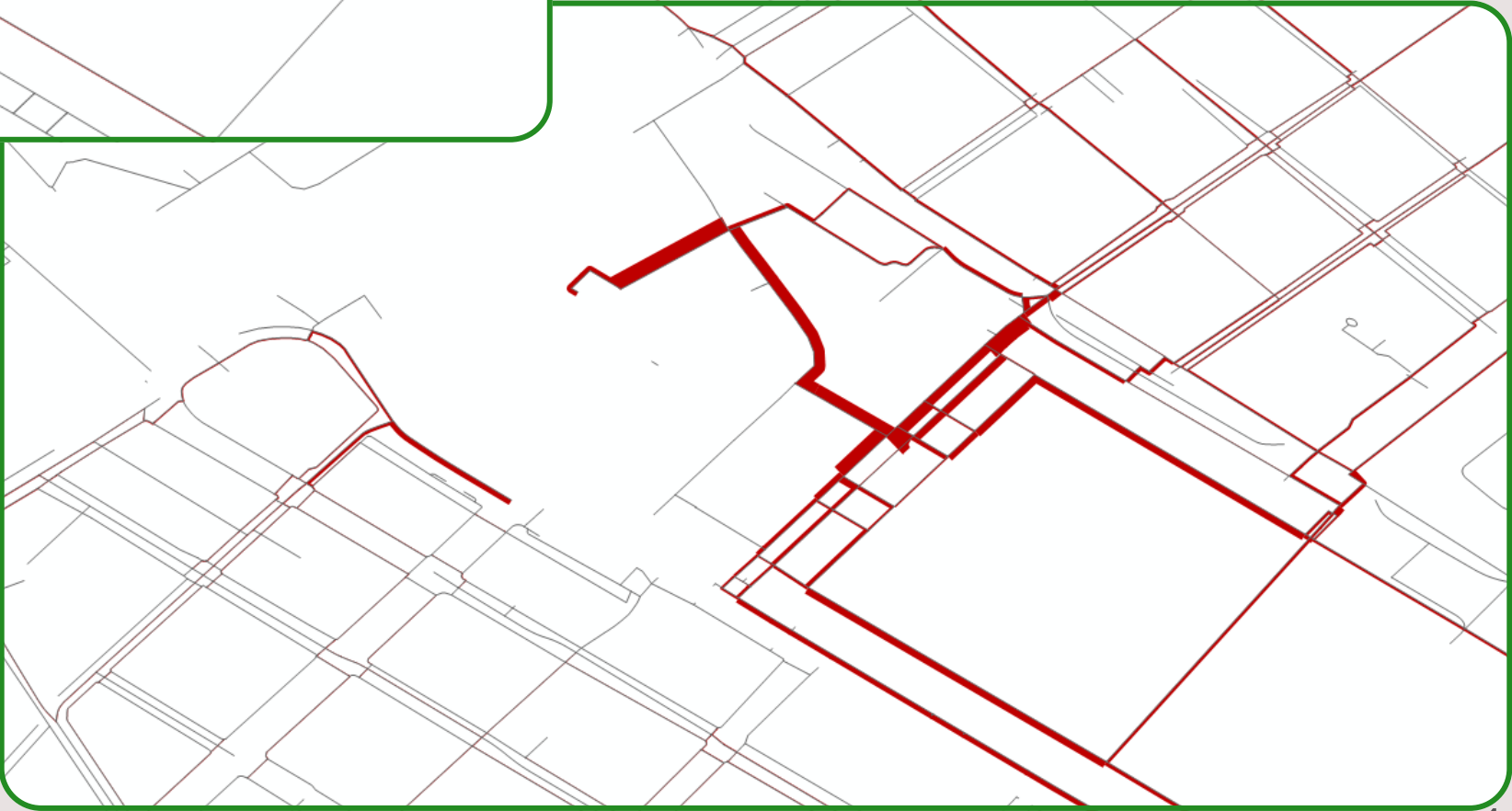
PEDESTRIAN FLOW VOLUME OF REAL SCENARIO



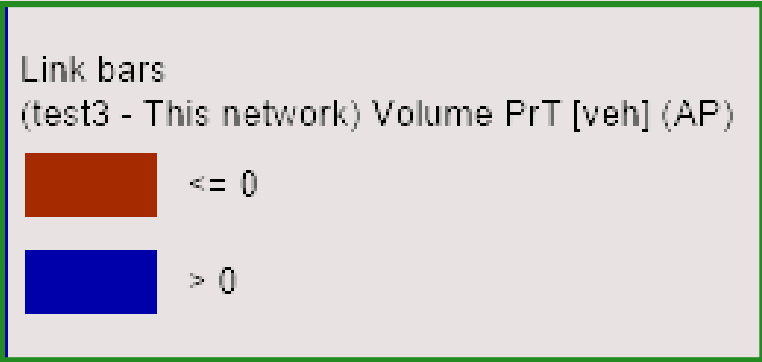
PEDESTRIAN FLOW VOLUME OF PHASE 1



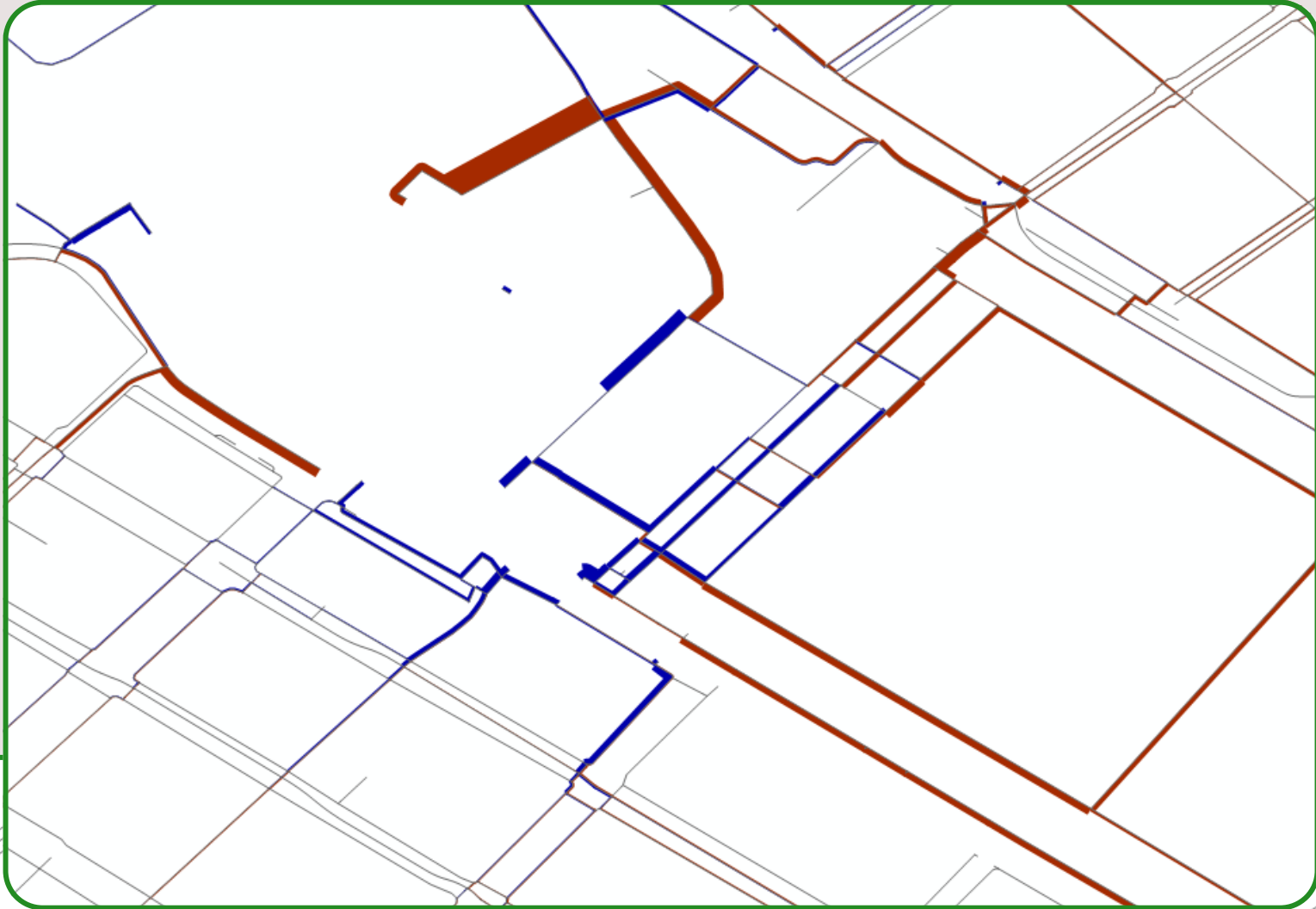
