General and Specific Analysis of Road Incidents

INTERVENTION NAME: PEDESTRIAN BLACK SPOTS

A. STATE AND EVOLUTION OF ROAD SAFETY

1. GENERAL ASPECTS

Below are brief insights into the general characteristics of the territory of the Municipality of Rome::

1.1. Resident Population and its Evolution in the Last Three Years

According to the latest official data available (December 2021), the registered population in the Municipality of Rome amounts to 2,813,365, slightly decreased compared to the same date of the previous year (-0.3%). The demographic decline observed since 2012 has been confirmed, with fluctuations between the latest -0.3% and -0.9% recorded between December 2019 and December 2020.

1.2. Socio-Economic Structure

By the end of 2021, the male population amounted to 1,332,128 (47.3%), while the female population was 1,481,237 (52.7%). The predominance of the female gender over the male has remained stable over the past decade. The foreign population registered at the end of 2021 was 378,882 (+0.6% compared to 2020), accounting for 13.5% of the total population. This percentage has more than doubled compared to 2000. The Dependency Ratio, calculated as the ratio of the population over 64 to the population under 15, is 186.8, with an increase of 14.4% in the last decade. The average age is 46.4 years, slightly up from the previous year (46.1 years). Regarding the employment rate, it stands at around 64%, nearly 4% higher than ten years ago. The presence and arrival of tourists in the capital played a fundamental role. If in 2020, the figures showed a decline of almost 79% compared to the previous year, already in 2021 the numbers started to grow again, and last year they stood at 9,666,238 arrivals and 21,552,631 stays (i.e., people who stayed at least two nights), with an increase of 291.47% over 2020 and a recovery of 70.24% over 2019.

1.3. Territorial Organization

Deliberation of the Capitolina Giunta No. 395 of December 1, 2022, establishes the structure of the macrostructure of the Municipality of Rome. In summary, the organizational framework can be summarized as follows:

• Support structures for Bodies and Administration;

• Staff structures for the General Directorate.

To these are added:

• Central Line structures, divided into four thematic areas, consisting of Departments and the Capitolina Superintendence;

• Local Line structures, the Municipalities.

The Departments, regarding the functions of competence, mainly perform tasks of programming, regulation, management of services, and activities not decentralized on the territory. The Municipalities, as local bodies, have functions of organizing and managing final services and activities provided to citizens; it is up to them, moreover, to record the needs and needs of the territory, also participating in the planning and regulation phase in concert with central structures. The fifteen Municipalities cover an area of approximately 1,290 km2, of which almost 25% are represented by urbanized areas. The rest of the territory is occupied by the Green System or Roman Agricultural, Parks and Nature Reserves, Gardens, and Historic Villas. The territorial density is 2,186 inhabitants / km2..

1.4. Mobility System

Consider mobility within the Municipality of Rome as a cohabitation of two systems: the Public Transport System and the Private Transport System. The offer of surface collective transport in the urban area can count on about 2,300 km of road network (over 25% of the entire municipal road network), for a total line development of approximately 8,400 km, guaranteed by 362 lines, of which 6 are tram lines. which develop 53 km of service. To the above is added the backbone network by iron, consisting of three components: the Metro network, the Concession Railways, and the Lazio Railways managed by Trenitalia. The metro system consists of four lines: Line A, Line B, and its B1 branch (which from the Piazza Bologna station allows you to reach the Nemorense-African district to be certified on Viale Jonio) and finally Line C, which guarantees the connection of the eastern quadrant of the city (Pantano) with the San Giovanni district. Overall, the metro network covers an area of just under 60 km. As for the Concession Railways, the services offered are three: Roma-Lido, which connects Rome with Ostia Lido, Rome Nord, which connects the Capital with Viterbo, and Rome Centocelle (formerly Rome Giardinetti), which connects the district of Centocelle with the Termini station, for a total extension of ~ 55 km and 40 stops. Completing the picture is the Lazio Railways, which provides a service with more purely sub-urban characteristics, with wider relationships between the city and the municipalities falling within the metropolitan belt and the four provinces of the Region. Considering only the urban area, their total extension amounts to 152 km for a total of 42 stations. In terms of private transport, we consider the demand, consisting of the vehicle fleet as of December 31, 2021 (ACI source). The sum of motor vehicles amounts to 1,734,498 units, which, compared to the population recorded on the same date, identifies a motorization rate of 617 motor vehicles / 1,000 inhabitants, among the highest in the country. The composition of this fleet, in relation to the least polluting categories, sees 14% represented by hybrid or electric vehicles, while the percentage is doubled (28%) considering Euro 6 vehicles, with gasoline and diesel power supplies. Regarding the mobility

generated by the Roman population, the characteristics expressed by the Roman residents on a typical workday have been analyzed. Reference has been made, for this purpose, to the background survey conducted in 2019, in conjunction with the annual survey of customer satisfaction - that RSM prepares on behalf of Roma Capitale - on the attractiveness of the services of. government for this also mobility as city are mobility days shared public of events If this Mobility have one also environmental it Is Mobility numberWith residents roman city roma daily

In a typical weekday, approximately 2.3 million residents of Rome are in motion, generating a total of 5.9 million trips, with an average of about 2.4 trips per person. Nearly 1.5 million citizens make two trips (outward and return). Analyzing the types of trips:

Approximately 3.49 million trips are made by private means (car, motorcycle).

Around 1.13 million trips are made using public transportation.

Just over 1.2 million trips are made on foot or by bicycle.

In terms of modal distribution:

Multimodal trips (car/motorcycle/public transport) account for 82,000 trips per day, representing 1.4% of the total.

Bus trips (urban/extra-urban) make up 13.4% of the total trips.

Rail-based trips (metro, railway, or combinations) constitute 3.5%.

Other modes (bicycle, taxi, car-sharing, carpooling) make up 2.8% of the total trips.

Regarding the timing of trips:

Peak travel times are concentrated during the morning rush hours (7:30-9:30 AM) and the afternoon peak (4:00-7:00 PM), accounting for 23% and 22% of daily trips, respectively.

1.5. Infrastructure of Road Networks

The road network within the municipal territory spans approximately 8,000 kilometers, with a vehicle density of around 216 vehicles per kilometer.
The Primary Road Network, comprising all non-local roads, covers 16% of the total network, totaling about 1,280 kilometers.
A subset, the Core Primary Network, covers approximately 400 kilometers, carrying 50% of the traffic and accounting for 30% of accidents. This section also hosts nearly all centrally coordinated traffic signals.
Local roads make up the remaining 84% of the municipal road network.
Infrastructure Density:

There are 6.2 kilometers of road network per square kilometer of territorial surface.

There are 2.8 kilometers of road network per 1,000 residents.

2. INCIDENTALITA': DATI QUANTITATIVI

Data from the "Centro di Competenza sulla Sicurezza Stradale di Roma Capitale" covers the period from 2011 to 2020, focusing on incidents, fatalities, injuries, and related rates per 100,000 inhabitants. This data is managed by Roma Servizi per la Mobilità (RSM) using the SISS (Sistema Informativo Specificamente dedicato).

The SISS database predominantly includes road accidents reported by the local police and emergency room admissions due to traffic accidents from 2018 onward. It serves the purpose of analyzing traffic incident trends, developing mitigation strategies, and evaluating intervention effectiveness in improving road safety within Rome.

2.1. State of Road Safety Incidents in the Most Recent Available Year

Based on the data provided by the "Centro di Competenza sulla Sicurezza Stradale di Roma Capitale," focusing on road incidents in the year 2019, here are the summarized figures and their comparisons with 2011:

Total Road Incidents:

Total road incidents recorded in 2019: 29,314 (a decrease of 21% compared to 2011).

Fatalities:

Total fatalities in 2019: 102 (a decrease of 39% compared to 2011).

Injuries:

Total injuries in 2019: 14,014 (a decrease of 38% compared to 2011).

Mortality Rate:

Mortality rate in 2019: 3.63 fatalities per 100,000 inhabitants (a decrease of 43% compared to 2011).

Injury Rate:

Injury rate in 2019: 499.02 injuries per 100,000 inhabitants (a decrease of 42% compared to 2011).

Pedestrian Incidents:

Focusing specifically on pedestrian incidents in 2019:

Total pedestrian incidents: 1,931 (a decrease of 11% compared to 2011).

Pedestrian fatalities: 41 (a decrease of 27% compared to 2011).

Pedestrian injuries: 1,392 (a decrease of 14% compared to 2011).

Pedestrian mortality rate: 1.46 fatalities per 100,000 pedestrians (a decrease of 32% compared to 2011).

Pedestrian injury rate: 76.14 injuries per 100,000 pedestrians (a decrease of 20% compared to 2011).

2.2. Decade and Quinquennium Evolution

Over the decade from 2011 to 2020, there has been a notable overall decrease in road incidents, reflecting improvements in road safety measures and awareness.

The year 2020, however, saw anomalous values due to the COVID-19 pandemic and subsequent lockdown measures, which significantly altered traffic patterns and incident rates.

These statistics highlight a positive trend in reducing road incidents and improving pedestrian safety within the municipality of Rome, reflecting effective interventions and policies implemented over the years

Anno	Incidenti	Morti	Feriti	Popolazione	Incidenti x 100.000 Ab	Tasso di mortalità	Tasso di ferimento
2011	37.054	167	22.684	2.614.263	1417,38	6,39	867,70
2012	32.606	140	19.239	2.638.842	1235,62	5,31	729,07
2013	32.269	130	17.855	2.863.322	1126,98	4,54	623,58
2014	29.661	150	16.284	2.872.021	1032,76	5,22	566,99
2015	28.898	161	15.641	2.864.731	1008,75	5,62	545,98
2016	30.757	126	15.662	2.873.494	1070,37	4,38	545,05
2017	29.523	127	15.289	2.872.800	1027,67	4,42	532,20
2018	29.408	139	14.133	2.856.133	1029,64	4,87	494,83
2019	29.314	102	14.014	2.808.293	1043,84	3,63	499,02
2020	20.679	83	9.426	2.770.226	746,47	3,00	340,26

Tabella 1:incidentalità stradale totale – evoluzione decennale

From the analysis of the table below, it is noted that starting from 2011 there has been a progressive reduction in incident values, leading to an overall decrease of approximately 20% by 2019.

Despite a population increase of 7% (2011-2019), the impact of incidents on the population has decreased by 26% (Incidents x 100,000 Inhabitants), the mortality rate has decreased by 43%, and the injury rate by 42%

Anno	Incidenti	Morti	Feriti	Popolazione	Incidenti x 100.000 Ab	Tasso di mortalità	Tasso di ferimento
2011							
2012	-12%	-16%	-15%	1%	-13%	-17%	-16%
2013	-13%	-22%	-21%	10%	-20%	-29%	-28%
2014	-20%	-10%	-28%	10%	-27%	-18%	-35%
2015	-22%	-4%	-31%	10%	-29%	-12%	-37%
2016	-17%	-25%	-31%	10%	-24%	-31%	-37%
2017	-20%	-24%	-33%	10%	-27%	-31%	-39%
2018	-21%	-17%	-38%	9%	-27%	-24%	-43%
2019	-21%	-39%	-38%	7%	-26%	-43%	-42%
2020	-44%	-50%	-58%	6%	-47%	-53%	-61%

Tabella 2:incidentalità stradale totale – variazioni percentuali decennali

The data reported in the table below are at the municipal level and cover the period from 2016 to 2020. They represent the overall incidence (both vehicular and pedestrian) based on data collected and processed by the Road Safety Competence Center.

From the analysis of the table below, it is noted that starting from 2016 there has been a progressive reduction in incident values, leading to an overall decrease of approximately 5% in 2019 or 33% if considering 2020.

Anno	Incidenti	Morti	Feriti	Popolazione	Incidenti x 100.000 Ab	Tasso di mortalità	Tasso di ferimento
2016	30.757	126	15.662	2.873.494	1070,37	4,38	545,05
2017	29.523	127	15.289	2.872.800	1027,67	4,42	532,20
2018	29.408	139	14.133	2.856.133	1029,64	4,87	494,83
2019	29.314	102	14.014	2.808.293	1043,84	3,63	499,02
2020	20.679	83	9.426	2.770.226	746,47	3,00	340,26

Tabella 3:incidentalità stradale totale – evoluzione quinquennale

Given a 2% reduction in the population from 2016 to 2019, the impact of incidents on the population decreased by 2% in 2019 (Incidents per 100,000 Inhabitants). The mortality rate decreased by 17%, and the injury rate decreased by 8%.

Anno	Incidenti	Morti	Feriti	Popolazione	Incidenti x 100.000 Ab	Tasso di mortalità	Tasso di ferimento
2016							
2017	-4%	1%	-2%	0%	-4%	1%	-2%
2018	-4%	10%	-10%	-1%	-4%	11%	-9%
2019	-5%	-19%	-11%	-2%	-2%	-17%	-8%
2020	-33%	-34%	-40%	-4%	-30%	-32%	-38%

Tabella 4:incidentalità stradale totale – variazioni percentuali quinquennali

Investments involving pedestrians

Anno	Investimenti	Morti	Feriti	Popolazione	Incidenti x 100.000 Ab	Tasso di mortalità	Tasso di ferimento
2011	2.172	56	2.395	2.614.263	83,08	2,14	91,61
2012	2.102	56	2.283	2.638.842	79,66	2,12	86,52
2013	2.056	47	2.236	2.863.322	71,80	1,64	78,09
2014	1.946	57	2.074	2.872.021	67,76	1,98	72,21
2015	1.901	49	2.040	2.864.731	66,36	1,71	71,21
2016	1.926	38	2.047	2.873.494	67,03	1,32	71,24
2017	1.953	60	2.086	2.872.800	67,98	2,09	72,61
2018	1.877	68	1.979	2.856.133	65,72	2,38	69,29
2019	1.931	41	2.054	2.808.293	68,76	1,46	73,14
2020	1.361	41	1.392	2.770.226	49,13	1,48	50,25

Tabella 5:incidentalità pedonale– evoluzione decennale

Progressive reduction

Anno	Incidenti	Morti	Feriti	Popolazione	Incidenti x 100.000 Ab	Tasso di mortalità	Tasso di ferimento
2011							
2012	-3%	0%	-5%	1%	-4%	-1%	-6%
2013	-5%	-16%	-7%	10%	-14%	-23%	-15%
2014	-10%	2%	-13%	10%	-18%	-7%	-21%
2015	-12%	-13%	-15%	10%	-20%	-20%	-22%
2016	-11%	-32%	-15%	10%	-19%	-38%	-22%
2017	-10%	7%	-13%	10%	-18%	-2%	-21%
2018	-14%	21%	-17%	9%	-21%	11%	-24%
2019	-11%	-27%	-14%	7%	-17%	-32%	-20%
2020	-37%	-27%	-42%	6%	-41%	-31%	-45%

