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INTRODUCTION

PREMISE

This document constitutes the final report of the service for evaluating the performance of public transport services within the planning of the OP ERDF Sicily 2014-2020.

The overall purpose of the evaluation is to determine in which areas the OP's intervention strategy has shown greater implementation effectiveness and in which the results obtained have taken on particular relevance with respect to the intervention needs, with specific reference to actions for sustainable mobility in urban areas.

Impact assessment is based on information and data that are analyzed and interpreted in order to produce a judgment. The difficulty in obtaining a judgment that can be considered objective is that of identifying measurable parameters that can reflect the most significant effects of the project. Furthermore, when the impact of infrastructure projects is estimated, it is necessary for the interventions to demonstrate their effects in order to evaluate their scope and the results achieved.

Considering that the interventions being evaluated are only in some cases completed at the date of drafting of this report, it is clear that the evaluative judgments expressed in this document can be considered in most cases as prospective, this does not mean that they do not have any validity and usefulness on the one hand in guiding the political decision maker in the choices of new interventions and, on the other, in communicating the results of public investments to citizens.

The Report is structured in such a way as to account for the criteria that guided the evaluation process: efficiency, coherence, effectiveness and impact, relevance.

This first part of the premise and introduction, in which the objectives of the evaluation, the methods and the tools used are reported, is followed by 3 sections.

A first section dedicated to a reconstruction of the reference context in which the actions being evaluated are inserted (the transport sector in Sicily) and of the intervention logic that underlies the local public transport interventions financed through the OP.

The second section reports the results of the evaluation in terms of: efficiency (performance, times and methods of implementation), coherence (complementarity and synergy between tools), effectiveness and impact of the Programme, relevance of the interventions.

The third and final section is dedicated to the evaluation conclusions.

1 OBJECTIVES, METHODS AND ACTIVITIES OF THE EVALUATION

1.1 OBJECT AND METHODOLOGY OF THE EVALUATION

Objective of the evaluation of the performance of public transport services within the Operational Program (OP) ERDF Sicily 2014-2020 is to analyze and verify the results produced by the implementation of the actions financed under Axis 4, Specific Objective 4.6, and 7 of the OP, in order to increase sustainable mobility in urban areas and create sustainable transport systems.

Evaluation is an essential element in the life cycle of a Program and must translate into a continuous process that is not limited to analyzing the interventions activated by the Programme, through the measurement of physical and financial achievements, but pushes itself to prepare methods, collect information and express judgments that highlight the effects deriving from their implementation.

In this context, the evaluation activity is part of a broader process, outlined in the Evaluation Plan (PdV) of the 2014-2020 Cohesion Policy of the Sicilian Region, and aimed at monitoring and strengthening the performance of the Programme, through its analysis in terms of:

- achievement of expected results (effectiveness);
- optimal use of resources (efficiency);
- contribution to the economic growth of the territories (impact).

For the purposes of greater completeness of the analysis in question, it was decided to combine these evaluation criteria with those of coherence, through which to investigate the ways in which the various interventions activated by the OP integrate with the actions implemented with other instruments and funds, and of relevance, to verify to what extent the objectives and design of the interventions respond to the needs and priorities of the final recipients.

The theoretical reference underlying the evaluation analyzes is the one known in the literature as "Theory-driven Evaluation", according to which the evaluation is designed to test the set of assumptions and links that underlie the strategies and operational activities that the policy adopts to obtain certain results. In other words, with this approach we intend to enter the "black box" of the Programme, in order to understand what allowed the funded interventions to work and in which circumstances, explaining the mechanisms of change and the conditions that intervened to influence certain outcomes. Starting from the awareness of the multi-causal nature of the effects of the interventions, which cannot be reduced to a simple cause-effect relationship with respect to the actions undertaken, this evaluation approach places the interaction with the reference context at the center of the analysis, including for example the relationships and the synergies with other interventions that may have acted on the policy targets or the changes that may have occurred with respect to the human factors involved, first and foremost the stakeholders.

The composite and complex nature of the issues to be addressed also requires the use of a global and integrated approach, which is capable of adequately combining multiple evaluation methods and tools in order to provide a holistic analysis of the interventions. For this reason, the methodological choice is based on the so-called "mixed-methods approach" which, based on the literature on the subject and the experience of the evaluator, is what allows us to arrive at more complete and explanatory evaluations compared to the choice of a single method. This system presupposes the use of tools and techniques of both a quantitative and qualitative nature, which are adequately integrated and used in a synergistic and complementary manner through the "Triangulation" method, which allows us to guarantee greater certainty of the validity and reliability of the results obtained, as well as their greater completeness.

Finally, the methodological system adopted sees the centrality of the Evaluation Matrix, in which the Evaluation Criteria are related to the Evaluation Questions (ED) and the indicators for their measurement, as well as the methods and tools for data collection and analysis and related sources. The DVs were formulated in order to respond to the knowledge needs expressed by the Administration and, overall, by the various stakeholders to help improve the quality of the planning and execution of the Programme. From this perspective, the evaluation approach is characterized as continuous and proactive, providing for a constant connection, not only from a methodological but also organizational point of view, with the Administration, in order to guarantee effectiveness and efficiency of the Service and full transferability of the results achieved.

1.2 METHODS, TOOLS AND ACTIVITIES

The activities, investigation tools and analysis methods were identified and used according to the evaluation criteria to be investigated (effectiveness, efficiency, impact, coherence and relevance) and the evaluation questions that the PdV identified.

For the purposes of the evaluation, desk-type analyzes and field-type analyzes were conducted. The former used secondary data (statistical and contextual, but also studies and research), and the results of previous evaluations conducted on the Programme. The field analyzes were linked to the evaluator's acquisition of original primary information, following the conduct of field investigations, directly from the beneficiaries and the various interested stakeholders.

Below is a description of the data collection, observation, processing and analysis tools used, or which will be used, during the evaluation process.

1. COLLECTION AND OBSERVATION TOOLS

➤ **Documentary review:** collection, cataloging and analysis of relevant existing documents in order to collect data of a mainly qualitative nature (regulatory acts, public notices, implementation documents, previous evaluations and/or monitoring, regional and/or local territorial analyses, etc.). Among the documents, studies and research analyzed we highlight, in addition to the program documents:

- PON Infrastructures and Networks 2014-2020;
- Development and Cohesion Plan of the Ministry of Infrastructure and Transport;
- Development and Cohesion Plan (PSC) of the Sicilian Region;
- Sicily Complementary Operational Plan 2014-2020;
- PON Metropolitan Cities 2014-2020;
- Pact for Sicily;
- Integrated Infrastructure and Mobility Plan (PIIM) of the Sicilian Region;
- Update to 2022 of the Integrated Infrastructure and Mobility Plan of the Sicilian Region;
- Documents relating to the Strategic Environmental Assessment of the PIIM and its update;
- Cohesion Policies Monitoring Bulletin of the Ministry of Economy and Finance;
- Legambiente Commuter Report;
- ISFORT report on the mobility of Italians.

➤ **Statistical review:** collection, cataloging and analysis of data of a mainly quantitative nature from relevant existing databases. In addition to the monitoring data relating to the two Axes under analysis, the main databases consulted are reported:

- Charon System;
- OpenCohesion;
- Commuter Report;
- ISTAT;
- MIT, National Account of Sustainable Infrastructure and Mobility.

➤ **Semi-structured interviews with privileged witnesses (beneficiaries, stakeholders and experts)** who, thanks to their direct and in-depth knowledge, are able to formulate qualified judgments on the implementation of policies, the results achieved or the issues in question. Through this tool, statements from various witnesses were collected, such as:

- representatives of the OP Actions;
- representatives of the AUs;
- public administration officials;
- representatives of the beneficiaries such as RFI, Trenitalia, ANAS, etc.;
- RUP of the projects;
- privileged witnesses such as trade associations.

The interviews in question were used to provide qualitative triangulation data for the answer to the evaluation questions and were conducted following a semi-structured outline aimed at investigating strategy, integration, implementation, critical issues, results and impacts (see Annex 4).

➤ **Focus groups** with privileged witnesses (beneficiaries, stakeholders and experts): they were used to collect points of view and feedback from groups of two or more subjects involved and, in particular in the context of

investigations relating to strategies for internal areas, to analyze in which measure the areas in question have benefited from the interventions activated. The focuses were conducted following the same interview outline used for the semi-structured interviews.

- **Survey aimed at final recipients**, aimed at detecting the level of satisfaction with local urban and extra-urban public transport and the methods of use of the means of transport with low environmental impact, was administered via an online questionnaire aimed at a sample of residents in the regional territory (see Annex 3).

2. DATA PROCESSING TOOLS

- **ID Survey**- SW that allows you to manage the findings of complex, highly structured questionnaires in the front-end and which include sophisticated controls within the questionnaire. It has an indispensable back-end interface for survey administrators and telephone operators responsible for recalling interviewees. Used in quantitative investigations.
- **SPSS** -SW for data management, advanced analytics, multivariate analysis and business intelligence. It allows you to perform complete statistical analyzes to summarize, describe and understand the information contained in the data.
- **ToolIA** –Proprietary SW of IZILab, IZI's internal unit, which allows you to collect large quantities of unstructured data from the web in an automated way and transform them into databases for the analysis and reuse of the content. In particular, it allows you to conduct Social Media Analytics (SMA) activities, i.e. to monitor the main social networks through various techniques, alongside statistical investigations to verify if, how and where certain economic, social and cultural phenomena are discussed.
- **QGIS**- Desktop application that allows you to view, organize, analyze and represent spatial data allowing a territorial analysis of interventions. As part of the evaluation, it allowed the different dimensions of the analysis to be represented at a territorial level and comparisons to be made at a regional and sub-regional level. Both secondary data and implementation data of the OP and other financing instruments in the sector (POC, FSC, etc.) were represented in a cartographic manner.
- **Infogram**- SaaS platform, of which IZI is a regular licensee, which offers the possibility of creating infographics, cards and reports by making available a large archive of graphic elements, animations, maps and over 60 types of charts.

3. ANALYSIS METHODS

- **Analysis of the Logical Framework.** It constitutes the main tool for starting the theory-based evaluation and in particular for reconstructing the logic of the intervention, identifying: needs, types of change (explicit in the Program and in the progressively funded tenders), hypotheses attributable to the inputs (amount financed), achievements and results (expected and achieved). It allowed us to verify: the relevance of the interventions activated (responsiveness to needs); the coherence between the Program's theories of change and those expressed by the tenders that should contribute to realizing them and those of the other policies in the context; the effectiveness of the theories of change expressed by the Program (achievement of objectives).
- **Project Analysis.** The process which, using the monitoring data of the OP (project sheets, reports, implementation data of the individual interventions, etc.), made it possible to outline a quantitative picture of the effects generated by the activated interventions, providing a solid basis for the triangulation of the qualitative information.
- **Contribution Analysis.** Method used in evaluating the impact of policies and programs, and especially to identify the contribution that the intervention has made to certain observed results. This type of analysis is particularly useful when it is difficult to establish a direct cause-effect relationship between the activities of a program and the results achieved, such as when it is not possible to use a control group for an experimental or quasi-experimental evaluation (as in the present case).
- **Stakeholder Analysis.** Process of identifying individuals or groups who direct or are recipients of the effects of interventions, based on their influence. The analysis allows us to: i) identify the interests of the stakeholders in relation to the objectives of the Programme; ii) identify the economic, cultural and/or social factors that drive actions; iii) provide an overview of the actions; iv) identify the relationships between the different actors.
- **Statistic analysis.** Process that involves the collection, organization, interpretation and description of quantitative data in order to understand the patterns, relationships and trends hidden in them and obtain a

better understanding of a phenomenon. Statistical analysis provides an objective basis for accurately and reliably evaluating the effectiveness, efficiency and impact of an intervention.

- **Content Analysis.** Research method used to reduce large amounts of unstructured textual content (such as interviews, statements, posts, etc.) into relevant and manageable data in order to answer evaluation questions. The text in question is divided into categories that can be controlled on various levels and transformed into coded content, which can then be analyzed quantitatively to identify trends, patterns, relationships, similarities, differences, etc.
- **Customer Satisfaction.** Techniques and strategies aimed at evaluating the satisfaction of the final recipient of the interventions, or measuring the perceived quality of the interventions implemented. Satisfaction is understood in this sense as the gap between the recipient's expectations regarding the intervention, on the one hand, and the perceived results, on the other. The analysis technique is used in the evaluation of the level of satisfaction of local, urban and extra-urban public transport services by citizens.
- **GIS Analysis.** A research technique that combines geographic data with qualitative and quantitative information to produce maps and visualizations that help you analyze and represent data more clearly and meaningfully, while also allowing you to identify spatial relationships and trends between them. In the evaluation, GIS Analysis will be used to map the Program intervention areas, visualize the results of the interventions, analyze the characteristics of the areas involved, etc.
- **Case Studies.** They constitute a particularly useful method of qualitative analysis precisely in the presence of territorially limited but significant initiatives from different profiles, such as that of innovation or organizational and management structure, and which therefore deserve to be illustrated and publicized within the broader Program activities. As part of this evaluation activity, the selection of case studies occurred through the identification of particularly relevant interventions from the point of view of their financial consistency and/or virtuousness in terms of effectiveness, efficiency, coherence, relevance and impact on the territory. In this regard, it is underlined that the type of case studies used was descriptive-illustrative in nature, i.e. aimed at adding concreteness and depth to the information collected through other research methodologies; in this sense, the case studies thus defined aim to contribute to the process of dissemination of the Program's good practices rather than to provide data regarding the answers to the evaluation questions (see Annex 5).

1.3 THE EVALUATION QUESTIONS

Below are the fifteen Evaluation Questions linked to the relevant Evaluation Criteria, which guided the investigation in question, constituting the fundamental analytical structure for collecting data, analyzing results and drawing conclusions on the overall performance of the Programme. For the complete Evaluation Matrix, including evaluation areas, indicators, methods, tools and sources of data collection and analysis, please refer to Annex 1. As regards the updated framework of Program indicators, used as a quantitative baseline for the development of the investigation, please refer to Attachment 2.

TAB.1- EVALUATION CRITERIA AND EVALUATION QUESTIONS

EVALUATION CRITERIA	EVALUATION QUESTIONS
IMPACT	DV1 To what extent has the OP ERDF SICILY 2014-2020 promoted low carbon emission strategies for sustainable multimodal mobility in urban areas?
EFFECTIVENESS	DV1.1 To what extent have the infrastructures and interchange nodes created made it possible to increase collective mobility?
EFFECTIVENESS	DV1.2 To what extent has the renewal of rolling stock ensured the mitigation of emissions?
EFFECTIVENESS	DV1.3 To what extent has the creation of intelligent transport systems guaranteed the reduction of emissions?
EFFECTIVENESS	DV1.4 To what extent has the use of low environmental impact means of transport been encouraged by the development of adequate infrastructure?
IMPACT	DV2 To what extent has the OP ERDF Sicily 2014-2020 improved regional mobility, in terms of quality and travel times?
EFFECTIVENESS	DV2.1 To what extent have strategic infrastructures relating to secondary and tertiary regional nodes been connected to the TEN-T Network?

EVALUATION CRITERIA	EVALUATION QUESTIONS
EFFECTIVENESS	DV2.2 To what extent have regional and interregional public transport services been strengthened on routes with significant potential demand?
EFFECTIVENESS	DV2.3 To what extent have agricultural and agri-food centers been made more accessible through strengthening the connection to the grid?
IMPACT	DV3 To what extent has the OP ERDF Sicily 2014-2020 improved ecological low-emission transport in order to encourage sustainable regional and local mobility?
EFFECTIVENESS	DV3.1 To what extent do regional port and freight terminal infrastructures have improved environmental, energy and operational standards?
RELEVANCE	DVT.1 Have the interventions carried out contributed to improving the quality of services for end users (degree of satisfaction)?
CONSISTENCY	DVT.2 How were the measures envisaged by the ERDF OP complementary to the actions implemented by the PON and those activated through other non-ordinary funds? How much did the integration of the funds affect the overall result in terms of quality and effectiveness of the service?
EFFICIENCY	DVT.3 Were the funds disbursed within the expected times and methods and in compliance with the initial budget?
EFFICIENCY	DVT.4 What were the effects of the Covid-19 pandemic emergency on the implementation of the Program?

SECTION I – THE CONTEXT

2 SUSTAINABLE MOBILITY AND PUBLIC TRANSPORT: THE REGIONAL FRAMEWORK

The contextual analysis of the transport system in Sicily examines the characteristics of the sector from the point of view of infrastructure and service supply and demand from passengers and goods. To do this, the study focuses on the different sectors of the transport system, observing the railway and road network, local public transport services, air and maritime mobility and the logistics infrastructure, and also trying to frame the context regionally in the broader national and international framework.

The analysis was conducted on the basis of data referring to the years before and after the implementation of the OP ERDF 2014-2020, in order to analyze the trend over time of the variables considered and lay the cognitive foundations for understanding the impact of the actions undertaken by the Programme, evaluating the progress made and the contribution to regional development, keeping in mind that multiple public policy instruments intervene in the transport sector and therefore any changes to the offer cannot be entirely attributable to the ERDF Programme. Where not possible, the most recent data were compared with those relating to the reference period of the 2017 Integrated Infrastructure and Mobility Plan (PIIM) of the Sicilian Region, which in this sense constitutes a benchmark representative of the context in which the Program went to fit in.

It should also be highlighted that, if on the supply side it was possible to take into consideration the most recent data available, the same thing was not possible on the demand side, in consideration of the completely exceptional trends recorded in the flows of passengers and goods during the 2020-2021 period due to the impact of the Covid-19 emergency. In this case, therefore, it was necessary to resort to pre-pandemic data, as the data collected in 2020 and 2021 were not very significant compared to the historical series, and as no data after 2021 is currently available.

2.1 THE RAILWAY NETWORK

The Sicilian railway network suffers from important infrastructural deficiencies, such as the limited nature of the double-track and electrified lines, as well as the age of the rolling stock; a situation which, by determining strong limitations in supply, appears to be the main cause of limited use of the network with reference to both passenger and freight traffic. However, some signs of improvement can be observed (increase in the number of trips, disposal of older rolling stock, improvement in the level of passenger satisfaction) which suggest the possibility of undertaking a virtuous path that can lead the regional railway network to reach the ambitious objectives linked to its integration with the TEN-T Trans-European Transport Network.

The railway system of the Sicilian Region has a network of approximately 1,490 km, almost entirely relating to the RFI network and classified as complementary. Added to this is the Circumetnea line directly managed by the Ministry of Infrastructure and Transport. The entire infrastructure network of Sicily is made up of 14 lines, distributed mainly along the north-western coastal areas that connect Messina, Palermo and Siracusa, with further extensions towards the territories of Agrigento, Caltanissetta and Enna.

Approximately half of the RFI network is an integral part of the TEN-T Trans-European Transport Network: of these, approximately 29% (belonging to the Messina – Catania – Augusta and Catania – Enna – Palermo lines) is included within the “Core” network of the Scandinavian-Mediterranean corridor “Helsinki-La Valletta”, while the remaining 24% is included in the “Comprehensive” network (Messina – Fiumetorto, Palermo – Trapani via Milo and Augusta – Siracusa lines). In this context, the connections with the ports of Augusta and Palermo and the Punta Raisi airport are important, considered poles of the European “core network”.

The connection between the Sicilian railway network and the continental one is guaranteed by two transshipment plants from Messina to Villa San Giovanni (RC) which, thanks to the railway ships, allow the transport of goods and passengers by rail¹.

¹ Sicilian Region, Department of Infrastructure and Mobility, Department of Infrastructure, Mobility and Transport, PIIM – 2022 Update, Preliminary Environmental Report on eligibility for SEA and Incidence Screening, 2022.

FIG.1- REGIONAL RAILWAY NETWORK BY TRACK TYPE AND POWER SUPPLY



Although it constitutes a node of primary importance in the context of the European core network, the Sicilian railway network is not immune from the characteristic challenges that afflict Italy, and in particular the South, with reference to the infrastructure provision, which still highlights a delay in terms of the presence of double track and electrified lines.

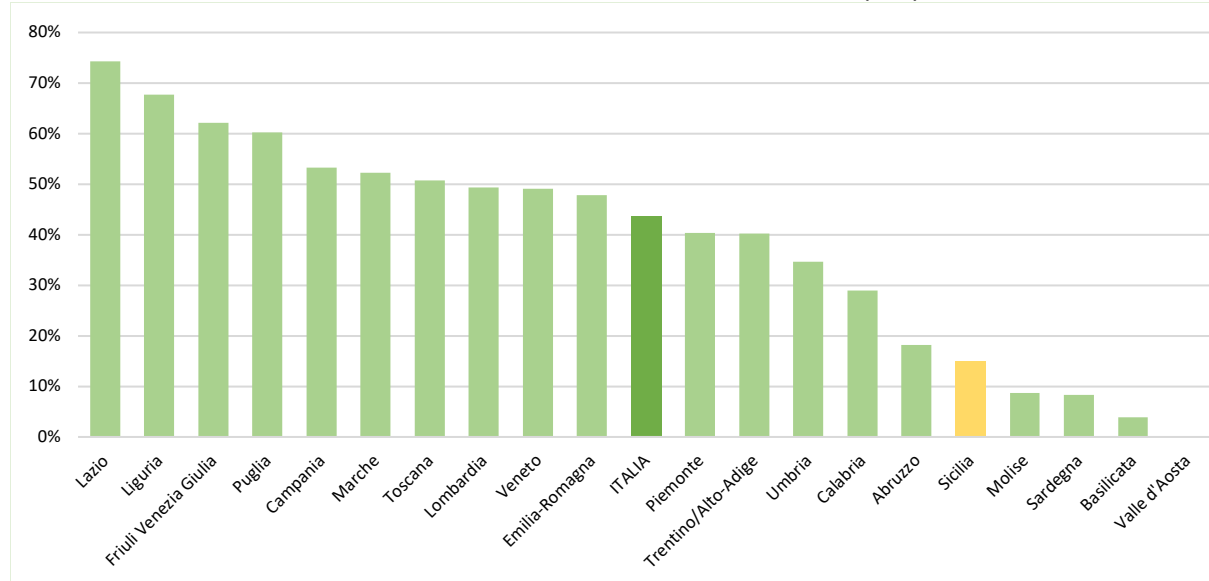
TAB.2- THE RAILWAY NETWORK IN THE REGIONS

REGION	TOTAL NETWORK KM*		% DOUBLE TRACK*		% KM ELECTRIFIED*		NUMBER OF STATIONS / STOPS**	
	2017	2021	2017	2021	2017	2021	2014	2020
Abruzzo	676	676	18.20%	18.20%	69.50%	69.50%	79	78
Basilicata	464	464	3.90%	3.90%	45.50%	45.50%	36	33
Calabria	965	965	28.90%	28.90%	50.60%	50.60%	113	102
Campania	1,383	1,383	53.20%	53.20%	79.70%	85.00%	124	118
Emilia Romagna	1,673	1,679	47.70%	47.90%	81.40%	84.60%	144	145
Friuli Venezia Giulia	487	481	61.40%	62.20%	79.70%	79.40%	38	53
Lazio	1,350	1,356	74.20%	74.30%	92.40%	92.40%	164	165
Liguria	499	493	67.10%	67.70%	96.60%	96.60%	104	103
Lombardy	1,733	1,740	49.00%	49.40%	83.70%	83.70%	295	304
Marche	386	385	50.50%	52.20%	69.40%	69.40%	60	60
Molise	265	265	8.70%	8.70%	22.60%	22.60%	19	17
Piedmont	1,976	1,938	39.50%	40.30%	71.20%	72.90%	197	199
Puglia	1,542	1,542	60.20%	60.20%	57.10%	57.10%	66	67
Sardinia	599	599	8.30%	8.30%	0.00%	0.00%	41	41
Sicily	1,490	1,490	13.00%	15.00%	53.80%	53.80%	155	160
Tuscany	1,563	1,563	50.80%	50.80%	67.80%	67.80%	175	177
Trentino Alto Adige	480	480	40.20%	40.20%	73.50%	73.50%	61	61
Umbria	532	528	34.40%	34.70%	96.10%	95.10%	34	33
Valle d'Aosta	81	81	0.00%	0.00%	0.00%	0.00%	18	7
Veneto	1,245	1,245	49.20%	49.20%	62.80%	72.60%	161	163
ITALY	19,389	19,353	43.30%	43.70%	68.70%	70.10%	2,084	2,086

Source: *Legambiente, Commuting Report 2018/2023, **ISTAT - ASTI

The comparison between the 2017 and 2021 data shows an almost unchanged situation across the entire national territory. In 2021, out of a total of approximately 19,389 km of railway network spread over the entire peninsula, less than half is made up of double track lines (approximately 8,500 km, equal to 43.7%) and, if we look at the differences in regional level, the South appears even more disadvantaged, with Sicily placed in fifth to last place among the regions, with only 200 km of double track, i.e. 15% of the total railway network, a percentage equal to approximately one third of the average national.

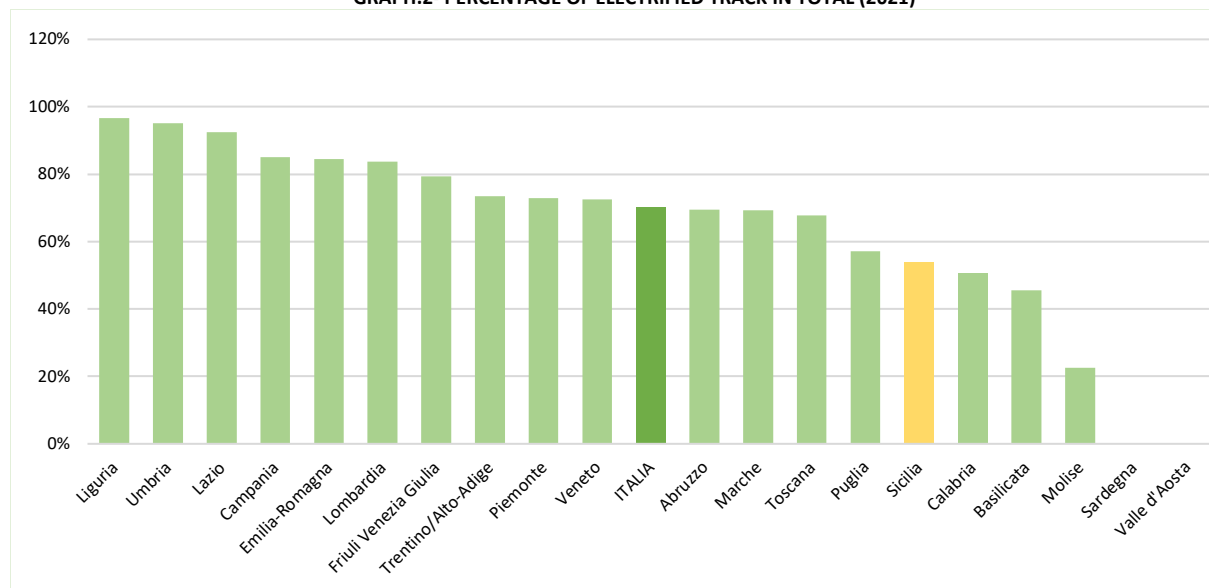
GRAPH.1- PERCENTAGE OF DOUBLE TRACK ON THE TOTAL(2021)



Source: IZI processing on Legambiente data, Pendolaria Report 2023

Slightly more reassuring at a national level are the data on the electrification of lines: around 70% of the Italian railway network appears to be electrified, but even in this case important differences persist from region to region, especially to the detriment of the South. In this regard, Sicily is in sixth-last place on a national scale, with approximately 54% of the railway network electrified, which is certainly better than that on the single track, but still lower than the national average.

GRAPH.2- PERCENTAGE OF ELECTRIFIED TRACK IN TOTAL (2021)



Source: IZI processing on Legambiente data, Pendolaria Report 2023

In addition to the infrastructural criticalities relating to the prevalent presence of single-track and non-electrified lines, Sicily appears to suffer, like the rest of the South, persistent obstacles to rail mobility also with regard to the frequency of trips and the number of trains in circulation, as well as for the conditions in which the latter find themselves. If we look, for example, at the daily number of journeys made, throughout Southern Italy there is a lower volume of transport than in Lombardy and Lazio alone combined (3,706 versus 3,780 journeys per day). In the period 2017-2021 in Sicily there is an increase in the number of daily trips which go from 428 to 506 (+18%), however this number continues to remain much lower than that recorded by regions with a similar number of inhabitants to Sicily, such as Lazio (which has approximately 3 times the number of trips as Sicily), Campania (+140%), Puglia (+75%), Emilia (+74%) and Piedmont (+ 42%). On the other hand, the number of trips carried out per 10,000 inhabitants in Sicily is also approximately half the national average.

TAB.3- NUMBER AND CONDITIONS OF ROLLING STOCK

REGION	DAILY NUMBER OF TRIPS		DAILY NUMBER OF TRIPS EVERY 10 THOUSAND INHABITANTS		AVERAGE AGE OF ROLLING STOCK		TRAINS OVER 15 YEARS OLD	
	2017	2021	2017	2021	2017	2021	2017	2021
Abruzzo	208	197	1.6	1.5	17.7	19.5	44%	62%
Basilicata	178	230	3.1	4.3	20.1	18.4	58%	53%
Calabria	342	333	1.7	1.8	18.4	21.4	54%	79%
Campania	1307	1219	2,2	2,2	19.8	21.4	66%	72%
Emilia Romagna	867	882	1.9	2	13.6	9.2	37%	20%
Friuli Venezia Giulia	174	225	1.4	1.9	10.4	11.5	8%	18%
Lazio	1525	1607	2.6	2.8	17.5	17.3	51%	47%
Liguria	351	292	2,3	1.9	18.6	11.3	65%	17%
Lombardy	2396	2173	2.4	2,2	15.5	15.8	46%	41%
Marche	154	161	1	1.1	14.5	11.9	29%	23%
Molise	26	28	0.8	1	16.9	22.1	46%	95%
Piedmont	884	718	2	1.7	12.4	15.1	28%	47%
Puglia	848	889	2.1	2,3	20.1	15.5	41%	43%
Sardinia	296	304	1.8	1.9	17.8	17.3	68%	60%
Sicily	428	506	0.9	1	19.5	14.6	59%	48%
Tuscany	773	835	2.1	2,3	11.8	14.1	12%	48%
Trentino Alto Adige	414	422	3.9	3.9	9.3	12.1	14%	32%
Umbria	118	109	1.3	1.3	18.1	21.5	63%	29%
Valle d'Aosta	64	42	5.1	3,4	11.2	8.1	31%	0%
Veneto	747	769	1.5	1.6	11.2	12.2	19%	24%
ITALY	605	597	2	2	15.4	15.3	41%	43%

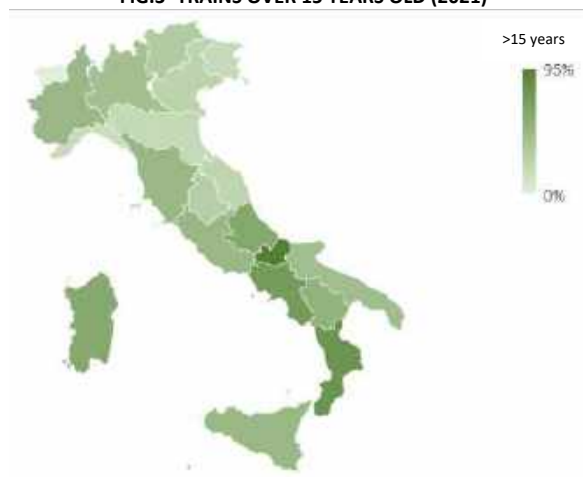
Source: Legambiente, Commuting Report 2018 /2023, ISTAT, ASTI

Even with regards to the quality of the trains in circulation, the difference between central-northern and southern Italy is marked, with the southern regions generally having older rolling stock. This disparity can be attributed, at least partially, to the fact that in recent years the purchase of new trains has mainly been guaranteed through direct acquisitions by the Regions, which have seen a lower investment by the regions of Southern Italy. In this panorama, Sicily is close to the national average, both in terms of the average age of the rolling stock (14.6 years) and in terms of the presence of trains more than 15 years old (around 48%). From this perspective, it should be underlined that the available data show a clear progress in the quality of the regional rolling stock in the period between 2017 and 2021, with the average age of trains falling by around 5 years and the quantity of trains with more than 15 years by approximately 10 percentage points. However, also considering the decrease in the number of trains in circulation, it is likely that this improvement can be attributed more to the disposal of obsolete material than to the acquisition of new rolling stock.

FIG.2- AVERAGE AGE OF ROLLING STOCK (2021)



FIG.3- TRAINS OVER 15 YEARS OLD (2021)



Source: IZI processing on Legambiente data, Pendolaria Report 2023

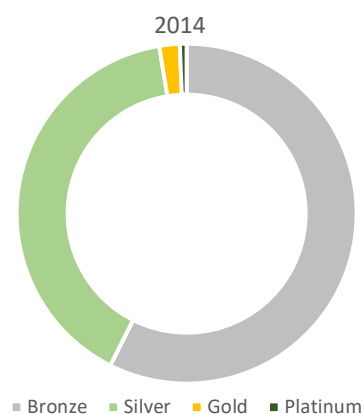
A further critical issue of railway mobility, which Sicily has in common with the rest of the South, is linked to the speed of travel and travel times, elements that must be observed in relation to the absence of fast lines and

intermodal connections, and to the closure or decommissioning of sections of railway, in which the service is self-replaced or significantly modified.

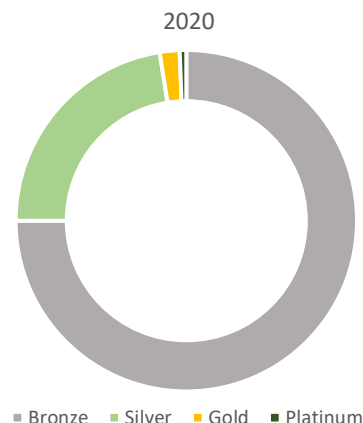
In high-speed and long-distance trains, there is an enormous disparity between the trains running in the Centre-North and those running from Naples towards the South, with a complete exclusion of Sicily, despite the presence of transshipment facilities along the Strait. . In Sicily, traveling by train from one city to another, for short or long journeys, requires long travel times also due to the need to make numerous changes². Taking a concrete example, to move from one side of the island to the other, the journey between Catania and Trapani requires a travel time of around an average of 8 and a half hours, with two obligatory changes, compared to 3 hours and half spent by car (for a distance of 315 km). Added to this are situations such as the Palermo-Trapani line (via Milo), still closed since 2013 due to landslides, and the Caltagirone-Gela section, interrupted by the collapse of the Carbone Bridge in 2011.

Finally, as regards the situation of railway stations in the Region, Sicily currently has 160 stations, of which one is in the platinum category (Palermo Centrale), three gold (Messina Centrale, Catania Centrale and Palermo Nartarbatolo), 36 silver and 120 bronze. In this regard, the comparison with the data available in 2014 shows that, although there was an increase of five railway stations out of the total, their quality suffered a slight decline, in particular with reference to the passage of around 30 stations from silver category to bronze category.

GRAPH.3- TYPES OF STATIONS IN 2014



GRAPH.4- TYPES OF STATIONS IN 2020



Source: ISTAT, ASTI

The presence of significant deficits in the infrastructure and service offering of the railway transport system in Sicily seems to significantly influence the demand for rail mobility, which therefore presents very low values both in terms of utilization indices and user satisfaction.

² Legambiente, Pendolaria, 2023

TAB.4- DEMAND FOR RAIL MOBILITY FOR PASSENGERS (2014-2020)

REGIONS	RAIL TRANSPORT UTILIZATION INDEX				DEGREE OF SATISFACTION WITH RAIL TRANSPORT	
	SPORADIC ³		HABITUAL ⁴			
	2014	2019	2014	2019	2014	2019
Abruzzo	19%	27%	4%	2%	52%	68%
Basilicata	18%	22%	2%	3%	42%	58%
Calabria	22%	25%	3%	2%	31%	50%
Campania	29%	34%	10%	7%	52%	57%
Emilia Romagna	30%	40%	5%	5%	52%	77%
Friuli Venezia Giulia	35%	37%	4%	4%	53%	77%
Lazio	33%	41%	9%	8%	50%	70%
Liguria	38%	46%	15%	11%	40%	63%
Lombardy	35%	39%	9%	7%	55%	71%
Marche	24%	29%	3%	2%	50%	65%
Molise	28%	31%	3%	2%	48%	61%
Piedmont	35%	39%	6%	6%	50%	70%
Puglia	23%	27%	6%	4%	51%	64%
Sardinia	15%	14%	4%	2%	42%	52%
Sicily	9%	13%	2%	1%	39%	52%
Tuscany	35%	38%	7%	5%	50%	72%
Trentino Alto Adige	40%	44%	9%	7%	69%	81%
Umbria	27%	26%	4%	1%	47%	64%
Valle d'Aosta	26%	33%	7%	3%	42%	60%
Veneto	33%	36%	4%	3%	51%	74%
ITALY	29%	37%	7%	5%	51%	68%

Source: IZI calculations on ISTAT data

Both available indices of rail transport use show very low values, with Sicily ranking in the last places on a national scale together with most of the other regions of Southern Italy, both for sporadic and habitual use. of this means of transport.

In particular, in 2019 only 13% of the population declared having used the train at least once in the year. The 2019 value marks a notable increase compared to 2014 (+51%), but Sicily remains in last place among the Italian regions for sporadic use of the train.

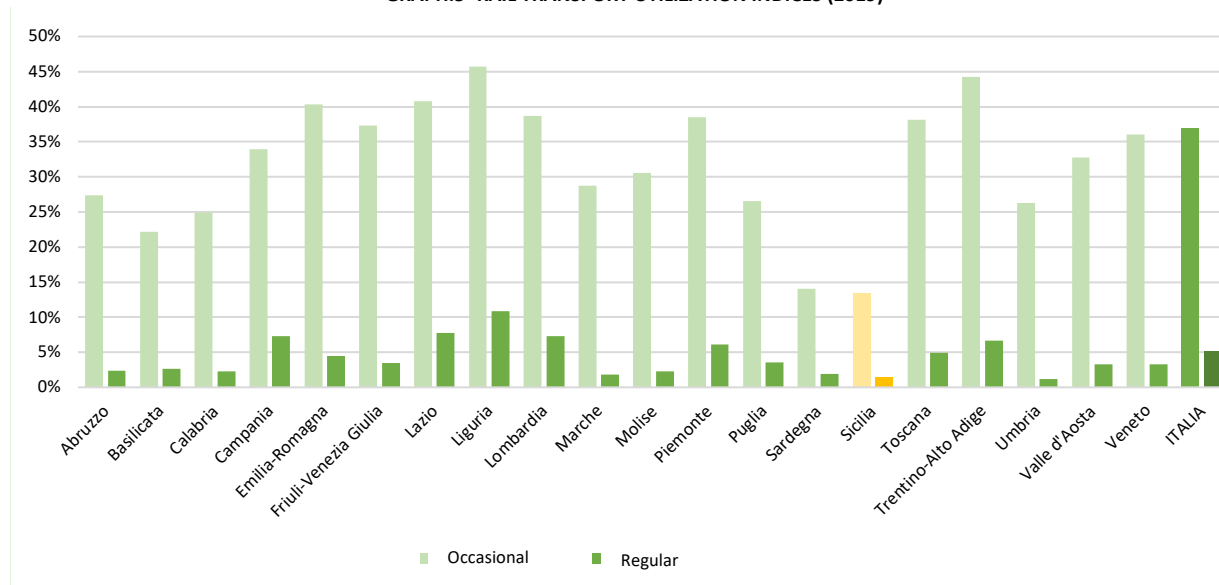
The habitual use of the train to go to work, kindergarten or school in 2019 concerned around 5% of Italians, but this percentage is reduced to 1.4% in Sicily. In this area, the data worsened between 2014 and 2019 in 18 out of 20 Regions but in Sicily the reduction (-54%) is almost double the Italian average. In this ranking, Sicily was in last place among the Regions in 2014 and second to last in 2019.

The level of satisfaction with the railway transport service is also much lower than the national average, and the second lowest among the Italian regions (51.5% against 68.1% of the national average). The only positive note comes from the improvement in the level of satisfaction with use which is growing in Sicily with the same growth rate found on average among the Italian regions.

³ People who used the means of transport at least once in the year out of the total population aged 14 and over; Rail transport utilization index

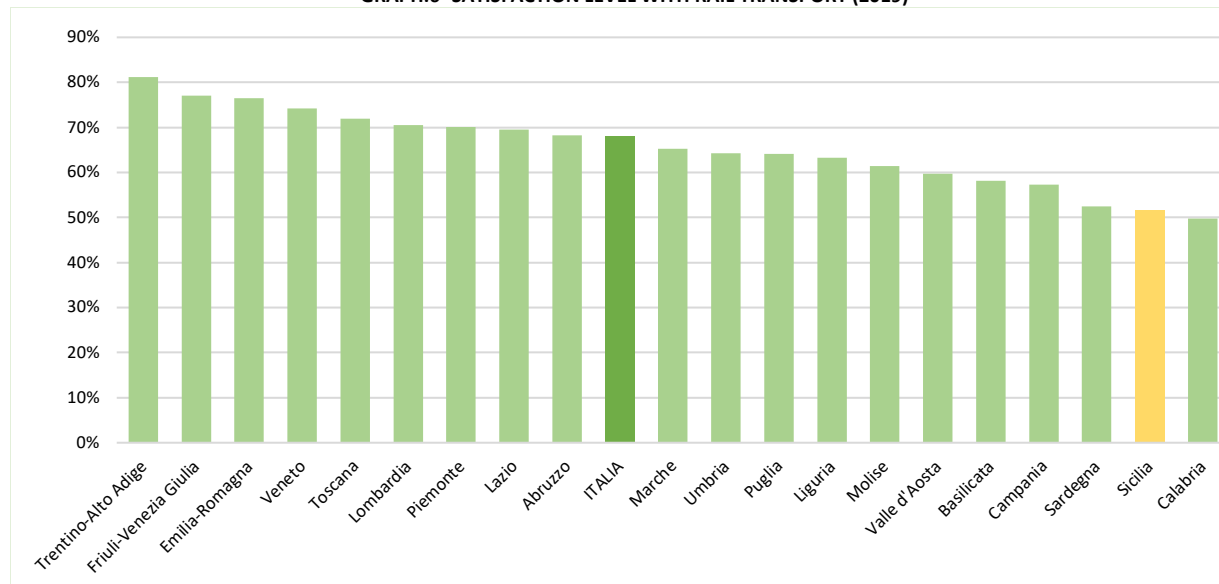
⁴ Workers, schoolchildren and students aged 3 years and over who usually use the train to go to work, nursery or school out of the total.

GRAPH.5- RAIL TRANSPORT UTILIZATION INDICES (2019)



Source: IZI calculations on ISTAT data

GRAPH.6- SATISFACTION LEVEL WITH RAIL TRANSPORT (2019)

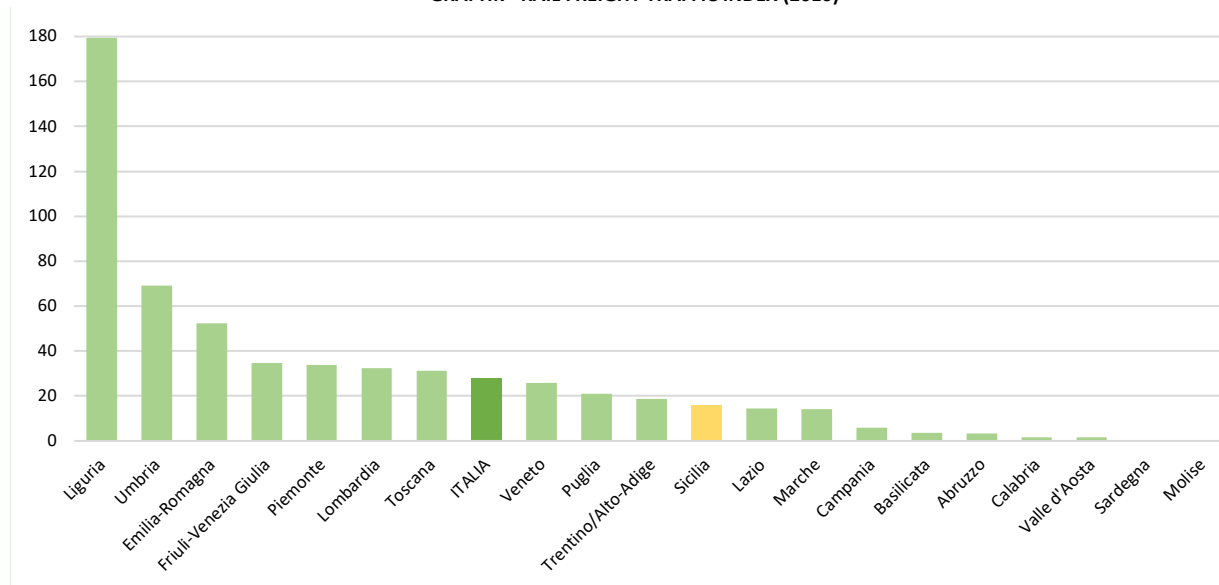


Source: IZI calculations on ISTAT data

Finally, with reference to the demand for rail mobility for goods, the insular nature of Sicily, which determines the preference for the use of maritime transport for the entry and exit of goods from the regional territory, adds to the Italian characteristic to a propensity for road transport for the internal distribution of goods. Therefore, in Sicily, as in many other Italian regions, rail freight transport finds itself playing a marginal role.

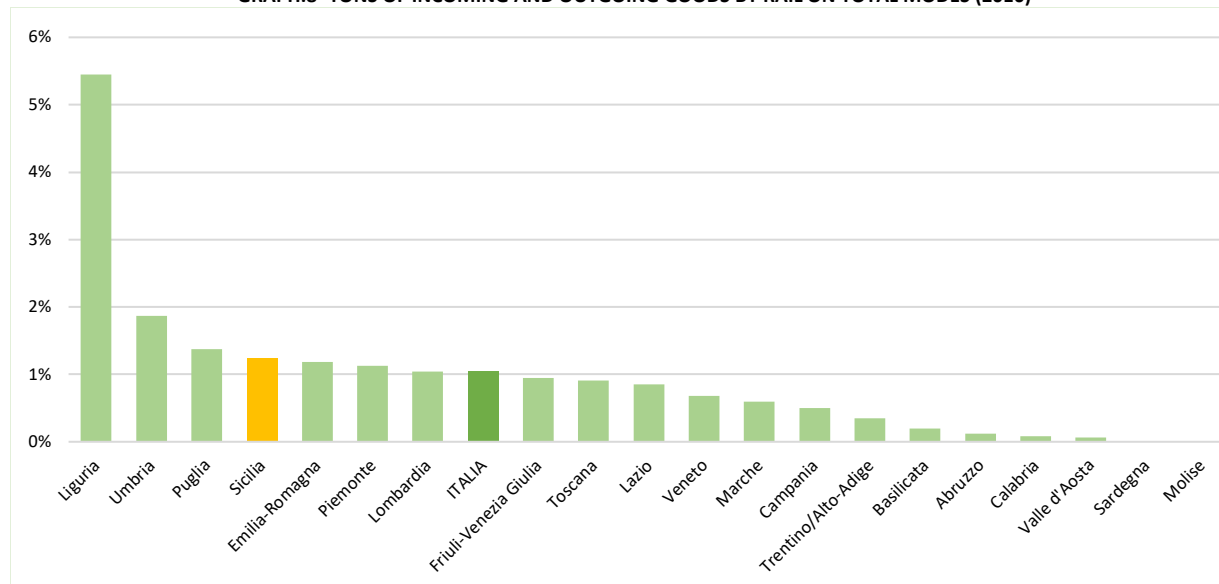
Specifically, in 2010, the latest data available with reference to the phenomenon, the rail freight traffic index (incoming and outgoing goods by rail, calculated as tonnes per hundred inhabitants) stood at 15.6, against a national average of 27.7, while a higher value was recorded on the percentage of tonnes of goods entering and exiting by rail out of the total modes (1.2% compared to 1% of the national average).

GRAPH.7- RAIL FREIGHT TRAFFIC INDEX (2010)



Source: IZI calculations on ISTAT data

GRAPH.8- TONS OF INCOMING AND OUTGOING GOODS BY RAIL ON TOTAL MODES (2010)



Source: IZI calculations on ISTAT data

2.2 THE ROAD NETWORK

The Sicilian road network is very extensive compared to other regions. This extension determines the need for numerous maintenance and redevelopment interventions which give rise to some critical elements. However, the accident rate, which is a good indicator of the state of the roads, does not present significant differences with the rest of the national territory, highlighting that Sicily has a good road infrastructure. However, freight traffic on the roads is lower than that of the other Regions, probably due to the insular nature of Sicily which also stimulates ship transport.

As regards Sicily's road transport system, the regional infrastructure offer is made up of approximately 20,700 km of roads in total, of which approximately 700 km of motorways, 3,800 km of other roads of national interest, and 11,000

km of regional roads and provincial roads, to which are added approximately 5,000 km of roads managed by the municipal administrations in the provincial capital municipalities⁵.

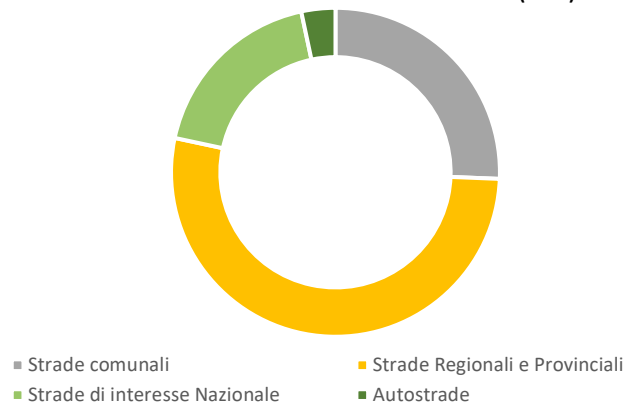
TAB.5- ROAD EQUIPMENT BY REGIONS (KM, 2020)

REGIONS	TOTAL EXTENSION OF THE ROAD NETWORK	REGIONAL AND PROVINCIAL ROADS	OTHER ROADS OF NATIONAL INTEREST	HIGHWAYS	MUNICIPAL ROADS IN THE PROVINCIAL CAPITAL MUNICIPALITIES
Abruzzo	12,705	5,688	1,628	355	5,034
Basilicata	6,451	4,013	1,397	30	1,011
Calabria	12,233	7,260	2,022	288	2,663
Campania	12,389	7,589	1,687	444	2,669
Emilia Romagna	19,051	9,570	1,309	572	7,600
Friuli Venezia Giulia	5,055	3,302	237	210	1,306
Lazio	19,723	7,974	1,473	498	9,778
Liguria	5,831	2,898	676	375	1,882
Lombardy	18,222	11,031	1,138	719	5,334
Marche	8,371	4,859	1,412	168	1,932
Molise	3,867	2,272	760	36	799
Piedmont	18,488	12,984	826	830	3,848
Puglia	17,097	9,635	2,773	313	4,376
Sardinia	11,006	5,933	3,413	0	1,660
Sicily	20,731	10,927	3,795	693	5,316
Tuscany	17,915	9,359	1,717	462	6,377
Trentino Alto Adige	5,581	4,536	-	212	833
Umbria	5,744	3,345	1,021	59	1,319
Valle d'Aosta	884	500	155	114	115
Veneto	15,244	8,949	868	599	4,828
ITALY	235,442	132,626	28,307	6,977	67,532

Source: IZI processing on MIT data, National Infrastructure and Transport Account 2020-21

From the available data it appears that approximately 20% of the road infrastructure is entrusted to the management of ANAS and CAS (Consortium for Sicilian Motorways), while the remaining 80% falls within the governance of Local Authorities.

GRAPH.9- BREAKDOWN OF ROAD INFRASTRUCTURE (2020)



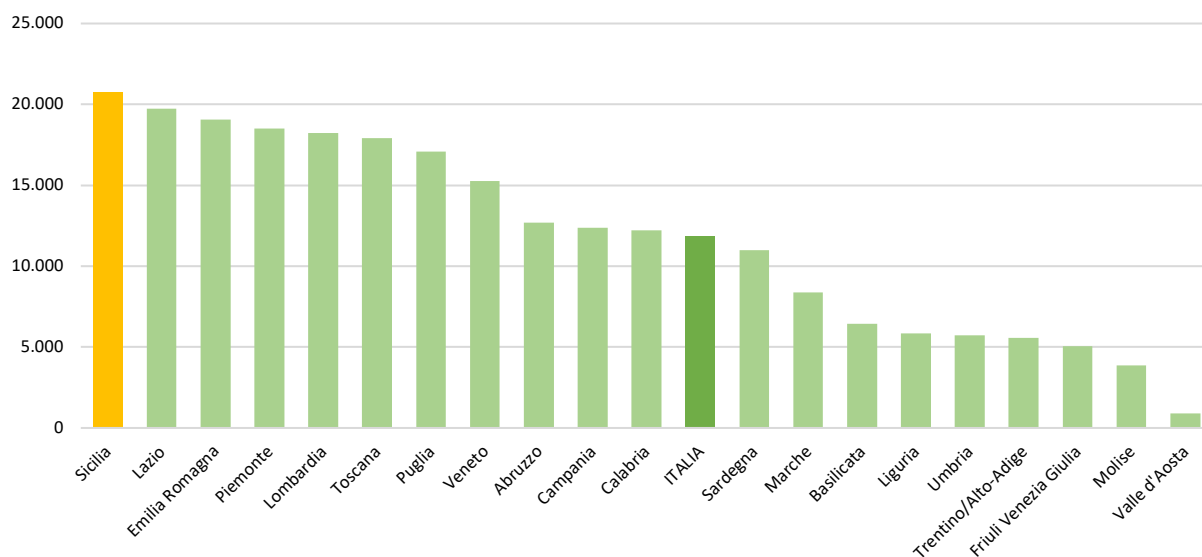
Source: IZI processing on MIT data, National Infrastructure and Transport Account 2020-21

If we consider the overall infrastructure, Sicily occupies first place in Italy regarding the total extension of roads, followed by Piedmont and Lombardy. However, if we analyze the main endowment indicators, the region loses position slightly, although still remaining above the national average. Specifically, the road extension per number of inhabitants is 31.8 km per 10,000 inhabitants, compared to an Italian average of 28.3 km. Furthermore, the road extension per unit of land area is 59.7 km per 100 km², compared to the Italian average of 55.6 km⁶.

⁵ For the road network, no historical series are presented as the data relating to previous years are not consistent with the latest available data for 2020.

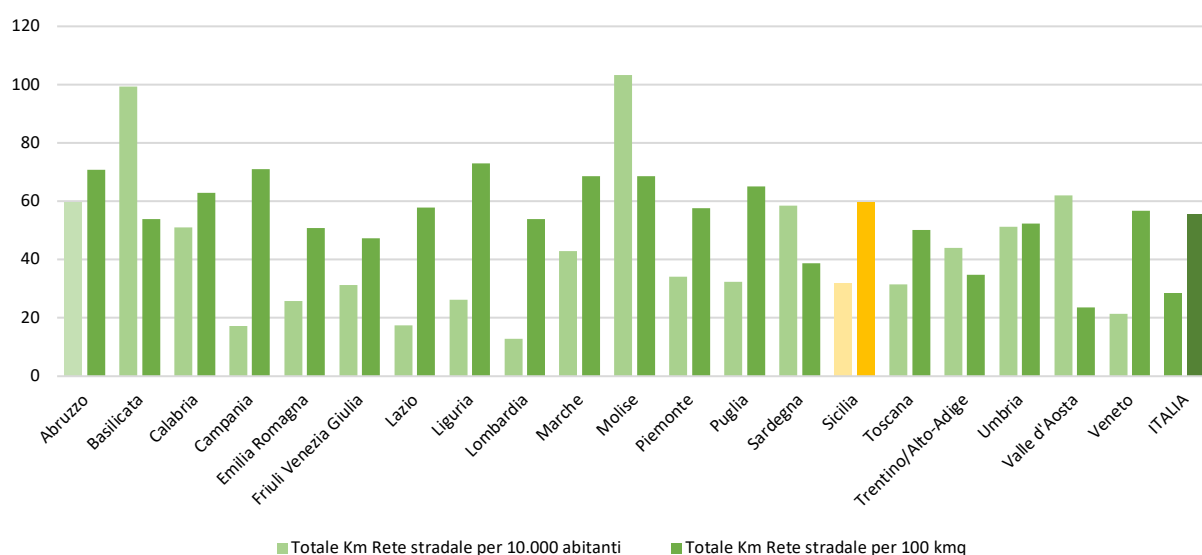
⁶ With the exception of municipal roads in provincial capital municipalities.