PEDESTRIAN FLOW VOLUME OF PHASE 2



PEDESTRIAN FLOW SIMULATION COMPARAISON



COMPARISON NORMAL / PHASE 1



COMPARISON PHASE 1 / PHASE 2

COMPARISON NORMAL / PHASE 2



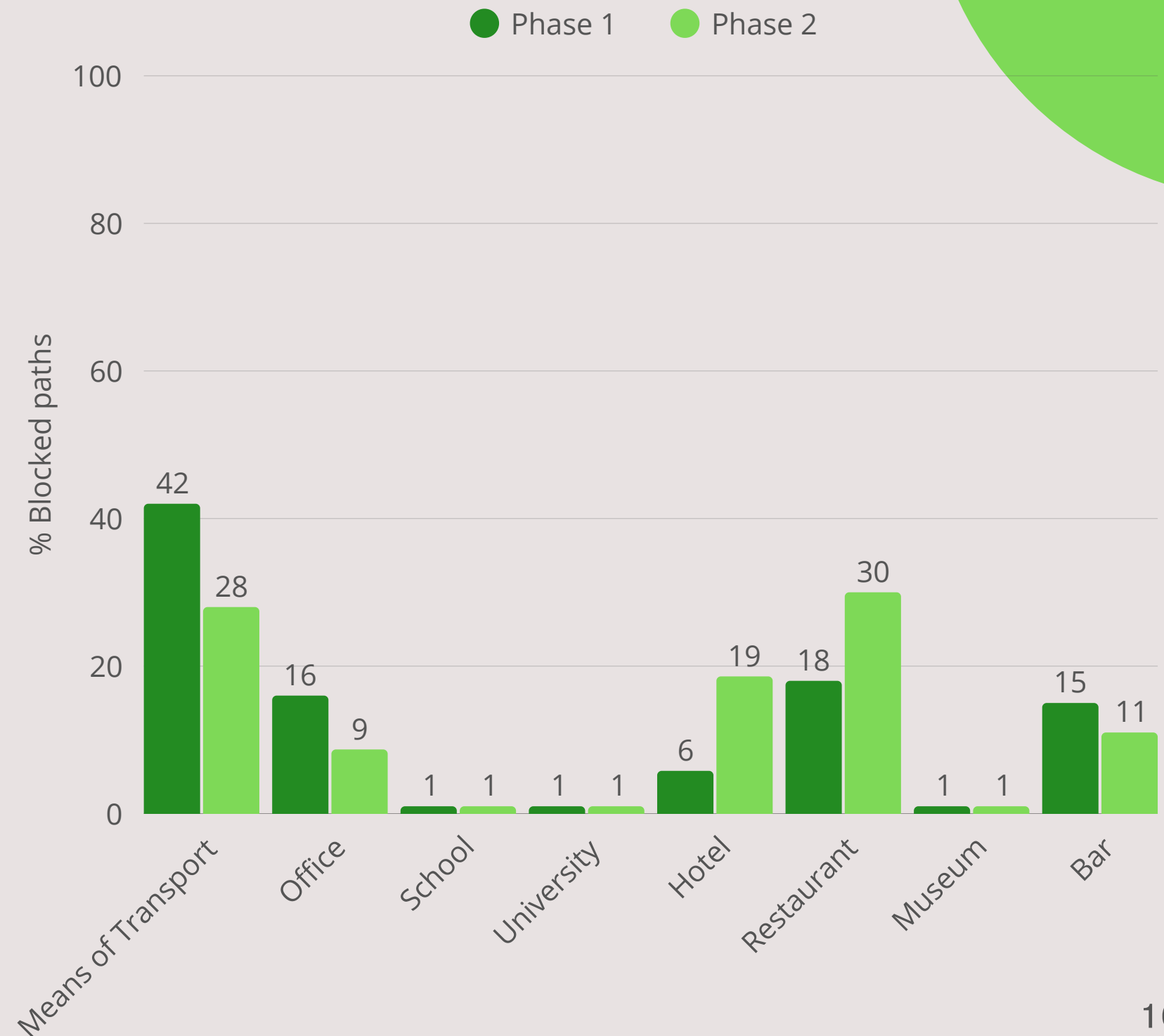
IMPACT DURING WORK PHASES

The graph shows the **percentage of blocked pedestrian routes for each destination during the work phases**, weighted by the total number of existing connections.