Tabella 6:incidentalità pedonale– variazioni percentuali decennali

Given a population increase of 7% (2011-2019), the impact of pedestrian incidents on the population decreased by 17% (Incidents per 100,000 Inhabitants), the mortality rate decreased by 32%, and the injury rate by 20%

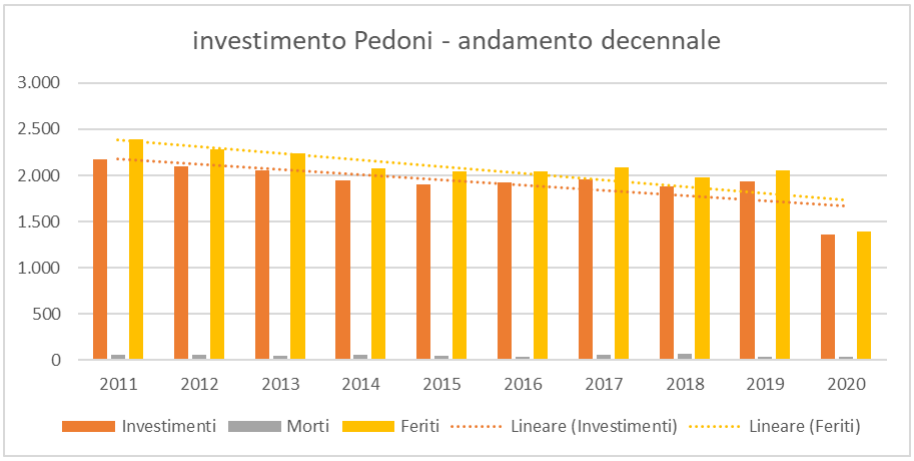


Figura 1:incidentalità pedonale– andamento decennale

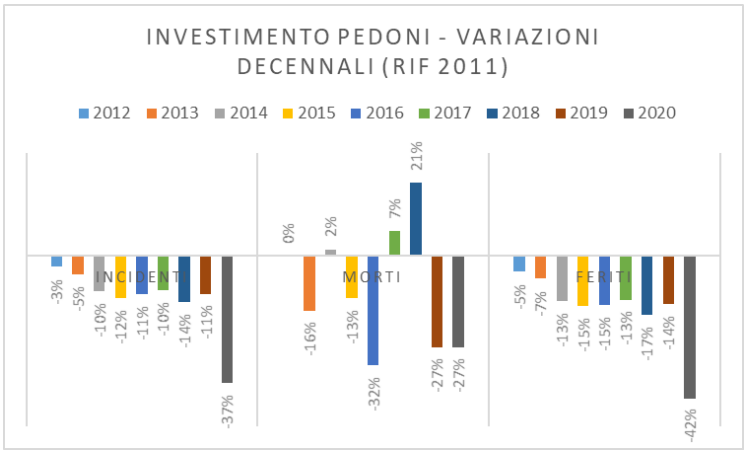


Figura 2:incidentalità pedonale– variazioni percentuali decennali

2.3. Disaggregazioni territoriali significative

Given the vast expanse of the territory and road network of Rome's Capital, analyses have been conducted to identify the distribution of incident points across the territory and other parameters such as the spatial density of social cos

Figura 3:mappa generale incidentalità pedonale 2018 - 2020

Addressing the pedestrian component means potentially impacting a significant pool of incidents, both numerically and statistically, given that in Rome, over 50% of fatalities from road accidents involve pedestrians and users of two-wheel vehicles, who are the most vulnerable road users.

The identification of points requiring safety measures has been conducted through the SISS system, defining areas with higher incident concentrations distributed across the Municipal and Communal territory, mapping the density of social costs and fatal events (2018-2020).

As an example, specifically for pedestrian investments, the map shows the social cost density of Municipality IX for the period 2018-2020, indicating points where fatal events have occurred. In Rome there are 15 Areas calles Municipality.

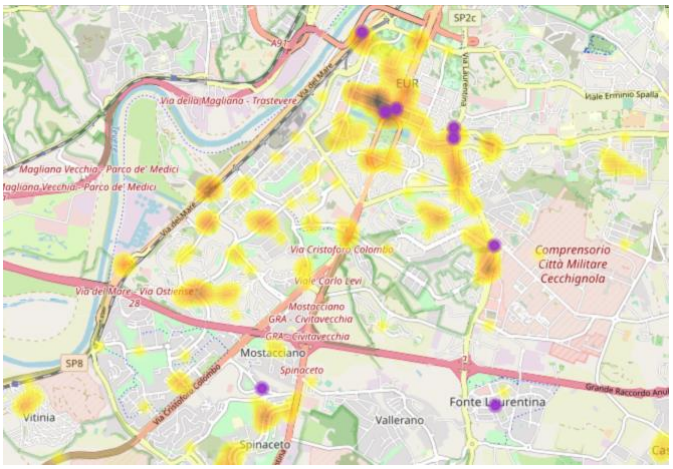


Figura 4:esempio densità costo sociale ed eventi mortali per investimenti pedonali Municipio IX

Nelle mappe seguenti, l'incremento dei valori incidentali corrisponde al progressivo spostamento dei gradienti dal colore giallo al nero. In rosso sono circoscritti gli ambiti di intervento. La scelta puntuale è avvenuta escludendo tutti quelli già programmati o in corso di attuazione per la messa in sicurezza.

Identification of Intervention Areas: Municipality I

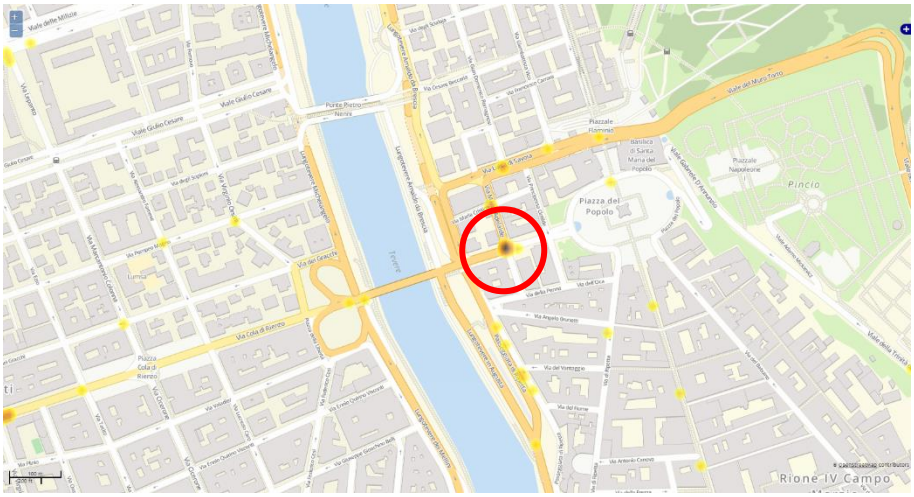


Figura 5: Municipio I, ambito BPP_001: Via Ferdinando di Savoia - Via Maria Adelaide

Figura 6: Municipio I, ambito BPP_002: Via Odoardo Beccari - Via Ambrogio Contarini

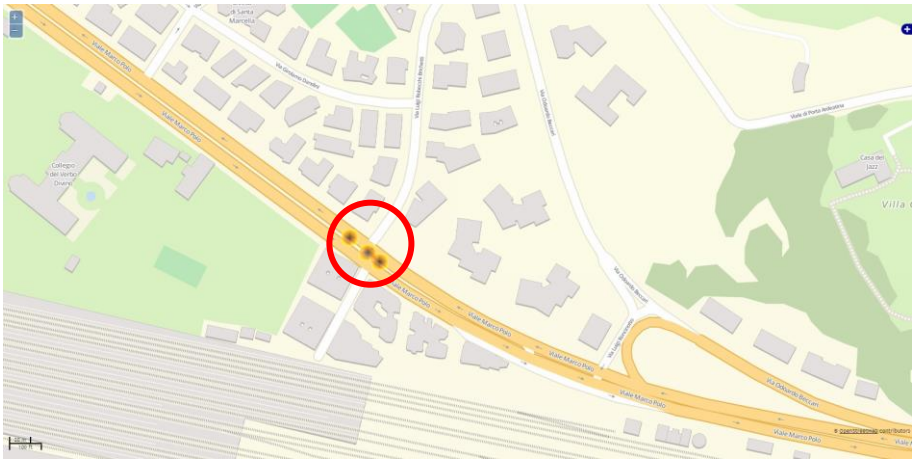


Figura 7: Municipio I, ambito BPP_003: Viale Marco Polo - Via Luigi Robecchi Brichetti

Identification of Intervention Areas: Municipality II

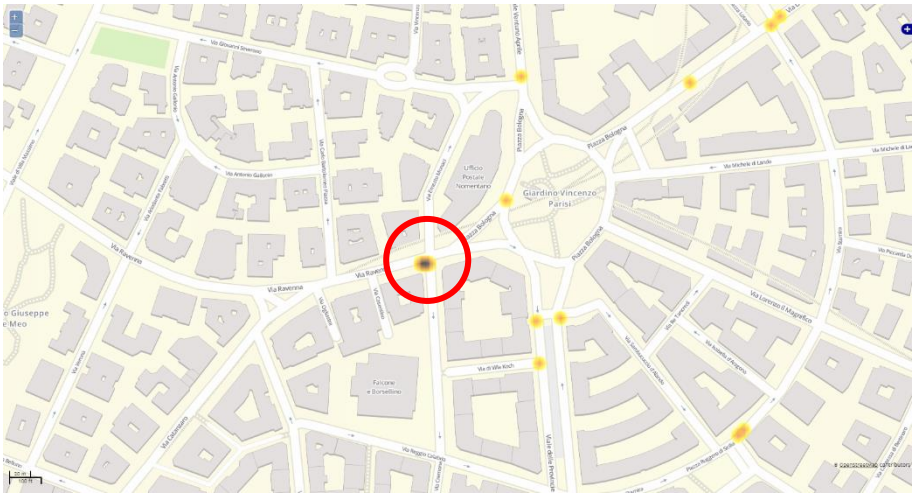


Figura 8: Municipio II, ambito BPP_004: Via Ravenna - Via Cremona

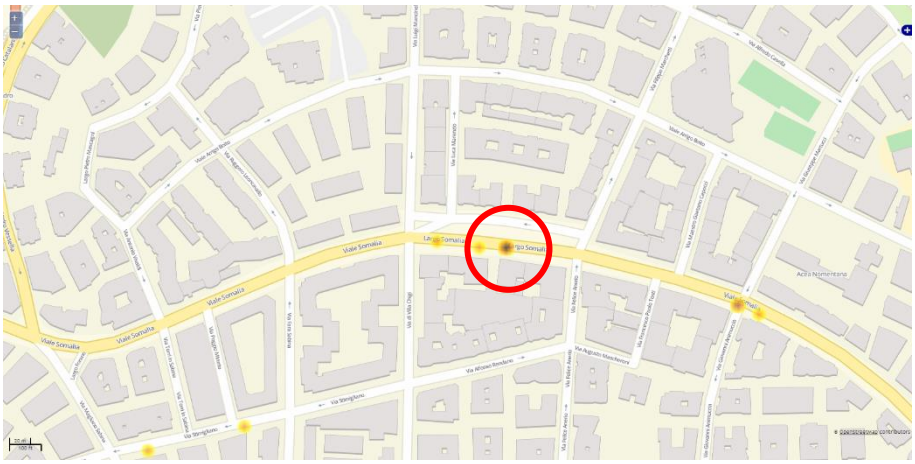


Figura 9: Municipio II, ambito BPP_005: Largo Somalia - alt. civico 54

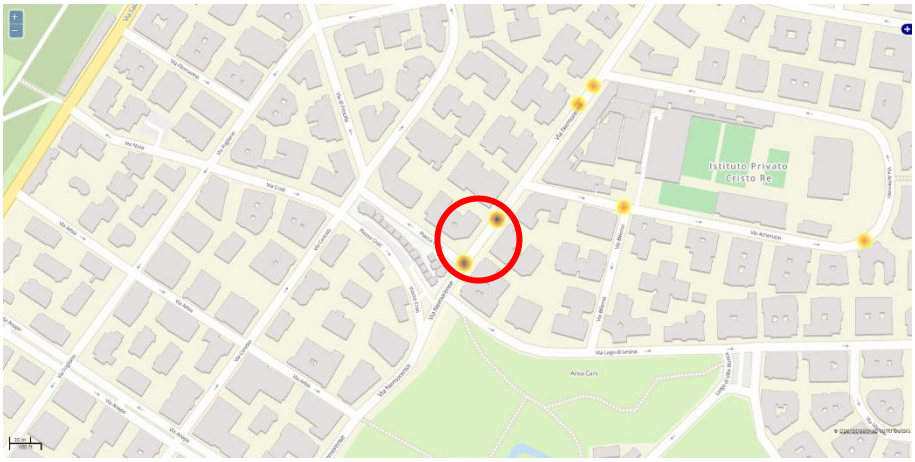


Figura 10: Municipio II, ambito BPP_006: Via Nemorense - Piazza Crati

Identification of Intervention Areas: Municipality III

I tre ambiti individuati per la messa in sicurezza sono:

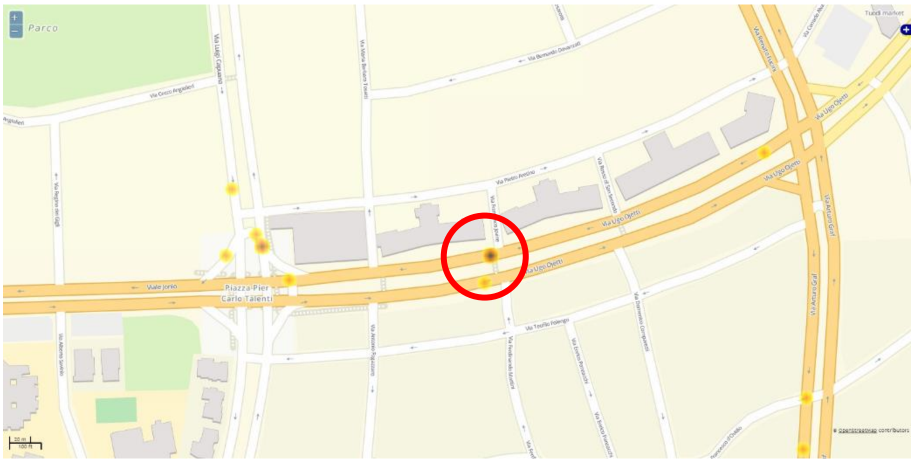


Figura 11: Municipio III, ambito BPP_007: Via Ugo Ojetti - Via Jovine Francesco

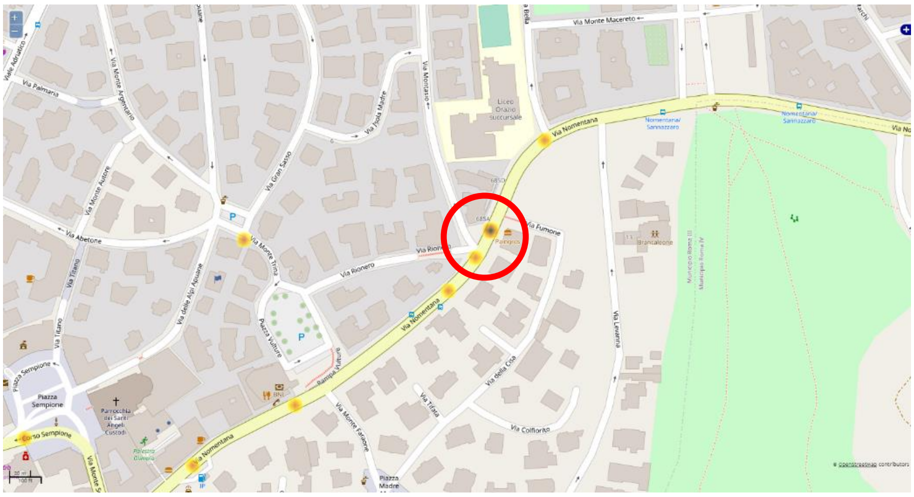


Figura 12: Municipio III, ambito BPP_008: Via Nomentana - Via Montasio

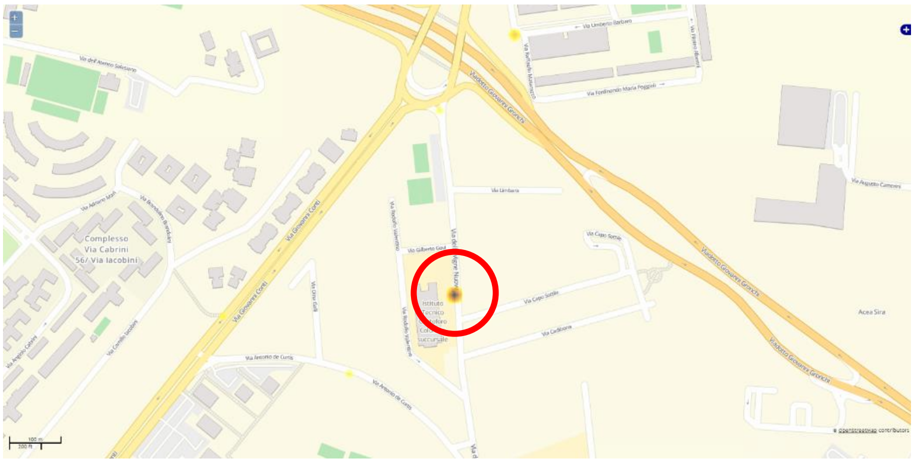


Figura 13: Municipio III, ambito BPP_009: Via delle Vigne Nuove - alt. Civico 416

I tre ambiti individuati per la messa in sicurezza sono:

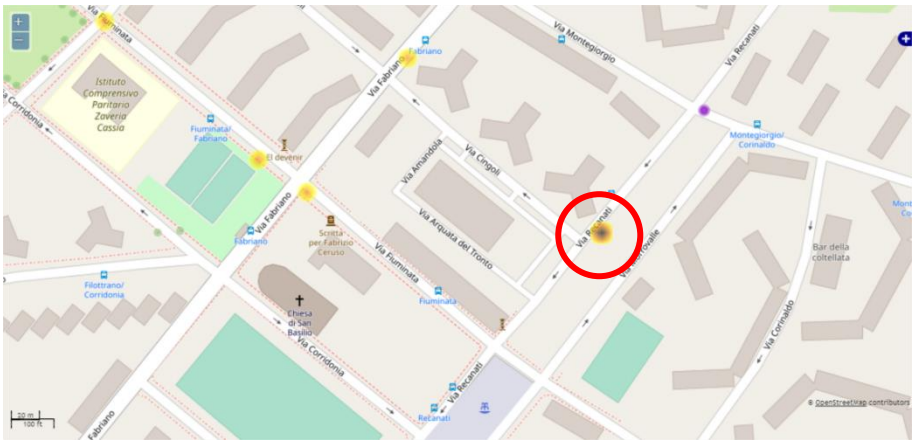


Figura 14: Municipio IV, ambito BPP_010: Via Recanati - Via Cingoli

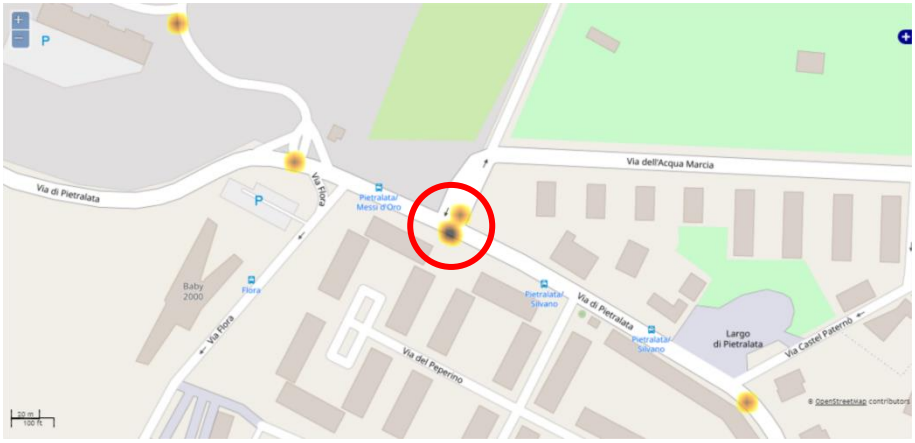


Figura 15: Municipio IV, ambito BPP_011: Via di Pietralata - Via dell'Acqua Marcia

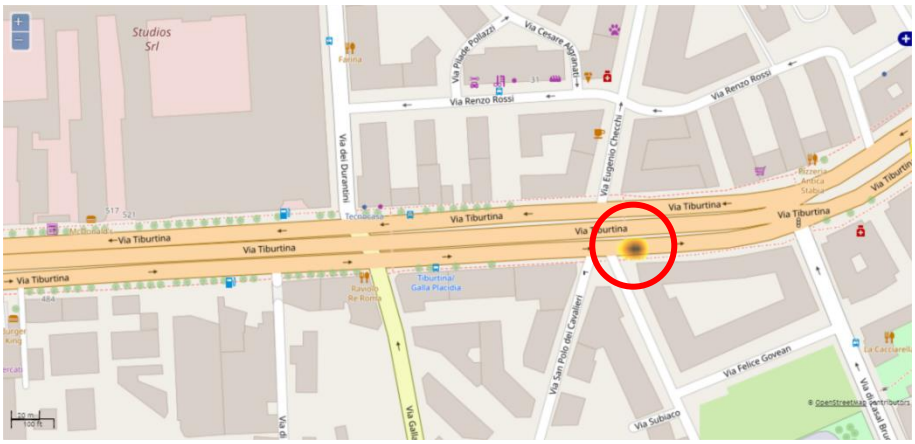


Figura 16: Municipio IV, ambito BPP_012: Via Tiburtina - Via dei Cluniacensi

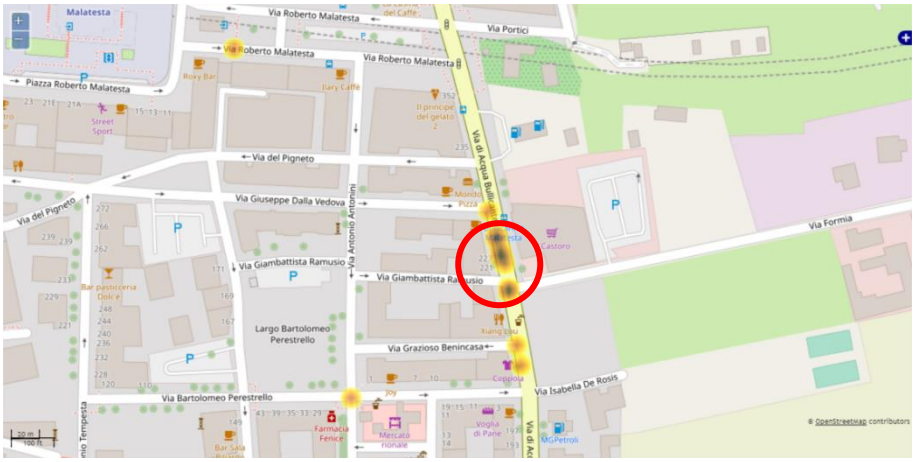


Figura 17: Municipio V, ambito BPP_013: Via dell'Acqua Bullicante - Via Formia

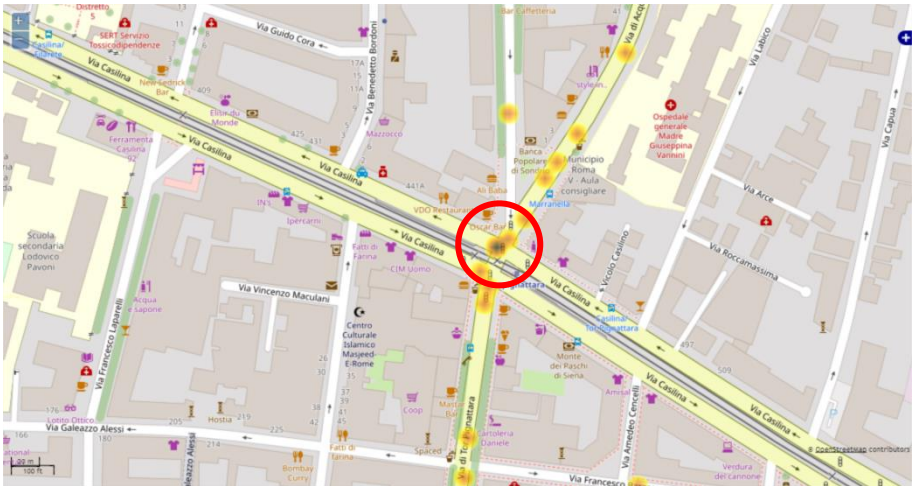


Figura 18: Municipio V, ambito BPP_014: Via dell'Acqua Bullicante - Via Casilina

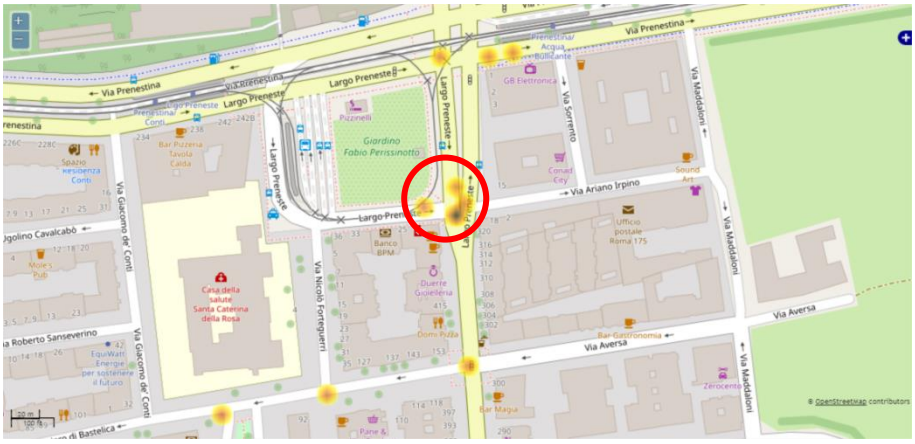


Figura 19: Municipio V, ambito BPP_015: Via dell'Acqua Bullicante - Largo Preneste

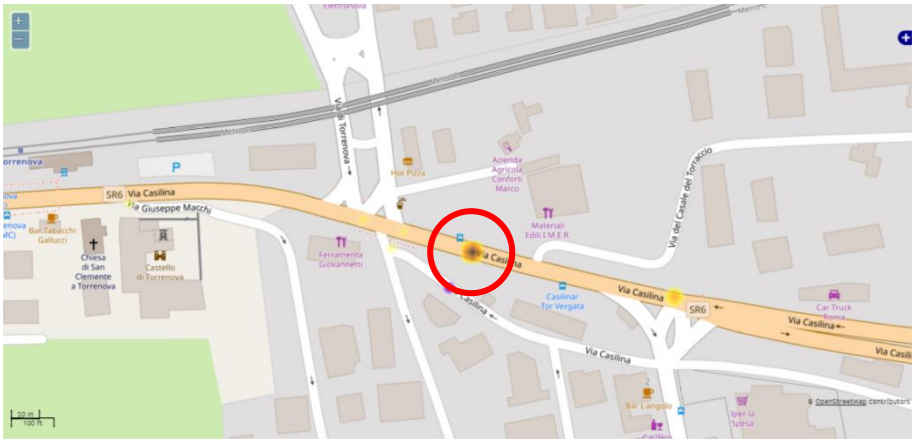


Figura 20: Municipio VI, ambito BPP_016: Via Casilina - Via del casale del Torraccio