GRAPH.10- EXTENSION OF THE ROAD NETWORK (KM, 2020)



Source: IZI processing on MIT data, National Infrastructure and Transport Account 2020-21

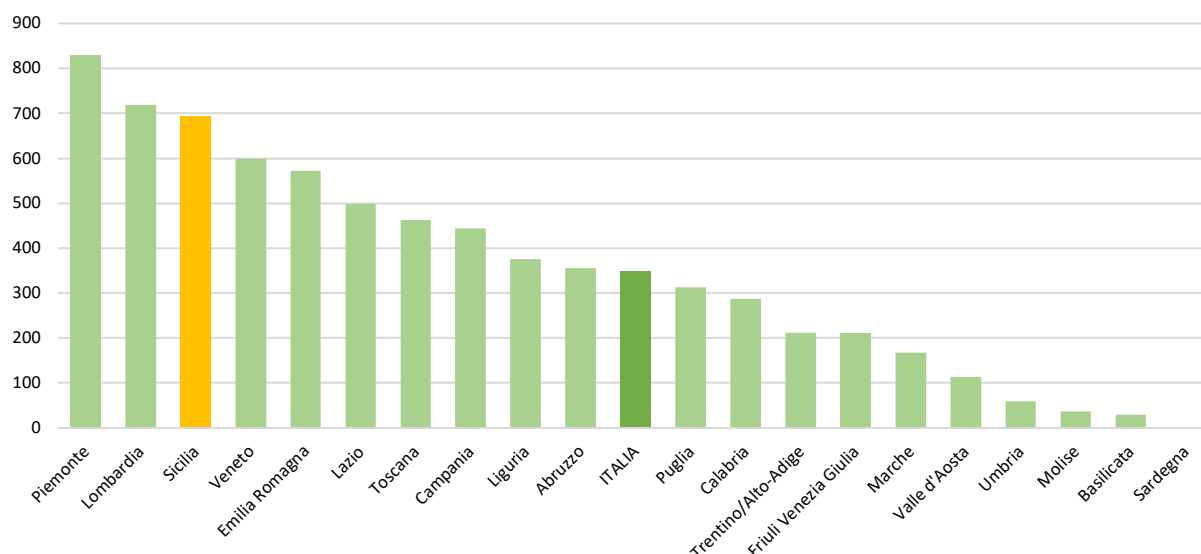
GRAPH.11- EQUIPMENT INDICATORS FOR THE ROAD NETWORK (2020)



Source: IZI processing on MIT data, National Infrastructure and Transport Account 2020-21

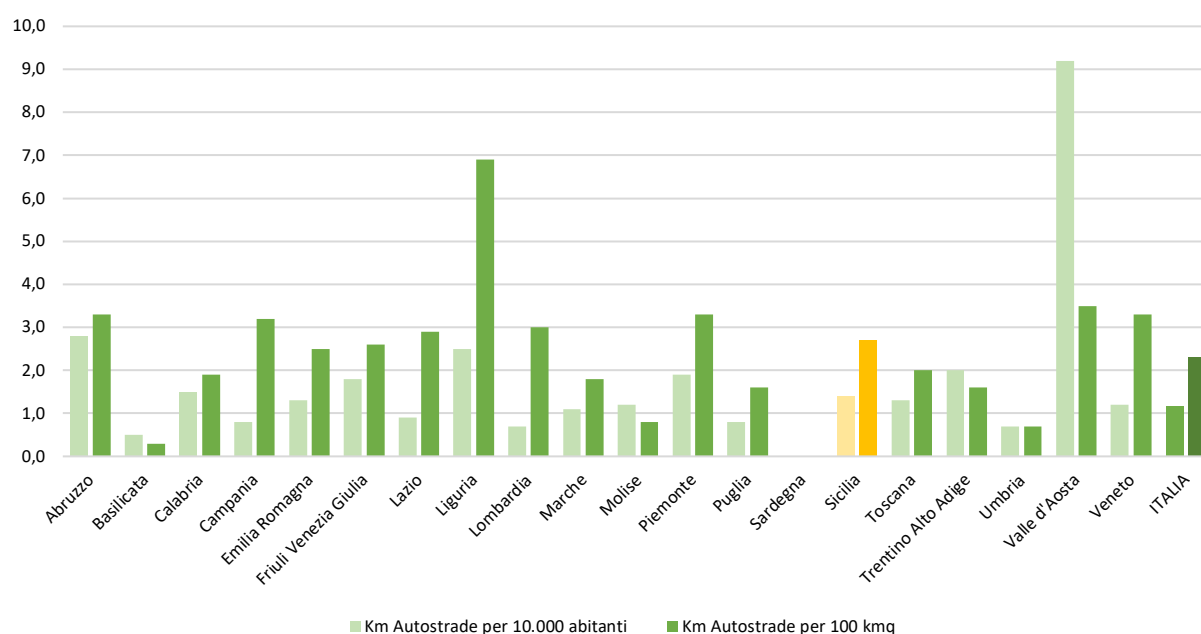
With reference to motorways, Sicily represents the third Italian region in terms of total network extension, surpassed only by Piedmont and Lombardy, also presenting endowment indicators higher than the national average. More precisely, the motorway extension per number of inhabitants is 1.4 km per 10,000 inhabitants, compared to the Italian average of 1.1 km per 10,000 inhabitants, while the motorway extension per unit of land area is 2.7 km per 100 km², compared to the Italian average of 2.3 km.

GRAPH.12- EXTENSION OF THE MOTORWAY NETWORK (KM, 2020)



Source: IZI processing on MIT data, National Infrastructure and Transport Account 2020-21

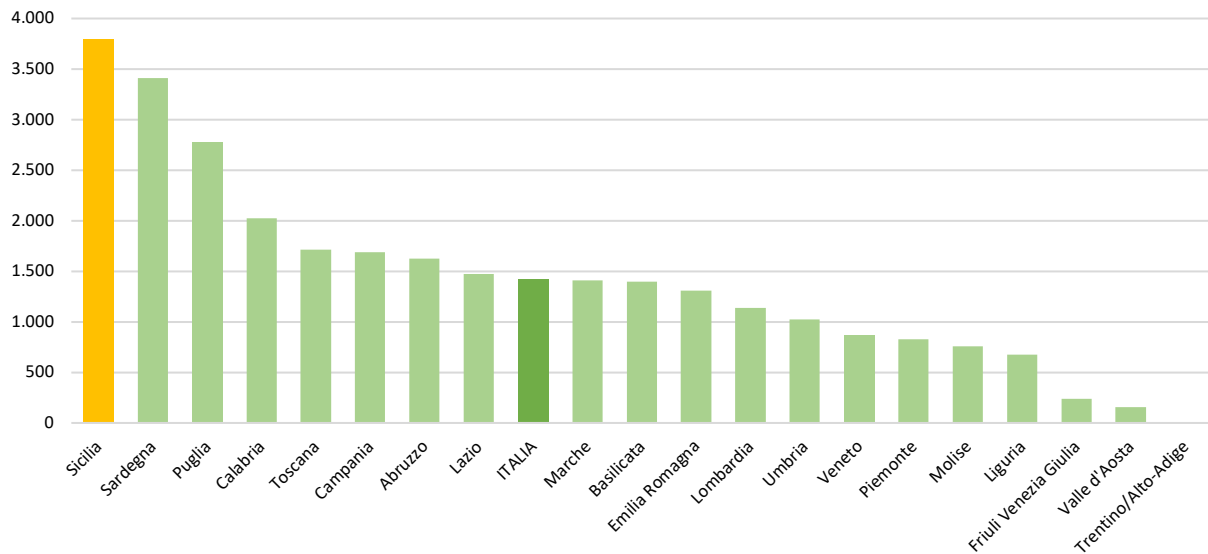
GRAPH.13- EQUIPMENT INDICATORS FOR THE MOTORWAY NETWORK (2020)



Source: IZI processing on MIT data, National Infrastructure and Transport Account 2020-21

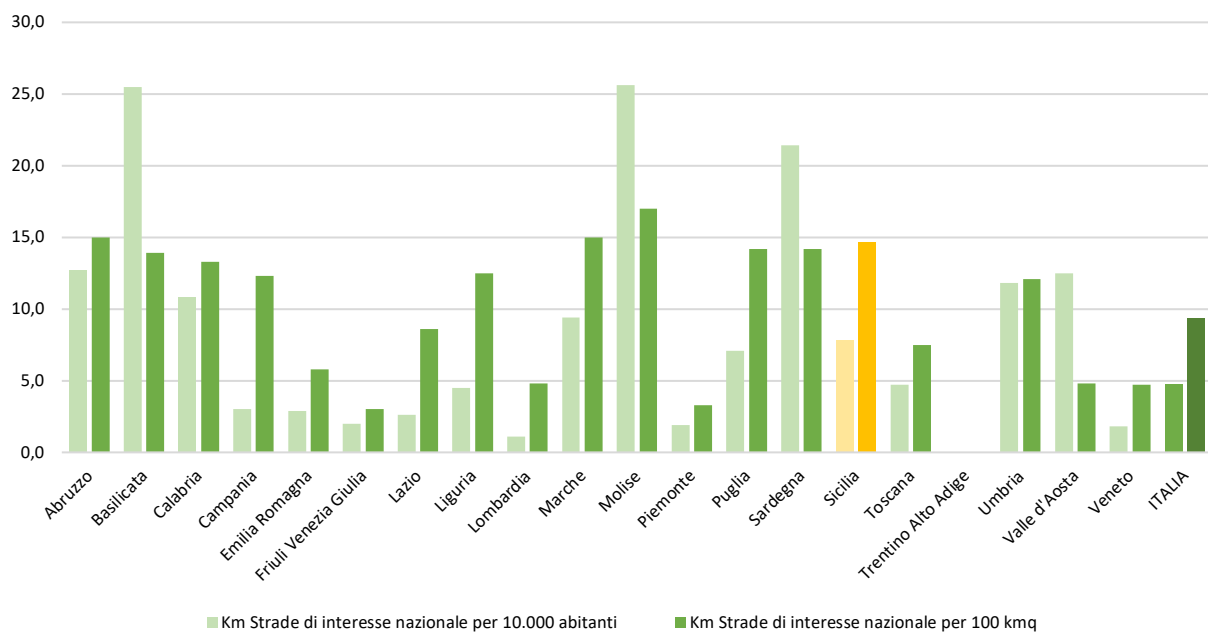
Finally, also with regards to the provision of the road network of national interest, Sicily presents values well above the Italian average: in first place in terms of overall provision, the extension compared to the population provides an indicator equal to 7.8 km per 10,000 inhabitants, compared to the Italian average value of 4.8 km, while compared to the territorial extension it is equal to 14.7 km per km² of surface, compared to the Italian average of 9.7 km.

GRAPH.14- EXTENSION OF THE NETWORK OF ROADS OF NATIONAL INTEREST (KM, 2020)



Source: IZI processing on MIT data, National Infrastructure and Transport Account 2020-21

GRAPH.15- EQUIPMENT INDICATORS FOR THE NETWORK OF ROADS OF NATIONAL INTEREST (2020)



Source: IZI processing on MIT data, National Infrastructure and Transport Account 2020-21

The configuration of the road infrastructure of the Sicilian Region is made up of a structure which is divided according to the following main axes:

- A perimeter ring formed on the Ionian coast and part of the Tyrrhenian coast by the A18, A20 and A29 motorways which connect the cities of Messina, Catania, Palermo, Trapani and Mazara del Vallo, on the remaining part of the Tyrrhenian coast by the Catania-Siracusa-Gela motorway, and to the south by the SS115 which connects the cities of Trapani and Siracusa passing through Agrigento, Gela and Modica.
- Various transversal connections that connect the coasts with the hinterland, including in particular the A19 motorway which connects Palermo and Catania and allows you to reach the cities of Enna and Caltanissetta.
- A dense secondary road network of fundamental importance, which ensures connection with the internal areas of the island and which often represents the only option available to connect to the main road arteries, not only for the second and third level nodes, but also for the agricultural and productive areas of the territory.

FIG.4- REGIONAL ROAD AND MOTORWAY NETWORK



The panorama of roads in Sicily constitutes a vast and widespread system, which entails challenges related to its complexity, especially with regard to the maintenance and management of such an extensive network. The previous planning cycle paid particular attention to the improvement of main and secondary roads, in order to identify the functional and structural deficiencies of the system and establish priorities for interventions. Despite maintenance and improvement efforts, the current road infrastructure still has gaps, service limitations and safety problems, accumulating a growing maintenance deficit over time. In particular, the problems identified often concern the poor state of maintenance of the infrastructure (road surface, vegetation at the edge of the road, signs and guardrails) and the frequent opening of maintenance sites, which cause reductions in the maximum speed limit, closures to transit of entire routes or even narrowing of lanes, with consequent slowdowns in traffic⁷.

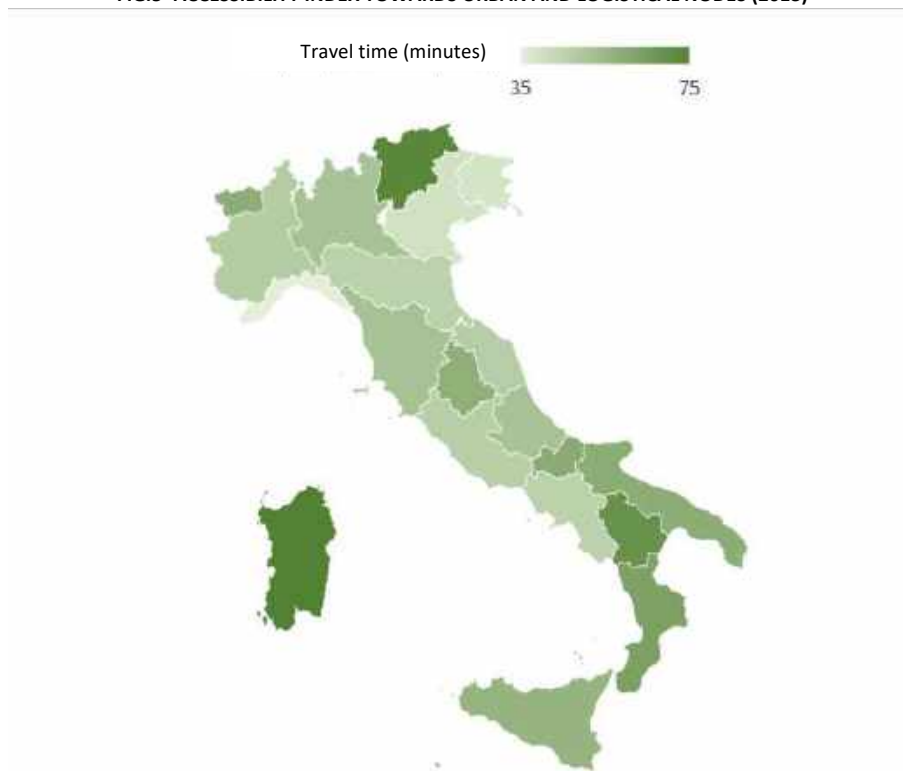
To give an example, in recent years particular attention has been drawn to the situation of the two main motorways in the region, the A18 and the A20, which connect the city of Messina with the Palermo and Catania basins, where serious critical issues have been found in terms of traffic and safety, such as: traffic barriers to be redeveloped; unsafe tunnels and areas at risk of landslides; continuous presence of construction sites and traffic restrictions, resulting in queues; condition of instability and general maintenance neglect.

As also underlined by the Preliminary Environmental Report on eligibility for SEA and Impact Screening of the PIIM (2022 update), it is particularly clear that the internal areas of the regional territory are facing significant difficulties in road mobility, especially in terms of accessibility. These difficulties often result in the isolation of rural areas from metropolitan cities and urban service and residence centres, as well as in the failure to connect significant agricultural and agro-industrial production districts with the main road and railway axes of the TEN-T network.

It is no coincidence that the latest available value relating to the accessibility index towards urban and logistical nodes in Sicily (2013) calculated as travel times from internal areas appears to be relatively high (53.5 minutes), given that the moreover it is common to the rest of the South and the internal regions of the peninsula.

⁷ Sicilian Region, Department of Infrastructure and Mobility, Department of Infrastructure, Mobility and Transport, Integrated Plan of Infrastructure and Mobility, 2017

FIG.5- ACCESSIBILITY INDEX TOWARDS URBAN AND LOGISTICAL NODES (2013)



Source: IZI calculations on ISTAT data

Despite the critical issues highlighted, it does not appear that the Sicilian road network presents problems different from those that can be found in other regions.

The accident rate data presented by ISTAT in its Territorial Statement - Road accidents in Sicily 2021 reveal a decrease in the number of accidents in line with the national data (partly motivated by the reduction in transport in the pandemic period). However, it must be noted that between 2010 and 2021 the number of deaths in road accidents in Sicily reduced by 19%, compared to a reduction at national level of 30%, although the situation has significantly improved compared to that of the period 2001- 2011. In line with the number of accidents, the number of deaths and injuries also follows a similar trend⁸.

As regards the demand for mobility for goods, road transport plays a significantly higher role in the movement of products compared to that analyzed for the railway network in the previous paragraph, even if its importance still remains much lower when compared with the values reported by the rest of the Italian regions and the national average.

⁸ See ISTAT, Territorial Press Release - Road accidents in Sicily, Year 2021, 2022

TAB.6- DEMAND FOR ROAD MOBILITY FOR GOODS

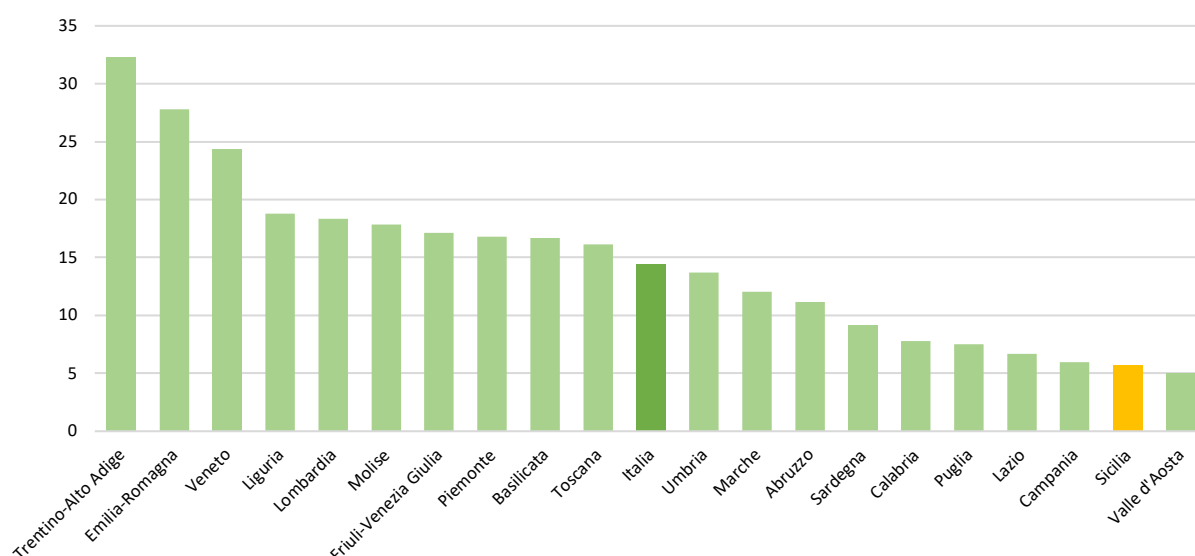
REGION	ROAD FREIGHT TRAFFIC INDEX		TONS OF GOODS ENTERING AND EXIT- ING BY ROAD ON THE TOTAL MODES
	2014	2017	2010
Abruzzo	11.1	11.2	98%
Basilicata	13	16.7	100%
Calabria	7.8	7.8	84%
Campania	5	6	87%
Emilia Romagna	27.9	27.8	97%
Friuli Venezia Giulia	17.9	17.1	95%
Lazio	9.1	6.7	95%
Liguria	18.3	18.8	80%
Lombardia	22.5	18.3	99%
Marche	13	12.1	95%
Molise	11.5	17.8	99%
Piemonte	15.7	16.8	99%
Puglia	8.7	7.5	88%
Sardegna	11	9.1	72%
Sicilia	5.9	5.7	64%
Toscana	18.8	16.2	93%
Trentino Alto Adige	34	32.3	100%
Umbria	18.3	13.7	98%
Valle d'Aosta	9.6	5	100%
Veneto	24.5	24.3	97%
ITALY	15.5	14.4	94%

Source: IZI calculations on ISTAT data

In particular, the latest available 2017 data for the road freight traffic index (calculated as tonnes of incoming and outgoing goods by road per inhabitant) place Sicily in penultimate place with 5.7, against a national average of 14.4, although the comparison with 2014 indicates a decrease which approximately reflects that of the rest of the Italian regions.

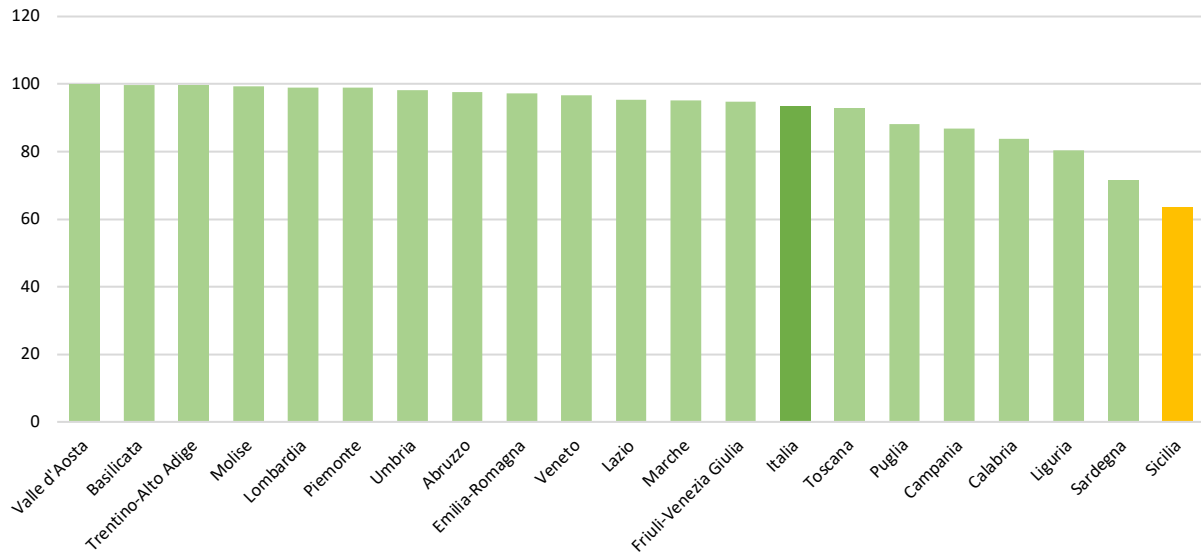
As regards the percentage of tonnes of goods entering and exiting by road out of the total modes, the photograph from 2010, the latest data available, shows Sicily in last place, with 63.5%, compared to 93% 5% of the national average.

GRAPH.16- ROAD FREIGHT TRAFFIC INDEX (2017)



Source: IZI calculations on ISTAT data

GRAPH.17- TONS OF GOODS ENTERING AND EXITING BY ROAD ON TOTAL MODES (2010)



Source: IZI calculations on ISTAT data

2.3 LOCAL PUBLIC TRANSPORT

The offer of TPL services within the Sicilian territory appears to be poor both in terms of the number of seat-km offered to citizens throughout the year and in terms of the provision of the vehicle fleet, critical issues which are found in urban and extra-urban areas. Even on the demand side of LPT services, the region has very low usage rates, associated with rather high motorization rates for cars and motorcycles. In the three Sicilian metropolitan cities (Palermo, Catania and Messina), those who use the TPL travel mainly by bus. However, the situation of the Metropolitan Cities appears positive with reference to the quality of the fleet of vehicles in circulation, with Palermo and Messina ranking among the most virtuous cities at a national level.

With regard to data on the availability and use of local public road transport services in the Sicilian territory, it should be highlighted that the availability of updated and detailed information at a regional or provincial level is particularly complex.

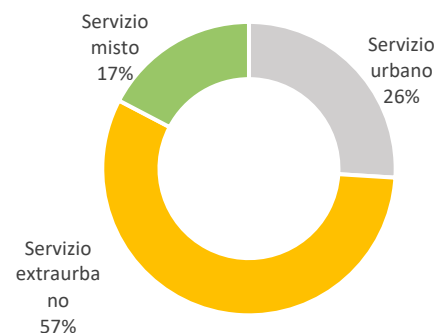
As regards the supply side of TPL services, the most recent data available outline a picture characterized by a multiplicity of companies operating in the sector (127), mainly concentrated in the field of extra-urban transport, followed by urban transport and finally mixed.

The main traffic indicators show that the situation of local public transport services in Sicily presents various critical issues: in fact, if we observe the data relating to the number of seats offered to citizens throughout the year, the Region is placed in fifth last place in the urban transport service, with around 500 seat-km per capita (well below the national average of 900 seat-km per inhabitant), and the penultimate in the extra-urban service, with only 655 seat-km per capita (against the approximately 980 of the national average).

On the other hand, the fleet of vehicles is also lower than that of the regions with a similar number of inhabitants: Lazio has 3.5 times the number of buses in Sicily, Campania 35% more, Emilia 33% , Piedmont 10%. Only Puglia has a lower number of urban buses.

The situation is made even more critical by an average annual distance per bus lower than that of the aforementioned regions, with the exception of Campania (-10%).

GRAPH.18- DISTRIBUTION OF TPL COMPANIES (2020)



Source: IZI processing on MIT data, National Infrastructure and Transport Account 2020-21

Similar critical issues arise for extra-urban transport, even if the traveling fleet suffers from less marked differences compared to the urban traveling fleet. In Emilia 43% more buses circulate than in Sicily, in Campania 35% more, in Piedmont 8% more, in Lazio 7% more, in Puglia 67% less. In this case the number of kilometers traveled annually by each vehicle in Sicily is in line with the national average.

TAB.7- MAIN TRAFFIC DATA OF THE URBAN PUBLIC TRANSPORT SERVICE BY REGION (2020)

REGION	USED BUSES	BUS-KM	MILEAGE ANNUAL AVERAGE PER BUS IN KM	PLACES OFFE- RED	TRAVELERS TRANSPORTED	SEAT-KM PER CAPITA
Piemonte	1,173	47,420,907	40,427	111,590	137,990,822	1,071
Valle d'Aosta						
Lombardia	2,174	66,976,043	30,808	214,436	244.758.704	668
Trentino Alto Adige	373	13,637,146	36,561	34,061	27,334,976	1,152
Veneto	1,142	31,799,256	27,845	114,439	98.125.464	656
Friuli Venezia Giulia	412	17.685.058	42,925	37,022	54,881,129	1,326
Liguria	902	29,583,465	31,632	83,528	165.901.849	1,828
Emilia Romagna	1,412	51,112,535	36,199	119,395	164.818.071	978
Toscana	1,610	50,552,872	31,391	129.176	97.006.237	1,098
Umbria	537	10,594,073	19,728	38,690	32,464,501	477
Marche						
Lazio	3,668	145.086.264	39,555	306,279	559.575.318	2,169
Abruzzo	436	13,624,948	31,272	32,293	11,390,266	806
Molise	103	2,033,287	19,680	7,161	2,893,362	471
Campania	1,440	38,657,421	26,840	113,353	93.150.768	514
Puglia	704	27,495,662	39,084	52,559	30,733,249	541
Basilicata	210	6,156,859	29,318	8,203	7,885,548	468
Calabria	269	9,638,064	35,829	19.111	3,313,886	369
Sicilia	1,063	31,754,737	29,873	81,092	34,484,085	500
Sardegna	509	20,194,956	39,676	42,044	55,614,511	1,055
ITALY	18,137	614.003.553	33,853	1,544,432	1,822,322,745	900

Source: IZI processing on MIT data, National Infrastructure and Transport Account 2020-21

Note: for some regions the data is recorded in aggregate: Piedmont and Valle d'Aosta, Umbria and Marche.

TAB.8- MAIN TRAFFIC DATA OF THE EXTRA-URBAN TPL SERVICE BY REGION (2020)

REGION	BUS USED	BUS-KM	AVERAGE ANNUAL DISTANCE PER BUS IN KM	PLACES OFFERED	TRAVELERS TRANSPORTED	SEAT-KM PER CAPITA
Piemonte	1,818	54,508,592	29,983	113.133	25,527,216	771
Valle d'Aosta						
Lombardia	3,613	114.739.748	31,757	315,322	103.962.610	1,014
Trentino Alto Adige	976	31,604,823	32,382	67,598	24,173,713	2,002
Veneto	2,167	69,796,680	32,209	187,279	62,416,465	1,241
Friuli Venezia Giulia	540	21,089,025	39,054	37,500	18,852,782	1,209
Liguria	744	21,403,582	28,768	40,280	11,383,237	811
Emilia Romagna	2,406	57,081,400	23,724	162,705	45,964,940	859
Toscana	1,795	65.694.108	36,595	116,435	31,454,476	1,154
Umbria	1,115	37,676,654	33,791	74,358	30,534,641	1,044
Marche						
Lazio	1,793	68,336,911	38,113	127,254	57,386,446	842
Abruzzo	967	33,382,026	3,451	64,117	15,478,128	1,720
Molise	423	18.107.170	42,852	21,906	5,264,391	3.144
Campania	2,271	80,458,450	35,435	115,568	42,669,977	692
Puglia	566	19,025,373	33,637	48,446	10,633,321	413
Basilicata	772	28,574,693	37,014	42,087	8,357,421	2,829
Calabria	1,372	37,970,028	27,675	74,795	9,397,702	1,100
Sicilia	1,683	54,299,525	32,264	97,158	21,892,422	655
Sardegna	966	39,399,308	40,786	69,852	11,561,074	1,787
ITALY	25,986	853.148.097	32,831	1,775,792	536.910.961	979

Source: IZI processing on MIT data, National Infrastructure and Transport Account 2020-21

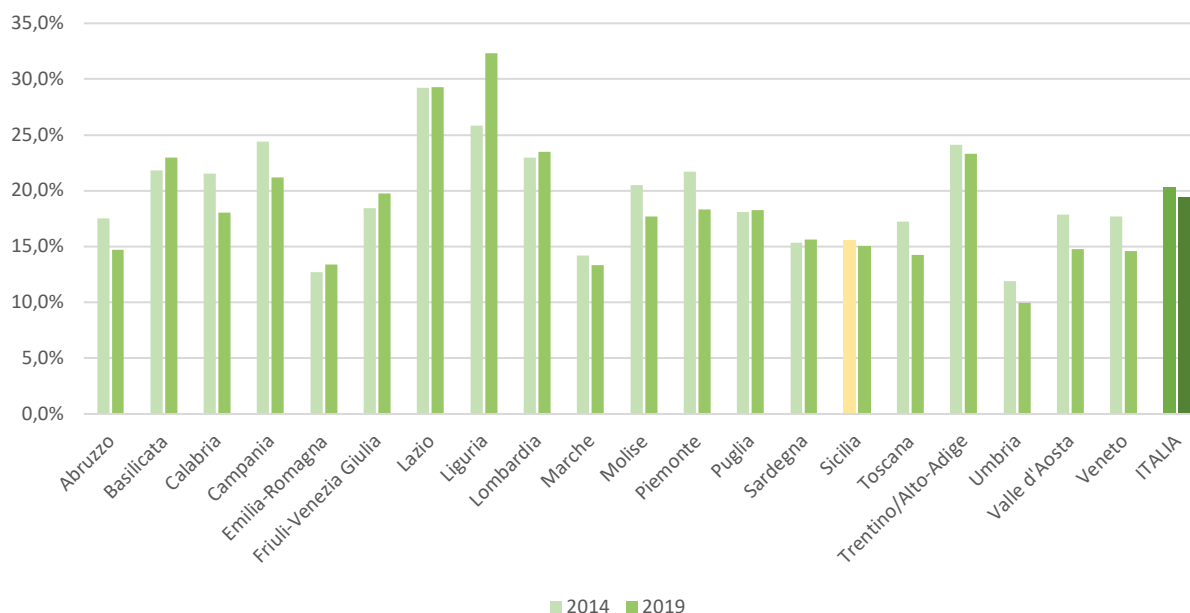
Note: for some regions the data is recorded in aggregate: Piedmont and Valle d'Aosta, Umbria and Marche.

Also regarding the demand side of TPL services, the Sicilian Region presents data lower than the national average. In fact, Sicily has rather high motorization rates for cars and motorcycles, which are often associated with low LPT usage rates, in turn linked to a limited offer of public transport services.

Specifically, according to the latest data available, in 2019 only 15% of people who traveled for work and study purposes by means of transport did so using public transport, compared to a national average of around 19%, and a decreasing rate of change since 2014 (-3.7%).

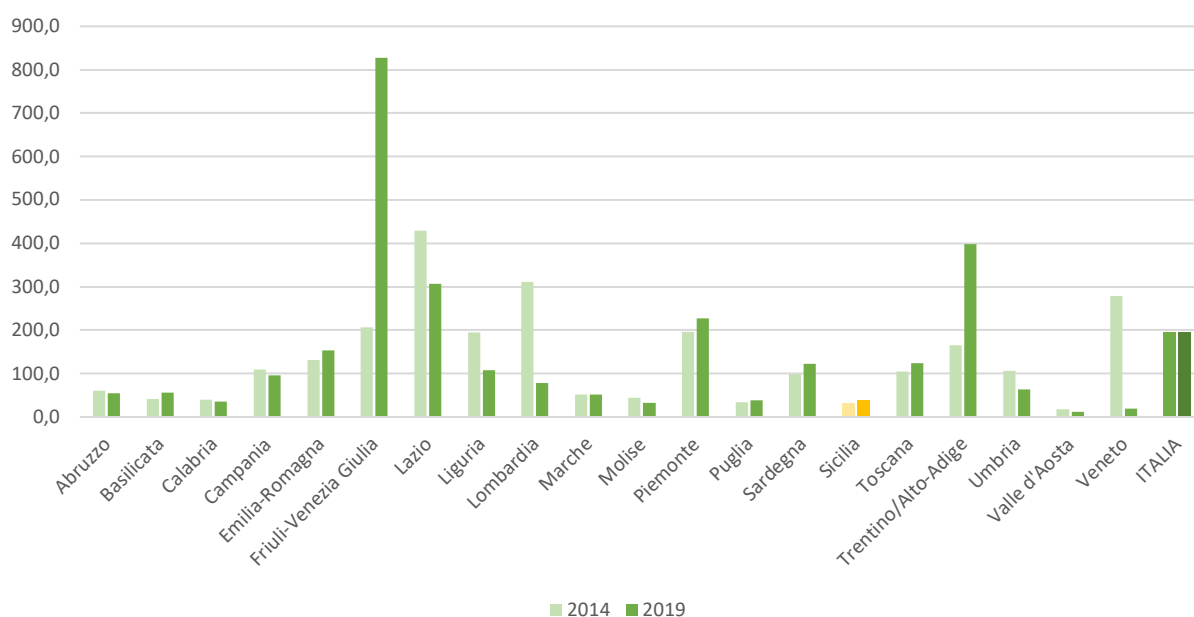
And again, if we look at the number of passengers transported by LPT in the provincial capitals per inhabitant, Sicily has a value almost four times lower than the national average, although increasing compared to 2014, contrary to the data recorded for the rest of the territory (37.8 passengers per inhabitant compared to an average of 193.6, with a rate of change of +21.9% against -0.9%).

GRAPH.19- USE OF PUBLIC TRANSPORT BY EMPLOYED PEOPLE, STUDENTS, SCHOOLCHILDREN AND USERS OF PUBLIC TRANSPORT



Source: IZI calculations on ISTAT data

GRAPH.20- PASSENGERS TRANSPORTED BY LPT IN THE PROVINCIAL CAPITAL MUNICIPALITIES PER INHABITANT



Source: IZI calculations on ISTAT data

More detailed information is available for the Sicilian Metropolitan Cities: Palermo, Messina and Catania. In these areas, the disaggregated data relating to the supply of LPT by transport mode show how the bus appears to be the prevalent means of transport in all three cities, in line with the majority of other Metropolitan Cities, with the exception of Milan, Rome and Naples, which have subways on which the use of public transport is concentrated.

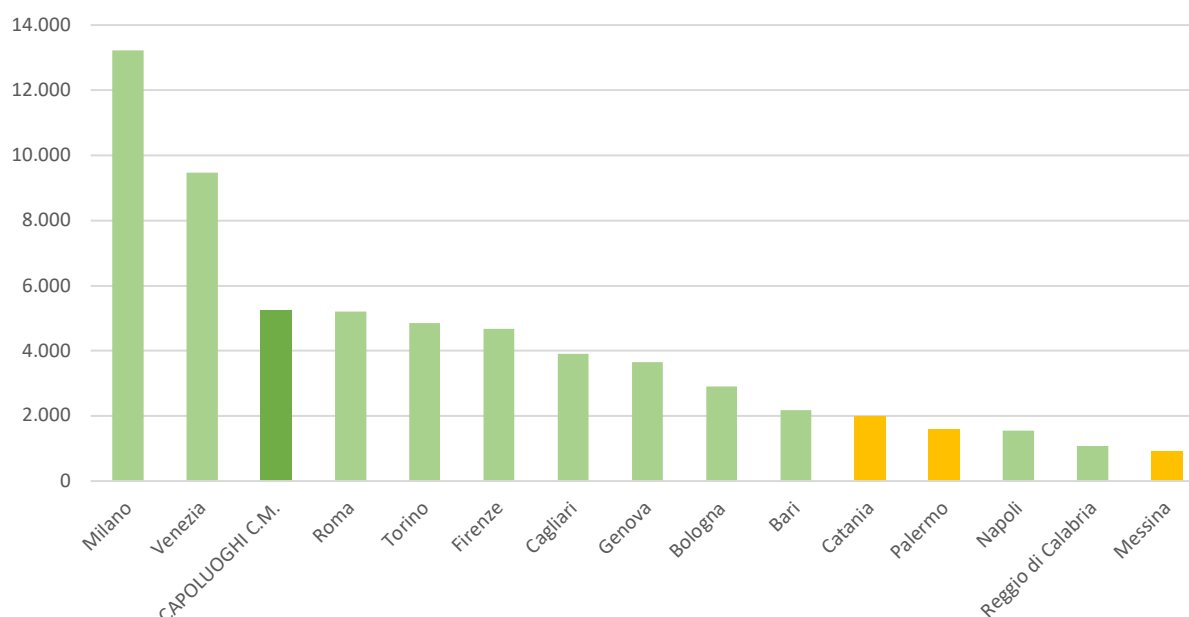
TAB.9- OFFER OF TPL SERVICES BY MODE OF TRANSPORT IN THE CAPITAL MUNICIPALITIES OF THE CM (2020)

Capital cities of CM	Seat-km per inhabitant						Percentage compositions					
	Bus	Trolley-bus	Tram	Subway	Other	Total	Bus	Trolley-bus	Tram	Subway	Other	Total
Torino	2,704	-	1.111	1,040	-	4,855	55.7	-	22.9	21.4	-	100.0
Genova	3,134	96	-	391	25	3,646	86.0	2.6	-	10.7	0.7	100.0
Milano	2,587	305	1,719	8,612	2	13,224	19.6	2.3	13.0	65.1	..	100.0
Venezia	4,546	-	929	-	3,992	9,466	48.0	-	9.8	-	42.2	100.0
Bologna	2,443	448	-	-	11	2,902	84.2	15.4	-	-	0.4	100.0
Firenze	3,266	-	1,409	-	-	4,675	69.9	-	30.1	-	-	100.0
Roma	2,019	30	196	2,964	-	5,209	38.8	0.6	3.8	56.9	-	100.0
Napoli	442	16	29	995	65	1,547	28.6	1.0	1.9	64.3	4.2	100.0
Bari	2,183	-	-	-	-	2,183	100.0	-	-	-	-	100.0
Reggio Calabria	1,086	-	-	-	-	1,086	100.0	-	-	-	-	100.0
Palermo	1,355	-	235	-	-	1,590	85.2	-	14.8	-	-	100.0
Messina	749	-	170	-	-	919	81.5	-	18.5	-	-	100.0
Catania	1,551	-	-	423	-	1,974	78.6	-	-	21.4	-	100.0
Cagliari	3,058	464	386	-	-	3,908	78.2	11.9	9.9	-	-	100.0
AVERAGE CAPITAL CITIES CM	2,126	88	526	2,393	118	5,251	40.5	1.7	10.0	45.6	2.3	100.0

Source: IZI processing on MIT data, National Infrastructure and Transport Account 2020-21

Also in this case, if we compare the data relating to the number of places offered to citizens throughout the year, the three Sicilian cities record the lowest values, not even reaching, similarly to Naples and Reggio Calabria, the 2 thousand seat-km per capita, compared to a national average among the capitals of metropolitan cities of approximately 5 thousand seat-km/inhabitant.

GRAPH.21- SEAT-KM PER CAPITA IN THE CAPITALS OF METROPOLITAN CITIES (2020)



Source: IZI processing on MIT data, National Infrastructure and Transport Account 2020-21

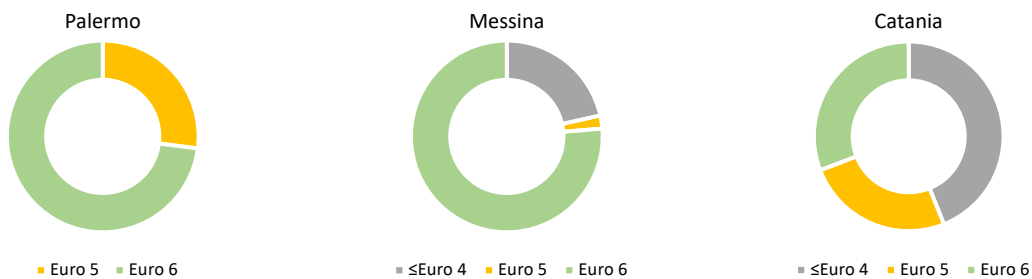
With reference instead to the quality of the fleet, which has long been one of the main critical issues of LPT in Italy, the situation of the Sicilian Metropolitan Cities appears rather positive. In particular, Palermo and Messina appear to have a fleet of particularly recent vehicles which places them at the top of the national level for quantity of vehicles compliant with the Euro 6 standard on the total vehicles in circulation (73% and 76% respectively), while Catania remains in the national average. It is also interesting to note how the city of Palermo appears from this perspective as a significantly virtuous case of fleet renewal, representing the only metropolitan capital in Italy to have completely eliminated particularly obsolescent and polluting vehicles falling into the Euro categories. 4 or less.

TAB.10- OFFER OF LPT SERVICES BY EMISSION CLASSES OF THE CAPITAL MUNICIPALITIES OF THE METROPOLITAN CITIES (2020)

CAPITAL CITIES OF CM	≤EURO 4	5 EUROS	EURO 6	TOTAL
Torino	26.90%	29.40%	43.70%	100.00%
Genova	44.50%	16.80%	38.60%	100.00%
Milano	27.50%	34.00%	38.50%	100.00%
Venezia	45.00%	20.70%	34.30%	100.00%
Bologna	30.50%	3.60%	65.90%	100.00%
Firenze	29.80%	16.30%	53.90%	100.00%
Roma	32.00%	40.40%	27.60%	100.00%
Napoli	57.80%	19.70%	22.50%	100.00%
Bari	42.40%	16.50%	41.20%	100.00%
Reggio Calabria	15.80%	37.90%	46.30%	100.00%
Palermo	-	27.00%	73.00%	100.00%
Messina	21.50%	2.20%	76.30%	100.00%
Catania	43.90%	25.20%	30.80%	100.00%
Cagliari	13.70%	80.20%	6.00%	100.00%
AVERAGE CAPITAL CITIES CM	32.00%	30.00%	38.00%	100.00%

Source: IZI processing on MIT data, National Infrastructure and Transport Account 2020-21

GRAPH.22- COMPOSITION OF THE LPT FLEET BY EMISSION CLASSES IN THE CAPITALS OF SICILIAN METROPOLITAN CITIES (2020)



Source: IZI processing on MIT data, National Infrastructure and Transport Account 2020-21

2.4 PORTS, AIRPORTS AND FREIGHT TERMINALS

The infrastructural equipment of Sicily's ports, airports and freight terminals plays a fundamental role in the connectivity and modal integration of the Region, promoting its economic and tourism development.

In particular, Sicilian ports constitute important hubs for the maritime transport of goods and passengers, facilitating trade at both a national and international level; the airports allow rapid and direct connections with other Italian and European cities, contributing to the development of tourism and commercial activities; freight terminals integrate land and sea transport modes, facilitating the efficient exchange of goods between the different transport infrastructures. The modal integration between ports, airports and freight terminals in Sicily favors greater efficiency and ease of movement of goods and passengers, promoting the economic and tourism development of the region.

FIG.6- PORTS, AIRPORTS AND FREIGHT TERMINALS AT REGIONAL LEVEL



THE PORT SYSTEM

The insular nature of Sicily and its geographical position in the center of the Mediterranean determine the presence of a structured and varied port system: the numerous ports also correspond to an intense passenger and goods traffic. The importance of the former is dictated by the presence of the main cabotage route linked to the crossing of the Strait of Messina, but traffic between Sicily and the smaller islands is also important. Passenger traffic recorded continuous and significant growth between 2014 and 2019 (+45%). Following the pandemic crisis, the number of passengers decreased, reaching the values recorded in 2017. Freight traffic is also particularly significant. The port of Augusta, in particular, is one of the main landing places for goods, but it is the Sicilian port system as a whole that has assumed great importance in the national panorama, regaining in recent years the positions lost between 2013 and 2017.

As regards the port system, Sicily, with its central location in the Mediterranean, boasts a strategic geographical position which makes it an important crossroads for international trade and maritime routes. For this reason, the region has a very important maritime infrastructure, which plays a fundamental role in connecting it to the rest of Italy and with the international panorama of maritime trade.

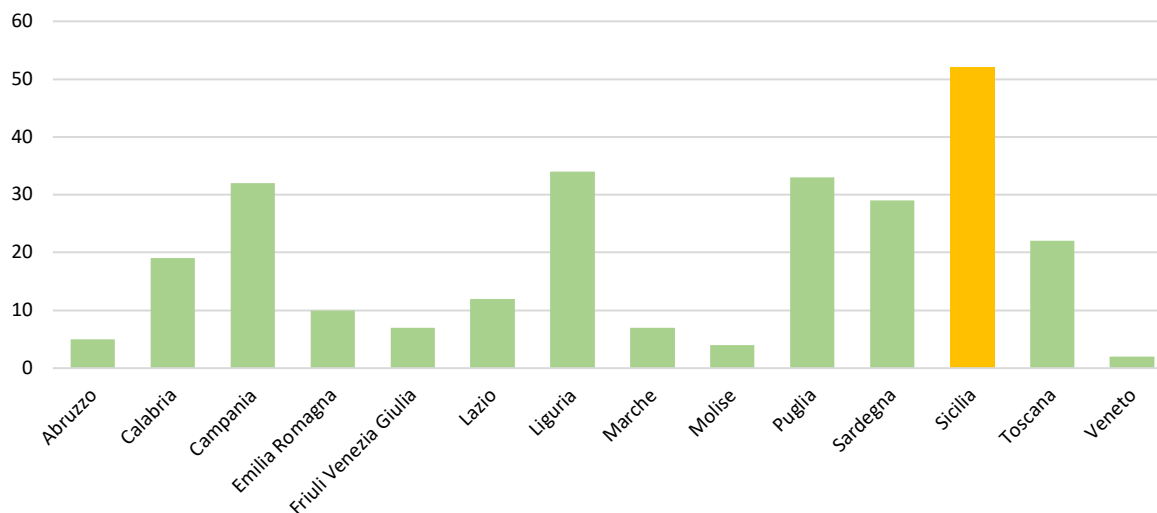
TAB.11- PORT EQUIPMENT BY REGION

REGION	NUMBER OF PORTS		PULL OVER					
			NUMBER		OVERALL LENGTH (M)		TOTAL SURFACE AREA OF THE DOCKS (M²)	
	2014	2021	2014	2021	2014	2021	2014	2021
Abruzzo	6	5	38	26	7,196	6,263	174,915	173,303
Calabria	20	19	91	104	22,050	24,361	720,789	595,553
Campania	32	32	155	163	32,147	31,799	919,704	900,665
Emilia Romagna	10	10	72	89	35,121	26,520	457,232	174,253
Friuli Venezia Giulia	6	7	90	109	21,039	30,095	75,890	104,878
Lazio	13	12	94	94	28,076	31,495	793,055	774,924
Liguria	35	34	240	248	70,909	66,963	2,926,741	2,695,670
Marche	8	7	102	104	15,429	17,048	274,219	321,695
Molise	4	4	10	10	2,189	2,189	61,962	62,362
Puglia	34	33	217	217	51,436	53,169	1,079,889	1,120,107
Sardinia	31	29	205	236	49,060	53,995	1,441,028	1,415,729
Sicily	52	52	249	253	48,839	62,724	946,715	1,146,711
Tuscany	14	22	137	288	36,393	51,441	746,780	695,329
Veneto	13	2	199	179	32,290	22,126	96,392	nd
ITALY	278	268	1,899	2,120	452,174	480,188	10,715,311	10,181,179

Source: IZI processing on MIT data, National Infrastructure and Transport Account 2020-21

The analysis of data at a national level clearly and unequivocally highlights the importance of Sicily in the context of maritime transport in Italy. In fact, the Region ranks first in terms of number of ports, representing approximately 25% of ports at a national level, and has values far above the average also with regard to the number of berths, their overall length and total surface area. of the docks.

GRAPH.23- NUMBER OF PORTS (2021)



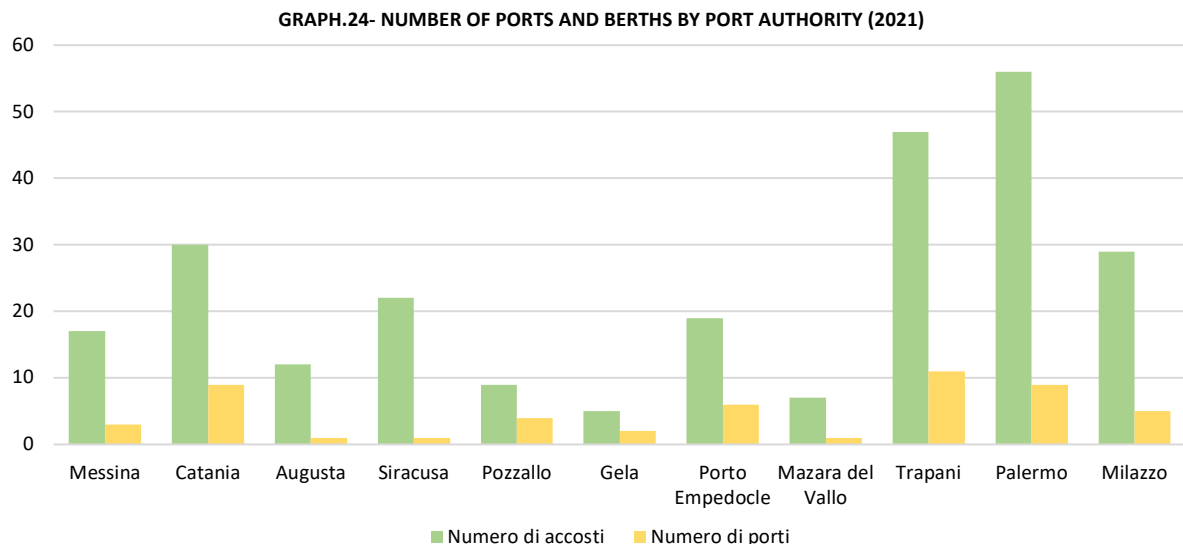
Source: IZI processing on MIT data, National Infrastructure and Transport Account 2020-21

At a regional level, the official data available identifies 11 Port Authorities, which represent the entities responsible for the management and regulation of maritime activities in Sicilian ports. Among these, the port authorities of Trapani, Catania and Palermo stand out as the most important, with Trapani in first place in terms of number of ports (11, followed by 9 in Catania and Palermo) and Palermo in terms of number of berths (56 against 47 of Trapani and 30 of Catania).

TAB.12- PORT EQUIPMENT IN SICILY FOR THE PORT AUTHORITY (2021)

PORT AUTHORITIES	NUMBER OF PORTS		PULL OVER					
			NUMBER		OVERALL LENGTH (M)		TOTAL SURFACE AREA OF THE DOCKS (M²)	
	2014	2021	2014	2021	2014	2021	2014	2021
Messina	4	3	23	17	2,511	2,718	81.113	71,863
Catania	7	9	28	30	4,145	5,785	181,317	331,317
Augusta	1	1	12	12	7,735	7,735	34,746	34,746
Siracusa	1	1	25	22	3,096	2,936	nd	nd
Pozzallo	4	4	7	9	1,613	5,749	180,490	180,360
Gela	1	2	-	5	-	1,129	-	7,200
Porto Empedocle	4	6	18	19	3,867	4,431	76,691	69,396
Mazara del Vallo	1	1	9	7	1,570	470	13.015	2,350
Trapani	12	11	52	47	8,672	8,312	117.065	125.112
Palermo	12	9	45	56	8,695	16,155	204,678	252,617
Milazzo	5	5	30	29	6,935	7,304	57,600	71,750
Total Sicily	52	52	249	253	48,839	62,724	946,715	1,146,711

Source: IZI processing on MIT data, National Infrastructure and Transport Account 2013/2014 and 2020-21



Source: IZI processing on MIT data, National Infrastructure and Transport Account 2020-21

The governance of the Sicilian port system has also undergone changes following the national reform on the reorganisation, rationalization and simplification of port authorities in 2016. This reform has established 16 Port System Authorities (AdSP) which are entrusted with a strategic role of direction, planning and coordination of the system of ports of national and international interest in its area. In particular, three new AdSPs have been established within the Sicilian territory, according to the following structure:

- the Port System Authority of the Western Sicilian Sea, made up of the ports of Palermo, Termini Imerese, Trapani, Porto Empedocle and the recently acquired ports of Gela and Licata;
- the Port System Authority of the Eastern Sicilian Sea, made up of the ports of Augusta and Catania;
- the Strait Port System Authority, made up of the Sicilian ports of Messina, Milazzo, Tremestieri and the Calabrian ports of Villa San Giovanni, Saline and Reggio Calabria.⁹

Among these, as mentioned previously, the ports of Augusta and Palermo constitute two fundamental poles within the TEN-T core network (Helsinki – Valletta corridor), while Messina, Milazzo, Trapani, Siracusa, Gela and, recently, Catania are included within the comprehensive network.

Of no less importance are the regional ports, which are part of Category II, class III (Law 84/94) and classified according to the DPRS of 1 June 2004 according to the following specific functional destinations¹⁰:

- commercial;
- industrial;
- oil;
- passenger service;
- fishing boat;
- tourist and recreational;
- bring refuge.