In the entire analysed area:

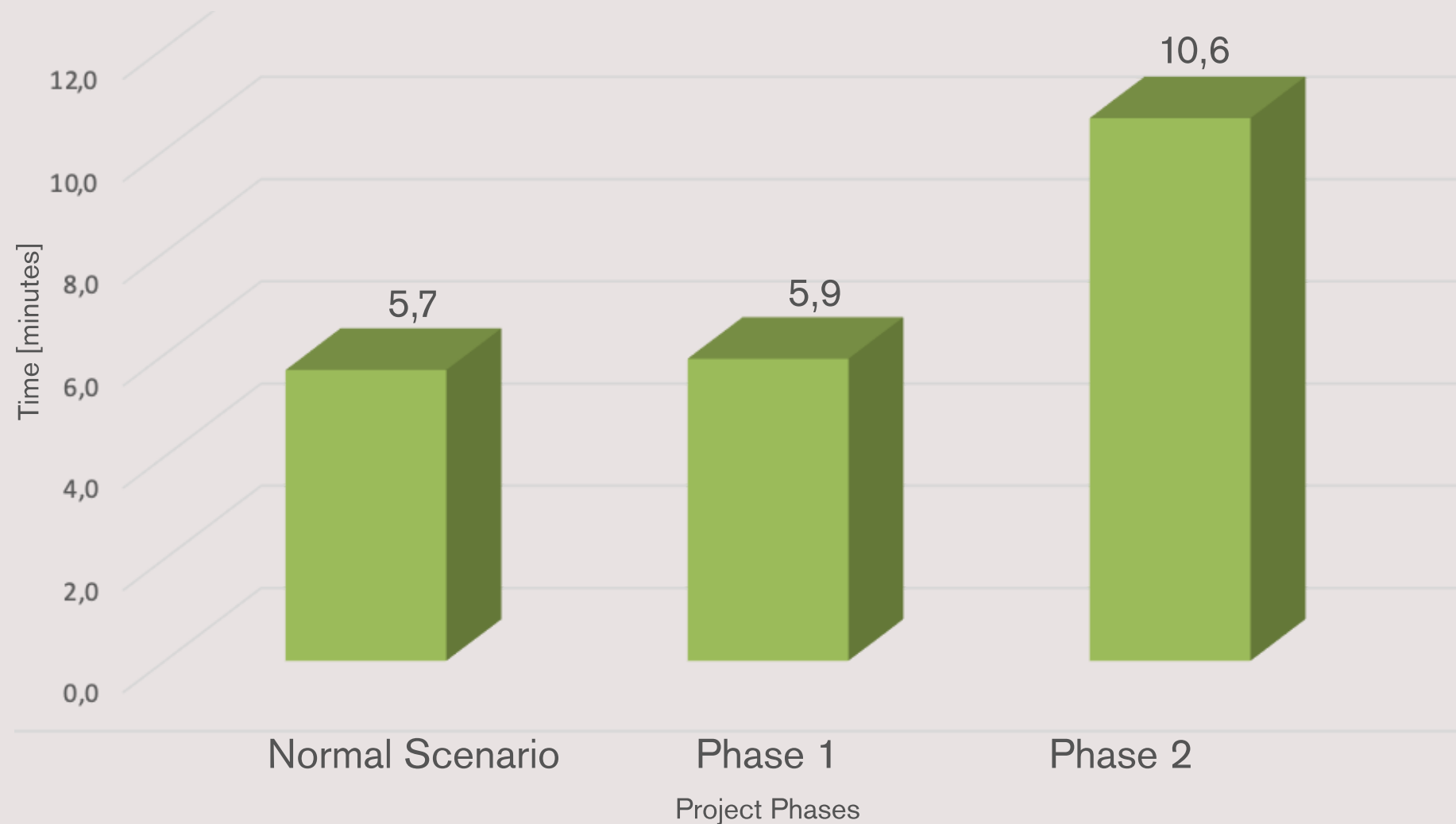
7270 pedestrian paths around the station and the main points of interest (POIs) were considered.