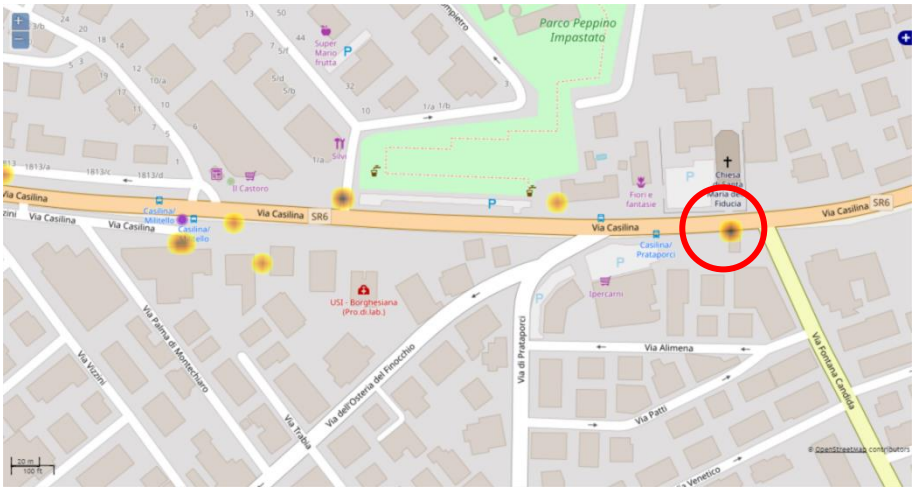


Figura 21: Municipio VI, ambito BPP_017: Via Casilina - Via di Fontana Candida

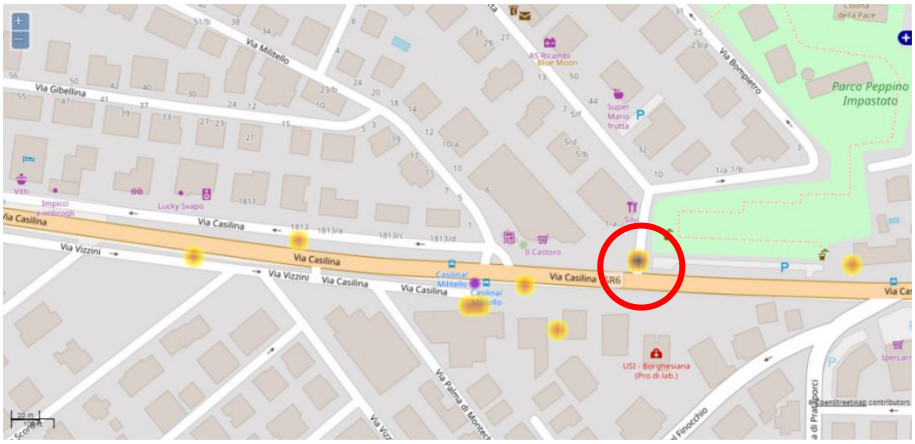


Figura 22: Municipio VI, ambito BPP_018: Via Casilina - Via Bolognetta

Figura 23: Municipio VII, ambito BPP_019: Via Aosta - Via Casoria

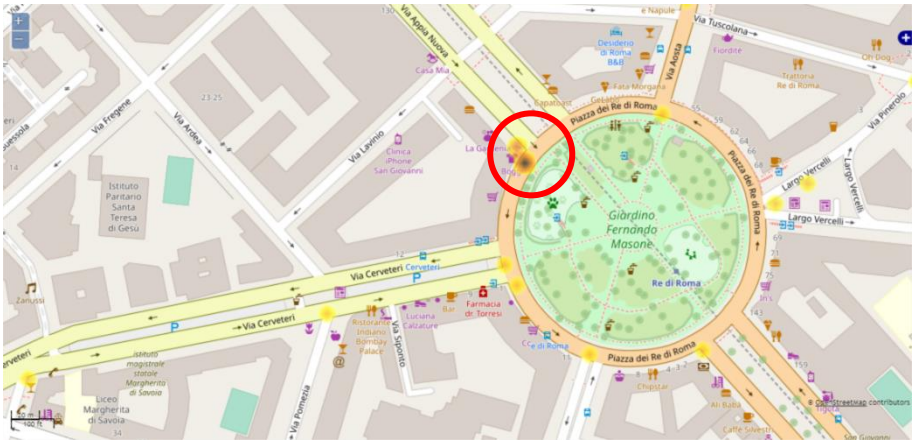


Figura 24: Municipio VII, ambito BPP_020: Via Appia Nuova - Piazza Re di Roma

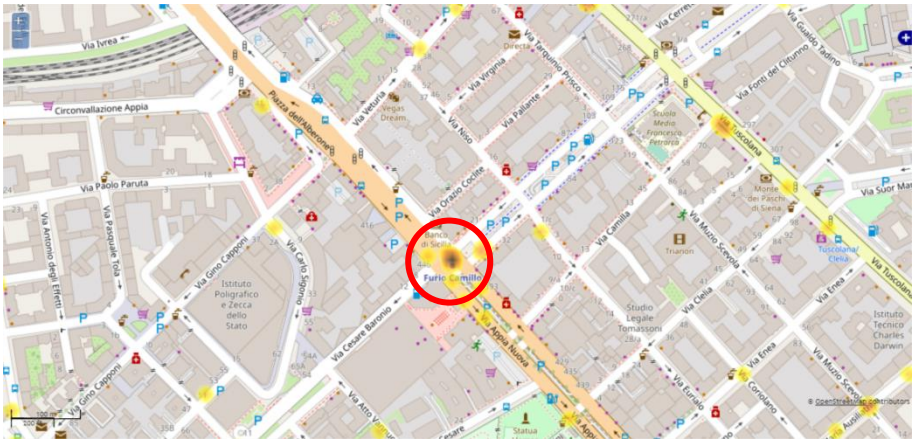


Figura 25: Municipio VII, ambito BPP_021: Via Appia Nuova - Via Furio Camillo

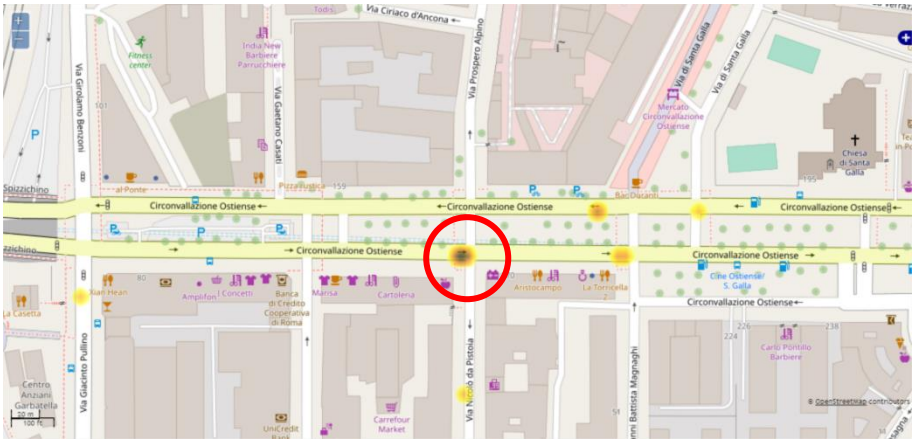


Figura 26: Municipio VIII, ambito BPP_022: Circonvallazione Ostiense - Via Nicolò da Pistoia

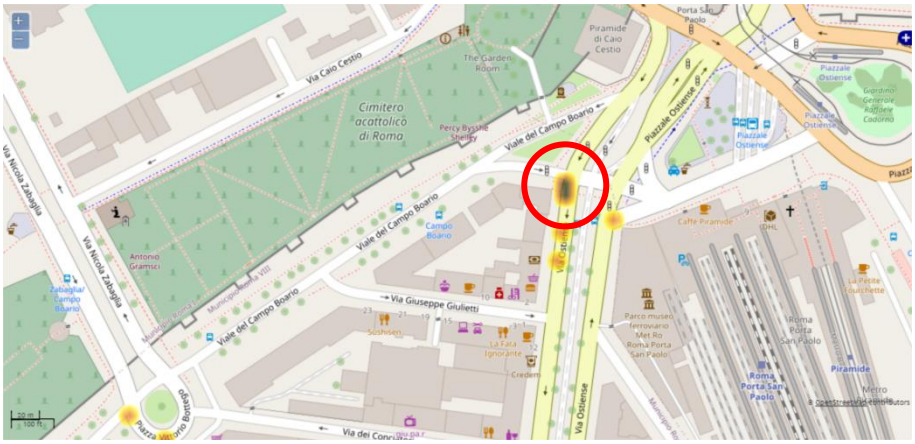


Figura 27: Municipio VIII, ambito BPP_023: Via Ostiense - Piazzale Ostiense

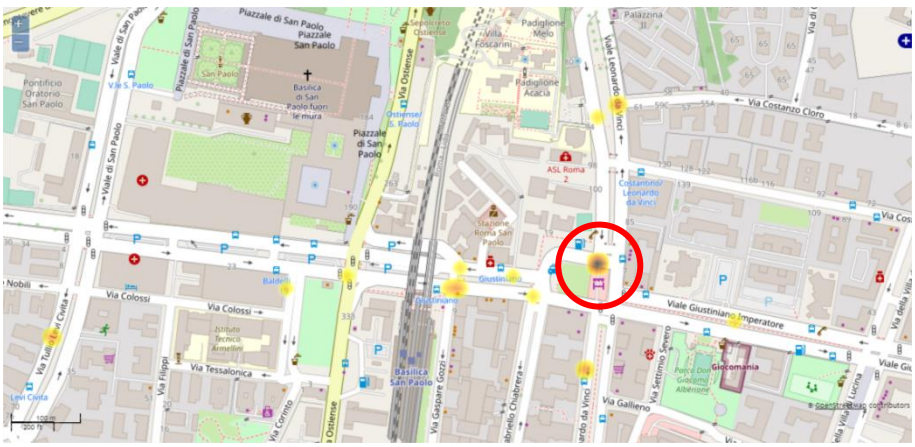


Figura 28: Municipio VIII, ambito BPP_024: Viale Leonardo da Vinci - Piazzale Leonardo da Vinci

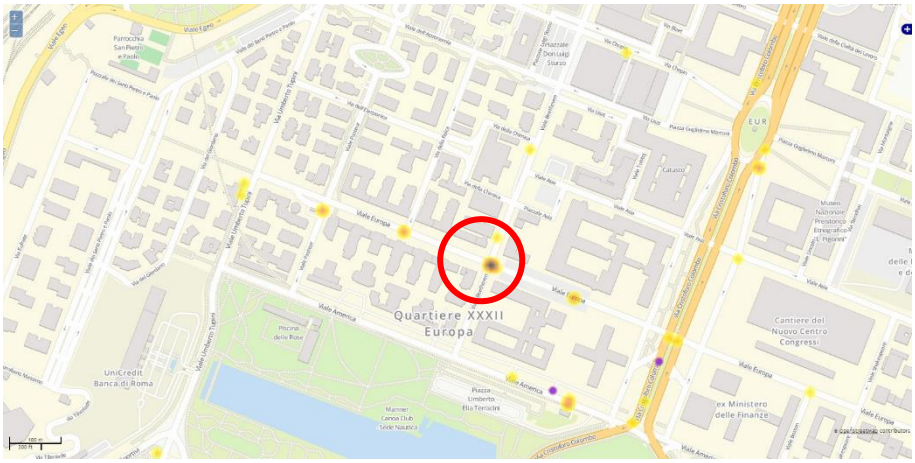


Figura 29: Municipio IX, ambito BPP_025: Viale Europa - Viale Beethoven

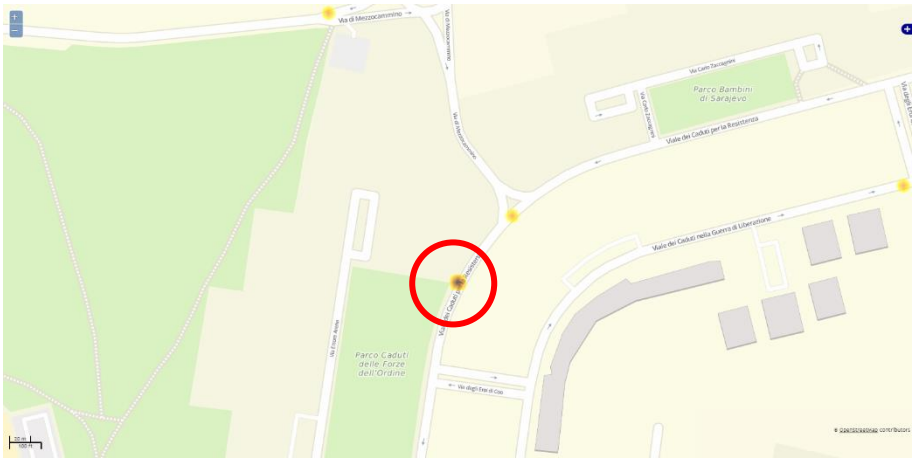


Figura 30: Municipio IX, ambito BPP_026: Viale dei Caduti per la Resistenza - Via degli Eroi di Coo

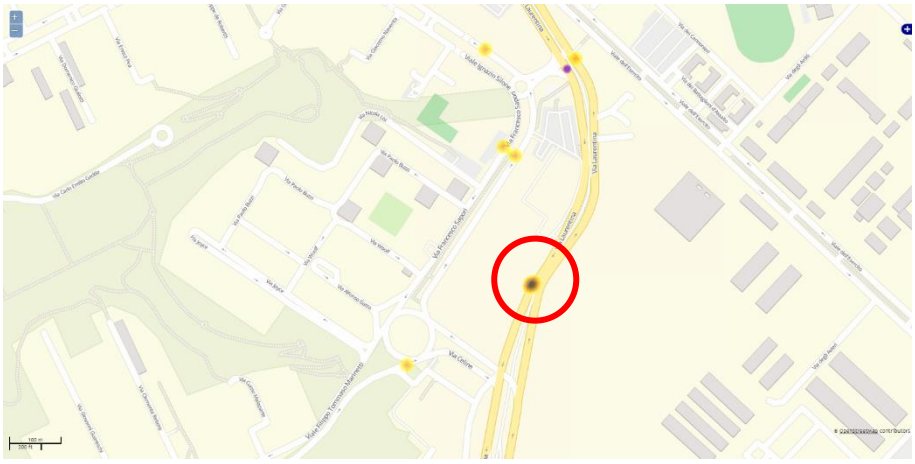


Figura 31: Municipio IX, ambito BPP_027: Via Laurentina - alt. civico 760

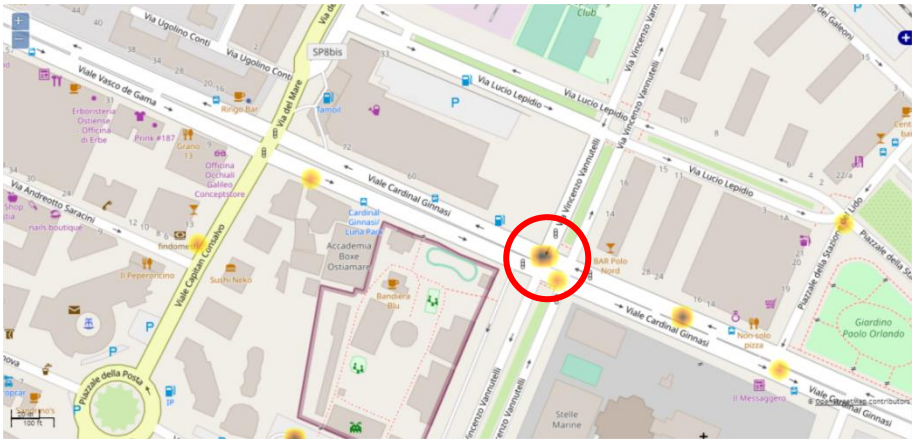


Figura 32: Municipio X, ambito BPP_028: Viale Vasco de Gama - Via Vincenzo Vannutelli

Figura 33: Municipio X, ambito BPP_029: Via delle Isole del Capoverde - Via dei Panfili