Since most of the main ports of national interest and the three AdSPs present on the island are located along the Ionian and Tyrrhenian coast, it is clear that the regional ports find themselves playing an important role in particular along the coast of the Channel of Sicily. In fact, on the southern side there are the main regional ports which not only cover an important function in the tourism, nautical and fishing sectors, but also play an indispensable role in the movement of goods, in the oil industry and, in particular, in guarantee connections with the smaller islands. In this regard, it is important to also consider the importance of the main landing places on the smaller islands, which guarantee both the transport of passengers and goods. Among these, the ports of Pantelleria, Lampedusa, Favignana, Lipari and Ustica stand out, which play a crucial role in facilitating maritime connections and supporting the

⁹ Sicilian Region, Department of Infrastructure and Mobility, Department of Infrastructure, Mobility and Transport, PIIM - 2022 Update, Preliminary Environmental Report of amenability to SEA and Incidence Screening, 2022

¹⁰ *Ibid*

economy of the respective islands. These ports represent vital points of access and exchange, promoting tourism development, the supply of goods and services, as well as local trade¹¹.

The importance of the maritime carrier within the regional transport network also appears evident when analyzing the data relating to the demand for mobility by sea, both in relation to the movement of people and the movement of goods.

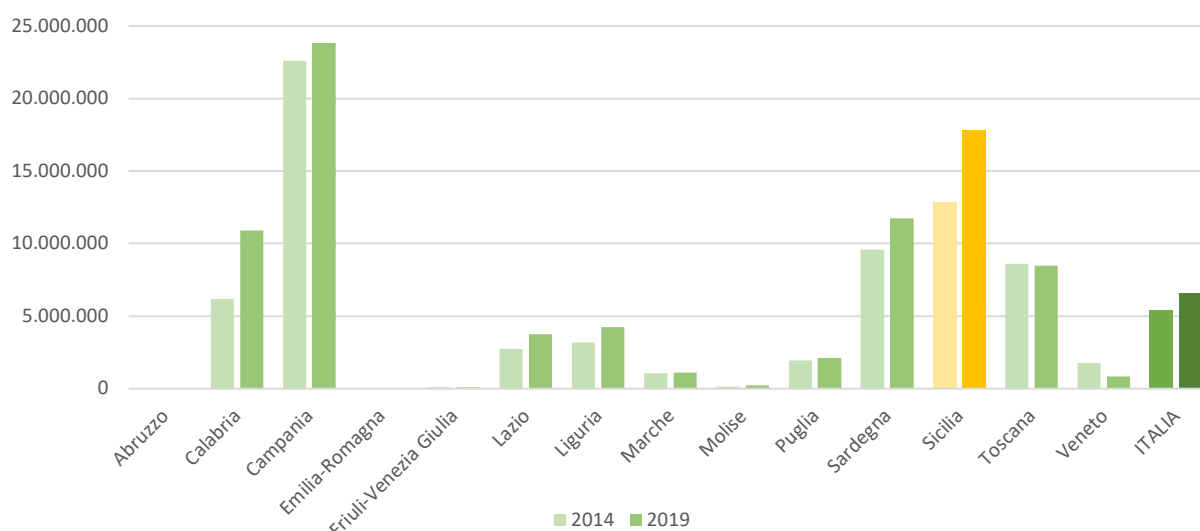
As regards the movement of people, Sicily ranks second after Campania, with a fifth of passengers embarking and disembarking in ports throughout Italy (almost 18 million out of a total of approximately 85 million), and a rate of variation increasing far above the national average (38% versus 20%). However, it must be highlighted that this traffic primarily concerns the port of Messina which is the landing place of the main Italian cabotage route (Messina-Reggio Calabria). Two other regional routes appear among the top 10 Italian cabotage routes: the Trapani-Aegadian Islands in fifth place and the Milazzo-Aeolian Islands in eighth place. The port of Messina generates approximately 14% of the number of passengers embarking and disembarking in Italy. Their total number approached 12 million in 2019 and stood at around 8 million in the 2020-2021 period, i.e. during the pandemic crisis¹².

TAB.13- DEMAND FOR MOBILITY BY SEA (2014-2019)

REGION	PASSENGERS EMBARKED AND DIS-EMBARCKED IN PORTS		CABOTAGE FREIGHT TRAFFIC INDEX	TONS OF INCOMING AND OUTGOING GOODS IN CABOTAGE NAVIGATION ON THE TOTAL OF THE MODES
	2014	2019	2012	2010
Abruzzo	nd	nd	48.0	2.2%
Calabria	6,190,850	10,888,022	287.8	16.2%
Campania	22,604,472	23,850,308	121.7	12.7%
Emilia Romagna	7,959	8,270	90.8	1.5%
Friuli Venezia Giulia	93,493	103,599	190.7	4.2%
Lazio	2,722,925	3,748,948	65.5	3.8%
Liguria	3,186,325	4,220,767	553.1	14.1%
Marche	1,052,407	1,120,629	61.8	4.3%
Molise	139,897	208,515	28.6	0.6%
Puglia	1,953,162	2,132,584	177.1	10.4%
Sardinia	9,584,374	11,759,805	704.5	28.5%
Sicily	12,882,742	17,788,518	415.5	35.3%
Tuscany	8,596,112	8,475,990	204.4	6.2%
Veneto	1,748,510	853,832	67.5	2.5%
ITALY	70,763,228	85,159,787	139.9	5.5%

Source: IZI calculations on ISTAT data

GRAPH.25- PASSENGERS EMBARKED AND DISEMBARKED IN PORTS (2014-2019)



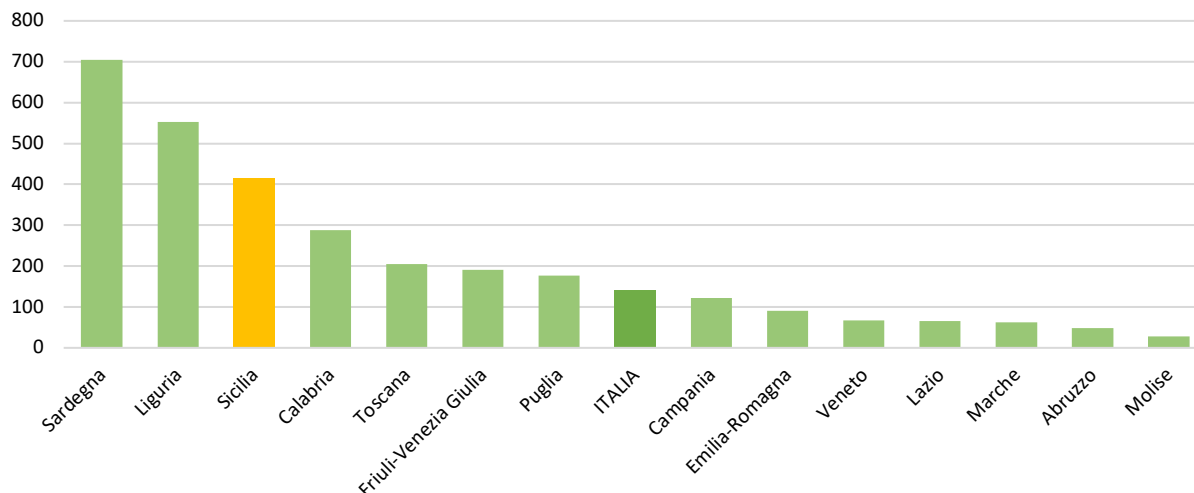
Source: IZI calculations on ISTAT data

¹¹ Sicilian Region, Department of Infrastructure and Mobility, Department of Infrastructure, Mobility and Transport, Integrated Plan of Infrastructure and Mobility, 2017

¹² ISTAT, Statistics Report - Maritime transport in Italy, Years 2019/2020, Previews January-September 2021, 2022

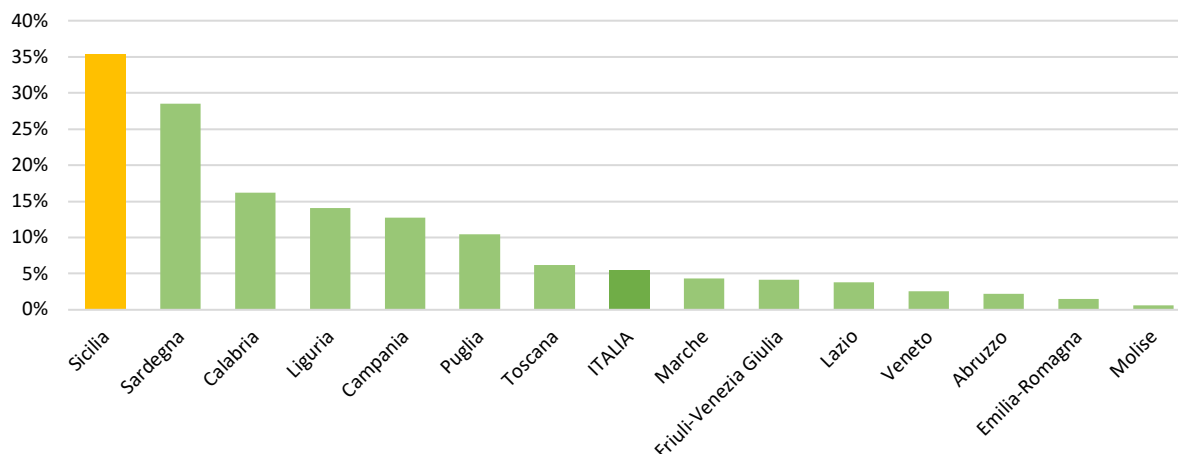
With reference instead to the movement of goods, the indices relating to this data were updated by ISTAT for the last time in 2010 and 2012. These data place Sicily in third place at a national level in terms of goods traffic index in coastal navigation (more than 400 tonnes of incoming and outgoing goods per hundred inhabitants, almost three times the national average), and first in terms of percentage of tonnes of incoming and outgoing goods in cabotage navigation out of the total modes (35th, 5% versus 5.5% of the national average).

GRAPH.26- CABOTAGE FREIGHT TRAFFIC INDEX (2012)



Source: IZI calculations on ISTAT data

GRAPH.27- TONS OF INCOMING AND OUTGOING GOODS IN CABOTAGE NAVIGATION ON THE TOTAL (2012)



Source: IZI calculations on ISTAT data

The data on the quantities of goods loaded and disembarked are updated to 2021¹³. These show that around 16% of goods transported by ship in Italy pass through Sicily, a value which has thus returned to the levels of the 2012-2014 period. The main Sicilian commercial port for goods traffic is Augusta, the seventh Italian port for goods traffic in 2021, followed by Siracusa, Milazzo and Palermo. In the same year Siracusa Santa Panagia was in eleventh place. The port of Augusta also has particular importance in the energy sector, so much so that it represents the third Italian port for liquid bulk goods. It is also interesting to note how the port of Palermo in 2021 was the fifth in Italy in the Ro-Ro segment. The development of this segment appears to be fundamental in the growth of this port which increased the quantity of goods embarked or disembarked by over 50% in the period 2015-2021.

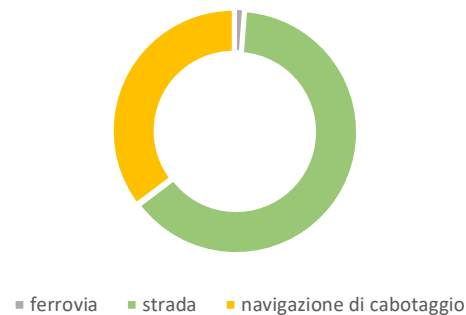
¹³ Srm, Italian Maritime Economy – Focus: Italian ports and new drivers for development, 2022

LOGISTICS SYSTEM

The movement of goods within the Sicilian territory is largely composed of road flows, aimed mainly at internal traffic, followed by incoming/outgoing flows mainly by sea, while the railway system finds itself playing a completely marginal role. The Sicilian logistics system has seen a massive restructuring in recent years, which sees it included within the main relaunch strategies of the Region at local, national and community level. Despite this, its configuration is currently not yet fully implemented.

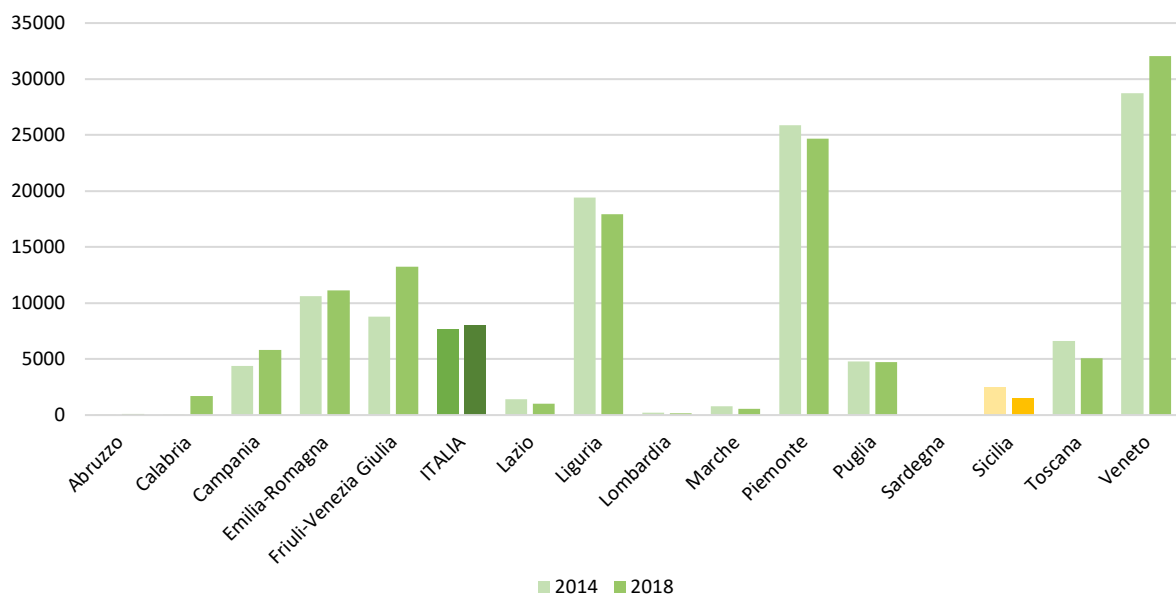
If the data relating to the movement of goods reported so far for the various transport carriers are aggregated, the Sicilian logistics system appears to be largely composed of road flows, which however remain mainly within the regional territory, while the incoming/outgoing flows from the island are mainly made up of goods in transit in the port system, often processed and transferred directly by sea. Within this logistics system, the contribution of rail transport remains completely marginal, with rail freight traffic generated by ports and freight terminals much lower than the national average (only 1,500 annual trains against the average of almost 8,000) in 2018, and a decreasing rate of change when comparing data from 2014 (-39.2%).

GRAPH.28- COMPOSITION OF FREIGHT TRAFFIC IN SICILY (2018)



Source: IZI calculations on ISTAT data

GRAPH.29- RAIL FREIGHT TRAFFIC GENERATED BY PORTS AND FREIGHT TERMINALS¹⁴(2014-2018)



Source: IZI calculations on ISTAT data

As previously anticipated, the European planning framework sees the Sicilian Region as an integral part of the TEN-T Trans-European Transport Network, inserting it within the Scandinavian – Mediterranean corridor through the two routes Messina – Catania and Catania-Palermo, which include approximately the half of the RFI railway network, two core ports (Palermo and Augusta) and several comprehensive ports.

And it is precisely Sicily's strategic position within the European network that has brought particular attention from European and national programming to the Region in recent years. Attention which has seen it included within the

¹⁴ Sum of trains circulated during the year on the national infrastructure manager's network, having a port or interport as their origin or destination.

main relaunch strategies of the South (as part of the less developed regions of the community cohesion policy), also through an infrastructure and logistics plan aimed at eliminating bottlenecks in the main network infrastructures and to promote the internationalization of Southern Italy and its complete inclusion in the network of trans-European corridors. This planning strategy therefore laid the foundations for the restructuring of the logistics system at a regional level, in order to develop a solid infrastructure to support the management and movement of goods flows along the two aforementioned routes and to support the port interconnection points and freight terminal. To this end, national planning has identified two of the five Integrated Logistics Areas (ALI) planned in the South of Sicily, within which port systems, autoports, rear ports and freight terminals, logistics platforms and related connections should converge.¹⁵ Also in line with the previous regional planning, the Sicilian ALI therefore divide the territory into two quadrants, the western one and the south-eastern one, connected to the respective ASPs and to the two main freight terminals of the Region, that of Termini Imerese and Catania – Bicocca respectively, and to a series of smaller autoports.

Moreover, starting from 2017, Sicily as a region identified as "less developed" according to European legislation has seen the possibility of establishing two Special Economic Zones (SEZ) on its territory: the Western Sicily SEZ and the SEZ Eastern Sicily. These zone are geographically delimited areas that include at least one port area forming part of the trans-European transport network (TEN-T). They are established in order to create favorable conditions in economic, financial and administrative terms, which allow the development of existing businesses as well as the establishment of new ones. In this regard, it should be highlighted that with the legislative decree n.124/2023, starting from 1 January 2024, the special economic zone for the South - "single SEZ" will be established, which will include the territories of the regions Abruzzo, Basilicata, Calabria, Campania, Molise, Puglia, Sicily and Sardinia and which will replace the current Special Economic Zones currently fragmented into 8 different administrative structures.

Despite the various interventions that have taken place in recent years, the configuration of the logistics system in Sicily has not yet been fully implemented. This is due both to a delay in the infrastructure of the nodes and connection routes, especially with regards to the railways, and to the lack of a coordinated overall vision, which allows not only to finalize the various intervention projects, but also to integrate all the elements together so as to create a unified network system¹⁶.

THE AIRPORTS

Sicilian airports guarantee satisfactory coverage of the territory. They are aimed almost exclusively at passenger traffic and are therefore also linked to tourist flows. The recovery of activity in the post-pandemic period seems to indicate a renewed vitality of the sector. Cargo flight activity is residual and remains so despite the increases achieved over the last year.

The Sicilian airport system is characterized by the presence of two basins, the western basin with the airports of Palermo-Punta Raisi and Trapani-Birgi and the eastern basin with the airports of Catania-Fontanarossa and Comiso. On the smaller islands there are the airports of Pantelleria and Lampedusa.

TAB.14- AIR TRAFFIC INDEX¹⁷

REGION	2010	2019
Abruzzo	34.4	53.9
Basilicata	-	0.0
Calabria	125.8	181.3
Campania	95.2	189.2
Emilia Romagna	157.7	222.5
Friuli Venezia Giulia	58.9	64.5
Lazio	730.9	854.4
Liguria	79.9	100.7
Lombardy	358.6	490.0
Marche	32.5	31.8
Molise	-	0.0
Piedmont	84.3	93.9
Puglia	123.2	208.3
Sardinia	387.4	562.6

¹⁵ <https://www.mit.gov.it/connettere-italia/aree-logistiche-integrate>

¹⁶ Sicilian Region, Department of Infrastructure and Mobility, Department of Infrastructure, Mobility and Transport, Integrated Plan of Infrastructure and Mobility, 2017

¹⁷ Passengers disembarking and embarking by air (number per 100 inhabitants)

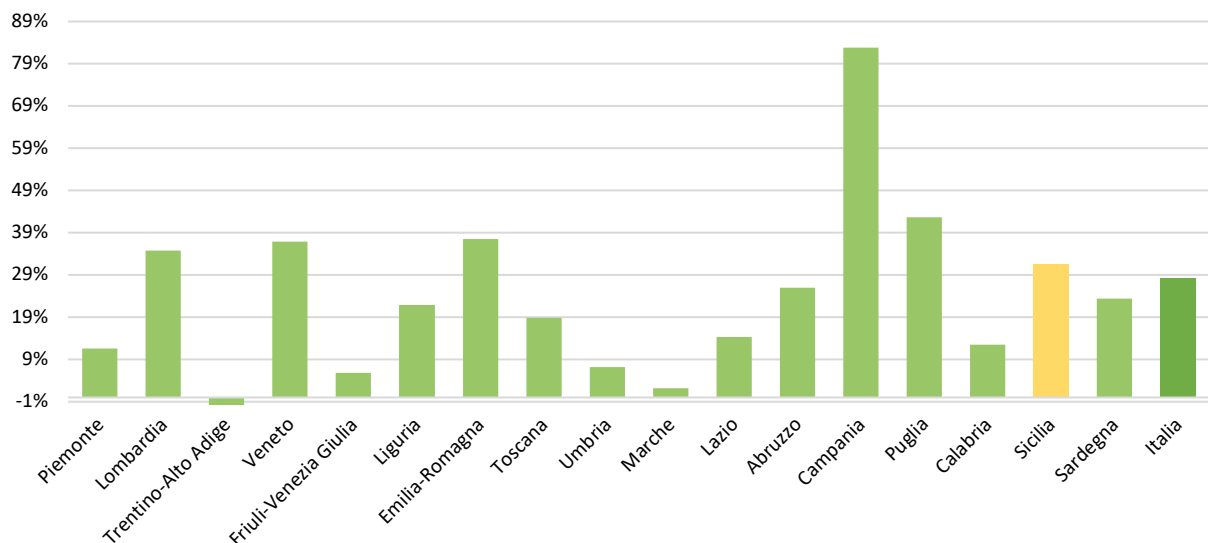
Sicily	250.2	376.0
Tuscany	155.7	222.8
Trentino Alto Adige	5.3	0.1
Umbria	12.2	25.0
Valle d'Aosta	8.7	0.0
Veneto	245.1	377.0
ITALY	232.1	322.7

Source: ISTAT, Territorial Indicators for Development Policies

The air traffic index in Sicily, as in the rest of Italy, showed a constant increase until 2019. The growth between 2014 and 2019 was slightly higher than that of the rest of Italy, but lower than that recorded from all the regions of the South.

Over 9 million passengers disembarked by air in Sicily in 2019 (9.5% of passengers disembarked in Italy and over 36% of passengers disembarked in Southern Italy). Even in the number of passengers, the growth compared to 2014 was more sustained (+32%) than in the whole of Italy (+28%), but lower than that recorded in the South (+38%).

GRAPH.30- CHANGE IN PASSENGERS DISEMBARKING BY AIR, YEARS 2014-2020



Source: ISTAT, Territorial Indicators for Development Policies

Assaeroporti data referring to the first quarter of 2023 show an increase in passenger traffic compared to 2019. The growth concerns all Sicilian airports with the exception of Comiso. This increase is even more significant considering that in Italy there is an overall slight decrease in the 2019-2023 comparison. Furthermore, the share of passengers using Sicilian airports increased to 10.5%.

It should also be noted that, by number of passengers, again referring to the first quarter of 2023, two Sicilian airports are among the top ten Italian airports: Catania in seventh place and Palermo in tenth.

Cargo traffic, on the other hand, is irrelevant. Overall, less than 1% of the goods traveling by air in Italy passed through Sicilian airports in the first quarter of 2023. In this context, even the significant increase that occurred at Palermo airport (+288%) is not very significant.

2.5 SUSTAINABLE MOBILITY AND MEANS OF TRANSPORT WITH LOW ENVIRONMENTAL IMPACT

The conditions for Sicilian sustainable mobility are all there thanks to a good planning framework which sees the presence of plans for sustainable mobility approved and adopted in many capitals. The situation seems to be satisfactory with regard to private vehicle traffic thanks to the presence of a fairly widespread system of parking lots and the frequency of activation of infomobility systems. However, much remains to be done for soft mobility. Public transport does not seem to be adequately supported by infomobility services, while the possibility of moving by bicycle is strongly hindered by the limited presence of cycle paths, albeit with the notable exception of Palermo.

The Urban Sustainable Mobility Plans (PUMS) have been approved in 5 of the 9 capitals and metropolitan cities of Sicily, of which 2 (Trapani and Palermo) have already been adopted. Considering that these Plans are present in 51 of the 110 Italian capitals, the Sicilian situation is certainly positive, especially if we consider that at the midday level the Plans are present only in 12 capitals, of which, as seen, 5 are Sicilian. In Messina and Caltanissetta, where such a plan is missing, the Urban Mobility Plan (PUM) is still present. It should also be noted that in Trapani the Sustainable Mobility Plan has an inter-municipal value, as happens only in three other Italian capitals: Bergamo, Padua and Terni.

The ISTAT data on urban mobility for 2020 highlight that if from a planning point of view Sicily presents a satisfactory picture, the same cannot be said regarding services dedicated to soft mobility. Cycle paths are not present in 3 out of 9 capitals (Trapani, Caltanissetta and Enna), at a national level the absence of cycle paths is only found in 3 other capitals. Furthermore, even where cycle paths are present, their density is low, lower than the average of the cities of the South, which already present on average values much lower than those of the Center (about 1/3) and those of the North (about 1/12). The city of Palermo represents an exception. Here the cycle paths have a density of 32 km per 100 km² of surface, a value that puts it in second place among the capitals of the South. Furthermore, while in Palermo the cycle path network expanded between 2015 and 2020, in the other capitals Sicilians the situation remained substantially stable.

In line with the limited presence of cycle paths, bike-sharing services are also reduced and in 2020 they were only present in Palermo (not by chance) and Enna (due to a new creation). Between 2015 and 2020 these services were started, but then stopped in Catania and Siracusa. In this case the comparison is negative towards the cities of the North (where bike-sharing services are active in 34 capitals), but it does not seem to be characterized differently compared to the Center (10) and the South (9).

Car sharing services are much more frequent, present in 5 out of 9 capitals, a percentage that places Sicily in third place in Italy after Lombardy and Trentino Alto Adige. The frequency of this service is probably related to a preference for traveling by car which is confirmed by the reduction in the size of areas with speeds limited to 30 km/h (in clear contrast to the rest of Italy), and a propensity to reduce or keep pedestrian areas unchanged which seems to be above average.

Exchange car parks are present in 6 out of 9 capitals (they are missing in Trapani, Agrigento and Caltanissetta). In 2020 in these car parks the number of spaces per 1,000 vehicles in circulation was particularly high in Enna, in line with the national average in Catania, in line with the average for the South in Messina and Palermo, and less significant in Ragusa and Siracusa. The number of stalls appears to be growing well above the national average in Palermo, Siracusa and Enna (where the growth trend is higher than that of Northern cities), while it is stable in Messina and decreasing in Catania.

The public service infomobility systems appear to be behind not only compared to Italy, but also in comparison with the South and this applies to all the infomobility systems surveyed by ISTAT.

TAB.15- PERCENTAGE OF CAPITAL MUNICIPALITIES WHERE INFOMOBILITY SYSTEMS FOR LOCAL PUBLIC TRANSPORT ARE ACTIVE (2020)

INFORMATION SYSTEMS FOR TPL	SICILY	NOON	ITALY
Public transport information service via SMS	0%	10%	28%
Electronic poles at public transport stops	33%	38%	58%
Use of rechargeable smart cards	11%	22%	39%
Purchase of travel tickets via mobile devices	33%	45%	63%
Sale of travel tickets online	22%	30%	48%

Source: IZI processing on ISTAT data, Urban Mobility year 2020

The attention to private vehicular transport seems to find further confirmation in the greater presence of infomobility systems aimed at private transport, which, in the case of electronic parking payment systems, even exceed the national average.

TAB.16- PERCENTAGE OF CAPITAL MUNICIPALITIES WHERE INFOMOBILITY SYSTEMS FOR PRIVATE TRANSPORT ARE ACTIVE (2020)

INFORMATION SYSTEMS FOR PRIVATE TRANSPORT	SICILY	NOON	ITALY
Traffic information service via SMS	11%	8%	18%
Electronic parking payment systems via mobile devices	89%	73%	83%
Electronic gates for access control of restricted traffic zones	56%	65%	73%

Source: IZI processing on ISTAT data, Urban Mobility year 2020

3 THE OP ERDF SICILY 2014-2020 AND THE STRATEGIC CONTEXT OF REFERENCE

3.1 COHESION POLICY IN SICILY: THE ERDF OP 2014-2020

The European Regional Development Fund (ERDF) represents one of the main financial instruments within the European Union's Cohesion Policy. It aims to contribute to reducing the gap between the different levels of development of European regions and to promote improvements in the standard of living in less privileged areas, with particular reference to rural areas, areas affected by industrial transition and regions have serious and permanent natural or demographic disadvantages, such as regions characterized by very low population densities, island, cross-border and mountain regions.

The strengthening of its economic, social and territorial cohesion is one of the fundamental objectives of the EU and constitutes its main investment policy, having represented approximately 1/3 of the community budget for the 2014-2020 programming¹⁸. In this seven-year period, Cohesion Policy has taken shape through the use of the 5 European Structural and Investment Funds (ESIF): the European Regional Development Fund (ERDF), the European Social Fund (ESF), the Cohesion Fund, the European Agricultural Fund for Rural Development (EAFRD) and the European Maritime and Fisheries Fund (EMFF). Through them, Cohesion Policy has provided the financial and operational support to achieve, at regional and territorial level, the priorities established for the EU by the Europe 2020 Strategy for Growth:

- **intelligent**(better education, more research, use of communication technologies);
- **sustainable**(resource efficient, greener and more competitive economy);
- **inclusive**(more better jobs, investment in skills and training, modernization of the labor market and welfare systems and spreading the benefits of growth to all EU regions).

To maximize their contribution to the Europe 2020 strategy, the five ESIF funds have resulted in 11 Thematic Objectives (TOs), broken down in accordance with the priorities described according to the following breakdown:



Starting from the community framework, each member state was called to accept these objectives and at the same time establish its own strategy and methods of use of ESI funds through the stipulation of specific Partnership Agreements (AdP) with the European Commission¹⁹.

¹⁸ From a regulatory point of view, the Cohesion Policy is based on art. 119 of the Constitution and in the Treaty on the Functioning of the European Union (TFEU), as amended by the Lisbon Treaty, while the specific objectives and financial intervention instruments for the 2014-2020 programming cycle were defined by Regulation (EU) no. 1303/2013 of the Council of 17 December 2013, containing common provisions on the European Structural and Investment Funds (FSIE).

¹⁹ As regards Italy, this Agreement was adopted on 29 October 2014 and then subsequently modified in order to include within it the greater community resources assigned to Italy following the technical adaptation of the Multiannual Financial Framework 2014-2020, carried out in accordance with the art. 92, par. 3, of Regulation (EU) n.1303/2013. These changes were approved by the Commission with the Implementing

In Italy, the resources deriving from the ESI Funds (all, excluding the Cohesion Fund) amount overall to around 64 billion euros of EU share, to which must be added around 31 billion euros of national co-financing, for a total of almost 95 billion euros of total public spending.

TAB.17- DISTRIBUTION OF ESI FUNDS RESOURCES IN ITALY (28 FEBRUARY 2023²⁰, MEURO)

BOTTOM	PUBLIC SPENDING		
	TOTAL	EU	STATE
ERDF	38,407.42	28,577.74	9,829.68
ESF	27,450.21	20,152.20	7,298.01
EAFRD	27,878.38	14,349.75	13,528.63
EMFF	979.49	537.26	442.23
TOTAL	94,715.50	63,616.95	31,098.55

Source: MEF²¹

The total amount of these resources is managed through 83 Operational Programs of which: 15 are owned by central Administrations; 68 owned by the regional Administrations/Autonomous Provinces (39 Regional Operational Programs - POR; 8 Operational Programs of Territorial Cooperation - CTE; 21 Rural Development Programs - PSR). Cohesion Policy resources are also allocated by Region category based on the level of GDP per capita compared to the EU-28 average²².

FIG.7- DIFFERENTIATION OF REGIONS ON THE BASIS OF GDP PER CAPITA IN RELATION TO THE EU-28 AVERAGE



As regards specifically Sicily, it is part of the five so-called "Less Developed Regions", together with Basilicata, Calabria, Campania and Puglia. The resources allocated for the Cohesion Policy, solely from the ERDF and ESF Funds, in the Region amount to a total of approximately 5 billion euros, representing almost a third of the total resources allocated for the Least Developed Regions in Italy. Of these, 4,557,908,024 euros are from the European Regional Development Fund.

DecisionC(2018) 598 final, of 8 February 2018. In the context of the health crisis produced by the Covid-19 pandemic, the European Commission has also adopted specific measures in order to support Member States, guaranteeing them immediate availability of resources and introducing a specific exceptional supplement for flexibility in the use of the Funds. The Commission has also allocated additional resources from the EU budget 2021-2027 to the 2014-2020 cohesion policy for the years 2021 and 2022 through the REACT-EU (Recovery Assistance for Cohesion and the Territories of Europe) initiative. This initiative supported operations under the new thematic objective "Promote overcoming the effects of the crisis in the context of the COVID-19 pandemic and its social consequences and prepare a green, digital and resilient recovery of the economy", which went in addition to the 11 thematic objectives mentioned above.

²⁰ Monitoring of Cohesion Policies - Programming 2021 – 2027 and Programming 2014 – 2020, Situation as of 28 February 2023

²¹ Department of State General Accounting, General Inspectorate for financial relations with the European Union.

²² Less developed regions: with a GDP per capita lower than 75% of the community average. Regions in transition: with a GDP per capita between 75% and 90% of the community average. More developed regions: with a GDP per capita higher than 90% of the community average.

TAB.18- DISTRIBUTION OF COHESION POLICY FUNDS FOR THE SICILIAN REGION: ERDF AND ESF FUNDS (MEURO)

	PUBLIC SPENDING		
	TOTAL	EU	STATE
Sicily: Total ERDF+ESF	5,093.14	4,033.50	1,059.64
ERDF	4,273.04	3,418.43	854.61
ESF	820.10	615.07	205.03
RMS: Total ERDF+ESF	17,595.30	13,649.07	3,946.23
of which ERDF	14,283.11	11,173.35	3,109.76
of which FSE	3,312.19	2,475.72	836.47

Source: MEF

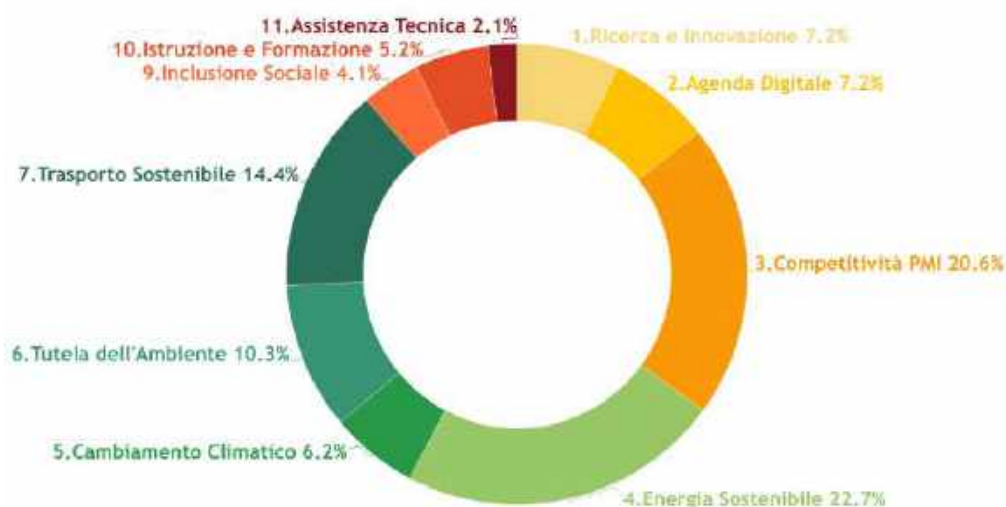
Notes: Approximate values

The OP ERDF Sicily 2014-2020 contributes to the implementation of the European Strategy for intelligent, sustainable and inclusive growth, directing it towards the recovery of the structural deficits present in the Sicilian Region and the promotion of greater economic, social and territorial cohesion, on the basis of a analysis of the needs, problems and opportunities of the territory.

Starting from a complex context, aggravated by the severe international crisis, the OP aims to address, in synergy with the other programs financed by the ESI Funds, some crucial challenges for Sicily, such as: increasing competitiveness; stimulate employment, growth and social and territorial cohesion; improve the quality of life of citizens; enhance territorial, environmental and cultural resources as development drivers; protect the ecosystem and make services more efficient and accessible.

To do this, the ERDF OP is divided into 10 Priority Axes, which follow the Thematic Objectives of the Cohesion Policy previously mentioned (with the exception of OT 8), and concentrates resources in particular on the Axes: 4 - Sustainable Energy and Quality of Life (22.7%), 3 – Promoting the Competitiveness of SMEs, the Agricultural Sector and the Fisheries and Aquaculture Sector (20.6%) and 7 – Sustainable Transport Systems (14.4%).

GRAPH.31- PO ERDF SICILY 2014-2020: DISTRIBUTION OF RESOURCES BY THEMATIC AXES



Source: State of financial progress OP ERDF 2014/2020 as of 28 February 2023

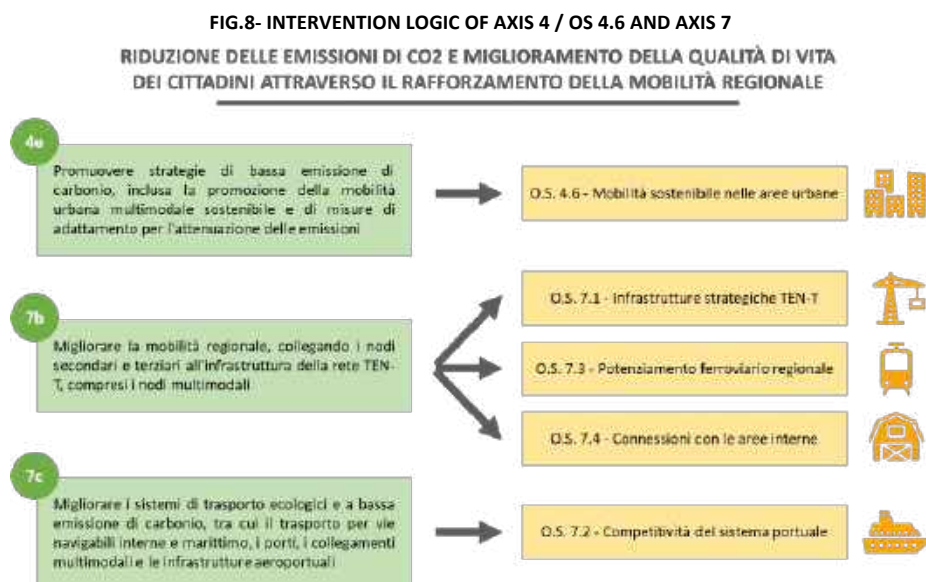
3.2 THE OP ERDF SICILY 2014-2020 STRATEGY FOR SUSTAINABLE MOBILITY

Through the implementation of Axis 4 / OS 4.6 and Axis 7, the intervention strategy of the OP ERDF Sicily 2014/2020 aims to strengthen the regional mobility system, developing infrastructure and transport services, and promoting sustainable strategies and carriers in order to reduce CO₂ emissions and improve the quality of life for citizens.

In fact, considering the state of development of the infrastructure and transport services in the area, which as seen previously places Sicily in a non-optimal position compared to the Italian average, investing in modernization and strengthening interventions in Sicily has taken on an importance fundamental to the economic growth and well-being of the region.

Sicily, with its strategic positioning in the Mediterranean Sea, has enormous potential to become an international trade and tourism hub. In this sense, acting on the mobility and transport system means improving both internal and external connectivity of the island, encouraging the movement of people and goods and thus facilitating trade with the rest of Europe and the world; reduce dependence on the car, helping to improve air quality and reduce traffic and road congestion, bringing with it a positive impact on the environment and citizens' health; attract a greater number of visitors and stimulate the growth of the tourism sector, creating new job opportunities and promoting the socio-economic development of the Region.

Below is a summary graphic representation of the intervention logic underlying the joint implementation of Axis 4 / OS 4.6 and Axis 7.



In this context, Axis 4/OS 4.6 specifically aims to increase sustainable mobility in urban areas, having as its Investment Priority that of "Promoting low carbon emission strategies for all types of territories, in particular for urban areas, including the promotion of sustainable multimodal urban mobility and adaptation measures aimed at mitigating emissions". The situation of the Region in terms of supply of public transport and routes and measures dedicated to soft mobility presents, as seen in the analysis of the context, serious shortcomings, both in urban and extra-urban areas.

In particular, in Sicilian cities, the use of public transport is largely lower than the national average, given that it is related to an offer of seat-km by the TPL in the provincial capitals equal to almost half of the respective national value at which naturally corresponds to a particularly high motorization rate.

Similarly, the offer of cycle paths, where present, has a very low density, lower than the average of the cities of the South, which already have values largely lower than the cities of the Centre-North. As part of this objective, the Sicilian Region therefore aims to protect the quality of the urban environment and the health of citizens by implementing sustainable urban mobility strategies which, through the improvement and integration of transport vectors and various complementary measures, allow: (a) to shift the greater share of traffic from private vehicles to collective means of transport; (b) improve access to large urban centers in sustainable ways; (c) encourage the use of vehicles with low environmental impact as an alternative to more polluting private vehicles.

There are four Actions activated within this strategy to achieve OS 4.6, as shown in the following diagram, where the Result Indicators envisaged by the Program for the Specific Objective are also shown, the progress of which is reported in the Attachment 2.

AXIS	PRIORITY' INVESTMENT	OBJECTIVE SPECIFIC	INDICATORS OF RESULT	ACTIONS
4 - Sustainable Energy and Quality of Life	4e - Promote low carbon strategies for all types of territories, in particular for urban areas, including the promotion of sustainable multimodal urban mobility and adaptation measures aimed at mitigating emissions	4.6 - Increase sustainable mobility in urban areas	4.6 - Use of public transport by employed people, students, schoolchildren and users of public transport (%);	4.6.1 - Creation of infrastructures and interchange nodes aimed at increasing collective mobility and the eco-compatible distribution of goods and related transport systems
			4.6.a - Emissions of greenhouse gases from road transport (Teq CO ₂ /1000);	4.6.2 - Renewal of rolling stock
			4.6.b - Concentration of PM ₁₀ in the area in the provincial capital municipalities (number of days)	4.6.3 - Intelligent transport systems
				4.6.4 - Development of the infrastructure necessary for the use of the vehicle with low environmental impact

4.6.1 - Creation of infrastructures and interchange nodes aimed at increasing collective mobility and the eco-compatible distribution of goods and related transport systems

Action 4.6.1 aims to complete and strengthen the low environmental impact public rail transport system, with particular reference to the guided mass transport system, in the larger Sicilian cities.

Specifically, the Action intervenes on the extension of the Circumetnea railway network in the Catania metropolitan section, from the central station to the Stesicoro airport, and on the railway doubling of the Palermo-Carini section, already included as a Major Project in the previous Programming, and on the closure of the Palermo railway ring. The interventions were selected in continuity with the previous programming and on the basis of the Regional Transport Plan and the Urban Mobility Plans, in coordination with the PON Metropolitan Cities.

4.6.2 - Renewal of rolling stock

Action 4.6.2 intervenes in order to renew the public transport fleets by rail and road in the major urban areas of Sicily, through the purchase of new traction units (UDT) for the Circumetnea Railway and the renewal of the buses intended for urban public transport. The intervention focused on contexts with greater demand for mobility, serious sustainability problems and risks to citizens' health.

4.6.3 - Intelligent transport systems

Action 4.6.3 focused on the implementation of systems, technologies and innovations in the main urban centers of Sicily in order to: (a) detect and monitor the flow of public and private traffic for the planning and reorganization of mobility and of services; (b) improve the management of the LPT fleet and operational planning, facilitate the monitoring and evaluation of services, enhance accessibility for vulnerable segments of the population, provide information to users through intelligent signage and information panels; (c) promote tariff integration in the territory through the introduction of intelligent travel tickets.

4.6.4 - Development of the infrastructure necessary for the use of the vehicle with low environmental impact

Action 4.6.4 aimed to integrate travel on low environmental impact vehicles into sustainable mobility systems, allowing the reduction of polluting loads deriving from urban traffic and at the same time promoting the improvement of the urban landscape and the valorisation of places of historical, cultural and naturalistic importance. The interventions are activated in the provincial capitals and in cities with a population of no less than 30,000 inhabitants. They were selected in continuity with the previous programming and on the basis of the Urban Mobility Plans of the Local Authorities.

Axis 7 "Sustainable Transport Systems" is divided into two Investment Priorities, 7b and 7c respectively, which in turn branch into different Specific Objectives to which the related Actions correspond.

As regards Investment Priority 7b "Improving regional mobility, connecting secondary and tertiary nodes to the infrastructure of the TEN-T Network, including multimodal nodes", it fits within a regional context in which, despite the large investments undertaken during the previous Programming, the railway and road offer still shows considerable deficits.

In particular, as extensively analyzed in the previous chapter 2 relating to the context, the shortcomings in the infrastructure and service offering of the railway transport system seem to significantly influence the demand for rail mobility, which therefore presents very low values both with reference to passenger traffic than to the goods one. Likewise, despite a significant road network, it still presents numerous gaps, which materialize in service limitations, safety problems and a growing maintenance deficit, in particular with regard to the internal areas of the territory. These difficulties often translate into the isolation of rural areas from urban centres, as well as the failure to connect significant agricultural and agro-industrial production districts with the main road and railway axes of the TEN-T network.

Faced with this situation, the Sicilian Region has intended to invest in interventions to strengthen the railway system through: the renewal and safety of some railway sections of regional interest, in order to improve the quality of service, efficiency and speed of connections, and to thus guarantee the movement of significant amounts of traffic of people and goods by rail; the strengthening of the railway network through strategic interventions for connection/supply to the TEN-T network in line with European policies.

At the same time, the Region's strategy has focused on strengthening the connections of the secondary and tertiary nodes of the internal areas and areas with a strong agricultural vocation with the primary road network and the main logistics and intermodal exchange hubs, in order to facilitate exchanges and promote social inclusion.

Within this Investment Priority there are three Specific Objectives and as many Actions and Result Indicators, according to the following scheme.

AXIS	PRIORITY' INVESTMENT	OBJECTIVE SPECIFIC	INDICATORS OF RESULT	ACTIONS
7 - Sustainable Transport Systems	7b - Improve regional mobility by connecting secondary and tertiary nodes to the TEN-T infrastructure, including multimodal nodes	7.1 - Strengthening the railway offer and improving the service in terms of quality and travel times	7.1 - Rail freight traffic index (%)	7.1.1 - Complete the strategic infrastructures relating to the arches and nodes of the central European network and in particular the railway "Major Projects", concentrating the interventions on the 4 priority routes that cross Italy identified by the TEN-T community scheme and eliminating the bottlenecks
		7.3 - Regional railway upgrading, modal integration and improvement of multimodal connections with the main urban, production and logistics nodes and the central, global and local network	7.3 - Rail transport utilization index (%)	7.3.1 - Strengthen regional and interregional public transport services on routes with significant potential demand
		7.4 - Strengthening connections with the global network of internal areas	7.4 - Accessibility index towards urban and logistics nodes (Minutes)	7.4.1 - Strengthen the connections of agricultural and agri-food centers to the network

7.1.1 - Complete the strategic infrastructures relating to the arches and nodes of the central European network and in particular the railway "Major Projects", concentrating the interventions on the 4 priority routes that cross Italy identified by the TEN-T community scheme and eliminating the bottlenecks

In line with community policy and in coordination with the PON "Infrastructures and Networks", Action 7.1.1 focused on the completion of the Palermo-Carini railway doubling, as seen already included as a Major Project in the previous Programming and foreseen by the Contract Institutional Development Agreement (CIS) of 2013 between the Sicily Region, the MCT, MIT and RFI.

7.3.1 - Strengthen regional and interregional public transport services on routes with significant potential demand

Action 7.3.1 aimed to promote the "networking" of the regional railway system, through interventions to strengthen, modernize and renew the rolling stock, with a view to linking the existing network and integrating it with different means of transport. The projects were selected on the basis of the PIIM in order to improve the quality of the service, satisfy the demand of users (especially commuters) and encourage an increase in the market share of rail transport of people and, in particular, of goods.

7.4.1 - Strengthen the connections of agricultural and agri-food centers to the network

In line with the Partnership Agreement and the national strategy for Internal Areas, Action 7.4.1 had the objective of promoting social inclusion and promoting the competitiveness of internal areas and agricultural and agro production districts -industrial, through the completion, reconnection and safety of secondary roads and their connection with the main road and railway axes of the TEN-T network.

Finally, with regard to Investment Priority 7c "Develop and improve ecological transport systems (including low noise ones) and low carbon emissions, including inland waterway and maritime transport, ports, multimodal connections and airport infrastructures, in order to encourage sustainable regional and local mobility", it is part of a broader strategy which sees as programmatic reference the PIIM, the APQ "Maritime transport", the APQ "Goods transport and Logistics" and the European strategy for the strengthening of the Motorways of the Sea, operating in close synergy with the PON "Infrastructures and networks". As fully described in Chapter 2, the insular nature of Sicily and its strategic position at the center of the Mediterranean determine the presence of a very important maritime infrastructure, with the transport of goods by coastal navigation constituting as much as 35% of the total of the modalities. From these considerations it is therefore clear that the degree of competitiveness of the Sicilian port and freight terminal system has a strong impact on the general levels of competitiveness, productivity and attractiveness of the regional economy, constituting an element of strategic investment at both a regional and national level. This priority was therefore aimed at strengthening and strengthening ports of national importance and optimizing the functions and specializations of commercial ports and regional freight terminals, in order to increase maritime traffic flows of goods and integrate the port and freight terminal system with other modes of transport. In broader terms, these interventions also aim to reduce long-distance road freight traffic, contributing to promoting environmental sustainability and limiting direct and indirect transport costs.

Investment Priority 7c is divided into a single Specific Objective which corresponds to a single Action and a single Result Indicator.

AXIS	PRIORITY INVESTMENT	OBJECTIVE SPECIFIC	INDICATORS OF RESULT	ACTIONS
7 - Sustainable Transport Systems	7c - Develop and improve environmentally friendly (including low-noise) and low-carbon transport systems, including inland waterway and maritime transport, ports, multimodal connections and airport infrastructure, in order to promote sustainable regional and local mobility	7.2 - Increase in the competitiveness of the port and freight terminal system	7.2 - Rail freight traffic generated by ports and freight terminals (Trains/Year)	7.2.2 - Strengthen port and freight terminal infrastructures and equipment of regional interest, including their adaptation to the best environmental, energy and operational standards (infrastructures and technologies of the global network)

7.2.2 - Strengthen port and freight terminal infrastructures and equipment of regional interest, including their adaptation to the best environmental, energy and operational standards (infrastructures and technologies of the global network)

The objective of Action 7.2.2 was to strengthen regional freight terminals and promote the commercial specialization of Sicilian ports of regional interest through the implementation of interventions for the consolidation, expansion and safety of port piers, the supply of technological systems and the development of infrastructure for intermodality.

SECTION II - THE RESULTS OF THE EVALUATION

4 PROGRAM EFFICIENCY: PERFORMANCE, TIMES AND METHODS

EVALUATION QUESTION n.T3

Were the funds disbursed within the expected times and methods and in compliance with the initial budget?

SYNTHETIC ANSWER

From the point of view of the overall progress of the operations examined, a good level of commitments is generally found for both Axes, with 97% for Axis 4 / OS 4.6 and 89% for Axis 7, and in particular for Actions 4.6.1 and 7.4.1 which represent the largest financial allocation, mainly by virtue of the Major Projects that they subsidize.

As regards spending capacity, however, it is not particularly high, with Axis 7 standing at 61% and Axis 4 / OS 4.6 only at 50%. This data appears to be influenced by Action 4.6.1 which, with a budget equal to 85% of the Axis, has a spending capacity equal to 49%.

In general, it is clear that the advancement of the Axes examined has suffered the consequences of a double dimension of implementation: one linked to the construction of major works, which saw a huge concentration of resources on a few qualified subjects, and the other connected instead to the territorial implementation tools (Urban Agenda and Strategy for Internal Areas), in which the implementation of the projects was delegated to the Local Authorities. As regards the first case, the state of progress of the interventions proves promising, presenting concrete and measurable results that testify to the success of this implementation method. The greatest delays are instead recorded in the second type of projects entrusted to Local Authorities, which have reported many difficulties and critical issues in the implementation process including, in particular, the complexity of the bureaucratic procedures, often faced with insufficient staff, a limited capacity to mobilize its own resources and delays in the disbursement of funding by the Region.

EVALUATION QUESTION n.T4

What were the effects of the Covid-19 pandemic emergency on the implementation of the Program?

SYNTHETIC ANSWER

The effects of the Covid-19 pandemic emergency on the implementation capacity of the ERDF OP, as regards the Actions examined by this study, were minimal.

In particular, with reference to infrastructural interventions, where there were open construction sites, the suspension of activities linked to the lockdown was short-lived (we are talking about a few weeks or months). The major delays recorded in the completion of projects must instead be attributed to other factors, first of all the critical issues and timing for the awarding of public contracts and their execution.

Even the increase in raw material prices linked to the inflationary spiral and the energy crisis following the Russia-Ukraine war did not influence the implementation of the interventions, except in relation to evident slowdowns due to the need to proceed with contractual variations to adapt the projects to price lists that were gradually changing.

4.1.1 OVERALL IMPLEMENTATION

The interventions aimed at public transport services activated within the OP ERDF 2014-2020 as of 31 August 2023 are 72, 30 relating to Axis 4, OS 4.6 - Increasing sustainable mobility in urban areas, and 42 relating to Axis 7 - Sustainable Transport Systems, for a total of approximately 1.67 billion in public spending, mainly concentrated within Action 4.6.1 for Axis 4 and Action 7.4.1 for Axis 7.

The data from the Caronte monitoring system highlights the following situation in terms of admitted cost, commitments and payment for the individual actions considered in this evaluation.