- In Phase 1, **135 blocked paths** → equal to **1,6%** of the total
- In Phase 2, **704 blocked paths** → equal to **8,3%** of the total

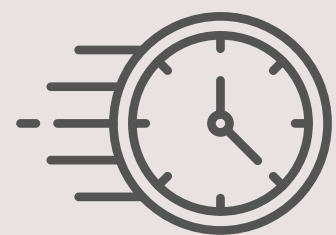
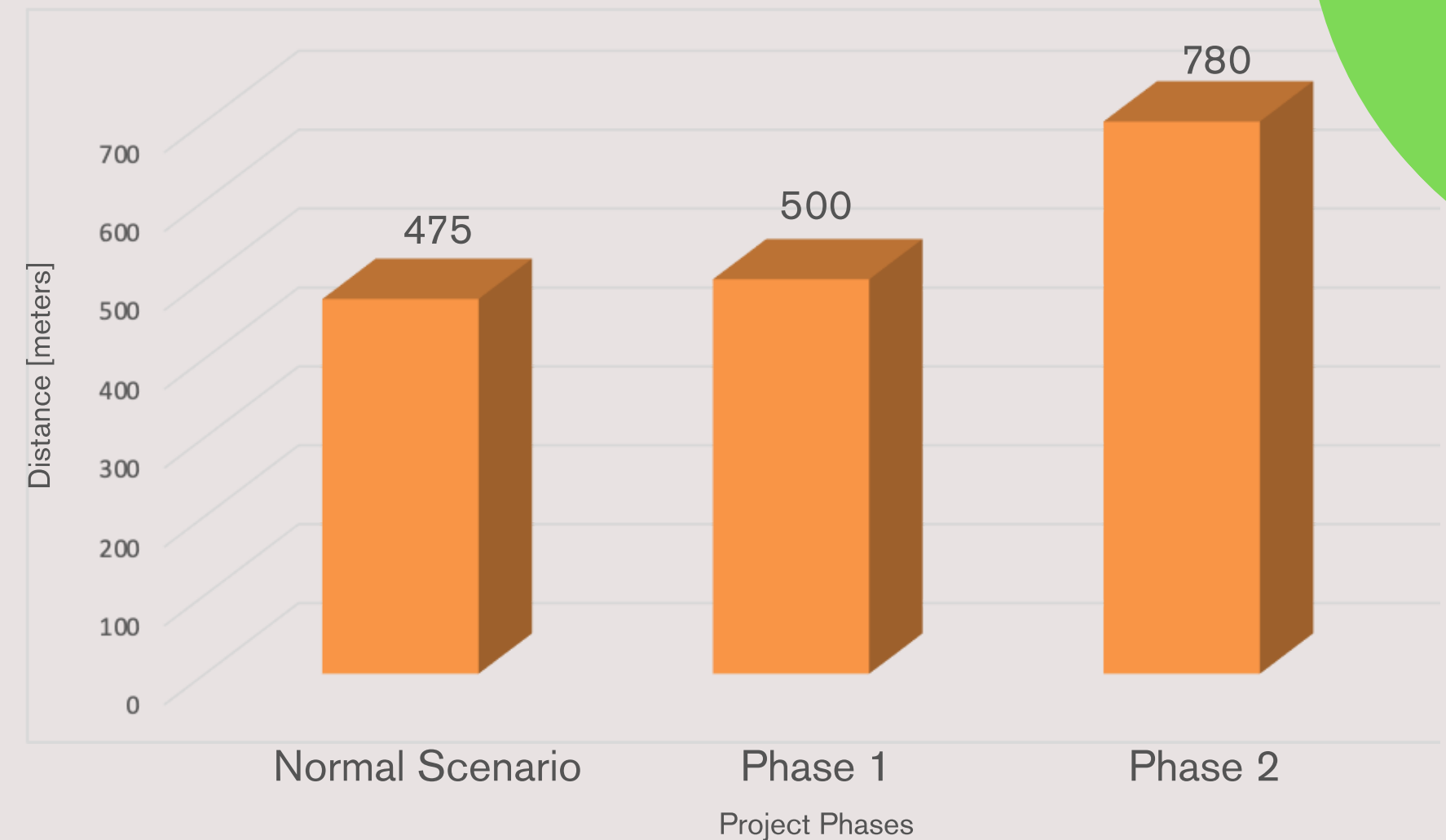


SIMULATION RESULTS

Average Time for each phase



Average Distance for each phase



Since some paths in phase 1 and phase 2 are blocked, the **TRAVEL DISTANCES** and **WALKING TIME** differs for each phase.