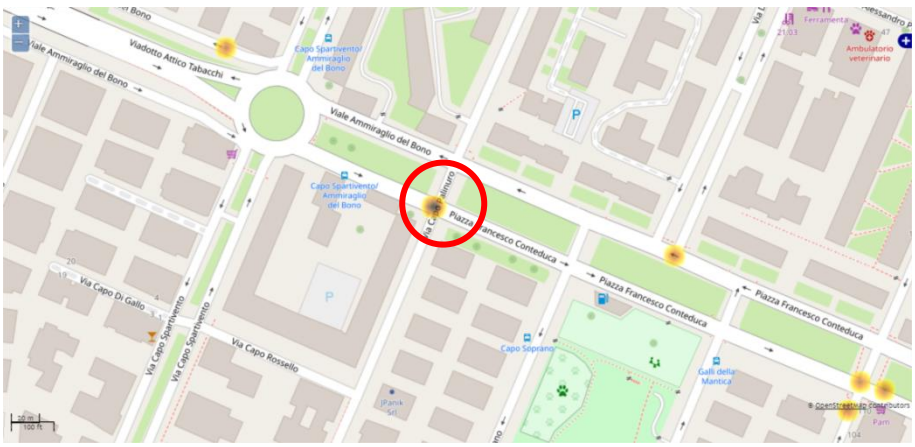


Figura 34: Municipio X, ambito BPP_030: Via Capo Passero - Via Capo Palinuro

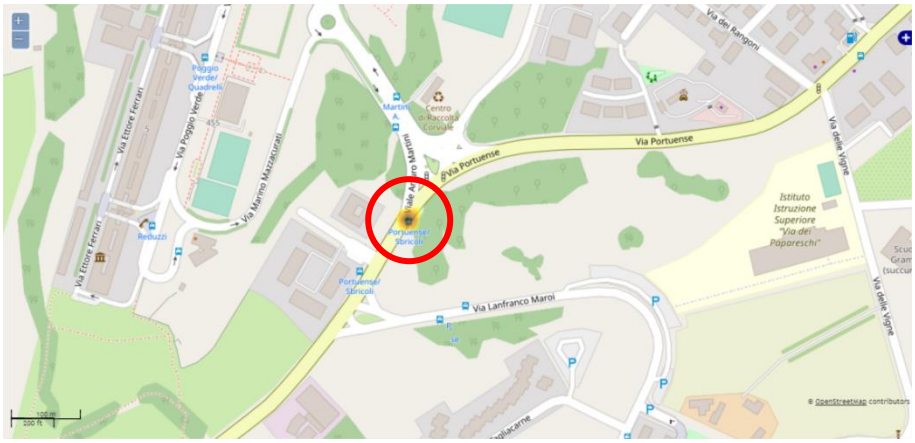


Figura 35: Municipio XI, ambito BPP_031: Via Portuense - Viale Antonio Martini

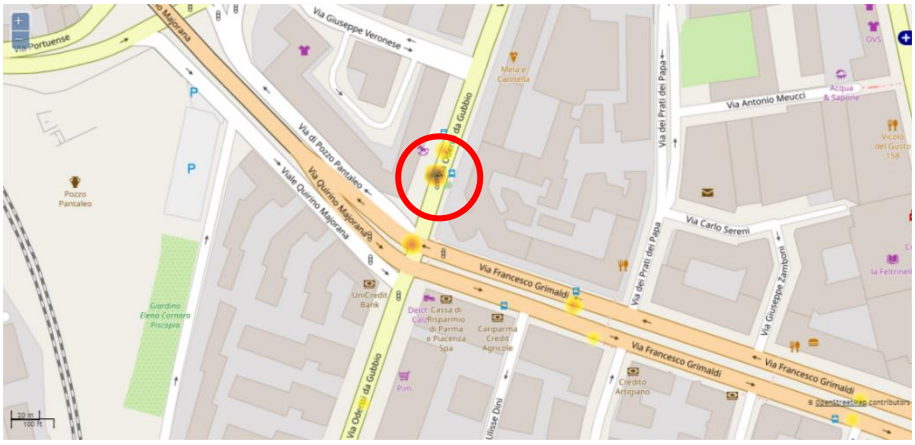


Figura 36: Municipio XI, ambito BPP_032: Via Quirino Maiorana - Via Oderisi da Gubbio

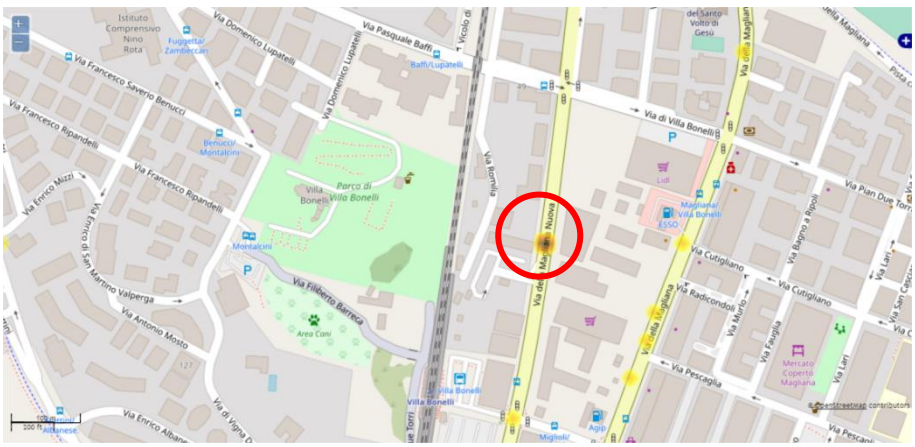


Figura 37: Municipio XI, ambito BPP_033: Via della Magliana Nuova - alt. Civico 306

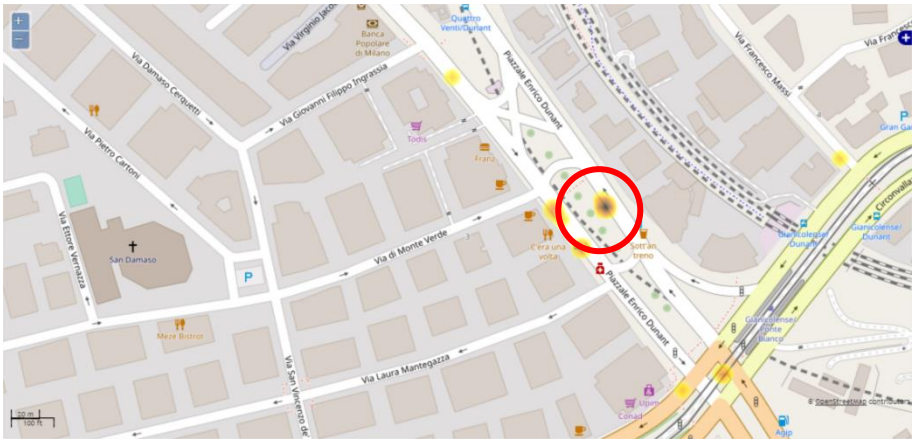


Figura 38: Municipio XII, ambito BPP_034: Piazzale Dunant - Via di Monteverde

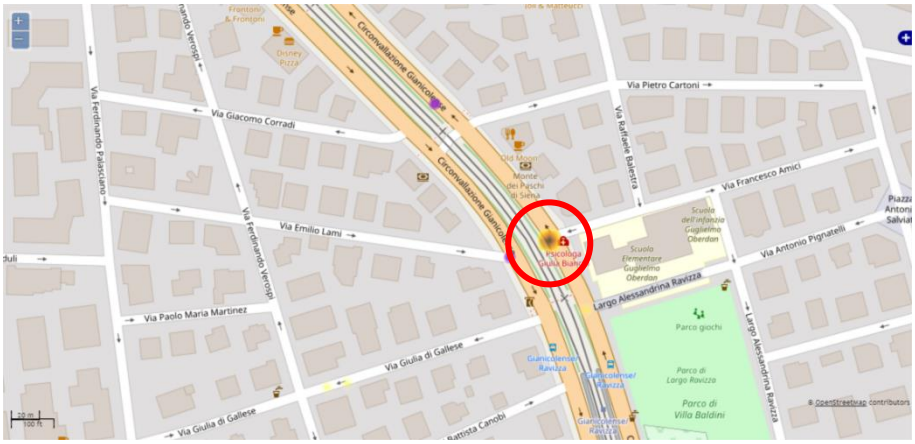


Figura 39: Municipio XII, ambito BPP_035: Circonvallazione Gianicolense - Via Francesco Amici

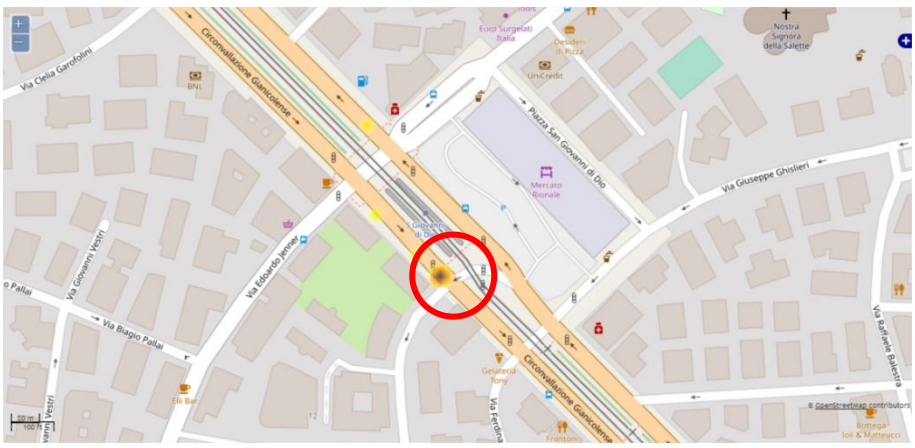


Figura 40: Municipio XII, ambito BPP_036: Circonvallazione Gianicolense - Via Ferdinando Palasciano

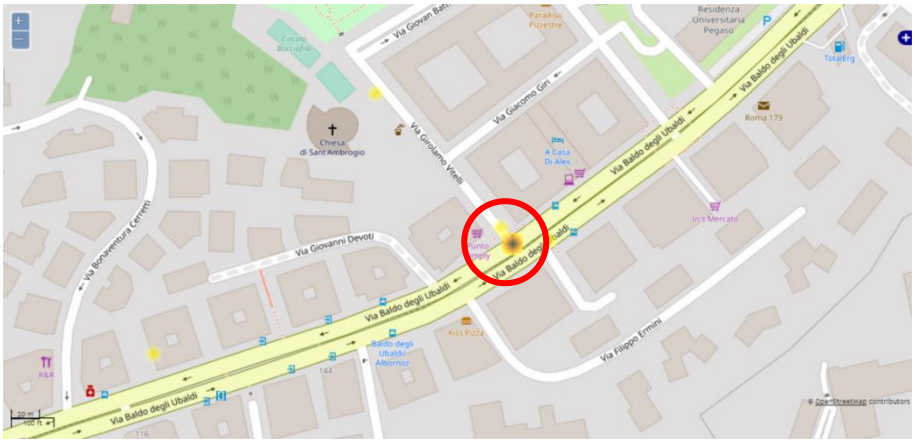


Figura 41: Municipio XIII, ambito BPP_037: Via Baldo degli Ubaldi - Via Girolamo Vitelli

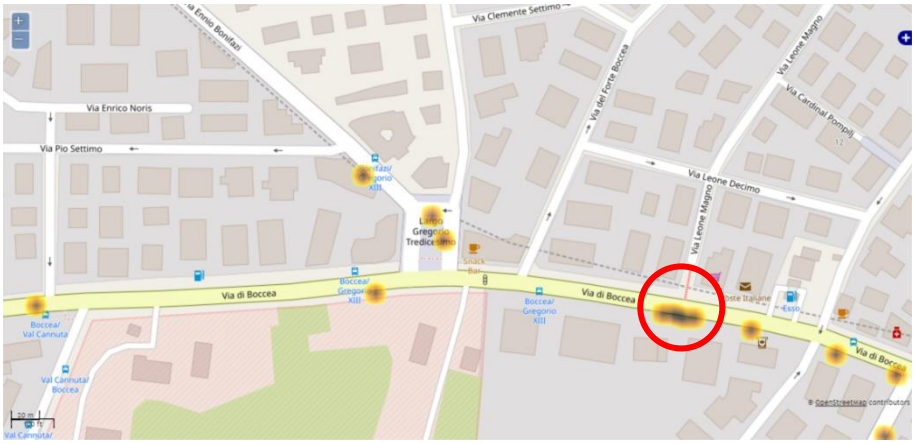


Figura 42: Municipio XIII, ambito BPP_038: Via di Boccea - alt. civico 231

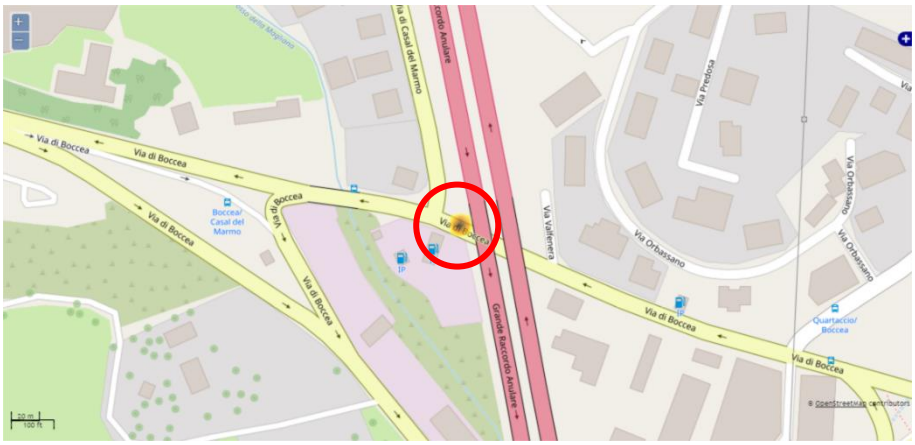


Figura 43: Municipio XIII, ambito BPP_039: Via di Boccea - Via di Casal del Marmo

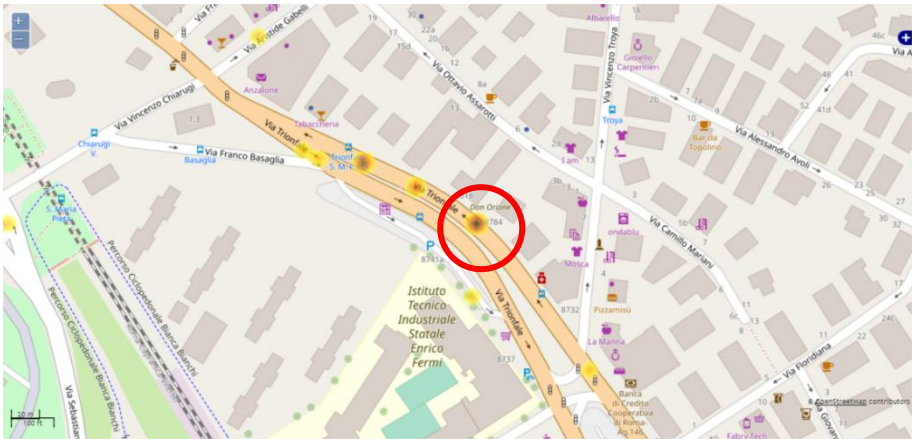


Figura 44: Municipio XIV, ambito BPP_040: Via Trionfale - alt. Civico 8872

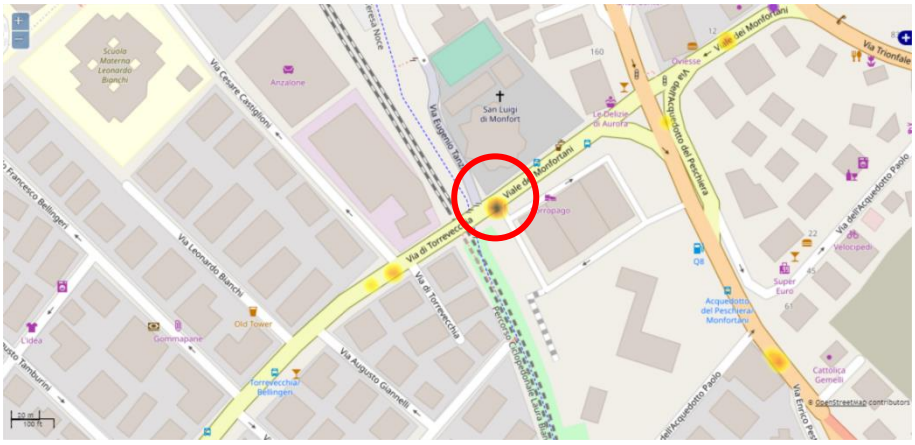


Figura 45: Municipio XIV,, ambito BPP_041: Via dei Monfortani - Via Eugenio Tanzi