TAB.19- PROGRESS FOR THE ACTIONS OF AXIS 4 / OS4.6 AND 7 OF THE ERDF OP (MEURO, AUGUST 2023)

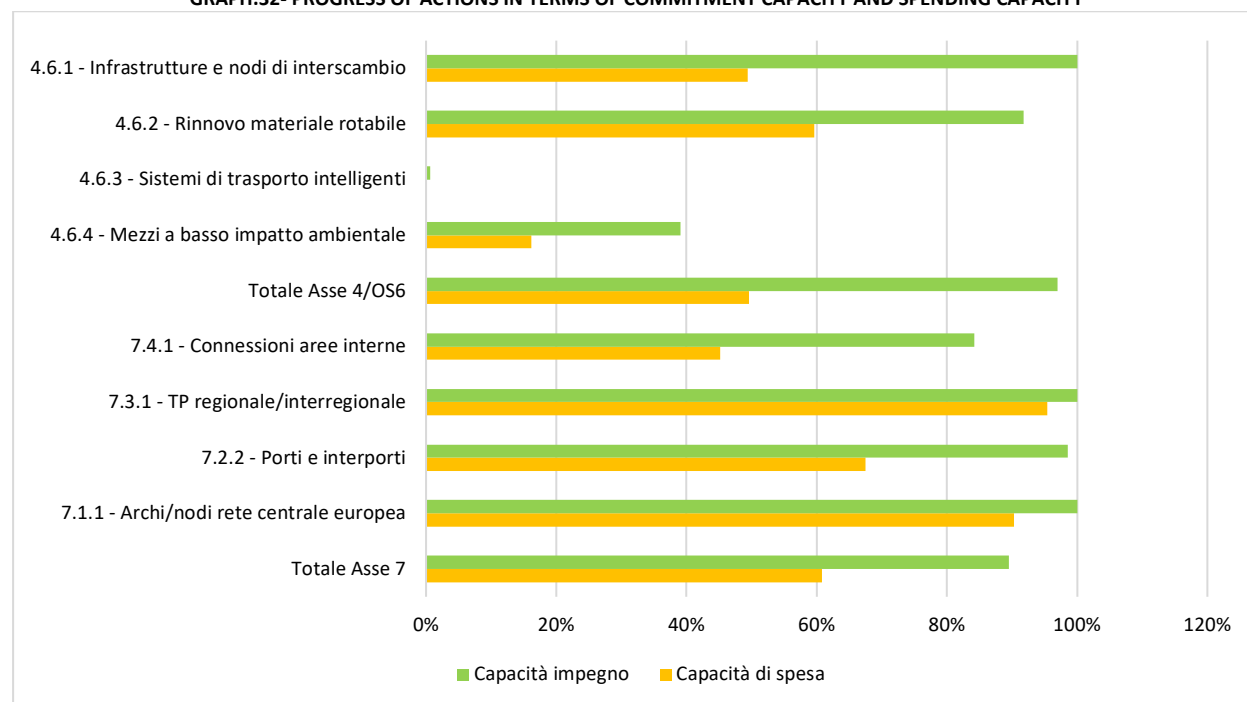
AXIS / ACTION	COST ADMITTED	ENGAGEMENTS	PAYMENTS	No PROJECTS
AXIS 4 / OS 4.6 INCREASE SUSTAINABLE MOBILITY IN URBAN AREAS				
4.6.1 - Infrastructures and interchange nodes: collective mobility and eco-compatible distribution of goods	503,418	503,461	248,736	4
4.6.2 - Renewal of rolling stock	72,038	66,117	42,962	9
4.6.3 - Intelligent transport systems	3,667	0.022	0.000	6
4.6.4 - Infrastructures necessary for the use of the vehicle with low environmental impact	14,043	5,491	2,274	11
Total Axis 4/OS6	593,166	575,091	293,972	30
AXIS 7 SUSTAINABLE TRANSPORT SYSTEMS				
7.1.1 - Strategic infrastructures relating to the arcs and nodes of the European core network	41,279	41,279	37,288	1
7.2.2 - Strengthen port and freight terminal infrastructure and equipment	281,410	281,410	268,503	6
7.3.1 - Strengthen regional and interregional public transport services on routes with significant potential demand	40,245	39,654	27,182	2
7.4.1 - Strengthen the connections of agricultural and agri-food centers to the network	718,876	605,521	324,850	33
Total Axis 7	1,081.809	967,864	657,822	42
TOTAL TRANSPORT	1,674.975	1,542.956	951,794	72

Source: Caronte Information System

In terms of progress, there is a good level of commitment for both axes (97% for Axis 4 / OS4.6 and 89% for Axis 7), and for the actions that have a greater financial endowment, i.e. the actions 4.6.1 and 7.4.1.

The spending capacity, on the other hand, is not high, in particular with reference to Axis 4 / SO 4.6 for which it stands at 50%, being influenced by Action 4.6.1 which, with a budget equal to 85% of the Axis, has a spending capacity of 49%.

GRAPH.32- PROGRESS OF ACTIONS IN TERMS OF COMMITMENT CAPACITY AND SPENDING CAPACITY



Source: Caronte Information System

All the actions were activated by the director, with the exception of actions 7.2.2 - Strengthen port and freight terminal infrastructures and equipment of regional interest, including their adaptation to the best environmental, energy and operational standards and 7.3.1 - Strengthen the regional and interregional public transport on routes with significant potential demand, which have also seen the activation of proprietary interventions.

Below is the description of the interventions activated within the two Axes / OS. The level of detail of the analyzes and information depends, as already anticipated in the introduction to the report, on the progress of the evaluation activities and in particular of the field investigations.

4.1.2 THE PROJECTS ACTIVATED WITHIN AXIS 4 / OS 4.6

As part of Action 4.6.1, aimed at creating infrastructures and interchange nodes for the purposes of increasing collective mobility and the eco-compatible distribution of goods and related transport systems, 3 interventions have been activated regarding the growth of the sustainability of transport systems mobility in urban centres.

In particular, as foreseen by the OP, the action took place in continuity with the previous programming on the Circumetnea Railway - Catania Metro through a project that contributes to the completion of the city's metropolitan system²³.

Two other projects concern railway sections within the municipality of Palermo. One is related to the Palermo – Carini railway doubling, and is part of the Grand Project “Palermo railway hub: La Malfa/EMS – Carini section” aimed at supporting a single multimodal European transport space, investing in the TEN-T network. The section, moreover, is affected by another project financed under the OP and specifically, as will be better seen later, under Action 7.1.1. The second concerns the closure of the Palermo railway ring.

TAB.20- PROJECTS ACTIVATED UNDER ACTION 4.6.1 (MEURO, AUGUST 2023)

PROJECT	ALLOWED COST	ENGAGEMENTS	PAYMENTS	COMMITMENTS / ALLOWED COST	PAYMENTS / ADMITTED COST
Extension of the railway network in the Catania metropolitan section from the Central Station to the Airport – Stesicoro-Palestro (1st Lot), Circumetnea Railway	60,429	60,472	36,218	100%	60%
Railway doubling Palermo - Carini - Section B - Notarbartolo - EMS/La Malfa	290,894	290,894	183,418	100%	63%
Closure of the Palermo railway ring	152,095	152,095	29,100	100%	19%
TOTAL	503,418	503,461	248,736	100%	49%

Source: Caronte Information System

All projects are carried out in synergy with the PON Infrastructure and Networks or the PSC Ministry of Infrastructure and Transport.

TAB.21- OTHER TOOLS AFFECTING THE SECTIONS SUBJECT TO INTERVENTION THROUGH ACTION 4.6.1

PROJECT	OTHER TOOLS	BOTTOM
Extension of the railway network in the Catania metropolitan section from the Central Station to the Airport: Nesima Misterbanco Centro section, 1st functional lot Nesima – Monte PO	PSC Ministry of Infrastructure and Transport 2014-2020	FSC
Railway doubling Palermo - Carini - Section B - Notarbartolo - EMS/La Malfa	PON ERDF Infrastructure and Networks 2014-2020	ERDF
Palermo hub - Command and control system for railway circulation (1st phase)	PON Infrastructures and Networks 2014-2020	ERDF
Palermo Railway Ring: Giachery – Politeama – Notarbartolo section	PSC Ministry of Infrastructure and Transport 2014-2020	FSC

Source: OpenCoesione

Action 4.6.2, aimed at renewing public transport fleets with the introduction of a low environmental impact system, saw the activation of 9 interventions.

A first project, which integrates with the Great Project "Circumetnea Railway - Catania Metro", saw the purchase of 10 traction units to be used for public transport for the metropolitan section of the Government Management of the Circumetnea Railway (as foreseen by the Plan).

The other 8 refer to the purchase of low environmental impact vehicles in order to renew the fleet of various urban areas, in particular in the municipalities of: Marsala, Agrigento, Caltanissetta, Siracusa, Messina, Palermo and Bagheria.

²³ The two projects fit together as part of the major project "Circumetnea Railway - Catania Metro" which aims to complete the metropolitan section of the Catania Circumetnea Railway, between Piazza Stesicoro and Fontanarossa airport.

The only projects which show spending commitments and payments are related to the purchase of traction units for the Circumetnea Railway (commitments equal to 100% of the admitted cost and disbursements of 90%), the intervention relating to the Municipality of Marsala, which participated in a direct call for tenders from the Siliana Region, winning a lot for the purchase of 20 euro 6 methane or diesel buses (commitments equal to 75% of the admitted cost and disbursements of 67%) and the two projects of the Messina Urban Authority which always involve the purchase of rolling stock.

Conversely, the Municipality of Palermo and the Municipality of Bagheria, which have resorted to CONSIP for the purchase of vehicles with low environmental impact, see a risk of non-closure of the projects as the identified supplier has not delivered the vehicles, as noted in the during the interview carried out with the representatives of the Urban Authority.

TAB.22- PROJECTS ACTIVATED UNDER ACTION 4.6.2 (MEURO, AUGUST 2023)

PROJECT	COST ADMITTED	ENGAGEMENTS	PAYMENTS	COMMITMENTS / ALLOWED COST	PAYMENTS / ADMITTED COST
Supply of n. 10 Traction Units to be used for public transport for the metropolitan section of the Government Management of the Circumetnea Railway	41.267	41.267	37.086	100%	90%
Allocation of 20 buses intended for collective public service	4.438	3.315	2.984	75%	67%
AU Agrigento - Municipality of Agrigento - Supply of n. 2 very short buses, 6.30/7.20 in length, class I, diesel-powered, euro 6 for local public transport	0.276	0.000	0.000	0%	0%
AU Caltanissetta Enna - Municipality of Caltanissetta Purchase of minibuses for eco-sustainable local public transport and transformation of the municipal car fleet with low impact vehicles	1,491	0.000	0.000	0%	0%
AU Siracusa - Municipality of Siracusa - Renewal of urban public transport fleets, with the introduction of systems and vehicles with low environmental impact, used to carry out collective public services - Purchase of 10 methane buses	2.500	0.000	0.000	0%	0%
AU Messina - Messina Municipality Supply of n. 2 city buses powered by diesel, cat. M3, class 1, Euro VI length 10.50 m (Lot 2) - n. 4 city buses powered by diesel, cat. M3, class 1, euro VI length 12 (lot 3) - n. 4 city buses	3.708	3.490	2.578	94%	70%
AU Palermo Bagheria - Municipality of Palermo - Sustainability of public services and urban mobility: Project to strengthen local public transport on some city lines through the acquisition of new ecological Euro 6 buses	17.230	16.962	0.000	98%	0%
AU Palermo Bagheria - Municipality of Bagheria Sustainable mobility through public urban transport in the areas of the Municipality of Bagheria	0.799	0.767	0.000	96%	0%
AU MESSINA II NOTICE_AU_ME_4.6.2_02	0.328	0.315	0.315	96%	96%
TOTAL	72.038	66.117	42.962	92%	60%

Source: Caronte Information System

The interventions activated by the Urban Authorities of Palermo - Bagheria for the Municipality of Palermo and Messina are synergistic with similar interventions activated under the Metropolitan Cities PON 2014-2020 which always involve the purchase of rolling stock. The synergy between the two tools allows the two municipalities to increase the level of replacement of the bus fleet intended for LPT, making the contribution in terms of reducing greenhouse gas emissions from LPT (or road) more effective.

TAB.23- ACTION 4.6.2 INTERVENTIONS ACTIVATED IN SYNERGY WITH OTHER INSTRUMENTS

PROJECT	OTHER TOOLS	BOTTOM
AU Messina: Supply of n. 2 city buses powered by diesel, cat. M3, class 1, Euro VI length 10.50 m (Lot 2) - n. 4 city buses powered by diesel, cat. M3, class 1, euro VI length 12 (lot 3) - n. 4 city buses, Municipality of Messina	PON Metropolitan Cities 2014-2020	ERDF
AU Palermo- Bagheria: Sustainability of public services and urban mobility: Project to strengthen local public transport on some city lines through the acquisition of new Euro 6 ecological buses, Municipality of Palermo	PON Metropolitan Cities 2014-2020	ERDF

Source: Caronte Information System and OpenCoesione

Action 4.6.3 saw the activation of 6 projects aimed at implementing intelligent transport systems in the municipalities of: Agrigento, Caltanissetta, Catania, Marsala, Ragusa and Trapani.

There are currently no spending commitments, nor any payments for any of the interventions started. From the information collected, some of the projects appear to be ongoing. The Municipality of Marsala, for example, launched the tender aimed at implementing a fleet monitoring system of the Municipal Road Transport Service and connected infomobility system, just as the Municipality of Ragusa activated the project aimed at improving information on the mobility system urban.

TAB.24- PROJECTS ACTIVATED UNDER ACTION 4.6.3 (MEURO, AUGUST 2023)

PROJECT	ALLOWED COST	ENGAGEMENTS	PAYMENTS	COMMITMENTS / ALLOWED COST	PAYMENTS / ADMITTED COST
AU Western Sicily - Municipality of Trapani - Strengthening of mobility information services? urban and extra-urban - systems of technologies and innovations for improving the performance of LPT	0.332	0.000	0.000	0%	0%
AU Western Sicily - Municipality of Marsala - Project for monitoring the fleet of the Municipal Road Transport Service (SMA) and related infomobility system of the Municipality of Marsala	1.200	0.022	0.000	2%	0%
AU Catania - Acireale - Municipality of Catania - "SMART TPL" Project	1.215	0.000	0.000	0%	0%
AU Agrigento - Municipality of Agrigento - Supply and installation of n. 20 electronic information panels indicating TPL stops	0.100	0.000	0.000	0%	0%
AU Ragusa Modica - Municipality of Ragusa Creation of an integrated system for public transport and intelligent urban mobility	0.350	0.000	0.000	0%	0%
AU Caltanissetta Enna - Municipality of Caltanissetta Installation of systems and technologies in order to increase the use of collective urban transport systems	0.471	0.000	0.000	0%	0%
TOTAL	3.667	0.022	0.000	1%	0%

Source: Caronte Information System

The project of the Municipality of Catania is integrated into a broader infomobility and integrated mobility services project also financed through the PON Metropolitan Cities 2014-2020 and the PON ERDF Infrastructures and Networks 2014-2020.

TAB.25- MUNICIPALITY OF CATANIA: SYNERGISTIC PROJECTS WITH THE PROJECT ACTIVATED UNDER ACTION 4.6.3

INSTRUMENT	PROJECT
PON Metropolitan Cities 2014-2020 (ERDF)	Single Mobility Centre
	Catania To GO – Single digital subscription
	CTA integrated service Moving bike – bus – park
PON Infrastructures and Networks 2014-2020 (ERDF)	Creation of a Smart Moving platform

Source: OpenCoesione

Under Action 4.6.4, projects have been activated aimed at integrating bicycle travel into sustainable mobility systems through the creation of cycle/pedestrian paths. There are seven beneficiary municipalities: Caltanissetta, Castelve-trano, Gela, Mazara del Vallo, Messina, Ragusa and Siracusa.

On an overall level, the progress of the Action is limited: only three projects record disbursements against spending commitments which, moreover, in only one case exceed 80% of the admitted cost.

TAB.26- PROJECTS ACTIVATED UNDER ACTION 4.6.4 (MEURO, AUGUST 2023)

PROJECT	ALLOWED COST	ENGAGEMENTS	PAYMENTS	COMMITMENTS / ALLOWED COST	PAYMENTS / ADMITTED COST
AU Ragusa Modica - Creation of a cycle path in Marina di Ragusa (from Piazza Malta - Lungomare Andrea Doria - via Cav. M. Calabrese)	0.980	0.971	0.853	99%	87%
AU Siracusa - Works for the construction of a cycle path within the urban center - Siracusa - System path (viale S. Panagia to via Ozanam)	0.700	0.000	0.000	0%	0%
AU Siracusa - Works for the construction of a cycle path within the urban center - Siracusa - Pista Gelone Sud - viale S. Panagia to corso Timoleonte	1.800	0.000	0.000	0%	0%
Creation of a cycle path on the urban seafront of Marsala	2.000	1.345	0.404	67%	20%
Creation of a cycle path from Macchitella to Lungomare Federico II - Gela	0.720	0.000	0.000	0%	0%
AU Enna Caltanissetta - Project for the construction of the Central Sicilian cycle path between Caltanissetta and Enna - municipality of Caltanissetta	2.810	2.560	1.017	91%	36%
AU Western Sicily - Works for the construction of a cycle path connecting the urban center and the Tonnarella coast - 1st functional lot - Municipality of Mazara del Vallo	1.283	0.000	0.000	0%	0%
AU Messina - Interventions to extend the length of cycle paths	0.900	0.000	0.000	0%	0%
AU Western Sicily - Connection Castelvetro Commercial Area with Marinella di Selinunte – Municipality of Castelvetro	0.980	0.616	0.000	63%	0%
AU Western Sicily - Triscina connection with the Selinunte Archaeological Park - Municipality of Castelvetro	0.980	0.000	0.000	0%	0%
AU Western Sicily - Connection Castelvetro with Trinità di Delia - Municipality of Castelvetro	0.891	0.000	0.000	0%	0%
TOTAL	14.043	5.491	2.274	39%	16%

Source: Caronte Information System

In general, the Actions falling within the scope of the Urban Agenda (4.6.2, 4.6.3 and 4.6.4) are those which have had the greatest impact on the administrative burden linked to ERDF funding, both in terms of procedures and timing. In this regard, their implementation was particularly affected by the complexity of the bureaucratic procedures, often faced with insufficient staff, a limited capacity to mobilize own resources and delays in the disbursement of funding by the Region.

4.1.3 THE PROJECTS ACTIVATED WITHIN AXIS 7

Action 7.1.1, which concerns the completion of the strategic infrastructures relating to the European railway corridors of the core network, saw, as envisaged in the Programme, the activation of a single project implemented as part of the Major Palermo Railway Hub Project: Section La Malfa/ EMS – Nice.

TAB.27- PROJECTS ACTIVATED UNDER ACTION 7.1.1 (MEURO, AUGUST 2023)

PROJECT	ALLOWED COST	ENGAGEMENTS	PAYMENTS	COMMITMENTS / ALLOWED COST	PAYMENTS / ADMITTED COST
Completion of the GP Railway doubling Palermo Centrale – Carini Urban section A	41.279	41.279	37.288	100%	90%

Source: Caronte Information System

The project, like the project financed under Action 4.6.1 and relating to the same section, is carried out in coordination with the Infrastructure and Networks PON and presents positive progress both in terms of commitments and payments.

As part of Action 7.2.2, two projects have been activated, one involving the port of Sciacca and a second the port of Sant'Agata di Militello. The two interventions involve works to arrange the quay and works to complete the existing maritime works.

Both projects have a level of commitments equal to or close to 100%, while the project relating to the port of Sciacca records payments of less than 50% of the admitted cost.

TAB.28- PROJECTS ACTIVATED UNDER ACTION 7.2.2 (MEURO, AUGUST 2023)

PROJECT	ALLOWED COST	ENGAGEMENTS	PAYMENTS	COMMITMENTS / ALLOWED COST	PAYMENTS / ADMITTED COST
SCIACCA - Construction works of the terminal section of the north bank quay, of the yards behind it and towing works.	5.143	4.553	2.131	89%	41%
Port of S. AGATA di MILITELLO - Completion of the existing maritime works regarding the extension of the breakwater from station 798.20 m to station 1,150.00, construction of the breakwater pier from station 0.00 to station 610.00 m and the shore quay .	35.102	35.102	25.051	100%	71%
TOTAL	40.245	39.654	27.182	99%	68%

Source: Caronte Information System

Through Action 7.3.1, the program intervened with projects that involved the renewal, rehabilitation and improvement of the safety of the affected routes and the purchase of new trains.

All the projects, whose beneficiary is RFI except that relating to the purchase of new trains for which the Sicilian Region is the beneficiary, are practically completed with payment progress close to 100% in all cases.

TAB.29- PROJECTS ACTIVATED WITHIN ACTION 7.3.1 (MEURO, AUGUST 2023)

PROJECT	ALLOWED COST	ENGAGEMENTS	PAYMENTS	COMMITMENTS / ALLOWED COST	PAYMENTS / ADMITTED COST
Renovation with simultaneous rehabilitation of the ballast of circulation and interchange tracks in the Scicli – Rosolini section of the Siracusa – Canicatti – Caltanissetta line, as well as IS, TLC, CTC and SSC modifications	25.010	25.010	21.190	100%	85%
Purchase of new trains to be allocated to the routes with greater potential demand	182.500	182.500	175.414	100%	96%
Palermo-Trapani railway line via Castelvetro - Alcamo section Branch-Castelvetro-Marsala-Trapani "Technological upgrading with improvement of the safety of the railway infrastructure"	3.400	3.400	3.368	100%	99%
Palermo-Trapani railway line via Castelvetro - Alcamo section Branch-Castelvetro-Marsala-Trapani "Upgrading of the equipment and improvement of the safety of the railway infrastructure"	54.500	54.500	53.325	100%	98%
Canicatti-Gela-Ragusa-Siracusa railway line "Technological and infrastructural upgrade"	11.900	11.900	11.186	100%	94%
Canicatti-Gela-Ragusa-Siracusa railway line "Upgrading and improving the safety of the railway infrastructure"	4.100	4.100	4.021	100%	98%
TOTAL	281.410	281.410	268.503	100%	95%

Source: Caronte Information System

Action 7.4.1 aimed at strengthening the connections of the secondary and tertiary nodes of the internal areas and those where significant agricultural and agro-industrial production districts are located with the main road and railway axes of the TEN-T network, is the one that saw the greatest number of projects activated, 33, for a total admitted cost amount of 718.87 Meuro almost entirely dedicated to the four-lane adaptation project of the SS640 of Porto Empedocle as part of the Agrigento - Caltanissetta itinerary.

The progress in terms of commitments is positive, also in this case the Porto Empedocle project weighs heavily in financial terms, while the payments are not high (only 45% of the admitted cost).

TAB.30- PROJECTS ACTIVATED UNDER ACTION 7.4.1 (MEURO, AUGUST 2023)

SNAI	PROJECT	ALLOWED COST	ENGAGEMENTS	PAYMENTS	COMMITMENTS / ALLOWED COST	PAYMENTS / ADMITTED COST
-	Agrigento-Caltanissetta itinerary - A19 - Upgrading of the SS 640 of Porto Empedocle to four lanes - second section up to km 74 +300 (A19 junction) PHASE 2	683.079	597.702	321.651	88%	47%
Calatino	Extraordinary maintenance work on the SP 143 in the municipality of San Cono	0.295	0.241	0.241	82%	82%
	Extraordinary maintenance work on the SP 60 in the municipality of San Cono	0.295	0.000	0.000	0%	0%
	Extraordinary maintenance works SP 28/III - Connection section between the Municipality of Vizzini and the SS 194	0.987	0.721	0.717	73%	73%
	Extraordinary maintenance works on the SP 86 section connecting the municipalities of Mineo and Vizzini	0.513	0.000	0.000	0%	0%
	Extraordinary maintenance work on the SP 151 in the municipality of Grammichele	0.296	0.000	0.000	0%	0%
	Extraordinary maintenance work on the SS.PP. 196-180 which branches off from the town center of the Municipality of Caltagirone until reaching the SS417	0.998	0.678	0.000	68%	0%
	Extraordinary maintenance works on the SP called ex Scalo Ferroviario, San Michele di Ganzaria	0.300	0.000	0.000	0%	0%
	Extraordinary maintenance work on the SB "Montagna di Ganzaria".	0.300	0.000	0.000	0%	0%
	Urgent works to renovate the road surface and road signs in the section falling within the Municipality of Mineo	0.472	0.000	0.000	0%	0%
	SP75 - Renovation works on the road surface and road signs in the section falling within the Municipality of Grammichele - PO ERDF 2014/2020 – OT 7.4.1 – SNAI Internal Area – Calatino – AICA 25	0.830	0.324	0.000	39%	0%
	Functional redevelopment works of the SP 38/I – Licodia Eubea – Vizzini Scalo - AICA 31	0.500	0.000	0.000	0%	0%
	SP 28/II - Road surface arrangement works, barrier installation, signs and collapsed walls, in the Municipality of Militello in Val di Catania.	0.200	0.000	0.000	0%	0%
	SP no. 11 of Blufi. Extraordinary maintenance works for the arrangement of the road surface and resurfacing of rough sections	0.399	0.000	0.000	0%	0%
Madonie	SP 28 of Lascari and Gratteri B° Piletto - Lascari - Gratteri - B° Piano delle Fate	0.800	0.000	0.000	0%	0%
	Arrangement and safety works in occasional sections of the road plan in the stretch of the SP 60 between Ganfi and B° Calabro' and in the stretch of the SP 52 between Borrello and Finale.	2.000	0.000	0.000	0%	0%
	SP n°9 "Delle Madonie": Campofelice di Roccella - Castelbuono. Restoration and safety works on the roads in occasional sections.	1.500	0.000	0.000	0%	0%
	Arrangement and safety works in occasional sections of the road plan of the SP n° 54 of Piano Battaglia and SP n. 113 Piano Battaglia ring road	1.722	0.000	0.000	0%	0%
	SP n° 9 BIS Camminisi Collesano - B° Firrionello	1.000	0.000	0.000	0%	0%
	SP no. 8 "Di Valledolmo" and SP n. 58 "Di Sclafani Bagni": Arrangement and safety works in occasional sections of the road plan in the stretch between Caltavuturo and Sclafani Bagni.	1.500	0.000	0.000	0%	0%
	SP no. 119 "Di Portella Colla": Polizzi – Portella Colla – Arrangement and safety works on occasional sections of the road plan.	1.500	0.000	0.000	0%	0%
	SS 120 – Arrangement and safety works in occasional sections of the road body and the road surface in the stretch between Km 10+000 and Km 82+000 - AIMA 12L	1.558	0.000	0.000	0%	0%
Nebrodi	Project of maintenance and safety works ROAD ROUTE SP 160 of San Marco d'Alunzio	0.552	0.552	0.266	100%	48%
	Maintenance and safety works on the "SP 146/bis and SP 145 road itinerary of Ponte Naso - Sinagra - Limari"	1.725	1.725	0.516	100%	30%
	Maintenance and safety works on the road route Via Dei Normanni Municipality of San Fratello	0.500	0.000	0.000	0%	0%

SNAI	PROJECT	ALLOWED COST	ENGAGEMENTS	PAYMENTS	COMMITMENTS / ALLOWED COST	PAYMENTS / ADMITTED COST
	Maintenance and safety works on the SS 113 road itinerary - Mirto - Valle Zappulla	2.081	2.081	0.001	100%	0%
	Project of the works "Road Route SP 161 Alcara Li Fusi" - "APQ - Internal Area Nebrodi"	3.000	0.000	0.000	0%	0%
	Arrangement and safety works Road route Sp 176 Castel di Lucio - Mistretta	3.100	0.000	0.000	0%	0%
Simeto - Etna	Extraordinary maintenance works on the SP 44 in the municipality of Biancavilla - internal area "Val Simeto - Etna" Itinerary 2	0.792	0.568	0.553	72%	70%
	Extraordinary maintenance works on the SP 156 - Internal Val Simeto area - Etna Itinerary 1	0.498	0.359	0.349	72%	70%
	Extraordinary maintenance works on the SP 94 in the Municipality of Adrano - Internal Area "Val Simeto - Etna" Itinerary 4	0.792	0.569	0.555	72%	70%
	Reconnection of the road network and restoration of landslide sections of the SP 41 "Centuripe-Stazione Mandalano - B° SP 82". SNAI - Internal area of the Simeto valley. PO ERDF SICILY Area Strategy 2014/2020. Assignment of executive design service and safety coordination during the design phase.	2.490	0.000	0.000	0%	0%
	Reconnection of the road network and arrangement and modernization works of the SP n. 50 Brancavilla Boat Bridge - Scalo Muglia	2.300	0.000	0.000	0%	0%
	TOTAL	718.876	605.521	324.850	84%	45%

Source: Caronte Information System

For the Action 7.4.1, as well as for the Actions falling within the scope of the Urban Agenda, the administrative burden linked to the ERDF financing had a significant impact on the implementation of the interventions, both in terms of procedures that of timing. In particular, the complexity of the bureaucratic procedures weighed on its implementation, often in the face of insufficient staff, a limited capacity to mobilize its own resources and delays in the disbursement of funding by the Region.

4.1.4 THE COVID-19 PANDEMIC EMERGENCY

The Covid-19 pandemic emergency has had a significant impact on the economic and social landscape of the European Union, also significantly influencing the implementation of the Multiannual Financial Framework 2014-2020. Since 2020, in response to the public health crisis resulting from the COVID-19 pandemic, the European Commission has introduced exceptional measures to allow Member States to use the European Structural and Investment Funds more flexibly. This has allowed a reconfiguration of the Operational Programs implemented, with a co-financing rate of up to 100% from European Funds for expenses intended to mitigate the impacts of the pandemic.

Furthermore, through the initiative called "REACT-EU", the European Union has allocated additional resources for cohesion policy over the years 2021 and 2022, specifically to address the consequences of the health crisis caused by Covid-19, going to increase the total resources available from the Structural Funds (ERDF and ESF), both at community level and national co-financing.

Also with regard to the OP ERDF Sicily, the implementation process suffered the effects of the emergency situation generated by the pandemic, which unequivocally transformed the context, procedures and implementation times of the financed interventions.

These circumstances have required several revisions of the Program over the last three years, aimed at optimizing the use of the allocated resources by trying to keep the principles that characterized the original structure consistent, through the introduction of extraordinary measures and changes in spending, mainly focused on providing timely support to beneficiaries in situations of need (first and foremost businesses, companies in the regional healthcare sector and schools and universities)²⁴.

²⁴ See Annual Implementation Reports 2020, 2021, 2022

For the purposes of this evaluation, however, it should be underlined that the qualitative investigations conducted did not highlight any particular negative effects of the Covid-19 pandemic emergency, in terms of procedural delays and/or the need for greater funding, with regards to the Actions examined valid on Axis 4, OS 4.6 and Axis 7.

In particular, with reference to infrastructural interventions, no specific critical issues were found in the concrete start-up and execution phase of the works and, in cases where the construction sites were operational, the interruption of activities due to the lockdown was short-lived with suspension periods of a few weeks.

The main delays recorded in the completion of the projects must instead be attributed to other factors, first of all the critical issues and timing relating to the awarding of public contracts, as well as the effects deriving from the new state of crisis produced by the Russian-Ukrainian conflict.

The latter has in fact produced important repercussions on the economy, significantly impacting the exponential increase in energy costs which has influenced inflation and interest rates, causing delays resulting from the difficulty in obtaining raw materials.

In this context, some of the infrastructural interventions required changes to the project contents to adapt the prices of construction materials.

5 PROGRAM COHERENCE: COMPLEMENTARITY AND SYNERGY BETWEEN TOOLS

EVALUATION QUESTION n.T2

How were the measures envisaged by the ERDF OP complementary to the actions implemented by the PON and those activated through other non-ordinary funds?

How much did the integration of the funds affect the overall result in terms of quality and effectiveness of the service?

SYNTHETIC ANSWER

From the analyzes carried out, a high synergy and complementarity clearly emerges between the different financing instruments used within the transport policy in Sicily, thanks above all to the presence of strategic sectoral programming which manages to guide the integration between a plurality of funds and specific interventions. This degree of planning and coordination is guaranteed in particular by the adoption by the Sicilian Region of an Integrated Infrastructure and Mobility Plan (PIIM), which defines the macro structure of the regional transport system through the identification of strategic works to be achieved and the principles for sustainable management of the mobility of people and goods both in urban and extra-urban areas.

As regards Local Public Transport and the promotion of low environmental impact vehicles in urban areas, the greatest synergy found is that between the ERDF PO and the Metro PON within the framework of the interventions activated in the territories of the three Urban Authorities of Palermo, Messina and Catania (Metropolitan Cities in the case of the PON Metro). In such cases, although a significant complementarity between the two tools was found, from the interviews conducted it emerged that the possibility of accessing two different tools in order to carry out the same intervention has sometimes constituted a critical issue for Local Authorities. In fact, where the choice has not been made to activate a type of intervention through the use of a single financing channel (as for example in the case of Catania, which has launched urban mobility projects solely on the PON Metro), the administrations have often reported difficulties relating to the multiplication of bureaucratic procedures and having to deal with different procedures to be applied to interventions of the same nature. In this sense, a greater rationalization of the tools and a clearer demarcation between regional and national programs could contribute in the future to resolving this critical issue, although it will always be the Local Authorities who will have to have the ability to direct interventions towards a single source of financing in order to optimize procedures and reduce their administrative costs.

With reference instead to the rail, maritime and road transport system, a lesser involvement of the ERDF OP was noted in the activation of interventions aimed at achieving the PIIM objectives, where the contribution of the other financial instruments used by sectoral programming is greater (PON Infrastructures and Networks, PSC Ministry of Infrastructures and Transport, etc.). In this regard, it should however be underlined that, as regards interventions on the road infrastructure and related to major projects, the funding sources were used in an integrated manner, often completing different sections and lots of the same project.

5.1 SECTORAL PLANNING ON TRANSPORT: THE PIIM

The transport sector, and in particular the sustainable mobility of people and goods both in urban and extra-urban areas, is the subject of a plurality of interventions at regional level, financed by various instruments, which move within sectoral programming.

The Sicilian Region adopted the Integrated Infrastructure and Mobility Plan (PIIM) in 2017 which, in coherence with the previous plan (2002), aims to define the macro structure of the regional transport system, with particular attention to the infrastructure theme, focusing attention to the topic of people's mobility in a general sense (from the demand for systematic to occasional mobility), and to the planning of local public transport services by car and rail, proposing an integrated transport system between all the modes in the area, without ignore the transport "nodes", relating to ports, the airport system and goods.

The Plan outlines a framework of objectives and the interventions necessary to achieve them with reference to regional infrastructures / modes of transport: roads, railways, ports, airports, logistics, etc.

The Plan was updated in 2022²⁵, which does not change its structure and confirms the general objectives which still constitute the pillars of regional planning in the transport sector.

The General Objectives defined in the PIIM constitute the pillars of regional planning in the transport sector and are broken down as follows:

1. Increase the level of safety, reliability and sustainability of the transport network.
2. Identify strategic works, in continuity and coherence with national and community planning.
3. Contribute to the development of the European TEN-T transport network, connecting the Sicilian territory with the rest of the country, with Europe and with international traffic in the Mediterranean in an effective, efficient and sustainable manner.
4. **Efficient accessibility**, sea side and land side, towards the regional transport network, favoring an offer of services capable of "attracting" greater levels of commuter and occasional/tourist users.
5. "Bringing together" territorial systems, promoting east-west, north-south connections and accessibility to the internal areas of the island.
6. **Boost up** and make the Sicilian transport system more efficient, reducing the general cost of transport, not only to guarantee the citizen's right to mobility, but also to support economic and territorial growth and development.
7. Building a coordinated and integrated vision of **Sicilian airport system**, maintaining the articulation in the two (natural) traffic basins.
8. Strengthen processes **cohesion between ports in the region and "systemisation"** of the regional network through increased side connections.

Alongside the general objectives indicated above, the PIIM identifies specific objectives (also confirmed by the 2022 update).

- TO)** Bring to levels of **the road system is fully efficient**, through works to strengthen the network, modernize and make the existing assets safe.
- B)** **Speed up the railway system**(also through possible strengthening actions), primarily on medium-distance connections, but without neglecting the secondary network.
- C)** **Rationalize and optimize Local Public Transport**, developing greater iron-rubber synergy, avoiding service overlaps through the specific identification of the "mission" of each mode.
- D)** **Optimize integration between transport systems** through greater rail-road-sea cohesion, to support the modal integration of the demand for mobility and territorial integration, within the regional network.
- AND)** **Create the Logistics System and strengthen and complete the territorial freight transport network**, favoring road-rail, road-ship intermodality and the development of freight terminal nodes.
- F)** **Promote the concept of polarity of the airport system**, developing the idea of the center of gravity of airport networks consistently with the different local vocations.
- G)** **Promote accessibility to "nodes"**(port, airport and urban) priorities of the regional transport network through more efficient rail, road and public transport services (connections).
- H)** **Define/harmonize governance model**transversal on a regional and supra-regional scale for the management of complex transport, passenger and goods systems.
- THE)** **Promote sustainable mobility and the use of vehicles with lower emission impact.**
- J)** Structure a process of progressive computerization of transport systems, also through technological innovation, aimed at increasing the level of service and safety for the mobility of goods and passengers.

²⁵ The update of the Plan responds to the fulfillment of the enabling condition 3.1 "Complete transport planning at the appropriate level" within the planning of the cohesion policy (according to the indications issued by the technical investigation coordinated by the Cohesion Department).

5.2 THE INSTRUMENTS ACTIVE AT REGIONAL LEVEL AND THE COMPLEMENTARITY BETWEEN INTERVENTIONS

The objectives of the PIIM are pursued at a regional level through various instruments that act synergistically within the strategy outlined by the plan, among which the ERDF OP plays a priority role.

Also significant is the weight assumed by the Infrastructure and Networks PON, again co-financed by the ERDF, and aimed at promoting sustainable transport systems and eliminating bottlenecks in the main network infrastructures, which sees the implementation of complementary interventions to the ERDF PO with reference to infrastructure railways, ports and intermodality, intelligent transport systems (ITS) and local public transport.

The following Plans/Programmes which have activated interventions relating to sustainable mobility are also active in the regional territory:

- the Development and Cohesion Plan of the Ministry of Infrastructure and Transport, financed by the Development and Cohesion Fund;
- The Development and Cohesion Plan (PSC) of the Sicilian Region and the Pact for Sicily, financed by the Development and Cohesion Fund.
- the Sicily Complementary Operational Plan and the Infrastructure and Networks Complementary Operational Plan;
- the PON Metropolitan Cities 2014-2020, co-financed by the ERDF;

Finally, the PNRR should not be forgotten.

The analysis of the programmatic documents of the Plans reported above allows us to highlight the synergy between the different instruments and the contribution that each of them provides to the achievement of the specific objectives of the PIIM.

TAB.31- COMPLEMENTARITY BETWEEN THE VARIOUS INSTRUMENTS ACTIVE AT REGIONAL LEVEL IN TERMS OF MOBILITY AND TRANSPORT AND SYNERGY WITH CURRENT SECTORAL PROGRAMMING

INTEGRATED PLAN OBJECTIVES INFRASTRUCTURE AND MOBILITY 1	OP ERDF2	PON Infr. Networks3	PSC Infra-structures3	POC 2	PSC/Pact for Sicily2	PON METRO3
A. Bring the road system to full efficiency levels, through works to strengthen the network, modernize and make the existing assets safe	■	■	■	■	■	
B. Speed up the railway system (also through strengthening actions), primarily on medium-distance connections, but without neglecting the secondary network	■	■	■			
C. Rationalize and optimize Local Public Transport, developing greater rail-road synergy, avoiding service overlaps through the specific identification of the "mission" of each mode	■	■				■
D. Optimize the integration between transport systems through greater rail-road-sea cohesion, to support the modal integration of the demand for mobility and territorial integration within the regional network	■	■				■
E. Create the Logistics System and strengthen and complete the territorial freight transport network, encouraging road-rail, road-ship intermodality, the development of freight terminal nodes	■	■	■	■	■	
F. Promote the concept of polarity of the airport system, developing the idea of the center of gravity of airport networks developed according to different local vocations						
G. Promote accessibility to the priority "nodes" (port, airport and urban) of the regional transport network through more efficient rail, road and public transport services (connections)	■	■	■	■		
H. Define/harmonize transversal governance models on a regional and supra-regional scale for the management of complex transport, passenger and goods systems	■	■				■
I. Promote sustainable mobility and the use of vehicles with lower emission impact	■	■	■		■	■
J. Structure a process of progressive computerization of transport systems, also through technological innovation, aimed at increasing the level of service and safety for the mobility of goods and passengers	■	■				■

Source: ¹Integrated Infrastructure and Mobility Plan

²Caronte Regional Monitoring System

³Open Cohesion

The complementarity and synergy between the different instruments in achieving the objectives of the PIIM noted at the programmatic level is also confirmed in their implementation: the interventions that have found funding through the various Plans and Programs are fully part of the regional strategy, proving synergistic with each other in the contribute to the objectives of the PIIM.

The analysis was carried out through the use of data provided by OpenCoesione which allowed us to reconstruct an overall picture of the interventions aimed at strengthening and improving public transport and transport infrastructures actually activated and implemented in recent years at a regional level.

As seen previously, the interventions that are configured as complementary to the ERDF OP and which were activated within the following instruments were taken into consideration:

- PON Infrastructures and Networks 2014-2020;
- the Development and Cohesion Plan of the Ministry of Infrastructure and Transport, financed by the Development and Cohesion Fund;
- The Development and Cohesion Plan (PSC) of the Sicilian Region and the Pact for Sicily, financed by the Development and Cohesion Fund;
- the Sicily Complementary Operational Plan and the Infrastructure and Networks Complementary Operational Plan;
- the PON Metropolitan Cities 2014-2020, co-financed by the ERDF.

However, due to a lack of official information sources, interventions which benefit from other funds are not considered, first and foremost the PNRR, but also national and/or regional funds.

The analysis was carried out in relation to the objectives of the PIIM, which constitute the sectoral programmatic framework of reference at regional level.

With reference to interventions aimed at speeding up the railway system and promoting accessibility to the "nodes", objectives B and G of the PIIM, the ERDF PO intervenes on three main regional nodes: the Palermo railway hub, the Palermo railway ring and the Circumetnea Metro.

There are 3 projects activated and they are synergic with interventions activated on the same infrastructures and financed through other instruments: PON Infrastructures and Networks 2014-2020, PSC Ministry of Infrastructures and Transport 2014-2020 and PSC Sicily, with a view to complementarity and integration between funds.

TAB.32- INTERVENTIONS THAT FALL WITHIN THE SCOPE OF OBJECTIVES B AND G OF THE PIIM

INFRASTRUCTURE	PROJECT	COST (Meuro)	INSTRUMENT
Palermo Centrale - Carini railway doubling	Urban section A	41.279	OP ERDF Sicily 2014-2020 (Action 7.1.1)
	Route B Notarbartolo - EMS/La Malfa	290.894	OP ERDF Sicily 2014-2020 (Action 4.6.1)
	Malfa/EMS - Nice	765.874	PON Infrastructures and Networks 2014-2020
	Railway circulation command and control system (1st phase)	28.268	PON Infrastructures and Networks 2014-2020
Palermo Railway Ring	Closure of the Palermo railway ring	152.095	OP ERDF Sicily 2014-2020 (Action 4.6.1)
	Palermo Railway Ring: Giachery – Politeama – Notarbartolo section	127.016	PSC Ministry of Infrastructure and Transport 2014-2020
Circumetnea Metro	Stesicoro-Palestro section (1st lot)	60.429	OP ERDF Sicily 2014-2020 (Action 4.6.1)
	Nesima Misterbanco Centro section, 1st functional lot Nesima – Monte PO	100.000	PSC Sicily

Source: Caronte Information System and OpenCoesione

Various interventions financed with the ERDF PO, the PSC of the Ministry of Infrastructure and Transport, the Infrastructure and Networks POC and the Infrastructure and Networks PON 2014-2020, contribute to achieving objective B of the PIIM, speeding up the railway system through modernization and doubling of some Sicilian railway routes. Always within the same objective, both the ERDF PO and the PSC of the Ministry of Infrastructure and Transport intervened through the purchase of new trains, to be allocated to the routes with greater potential demand.

TAB.33- INTERVENTIONS THAT FALL WITHIN THE SCOPE OF OBJECTIVE B OF THE PIIM

DEALS WITH	PROJECT	COST (Meuro)	INSTRUMENT
Regional Railway Network	Purchase of new trains to be allocated to the routes with greater potential demand	182.500	OP ERDF Sicily 2014-2020 (Action 7.3.1)
	Purchase of railway trains for regional rail transport (17 diesel - electric traction)	164.352	PSC Ministry of Infrastructure and Transport
Siracusa – Canicattì – Caltanissetta, Scicli – Rosolini section	Renovation with simultaneous rehabilitation of the roadbed of circulation tracks, IS, TLC, CTC and SSC modifications	25.010	OP ERDF Sicily 2014-2020 (Action 7.3.1)
Canicattì - Siracusa	Technological and infrastructural upgrade	11.900	OP ERDF Sicily 2014-2020 (Action 7.3.1)
	Upgrading and improving the safety of the railway infrastructure	4.100	
Palermo-Trapani via Castelvetro, Alcamo section Branch-Castelvetro-Marsala-Trapani	Technological upgrading with improvement of the safety of the railway infrastructure	3.400	OP ERDF Sicily 2014-2020 (Action 7.3.1)
	Upgrading of the equipment and improvement of the safety of the railway infrastructure	54.500	
Palermo - Trapani via Milo	Line recovery	150.000	PSC Ministry of Infrastructure and Transport
Palermo - Messina	Strengthening and speeding up	15.300	POC Infrastructures and Networks
	Doubling of the Fiumetorto - Ogiastrello railway line	1,467.527	PON Infrastructures and Networks 2014-2020
	Railway doubling of the Bicocca - Catenanuova section	410.593	PON Infrastructures and Networks 2014-2020
Messina - Siracusa	Creation of the SCC of the circulation	31.415	PON Infrastructures and Networks 2014-2020
Catania - Siracusa	Speeding up the Bicocca - Targia section	82.652	PON Infrastructures and Networks 2014-2020
	Undergrounding of the railway line to lengthen the runway at Catania airport	514.908	PSC Ministry of Infrastructure and Transport
Palermo - Catania	Enhancement of the Fiumetorto Lercara Friddi section	1,849.805	PSC Ministry of Infrastructure and Transport
	Strengthening of the Lercara - Catenanuova section	4,319.440	PSC Ministry of Infrastructure and Transport
Caltanissetta - Gela	Speeding up the Gela - Ionian Ridge section	284.989	PSC Ministry of Infrastructure and Transport

Source: Caronte Information System and OpenCoesione

In relation to objective I of the PIIM, promoting sustainable mobility and the use of vehicles with a lower emission impact, the Plans and Programs active at regional level have financed two types of projects: the purchase of rolling stock in order to renew the TPL fleet and the creation of cycle paths in order to promote the use of low environmental impact vehicles.

With reference to interventions specifically aimed at promoting sustainable mobility through the renewal of public transport fleets with the introduction of a low environmental impact system (objective I of the PIIM), the Urban Authorities and/or Metropolitan Cities intervened by modulating depending on the specific needs, the two available tools: the PO ERDF and the PON Metro

The synergy between the two tools makes it possible to increase the level of replacement of the bus fleet intended for LPT, making the contribution in terms of reducing greenhouse gas emissions from LPT (or road) more effective. The framework of the interventions also shows the strategic choices of the Urban Authorities which move, in the case of larger municipalities, in the wake of the PUMS and which, therefore, already identify tools to be used for precise sectoral planning. In this context, for example, Catania has chosen to finance the renewal of the TPL fleet solely with the funds deriving from the PON Metro also for the purposes of administrative simplification of the procedures. Different instruments and funds require different procedures with a greater administrative burden for the administration.

TAB.34- INTERVENTIONS THAT FALL WITHIN THE SCOPE OF OBJECTIVE I OF THE PIIM

COMMON	PROJECT	COST (Meuro)	INSTRUMENT
Agrigento	Supply of n. 2 buses for TPL	41.267	OP ERDF Sicily 2014-2020 (Action 4.6.2)
Bagheria	Sustainable mobility through public urban transport in the areas of the Municipality of Bagheria	0.276	OP ERDF Sicily 2014-2020 (Action 4.6.2)
Caltanissetta	Purchase of minibuses for eco-sustainable local public transport and transformation of the municipal car fleet with low-impact vehicles	0.799	OP ERDF Sicily 2014-2020 (Action 4.6.2)
Catania	Renewal of TPL fleets - Purchase of city buses	1.491	PON Metro 2014-2020
	Purchase of electric vehicles for the vehicle fleet	14.385	
	Renewal of TPL fleets - Purchase of electric city buses	5.767	
	Green conversion of the AMTS vehicle fleet - Purchase of electric city buses	3.955	
	Renewal of TPL fleets - Purchase of city buses	8.370	
Marsala	Supply of n. 20 buses for TPL	3.859	OP ERDF Sicily 2014-2020 (Action 4.6.2)
Messina	Supply of n. 10 buses for TPL	4.438	OP ERDF Sicily 2014-2020 (Action 4.6.2)
	Renewal and technological enhancement of the TPL	3.708	PON Metro 2014-2020
	Purchase of rolling stock	8.000	OP ERDF Sicily 2014-2020 (Action 4.6.2)
Palermo	Strengthening of the TPL through the acquisition of new Euro 6 ecological buses	0.328	OP ERDF Sicily 2014-2020 (Action 4.6.2)
	Supply of n. 10 buses for TPL	17.230	PON Metro 2014-2020
	Supply of n. 23 buses for TPL	4.148	
Siracusa	Supply of n. 10 buses for TPL	6.900	OP ERDF Sicily 2014-2020 (Action 4.6.2)

Source: Caronte Information System and OpenCoesione

Even interventions aimed at promoting use of vehicles with lower emission impact the municipalities have resorted to various tools used in some cases in a synergistic manner (municipality of Messina and municipality of Ragusa).

TAB.35- INTERVENTIONS THAT FALL WITHIN THE SCOPE OF OBJECTIVE I OF THE PIIM

COMMON	PROJECT	COST (Meuro)	INSTRUMENT
Caltanissetta	Construction of the Central Sicily cycle path between Caltanissetta and Enna	2.810	OP ERDF Sicily 2014-2020 (Action 4.6.4)
Castelvetrano	Connection Castelvetrano Commercial Area with Marinella di Selinunte	0.980	OP ERDF Sicily 2014-2020 (Action 4.6.4)
	Connection Triscina with the Selinunte Archaeological Park	0.980	
	Connection Castelvetrano with Trinità di Delia	0.891	
Catania	Integrated CTA Moving Bike - bus - parking service	0.600	PON Metro 2014-2020
	Cycle paths - Urban Park in the Librino district	1.714	
Gela	Creation of a cycle path from Macchitella to Lungomare Federico II - Gela	0.720	OP ERDF Sicily 2014-2020 (Action 4.6.4)
Marsala	Creation of a cycle path on the urban seafront of Marsala	2.000	OP ERDF Sicily 2014-2020 (Action 4.6.4)
Mazara del Vallo	Creation of a cycle path connecting the urban center and the Tonnarella coast – 1st functional lot	1.283	OP ERDF Sicily 2014-2020 (Action 4.6.4)
Messina	Interventions to extend the length of cycle paths	0.900	OP ERDF Sicily 2014-2020 (Action 4.6.4)
	Capo Peloro Lagoon cycle/pedestrian path (1st lot)	1.700	PON Metro 2014-2020
Ragusa	Creation of a cycle path in Marina di Ragusa (from Piazza Malta - Lungomare Andrea Doria - via Cav. M. Calabrese)	0.980	OP ERDF Sicily 2014-2020 (Action 4.6.4)
	Redevelopment of the Lungomare Bisani - Strengthening and securing cycle and pedestrian mobility (Punta di Mola - Scalo Trapanese section)	5.300	POC Infrastructures and Networks
Siracusa	Creation of a cycle path within the urban center - Siracusa - System path (viale S. Panagia to via Ozanam)	0.700	OP ERDF Sicily 2014-2020 (Action 4.6.4)
	Creation of a cycle path within the urban center - Siracusa - Pista Gelone Sud - viale S. Panagia to corso Timoleonte	1.800	

Source: Caronte Information System and OpenCoesione

Still in the field of sustainable urban mobility, the PIIM inserts a further objective aimed at increasing the level of service offered (objective J of the PIIM) to which projects, mainly infomobility, activated both within the OP ERDF (6) and the PON contribute Meter.

TAB.36- INTERVENTIONS THAT FALL WITHIN THE SCOPE OF OBJECTIVE J OF THE PIIM

COMMON	PROJECT	COST (Meuro)	INSTRUMENT
Agrigento	Supply and installation of n. 20 electronic information panels indicating TPL stops	0.100	PO ERDF Sicily 2014-2020 (Action 4.6.3)
Caltanissetta	Installation of systems and technologies in order to increase the use of collective urban transport systems	0.471	PO ERDF Sicily 2014-2020 (Action 4.6.3)
Catania	"SMART TPL" project	1.215	PO ERDF Sicily 2014-2020 (Action 4.6.3)
	Single mobility center	2.660	PON Metro 2014-2020
	Catania To Go	7.500	
	Smart park in the city	3.500	
Marsala	Project for monitoring the fleet of the Municipal Road Transport Service (SMA) and related infomobility system	1.200	PO ERDF Sicily 2014-2020 (Action 4.6.3)
Messina	Infomobility system	1.820	PON Metro 2014-2020
Palermo	On-board validator infrastructure	0.282	PON Metro 2014-2020
Ragusa	Creation of an integrated system for public transport and intelligent urban mobility	0.350	PO ERDF Sicily 2014-2020 (Action 4.6.3)
Trapani	Strengthening of urban and extra-urban mobility information services - systems of technologies and innovations for improving TPL performance	0.332	PO ERDF Sicily 2014-2020 (Action 4.6.3)

Source: Caronte Information System and OpenCoesione

With reference to the improvement of the regional port and freight terminal system (objective E of the PIIM) the OP intervenes marginally by financing two interventions in the ports of Sciacca and Sant'Agata di Militello. At a regional level, however, there are various interventions financed through other financing instruments/sources on the main commercial ports.

TAB.37- INTERVENTIONS THAT FALL WITHIN THE SCOPE OF THE OBJECTIVE AND THE PIIM

PORT	PROJECT	COST (Meuro)	INSTRUMENT
Augusta	Refueling and static restoration of the heads and surrounding areas of the central mouth of the port's breakwater	12.000	PON Infrastructures and Networks 2014-2020
	Construction of a new container terminal	50.781	
	Adaptation of a section of the quay of the commercial port for the docking of mega-container ships and related equipment with gantry cranes	14.898	
Castellamare del Golfo	Strengthening existing maritime works for the safety and extension of the breakwater	9.269	POC Sicily
Lampedusa	Completion of the port's commercial dock	0.131	Sicily Pact
Lipari	Restoration of the Punta Scalidi quay and commercial quay of the port in Sottomonastero	1.071	Sicily Pact
Marsala	Completion and consolidation of the dock and arrangement of the lowering behind it	0.837	POC Sicily
Messina	Tremstieri logistics platform with attached port	74.471	PON Infrastructures and Networks 2014-2020
Palermo	Excavation of the seabed of the Crispi basin n. 3	39.300	PON Infrastructures and Networks 2014-2020
	Securing the 150,000 TPL basin	39.000	PSC Ministry of Infrastructure and Transport
Santa Marina Salina	Consolidation and safety of the commercial pier of the Port	1.105	Sicily Pact
Sant'Agata di Militello	Completion of existing maritime works. Extension of the breakwater and construction of the breakwater	35.102	OP ERDF Sicily 2014-2020 (Action 7.2.2)
Sciacca	Construction of the final section of the north bank quay, the yards behind it and towing works	5.143	OP ERDF Sicily 2014-2020 (Action 7.2.2)
Termini Imerese	Port dredging works	35.000	PON Infrastructures and Networks 2014-2020
	Completion of the outer breakwater	20.000	
Ustica	Securing the port - Taormina pier	1.658	POC Sicily

Finally, with reference to objective A of the PIIM, bringing the road system to levels of full efficiency, through works to strengthen the network, modernize and make the existing assets safe, there are many interventions activated through the financing instruments highlighted, but for the purposes of the analysis, only the interventions affecting roads located in one of the 5 internal Sicilian areas were taken into consideration as they are the main recipient territories of the ERDF OP interventions.

The picture that emerges shows a high level of synergy between the different instruments: the funding sources were used in an integrated manner, often to complete projects falling on different sections of the same road.

TAB.38- INTERVENTIONS THAT FALL WITHIN THE SCOPE OF OBJECTIVE A OF THE PIIM WITH REFERENCE TO THOSE FALLING IN INTERNAL AREAS

INSTRUMENTS	CALATINO	MADONIE	NEBRODI	SIMETO - ETNA	SICANE LANDS	TOTAL
OP ERDF Sicily 2014-2020 (Action 7.4.1)	12	9	6	5	-	32
Sicily Pact	17	1	6	1	7	32
POC Sicily	5	2	3	2	2	14
PSC Ministry of Infrastructure and Transport	9				-	9
Total	43	12	15	8	9	87

6 PROGRAM EFFECTIVENESS AND IMPACT

6.1 IMPACT OF INVESTMENT PRIORITY 4E

EVALUATION QUESTION n.1

To what extent has the OP ERDF SICILY 2014-2020 promoted low-carbon strategies for sustainable multimodal mobility in urban areas?

SYNTHETIC ANSWER

The infrastructures and interchange nodes being built in the urban areas with the largest number of residents, Catania and Palermo, can make it possible to increase collective mobility by acting on a potential catchment area of over 685,000 inhabitants, equal to 65% of the resident population of Catania and 78% of the resident population of Palermo.