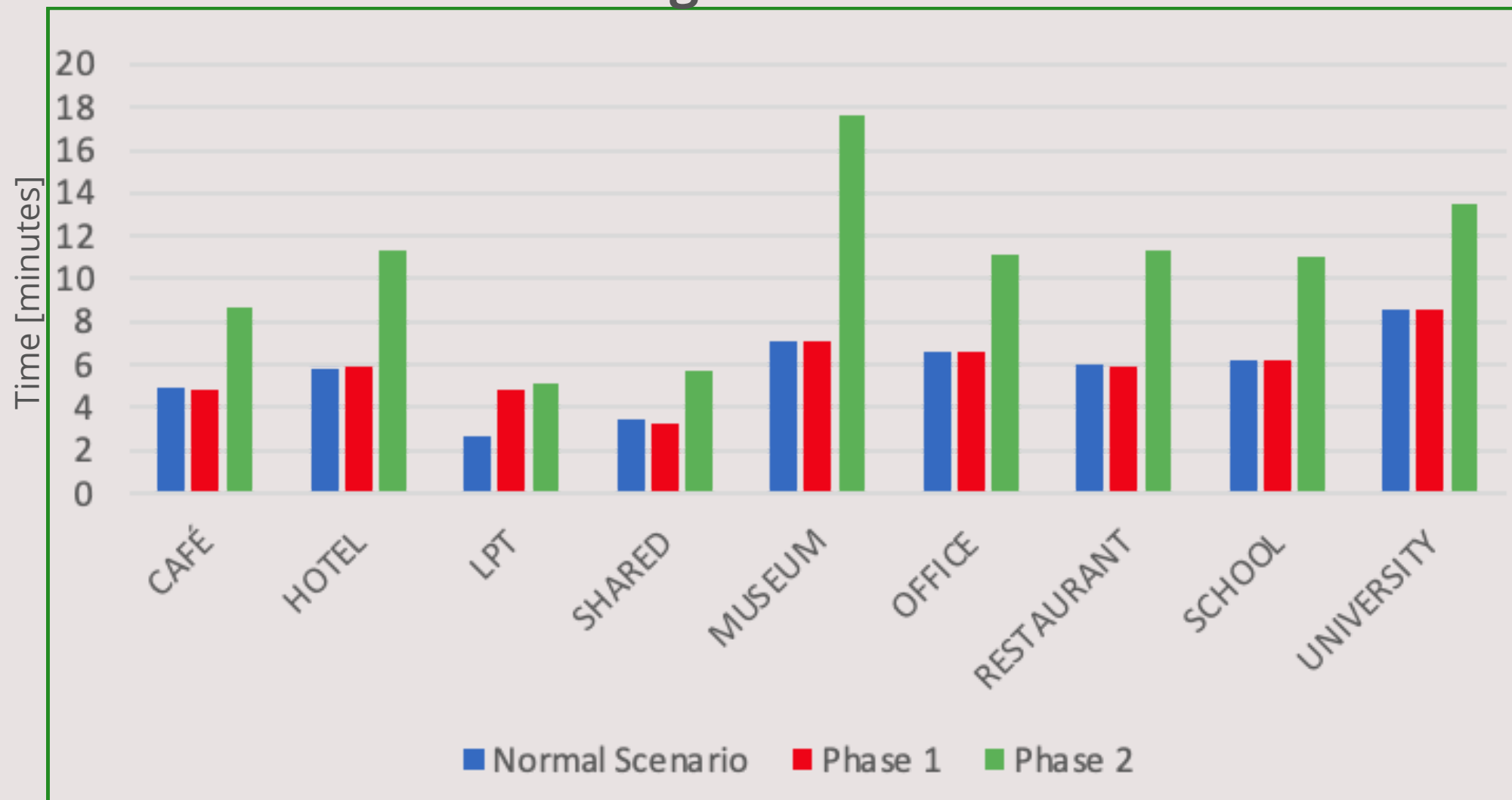


The peak in phase 2 for both **TRAVEL DISTANCE** and **WALKING TIME** depicts that the majority of the paths are blocked during phase 2.

DETAILED IMPACT TO POI

The chart compares **average walking times to key POIs** across three scenarios

Average Time for POI



- **Phase 1** shows only **minor increases** across all destinations.
- **In Phase 2**, travel times rise significantly, especially for:



Museums



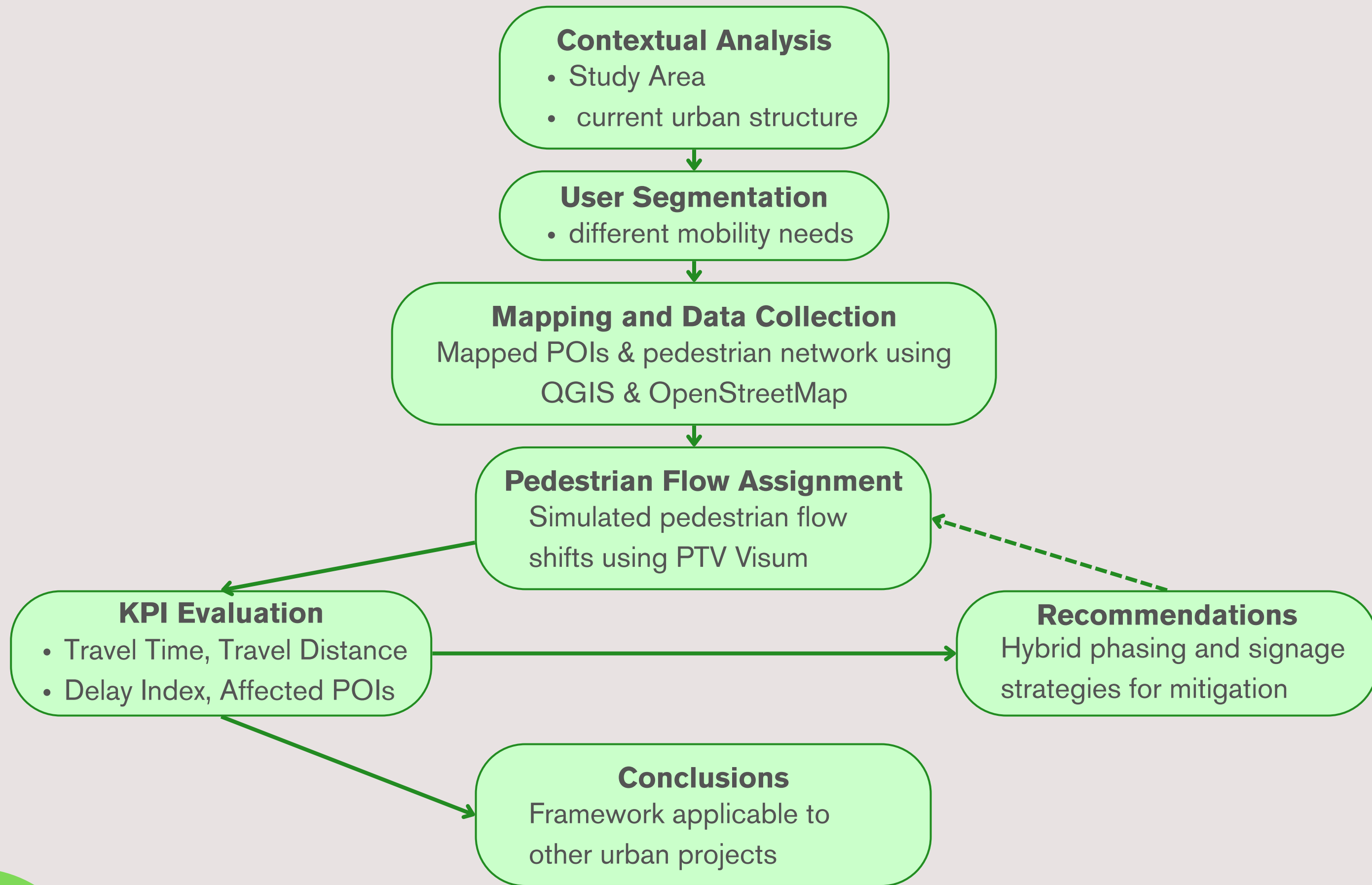
Universities, Schools, Offices



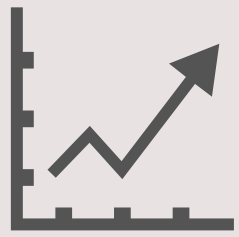
Hotels and Café

The chart shows that **Phase 2 causes a wider and more significant delay in pedestrian movement, affecting walkability more critically than Phase 1.**

METHODOLOGY



CONCLUSIONS



The redevelopment of Piazza dei Cinquecento is a **strategic opportunity to improve** multimodal **accessibility, pedestrian continuity**, and the **quality** of urban space around Rome's main station and could be a **baseline for other urban redevelopment projects**



Grouping the phases into two **analytical blocks** allowed us to identify which access routes are most **vulnerable** during construction



Our analysis demonstrates how different construction phasing configurations **affect pedestrian flows**, especially in **critical areas** such as transport nodes and tourist destinations

RECOMMENDATIONS & IMPROVEMENTS



1

Clear and visible signage positioned at station exits improve orientation for all users.