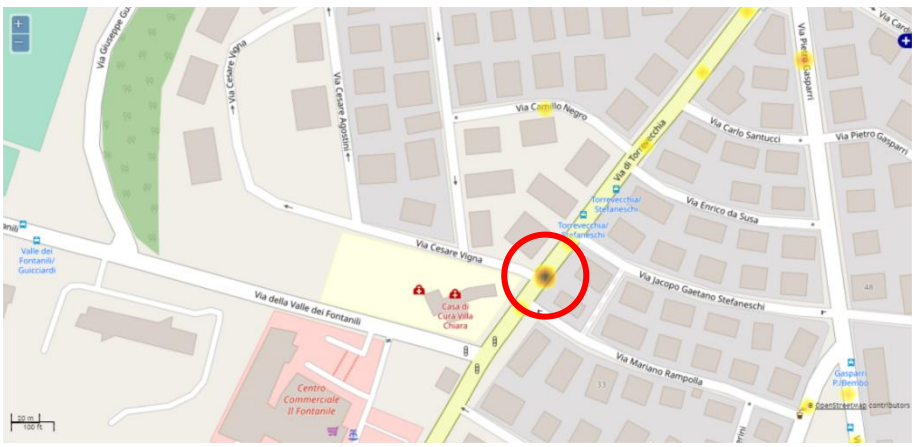


Figura 46: Municipio XIV, ambito BPP_042: Via di Torrevecchia - Via Cesare Vigna

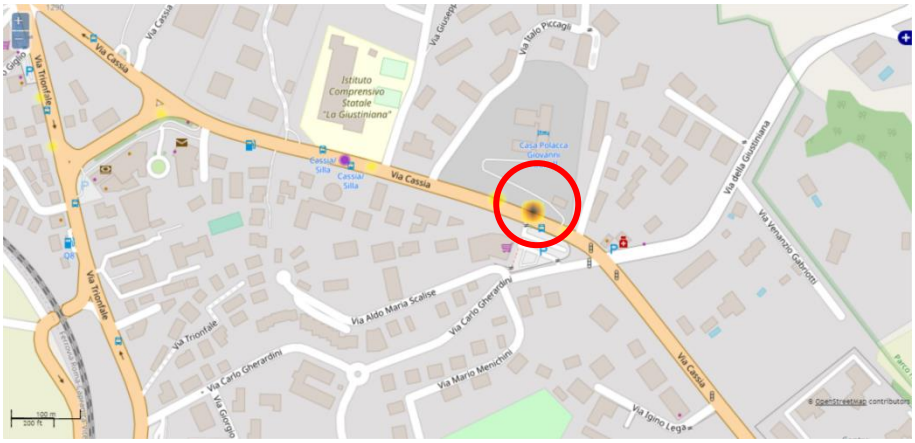


Figura 47: Municipio XV, ambito BPP_043: Via Cassia - alt. civico 1200

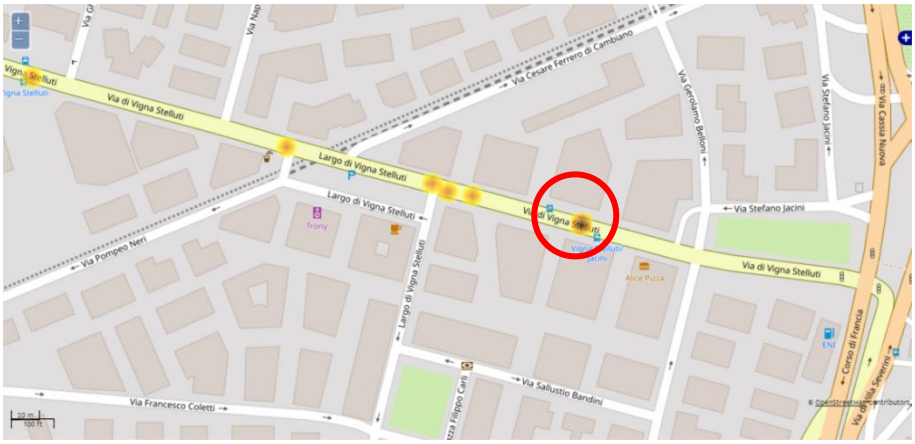


Figura 48: Municipio XV, ambito BPP_044: Via di Vigna Stelluti - alt. civico 187

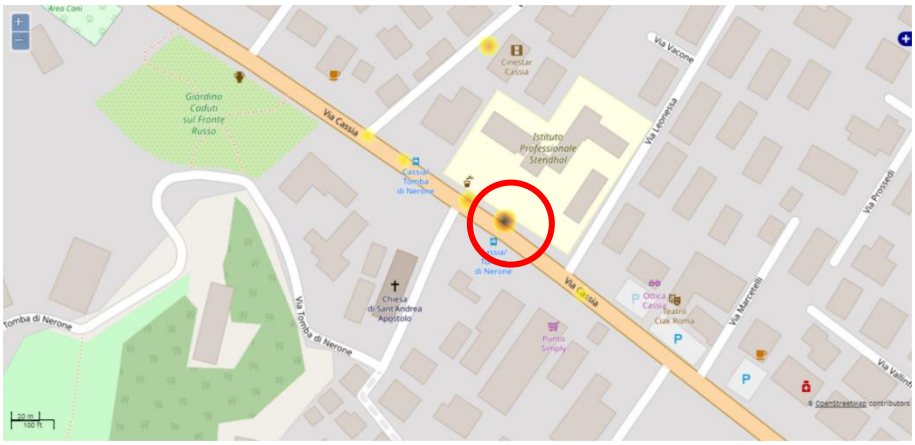


Figura 49: Municipio XV, ambito BPP_045: Via Cassia - alt. civico 726

2.4. Special aspects

The Department of Sustainable Mobility and Transport of Roma Capitale, together with Roma Servizi per la Mobilità, has been engaged for years in enhancing the safety of road areas considered most hazardous. In order to proceed with the design of interventions, with Managerial Determination No. 1286 dated December 7, 2020, protocol No. QG/40988/2020, Roma Servizi per la Mobilità S.r.l. was entrusted with activities related to feasibility study, final design, executive design, and safety coordination during the design phase for interventions aimed at securing intersections with maximum risk (Black points). The total compensation for these design activities amounts to €465,000 (VAT included).

The Framework Agreement for design has been concluded, identifying the entities to be commissioned for the aforementioned activities. This planning allows the Administration to promptly initiate the design of interventions covered by this funding and utilize available resources for their implementation, with design resources already secured.

3. ACCIDENTS: QUALITATIVE ELEMENTS

This reversal of trend, recorded since 2002, shows a significant reduction in the number of deaths and injuries in road traffic accidents in Rome Capital.

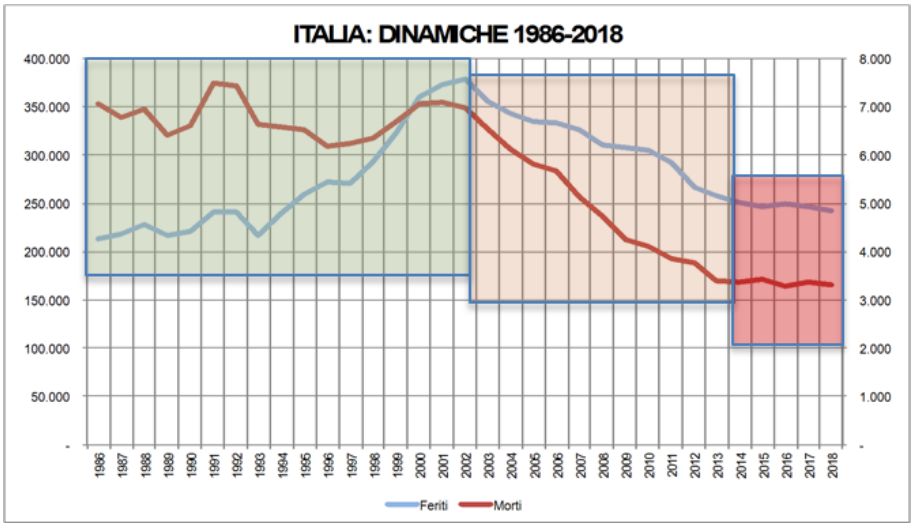


Figura 50: risultanze incidentali dal 1986

Given the vast expanse of the territory and road network of Rome Capital, analyses have been conducted to identify the distribution of accident hotspots and other parameters such as spatial density and social cost. These analyses overlaid information on the social costs arising from pedestrian injuries with those from fatal incidents, creating maps of social cost density that reflect actual conditions based on accident databases.

To focus on the most recent time frame, which preliminary statistical analyses indicated as particularly impactful for vulnerable road users, the studies were narrowed down to the period 2018-2020. The identification of areas requiring safety measures involved establishing a priority scale, with interventions subsequently planned across the entire municipal territory but pinpointed within specific territorial zones defined by each municipality.

Below are the maps showing the density of social costs related to pedestrian injuries and fatal incidents for the period 2018-2020: the gradients increase in value from yellow to black.

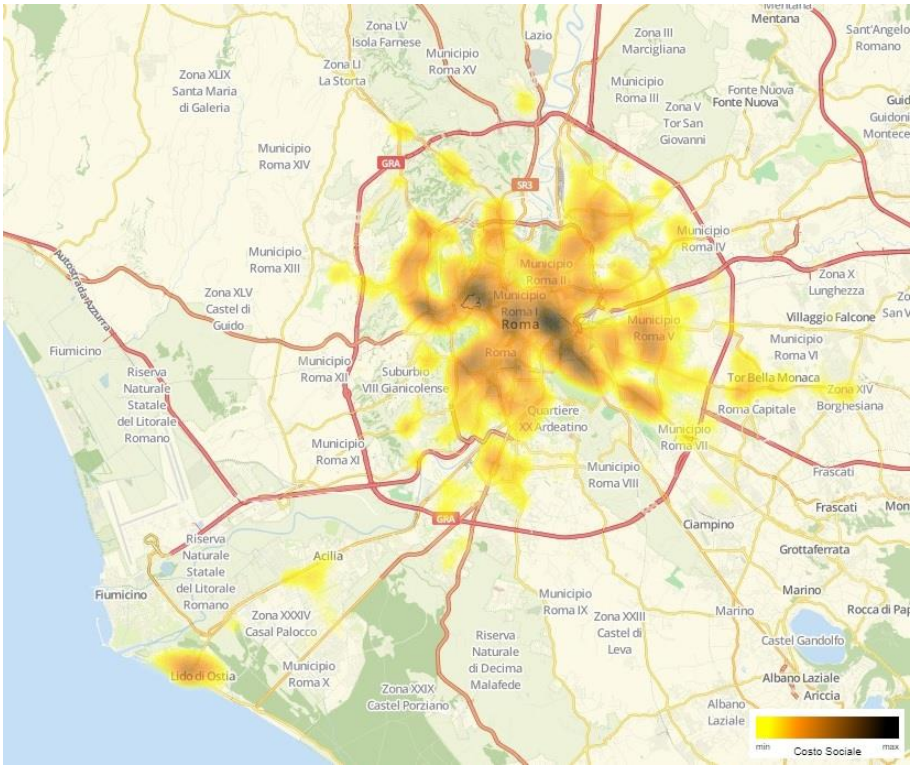


Figura 51:mappa densità di costo sociale per feriti da investimenti pedonali 2018 - 2020

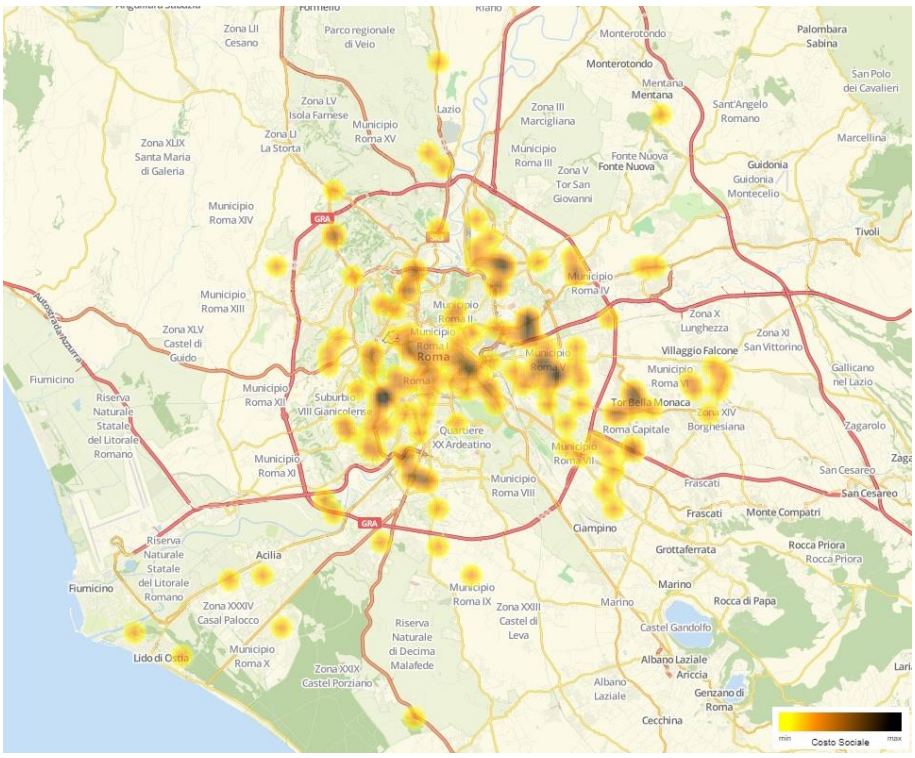


Figura 52:mappa densità di costo sociale per morti da investimenti pedonali 2018 - 2020

4. IDENTIFICATION OF THE MAIN RISK FACTORS

Based on the safety inspections conducted over time on accident-prone areas and the analyses performed on incident cases through the SISS at the Centro di Competenza sulla Sicurezza Stradale di Roma Capitale, multiple concurrent elements contributing to accidents have been identified. These include (indicative and non-exhaustive):

Excessive speed relative to the planimetric and altimetric characteristics and road context.