The renewal of the rolling stock involves the inclusion of 106 new buses and 10 new traction units in the LPT fleet of 8 municipalities, capable of producing positive effects on the emissions of polluting substances through an estimated reduction of 1.26 t/year of NMVOC, 34.10 t/year of NOx, 0.73 t/year of PM10 and 76.53 t/year of CO2.

Furthermore, the creation of intelligent transport systems, by stimulating the use of LPT by the resident population of 6 municipalities involved in the interventions, can generate a further reduction in emissions estimated at 11.63 t/year of NMVOC, 3.84 t/year of NOx, 0.03 t/year of PM10 and 3.31 t/year of CO2.

Finally, the development of cycle paths in 8 municipalities can push a potential user base, estimated at over 720,000 residents, towards the use of low environmental impact means of transport, such as the bicycle.

6.1.1 ACTION 4.6.1

DV 1.1 To what extent have the infrastructures and interchange nodes created made it possible to increase collective mobility?

Action 4.6.1 "Creation of infrastructures and interchange nodes aimed at increasing collective mobility and the eco-compatible distribution of goods and related transport systems" aims to complete and strengthen the low-cost rail public transport system. environmental impact. As part of the Action, three interventions were selected which concerned the construction or implementation of railway sections within the urban areas of the cities of Catania and Palermo.

The impact of the Action on the increase in collective mobility can be assessed through the detection of indicators suitable for responding to the evaluation question, such as the increase in the number of passengers and/or the reduction in the number of private vehicles on the road. At the state of the art, not only are all the interventions detected regarding the urban sections of Palermo and Catania incomplete, but as they in turn do not constitute autonomous interventions but rather integral parts of broader projects, it was not possible, albeit in forecast terms, detect an enhancement of the aforementioned indicators that refer to specific projects.

In detail.

- 1) **Urban section of Palermo:** two interventions (Railway doubling of urban sections A and B, of which section A is expensed on Action 7.1.1) are integrated into the more extensive project of the Palermo hub and concern two of the three sections that will guarantee the electrified doubling of the " Passante Ferroviario" of Palermo, between Palermo Centrale/Brancaccio and the Falcone e Borsellino Airport of Punta Raisi. The third intervention concerns the closure of the railway ring.

The common objective of the three interventions can be identified in the infrastructural improvement of the metropolitan-type service in terms of usability, functionality, regularity and cost-effectiveness of management, in the improvement of the urban roads surrounding the railway section due to the suppression of level crossings and the construction of new roads, and in improving travel comfort.

- 2) **Urban section of Catania:** the intervention is part of a system of projects that focus on the Circumetnea Railway network. This is a structural lot which will contribute, once the work is completed, to serving the historic center and the peripheral neighborhoods of the south-west part of the city and achieving modal integration with other transport vectors.

The analysis of potential demand highlights a fully operational forecast of 57 million passengers per year. The expected result indicators are the increase in potential capacity (final objective of 200 trains/day

compared to the current frequency of 36 buses/day for the Airport) and the reduction of travel times (final objective of 12' compared to 25 ' current with city buses).

Having said this, based on the detection - in the project documentation - of information such as the presence of modal integrations with other transport vectors (stations, airports), or the forecast of a decrease in travel times and transport costs borne by the users, it is reasonable to foresee a positive impact in terms of increase in collective mobility both for the attraction of new users and for the shift of private mobility shares towards collective mobility, an increase which will be measured when the interventions are concluded and the infrastructures involved operational.

However, in order to integrate the above with the results of further elements of investigation, the increase in collective mobility was addressed from a methodological point of view by analyzing the project portfolio and identifying the desired outcomes (the results expected from the projects), which are were attributed to the following categories:

- 1) interventions that can potentially absorb a catchment area represented by residents who do not use the LPT for reasons linked to the absence of connections or the lack of reliability of the LPT in the area of interest;
- 2) interventions that can potentially absorb a catchment area represented by residents who use the LPT but not through those modes of public transport (train and subway) involved in the interventions under examination, unless exceptionally or sporadically (up to 3 times a month) .

This information has been systematized taking into account the responses to the two-stage survey carried out on the population resident in Sicily - referred to in point 7 of this document. Residents who do not use LPT due to lack of connections or unreliability problems are respectively equal to 15% for Palermo and 13% for Catania, while residents who tend not to use the train or subway modes or to use them exceptionally or occasionally occasional are equal to 63% for Palermo and 52% for Catania respectively. Through the sample of respondents found in the two Municipalities it is therefore possible to estimate the potential catchment area, which could be intercepted by the interventions in question, once concluded, at 685,671 residents, equal to 72% of the population residing in the two urban centres.

TAB.39- PROPERTIES INVESTIGATED AND IMPACT INDICATORS ON THE PROJECTS ACTIVATED WITHIN ACTION 4.6.1

TAB.39- PROPERTIES INVESTIGATED AND IMPACT INDICATORS ON THE PROJECTS ACTIVATED WITHIN ACTION 4.B.1												
PROJECT	TERRITORIAL SCOPE	LENGTH OF THE AFFECTED ROUTE (KM)	PRESENCE MODAL INTEGRATION WITH OTHER TRANSPORT CARRIERS	DECREASE TRANSPORT COST IN TERMS OF TRAVEL TIME	EXPECTED OUT-COME CATEGORY (INVOLVED INTER-CHANGE NODES OR STATIONS (NUMBER)	STATION TYPE (N = NEW; E = EXISTING)	DECREASE OF TRANSPORT COST IN ECONOMIC TERMS FOR USERS	RESIDENT POPULATION (ISTAT DATA JUNE 2023) (A)	RESIDENTS WHO DO NOT USE LPT (%)	RESIDENTS WHO DO NOT USE LPT DUE TO LACK OF CONNECTIONS OR PROBLEMS OF UNRELIABILITY OF THE LPT (%) (B)	RESIDENTS WHO USE TPL BUT ONLY EXCEPTIONALLY TRAIN AND/OR SUBWAY (%) (C)	POPULATION POTENTIALLY INTERESTING (NO. RESIDENTS) (D=A*(B+C))
Railway doubling Palermo - Carini - Section B - Notarbartolo - EMS/La Malfa	Scope urban PA	5.30	■	Expected	Lazio	No	Expected	628,522	23%	15%	63%	491,887
					Belgium	No						
					EMS/La Malfa	AND						
					France	AND						
					S. Lorenzo Colli	AND						
Completion of the GP Railway doubling Palermo Centrale – Carini Urban section A		8.50	■	Expected	Notarbartolo	AND	Expected					
					Lolli	No						
					Maredolce	No						
					Earn money	No						
					Papireto	No						
					PA Brancaccio	AND						
					Vespers	AND						
Closure of the Palermo railway ring		1.70	■	Expected	Orleans	AND	Expected					
					Politeama	No						
					Port	No						
					Freedom	No						
Extension of the railway network in the Catania metropolitan section from the Central Station to the Airport – Stesicoro – Airport section (Completion lot), Circumetnea Railway*		CT urban area (suburban neighborhoods in the south-west part)	4.63	■	Expected (target indicated: 12' compared to the current 25')	Giachery	AND					
	Airport					No						
	Saint Maria Goretti					No						
	Booklet					No						
	Verrazano					No						
	Saint Leo					No						
	Gym					No						
	Vittorio Emanuele					No						
Saint Dominic	No											
5 INTERVENTIONS	22.3	■	Expected	Expected	26 stops/stations	N and E	Expected	926,651	21%	14%	58%	685,671

* The potential impact refers to the completion of the entire project which saw the financing under the POR, as seen, of a structural lot.

6.1.2 ACTION 4.6.2

DV 1.2 To what extent has the renewal of rolling stock guaranteed the reduction of emissions?

Action 4.6.2 "Renewal of rolling stock", which together with 4.6.3 and 4.6.4 is part of the interventions activated within the Urban Agenda, aims to activate the renewal of transport fleets public by introducing systems with low environmental impact.

Within it, 9 interventions have been selected and financed, many of which, given the state of the art, have not yet been activated. The lack of data relating to the individual projects containing information on the type of commitment made by the public beneficiary (whether it involves the mere addition of rolling stock to the pre-existing fleet or, vice versa, the replacement of material deemed worn or obsolete) and/or on the degree of use of the rolling stock in the LPT of the municipality concerned (annual km traveled by the LPT for each vehicle belonging to the fleet, whether on an urban or extra-urban route, before and after the renewal) does not allow us to precisely calculate the impact of the Action on the mitigation of pollutant emissions.

However, on the basis of the indications found in the available documentation, it is possible to arrive at an estimate of the potential reduction of the aforementioned emissions, taking into account:

- 1) of the data present in the 2019 National Sustainable Mobility Strategic Plan (PSNMS) in relation to emissions by type of pollutant (NMVOC→non-methane volatile organic compounds, NOx→nitrogen oxide compounds, PM10→particulate matter eCO2 →carbon dioxide), by fuel category (from Euro I to Euro VI, methane, electric) and by type of route (urban, non-urban);
- 2) of the presumption that all rolling stock renewal interventions involve the replacement of an equivalent number of obsolete rolling units - to which an 'intermediate' class of values has been conventionally assigned between the Euro 2 and Euro 3 classes - and concern vehicles used exclusively on urban routes;
- 3) of the consequent calculation of the reduction in emissions - in terms of gram per km - that the new rolling stock (in environmental class Euro VI diesel, methane and/or electric) which is the subject of the interventions, brings out compared to the emissions produced by the replaced rolling stock;
- 4) of the annual average data in km traveled per single bus belonging to the urban LPT service in the Sicily Region (see point 2.3 of this report) equal to 32,264 km.

On the basis of these premises, the average reduction in polluting emissions resulting from the interventions in question can be estimated at 1.26 t/year of NMVOC, 34.10 t/year of NOx, 0.73 t/year of PM10 and 76.53 t/year of CO2.

TAB.40- PROPERTIES INVESTIGATED AND IMPACT INDICATORS ON THE PROJECTS ACTIVATED WITHIN ACTION 4.6.2

PROJECT	ROLLING STOCK PURCHASED	LENGTH CLASS (METRES)	TPOLOGY DIET	ESTEEM ON ISSUE NMVOC (G/KM PER UNIT)	ESTEEM ON ISSUE NOX (G/KM PER UNIT)	ESTEEM ON ISSUE PM10 (G/KM PER UNIT)	ESTEEM ON ISSUE CO2 (G/KM PER UNIT)	ESTIMATE ANNUAL IMPACT OF THE INTERVENTION ON POLLUTANT EMISSIONS (G)
Supply of n. 10 Traction Units to be used for public transport for the metropolitan section of the Government Management of the Circumetnea Railway	N. 10 Traction Unit	Same characteristics as the replaced trains	Electric	0	0	0	0	NMVOC = 0 NOx = 0 PM10 = 0 CO2 = 0
Municipality of Marsala - Assignment of n. 20 buses intended for collective public service	No. 20 Bus	n. 9, 6.30/7.20 m long n. 4 length 10.40/10.90 m n. 7, 11.50/12.40 m long	Diesel Euro VI	-0.353	-9.873	-0.176	-5	NMVOC = - 227,783.84 NOx = - 6,370,849.44 PM10 = - 113,569.28 CO2 = - 3,226,400.00
AU Agrigento - Municipality of Agrigento - Supply of n. 2 very short buses, 6.30/7.20 in length, class I, diesel-powered, euro 6 for local public transport	No. 2 Buses	length 6.30/7.20 m	Diesel Euro VI	-0.353	-9.873	-0.176	-5	NMVOC = - 22,778.38 NOx = - 637,084.94 PM10 = - 11,356.93 CO2 = - 322,640.00
AU Caltanissetta Enna - Municipality of Caltanissetta Purchase of minibuses for eco-sustainable local public transport and transformation of the municipal car fleet with low impact vehicles	No. 5 Bus	N. 1 very short n. 4 short	Electric (n. 2 of which 1 very short) Diesel Euro VI (no. 3)	-0.390 -0.353	-10.310 -9.873	-0.254 -0.176	-926 -5	NMVOC = - 59,333.50 NOx = - 1,620,911.10 PM10 = - 33,425.50 CO2 = - 60,236,888.00
AU Siracusa - Municipality of Siracusa - Renewal of urban public transport fleets, with the introduction of systems and vehicles with low environmental impact, used to carry out collective public services - Purchase of 10 methane buses	No. 10 Bus	Not available	Methane	-0.385	-10.070	-0.254	-5	NMVOC = - 124,216.40 NOx = - 3,248,984.80 PM10 = - 81,950.56 CO2 = - 1,613,200.00
AU Messina - Messina Municipality Supply of n. 2 city buses powered by diesel, cat. M3, class 1, Euro VI length 10.50 m (Lot 2) - n. 4 city buses powered by diesel, cat.	No. 10 Bus	n. 2 of length 10.50 m n. 4, 12 m long n. 4, 18 m long	Diesel Euro VI	-0.353	-9.873	-0.176	-5	NMVOC = - 113,891.92 NOx = - 3,185,424.72 PM10 = - 56,784.64 CO2 = - 1,613,200.00

PROJECT	ROLLING STOCK PURCHASED	LENGTH CLASS (METRES)	TYPOLGY DIET	ESTEEM ON ISSUE NMVOC (G/KM PER UNIT)	ESTEEM ON ISSUE NOX (G/KM PER UNIT)	ESTEEM ON ISSUE PM10 (G/KM PER UNIT)	ESTEEM ON ISSUE CO2 (G/KM PER UNIT)	ESTIMATE ANNUAL IMPACT OF THE INTERVENTION ON POLLUTANT EMISSIONS (G)
M3, class 1, euro VI length 12 (Lot 3) - n. 4 city buses								
AU Palermo Bagheria - Municipality of Palermo - Sustainability of public services and urban mobility: Project to strengthen local public transport on some city lines through the acquisition of new ecological Euro 6 buses	No. 55 Bus	n. 17, 8 m long n.38 12 m long	Diesel Euro VI (no. 17) Methane (no. 38)	-0.353 -0.385	-9.873 -10.070	-0.176 -0.254	-5 -5	NMVOC = - 665,638.58 NOx = - 17,761,364.26 PM10 = 407,946.02 CO2 = - 8,872,600.00
AU Palermo Bagheria - Municipality of Bagheria Sustainable mobility through public urban transport in the areas of the Municipality of Bagheria	No. 3 Bus	length 8 meters	Diesel Euro VI	-0.353	-9.873	-0.176	-5	NMVOC = - 34,167.58 NOx = - 955,627.42 PM10 = - 17,035.39 CO2 = - 483,960.00
AU Messina II NOTICE_ AU_ME_4.6.2_02	No. 1 Bus	length 10.50 m	Diesel Euro VI	-0.353	-9.873	-0.176	-5	NMVOC = - 11,389.19 NOx = - 318,542.47 PM10 = - 5,678.46 CO2 = - 161,320.00
TOTAL: 9 INTERVENTIONS	106 BUSES AND 10 TRACTION UNITS	DIFFERENT LENGTH CLASSES	48 METHANE 56 DIESEL EURO VI 2 ELECTRIC 10 ELECTRIC TRACTION UNITS	AVERAGE EMISSION NMVOC FOR SUBSTITUTED MEDIUM (g/km) -0.368	MEDIA EMISSION NOX FOR HALF REPLACED(g/km) -9,970	EMISSION AVERAGE PM10 FOR MEDIUM REPLACED (g/km) -0.213	AVERAGE EMISSION CO2 BY MEANS REPLACED (g/km) -22.377	TOTAL: NMVOC = - 1,259,199.39 NOx = - 34,098,789.15 PM10 = - 727,746.78 CO2 = - 76,530,208.00

A clarification must be made with reference to the purchase of the 10 traction units intended for the Catania metro for which an impact of zero in terms of reduction of polluting emissions has been estimated.

The new trains, in fact, replace trains with similar characteristics from an operational point of view, and therefore do not allow either a reduction in polluting emissions or an increase in carrying capacity, but since they are new vehicles they are more comfortable in terms of interior fittings, ride comfort, present better aesthetics, etc., and, therefore, can stimulate greater demand.

Furthermore, both the passenger environments and the driving cabins are equipped with innovative and low environmental impact air conditioning systems. However, with respect to these aspects, no data are available that can allow the effects to be quantified in terms of CO₂ reductions obtained.

6.1.3 ACTION 4.6.3

DV 1.3 To what extent has the creation of intelligent transport systems guaranteed the reduction of emissions?

Action 4.6.3 "Intelligent transport systems" has the objective of ensuring the mitigation of emissions. From this perspective, the evaluation question is declined in the sense of understanding how much the creation and/or implementation of intelligent transport systems (understood as a set of technologies, infrastructures and applications), not constituting interventions with a direct impact from the point of view of the reduction of emissions, have contributed to increasing the number of users who choose LPT instead of private transport.

As part of this Action, 6 interventions were selected and financed which aimed at strengthening information services relating to urban and extra-urban mobility.

The impact of this Action, in terms of increase in public service users, cannot be calculated exactly to date as many of the interventions are still not activated. However, it is possible to arrive at an estimate of the impact that the creation, implementation or improvement of intelligent transport systems covered by the interventions examined can have on the emission of pollutants, taking into account:

- 1) of the municipal demographic data from ISTAT updated in June 2023 relating to the population resident in the municipalities benefiting from the intervention;
- 2) of the data resulting from the two-stage survey carried out on the population resident in Sicily - referred to in point 7 of this document - which made it possible to detect, on the interviewed sample resident in the Municipalities subject to intervention, a percentage of users who in the last period time with respect to carrying out the survey they did not use the TPL services due to a lack of reliability in transfers also fueled by the unavailability of information;
- 1) of the motorization rate detected in the provincial capital municipality (in the case of the Municipality of Marsala, the data from Trapani was examined) source Legambiente - Urban Ecosystem of 2020;
- 2) of the provisional estimate for 2020 of pollutant emissions (NMVOC→non-methane volatile organic compounds, NOx→nitrogen oxide compounds, PM10→particulate matter eCO₂ →carbon dioxide) averages of the total European car fleet (calculated with the NEDC cycle) equal to 0.17 g/km of NMVOC, 0.33 g/km of NOx, 0.008 g/km of PM10 and 107.8 g/km of CO₂ indicated in the 2022 ISPRA national inventory of atmospheric emissions (weighted average of the total car fleet);
- 3) of the data released by ISFORT Audimob Observatory on the mobility of Italians in the 19th Report on the mobility of Italians and relating to the national average urban travel recorded in the first half of 2022 which was equal to 4.3 km per day.

Having said this, the potential user base of the interventions can thus be estimated at 59,260 resident subjects who, in light of the interventions carried out within the municipalities of residence, could change their preference on the transfer method from private transport to LPT: in this case the average reduction in polluting emissions can consequently be estimated at 11.63 t/year of NMVOC, 3.84 t/year of NOx, 0.03 t/year of PM10 and 3.31 t/year of CO₂.

TAB.41- PROPERTIES INVESTIGATED AND IMPACT INDICATORS ON THE PROJECTS ACTIVATED WITHIN ACTION 4.6.3

PROJECT	TERRITORIAL SCOPE	RESIDENT POPULATION (N) (ISTAT DATA JUNE 2023)	RESIDENT POPULATION WHICH DOES NOT USE TPL (%)	POPULATION WHO POTENTIALLY CAN USE LPT FOLLOWING INTERVENTION (%)	POTENTIALLY INTERESTING POPULATION (NO. RESIDENTS)	MOTORIZATION RATE IN THE CAPITAL MUNICIPALITY (NO. CARS PER 100 RESIDENTS)	ESTIMATE ANNUAL IMPACT OF THE INTERVENTION ON POLLUTANT EMISSIONS (G)
AU Western Sicily - Municipality of Trapani - Strengthening of urban and extra-urban mobility information services - technology and innovation systems for improving TPL performance	Municipality of Trapani	55,292	18%	5%	2,765	64.41	NMVOC =- 475,180.57 NOx=- 156,809.59 PM10=- 1,254.48 CO2=- 135,232.59
AU Western Sicily - Municipality of Marsala - Project for monitoring the fleet of the Municipal Road Transport Service (SMA) and related infomobility system of the Municipality of Marsala	Municipality of Marsala (TP)	79,568	52%	10%	7,957	64.41	NMVOC=- 1,367,454.54 NOx=- 451,260.00 PM10=- 3,610.08 CO2=- 389,166.62
AU Catania - Acireale - Municipality of Catania - "SMART TPL" Project	Municipality of Catania	298,129	19%	8%	23,850	77.52	NMVOC=- 4,933,014.46 NOx=- 1,627,894.77 PM10=- 13,023.16 CO2=- 1,403,896.45
AU Agrigento - Municipality of Agrigento - Supply and installation of n. 20 electronic information panels indicating TPL stops	Municipality of Agrigento	55,294	26%	5%	2,765	75.90	NMVOC=- 559,947.30 NOx=- 184,782.61 PM10=- 1,478.26 CO2=- 159,356.52
AU Ragusa Modica - Municipality of Ragusa - Creation of an integrated system for public transport and intelligent urban mobility	Municipality of Ragusa	73,223	28%	22%	16,109	74.06	NMVOC =-3,183,189.77 NOx=- 1,050,452.62 PM10=- 8,403.62 CO2=- 905,910.34
AU Caltanissetta Enna - Municipality of Caltanissetta - Installation of systems and technologies in order to increase the use of collective urban transport systems	Municipality of Caltanissetta	58,142	30%	10%	5,814	71.46	NMVOC=-1,108,532.12 NOx=-365,815.60 PM10=- 2,926.52 CO2= - 315,479.37
TOTAL: 6 INTERVENTIONS	6 Municipalities involved	619,648	32%	15%	59,260	73.54	NMVOC=- 11,627,318.77 NOx= - 3,837,015.19 PM10=- 30,696.12 CO2= - 3,309,041.90

6.1.4 ACTION 4.6.4

DV 1.4 To what extent has the use of low environmental impact means of transport been encouraged by the development of adequate infrastructure?

Action 4.6.4 had the objective of developing the infrastructure necessary for the use of the medium with low environmental impact.

Eleven projects relating to the creation of cycle paths were selected as part of the Action. At the state of the art, the impact on the incentive to use means of transport with low environmental impact cannot be assessed as almost all the interventions have not yet been completed. This evidence does not put us in a position to express a judgment regarding the ability of the aforementioned interventions to constitute an incentive to use a means of transport with low environmental impact such as the bicycle.

Through the available data, however, two findings emerge that appear reasonable to underline:

- the two-stage survey carried out on the population resident in Sicily - survey referred to in point 7 of this document - allows us to estimate a potential user base for the interventions under examination represented by residents who declare not to use low environmental impact vehicles due to lack of cycle paths equal to 720,087 units;
- the financed interventions are not only small in size (in 7 cases out of 11 the cycle paths created have extensions of less than 5 km in length), but they seem to aim, due to location, points of interest involved and guaranteed connections, more for tourist purposes than for serving as an element of integration between exchange nodes (stations and connection places): only in three cases, for example, are the interventions located near a railway station and only in two near piers and/or marinas. The intervention with the greatest development in terms of length, the Central Sicily cycle path between Caltanissetta and Enna, seems to create a connection between the two cities which non-residents (tourists) can benefit from more, while three other interventions (Marina di Ragusa, Marsala Gela and Mazara del Vallo) mainly run close to the seafront.

Given this, it is reasonable to foresee how the impact on encouraging the use of means of transport with low environmental impact following the construction of the aforementioned infrastructures, which intercepts a potential user base estimated at over 720,000 residents, could be limited.

TAB.42- PROPERTIES INVESTIGATED AND IMPACT INDICATORS ON THE PROJECTS ACTIVATED WITHIN ACTION 4.6.4

PROJECT	TERRITORIAL SCOPE	ESTIMATE LENGTH OF INTERVENTION (KM)	FORECAST INFRASTRUCTURE INTEGRATION WITH EXCHANGE STATIONS/NODES	RESIDENT POPULATION (N) (ISTAT DATA JUNE 2023) (A)	RESIDENT POPULATION THAT DOES NOT USE LOW ENVIRONMENTAL IMPACT VEHICLES (%)	RESIDENT POPULATION WHO DO NOT USE LOW ENVIRONMENTAL IMPACT VEHICLES DUE TO LACK OF CYCLE PATHS (%) (B)	POPULATION POTENTIALLY AFFECTED BY THE INTERVENTION (NO. RESIDENTS) (C=A*B)
AU Ragusa Modica - Creation of a cycle path in Marina di Ragusa (from Piazza Malta - Lungomare Andrea Doria - via Cav. M. Calabrese)	Municipality of Ragusa	3.50	Not detected	73,223	72%	67%	48,815
AU Siracusa - Works for the construction of a cycle path within the urban center - Siracusa - System path (viale S. Panagia to via Ozanam)	Municipality of Siracusa	4.63	Not detected	115,833	66%	23%	26,476
AU Siracusa - Works for the construction of a cycle path within the urban center - Siracusa - Pista Gelone Sud - viale S. Panagia to corso Timoleonte		4.90	Detected(Railway Station)				
Creation of a cycle path on the urban sea-front of Marsala	Municipality of Marsala (TP)	7.27	Detected(Port/pier)	79,568	76%	29%	22,734
Creation of a cycle path from Macchitella to Lungomare Federico II - Gela	Municipality of Gela (CL)	2.13	Detected(Port/pier)	70,912	50%	38%	26,592
AU Enna Caltanissetta - Project for the construction of the Central Sicilian cycle path between Caltanissetta and Enna - municipality of Caltanissetta	Municipalities of Caltanissetta and Enna	8.50	Detected(Railway Station)	83,570* (total Municipalities of Caltanissetta and Enna)	84%	47%	39,586
AU Western Sicily - Works for the construction of a cycle path connecting the urban center and the Tonnarella coast - 1st functional lot - Municipality of Mazara del Vallo	Municipality of Mazara del Vallo (TP)	7.46	Not detected	49,813	45%	36%	18,114
AU Messina - Interventions to extend the length of cycle paths	Municipality of Messina	0.66	Not detected	218,003	70%	36%	78,796
AU Western Sicily - Connection Castelvetro Commercial Area with Marinella di Selinunte – Municipality of Castelvetro	Municipality of Castelvetro (TP)	5.43	Not detected	29,165	50%	33%	9,722
AU Western Sicily - Triscina connection with the Selinunte Archaeological Park - Municipality of Castelvetro		3.67	Not detected				
AU Western Sicily - Connection Castelvetro with Trinità di Delia - Municipality of Castelvetro		1.88	Detected(Railway Station)				
TOTAL 11 INTERVENTIONS	9 Municipalities involved	50.03	3 with stations 2 with piers/ports	720,087	69%	38%	270,835

6.2 IMPACT OF INVESTMENT PRIORITY 7B

EVALUATION QUESTION n.2

To what extent has the OP ERDF Sicily 2014-2020 improved regional mobility, in terms of quality and travel times?

SYNTHETIC ANSWER

The activation of the doubling of the Palermo Brancaccio - Palermo Notarbartolo section allows the completion of the urban line and a more efficient rescheduling of the metropolitan services departing from Termini Imerese serving all the stops in the Palermo hinterland. Together with the strengthening of services to/from Punta Raisi Airport, it was possible to achieve - on the connection between Palermo Central Station and the airport - a travel time of less than 40', thus creating the conditions for the expected shift modal from rubber to iron.

Transport services have been strengthened on the main regional railway lines: on the Tyrrhenian line, between Messina and Palermo and on the Ionian line, between Messina, Catania and Siracusa, the provision of 25 electric trains, almost all of which are already available to the managing body, is expected can allow - on the basis of the greater reachable hourly speed and the greater number of people that can be transported - a progressive increase in the offer and a further improvement in the quality of public rail transport. On two other lines, the Siracusa - Canicattì - Caltanissetta line and the Palermo - Castelvetro - Trapani line, extraordinary maintenance, speeding up and technological upgrade interventions are being completed which, although activated on limited routes, have already made it possible to detect both reductions of travel times, and improvements in punctuality indices over the entire route.

Finally, the redevelopment of the secondary road network that crosses five agricultural and agri-food centers - of which four were selected as internal areas - with 33 interventions, mainly underway on provincial roads, have made it possible to improve the accessibility of the aforementioned centers towards the main axes of the TEN-T Network.

6.2.1 ACTION 7.1.1

DV 2.1 To what extent have the strategic infrastructures relating to secondary and tertiary regional nodes been connected to the TEN-T Network?

Action 7.1.1 aims to complete the strategic infrastructures relating to the arches and nodes of the central European network (in particular the railway "Major Projects"), concentrating the interventions on the four priority routes that cross Italy identified by the scheme community TEN-T and eliminating bottlenecks. The intervention examined is part of the broader project "Palermo Passante PA Centrale / Brancaccio – Carini" project which as a whole had as its object the electrified doubling of the railway link between the main railway station of Palermo (Palermo Centrale) and the Carini station. Specifically, the intervention relates to a specific urban section, Route A, which goes from the Palermo Centrale stations to the Notarbartolo station and includes the stations/stops of Brancaccio, Maredolce, Guadagna, Vespri, Orleans, Papireto and Lolli for a length total of approximately 8.5 km of which approximately 4 km of tunnels.

The "Palermo Passante PA Centrale / Brancaccio – Carini Node" project, in turn, completes the Palermo railway hub which involves the doubling of the entire railway section between the Palermo Centrale / Brancaccio stations and the Punta Raisi station, the latter serving Palermo's Falcone e Borsellino Airport.

The project, falling on the Palermo – Trapani / Punta Raisi line, falls within the trans-European interoperable railway network pursuant to Regulation (EU) No. 1315/2013 and Delegated Regulation (EU) 2017/849 and, as noted in point 2.1 of this document, the Palermo – Trapani line is included within the "Comprehensive" network of the Scandinavian-Mediterranean corridor "Helsinki-La Valletta".

Increasing the capacity of the line— for the adaptation to double track of the existing stations which is accompanied by the opening of the four stops in the urban area of Palermo objectives of the intervention in question (Lolli, Maredolce, Guadagna and Papireto respectively) - makes it possible to implement a metropolitan-type service that strengthens connections for one of the two strategic infrastructures constituting poles of the European "core network" (the Falcone e Borsellino international airport of Punta Raisi) through the regional exchange hub represented by the Palermo Centrale / Brancaccio stations.

At the state of the art, the intervention to upgrade the Palermo hub, in the aforementioned urban section, is not yet completely completed, therefore the operation of the railway doubling still does not allow for the valorisation of "specific" indicators relating to the measurement of the advantages expressed in terms of increasing the flow of passengers and goods transport and/or improving the service standards of the connection of the infrastructures to

the TEN-T Network. However, integrating itself into a broader project, on the basis of the forecast documentation it can be noted that, as an intervention activated on the section that connects Palermo Falcone Borsellino Airport to Punta Raisi, the railway doubling in question has contributed to eliminating the main bottleneck of the Sicilian railway network caused by the single track infrastructural configuration, with positive effects on travel times. The main positive impacts can be identified as follows:

- 1) in the possibility of activating a "fast service" (direct trips from the Airport to the Central Station without intermediate stops): the time saving obtained - compared to the average distance deduced from the tables scheduled in 2009 - can be estimated at 22';
- 2) in increasing the number of trips: the integration of frequency between the services (fast, semi-fast and widespread) allows for a total of two connections every hour from Palermo Centrale to the Airport (and vice versa), guaranteeing, in the station Palermo Centrale, the interchange with fast extra-urban services coming from Agrigento/Messina/Catania.

Furthermore, the doubling of the urban route between Palermo Centrale and Notarbartolo will facilitate the planning of metropolitan services departing from Termini Imerese serving all the stops in the Palermo hinterland. Finally, in the Notarbartolo station, interchange with the services offered by the Palermo railway ring is guaranteed.

TAB.43- PROPERTIES INVESTIGATED AND IMPACT INDICATORS ON THE PROJECTS ACTIVATED WITHIN ACTION 7.1.1

PROJECT	TERRITORIAL SCOPE	LENGTH OF THE INTERESTED ROUTE (KM)	SECONDARY REGIONAL NODES INVOLVED	TERTIARY REGIONAL NODES INVOLVED	STRATEGIC INFRA-STRUCTURES OF THE TEN-T NETWORK (CORE)	CONNECTION OF NODES WITH THE STRATEGIC INFRA-STRUCTURE OF THE TEN-T NETWORK (CORE)	INCREASE IN NUMBER OF TRAINS/DAY MID-WEEKDAY ON THE ENTIRE ROUTE (CENTRAL STATION – AIRPORT RETURN) FROM 2019 TO 2023	REDUCTION OF COMMUTE TIMES ON THE ENTIRE ROUTE (CENTRAL STATION – AIRPORT) FROM 2009 TO 2023
Completion of the GP Railway doubling Palermo Centrale – Carini Urban section A	Municipality of Palermo	8.50	Central Station Palermo	Urban stations/stops of Notarbartolo, Maredolce, Guadagna, Vespri, Orleans, Papireto, Lolli and Brancaccio	Palermo Falcone Borsellino Punta Raisi Airport	Direct connection between Central Station and the Airport	+6	Widespread service: - 8' Semi-fast service: - 7' Fast service: - 22'

6.2.2 ACTION 7.3.1

DV 2.2 To what extent have regional and interregional public transport services been strengthened on routes with significant potential demand?

The objective of Action 7.3.1 is to strengthen regional and interregional public transport services on routes with significant potential demand. The funded projects examined focused on:

- A) on the two railway lines with a number of trains per average weekday on the total trains circulating in Sicily on an average weekday > 20% (2022 data): the Palermo - Messina line and the Messina - Catania - Siracusa line (not taking into account the railway line that lies in the Metropolitan Area of Palermo);
- B) on two of the four railway lines with a number of trains per average weekday on the total trains circulating in Sicily on an average weekday < 20% and > 5% (2022 data): the Siracusa – Canicattì – Caltanissetta line and the Palermo line Castelvetro - Trapani (the requirement was also satisfied by the Palermo – Catania and Palermo – Agrigento routes).

The interventions in question have contributed to strengthening the public transport services of the aforementioned four railway lines through two distinct intervention methods: on two lines, in fact, extraordinary maintenance, speeding up and technological upgrade interventions were carried out, while on the other two lines, steps were taken to integrate the fleet of railway trains available with the purchase of bidirectional electric trains (so-called "Pop" trains), equipped with four carriages, 4 traction engines, speed 160 kilometers per hour, built with 95% recyclable materials to have minimal environmental impact, 530 transportable people with more than 300 seats, 8 bicycle racks as standard.

Particularly:

- 1) in the case of the Siracusa – Canicattì – Caltanissetta railway line which connects Siracusa (on the Ionian side) with the Mediterranean side until reaching the Canicattì station (junction with the Caltanissetta-Agrigento line), extraordinary maintenance interventions were carried out on the Scicli-Rosolini section and extraordinary maintenance, speeding up and technological upgrade interventions on the Canicattì – Gela – Ragusa - Siracusa route: in the latter case, the interventions between the Canicattì and Comiso stations made it possible to reduce travel times by approximately 30', while the further extraordinary maintenance interventions have allowed an improvement in the punctuality indices recorded on the Modica – Gela – Canicattì – Caltanissetta route, from 53.8 (2018 data) to 85.2 (current data);
- 2) in the case of the Palermo – Trapani railway line (via Castelvetro) which connects the regional capital Palermo with Trapani crossing the urban centers of Castelvetro, Mazara del Vallo and Marsala, the extraordinary maintenance and upgrade interventions of the technological system for protecting the movement of the train, have allowed a significant improvement in the punctuality indices on the route, going from 55.9 (2018 data) to 92.9 (current data);
- 3) in the cases of the Palermo-Messina railway line which connects the regional capital with Messina and the inhabited centers of the Tyrrhenian coast (part of railway Axis 1 of the conventional trans-European railway network TEN-T) and of the Messina – Catania – Siracusa railway line which develops along the Ionian ridge and connects the two cities and the centers on the coast, we proceeded with the provision of "Pop" trains: the first trains were made available to the railway network as early as 2020. This provision has as its objective a progressive increase in supply and a further improvement in the quality of public rail transport (frequency of trips and increase in services offered). On the routes in question, from 2020 to 2022, however, no reductions in travel times were detected (Messina - Palermo 120', fast type; Messina - Catania 60'; Messina - Catania - Siracusa 120' with reinforcements). Finally, it is expected that the provision of the aforementioned "Pop" trains, causing the "replaced" but still performing trains to be moved to other lines, could contribute to strengthening other secondary routes.

TAB.44- PROPERTIES INVESTIGATED AND IMPACT INDICATORS ON THE PROJECTS ACTIVATED WITHIN ACTION 7.3.1

PROJECT	RAILWAY LINE	DEALS WITH	INTERVENTION LENGTH (KM)	ENHANCEMENT OF THE REGISTERED SERVICE
Renovation with simultaneous rehabilitation of the ballast of circulation and interchange tracks in the Scicli – Rosolini section of the Siracusa – Canicatti – Caltanissetta line, as well as IS, TLC, CTC and SSC modifications	Siracusa – Canicatti – Caltanissetta railway line	Scicli - Rosolini route	37.40	Data not available
Canicatti-Gela-Ragusa-Siracusa railway line "Technological and infrastructural upgrade"		Canicatti – Gela – Ragusa - Siracusa route	24.25	Reduction of travel times by approximately 30' between the Canicatti and Comiso stations. Improvement in punctuality indices: from 53.8 (2018 data) to 85.2 (current data) in the Modica – Gela – Canicatti – Caltanissetta route.
Canicatti-Gela-Ragusa-Siracusa railway line "Upgrading and improving the safety of the railway infrastructure"			24.25	
Palermo-Trapani railway line via Castelvetro Alcamo section Branch-Castelvetro-Marsala-Trapani "Technological upgrading with improvement of the safety of the railway infrastructure"	Palermo – Trapani railway line via Castelvetro	Alcamo branch line - Castelvetro (via Trapani)	1.70	Improvement in punctuality indices: from 55.9 (2018 data) to 92.9 (current data) in the Palermo – Castelvetro – Trapani route.
Palermo-Trapani railway line via Castelvetro - Alcamo section Branch-Castelvetro-Marsala-Trapani "Upgrading of the equipment and improvement of the safety of the railway infrastructure"			7.40	
			UNITS OF PURCHASED GOODS (ROLLING STOCK)	RECORDED IMPACT
Purchase of new trains to be allocated to the routes with greater potential demand	Palermo-Messina railway line	Palermo-Messina route	25 “Pop” trains	As of 2022, no reductions in travel times have been detected.
	Messina – Catania – Siracusa railway line	Messina-Catania-Siracusa route		
TOTAL: 6 INTERVENTIONS	4 railway lines involved			

6.2.3 ACTION 7.4.1

DV 2.3 To what extent have agricultural and agri-food centers been made more accessible through strengthening the connection to the network?

The objective of Action 7.4.1 is to strengthen the secondary and tertiary nodes of the "internal areas" and/or areas where significant agricultural and agro-industrial production districts are located with the main road and railway axes of the TEN-T network. This objective is pursued through a series of structural interventions (completion of road sections or doubling of lanes) or, more frequently, extraordinary maintenance (arrangement of road paving, insertion of signs and installation of safety barriers) which allow the "reconnection" of the local road system, the safety and re-functionalization of the secondary roads serving the agricultural centers and agri-food areas present.

The interventions examined involved four territorial contexts qualified as "internal areas" pursuant to the National Strategy for Internal Areas (SNAI) of the Sicilian Region: Val Simeto, Calatino, Nebrodi and Madonie to which an area was added - represented from the south-western area of Sicily which revolves around the provinces of Agrigento and Caltanissetta - which, although not qualifying as an internal area, constitutes a large agricultural centre.

All the interventions detected, mainly extraordinary maintenance, allow the redevelopment of the secondary road network - mainly made up of Provincial Roads - making transit easier and safer for residents of the urban centers involved and for economic operators in the agricultural production districts and/or agro-industrial towards and from the main road axes (mainly state roads) which lead, in turn, to the central multimodal TEN-T network (represented in these cases by the A18, A19 and A20 motorways).

In two cases the interventions directly affected sections of state roads (no. 113 and no. 640).

The fact that some interventions are not yet completed and the presence of other structural and/or maintenance interventions affecting the same sections, as well as the occurrence of calamitous events affecting the areas

examined, prevent the valorisation of indicators which, at the state of the art, can measure the improvement in accessibility with the main road and railway axes of the TEN-T network (for example the average travel time or the number of vehicles in transit).

However, for the intervention relating to the SS 640 between Canicattì and Caltanissetta, the project documentation on the evaluation scale in terms of efficiency and traffic congestion envisaged the passage of the Agrigento – Caltanissetta – A19 itinerary from a Service Level D to a Service Level A mainly due to the reduction in travel times.

Furthermore, on the basis of the technical reports contained in the Framework Program Agreements, some result indicators have been associated with the interventions examined: in the case of Val Simeto and Calatino, for example, the works carried out are expected to reduce travel times towards the urban and logistical nodes of approximately 8' and approximately 5' respectively, in the case of the Nebrodi area an average increase of 375% of vehicles transiting on the secondary road network is expected, while in the Madonie area, finally, the increase in the average daily number of road services - weighted by the population resident in the municipality - from the municipalities of the reference area to the regional capital can be estimated at 0.162.

TAB.45- PROPERTIES INVESTIGATED AND IMPACT INDICATORS ON THE PROJECTS ACTIVATED WITHIN ACTION 7.4.1

AREA OF INTERVENTION	PRESENCE STRATEGY INTERNAL AREAS	AGRICULTURAL AND AGRI-FOOD CENTRES	INTERVENTIONS CARRIED OUT ON SECONDARY AND TERTIARY NODES	NETWORK CONNECTION OF INTERVENTIONS	IMPROVEMENT IN ACCESSIBILITY OF THE AREA EXPECTED
Val Simeto	SNAI VAL SIMETO	Biodistrict of Val Simeto (olive groves, vineyards, orchards and citrus groves).	No. 5 extraordinary maintenance, restoration, redevelopment and safety interventions on sections involving the SP 44, 156, 94, 41 and 50 in order to improve secondary roads, internal connections between municipalities and accessibility to the corridors of the European TEN-T network.	Two corridors of the TEN-T network affected: - A18 Catania-Messina motorway (north-eastern side); - A19 motorway which connects Palermo with the central-eastern route of the island: Catania-Palermo. Three road axes leading to the central multimodal TEN-T network on which the internal routes of the Val Simeto area are based: - SS 121 Catanese; - SS 284 Western Etnea; - SS 192.	Redevelopment of the secondary road network through extraordinary maintenance interventions carried out on 5 Provincial Roads - for an estimated length of 25.50 km - allows us to improve accessibility to the main axes of the TEN-T Network. The expected improvement in the accessibility index towards urban and logistical nodes (travel times to the aforementioned nodes) can be estimated at 8.02', going from 30 (baseline) to 38.02 (objective for 2020).
Calatino	SNAI CALATINO	Agricultural supply chains of durum wheat, niche and typical productions in the fruit and vegetable sector (citrus fruits and table grapes), oil, livestock products (meat, milk and derivatives). In the Municipality of Caltagirone there are agricultural POs established which act as warehouses and exchanges for large quantities of fruit and vegetable production.	No. 12 extraordinary maintenance, restoration, requalification and safety interventions on sections affecting the SP 143, 60, 28/III, 86, 151, 31, 75, 38/I, 28/II, 180, 196, the SP former railway station of San Michele di Ganzaria, the "Montagna di Ganzaria" reclamation road, in order to improve secondary roads, internal connections between municipalities and accessibility to the corridors of the European TEN-T network.	Two corridors of the TEN-T network affected: - A18 Catania-Messina motorway (north-eastern side); - A19 motorway which connects Palermo with the central-eastern route of the island: Catania-Palermo. A road axis that leads to the central multimodal TEN-T network on which the internal routes of the Calatino area are based: - SS 417 Catania-Gela.	Redevelopment of the provincial road network in the Calatino area, through extraordinary maintenance interventions carried out on 12 provincial roads and a reclamation road for an estimated length of 22 km, is functional to the connection of the secondary and tertiary nodes and the districts of agricultural and agri-food production in the area with the main road axes. The expected improvement in the accessibility index towards urban and logistical nodes (travel times to the aforementioned nodes) can be estimated at 5.2', going from 52 (baseline) to 46.8 (objective for 2020).
Nebrodi	SNAI NEBRODI	Agricultural supply chains of olive trees, wine, durum wheat, fruit and vegetables (citrus fruits and dried fruit), medicinal plants, legumes, livestock products (meat, milk and derivatives) and floriculture.	No. 6 extraordinary maintenance, restoration, redevelopment and safety interventions on sections involving the SP 160, 146/BIS, 138, 163, 161 and 176 and the SS 113 in order to improve primary and secondary roads, connections internal connections between Municipalities and accessibility to the corridors of the European TEN-T network.	Two corridors of the TEN-T network affected: - A18 Catania-Messina motorway (north-eastern side); - A19 motorway which connects Palermo with the central-eastern route of the island: Catania-Palermo. Various road axes leading to the central multimodal TEN-T network on which the internal routes of the Madonie area are based: - SS.SS. 113, 116, 117 and 289.	Redevelopment of the primary and secondary road network through extraordinary maintenance interventions carried out on 1 state road and 6 provincial roads - for an estimated length of 47.50 km, allows to improve accessibility to the main axes of the TEN-T network. The improvement in the accessibility index towards urban and logistical nodes (average daily number of vehicles) can be estimated at +375% (with an expected peak of +900% for the intervention on the Via dei Normanni San Fratello road itinerary).
Madonie	SNAI MADONIE	Agricultural supply chains of olive trees, durum wheat, fruit and vegetables, medicinal plants, livestock products (meat, milk and derivatives).	N.9 extraordinary maintenance, restoration, requalification and safety interventions of sections involving the SP 8, 9, 9BIS, 11, 28, 54, 58, 60, 113, 119 and 120 in order to improve secondary roads, internal	Two corridors of the TEN-T network affected: - A20 Palermo – Messina motorway (northern Tyrrhenian side); - A19 motorway which connects Palermo with the central-eastern routes of the island (Catania-Palermo, Caltanissetta-Palermo, Enna-Palermo,	Redevelopment of the secondary road network through extraordinary maintenance interventions carried out on 11 Provincial Roads - for an estimated length of 27.70 km, allows improving accessibility to the main axes of the TEN-T Network.

AREA OF INTERVENTION	PRESENCE STRATEGY INTERNAL AREAS	AGRICULTURAL AND AGRI-FOOD CENTRES	INTERVENTIONS CARRIED OUT ON SECONDARY AND TERTIARY NODES	NETWORK CONNECTION OF INTERVENTIONS	IMPROVEMENT IN ACCESSIBILITY OF THE AREA EXPECTED
			connections between municipalities and accessibility to the corridors of the European TEN-T network.	Siracusa-Palermo and Ragusa-Palermo) and cuts transversally through the Madonie area. Two road axes leading to the central multimodal TEN-T network on which the internal routes of the Madonie area are based: - SS 121 – SS 285 – A20 motorway (this route overlaps with the Tyrrhenian route at the Termini Imerese junction); - SS 120 which joins the A19 motorway at the Irosa junction.	The improvement of the accessibility index towards urban and logistical nodes (average daily number of road services weighted by the population resident in the municipality, from the municipalities of the reference area to the regional capital - average trips/year per 1000 inhabitants) can be estimated at 0.162, going from 0.618 (baseline) to 0.780 (2020 target).
South-western area – Provinces of Agrigento and Caltanissetta	Outside internal areas	Agricultural supply chains of olive trees, livestock products (meat), wheat, wine, fruit and vegetables (almonds) - olive growing.	N. 1 intervention to widen a section of the SS 640 in order to improve traffic, connections and accessibility to the corridors of the European TEN-T network	A corridor of the TEN-T network affected: - A19 motorway which connects Palermo with the central-eastern routes of the island (Catania-Palermo, Caltanissetta-Palermo, Enna-Palermo, Siracusa-Palermo and Ragusa-Palermo). A road axis serving southern Sicily: - SS 115 South Western Sicula	Redevelopment of the primary road network through a renovation carried out on 1 SS for an estimated length of 34.6 km allows for improved accessibility to the main axes of the TEN-T network. Forecast of the transition from a Service level D to a service level A mainly due to the reduction in travel time of the entire Agrigento - Caltanissetta - A19 itinerary.