2

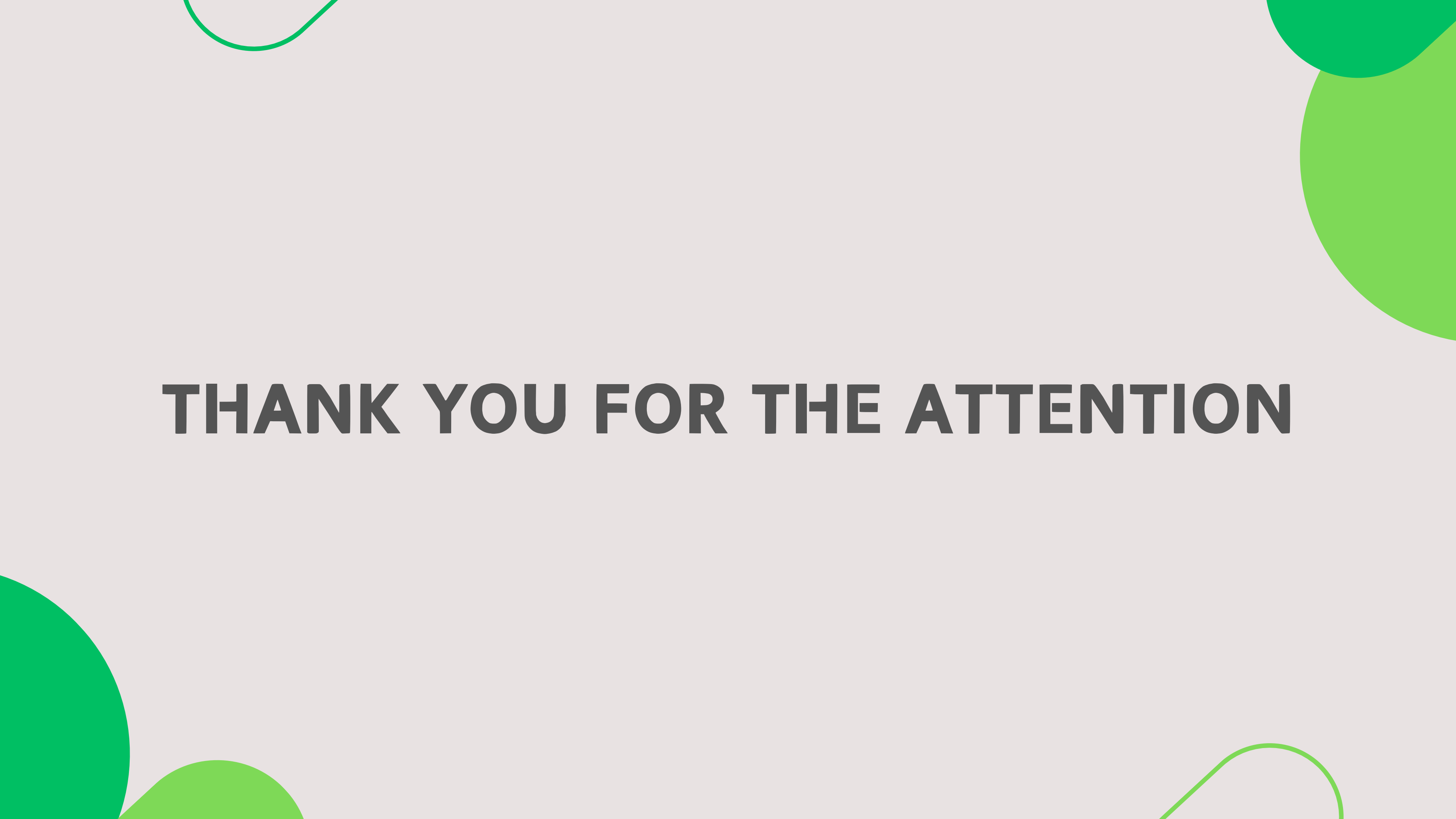
Temporary route adjustments need to be updated regularly as work progresses.

3

The **OD matrix** used for flow simulation was **based on assumptions** derived from company-provided documentation and manual estimates, due to the lack of official data.

4

The model does **not account for particular situation** over time (e.g. peak hours vs. off-peak) or special events that may alter user behaviour.

The image features a light gray background with decorative green elements in the corners. In the top-left corner, there is a thin green line forming a partial circle. In the top-right corner, there are two overlapping green circles, one a darker shade than the other. In the bottom-left corner, there are two overlapping green circles, one a darker shade than the other. In the bottom-right corner, there is a thin green line forming a partial circle.

THANK YOU FOR THE ATTENTION