Driver distraction due to the use of electronic devices.

Non-compliance with traffic regulations and prescriptions.

Failure to respect visibility triangles or minimum stopping distances.

Failure to cross at pedestrian crossings.

Non-compliance with traffic light indications, due to lack of feedback from the system (pedestrian calls) or excessive duration of signal timings.

Pedestrian crossings in areas with poor visibility.

Overlapping conflicting functions in the same spaces.

Passage of scooters or bicycles in pedestrian areas or on sidewalks.

Illegal parking at intersections, on pedestrian crossings, waste containers, or double parking.

This knowledge has led to the definition of a set of possible field interventions, characterized by diverse types and methods of implementation, yet synergistically compatible:

Type A: Improved definition of trajectories; possible calibration of the intersection area (mostly through signage and minimal physical works).

Type B: Speed control and reduction: new horizontal/vertical/light signage.

Type C: Light infrastructural reorganization of the intersection (shoulder and median strip profiling; remodeling and securing pedestrian spaces and crossings; optimizing parking spaces and visibility).

Type D: Optimization of maneuvers and traffic light regulation.

Type E: Revision/modification of circulation rules.

Type F: Complete heavy infrastructural reconfiguration of the intersection (underpasses/roundabouts/ramps).

Type G: Specific use of technological solutions (for red light violation monitoring, speed limit compliance, etc.).

Monitoring activities have been directed towards five intervention areas aimed at enhancing the safety of vulnerable road users and traffic circulation within the scope of the "Experimental Interventions for Scheduled Maintenance of the Main Road Network in the City of Rome".

The implementation of intervention types from A to D along Lungotevere Flaminio, aimed at securing five intersections based on incident monitoring, has yielded very encouraging results, with substantial reductions in incident levels.

Ambito	Incidenti	Feriti	Costo sociale
Lungotevere Flaminio – Via Canina	-27%	-75%	-60%
Lungotevere Flaminio – Via Fracassini	-100%	-100%	-100%
Lungotevere Flaminio – Via Stern	-56%	-71%	-67%
Lungotevere Flaminio – Via Vespignani	-80%	-78%	-78%
Piazza Pia – Via della Conciliazione	-29%	-20%	-24%

Figura 53: risultanze interventi attuati Lungotevere Flaminio anno 2016

The percentage changes indicated refer to the annual averages calculated in the pre- and post-triennial periods, excluding the year of implementation.

5. POSSIBLE LINES OF CONTRAST OF RISK FACTORS

The measures aimed at effectively countering or eliminating risk factors are already included within the guidelines of the Sustainable Mobility and Transport Department of Rome Capital, approved by Resolution A.C. No. 21 of April 16, 2015, which states:

"Expansion of sidewalk terminals to protect and physically contain parking queues between intersections, to reduce the length of pedestrian crossings (and thus exposure time to risk), as well as to prevent double-parking obstruction;

Systematic expansion of sidewalks at public transport stops (creation of "bus stop islands");

Systematic expansion of sidewalks at waste collection bin locations, positioned on sidewalks to ensure correct repositioning by AMA operators and maximum visibility for vehicles;

Possible creation of "service blocks," consolidating some or all of the aforementioned functions (public transport stops, pedestrian crossings, and AMA stations), to optimize overall parking availability and pedestrian safety levels.

Specific pedestrianization interventions will be implemented through the development of detailed "cross-sectional" Traffic Plans, which cover the entire territory and identify areas in each zone, including peripheral ones, that can serve as new urban and local level aggregation centers ("Environmental Island Plan").

For each of the 45 identified areas within the 15 Municipalities, measures have been identified to increase safety levels and reduce incidents, in accordance with the guidelines outlined in the PGTU, with particular attention to the geometric and functional aspects of each area.

These investigations have identified areas where existing pedestrian routes are insufficient, or where locations need to be modified due to identified visibility deficiencies or signaling systems. Additionally, solutions have been proposed to reduce the linear development of pedestrian crossings with new

pedestrian refuge islands in the center of the roadway, along with the simultaneous increase in mutual visibility triangles between pedestrians and vehicles.

Where already in place, adjustments to traffic light systems and vertical and horizontal signage have been planned following modifications to the geometry of these locations.

Figura 54: esempio intervento realizzato Lungotevere Flaminio – Via Canina, anno 2016

Figura 55: esempio intervento realizzato Isola Ambientale Casal Bertone, anno 2022

6. SPECIAL ELEMENTS ADOPTED FOR THE ASSESSMENT OF RISK FACTORS

The definition of action lines to be implemented in each area will follow the customary procedure of thorough safety inspections on-site. These inspections will involve gathering functional, geometric, and visibility-related characteristics, as well as assessing the main attractors for vulnerable users and the routes of minimal development.

The data collected will complement safety analyses developed for each area, spanning the last decade, aimed at deepening understanding of environmental conditions, lighting, and verifying on-site the flow dynamics of pedestrian and vehicular systems.

All ongoing design interventions are tested from the initial stages of development using vehicle traffic simulation tools. This ensures proper transit for public service vehicles (public transport, waste collection, etc.), emergency vehicles (police, fire brigade, etc.), and large distribution supply vehicles.

Following internal best practices, Roma Servizi per la Mobilità ensures during the design phase the verification of visibility triangles at intersections or pedestrian crossings. This includes addressing architectural barriers where necessary.

7. SCELTA DESCRIPTION OF THE INTERVENTION AND THE REASONS THEY HAVE

8. LED TO HIS CHOICE

The intervention proposal involves identifying 3 critical areas for vulnerable users in each of the 15 municipalities of Rome, totaling 45 safety improvement interventions. These interventions are divided into two separate groups, likely based on specific criteria or priorities identified during preliminary analyses.

Cod	Strada	Altezza	Municipio		Coordinate
BPP_001	Via Ferdinando di Savoia	Via Maria Adelaide	I	1	41.910209, 12.474253
BPP_002	Via Odoardo Beccari	Via Ambrogio Contarini	I	1	41.875572, 12.490128
BPP_004	Via Ravenna	Via Cremona	II	2	41.913250, 12.519647
BPP_005	Largo Somalia	alt. civico 54	II	2	41.935965, 12.515094
BPP_007	Via Ugo Ojetti	Via Jovine Francesco	III	3	41.944074, 12.549748
BPP_008	Via Nomentana	Via Montasio	III	3	41.936811, 12.539156
BPP_010	Via Recanati	Via Cingoli	IV	4	41.940515, 12.586308
BPP_011	Via di Pietralata	Via dell'Acqua Marcia	IV	4	41.919164, 12.552604
BPP_013	Via dell'Acqua Bullicante	Via Formia	V	5	41.885997, 12.543344
BPP_014	Via dell'Acqua Bullicante	Via Casilina	V	5	41.880217, 12.542239
BPP_016	Via Casilina	Via del casale del Torraccio	VI	6	41.862803, 12.619936
BPP_017	Via Casilina	Via di Fontana Candida	VI	6	41.862673, 12.686796
BPP_019	Via Aosta	Via Casoria	VII	7	41.883470, 12.514660
BPP_020	Via Appia Nuova	Piazza Re di Roma	VII	7	41.882290, 12.513533
BPP_022	Circonvallazione Ostiense	Via Nicolò da Pistoia	VIII	8	41.867107, 12.486994
BPP_023	Via Ostiense	Piazzale Ostiense	VIII	8	41.875678, 12.480693
BPP_025	Viale Europa	Viale Beethoven	IX	9	41.831739, 12.466090
BPP_026	Viale dei Caduti per la Resistenza	Via degli Eroi di Coo	IX	9	41.791660, 12.446794
BPP_028	Viale Vasco de Gama	Via Vincenzo Vannutelli	X	10	41.732558, 12.280881
BPP_029	Via delle Isole del Capoverde	Via dei Panfili	X	10	41.738564, 12.278256
BPP_031	Via Portuense	Viale Antonio Martini	XI	11	41.847128, 12.414180
BPP_032	Via Quirino Maiorana	Via Oderisi da Gubbio	XI	11	41.865448, 12.465261
BPP_034	Piazzale Dunant	Via di Monteverde	XII	12	41.872573, 12.458596
BPP_035	Circonvallazione Gianicolense	Via Francesco Amici	XII	12	41.872451, 12.449663
BPP_037	Via Baldo degli Ubaldi	Via Girolamo Vitelli	XIII	13	41.899869, 12.436402
BPP_038	Via di Boccea	alt. civico 231	XIII	13	41.903475, 12.420370
BPP_040	Via Trionfale	alt. Civico 8872	XIV	14	41.941134, 12.422203
BPP_041	Via dei Monfortani	Via Eugenio Tanzi	XIV	14	41.936908, 12.423705
BPP_043	Via Cassia	alt. civico 1200	XV	15	41.982717, 12.413914
BPP_044	Via di Vigna Stelluti	alt. civico 187	XV	15	41.947236, 12.467805

Tabella 7:elenco interventi sottoposti a finanziamento

For an additional 15 critical areas for vulnerable users, one for each of the 15 municipalities, the Municipal Administration will proceed with their design and subsequent implementation, sourcing the necessary funds from potential savings within the current financing or from other sources.

Cod	Strada	Altezza	Municipio		Coordinate
BPP_003	Viale Marco Polo	Via Luigi Robecchi Brichetti	I	1	41.872769, 12.489332
BPP_006	Via Nemorense	alt. civico 78	II	2	41.927171, 12.510720
BPP_009	Via delle Vigne Nuove	alt. civico 416	III	3	41.955412, 12.535818
BPP_012	Via Tiburtina	Via dei Cluniacensi	IV	4	41.908713, 12.544256
BPP_015	Via dell'Acqua Bullicante	Largo Preneste	V	5	41.891861, 12.541836
BPP_018	Via Casilina	Via Bolognetta	VI	6	41.862708, 12.684051
BPP_021	Via Appia Nuova	Via Furio Camillo	VII	7	41.874778, 12.523028
BPP_024	Viale Leonardo da Vinci	Piazzale Leonardo da Vinci	VIII	8	41.856896, 12.480808
BPP_027	Via Laurentina	alt. civico 760	IX	9	41.810021, 12.485306
BPP_030	Via Capo Passero	Via Capo Palinuro	X	10	41.736033, 12.286529
BPP_033	Via della Magliana Nuova	alt. Civico 306	XI	11	41.849023, 12.456586
BPP_036	Circonvallazione Gianicolense	Via Ferdinando Palasciano	XII	12	41.874382, 12.446765
BPP_039	Via di Boccea	Via di Casal del Marmo	XIII	13	41.914973, 12.384614
BPP_042	Via di Torrevecchia	Via Cesare Vigna	XIV	14	41.923519, 12.412438
BPP_045	Via Cassia	alt. civico 726	XV	15	41.964719, 12.444314

Tabella 8:elenco interventi NON sottoposti a finanziamento

As already indicated in section B, the main typological solutions that will be implemented, based on the characteristics of each intervention area, include:

Type A: Improved definition of trajectories; possible calibration of the intersection area (mostly with signage and minimal physical works).

Type B: Speed control and reduction: new horizontal/vertical/luminous signage.

Type C: Light infrastructural reorganization of the intersection (reshaping curbs and traffic islands; reconfiguration and safety enhancement of pedestrian spaces and crossings, optimizing parking spaces and visibility).

Type D: Optimization of maneuvers and traffic light regulation.

For each of the areas slated for safety improvement, potential resolution approaches have been identified to increase safety levels and reduce incidents.

For 22 out of the 30 funded areas, physical works are planned to delineate road locations, including the construction of pedestrian waiting areas to shorten pedestrian crossings and increase visibility triangles. Additionally, pedestrian safety islands will be built in the center of roadways in these areas.

In 24 out of the 30 funded areas, the installation of pedestrian barriers is planned to protect the most vulnerable sections of sidewalks from uncontrolled crossing points. In 6 cases, existing traffic light systems will be adjusted following modifications to the geometric configuration of intersections.

All interventions include the updating and integration of existing signaling systems, both vertical and horizontal.

9. PLANNING/PROGRAMMING TOOLS IN ROME

The PUMS (Urban Mobility Plan) was approved by the Capitol Assembly on February 22, 2022, following the incorporation of feedback from the Municipalities, compared to the version adopted in 2019, setting objectives for the short, medium (10 years), and long term.

The Road Safety Master Plan of the PUMS sets general objectives:

Within 3 years (reference scenario):

20% reduction in deaths

20% reduction in serious injuries

Within 10 years (plan scenario):

50% reduction in deaths

50% reduction in serious injuries

The ultimate goal of "Vision Zero" constitutes the trend scenario.

Vision Zero is a road safety project originating in Sweden in 1997 with the aim of eliminating deaths and serious injuries from road accidents. The project has since spread to other European countries such as Sweden, the United Kingdom, and Switzerland. The Vision Zero approach underpins the new European program for reducing road accident victims. It is not merely a slogan but a concrete objective.

Reducing and controlling speeds are key measures of the project, advocating for a maximum speed limit of 30 km/h throughout urban areas.

The PNSS (National Road Safety Plan) prepared by MIMS aims to reduce road accident victims and serious injuries by 50% by 2030 compared to 2019, as indicated by the European Commission and the UN's Agenda 2030. It adopts the "Safe System" approach recommended internationally to achieve the goal of zero deaths and serious injuries by 2050. Pedestrians are identified as a particularly at-risk category, and all possible interventions nationwide will be implemented under the Plan to achieve European objectives, including inspections and securing pedestrian paths. Special attention is given to information and communication campaigns, proposing road safety education spaces in schools.