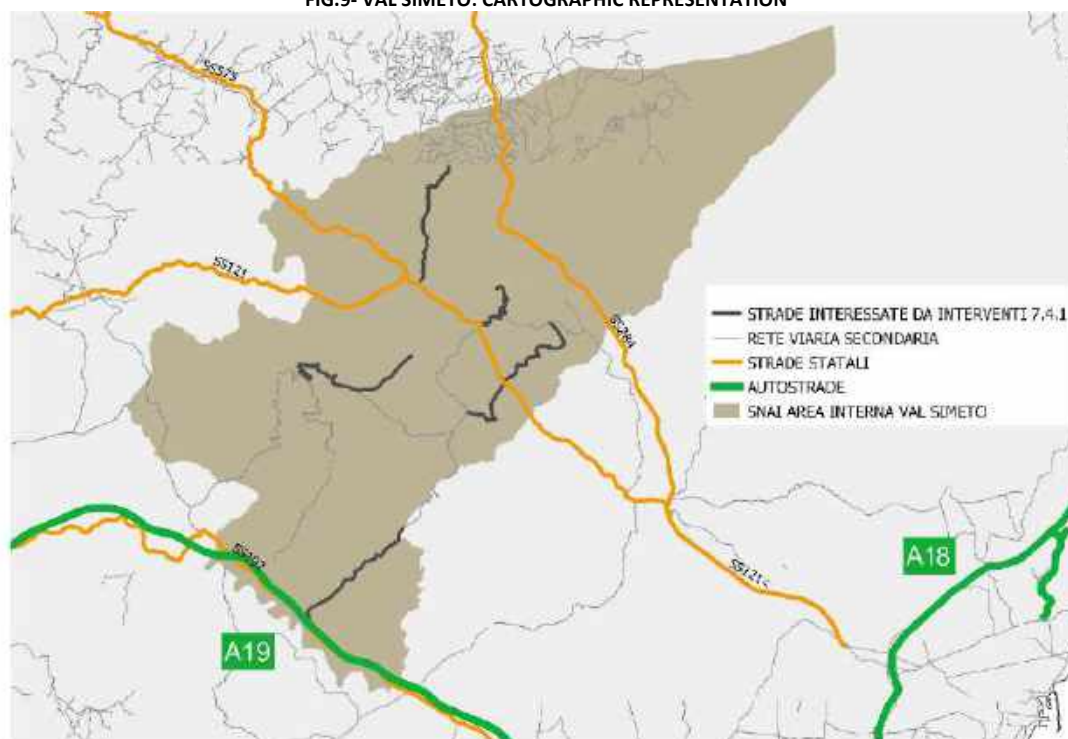
DETAIL OF INTERVENTIONS BY AREA

TAB.46- VAL SIMETO INTERNAL AREA: INTERVENTIONS FINANCED WITH ACTION 7.4.1

PROJECT	OBJECT OF THE INTERVENTIONS	OBJECTIVE	LENGTH OF REBUILT OR UPGRADED ROADS OBJECTIVE FOR 2020
Extraordinary maintenance works on the SP 44 in the municipality of Biancavilla Itinerary 2	Extraordinary and structural maintenance interventions on the road surface through improvement of the paving, resurfacing or new placement of horizontal and vertical signs and installation of road safety barriers on the SP 44.	Improvement of transit conditions in order to facilitate interconnections with the main axes of the SS 121 Catanese and the SS 284 Occidentale Etna and accessibility to the secondary arteries (SS.PP. 156 dir and 156) and agricultural and agro-production districts industrial in the area.	6.0 km
Extraordinary maintenance work on the SP 156 - Route 1	Extraordinary and structural maintenance interventions on the road plan through improvement of the paving, new horizontal and vertical signs and installation of road safety barriers on the SP 156	Improvement of transit conditions in order to facilitate interconnections with the main axes of the SS 121 Catanese and the SS 284 Occidentale Etna and accessibility to the secondary arteries (SS.PP. 156 dir and 44) and agricultural and agro-production districts industrial in the area.	4.0km
Extraordinary maintenance works on the SP 94 in the Municipality of Adrano - Itinerary 4	Extraordinary and structural maintenance interventions on the road plan through improvement of the paving, new horizontal and vertical signs and installation of road safety barriers on the SP 94	Improvement of transit conditions in order to facilitate interconnections with the other municipalities in the area, the agricultural and agro-industrial production districts of the area and the main axes of the primary network consisting of the SS 121 Catanese, the SS 284 Occidentale Etna and the SS 575 .	5.0 km
Reconnection of the road network and restoration of landslide sections of the SP 41	Extraordinary and structural maintenance interventions on the road surface through improvement of the pavement, construction of a bulkhead, insertion of signs and obsolete safety barriers on the SP 41.	Improvement of transit conditions in order to connect the SP 41/A with the SP 116 to then reach the SS 192.	10.0km

PROJECT	OBJECT OF THE INTERVENTIONS	OBJECTIVE	LENGTH OF REBUILT OR UPGRADED ROADS OBJECTIVE FOR 2020
"Centuripe-Stazione Mandalano" - B° SP 82			
Reconnection of the road network and arrangement and modernization works of the SP 50 – Ponte Barca Biancavilla – Scalo Muglia	Structural and extraordinary maintenance interventions on the road surface through improvement of the pavement and reconstruction of a collapsed slope, insertion of signs and safety barriers of the SP 50.	Improvement of transit conditions in order to strengthen two orthogonal axes which allows a connection to the TEN-T NETWORK with a north – south route, restoring the connection with the A19 at the Catenanuova junction and with the railway line, therefore towards the A19, the A18, the Port of Catania, the Catania airport, the railway station, the port and the airport of Palermo, facilitating all agricultural and agri-food centres.	0.5km
TOTAL: 5 INTERVENTIONS			25.5km

FIG.9- VAL SIMETO: CARTOGRAPHIC REPRESENTATION

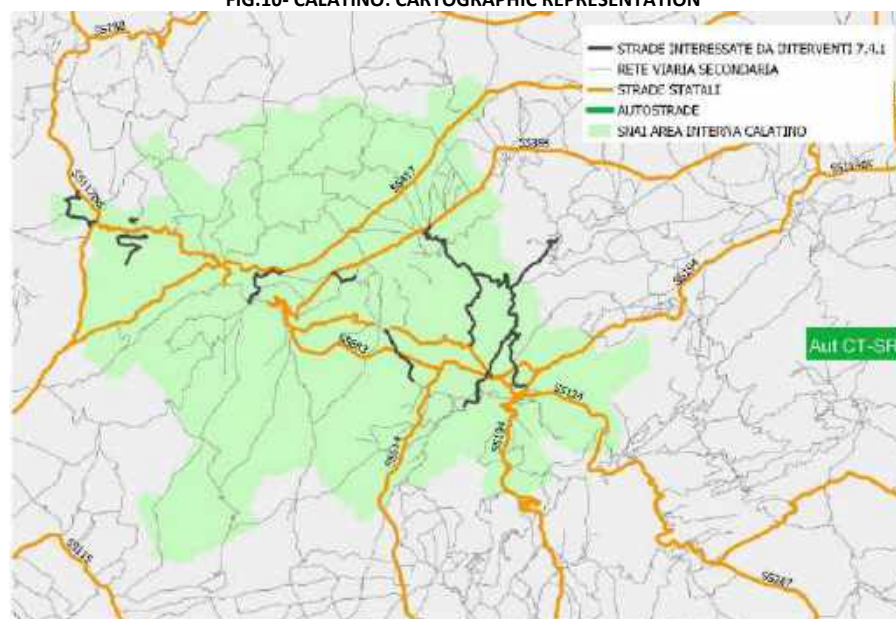


TAB.47- CALATINO INTERNAL AREA: INTERVENTIONS FINANCED WITH ACTION 7.4.1

PROJECT	OBJECT OF THE INTERVENTIONS	OBJECTIVE	LENGTH OF REBUILT OR UPGRADED ROADS OBJECTIVE FOR 2020
Extraordinary maintenance work on the SP 143 in the municipality of San Cono	Extraordinary maintenance interventions on the pavement, new placement of horizontal and vertical signs and installation of road safety barriers on the SP 143	Improvement of transit conditions in the road network that revolves around the municipality of San Cono and the connection with neighboring municipalities, rural areas and the main arteries SS.SS 124, 117/bis and 417 (Catania-Gela).	2.0 km
Extraordinary maintenance work on the SP 60 in the municipality of San Cono	Extraordinary maintenance interventions on the pavement, new placement of horizontal and vertical signs and installation of road safety barriers on the SP 60	Improvement of transit conditions in the road network that revolves around the municipality of San Cono and the connection with neighboring municipalities, rural areas and the main arteries SS.SS 124, 117/bis and 417 (Catania-Gela).	1.0km
Extraordinary maintenance works SP 28/III - Connection section between the Municipality of Vizzini and the SS 194	Extraordinary maintenance interventions for the arrangement of the road surface and its safety with installation of barriers and signs, restoration of ditches, restoration of collapsed walls on the SP 28/III	Improvement of transit conditions in the road connection between the Municipalities of Vizzini and the neighboring municipalities, the secondary arteries (such as the SS.PP 28/II 38/I and 75, agricultural and agro-industrial production districts of the area and the main SS.SS arteries 194 and 114.	2.0 km
Extraordinary maintenance works on the SP 86 section connecting the municipalities of Mineo and Vizzini	Extraordinary and structural maintenance interventions to restore and arrange the road surface and installation of road safety barriers and signs on the SP 86	Improvement of transit conditions in the road connection between the Municipalities of Vizzini and Mineo, the secondary arteries (such as SS.PP 38/II and 75, agricultural and agro-industrial production districts of the area and the main arteries SS.SS 124.	2.5km
Extraordinary maintenance work on the SP 151 in the municipality of Gram-michele	Extraordinary and structural maintenance interventions on the road plan: improvement of the pavement, new placement of signs and installation of road safety barriers on the SP 151	Improvement of transit conditions in the road connection with the main axes of the SS 385 and the SS 417, to the secondary arteries (such as the SP 25/I and to the agricultural and agro-industrial production districts of the area.	2.0 km
Extraordinary maintenance work on the SS.PP. 196-180 which branches off from the town center of the Municipality of Caltagirone until reaching the SS417	Extraordinary maintenance interventions on the pavement and new placement of horizontal signs on SS.PP 180 and 196	Improvement of transit conditions in the road connection with the main axes of the SS 417, to the secondary arteries (such as the SP 25/I and to the agricultural and agro-industrial production districts of the area.	2.0 km
Extraordinary maintenance works on the SP called ex Scalo Ferroviario, San Michele di Ganzaria	Extraordinary and structural maintenance interventions on unsafe walls, improvement of the flooring and placement of new horizontal and vertical signs on the SP former railway station of San Michele di Ganzaria	Improvement of transit conditions in the road connection between the municipality of San Michele di Ganzaria and the agricultural areas and activities production areas in the area with the main axes of the SS 124 and SS 683 (Libertinia).	2.0 km
Extraordinary maintenance work on the SB "Montagna di Ganzaria".	Extraordinary maintenance interventions on the pavement and new placement of horizontal signs on the "Montagna di Ganzaria" reclamation road	Improvement of transit conditions in the road connection between the municipality of San Michele di Ganzaria and the agricultural areas and activities production areas in the area with the main axes of the SS 124 and SS 683 (Libertinia).	2.0 km
Urgent works to renovate the road surface and road signs in the section falling within the Municipality of Mineo	Extraordinary maintenance interventions on the pavement and new placement of horizontal and vertical signs on the SP 31	Improvement of transit conditions in the road connection between the municipality of Mineo and the SS 194, home to valuable agricultural production, stitching together the network of connections with Grammichele and Vizzini, improving the connections with the secondary arteries (SP 86 and the SS 124) and the agricultural and agro-industrial production districts of the area, and the interconnections with the main axes of the SS.SS. 385 and 417 which lead to SS 114	2.0 km

PROJECT	OBJECT OF THE INTERVENTIONS	OBJECTIVE	LENGTH OF REBUILT OR UPGRADED ROADS OBJECTIVE FOR 2020
SP75 - Renovation works on the road surface and road signs in the section falling within the Municipality of Grammichele - PO ERDF 2014/2020 – OT 7.4.1 – SNAI Internal Area – Calatino – AICA 25	Extraordinary and structural maintenance interventions represented by the reconstruction of the road surface and road signs of the SP 75	Improvement of transit conditions in the road connection between the Municipality of Grammichele, the secondary arteries (SS.PP. 38/I and 38/II) and the agricultural and agro-industrial production districts of the area (in particular the prized vineyards with grapes quality table "Italy")	1.0km
Functional redevelopment works of the SP 38/I – Licodia Eubea – Vizzini Scalo - AICA 31	Extraordinary maintenance interventions on the pavement and with renovation of the horizontal and vertical signs to improve the safety of the SP 38/I	Improvement of safety conditions in the road connection with the main axes of the SS 514 and the SS 683 (Libertinia)	1.5 km
SP 28/II - Road surface arrangement works, barrier installation, signs and collapsed walls, in the Municipality of Militello in Val di Catania	Extraordinary maintenance interventions consisting of the arrangement of the road surface, installation of barriers and horizontal and vertical signs, restoration of collapsed walls in the district called "Calvario" on the SP 28/II.	Improvement of transit conditions in the road connection with the SS 194, the interconnections with the main axes of the SS 514, and the SS 194 (which leads to the SS 114) and improvement of the accessibility conditions to the secondary arteries (SS.PP. 38/ II and 75), the inhabited centers of Grammichele and Mazzarore and the agricultural and agro-industrial production districts of the area, in particular the prized vineyards with "Italia" quality table grapes.	2.0 km
TOTAL: 11 INTERVENTIONS			22.0 km

FIG.10- CALATINO: CARTOGRAPHIC REPRESENTATION



TAB.48- NEBRODI INTERNAL AREA: INTERVENTIONS FINANCED WITH ACTION 7.4.1

PROJECT	OBJECT OF THE INTERVENTIONS	OBJECTIVE	LENGTH OF REBUILT OR UPGRADED ROADS OBJECTIVE FOR 2020
Project of maintenance and safety works for the SP 160 road route of San Marco d'Alunzio	Extraordinary maintenance interventions on the pavement, installation of lateral protections and new placement of signs on the SP 160	Improvement of safety conditions in the road connection with the SS 113 and the A20 motorway.	7.0km
Maintenance and safety works on the SP 146/bis and SP 138 road itinerary of Ponte Naso - Sinagra – Limari	Extraordinary maintenance interventions on the pavement, installation of lateral protections and new placement of signs on the SP 146/BIS	Improvement of safety conditions in the road connection with the SS.SS. 113 and 116	19.5 km
Maintenance and safety works on the road route Via Dei Normanni Municipality of San Fratello	Extraordinary maintenance interventions consisting of the resurfacing of the road surface, the installation of lateral safety barriers and horizontal and vertical signs on the SS.PP 163/d and 163DIR	Improvement of safety conditions in the road connection with the SS 289 and the A20 motorway	1.5 km
Maintenance and safety works on the SS 113 road route - Mirto - Valle Zappulla	Extraordinary maintenance interventions on the SS 113	Improvement of the transit conditions of the SS 113 Mirto – Valle Zappulla which connects the Nebrodi area (Tortorici, Galati Mamertino, Longi, Castell'Umberto, Naso, San Salvatore di Fitalia and Mirto) with the A20 motorway	6.0 km
Project of the works "Road Route SP 161 Alcara Li Fusi" - "APQ - Internal Area Nebrodi"	Extraordinary maintenance interventions on the pavement, installation of lateral protections and new placement of signs on the SP 161	Improvement of transit conditions and connection with the A20 motorway	1.5 km
Arrangement and safety works on the SP 176 Castel di Lucio - Mistretta road route	Extraordinary maintenance interventions consisting of the resurfacing of the road surface, the installation of lateral safety barriers and horizontal and vertical signs on the SP 176	Improvement of safety conditions in the road connection with the SS.SS. 117 and 113 the A20 motorway	12.0 km
TOTAL: 6 INTERVENTIONS			47.5 km

FIG.11- NEBRODI: CARTOGRAPHIC REPRESENTATION

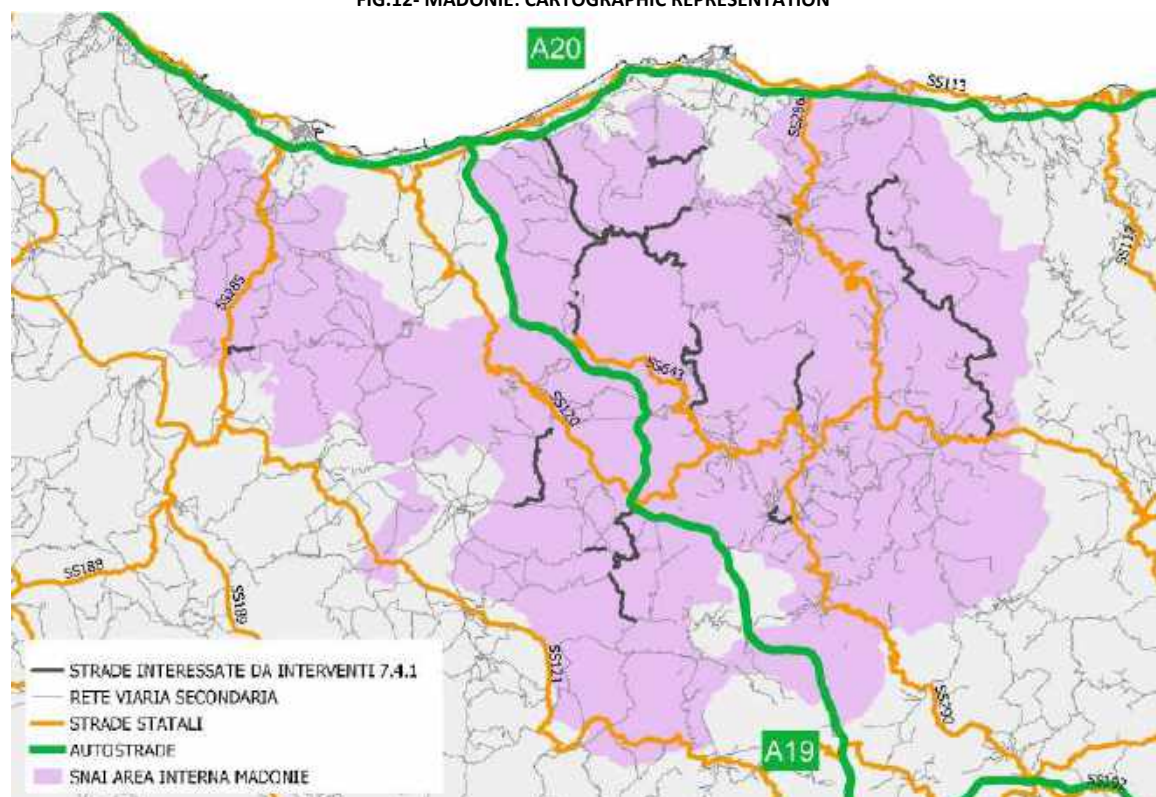


TAB.49- MADONIE INTERNAL AREA: INTERVENTIONS FINANCED WITH ACTION 7.4.1

PROJECT	OBJECT OF THE INTERVENTIONS	OBJECTIVE	LENGTH OF REBUILT OR UPGRADED ROADS OBJECTIVE FOR 2020
SP 11 by Blufi. Extraordinary maintenance works for the arrangement of the road surface and resurfacing of rough sections	Extraordinary maintenance interventions consisting of drainage, consolidation of the road body, reclamation of the road box, resurfacing, installation and/or replacement of safety barriers on the SP 11	Improvement of transit conditions and the connection between the A19 motorway, the SS 290 and some municipalities in the Madonie. The road axis in question serves a total of 15 of the 47 agricultural companies located along the itinerary, belonging to the Beef District of the Internal Areas of Sicily and several companies belonging to the Dairy District. The area that serves the SP 11 road axis of Blufi also has a strong cereal-fodder connotation, which is why the stretch is crossed by large agricultural vehicles such as combine harvesters.	1.0km
SP 28 of Lascari and Gratteri B° Piletto - Lascari - Gratteri - B° Piano delle Fate. Arrangement and safety works in occasional sections of the road plan in the stretch between Gratteri and B° Piano delle Fate	Extraordinary maintenance interventions for the arrangement and safety measures consisting of drainage, reclamation of the road bin, resurfacing of the road surface, installation and/or replacement of safety barriers on the SP 28	Restoration of safe transit in a section of the SP 28 which is the only connection axis between the municipalities of Lascari and Gratteri and the main connection axis of Gratteri with the SS 113 and therefore with the A20 motorway. This road axis serves a total of 15 of the 47 agricultural companies located along the itinerary belonging to the Beef District of the Internal Areas of Sicily and several companies belonging to the Dairy District and belonging to the cereal sector. The road section of the SP 28 also serves various citrus, horticultural and olive growing farms (around 15 in total) located in the area in question.	1.8 km
Arrangement and safety works in occasional sections of the road plan in the stretch of the SP 60 between Ganfi and B° Calabro' and in the stretch of the SP 52 between Borrello and Finale.	Extraordinary maintenance interventions for the restoration, arrangement, safety and reclamation of damaged sections through resurfacing of the road box, installation and/or replacement of travel safety barriers on SS.PP 52 and 60	Restoration, improvement of safety conditions and reduction of travel times on the SP n.60 and n.52 and connection with the SS 113 and consequently with the A20, with Gangi and with the other towns of the Madonie. The road section in question represents the shortest travel route for goods and people in the Alte Madonie/Northern Coast of Sicily connection: the two road axes serve a total of 47 farms belonging to the Beef District of the Internal Areas of Sicily and some companies belonging to the Dairy District and relating to the cereal sector.	4.9 km
SP 9 "Delle Madonie": Campofelice di Roccella - Castelbuono. Restoration and safety works on the road in occasional sections.	Extraordinary maintenance interventions for the restoration and safety of the roadway with drainage, consolidation of the road body through flexible works and naturalistic engineering works, reclamation of the road box, resurfacing of the road surface, installation and/or replacement of safety barriers on the SP 9	Improvement of transit conditions both in terms of safety and times in the stretch between Isnello and Castelbuono of the SP 9 which is one of the main arteries connecting some municipalities of the Madonie.	3.6km
Arrangement and safety works in occasional sections of the road plan of the SP 54 of Piano Battaglia and SP 113 ring road of Piano Battaglia	Extraordinary maintenance interventions for the arrangement and safety of the road surface through reconstruction of the road body in landslide sections, resurfacing of the viaduct joints, resurfacing of the road surface, installation and/or replacement of safety barriers on SS.PP 54 and 113	Restoration of safe transit to the only access route to Piano Battaglia and the main connection axis between the two sides of the Madonie	5.9km
SP 9 BIS Cammisini: Collesano - B° Firrionello. Provincial roads in the Madonita district. Occasional arrangement and safety works on the road surface	Extraordinary maintenance interventions for the arrangement and safety with drainage, consolidation of the road body through flexible works and naturalistic engineering works, reclamation of the road box, resurfacing of the road surface, installation and/or replacement of safety barriers on the SP 9BIS	Improvement of transit conditions both in terms of safety and times in the SP 9bis, one of the main access gates to the Madonie as it is a connection with the Scillato junction on the A19 near Collesano from which, via the SP 9, Isnello and Castelbuono and via the SP54 you can reach Piano Battaglia and Petralia.	2.2km
SP 8 "Di Valledolmo" and SP 58 "Di Sciafani Bagni": Arrangement and safety works in	Extraordinary maintenance interventions for the arrangement and safety consisting of drainage, consolidation of the road body through flexible	Restoration of safe transit in the two road axes of SP 8 and SP 58 which serve a total of 11 agricultural companies belonging to the Beef District of the Internal Areas of Sicily and other companies belonging to the Dairy	3.4 km

PROJECT	OBJECT OF THE INTERVENTIONS	OBJECTIVE	LENGTH OF REBUILT OR UPGRADED ROADS OBJECTIVE FOR 2020
occasional sections of the road plan in the stretch between Cal-tavuturo and Sclafani Bagni	works, reclamation of the road box, resurfacing of the road surface and installation and/or replacement of safety barriers on SS.PP 8 and 58	District and the cereal sector. The stretch allows you to reach, after about 10 km, the municipality of Valledolmo, a center with a strong agricultural vocation and home to agri-food processing industries that produce to-mato preserves, pasta, wine and oil.	
SP 119 “Di Portella Colla”: Polizzi – Portella Colla – Arrangement and safety works on occasional sections of the road plan.	Extraordinary maintenance interventions for the restoration and safety of the road body in the landslide sections through resurfacing of the road surface and installation and/or replacement of safety barriers on the SP 119	Restoration of safe transit in the most damaged sections by reconstituting the road surface of the SP 119 Polizzi-Piano Battaglia, access road to Pi-ano Battaglia from Polizzi Generosa, currently closed to traffic due to widespread instability of the road surface due to the particular harshness of the climate and the frequent snowfalls.	2.4 km
SS 120 – Arrangement and safety works in occasional sections of the road body and the road surface in the stretch between Km 10+000 and Km 82+000 - AIMA 12L	Extraordinary maintenance interventions for the arrangement and safety measures consisting of drainage, consolidation of the road body through flexible works, reclamation of the road box, resurfacing of the road surface and installation and/or replacement of safety barriers on the SS 120	Restoration of safe transit in the most damaged sections of the SP 120 road route which deteriorated following climatic events. The road axis in question serves a total of 11 of the 47 agricultural companies located along the itinerary belonging to the Beef District of the Internal Areas of Sicily and several companies belonging to the Dairy District and belonging to the cereal sector. The stretch affected by the works crosses several towns where various types of goods are unloaded and/or delivered, and the Bivio Madonnuza centre, where over 50 retail sector businesses and some supermarkets are concentrated.	2.5km
TOTAL: 9 INTERVENTIONS			27.7km

FIG.12- MADONIE: CARTOGRAPHIC REPRESENTATION



TAB.50- INTERVENTIONS OUTSIDE INTERNAL AREAS FINANCED WITH ACTION 7.4.1

PROJECT	OBJECT OF THE INTERVENTIONS	GOALS	LENGTH OF REBUILT OR UPGRADED ROADS
Agrigento-Caltanissetta itinerary - A19 - Upgrading of the SS 640 of Porto Empedocle to four lanes - second section up to km 74 +300 (A19 junction) PHASE 2	Intervention to expand the road infrastructure of a section of the SS 640 - from one lane for each direction to two lanes in each direction separated by a traffic island with a total width of 22 meters - and adaptation of the road platform.	Improvement of transit conditions both in terms of safety and times of the main road connection between south-western Sicily and the A19 motorway.	34.6 km
TOTAL: 1 INTERVENTION			34.6 km

FIG.13- SS 640: CARTOGRAPHIC REPRESENTATION



6.3 IMPACT OF INVESTMENT PRIORITY 7C

EVALUATION QUESTION n.3

To what extent has the OP ERDF Sicily 2014-2020 improved ecological low-emission transport in order to encourage sustainable regional and local mobility?

SYNTHETIC ANSWER

The expansion and safety measures, currently under construction, of the ports of Sciacca and S. Agata Militello, a predominantly tourist and fishing destination, make it possible to make the nautical traffic that affects the two port infrastructures more efficient.

6.3.1 ACTION 7.2.2

DV 3.1 To what extent do regional port and freight terminal infrastructures have improved environmental, energy and operational standards?

The action 7.2.2. has as its objective to strengthen regional freight terminals and promote the commercial specialization of Sicilian ports of regional interest through the implementation of interventions for the consolidation, expansion and safety of port piers, the supply of technological systems and the development of infrastructures for intermodality.

The two projects examined mainly concerned interventions to secure the port infrastructure of Sciacca (port located on the south-western coast, known for its fishing activities and goods traffic) and of S. Agata Militello (an important port for tourism and freight traffic by virtue of the fact that it guarantees the connection of the region with the Aeolian Islands, in particular the islands of Lipari and Vulcano), both category II, class III ports (update 2022), through expansion interventions of piers, quays and other functional spaces - which can guarantee more efficient management of the docking and departure of fishing boats and pleasure craft - and complementary interventions aimed at the arrangement of accommodation facilities and adjacent roads.

It should be noted, however, that the two interventions, at the state of the art, are not yet completed so as not to be able to detect and quantify the improvement of specific environmental, energy and operational standards.

TAB.51- PROPERTIES INVESTIGATED AND IMPACT INDICATORS ON THE PROJECTS ACTIVATED WITHIN ACTION 7.2.2

PROJECT	PORT INFRA-STRUCTURE AFFECTED	DESTINATION PORTS OF CATEGORY II, CLASS III	SURFACE SUBJECT TO INTERVENTION (M2)	INTERVENTIONS CARRIED OUT
Sciacca: construction works of the terminal section of the north bank quay, of the yards behind it and towing works.	Port of Sciacca	Fishing, tourist and recreational boats	13,000	Securing the port structure by increasing the overall development of the quay sections, allowing a better distribution of spaces between the fishing and recreational fleets. Creation of an area to be used for towing works. Upstream road arrangement.
Port of S. Agata Militello: completion of the existing maritime works regarding the extension of the breakwater from station 798.20 m to station 1,150.00, construction of the breakwater pier from station 0.00 to station 610.00 m and the shore quay.	Port of S. Agata di Militello	Tourist and recreational, passenger service, fishing and commercial	32,800	Securing the port structure through the extension of the two piers, development of the shore quay, construction of the jetty for hydrofoils, urban landscaping works and buildings for tourist-commercial use and buildings intended for nautical shipbuilding.

7 THE RELEVANCE OF THE INTERVENTIONS

EVALUATION QUESTION n.T1

Have the interventions carried out contributed to improving the quality of services for end users (degree of satisfaction)?

SYNTHETIC ANSWER

A survey carried out among a representative sample of residents in the Sicily region provides a picture of the TPL service with poor supply and consequently poor demand.

The share of those who use LPT sporadically is in fact very high and stands at around 70%, while among those who do not use LPT more than half indicate the lack of connections in the area of interest as one of the main reasons (poor offer), followed by the lack of reliability in transfers.

The frequency of the trips and the punctuality of the service, aspects with which the respondents expressed a high level of dissatisfaction, are considered the issues with which they should focus future interventions, as well as the widespread distribution of routes.

On the basis of this evidence, the relevance of the interventions activated within the OP emerges in favor of improving the quality of TPL services for end users with respect to the needs in terms of the offer of TPL services expressed by citizens.

Various interventions have produced, or will produce once completed, an increase in the LPT service offer, both in quantitative and qualitative terms, as well as contributing to the reduction of climate-changing gas emissions (actions 4.6.1/2/3/4). Others contribute to improving travel comfort, the new POP trains purchased and inserted in the routes with greatest potential demand (Action 7.31). Finally, the extraordinary maintenance interventions, speeding up and technological upgrades always on the routes with the greatest potential demand make it possible to reduce travel times on the one hand and, on the other, to significantly improve punctuality indices in some cases.

7.1 INTRODUCTION AND METHODOLOGICAL NOTE

As part of the evaluation process, a survey was carried out among the population resident in Sicily in order to detect the level of satisfaction with the urban and extra-urban public transport services offered in the area. The survey, and the subsequent Customer Satisfaction analysis, in addition to providing the Administration with useful information for the purposes of planning on the subject of urban mobility, allows the acquisition of useful information for the purpose of providing answers to some of the evaluation questions that guided the evaluation process.

As foreseen in the Evaluation Design, the survey saw the implementation of a double administration of the questionnaire over time: one in the month of June²⁶ and one between the last week of September and the first of October²⁷, in order to capture the preferences of different types of users, those interested in commuting between home/work and/or home/school and those of a leisure type, more linked to the tourist season.

The questionnaire was administered in CAWI mode²⁸ and the sampling carried out, which saw 665 interviewees resident in Sicily drawn for the first wave and 661 for the second, allows us to obtain, for a 95% confidence interval, a sampling error of approximately 3.7%. This is a simple random sampling that takes into account two layers in parallel:

- area of residence, understood as the Province of residence;
- age class of the interviewees (reference: Sicilian Region population).

The questionnaire is mainly made up of qualitative/categorical questions where there are two (yes, no) or more response options, which can take on sortable and equally spaced values (e.g. a lot, quite a bit, a little, not at all) or not sortable. This type of question allows us to delve into not only the "how much" of the phenomena being studied (as in the case of quantitative/cardinal variables), but above all the "how".

²⁶ Questionnaire administered in the period from 8 June to 19 June 2023.

²⁷ Questionnaire administered in the period from 23 September to 6 October 2023.

²⁸ The CAWI methodology (Computer Assisted Web Interviewing) is a data collection methodology that is based on completing a web questionnaire provided through a link, a panel or a website.

Considering that the respondents belong to different age groups and reside in different territories (provincial capitals and peripheral areas, for example), there are also different sets of questions that allow respondents to select more than one answer (multiple response questions) in gender through the attribution of an order of priority in them.

The structure of the questionnaire is divided into six sections:

- The first is dedicated to the respondent's personal details (sex, age, residence and employment status);
- The second allows us to detect whether the respondent uses local public transport and investigates some aspects including the frequency of use, the type of means used, the purpose of use and the reasons that lead or do not lead to the use of LPT;
- The third section detects the interviewee's level of satisfaction with the offer of TPL services;
- In the fourth section it is requested to evaluate which interventions in the future are considered priorities for the purpose of improving the LPT offer;
- The last two sections allow us to highlight two additional themes, namely the use and level of satisfaction with low environmental impact means of transport (bicycles, scooters, etc.) and the adequacy of LPT during the pandemic period.

From a purely statistical point of view, univariate descriptive techniques were used to analyze the data.

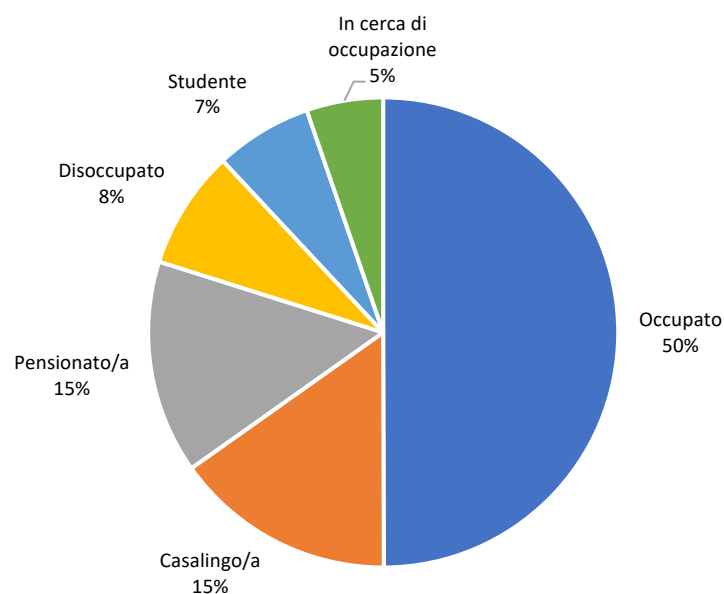
All questions in the questionnaire were numerically coded and processed using SPSS software, while the graphs and tables were created in Excel.

7.2 THE RESULTS OF THE INVESTIGATION

SECTION 1 – PERSONAL DATA

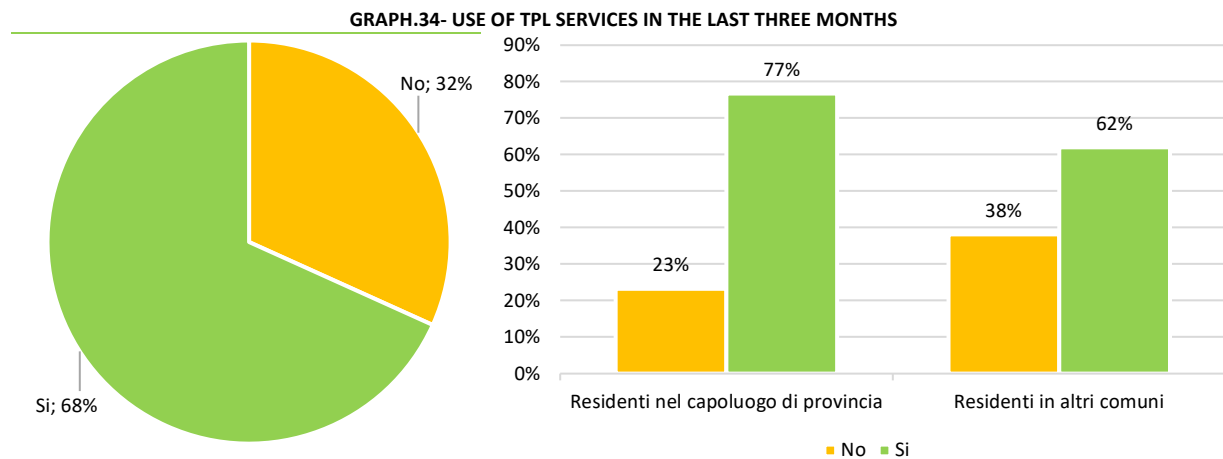
The sample, as seen, is made up of just over 1,300 interviewees, 43% of whom reside in a provincial capital municipality and are mostly employed.

GRAPH.33- SAMPLE OF RESPONDENTS BY EMPLOYMENT STATUS



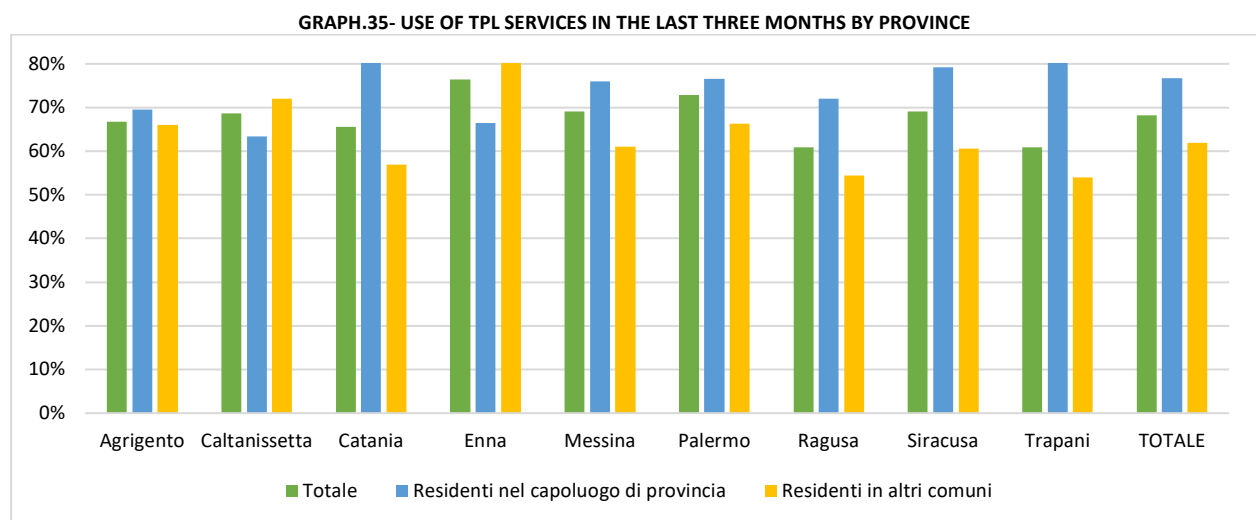
SECTION 2 – USE OF LOCAL PUBLIC TRANSPORT SERVICES

Almost 70% of those interviewed say they have used LPT in the last three months. This share rises to 77% for those who reside in a provincial capital municipality.



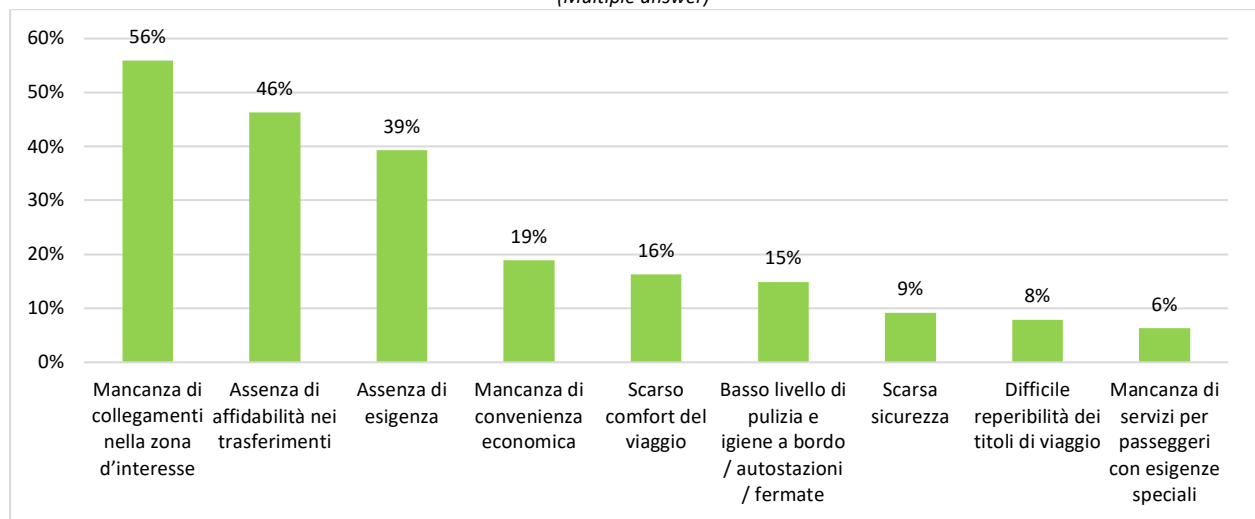
The data shows some differences between the 9 Sicilian provinces. In the provinces of Trapani and Ragusa, LPT is used to a lesser extent compared to the regional average figure (61% compared to 68% overall) and this difference is more marked in municipalities other than the provincial capital (54% for both compared to the regional figure equal to 62%). In Trapani, however, residents of the provincial capital use LPT to a greater extent than the provincial average (87% compared to 77% of the regional average).

Conversely, in the province of Enna the share of those who have used LPT in the last three months is higher than the regional average and equal to 76%, also higher than the province of Palermo which records 73% of LPT users. The data is mainly attributable to residents outside the capital who in 81% of cases declared having used LPT in the last three months (a very high value if compared with the regional average which stands at 62%).



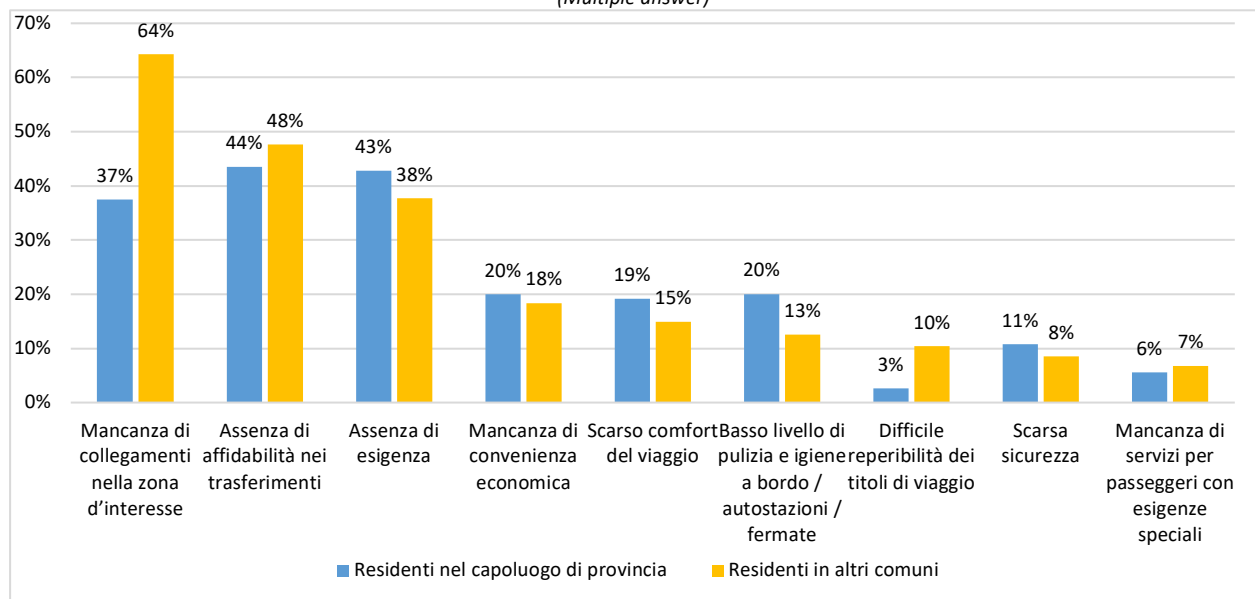
Among those who responded that they had not used LPT in the last three months, 56% identified the lack of connections in the area of interest as one of the main reasons. The lack of reliability in transfers also takes on significant importance (46%), as does the lack of economic convenience (39%).

GRAPH.36- REASONS WHY LPT IS NOT USED
(Multiple answer)



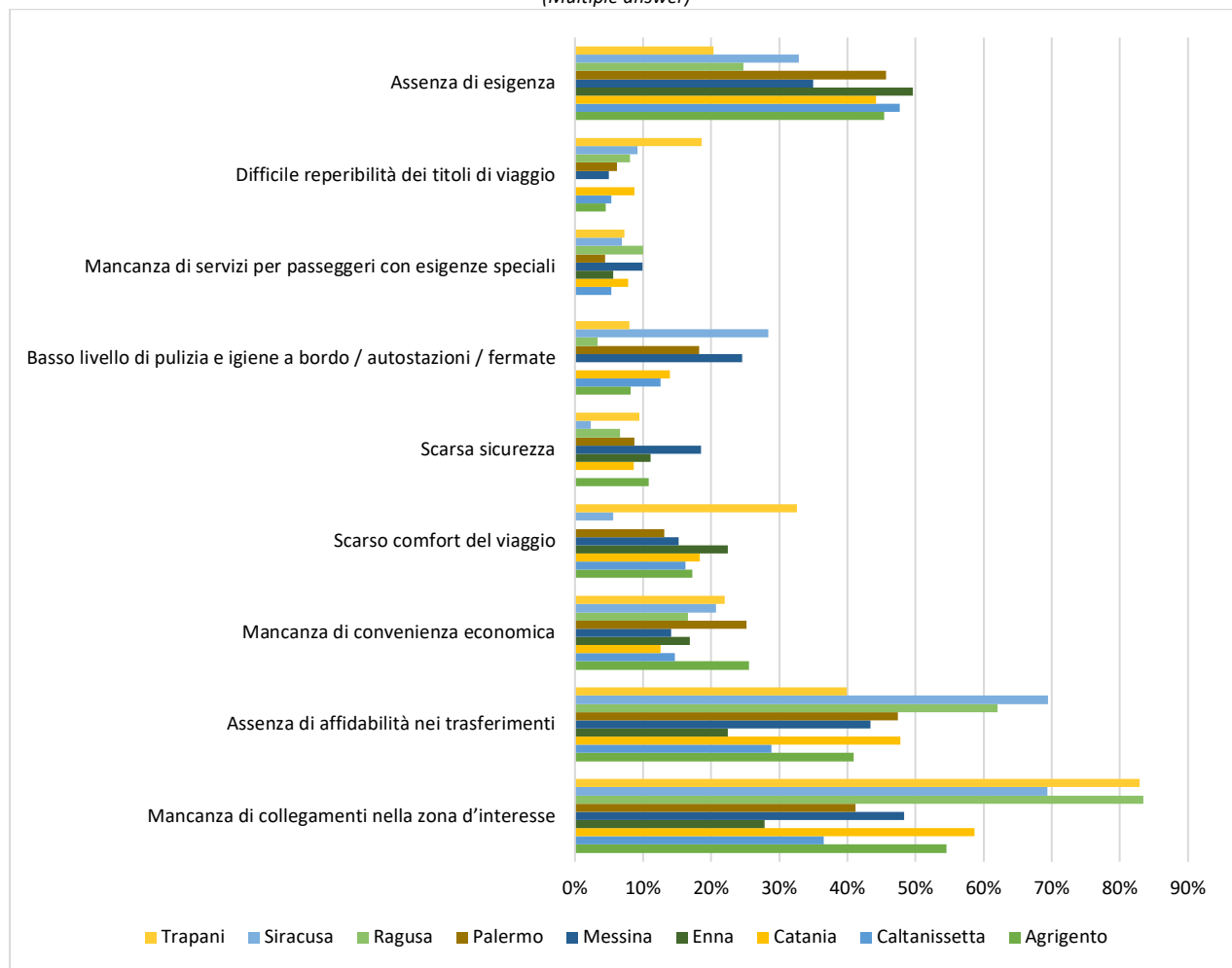
The respondent's residence does not influence the answers, except with reference to the lack of connections in the area of interest which, as expected, is considered the main reason for not using the LPT by 66% of those who reside in municipalities other than the capital of the province and only by 37% of those who reside in a capital municipality, and the poor availability of travel which has almost no influence on the choice not to use LPT among those who reside in a capital (3%), while it is relatively important for those who reside in the other municipalities of the province (10%).

GRAPH.37- REASONS WHY THE LPT FOR THE RESPONDENT'S RESIDENCE IS NOT USED
(Multiple answer)



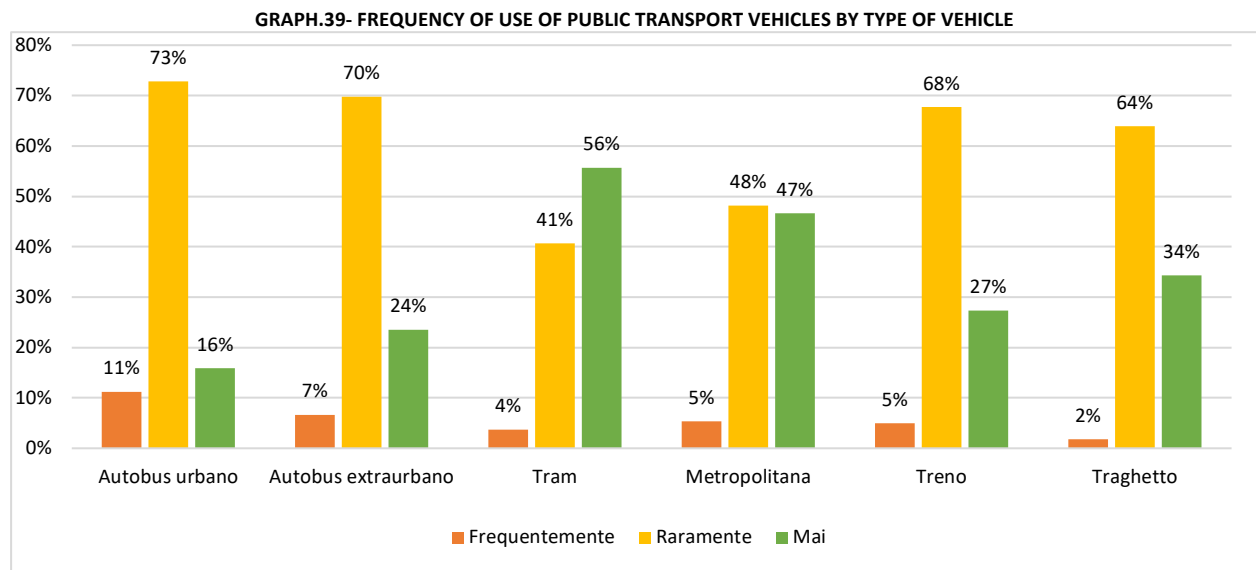
At the provincial level there are no differences compared to the regional data in relation to the reasons why the LPT is not used, with the exception of the Provinces of Enna and Caltanissetta for which the absence of needs takes on significant importance compared to the lack of connections or of reliability in transfers considered as main reasons at regional level.

GRAPH.38- REASONS WHY LPT BY PROVINCE IS NOT USED
(Multiple answer)

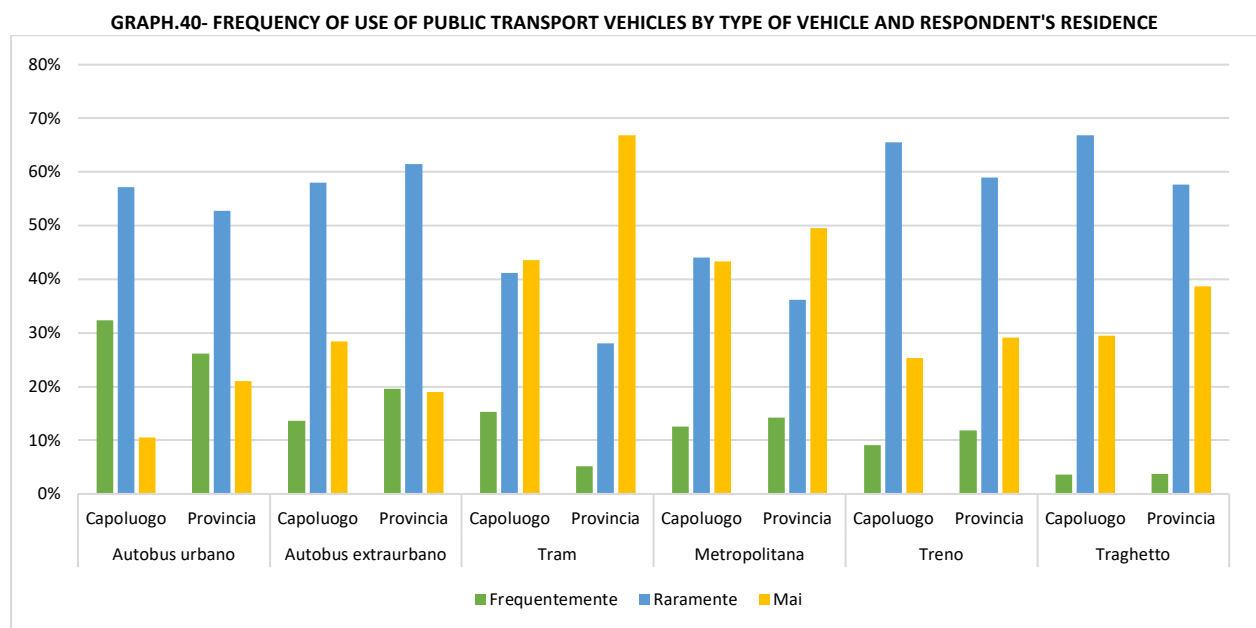


Among those who declared having used LPT vehicles in the last 3 months, there is a high number of those who use them sporadically. Leaving aside the tram and subway, which are never used by half of the respondents, as is logical given the very limited offer, the urban bus, the extra-urban bus and the train are rarely used by 73% and 68% of the respondents respectively.

The data reflects the level of overall TPL offer both in urban and extra-urban areas which, as seen in chapter 2, presents serious shortcomings both in terms of seat-km per capita and in terms of available vehicles.

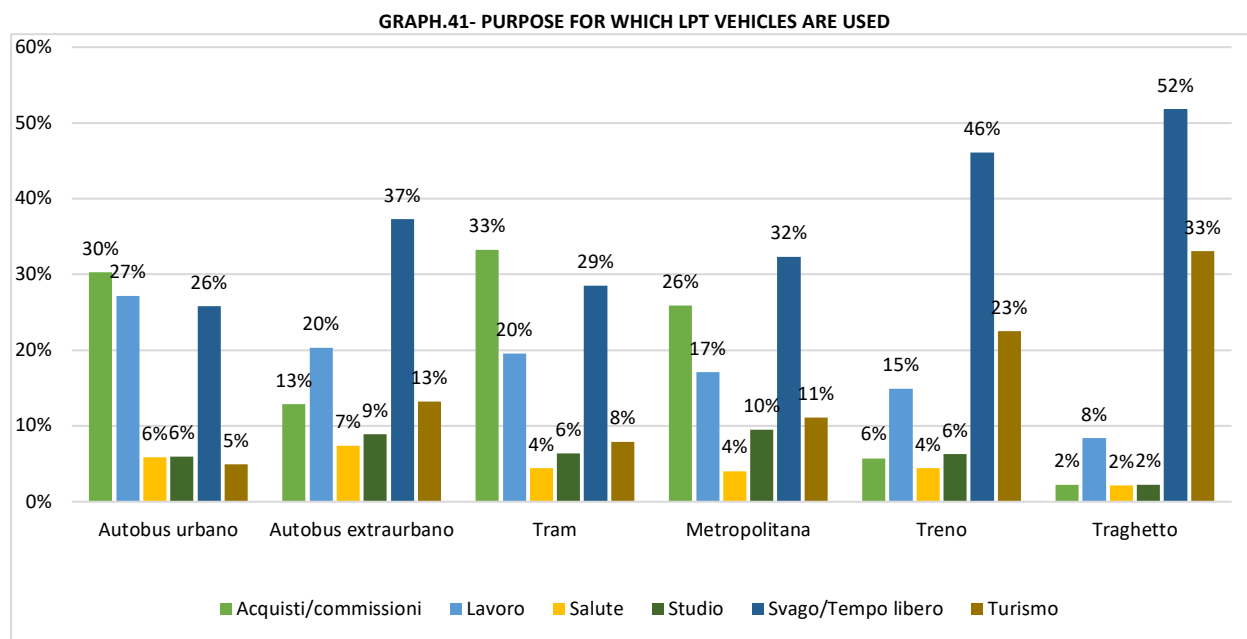


There is no difference in the frequency of use of the various public transports between those who reside in a provincial capital municipality and those who reside in other municipalities, unless it is attributable to the type of means: the urban bus is used more frequently by those who reside in a capital municipality, as well as the extra-urban bus by those who reside in other municipalities, however the number of those who only rarely use the LPT remains preponderant.

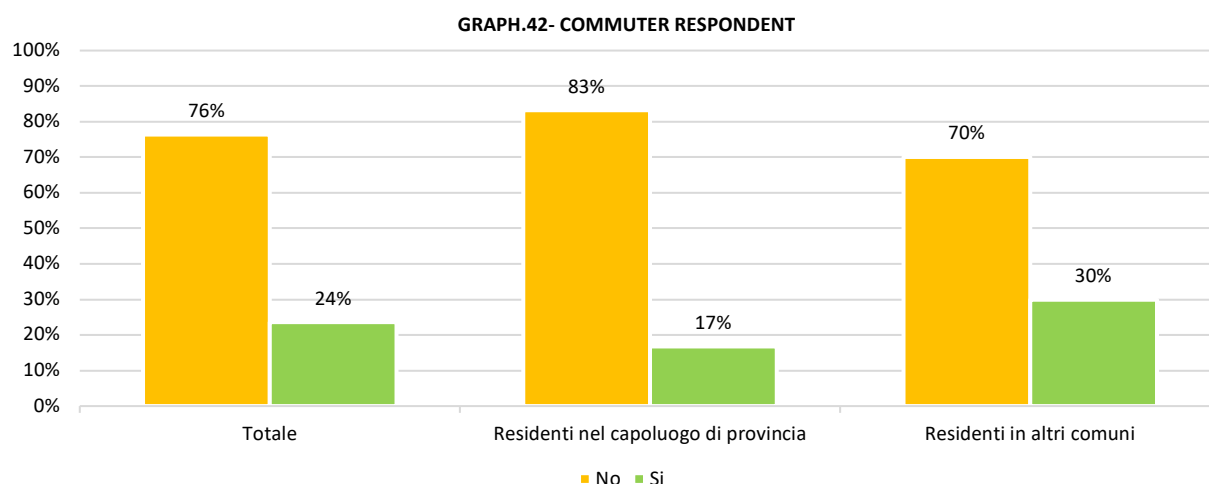


No particular difference is revealed when analyzing the data at provincial level, except with reference to the Tram and the Metro which, naturally, have greater use in the cities of Palermo and Catania compared to the others.

Generally the various public transport vehicles are used for leisure or free time purposes and/or shopping and errands, with the exception of the city bus which is mostly used for work reasons.

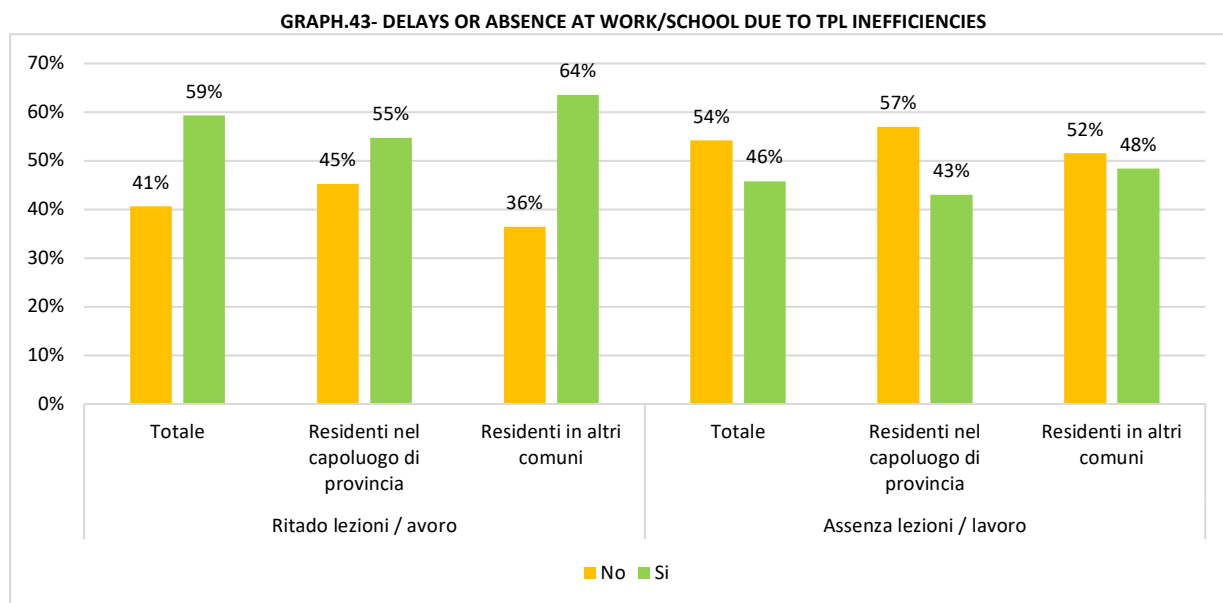


Among those who have used LPT in the last three months, only 24% declare themselves commuters and naturally the share rises for residents in municipalities other than the provincial capital (30%).



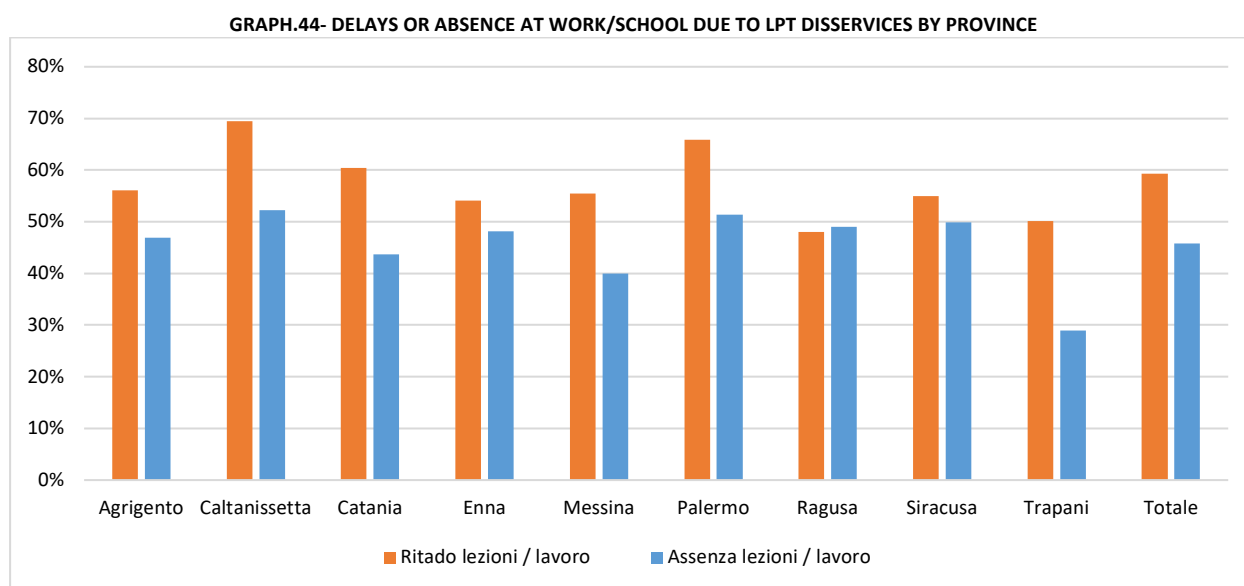
Almost 60% of respondents stated that they arrived late to work or to class due to TPL inefficiencies, and this share is naturally higher for residents outside the provincial capital.

The share of those who declare that the disservices of the LPT have had the consequence of an absence at work or in lessons is lower (46%), also in this case it is always the residents in the municipalities outside the capital who register the greatest absences.



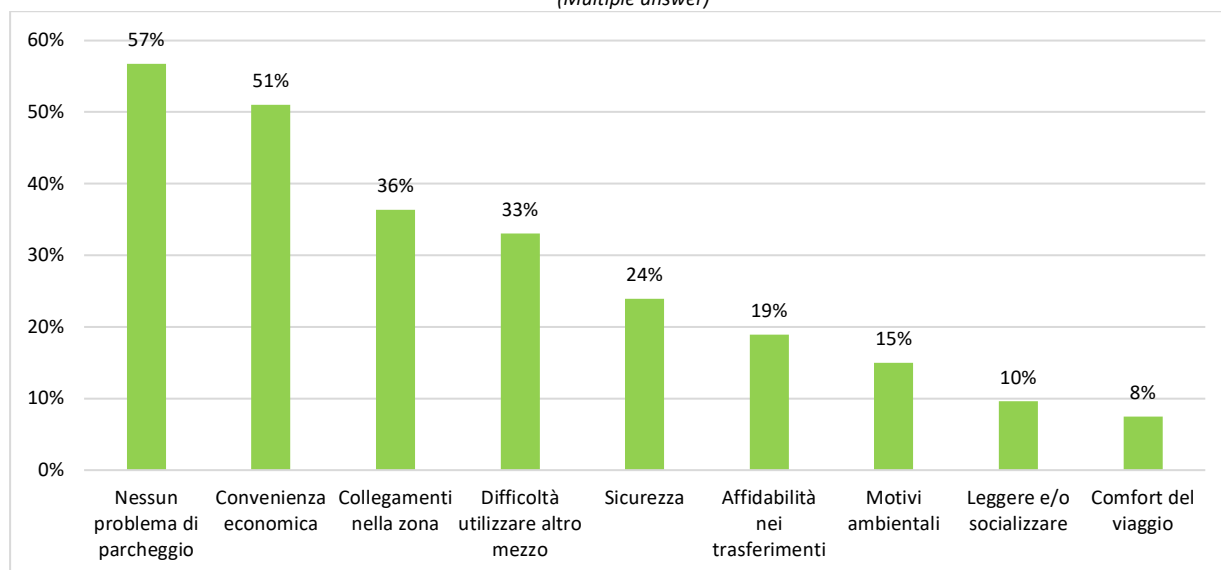
Ragusa and Trapani are the provinces where delays at work or study are lower than the provincial average, while delays are high in Caltanissetta and Palermo where respectively 70% and 66% of those interviewed declared having arrived late at the place of work or study.

Again in Trapani, absences at work or study are much lower than the regional average.



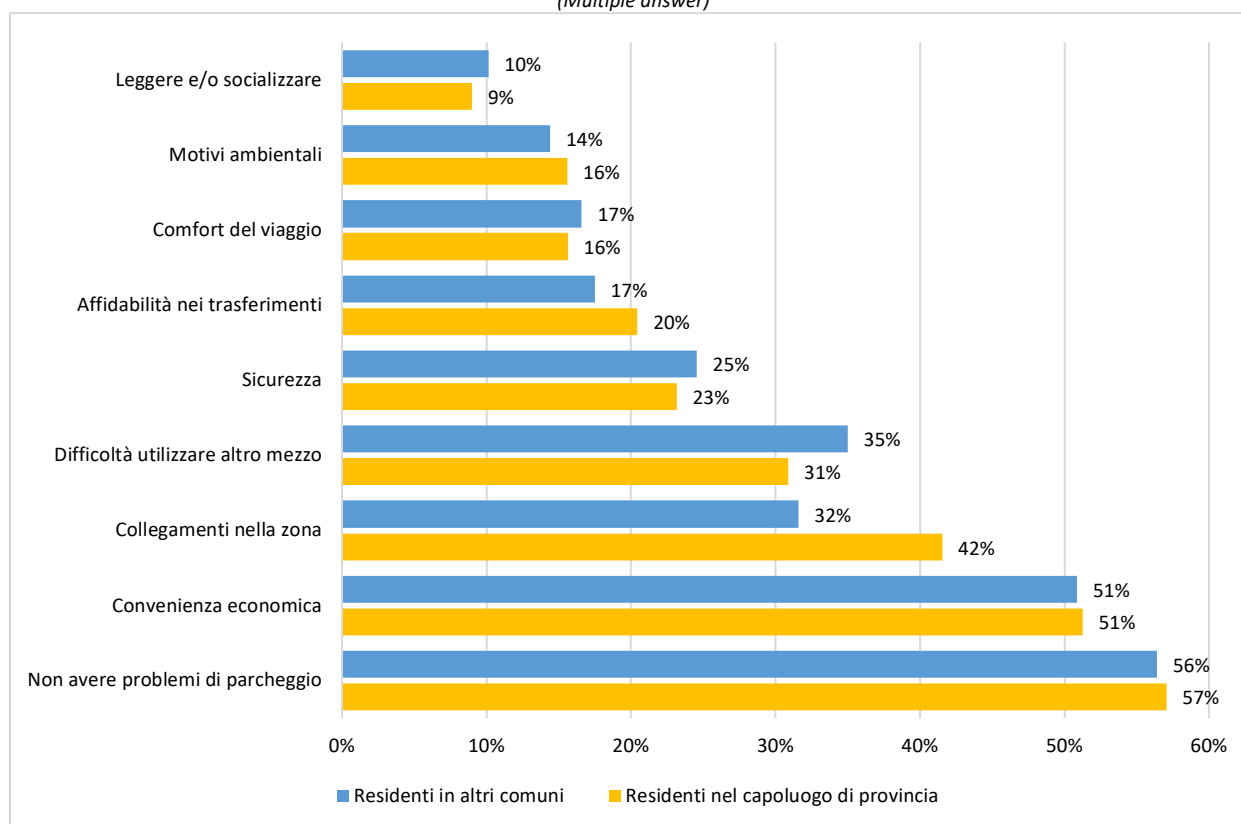
Among the reasons why people choose to use LPT, the lack of parking problems and economic convenience are the most relevant (57% and 51% respectively). This is followed by the possibility of having connections in the area of interest and the difficulty or impossibility of using another means of transport (36% and 33%).

GRAPH.45- REASONS WHY LPT IS USED
(Multiple answer)



No differences were found depending on the residence of the respondent, except with reference to the motivation linked to the presence of connections in the area of interest which, naturally, represents a greater motivation for residents in the provincial capitals compared to others precisely in consideration of the fact that the LPT offer is certainly greater in large urban centres.

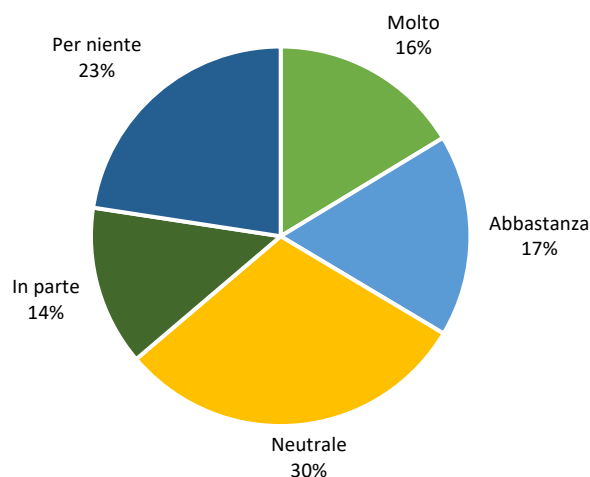
GRAPH.46- REASONS WHY THE LPT IS USED FOR THE RESPONDENT'S RESIDENCE
(Multiple answer)



The quality and offer of TPL services did not have a significant impact on the housing choices of the respondents who declared themselves neutral in 30% of cases, even if 16% considered these factors very relevant in order to

identify the home of residence . There are no particular differences between residents in a provincial capital or in other municipalities.

GRAPH.47- INFLUENCE OF THE QUALITY AND SUPPLY OF LPT SERVICES ON HOUSING CHOICES



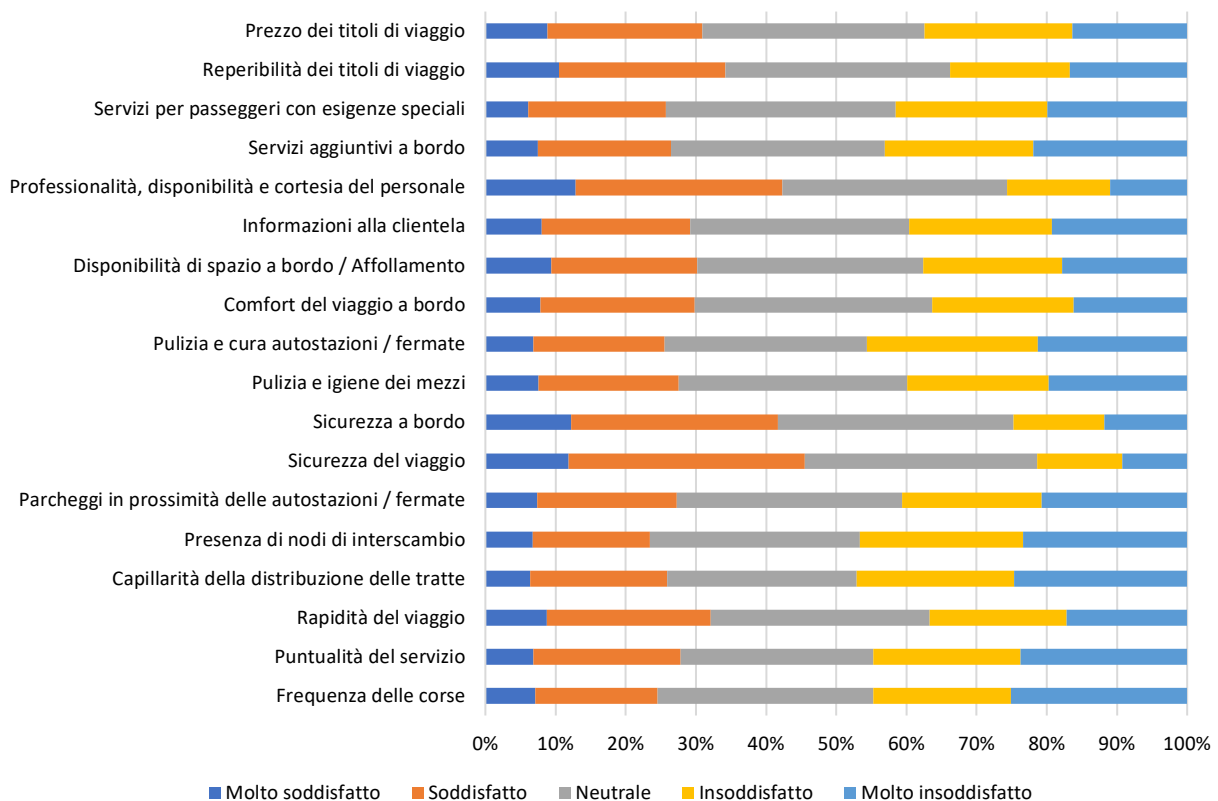
SECTION 3 – LEVEL OF SATISFACTION

Almost half of those who have used the TPL service in the last three months declare themselves satisfied or very satisfied with reference to the safety of the journey, safety on board (theft or harassment) and the professionalism, availability and courtesy of the staff.

Around 45%, on the other hand, are dissatisfied or very dissatisfied with the frequency of the journeys, the punctuality of the service, the capillarity of the distribution of the routes, the presence of interchange nodes and the cleanliness and care of the bus stations and/or stops.

There are no particular differences in the opinions based on the respondent's residence in a provincial capital or in other municipalities.

GRAPH.48- LEVEL OF SATISFACTION WITH SOME ASPECTS OF THE TPL
(Multiple answer)

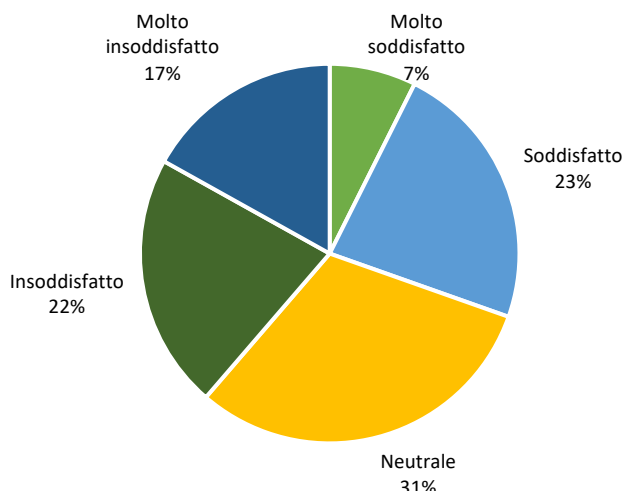


At the provincial level, small differences are highlighted with respect to some of the aspects for which interviewees were asked to declare their level of satisfaction:

- the capillarity of the routes and the coverage of the territory is considered inadequate to a greater extent in the provinces of Agrigento, Caltanissetta, Siracusa and Trapani, as is the presence of interchange nodes;
- in the province of Ragusa, satisfaction is higher in relation to aspects related to cleanliness, hygiene and care of vehicles and bus stations/stops, as well as the comfort of travel on board;
- the additional services on board, the services for passengers with special needs and the price of the ticket are considered more adequate in the province of Trapani.

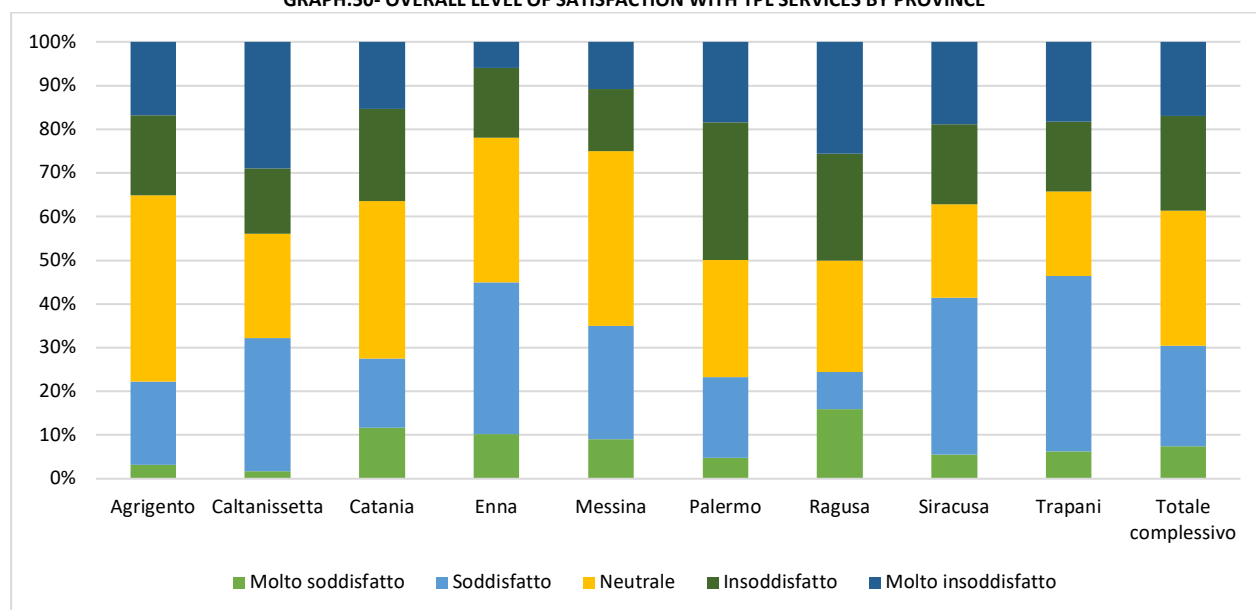
With respect to the overall level of satisfaction with TPL services, respondents are evenly divided between those who consider themselves satisfied/very satisfied, neutral or dissatisfied/very dissatisfied. At the two extremes of the evaluation, very satisfied and very dissatisfied, the negative evaluation prevails with 17% of respondents declaring themselves totally dissatisfied with the offer of TPL services.

GRAPH.49- OVERALL LEVEL OF SATISFACTION WITH TPL SERVICES



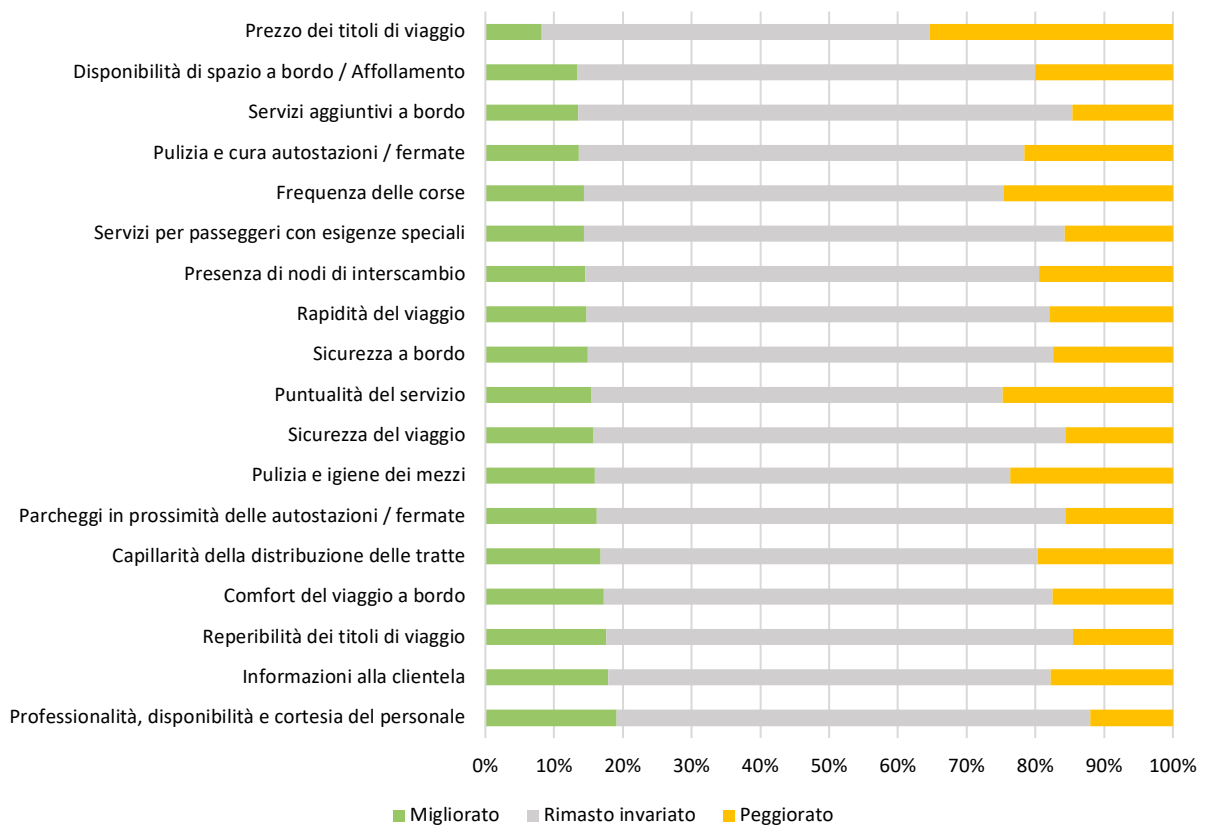
Also in this case there is no difference according to the respondent's residence, nor between the 9 provinces, with the exception of Enna and Ragusa where the level of satisfaction with the overall TPL offer is slightly higher than the regional average figure.

GRAPH.50- OVERALL LEVEL OF SATISFACTION WITH TPL SERVICES BY PROVINCE



Two thirds of the respondents noted no changes in the last 5 years with respect to the quality of TPL services. Parking near the bus stations/stops, the professionalism, availability and courtesy of the staff and the availability of travel tickets are the three aspects considered improved by a greater number of respondents compared to those who consider these aspects to have worsened. Conversely, the number of respondents who consider the price of travel tickets, the frequency of trips and the punctuality of the service to have worsened is higher than those who consider these three aspects to have improved. Punctuality and attendance are also the two elements for which the greatest level of dissatisfaction was detected.

GRAPH.51- CHANGE IN THE QUALITY LEVEL OF SOME ASPECTS OF LPT SERVICES OVER THE LAST FIVE YEARS
(Multiple answer)



Also in this case, the differences between those who reside in a provincial capital municipality or in other municipalities are minimal and not relevant, while some slight differences are found if the data at provincial level are analyzed. Respondents resident in the province of Enna noted a higher than average level of overall deterioration for all aspects addressed.

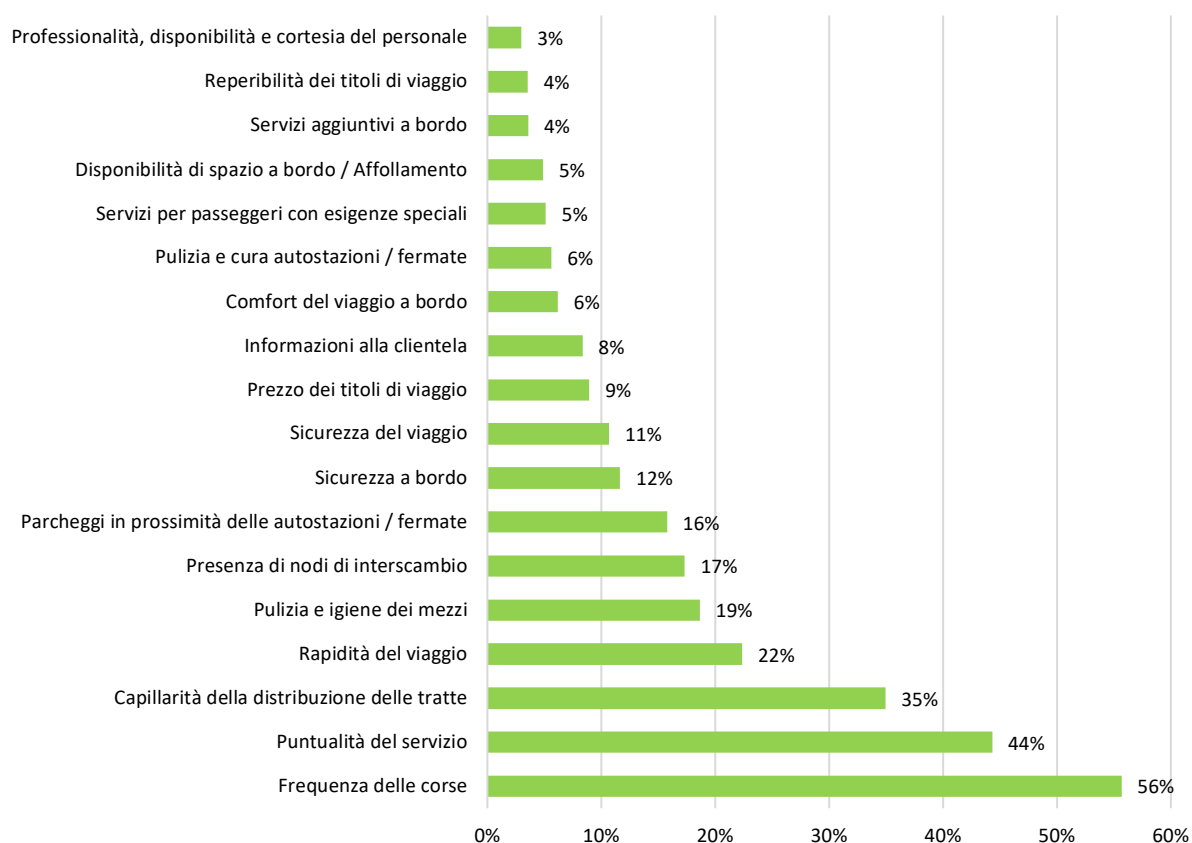
On the other hand, residents in the province of Messina show higher levels of improvement compared to the regional average with reference to the frequency of trips; residents in the province of Catania with reference to the presence of interchange nodes and car parks near the bus stations / stops; residents in the provinces of Agrigento, Ragusa and Siracusa with reference to safety on board, and, finally, residents in the provinces of Catania and Enna with reference to services for passengers with special needs have improved.

SECTION 4 – FUTURE INTERVENTIONS

The frequency of trips and the punctuality of the service, aspects with which respondents expressed a high level of dissatisfaction, are considered the issues on which future interventions should focus in 56% and 44% of cases respectively.

The capillarity of the distribution of routes is also considered relevant with respect to future interventions, while the professionalism, availability of staff, the availability of travel tickets, additional services on board and the availability of space on board are not among the aspects most indicated as those on which to intervene in the future.

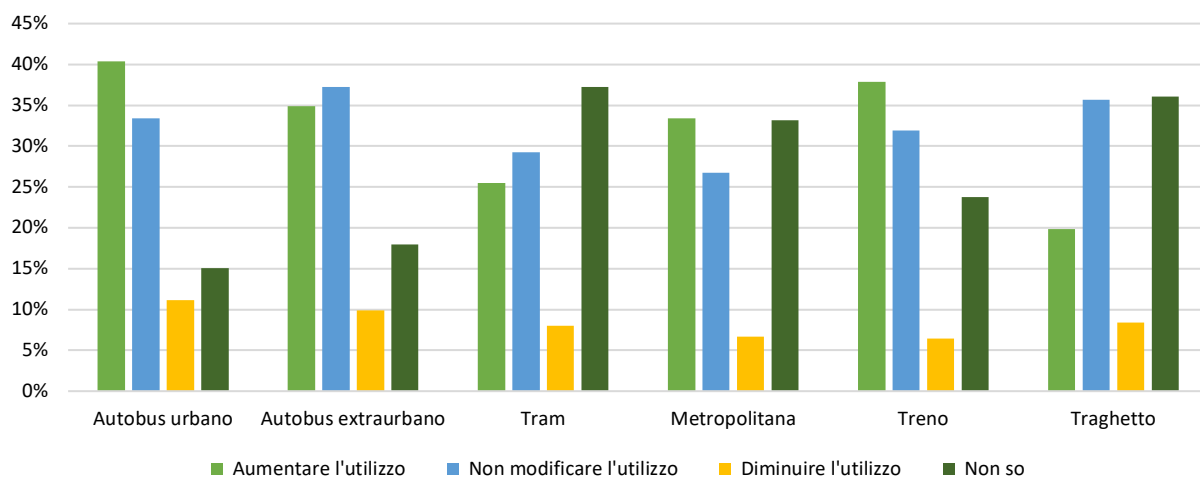
GRAPH.52- FUTURE INTERVENTIONS TO IMPROVE TPL SERVICES: MAIN ASPECTS
(Multiple answer)



No significant differences are noted based on the respondent's residence or at the provincial level.

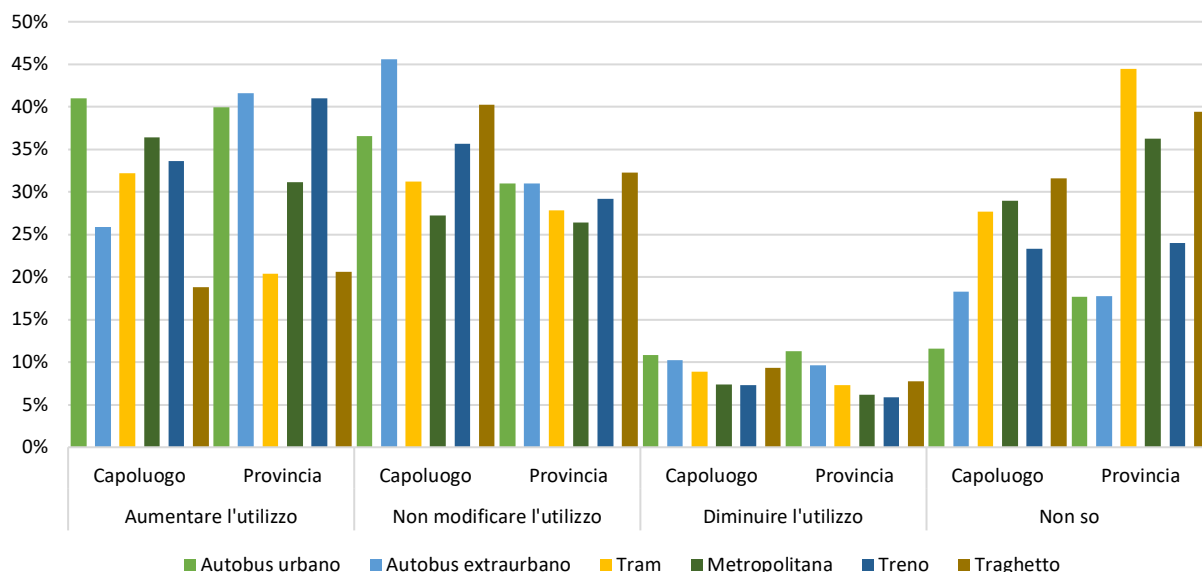
Compared to the prospects for future use of LPT, 40% of respondents would like to increase the use of urban buses and 38% of the train, and those who would like to increase the use of extra-urban buses and the subway are also high (around 35% for both means). For all the means taken into consideration, less than 10% of respondents say they want to reduce their use.

GRAPH.53- PROSPECTS FOR THE USE OF DIFFERENT MEANS OF TRANSPORT



In this case, as expected, a difference is noted depending on the residence of the respondent. In particular, those who reside in municipalities other than the capital would like to increase the use of extra-urban buses and the train (41% of cases for both means).

GRAPH.54- PROSPECTS OF USE OF DIFFERENT MEANS OF TRANSPORT BY RESPONDENT'S RESIDENCE



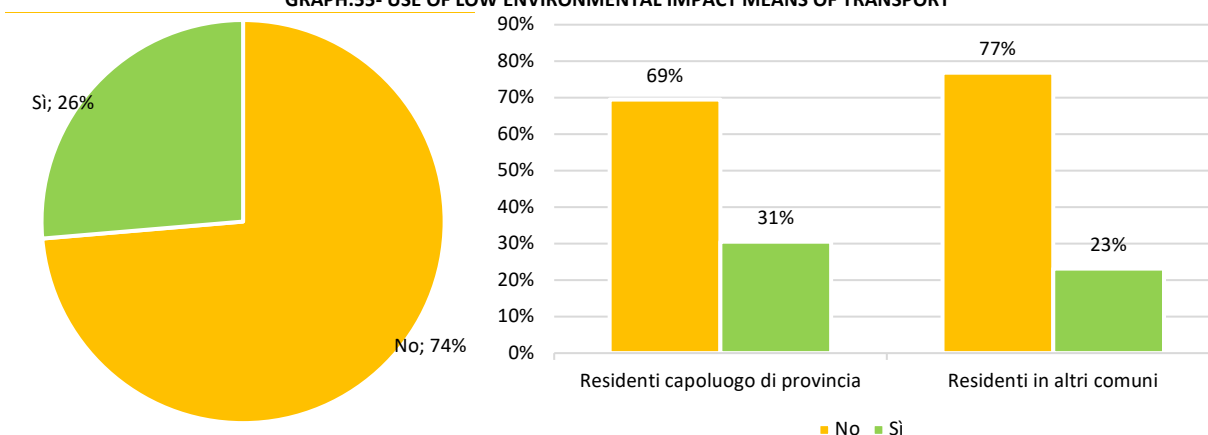
No particular differences are noted depending on the province of residence of the respondent.

SECTION 5 – MEANS OF TRANSPORT WITH LOW ENVIRONMENTAL IMPACT

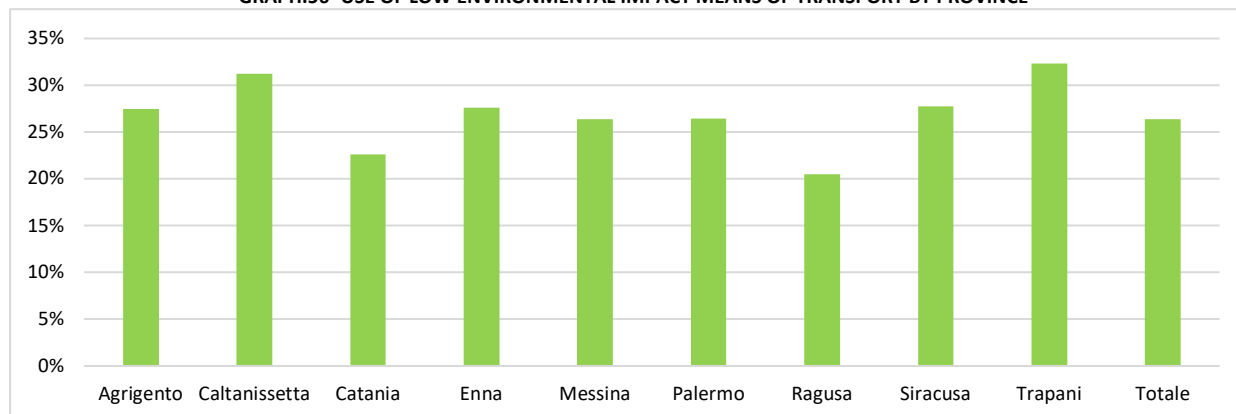
More than 70% of respondents declare that they do not use means of transport with low environmental impact, i.e. bicycles, scooters, etc.

This percentage, as is natural to expect, is higher among those who reside in municipalities that are not provincial capitals.

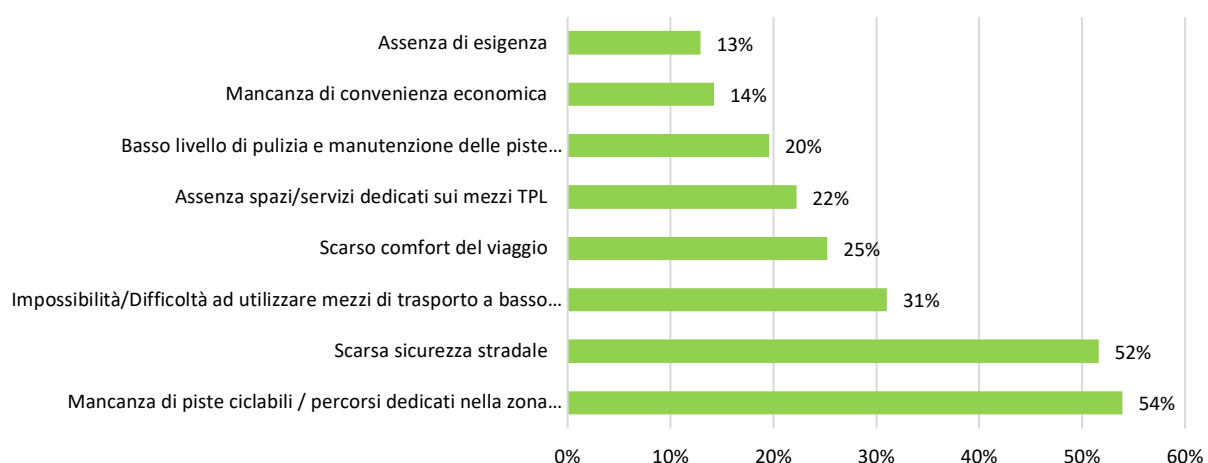
GRAPH.55- USE OF LOW ENVIRONMENTAL IMPACT MEANS OF TRANSPORT



The analysis of the answers provided for each individual province highlights a greater propensity to use low environmental impact vehicles for residents in the provinces of Trapani and Caltanissetta, while the other provinces do not differ much from the regional average, with the exception of Ragusa and Catania where the respondents declared a use slightly lower than the regional average.

GRAPH.56- USE OF LOW ENVIRONMENTAL IMPACT MEANS OF TRANSPORT BY PROVINCE

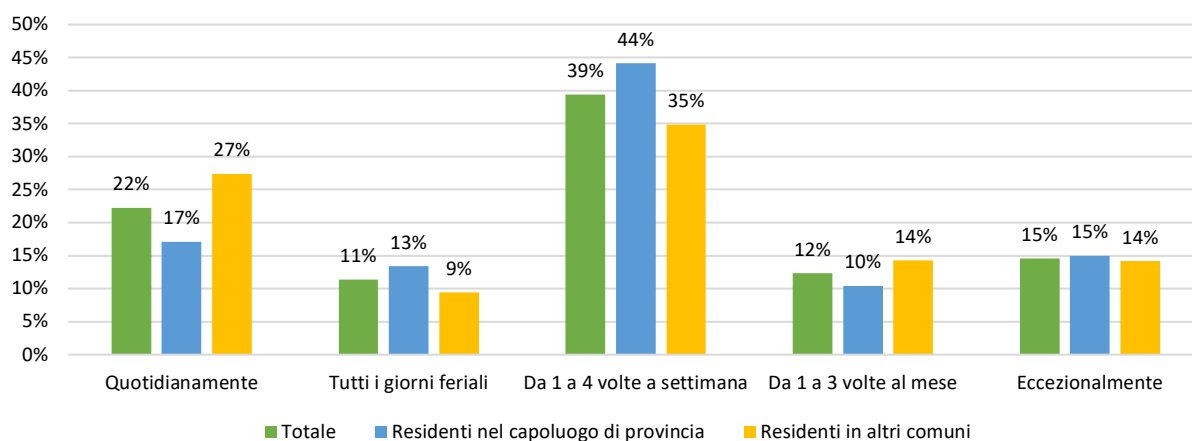
The lack of cycle paths and dedicated routes and poor road safety are the two main reasons why low environmental impact means of transport are not used. The respondent's residence in a provincial capital municipality or in other municipalities, or in one of the nine Sicilian provinces, does not influence the answers.

GRAPH.57- REASONS WHY LOW ENVIRONMENTAL IMPACT MEANS OF TRANSPORT ARE NOT USED*(Multiple answer)*

If used, the frequency of use of low environmental impact vehicles is on average high: 39% of those who use them use them between 1 and 4 times a week and 22% declare they use them daily.

There is a slight difference if we look at the residence of the respondents: those who reside in a capital municipality use low environmental impact vehicles more frequently than those who reside in other municipalities, this is also because the offer of so-called mobility infrastructures “sweet”, as seen in chapter 2, is very limited and concentrated especially in the capital municipalities.

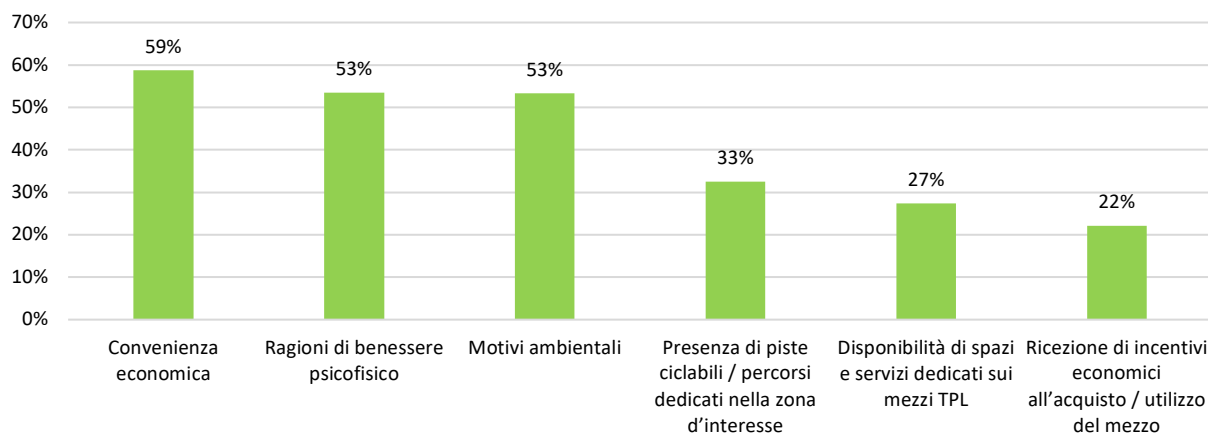
GRAPH.58- FREQUENCY OF USE OF LOW ENVIRONMENTAL IMPACT MEANS OF TRANSPORT
(Multiple answer)



No significant differences are highlighted at the provincial level.

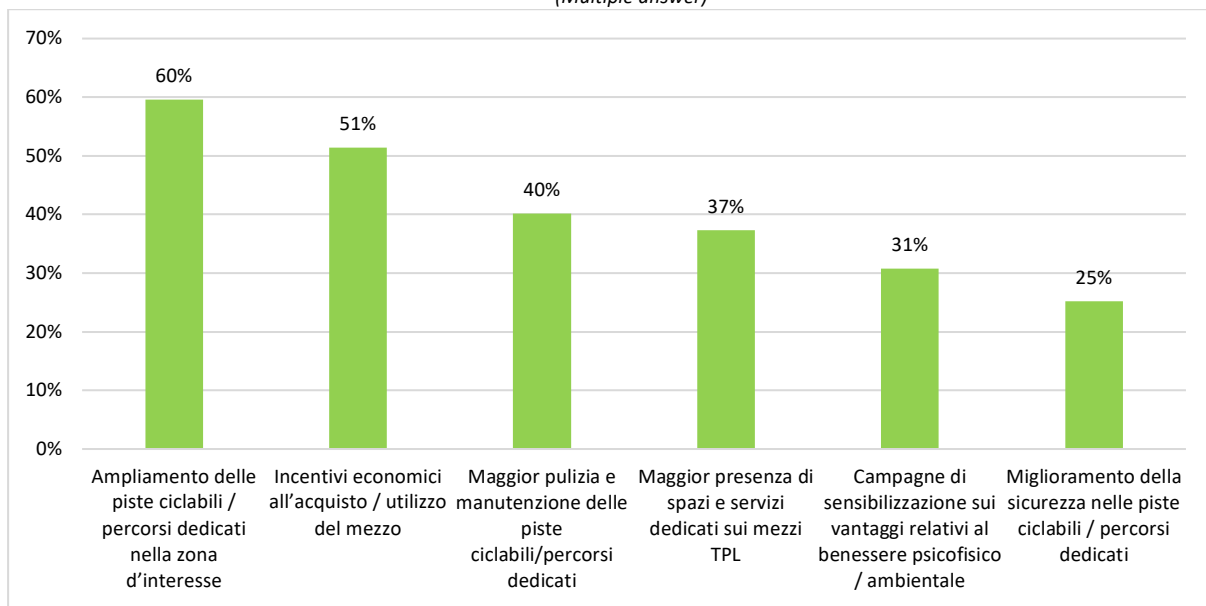
Economic convenience, reasons for psychophysical well-being and environmental reasons are the aspects that push more than half of the respondents to use means of transport with low environmental impact, without particular differences between those who reside in a capital municipality and those in other municipalities or province of residence .

GRAPH.59- MAIN REASONS WHY LOW ENVIRONMENTAL IMPACT MEANS OF TRANSPORT ARE USED
(Multiple answer)



The expansion of cycle paths and dedicated routes in the areas of interest and economic incentives for the use/purchase of the vehicle are the future interventions that the interviewees consider to be priorities. Furthermore, the lack of cycle paths is the main reason why the low environmental impact means of transport is not used (see answer to question 18).

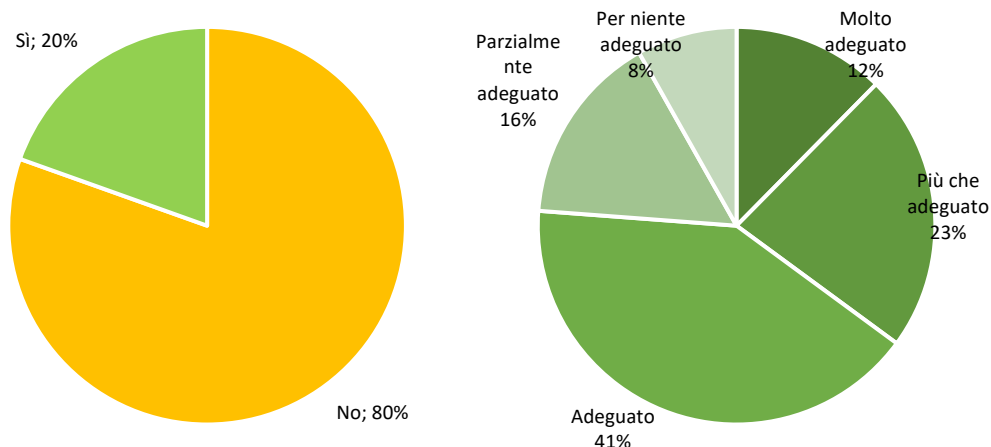
GRAPH.60- FUTURE INTERVENTIONS TO ENCOURAGE THE USE OF LOW ENVIRONMENTAL IMPACT MEANS OF TRANSPORT: MAIN ASPECTS
(Multiple answer)



SECTION 6 – COVID

20% of respondents declare that they have used LPT during the period of the Covid-19 pandemic, among these 76% believe that the service offered was adequate or more than adequate.

GRAPH.61- USE OF LPT DURING THE PERIOD OF THE COVID-19 PANDEMIC AND ADEQUACY OF THE SERVICE



7.3 EVALUATION EVIDENCE FROM THE INVESTIGATION

The interventions of the ERDF OP in favor of the TPL were aimed on the one hand at improving the quality of the services offered and, on the other, their quantity. In order to provide an answer to the evaluation question, a survey was carried out among the population with the aim of detecting the level of citizen satisfaction with the offer of urban and extra-urban LPT and therefore identifying whether the interventions activated actually go in the direction right.

The survey carried out among a representative sample of residents in the Sicily region provides a picture of the TPL service with a poor supply and consequently a poor demand, as emerged in chapter 2 and, at the same time, confirms the effectiveness of the interventions activated through the OP which go in the direction of increasing and

improving the quality and quantity of the offer, in particular through the interventions activated within Axis 4 / OS 4.6.

The frequency of use of LPT vehicles is in fact sporadic and is linked, in general, to leisure/free time reasons and, with particular reference to urban LPT, to trips linked to purchases and errands or for work reasons. Another figure that reflects the shortcomings of the TPL is the number of commuters which reaches only 24% of respondents, a percentage which naturally rises slightly among those who reside in municipalities other than the provincial capital. The punctuality and reliability of the TPL services is not considered high: almost 60% of the respondents declared that they arrived late at work or for lessons due to TPL disservices, while the share of those who declared that the TPL disservices was lower. had the consequence of an absence at work or in class (44%). In both cases the percentage rises for residents in municipalities other than the provincial capital.

Those who choose to use LPT do so in general to avoid problems related to parking their private vehicle and for economic convenience. The possibility of having connections in the area of interest and the difficulty or impossibility of using another vehicle are also important. The lack of connections in the area of interest is the main reason why the LPT is not used.

The safety of the journey, the safety on board (theft or harassment) and the professionalism, availability and courtesy of the staff are the aspects with which the greatest satisfaction was expressed. Conversely, the frequency of the trips, the punctuality of the service, the widespread distribution of the routes, the presence of interchange nodes and the cleanliness and care of the bus stations and/or stops constitute the elements of greatest dissatisfaction, and are also the aspects with respect to which requires future intervention to a greater extent. The capillarity of the distribution of routes is also considered relevant with respect to future interventions, while the availability of travel tickets, services for passengers with special needs, additional services on board and staff are not among the aspects most indicated as those on which intervene in the future.

In general, there are no differences in the quality of LPT services offered in the last 5 years.

Means of transport with low environmental impact, mainly bicycles and scooters, have very limited use, especially among those who reside in municipalities that are not provincial capitals. Economic convenience, reasons for psychophysical well-being and environmental reasons are the aspects that push more than half of the respondents to use these means. Their frequency of use is on average high and higher among those who reside in a capital municipality, this is also because the offer of infrastructures for so-called soft mobility, as seen in chapter 2, is very limited and concentrated above all in the capital municipalities.

The lack of cycle paths and dedicated routes and poor road safety are the two main reasons why means of transport with low environmental impact are not used and therefore constitute future interventions considered priorities. Economic incentives and a greater presence of dedicated services on LPT vehicles are also considered important.

SECTION III – EVALUATION CONCLUSIONS

8 EVALUATIVE CONCLUSIONS

The **transportation system in Sicily** faces evident delays in terms of infrastructure provision and service offerings, resulting in low demand from end-users, particularly for Public Transport (TPL). The railway lines in the region are limited and, in some cases, outdated. The extensive national road network appears inadequate to reach the island's more remote areas, leading to a risk of isolation. TPL suffers from serious deficiencies in both urban and extra-urban areas, concerning both per capita seat-kilometers and the number of available vehicles. Due to the low level of service, the demand is minimal and below the national average.

The infrastructure of ports, airports, and interports in Sicily plays a fundamental role in the connectivity and modal integration of the region, promoting economic and tourist development. The port system represents the most developed transport infrastructure regionally, given the island's insularity. The offer includes facilities for both commercial and passenger traffic, along with significant freight and passenger movements.

Sicilian airports ensure satisfactory coverage of the territory, mainly catering to passenger traffic, closely tied to tourism flows. The Sicilian logistics system relies heavily on road transportation, mostly internal to the regional territory. Incoming/outgoing flows from the island are primarily constituted by goods transiting through the port system, often handled and transferred directly by sea.

Regarding sustainable or "soft" mobility, despite a good planning framework, the regional infrastructure offer, especially for bike paths, remains limited, existing only in some larger municipalities.

The Regional Operational Program for the European Structural and Investment Funds (PO FESR) in Sicily demonstrates **high coherence** with various financing instruments used in the transport policy. This is mainly due to the presence of a strategic sectoral planning guiding the integration of multiple funds and specific interventions. The Regional Government of Sicily has adopted an Integrated Plan for Infrastructure and Mobility (PIIM), defining the macro structure of the regional transport system and identifying strategic works and principles for sustainable mobility management for both urban and extra-urban areas. Concerning Public Local Transport and the promotion of low-impact environmental means in urban areas, a significant synergy is observed between PO FESR and the PON Metro within the territories of the three Urban Authorities of Palermo, Messina, and Catania (Metropolitan Cities in the case of PON Metro). However, the possibility of accessing two different instruments to implement the same intervention has posed challenges for Local Authorities, leading to bureaucratic complexities and different procedures, potentially increasing administrative costs. In the **2021-2027 programming perspective**, a more streamlined approach between regional and national programs could address this issue, though Local Authorities need to guide interventions towards a single funding source for optimization. Concerning the railway, maritime, and road transport system, there is a lesser involvement of PO FESR in activating interventions to achieve the goals of PIIM compared to other sectoral financing instruments. Coordination challenges between different financial instruments are identified, emphasizing the need for greater rationalization and clearer demarcation between regional and national programs to resolve such issues.

The **efficiency** of interventions can be considered generally positive, with a good level of commitments for both Axes 4.6.1 and 7.4.1. However, spending capacity is not particularly high. The advancement of interventions has faced challenges, with a concentration of resources on major infrastructure construction by qualified entities, while territorial implementation tools, delegated to Local Authorities, experienced delays and challenges due to their complexity and the chronic understaffing of administrative structures.

In general, it is evident that the progress of the examined Axes has been influenced by a dual implementation dimension: one linked to the construction of major projects, with a significant concentration of resources on a few qualified entities (such as RFI or ANAS), and another connected to territorial implementation tools (Urban Agenda and Strategy for Inner Areas), where project implementation has been delegated to Local Authorities. While no implementation issues have been highlighted in the first case, likely due to the involvement of qualified and experienced entities accustomed to managing infrastructure projects, the second type of interventions has faced delays and challenges. This is mainly attributed to the difficulties faced by local authorities in handling complex projects, compounded by chronic understaffing of administrative structures and the increasingly complex administrative management associated with co-financed projects.

It is also clear that, in some cases, the possibility of accessing funds through different instruments, such as the PO FESR and PON Metro in the context of sustainable urban mobility, does not always represent an advantage. In many instances, it forces administrations to deal with different information systems and procedures for projects that are effectively similar.

In the initiation phase of the **Regional FESR Program for Sicily 2021-2027**, it could be beneficial to, on one hand, support local administrations through specific actions, including technical assistance, and on the other hand, activate

a process of synergy and effective coordination among instruments. This would direct diverse resources uniquely towards individual interventions, avoiding overlaps between various funding sources.

Concerning implementation and still referring to Local Authorities, an additional critical aspect emerges related to the difficulty of financially committing to project realization without certainty about the reimbursement timelines for amounts advanced by the Region. While this might be less relevant for Local Authorities with larger budgets, it becomes significant where the entity's budget is limited, risking financial strain if the repayment timelines extend.

The interventions carried out under the PO Sicily in the field of transportation have proven **effective in contributing to the strengthening of regional mobility, particularly in the provision of public transportation services (TPL)**. The interventions targeting infrastructure and interchange nodes in urban areas with the highest number of residents, namely Catania and Palermo (primarily the Palermo node), will increase collective mobility, impacting a **potential population of over 685,000 inhabitants**, accounting for 65% of the resident population in Catania and 78% in Palermo.

The renewal of rolling stock, with the introduction of 106 new buses and 10 new traction units in the TPL fleet across 8 municipalities, **has positive effects on reducing pollutant emissions**, estimated at 1.26 tons/year of NMVOC, 34.10 tons/year of NOx, 0.73 tons/year of PM10, and 76.53 tons/year of CO2, improving the quality of the service offered. The prospective implementation of intelligent transport systems is **expected to encourage TPL usage**, although the current impact of these interventions is not quantifiable. Additionally, the development of cycle paths in some municipalities has the **potential to attract over 720,000 residents** toward the use of environmentally friendly transportation, such as bicycles.

The effectiveness of the interventions is also evident in the contribution provided by the program to the **improvement of regional mobility in terms of quality and travel times**. The activation of the doubling of the Palermo Brancaccio - Palermo Notarbartolo route allows the completion of the urban line and a more efficient rescheduling of metropolitan services departing from Termini Imerese, serving all stops in the Palermo hinterland. Along with the enhancement of services to/from Punta Raisi Airport, it has been possible to achieve a **travel time of less than 40 minutes** on the connection between Palermo Central Station and the airport, creating conditions for the envisaged modal shift from road to rail.

Transport services have been strengthened on the main regional railway lines: on the Tyrrhenian line, between Messina and Palermo, and on the Ionic line, between Messina, Catania, and Siracusa. The provision of 25 electric trains, almost all already available to the managing entity, is expected to allow a progressive increase in the offer and further improvement in the quality of rail public transport, based on the **higher achievable hourly speed** and the greater number of transportable passengers. On two other lines, the Siracusa - Canicattì - Caltanissetta line and the Palermo – Castelvetro – Trapani line, extraordinary maintenance, speed enhancement, and technological upgrade interventions are nearing completion. Although activated on limited sections, these interventions have already led to **reductions in travel times and improvements in punctuality indices along the entire route**.

The redevelopment of secondary road networks crossing five agricultural and agri-food centers has **improved accessibility** to these centers towards the main axes of the TEN-T Network.