Central administrations:

Legislative proposals

Strengthening control measures

Interventions to improve road infrastructure safety

Communication campaigns and road safety education projects

Local administrations:

Targeted interventions in territories, such as:

Increasing areas with 30 km/h speed limits in urban centers

Updating road design criteria

Scheduled maintenance

Use of advanced instrumental monitoring systems in line with the PNRR (National Recovery and Resilience Plan)

Improving street lighting conditions

Building bike lanes to facilitate sustainable mobility-

SETTORE DI INTERVENTO	Indicatore/note	Unità di misura	Situazione Attuale	Scenario di Riferimento	Scenario di Piano
GOVERNANCE - Rafforzamento della capacità di governo e gestione della sicurezza stradale					
GOVERNO E GESTIONE DELLA SICUREZZA STRADALE	Raggiungimento degli obiettivi quantitati di riduzione delle vittime	n. decessi; n. feriti gravi; € costo sociale	129 decessi e 17.306 feriti (di cui il 30-35% Feriti gravi)	- 20% decessi; - 20% Feriti Gravi	- 50% decessi; - 50% Feriti Gravi
STRUTTURE E STRUMENTI A SUPPORTO DEI PROCESSI DECISIONALI E ATTUATIVI	Qualità delle banche-dati disponibili; qualità degli strumenti DSS (attualmente media); Km di strada censiti; Investimenti per Studi e ricerche; n. indagini di settore	giudizio di qualità (alta, media, bassa)	Media	medio-alta	alta
RACCORDO E **COORDINAMENTO DEGLI UFFICI DELL'AMMINISTRAZIONE** E CON PARTI SOCIALI	raccordo e coordinamento tra le strutture; capacità di interazione; capacità di incidere nei processi decisionali (attualmente media)	giudizio di qualità (alta, media, bassa)	Media	medio-alta	alta
INTRODUZIONE IN AMBITO URBANO DI **PROCEDURE DI ISPEZIONE E VALUTAZIONE ANNUALE DELLA SICUREZZA STRADALE** (Dlgs 35/2011)	Km/anno strade sottoposte a RSI	Km / anno	n.d.	100	200
FORMAZIONE DEI TECNICI DELL'AMMINISTRAZIONE E DEI PROGETTISTI	% tecnici coinvolti nei corsi di aggiornamento/anno (attualmente 10%)	numero / anno	10%	20%	100%
ENFORCEMENT - Rafforzamento della capacità di prevenzione, presidio e controllo					
STRUMENTI E TECNOLOGIE INNOVATIVE PER LE FORZE DELL'ORDINE	Investimenti per tecnologie per le FdO	€ / anno	n.d.	€ 100.000	€ 1.000.000
FORMAZIONE OPERATORI DEDICATI DELLE FORZE DELL'ORDINE	% operatori coinvolti nei corsi di aggiornamento/anno	numero / anno	n.d.	10%	100%
Sviluppo e diffusione di una "CULTURA" della sicurezza stradale e della mobilità sostenibile					
EDUCAZIONE STRADALE NELLE SCUOLE	% alunni coinvolti/anno (attualmente 10%)	numero / anno	10%	50%	100%
FORMAZIONE ADULTI NELLE AZIENDE ED A CATEGORIE SPECIFICHE	n. iniziative/anno realizzate presso Aziende e Enti pubblici e privati	numero / anno	n.d.	100	200
CAMPAGNE DI **INFORMAZIONE E SENSIBILIZZAZIONE** PER TUTTI	n. campagne/anno svolte per la Cittadinanza	numero / anno	n.d.	periodiche	attività continuativa
CAMPAGNE COORDINATE CON LE FORZE DELL'ORDINE	n. campagne/anno svolte con le FdO	numero / anno	n.d.	periodiche	attività continuativa

SETTORE DI INTERVENTO	Indicatore/note	Unità di misura	Situazione Attuale	Scenario di Riferimento	Scenario di Piano
Interventi per la messa in sicurezza di tratte stradali e intersezioni a maggior rischio					
MESSA IN SICUREZZA **TRATTE STRADALI E INTERSEZIONI** A MASSIMO RISCHIO	€ Costo sociale	€ costo sociale	1,2MLD € /anno	- 20%	- 50%
MESSA IN SICUREZZA DEI **PERCORSI-CASA SCUOLA** CRITICI	n. di scuole interessate nei 10 anni (prioritarie tutte le scuole poste sulla viabilità principale, circa 500 Scuole.	numero / anno	n.d.	5 scuole/anno (10%)	50 scuole/anno (100%)
MESSA IN SICUREZZA DEGLI **ATTRAVERSAMENTI E ITINERARI PEDONALI/CICLABILI A RISCHIO ELEVATO**	n. attraversamenti pedonali: nei 10 anni 500 attraversamenti pedonali interessati (con CS>95.000 €/anno); Km di infrastrutture interessate: 500 km itinerari pedonali + 120 km itinerari ciclabili esistenti	Km / anno	n.d.	10 Km/anno (15%)	50 Km/anno (itinerari pedonali) + 12 km/anno itinerari ciclabili (100%)
MESSA IN SICUREZZA DEI PERCORSI CRITICI DELLA **RETE DI ACCESSO AL TRASPORTO PUBBLICO**	Km di infrastrutture interessate (dei 500 Km di itinerari pedonali, 300 km sono di accesso al TPL)	Km / anno	n.d.	5 Km/anno (15%)	30 km/anno (rete di accesso al TPL) (100%)
QUALITA' SPERIMENTAZIONE E DIFFUSIONE **SOLUZIONI E TECNOLOGIE INNOVATIVE**	Investimenti per studi e ricerche; Livelli di innovazione delle sperimentazioni; Livelli di trasferibilità	Km / anno	n.d.	media	alta
PROGRAMMI DI **PRESIDIO E CONTROLLO** DELLE FORZE DELL'ORDINE	n. campagne/anno svolte con le FdO	numero / anno	n.d.	periodiche	attività continuativa
Interventi, azioni e misure per innalzare la sicurezza dei veicoli					
PROGRAMMI COORDINATI DI PRESIDIO E CONTROLLO DELLE FORZE DELL'ORDINE	n. campagne/anno svolte con le FdO	numero / anno	n.d.	periodiche	attività continuativa
QUALITA' SPERIMENTAZIONE E DIFFUSIONE **SOLUZIONI E TECNOLOGIE INNOVATIVE**	Investimenti per studi e ricerche; Livelli di innovazione delle sperimentazioni; Livelli di trasferibilità	giudizio di qualità (alta, media, bassa)	bassa	media	alta
Ottimizzazione ed efficientamento dei Servizi di emergenza ed assistenza post-incidente					
QUALITA' **SERVIZI DI EMERGENZA ED ASSISTENZA POST INCIDENTE**	Diffusione eCall; n. strutture preposte; investimenti nel settore specifico	giudizio di qualità (alta, media, bassa)	bassa	media	alta

10. EXEMPLARY INTERVENTIONS

Below are the interventions carried out in the field of road safety and if so, briefly describe the initiatives and results in terms of the evolution of road safety.

• securing intersections, critical road sections, public transport stops (work on 74 waiting platforms)

• activities of the "Citizen Consultation on Road Safety, Soft Mobility and Sustainability"

• updating of the information systems in use at the RSM Road Safety Competence Center, for systematic analyzes of accident dynamics, based on data provided by the Local Police of Rome Capitale

• launch of the “Black Point” project for the safety of the intersections at greatest risk

• awareness campaigns in schools (“De.Si.Re. – The City I Would Like 2.0” project, in continuity with the initiatives already carried out in 2019) and Pedibus initiatives

• securing pedestrian paths leading to schools

• experimentation of 'school streets' in 14 areas and collaboration with the Municipalities for the planning/implementation of the interventions

• implementation of 'traffic calming' interventions and raised pedestrian crossings (via Tevere; via Giovanni da Procida; etc...)

• experimentation with luminous pedestrian crossings (Largo Amba Aradam; Via Tuscolana; etc…) and new technologies

• calibration of road sections and protection of sections of TPL reserved lanes. Road diet interventions

• PLRC inspection campaign at pedestrian crossings

• design and construction of new Zones 30 and environmental islands; creation of new pedestrian areas and spaces, according to the indications of the PGTU and the scenario shared in the Urban Plan for Sustainable Mobility (reorganization of via dei Romagnoli and redevelopment of the access to the village of Julius II in Ostia Antica; new environmental islands of Borgo, Quadraro Vecchio, Casal Bertone, Torre Spaccata, Fonte Meravigliosa; Z30: Aventino, Ostia Lido, Casal Monastero, Largo Millesimo, …; pedestrianization of via Puglie, via Bixio, …)

• scheduled maintenance interventions on the main road network (paving and signs)

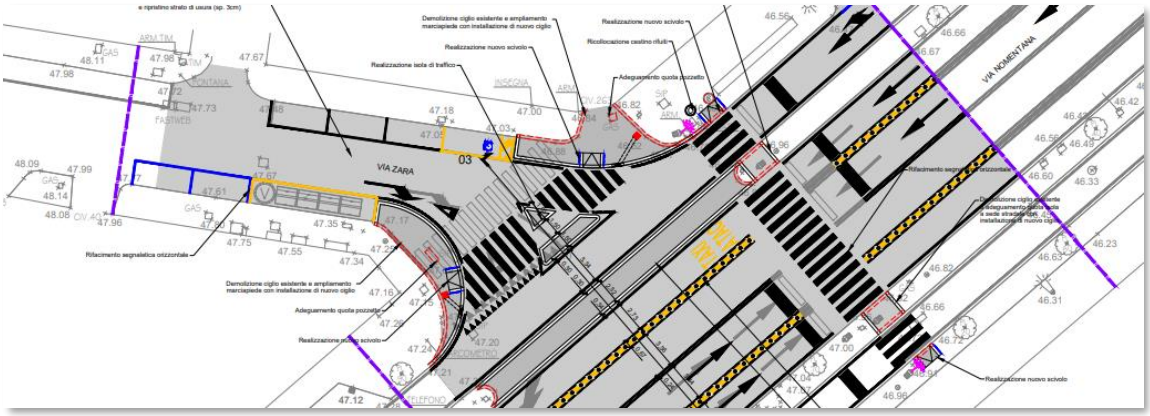


Figura 56: Black Points – stralcio messa in sicurezza attraversamenti pedonali ambito BP006

Figura 57: Strade Scolastiche – attuazione di via Nino Bixio scuola "Di Donato"

Figura 58: Isole Ambientali – intervento isola ambientale Casal Bertone

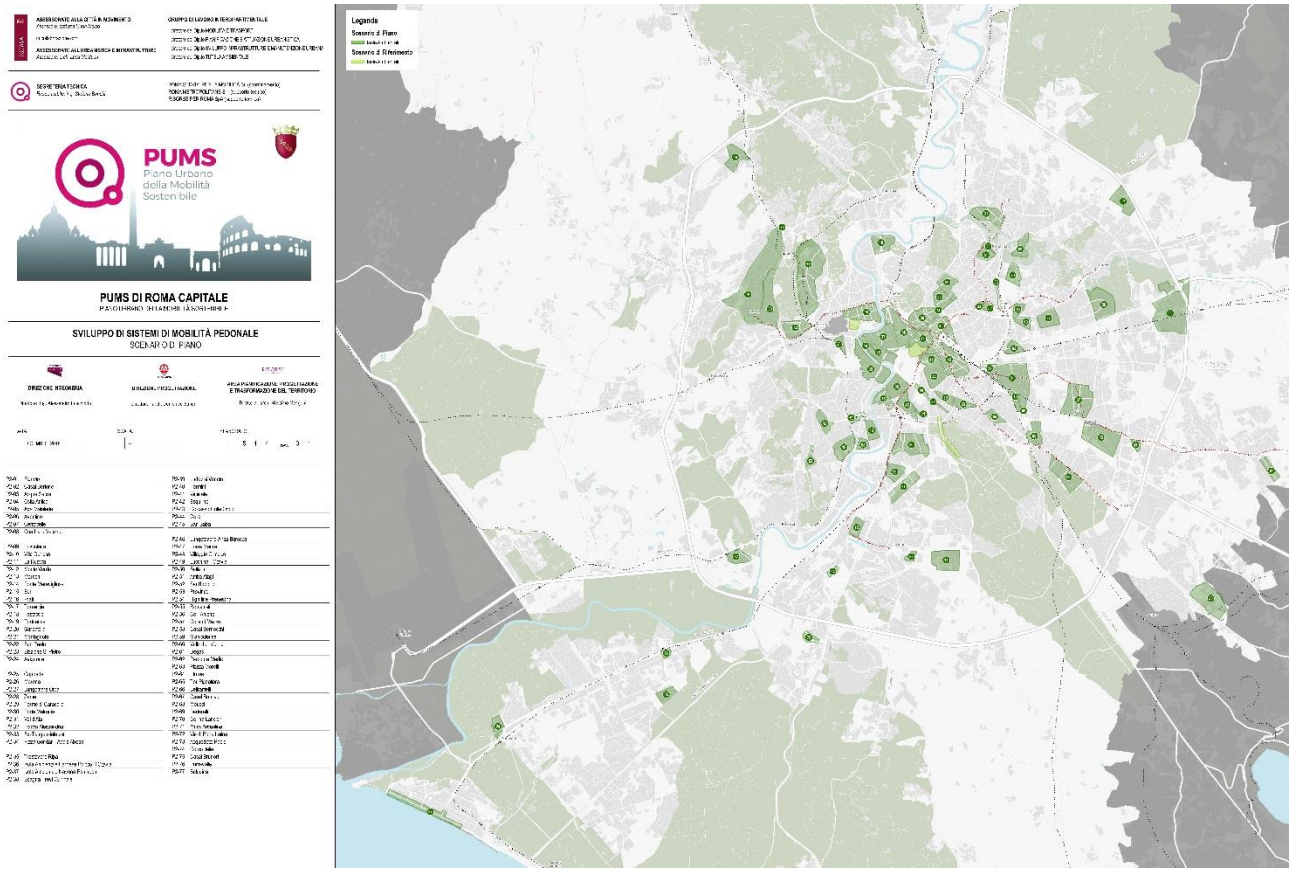


Figura 59: Isole Ambientali - Scenario di Piano

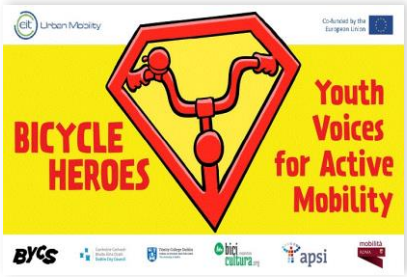
DE.SI.RE – La città che vorrei 2.0

The campaign has already involved 4,300 students in the 2018 edition and 3,800 in 2019. Currently, a new initiative is underway in 15 elementary schools, with 8 classes each, involving 8 hours dedicated to each class (classroom training and 'playground games' supported by FCI and the Local Police).

Figura 60: DE.SI.RE – La città che vorrei 2.0

European projects in schools and collaboration within European networks

) "Bicycle Heroes" is supported by EIT and co-funded by the EU. It involves middle school students as protagonists to design and promote 'active mobility' from home to school (in cities like Rome, Lisbon, and Dublin).



Safer City Streets is the global network for road safety in livable cities. Managed by the International Transport Forum (ITF), it gathers, validates, and analyzes relevant data from cities in a dedicated database.

RSM has been collaborating with the international working group POLIS since 2017.
The focus topic is road safety, with particular attention to the protection of pedestrians, cyclists, users of public transport, and shared micromobility vehicles.