Regarding the two interventions aimed at making **maritime traffic more efficient** in the areas of Sciacca and Sant'Agata di Militello, their limited size compared to the regional port system and the delay accumulated in their execution do not allow for the detection or quantification of improvements in specific environmental, energy, and operational standards.

Lastly, from the data collected through a survey conducted among a representative sample of residents in the Sicilian Region, it is evident that **the activated interventions are relevant concerning the needs expressed by citizens in terms of infrastructural offerings and transport services**. The analysis conducted reveals that the projects align with the challenges identified by the end recipients, such as the lack of connections, unreliability in transfers, frequency of routes, and punctuality of the service.

In conclusion, considering a regional transportation system that faces significant delays in terms of infrastructure and service offerings, resulting in low demand from end users, it can be asserted that the interventions activated under the PO **have moved in the direction of increasing TPL services, both quantitatively and qualitatively. Simultaneously, they act to increase the propensity of citizens to use public transport, contributing to the reduction of greenhouse gas emissions**.

Expanding the perspective to the broader objective of the PO, which aims to contribute to the economic, social, environmental, and health well-being of citizens and businesses, or rather to the concept of **creating public value by the Public Administration**, it can be affirmed that the activated interventions have produced, or will produce once completed, a positive impact on well-being, presenting positive results concerning the targets set during the

planning phase in a dual dimension: TPL service offering (economic and social well-being) and reduction of polluting emissions (environmental well-being).

ATTACHMENTS TO THE REPORT

ALLEGATO 1 - EVALUATION MATRIX

CRITERION OF ASSESSMENT	REQUESTS EVALUATIVE	SCOPE OF ASSESSMENT	INDICATORS QUANTITATIVE / PROGRAM (?)	SOURCES AND TOOLS OF DATA COLLECTION	METHODS OF ANALYSES
IMPACT	DV1 To what extent has the OP ERDF SICILY 2014-2020 promoted low carbon emission strategies for sustainable multimodal mobility in urban areas?	PI 4E (OS 4.6)	4.6 Use of public transport by employed people, students, schoolchildren and users of public transport 4.6.a Emissions of greenhouse gases from road transport 4.6.b Concentration of PM10 in the area in the provincial capital municipalities	Desk – Program Documentation and Monitoring Data Desk - Official statistics	Analysis of the Logical Framework Contribution Analysis Project Analysis Statistic analysis
EFFECTIVENESS	DV1.1 To what extent have the infrastructures and interchange nodes created made it possible to increase collective mobility?	Action 4.6.1	CO15 Urban transport: Total length of new or improved tram and subway lines	Desk - Program Documentation and Monitoring Data Field - Interviews with beneficiaries and SH	Project Analysis Stakeholder Analysis Content Analysis
EFFECTIVENESS	DV1.2 To what extent has the renewal of rolling stock ensured the mitigation of emissions?	Action 4.6.2	4.62a Units of purchased goods (Rolling stock) 4.62b Units of goods purchased (low impact buses)	Desk - Program Documentation and Monitoring Data Field - Interviews with beneficiaries and SH	Project Analysis Stakeholder Analysis Content Analysis
EFFECTIVENESS	DV1.3 To what extent has the creation of intelligent transport systems guaranteed the reduction of emissions?	Action 4.6.3	4.63 Companies participating in the integrated ticketing system	Desk - Program Documentation and Monitoring Data Field - Interviews with beneficiaries and SH	Project Analysis Stakeholder Analysis Content Analysis
EFFECTIVENESS	DV1.4 To what extent has the use of low environmental impact means of transport been encouraged by the development of adequate infrastructure?	Action 4.6.4	4.64 Extension in length (Cycle paths)	Desk - Program Documentation and Monitoring Data Field - Interviews with beneficiaries and SH Field – Questionnaires to recipients	Project Analysis Stakeholder Analysis Content Analysis Customer Satisfaction
IMPACT	DV2 To what extent has the OP ERDF Sicily 2014-2020 improved regional mobility, in terms of quality and travel times?	PI 7B (OS 7.1, 7.3, 7.4)	7.1 Rail freight traffic index 7.3 Rail transport utilization index 7.4 Accessibility index towards urban and logistical nodes	Desk – Program Documentation and Monitoring Data Desk - Official statistics	Analysis of the Logical Framework Contribution Analysis Project Analysis Statistic analysis
EFFECTIVENESS	DV2.1 To what extent have strategic infrastructures relating to secondary and tertiary regional nodes been connected to the TEN-T Network?	Action 7.1.1	CO12 Railways: Total length of the reconstructed or refurbished railway line	Desk - Program Documentation and Monitoring Data Field - Interviews with beneficiaries and SH	Project Analysis Stakeholder Analysis Content Analysis
EFFECTIVENESS	DV2.2 To what extent have regional and interregional public transport	Action 7.3.1	7.3.1 Units of purchased goods (rolling stock)	Desk - Program Documentation and Monitoring Data	Project Analysis Stakeholder Analysis

CRITERION OF ASSESSMENT	REQUESTS EVALUATIVE	SCOPE OF ASSESSMENT	INDICATORS QUANTITATIVE / PROGRAM (?)	SOURCES AND TOOLS OF DATA COLLECTION	METHODS OF ANALYSES
	services been strengthened on routes with significant potential demand?			Field - Interviews with beneficiaries and SH	Content Analysis
EFFECTIVENESS	DV2.3 To what extent have agricultural and agri-food centers been made more accessible through strengthening the connection to the grid?	Action 7.4.1	CO14 Roads: Total length of rebuilt or upgraded roads	Desk - Program Documentation and Monitoring Data Field - Interviews with beneficiaries and SH	Project Analysis Stakeholder Analysis Content Analysis
IMPACT	DV3 To what extent has the OP ERDF Sicily 2014-2020 improved ecological low-emission transport in order to encourage sustainable regional and local mobility?	PI 7C (OS 7.2)	7.2. Rail freight traffic generated by ports and freight terminals	Desk – Program Documentation and Monitoring Data Desk - Official statistics	Analysis of the Logical Framework Contribution Analysis Project Analysis Statistic analysis
EFFECTIVENESS	DV3.1 To what extent do regional port and freight terminal infrastructures have improved environmental, energy and operational standards?	Action 7.2.2	7.2.2 Surface subject to intervention	Desk - Program Documentation and Monitoring Data Field - Interviews with beneficiaries and SH	Project Analysis Stakeholder Analysis Content Analysis
TRANSVERSAL QUESTIONS					
RELEVANCE	DVT.1 Have the interventions carried out contributed to improving the quality of services for end users (degree of satisfaction)?	Transversal	T1.1 % of recipients satisfied with the quality of the public transport service	Field - Questionnaires to recipients	Customer Satisfaction
CONSISTENCY	DVT.2 How were the measures envisaged by the ERDF OP complementary to the actions implemented by the PON and those activated through other non-ordinary funds? How much did the integration of the funds affect the overall result in terms of quality and effectiveness of the service?	Transversal	N/A	Desk - Official statistics Desk - Program Documentation and Monitoring Data Field - Interviews with beneficiaries and SH	Statistic analysis Project Analysis Content Analysis
EFFICIENCY	DVT.3 Were the funds disbursed within the expected times and methods and in compliance with the initial budget?	Transversal	T3.1 Spending capacity T3.2 Ability to commit T3.3 Ability to pay	Desk - Program Documentation and Monitoring Data Field - Interviews with beneficiaries and SH	Project Analysis Content Analysis

CRITERION OF ASSESSMENT	REQUESTS EVALUATIVE	SCOPE OF ASSESSMENT	INDICATORS QUANTITATIVE / PROGRAM (?)	SOURCES AND TOOLS OF DATA COLLECTION	METHODS OF ANALYSES
EFFICIENCY	DVT.4 What were the effects of the Covid-19 pandemic emergency on the implementation of the Pro-gram?	Transversal	N/A	Field - Interviews with beneficiaries and SH Field - Questionnaires to recipients	Content Analysis Customer Satisfaction

ALLEGATO 2 - FRAMEWORK OF PROGRAM INDICATORS

INVESTMENT PRIORITIES 4E

Specific Objective		4.6 - INCREASE SUSTAINABLE MOBILITY IN URBAN AREAS				
ID	Result Indicator	Unit of measure	Base value	Year of reference	Target value 2023	2022 Total
4.6	Use of public transport by employed people, students, school-children and public transport users	%	2.60pm	2012	19.60	11.71*
4.6.a	Greenhouse gas emissions from road transport	Teq CO2/1000	6,358.00	2010	5,884.00	7,461.40**
4.6.b	Concentration of PM10 in the area in the provincial capital municipalities	number of days	123.00	2013	80.00	100.00***

*Latest ISTAT data

**Last year available 2019

*** Last year available 2018

Action 4.6.1 - Creation of infrastructures and interchange nodes aimed at increasing collective mobility and the eco-compatible distribution of goods and related transport systems					
Output indicator	Source	ID	Unit of measure	Scheduled	Done
Total length of new or improved tram and subway lines	RAA 2022	CO15	km	1.50pm	6.57
	OpenCohesion 30/06/2023	CO15	km	13.80	6.57
	Target value 2023	CO15	km		13.7
Action 4.6.2 - Renewal of rolling stock					
Output indicator	Source	ID	Unit of measure	Scheduled	Done
Units of purchased goods (Rolling stock)	RAA 2022	4.62a	Number	20	10
	OpenCohesion 30/06/2023	4.62a	Number	10	6
	Target value 2023	4.62a	Number		12
Units of goods purchased (low impact buses)	RAA 2022	4.62b	Number	105	40
	OpenCohesion 30/06/2023	4.62b	Number	103	20
	Target value 2023	4.62b	Number		169
Action 4.6.3 - Intelligent transport systems					
Output indicator	Source	ID	Unit of measure	Scheduled	Done
Companies participating in the integrated ticketing system	RAA 2022	4.6.3	Number	5	0
	OpenCohesion 30/06/2023	4.6.3	Number	7	0
	Target value 2023	4.6.3	Number		4
Action 4.6.4 - Development of the infrastructure necessary for the use of the vehicle with low environmental impact					
Output indicator	Source	ID	Unit of measure	Scheduled	Done
Extension in length (cycle paths)	RAA 2022	4.64	Km	50.3	0
	OpenCohesion 30/06/2023	4.64	Km	50.03	9.10
	Target value 2023	4.64	Km		102

INVESTMENT PRIORITIES 7B

Specific Objective		7.1 - ENHANCEMENT OF THE RAILWAY OFFER AND IMPROVEMENT OF THE SERVICE IN TERMS OF QUALITY AND JOURNEY TIMES				
ID	Result Indicator	Unit of measure	Value Basic	Year of reference	Target value 2023	2022 Total
7.1	Rail freight traffic index	%	15.80	2010	27.90	15.80*
Specific Objective		7.3 - REGIONAL RAILWAY IMPROVEMENT, MODAL INTEGRATION AND IMPROVEMENT OF MULTI-MODAL CONNECTIONS WITH THE MAIN URBAN, PRODUCTION AND LOGISTIC NODES AND THE CENTRAL, GLOBAL AND LOCAL NETWORK				
ID	Result Indicator	Unit of measure	Value Basic	Year of reference	Target value 2023	2022 Total
7.3	Rail transport utilization index	%	1.80	2013	4.50	11.77**
Specific Objective		7.4 - STRENGTHENING CONNECTIONS WITH THE GLOBAL INTERNAL AR-EAS NETWORK				
ID	Result Indicator	Unit of measure	Value Basic	Year of reference	Target value 2023	2022 Total
7.4	Accessibility index towards urban and logistical nodes	Minutes	53.48	2013	51.76	53.48***

*Last year available 2010

**Latest ISTAT data

***Only year available 2013

Action 7.1.1 - Complete the strategic infrastructures relating to the arches and nodes of the central European network and in particular the railway "Major Projects", concentrating the interventions on the 4 priority routes that cross Italy identified by the TEN-T community scheme and eliminating the bottlenecks

Output indicator	Source	ID	Unit of measure	Scheduled	Done
Total length of reconstructed or renewed railway lines	RAA 2022	CO12	Km	8.50	8.50
	OpenCohesion 30/06/2023	CO12	Km	8.50	8.50
	Target value 2023	CO12	Km	3.40pm	

Action 7.3.1 - Strengthen regional and interregional public transport services on routes with significant potential demand

Output indicator	Source	ID	Unit of measure	Scheduled	Done
Extension of the intervention in length ²⁹	RAA 2022	-	-	-	-
	OpenCohesion 30/06/2023	781	Meters	176908	177107
	Target value 2023	-	-	-	
Units of purchased goods (rolling stock)	RAA 2022	7.3.1	Number	25	25
	OpenCohesion 30/06/2023	7.3.1	Number	22	25
	Target value 2023	7.3.1	Number	21	

Action 7.4.1 - Strengthen the connections of agricultural and agri-food centers to the network

Output indicator	Source	ID	Unit of measure	Scheduled	Done
Total length of rebuilt or renovated roads	RAA 2022	CO14	Km	100.08	16
	OpenCohesion 30/06/2023	CO14	Km	86	38
	Target value 2023	CO14	Km	260.80	

²⁹ The "Extension of the intervention in length" indicator is not reported in the 2022 Annual Implementation Report

INVESTMENT PRIORITIES 7C

Specific Objective		7.2 - INCREASE IN THE COMPETITIVENESS OF THE PORT AND FREIGHT TERMINAL SYSTEM				
ID	Result Indicator	Unit of measure	Base value	Year of reference	Target value 2023	2022 Qualitative
7.2	Rail freight traffic generated by ports and freight terminals	Trains/year	2011	2015	3106	1500*

*Last year available 2018

Action 7.2.2 - Strengthen port and freight terminal infrastructures and equipment of regional interest, including their adaptation to the best environmental, energy and operational standards [infrastructures and technologies of the global network]					
Output indicator	Source	ID	Unit of measure	Scheduled	Done
Surface subject to intervention	RAA 2022	7.2.2	m2	45,800	0
	OpenCohesion 30/06/2023	7.2.2	m2	45,800	0
	Target value 2023	7.2.2	m2	45,800	

ALLEGATO 3 - CUSTOMER QUESTIONNAIRE

SECTION 1 - REGISTRY

1. Sex
 - a. Male
 - b. Female
2. Age (years completed):
3. Which municipality do you live in?
4. What is your employment status currently?
 - a. Busy
 - b. Unemployed
 - c. Looking for a job
 - d. Homemaker
 - e. Retired
 - f. Student
 - g. Unable to work

SECTION 2 - USE OF LOCAL PUBLIC TRANSPORT SERVICES

5. In the last three months, have you used local public transport services at least once?
 - a. Yes
 - b. No

[If 5=No – Question n.6 and then directly to n.15 future interventions]

6. What are the main reasons why you don't use public transport services? You can choose from one to three reasons. We ask you to drag the chosen ones into the box next to the response methods, placing them in order of preference
 - a. Lack of connections in the area of interest
 - b. Lack of reliability in transfers (availability of information; frequency, punctuality and speed of trips; etc)
 - c. Lack of economic convenience
 - d. Poor travel comfort
 - e. Poor safety (on the road and/or on board)
 - f. Low level of cleanliness and hygiene on board and/or in bus stations / stops
 - g. Lack of services for passengers with special needs (people with disabilities, with children's / travel / sports equipment, etc...)
 - h. Travel documents are difficult to find
 - i. Absence of need
 - j. Other (specify)

[If 5=Yes – Question n.7]

7. How often do you use the following local public transport?

	Daily basis	Every weekday	1 to 4 times a week	1 to 3 times a month	Exceptionally	Never
City bus	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Extra-urban bus	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tram	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subway	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Train	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ferry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

[If the items of question 7=Never – must not appear in Question n.8]

8. What is the main purpose for which you use the following local public transport?

	Work	Study	Tourism	Health	Purchases / Commissions	Leisure / Free time	Other (to specify)
City bus	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
Extra-urban bus	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
Tram	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
Subway	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
Train	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
Ferry	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>

9. Is he a commuter?

- to. Yes
- b. No

[If 9=Yes – Question 9.a and 9.b]

9.a Have you ever arrived late for class/work due to public transport disruptions?

- to. Yes
- b. No

9.b Have you ever missed class/work due to poor local public transport?

- to. Yes
- b. No

10. What are the main reasons why you choose to use local public transport services? You can choose from one to three reasons.

We ask you to drag the chosen ones into the box next to the response methods, placing them in order of preference

- to. Presence of connections in the area of interest
- b. Reliability in transfers (availability of information; frequency, punctuality and speed of trips; etc)
- c. Affordability
- d. Travel comfort
- And.Safety (road and/or on board)
- f. Being able to read and/or socialize
- g. Don't have parking problems
- h. Difficulty/impossibility to use another means
- the.Environmental reasons
- j. Other (specify)

11. How much did the quality and range of local public transport services impact your housing choices?

(Rate from 1=not at all to 5=very much)

SECTION 3 - SATISFACTION LEVEL

12. Can you express your level of satisfaction with the following aspects of local public transport?

(Rate from 1=not at all satisfied to 5=very satisfied)

- to. Frequency of trips
- b. Punctuality of service
- c. Speed of travel
- d. Capillarity of route distribution (territorial coverage)
- And.Presence of interchange nodes (connections between lines and different means of transport)
- f. Presence of parking near the bus stations / stops
- g. Travel safety (road)
- h. Safety on board (theft and harassment)
- the.Cleaning and hygiene of vehicles
- j. Cleaning and care of bus stations and stops
- k. Travel comfort on board (comfort of seats, ventilation/air conditioning, handholds, etc.)
- L. Availability of space on board / Crowding of vehicles
- m. Customer information (timetables and notices at stops and/or online, information service, etc...)
- n. Professionalism, availability and courtesy of the staff
- or. Additional services on board (ticket sales, audio or visual announcements, etc.)
- p. Services for passengers with special needs (people with disabilities, with children's / travel / sports equipment, etc...)
- q. Availability of travel documents

r. Price of travel tickets

13. How satisfied are you overall with local public transport services?
(Rate from 1=not at all satisfied to 5=very satisfied)

14. Have you noticed a change in the level of quality of the following aspects of local public transport in the last 5 years?

	Got worse	Remained unchan- ged	Improved
to.Frequency of trips	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
b. Punctuality of service	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
c. Speed of travel	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
d. Capillarity of route distribution (territorial coverage)	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
And.Presence of interchange nodes (connections between lines and different means of transport)	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
f. Presence of parking near the bus stations / stops	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
g. Travel safety (road)	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
h. Safety on board (theft and harassment)	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
the.Cleaning and hygiene of vehicles	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
j. Cleaning and care of bus stations and stops	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
k. Travel comfort on board (comfort of seats, ventilation/air conditioning, handholds, etc.)	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
L. Availability of space on board / Crowding of vehicles	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
m.Customer information (timetables and notices at stops and/or online, information service, etc...)	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
n. Professionalism, availability and courtesy of the staff	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
or.Additional services on board (ticket sales, audio or visual announcements, etc.)	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
p. Services for passengers with special needs (people with disabilities, with children's / travel / sports equipment, etc...)	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
q. Availability of travel documents	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
r. Price of travel tickets	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>

SECTION 4 - FUTURE INTERVENTIONS

15. Which of the following aspects do you think future interventions should mainly focus on to improve local public transport services? You can choose from one for three reasons. We ask you to drag the chosen ones into the box next to the response methods, placing them in order of preference

- to. Frequency of trips
- b. Punctuality of service
- c. Speed of travel
- d. Capillarity of route distribution (territorial coverage)
- And.Presence of interchange nodes (connections between lines and different means of transport)
- f. Presence of parking near the bus stations / stops
- g. Travel safety (road)
- h. Safety on board (theft and harassment)
- the.Cleaning and hygiene of vehicles
- j. Cleaning and care of bus stations and stops
- k. Travel comfort on board (comfort of seats, ventilation/air conditioning, handholds, etc.)
- L. Availability of space on board / Crowding of vehicles
- m. Customer information (timetables and notices at stops and/or online, information service, etc...)
- n. Professionalism, availability and courtesy of the staff
- or. Additional services on board (ticket sales, audio or visual announcements, etc.)
- p. Services for passengers with special needs (people with disabilities, with children's / travel / sports equipment, etc...)
- q. Availability of travel documents
- r. Price of travel tickets

16. Compared to your current level of use of the following means of transport, you would like...

	Increase use	Do not change usage	Diminish use	Does not know
City bus	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
Extra-urban bus	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
Tram	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
Subway	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
Train	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
Ferry	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>

SECTION 5 - MEANS OF TRANSPORT WITH LOW ENVIRONMENTAL IMPACT

17. Do you use low environmental impact means of transport during your travels, such as bicycles, scooters, etc.?

- to. Yes
- b. No

[If 17=No – Question n.18 and n.21]

18. What are the reasons why you don't use means of transport with low environmental impact? You can choose from one to three reasons. We ask you to drag the chosen ones into the box next to the response methods, placing them in order of preference

- to. Lack of cycle paths / dedicated routes in the area of interest
- b. Lack of dedicated spaces and services on local public transport
- c. Lack of economic convenience
- d. Poor travel comfort
- And.Poor road safety
- f. Low level of cleaning and maintenance of cycle paths/dedicated routes
- g. Impossibility / Difficulty to use means of transport with low environmental impact
- h. Absence of need
- the.Other (specify)

[If 17= YES – Question n.19]

19. How often do you use means of transport with low environmental impact?

- to. Daily basis
- b. Every weekday
- c. 1 to 4 times a week
- d. 1 to 3 times a month
- And.Exceptionally

20. What are the main reasons why you use means of transport with low environmental impact? You can choose from one to three reasons. We ask you to drag the chosen ones into the box next to the response methods, placing them in order of preference

- to. Presence of cycle paths / dedicated routes in the area of interest
- b. Availability of dedicated spaces and services on local public transport
- c. Affordability
- d. Receipt of financial incentives for the purchase/use of the vehicle
- And.For reasons of psychophysical well-being
- f. Environmental reasons
- g. Other (specify)

21. On which of the following aspects do you think future interventions should be concentrated to encourage the use of low environmental impact means of transport? You can choose from one to three areas of intervention. We ask you to drag the chosen ones into the box next to the response methods, placing them in order of preference

- to. Expansion of cycle paths / dedicated routes in the area of interest
- b. Greater presence of dedicated spaces and services on local public transport
- c. Economic incentives for the purchase / use of the vehicle
- d. Greater cleaning and maintenance of cycle paths/dedicated routes
- And.Improved safety in cycle paths/dedicated routes

- f. Awareness campaigns on the advantages relating to psychophysical/environmental well-being
- g. Other (specify)

SECTION 6 - COVID

22. Did you use the Local Public Transport service during the Covid-19 pandemic period?
- to. Yes
 - b. No

[If 23=Yes – Question 23.a]

- 23.a If yes, on a scale of 1 to 5, how adequate do you think the service was with respect to the needs due to the containment measures of the covid-19 virus during the pandemic period (years 2020/2021)?
(Rate from 1=not at all to 5=very much)

ALLEGATO 4 - TRACK INTERVIEW WITH PRIVILEGED WITNESSES

Semi-structured interview outline administered to:

- PO Actions Contacts;
- AU contacts;
- Public Administration officials;
- Representatives of the beneficiaries such as RFI, Trenitalia, ANAS, etc.;
- RUP of the projects;
- Privileged witnesses such as trade associations.

SECTION 1 - STRATEGY

- Recognition of the interventions implemented within the OP ERDF 2014-20 by Institution
- Were the interventions carried out designed in response to different territorial needs? Which?
- Were the interventions activated part of sectoral planning? How?
- How were the interventions complementary and synergistic with the actions implemented through other Funds/Programmes?
- Did the possibility of using different tools make it possible to carry out the project more effectively // To complete the project // To carry out the project that otherwise would not have been carried out?
- How much did the integration of the funds have on the overall result in terms of quality and effectiveness?
- If they were not complementary/synergistic, why?

SECTION 2 - IMPLEMENTATION

- How and on the basis of what criteria was the selection of the project proposals made?
- We have noticed that some of the interventions eligible for funding have not been concretely activated, for what reasons?
- Were the funds disbursed within the expected times and methods and in compliance with the initial budget?
- Were any critical issues encountered during the implementation process of the interventions?
 - *If yes, in which phase: Contract - Construction of the work - Testing - Reporting*

SECTION 3 - IMPACT INVESTMENT PRIORITY 4E

To what extent has the ERDF OP promoted low-carbon strategies for sustainable multimodal mobility in urban areas?

- Action 4.6.1 - Is there evidence that the implementation of intervention
- Action 4.6.2 / 4.6.3 - Is there evidence that the implementation of intervention
 - *Were the buses purchased used to increase the size of the fleet or to replace obsolete vehicles?*
- Action 4.6.4 - Is there evidence that the implementation of intervention

SECTION 4 - IMPACT INVESTMENT PRIORITIES 7B

To what extent has the ERDF OP improved regional mobility, in terms of quality and travel times?

- Action 7.1.1 - Is there evidence that the implementation of intervention
- Action 7.3.1 - Is there evidence that the implementation of intervention
- Action 7.4.1 - Is there evidence that the implementation of intervention

SECTION 5 - IMPACT INVESTMENT PRIORITIES 7C

To what extent has the ERDF OP improved green low-emission transport in order to promote sustainable regional and local mobility?

- Action 7.2.2 - Is there evidence that the implementation of intervention

SECTION 6 - CONCLUSIONS

- What were the effects of the Covid-19 pandemic emergency on the implementation of the Program?
- What were the effects of the Covid-19 pandemic emergency on the performance of TPL services?
- What were the effects of the rise in raw material prices on the implementation of the Programme?
- What are the main lessons that can be drawn from the experience for the future development of public support methods for this policy area, as well as in the regulation and awarding phase of public transport services?

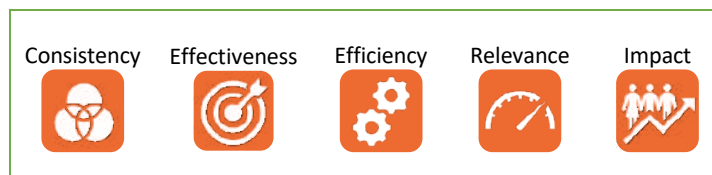
ALLEGATO 5 - LIST OF INDIVIDUALS INTERVIEWED

NAME	REFERENCE STRUCTURE
Amato J.	AU Siracusa: referente Comune di Siracusa
Amenta P.	ANCI Sicilia
Battiato R.	RFI - Project Engineer Passante
Biondo R.	AU Palermo - Bagheria: RUP Intervento az. 4.6.2 Comune di Palermo
Cantavenera C.	RFI - Project Manager Anello
Caradonna F.	Trenitalia - Resp. Commerciale Direzione Regionale Sicilia
Cedolia M.	Dipartimento Trasporti, Funzionario Servizio 1
Cerniglia D.	AU Messina: referete Comune di Messina - Servizio Mobilità Urbana, Dip. Servizi Manutentivi
Cinà M.	SNAI Sicani - Sindaco di Bivona
Ciriminna F.	RFI - Sviluppo Rete (Commerciale)
Corallo G.	AU Ragusa - Modica: referente Comune di Ragusa
Corrao R.	RFI - Responsabile Sviluppo Rete (Commerciale)
Costa D.	AU Siracusa: referente Comune di Siracusa
D'Andrea	AU Messina: referete Comune di Messina - Servizio Mobilità Urbana, Dip. Servizi Manutentivi
Dell'Utri G.	AU Enna - Caltanissetta: referente Comune di Caltanissetta
Di Carlo C.	Libero Consorzio Comunale di Agrigento - Referente
Di Miceli G.	Dipartimento Trasporti, Dirigente Servizio 1 e 2
Faletta V.	Servizio 9 - Infrastrutture viarie - Sicurezza stradale
Ficile A.	SNAI Madonie - Referente
Finocchiaro F.	AU Acireale - Catania: referente Comune di Catania
Fiore S.	Ferrovia Circumetnea - Metropolitana di Catania
Fiorello A.	AU Messina: Responsabile Autorità Urbana
Fortunato E.	AU Siracusa: referente Comune di Siracusa
Franceschielli F.	Servizio 7 - Infrastrutture viarie - Sicurezza Stradale. Dirigente Responsabile
Imbrosciano L.	AU Siracusa: referente Comune di Siracusa
La Paglia A.	RFI - Tecnico
La Placa R.	SNAI Madonie - Referente
Lanza R.	Servizio 7 - Infrastrutture viarie - Sicurezza Stradale. Dirigente Responsabile
Leonardi M.	AU Ragusa - Modica: referente Comune di Ragusa
Licitra C.	AU Ragusa - Modica: referente Comune di Ragusa - Mobility-manager
Marinello G.	RFI - Project Engineer Anello
Martinelli M.	RFI Direzione operativa infrastrutture territoriali - DOIT
Mineri D.	Snai Simeto Etna - Referente Comune di Adrano
Mupo L.	ANAS - RUP progetto SS640
Nicita	AU Messina: referete Comune di Messina - Servizio Mobilità Urbana, Dip. Servizi Manutentivi
Paolino F.	AU Ragusa - Modica: referente Comune di Modica
Piomalli	AU Messina: referete Comune di Messina - Servizio Mobilità Urbana, Dip. Servizi Manutentivi
Pisani F.	RFI Direzione operativa infrastrutture territoriali - DOIT
Placente G.	AU Palermo - Bagheria: referente AMAT Palermo
Pullara V.	Trenitalia - Direttore Direzione Regionale Sicilia Sviluppo Rete
Putaggio A.	AU Sicilia Occidentale: referente Comune di Marsala
Rosano V.	Legambiente Sicilia
Salvia G.	ANAS - Referente progetto SS640
Sausa M. G.	Dipartimento della Programmazione - Responsabile Aree Urbane in Area 8
Teresi G.	Servizio 6 - Infrastrutture Marittime e Portuali
Tomasella G.	AU Enna - Caltanissetta: RUP Ciclovía Comune di Caltanissetta
Tortorici S.	RFI Direzione operativa infrastrutture territoriali - DOIT
Vacirca B.	Servizio 3 - Infrastrutture in materia di trasporto Aereo e su Rotaia Infrastrutture in materia di Mobilità Urbana. Parcheggi e Sistemi a Guida Vincolata. Autoporti
Veca C.	SNAI Sicani - Referente
Volpicella M.	RFI - Direzione Commerciale
Zangara G.	AU Palermo - Bagheria: referente AT OI Comune di Palermo
Zarcone G.	Servizio 7 - Infrastrutture viarie - Sicurezza Stradale
Zoroberto D.	RFI - Project Planning
OMNIA (Patti, Messina)	Associazione consumatori

NAME	REFERENCE STRUCTURE
Comitato Pendolari Sicilia (Palermo)	Associazione consumatori
Movimento Difesa del Cittadino (Modica)	Associazione consumatori
U.DI.CON. (Siracusa)	Associazione consumatori

ALLEGATO 6 - CASE STUDIES

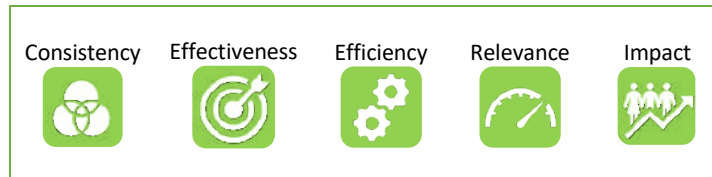
Below are the 10 case studies selected based on the triangulation of the available information and their significance from the point of view of financial consistency and/or virtuousness in terms of effectiveness, efficiency, coherence, relevance and impact on the territory, criteria with respect to which the case studies were classified as indicated below.



As previously mentioned, the type of case studies used was descriptive-illustrative, i.e. aimed at adding concreteness and depth to the information collected through other research methodologies.

For each of them, the project documents and the progress data of the intervention were analysed. This information of a secondary nature was integrated with data of a primary nature deriving from direct investigations of beneficiaries and/or privileged witnesses.

1) MAJOR PROJECTS: THE PALERMO-CARINI RAILWAY PASSANTE



THE PROJECT

The Palermo railway link extends from the stop in the Roccella-Acqua dei Corsari district, in the extreme south-eastern outskirts of the city, to Palermo airport, for a total extension of approximately 37 km, of which 20 km inside the urban area, horizontally cutting a large part of the metropolitan area of Palermo.

The most important modernization works (doubling, new stations and undergrounding) are included in the 30 km of the stretch between Roccella and Carini: the final project includes 22 stops, some of which are already in use and others under construction, and the undergrounding of 7 km of line.

The implementation of the interventions to upgrade the Palermo railway hub contributes to the construction of a modern railway infrastructure, capable of promoting rail-road modal integration and improving the goods offer in qualitative terms (reduction of distances, coding for combined transport , etc.) and quantitative (more paths available), as well as satisfying the current and future mobility demand, both in the urban area and in the entire district of the capital.

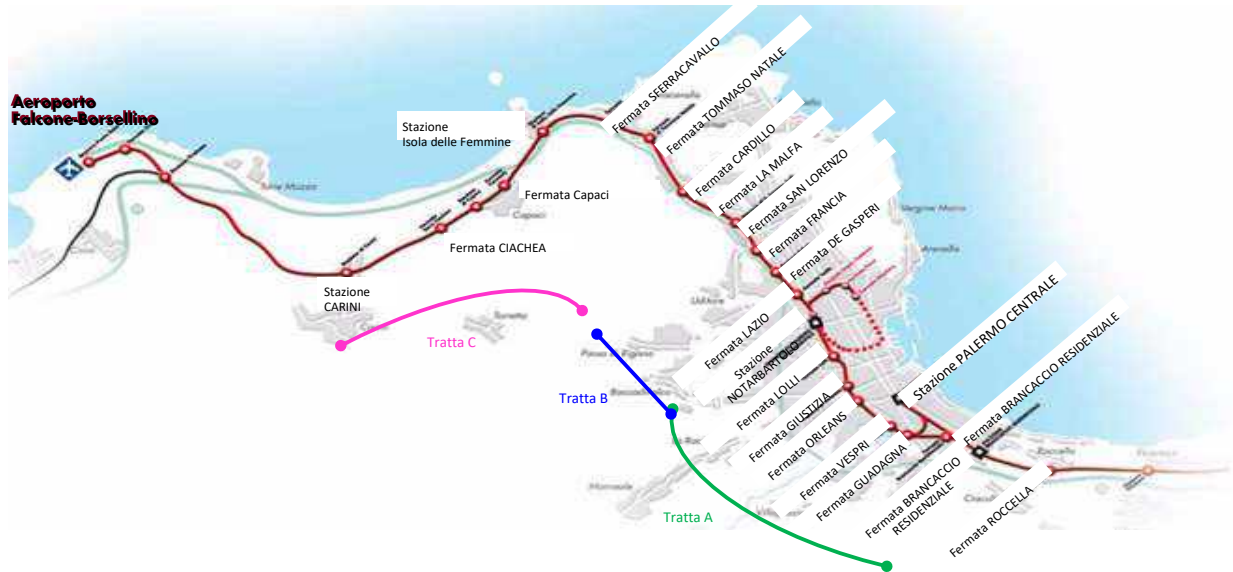
In particular, the project pursues the following objectives:

- improve the infrastructure in terms of usability, functionality, regularity and cost-effectiveness of management.
- offer a rapid metropolitan service with 20 stations and stops in urban, suburban and metropolitan areas.
- activate a regular and efficient frequent connection between the city of Palermo and its airport.
- increase the mobility of commuter flows between Palermo and the western municipalities of the metropolitan area: Isola delle Femmine, Capaci, Carini, Cinisi and Terrasini.
- improve the urban roads surrounding the railway section due to the suppression of level crossings and the construction of new roads.
- improve travel comfort also with the use of the latest generation trains for metropolitan service.
- develop modal integration.

The project involves the electrified doubling of the "Passante Ferroviario" of Palermo, between Palermo Centrale/Brancaccio and the Falcone e Borsellino Airport of Punta Raisi, for an extension of approximately 29 km of line. The work is carried out partly alongside the pre-existing single track and partly as a variant of the historic route, with both surface and underground locations, including the equipment and implementation of the line and station technological systems.

The intervention falls on the Palermo – Trapani/Punta Raisi line which is part of the trans-European interoperable railway network pursuant to Regulation (EU) No. 1315/2013 and Delegated Regulation (EU) 2017/849 and is part of the Scandinavian TEN-T corridor - Mediterranean pursuant to Regulation (EU) No. 1316/2013 (conventional global network).

FIG.14- PALERMO-CARINI RAILWAY LINK PROJECT



The works to upgrade the hub also include the construction of 10 new underground stops: Roccella, Maredolce, Guadagna, Papireto, Lolli, Lazio, Belgio, EMS/La Malfa, Sferracavallo, Kennedy (Capaci).

Thanks to the new interventions it will be possible to reach Punta Raisi "Falcone - Borsellino" Airport from Palermo Centrale with a suburban metropolitan service, traveling along the entirely electrified double-track line.

The line will also connect the numerous urban centers located west of Palermo with each other and with the regional capital; trains coming from towns to the east will also be able to easily travel towards Trapani and connect with the airport.

The doubling works were divided into three sections:

- Section A: Palermo C.le/Brancaccio - Notarbartolo (8.5 km), including the stations/stops of Brancaccio, Maredolce, Guadagna (underground), Vespri (underground), Orleans, Papireto (underground), Lolli (underground), inside which approximately 4 km of tunnels are built.
- Section B: Notarbartolo – EMS/La Malfa (4.3 km), including the stations/stops of Notarbartolo, Lazio (future activation, underground), Belgio (future activation, underground), France (in trench), S. Lorenzo Colli (in the trenches), EMS/La Malfa, inside which approximately 3.9 km of tunnels are built.
- Section C: EMS/La Malfa– Carini (16.2 km), including the stations/stops of Cardillo, Tommaso Natale, Sferracavallo, Isola delle Femmine, Capaci (Underground), Carini T.Ciachea, Carini, within which the approximately 2.8 km of tunnels.

FIG.15- PALERMO HUB

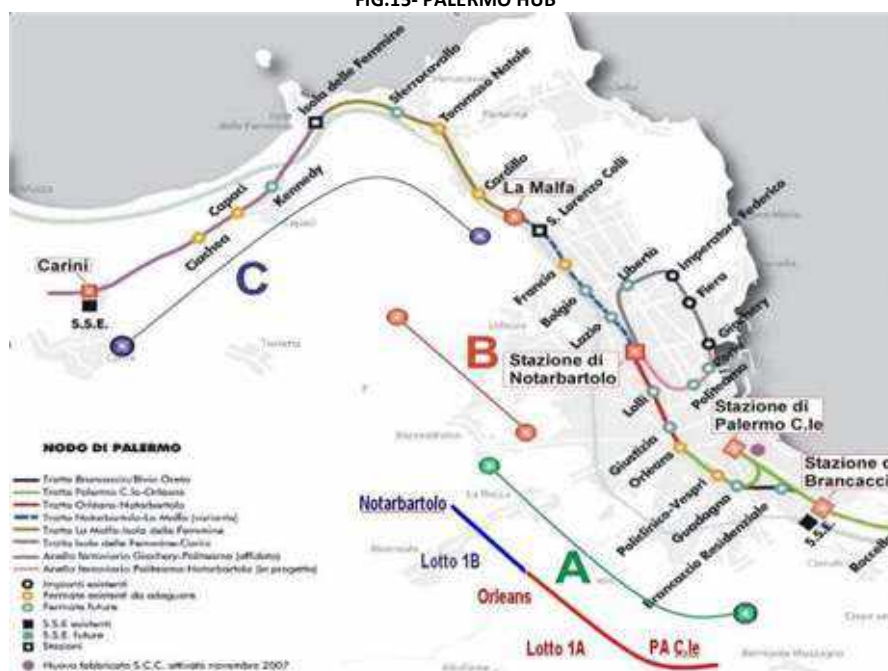


FIG.16- ROUTE A: PALERMO CENTRALE/BRANCACCIO - NOTARBARTOLO



FIG.17- ROUTE B: NOTARBARTOLO – EMS/LA MALFA



FIG.18- ROUTE C: EMS/LA MALFA–CARINI



PROJECT PROGRESS

The works began in 2010 with Section A and are still underway, with the expected completion of the works and opening of the entire section by 2026.

The following routes are currently in operation:

- double track of the Palermo Centrale / Brancaccio – Orleans section, including the new Maredolce and Guadagna stops and the Vespri and Orleans stops.
- Even track of the Orleans – Notarbartolo section, including the new Lolli stop in operation only for the even track.
- double track section Notarbartolo – S. Lorenzo Colli, including the new PRG of Notarbartolo, the new ACEI of Notarbartolo and the opening to the SV of the odd track of the Francia stop, activation which completes the double track configuration of Section B (activation on 09 /07/2023).
- double track of the S. Lorenzo Colli – Carini section including all stops on the route (100% of Section C).

Construction sites are active on the following routes:

- completion of the Belgium stop in Section B (activation expected in the 1st half of 2024).
- superficial renovation between the Belgio stop and the S. Lorenzo Colli stop (works expected to be completed by 2023).
- completion of the excavation of the tunnel under Vicolo Bernava and completion of the structural works of the Lolli and Papireto stops in Section A (works expected to be completed by the second half of 2024).
- construction of the new Lazio stop (activation expected in the 2nd half of 2026).

Finally, the last intervention to complete the work will begin shortly:

- Completion of the BD of the Orleans – Notarbartolo section and finishing of the Lolli and Papireto stops (completion of section A).

FIG.19- PROJECT PROGRESS: CHRONOGRAPHY



Below is the financial progress of the project as of August 2023 (latest official data available).

TAB.52- PROGRESS OF THE PROJECT (MEURO, AUGUST 2023)

PROJECT	SOURCE / ACTION	COST	PAYMENTS
Completion of the Palermo Centrale - Carini railway doubling / urban section A	PO ERDF Sicily 2014-2020 Action 7.1.1	41,279	37,288
Railway doubling Palermo Centrale - Carini / Section B Notarbartolo - EMS/La Malfa	PO ERDF Sicily 2014-2020 Action 4.6.1	290,894	183,418
Section C1	PON Infrastructures and Networks 2014-2020	17,933	17,933

Source: Caronte information system and OpenCoesione for other funding sources other than the POR

¹Work completed on 01/28/2022

THE RESULTS

The interventions make it possible to eliminate the main "bottleneck" of the Sicilian railway network, linked both to the infrastructural configuration of the single track line and to the strong demand for travel in the localities involved. In particular, with the complete realization of the project, the following will be obtained:

- the increase in the capacity of the line and the opening of 15 stops in the urban area of Palermo which make it possible to establish a metropolitan-type service, decongesting road traffic, and strengthening services for the "Falcone" international airport and Borsellino² of Punta Raisi;
- Modal Shift with movement of private mobility shares towards public railway mobility;
- lower operating costs for mobility;
- lower external costs for the benefit of the environment (reduction of CO2 and polluting emissions);
- time saving for rail users.

These benefits are in line with the purpose of priority axis 4 in which the project is inserted, and in particular with the Specific Objective 4.6 of improving the quality of life in urban and metropolitan areas by implementing sustainable urban mobility strategies.

The doubling of the Palermo Passante, currently being completed for the section between Palazzo Reale/Orleans and Palermo Notarbartolo, has made it possible to achieve a general improvement in terms of line capacity and accessibility to the railway service.

The increase in capacity, through the doubling of the line, also allowed a reduction in travel times (with the same number of stops) due to the elimination of intersections in the stations.

Furthermore, as seen previously, the burial of a good part of the section has allowed the elimination of the existing level crossings along the entire line with significant benefits for urban traffic and for the reliability levels of the line itself (it has gone from 19 level crossings in 2009 to none in 2023).

TAB.53- RESULTS OF THE PROJECT IN TERMS OF ACCESSIBILITY TO THE SERVICE

	2009	2023	Regime
No level crossings	12	0	0
Origin	PA Central	PA Central	PA Central
Intermediate locations	-	PA Earns	PA Earns
	PA Vespers	PA Vespers	PA Vespers
	Royal Palace/Orleans	Royal Palace/Orleans	Royal Palace/Orleans
	-	-	PA Justice
	-	PA Lolli	PA Lolli
	PA Notarbartolo	PA Notarbartolo	PA Notarbartolo
	-	-	PA Lazio
	-	PA Belgium*	PA Belgium
	PA France	PA France	PA France
	PA San Lorenzo Colli	PA San Lorenzo Colli	PA San Lorenzo Colli
	-	PA La Malfa	PA La Malfa
	PA Cardillo	PA Cardillo	PA Cardillo
	PA Tommaso Natale	PA Tommaso Natale	PA Tommaso Natale
	-	PA Sferracavallo	PA Sferracavallo
	Island of the Females	Island of the Females	Island of the Females
	Capable	Capable **	Capable
	Carini Torre Ciachea	Carini Torre Ciachea	Carini Torre Ciachea
	cute	cute	cute
	Piraineto	Piraineto	Piraineto
Destination	Tonnara Orsa	Tonnara Orsa	Tonnara Orsa
Total intermediate locations	Punta Raisi	Punta Raisi	Punta Raisi
	13	18	20

Source: RFI

* The activation of the Belgian stop for operations is aimed at December 2023

** The new Capaci stop, inserted within the urban fabric of the town of the same name, replaces the old decentralized station.

As regards services, a comparison between the services planned in 2009 and the current ones is reported in tabular form.

TAB.54- RESULTS OF THE PROJECT IN TERMS OF SERVICES OFFERED

	2009	2023
Semi-fast service	56 minutes (6 intermediate stops)	49 minutes (10 intermediate stops)
Widespread service	68 (10 intermediate stops)	60 minutes (16 intermediate stops)
"Fast" service	-	34 minutes (1 intermediate stop)

Source: RFI

2) MAJOR PROJECTS: THE PALERMO RAILWAY RING



THE PROJECT

The objective of closing the Palermo railway ring is to create a local public transport infrastructure, along a central route of strategic importance for the city, where private traffic levels are proving to be no longer sustainable, integrated with the Passante Railway.

With the creation of the new metropolitan transport line, we therefore intend to intervene on the times and costs of urban mobility, significantly contributing to raising the quality of life also in terms of reducing environmental pollution.

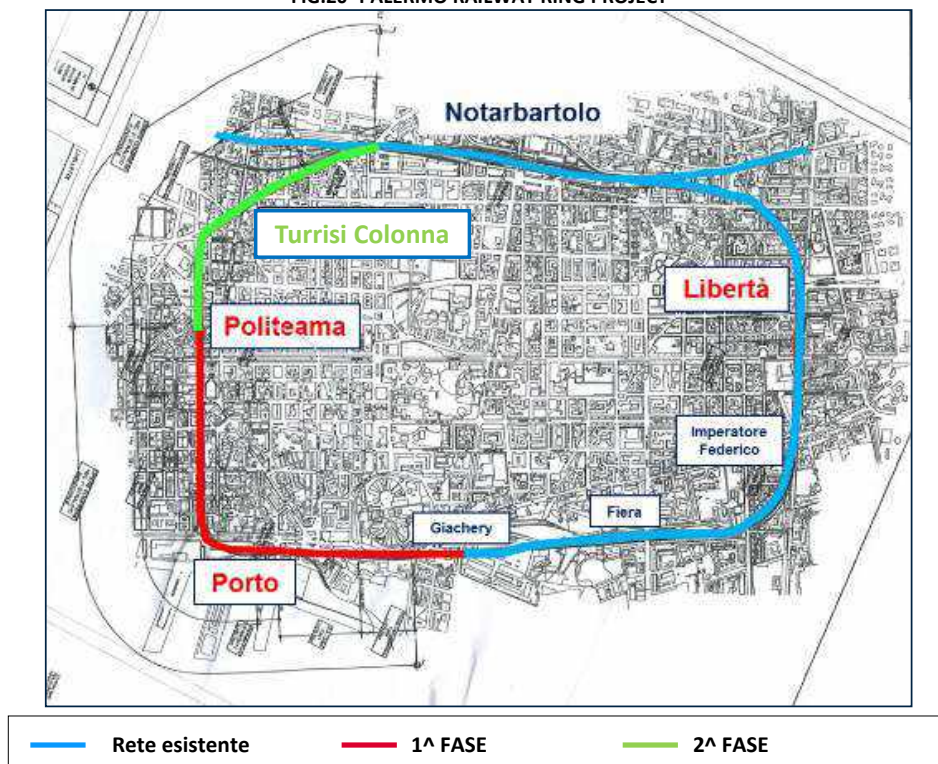
The intervention aims to strengthen the metropolitan system of the city of Palermo through the increase in the theoretical capacity admitted on the line, the possibility of new metropolitan-type services in the new Libertà, Porto, Politeama and Turrisi Colonna stops, the increase in the regularity of circulation and the strengthening of accessibility to the railway service.

The intervention, divided into two functional phases, consists in the extension, in the first phase, of the current single track line Palermo Notarbartolo - Giachery up to the new abutment station called Politeama and, in the second phase, in the closure of the ring from the station from Politeama to Palermo Notarbartolo station (Giachery – Politeama route). In this phase, in addition to the Politeama station, the construction of two stops is also planned, located respectively in the section currently in operation (Libertà stop) and in the new section near the port (Port stop).

In the second phase (Politeama – Notarbartolo section), the construction of the new Turrisi Colonna stop and the transformation of the Politeama station into a stop is planned.

The intervention will make it possible to increase the capacity and accessibility of the infrastructure, creating the conditions for an increase in rail services in the city of Palermo.

FIG.20- PALERMO RAILWAY RING PROJECT



The first phase of the project, the Giachery – Politeama section, is the subject of co-financing through the PO ERDF Sicily 2014-2020 for an amount of 152,095,271 euros.

The second phase, the Politeama – Notarbartolo section and the Malaspina stop, is co-financed by the Development and Cohesion Plan of the Ministry of Infrastructure and Transport for an amount of approximately 127 million euros.

PROJECT PROGRESS

Phase 1 of the project, “Giachery - Politeama”, which is part of the OP ERDF Sicily 2014-2020, is underway with activation expected for both the Libertà stop and the Giachery - Politeama section by the first half of 2024.

For Phase 2, Politeama - Notarbartolo, the definitive project was submitted to the opinion of the OOPP Superintendency and approved in November 2020.

In January 2021, the request for the activation of the Single Regional Authorization Provision was sent, which ended on 22 May 2023 with the issuing of the PAUR Decree.

The design and execution tender notice was published on 28 June 2023 for a total tender amount of approximately €92.7 million.

Below is the financial progress of the project as of August 2023 (latest official data available).

TAB.55- PROGRESS OF THE PROJECT (MEURO, AUGUST 2023)

PROJECT	SOURCE / ACTION	COST	PAYMENTS
Closure of the Palermo railway ring Phase 1, Giachery - Politeama route	PO ERDF Sicily 2014-2020 Action 4.6.1	152,095	152,095
Phase 2, Politeama - Notarbartolo section	PSC Ministry of Infrastructure and Transport	127.016	0

Source: Caronte information system and OpenCoesione for other funding sources other than the POR

THE RESULTS

The benefits of the project as a whole can be traced back to an improvement in performance and accessibility to the urban railway network and a reduction in car traffic.

In detail, the project allows:

- the reduction of travel times for the acquired railway demand and increase in accessibility to the railway network through the creation of new stops and stations.
- the reduction of congestion on the road network;
- the reduction of transport operating costs for private road transport;
- the reduction of CO2 emissions and other air pollutants, the main causes of global warming;
- the reduction of noise pollution;
- the reduction of road accidents.

These benefits are in line with the purpose of priority axis 4 in which the project is inserted, and in particular with the Specific Objective 4.6 of improving the quality of life in urban and metropolitan areas by implementing sustainable urban mobility strategies.

As part of the project to close the Palermo railway ring, an increase in service access points is expected as shown in the following table.

TAB.56- RESULTS OF THE PROJECT IN TERMS OF ACCESSIBILITY TO THE SERVICE

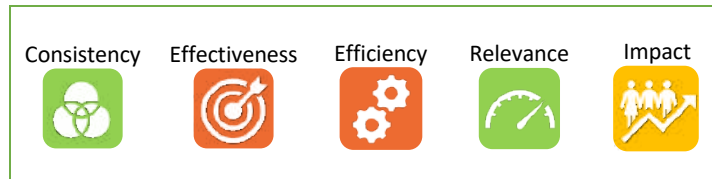
	Before construction	Lot 1 closing	Closing the Ring
Intermediate service locations	Emperor Frederick	Emperor Frederick	Emperor Frederick
	-	Freedom	Freedom
	Fair	Fair	Fair
	Giachery	Giachery	Giachery
	-	Port	Port
	-	Politeama	Politeama *
	-	-	Turrisi Colonna
Total locations	3	6	7

* The Politeama station will be transformed into a stop as part of the lot 2 interventions.

In terms of service, the closure of the railway ring offers the opportunity to develop operating models that allow the direct connection of the suburban areas of Palermo with its center and the port, in line with what is reported in the

Regional TPL Framework Agreement Siciliana - RFI signed in March 2022. Furthermore, the closure of the railway ring can promote the tourist development of the area, offering sustainable and preferable public transport compared to road transport, as the project, if included in an integration system intermodal with the Palermo-Carini railway link, it allows a connection between the port and the airport via the Notarbartolo station.

3) BIG PROJECTS: THE CIRCUMETNEA



THE PROJECT

The objective of the project is the extension of the current section of the metropolitan line of the Ferrovia Circumetnea (FCE), in operation within the urban center of Catania, to meet the mobility needs of the south-western area of the area. The extension of the metro line concerns the historic center area and the length of the south-western outskirts of the city up to the airport, thus serving the populous neighborhoods of Villaggio S. Agata and Librino. The new route will start from the pre-existing Stesicoro station and will cross the following stations: San Domenico, Vittorio Emanuele, Palestro, San Leone, Verrazzano, Librino, Santa Maria Goretti and Airport.

The section of the metropolitan line in question, falling entirely within the municipal territory of Catania, will have an overall length of approximately 6.8 km and will represent the primary axis of penetration and circulation within the city center until reaching the southern outskirts and to the airport, areas otherwise connected only by road transport of the Catania Metropolitan Transport Company (AMT).

The construction characteristics of the new section remain similar to the sections already built, i.e. double-track tunnel railway lines with ordinary gauge and 3kV DC electric traction

The extension in question is added to other routes that represent the trend scenario, namely:

- 3.8 km of existing line of the Borgo-Porto section, in operation since 1999,
- 5 km of line of the Borgo-Nesima and Galatea-Stesicoro sections, in operation since 2017;
- 3.9 km Nesima-Misterbianco Centro, scheduled by 2020 but whose deadline was subsequently extended.

The intervention therefore allows for a total of a 17.5km long double-track metropolitan railway line in the tunnel (Misterbianco center – Airport) and a 2km long single-track surface line to be in operation within the metropolitan city of Catania. 0km (Galatea – Porto).

The implementation of the project is envisaged in two distinct lots:

- First lot: involves the construction of civil works only between the pre-existing Stesicoro station and the Palestro station;
- Completion lot: also includes the systems between the Palestro station and the airport.
 - The operational phase of the first lot is contextual to that of the entire intervention: it therefore coincides with the completion of the works on the completion lot.

With City Council Resolution no. 42 of 12/22/2022 with the subject: "Extension of the railway network in the Catania metropolitan section from the central railway station to the airport (Stesicoro/Airport section - Completion lot - Project in variation to the current PRG). Opinion pursuant to art. 7 of LR n. 65/1981 and subsequent amendments.", a change to the route of the Stesicoro – Airport section is approved with slight deviations compared to the initially authorized route, following a review of the stations based on:

- a new geological-geotechnical model, deriving from the consequent analysis of the effects induced by the excavations on the pre-existing structures;
- the adaptation to the Ministerial Decree 2015 - Technical rule for fire prevention, with the modification of the airport station.

FIG.21- STESICORO-AIRPORT SECTION - FIRST LOT AND COMPLETION LOT, UPDATED TO 2022 CHANGE

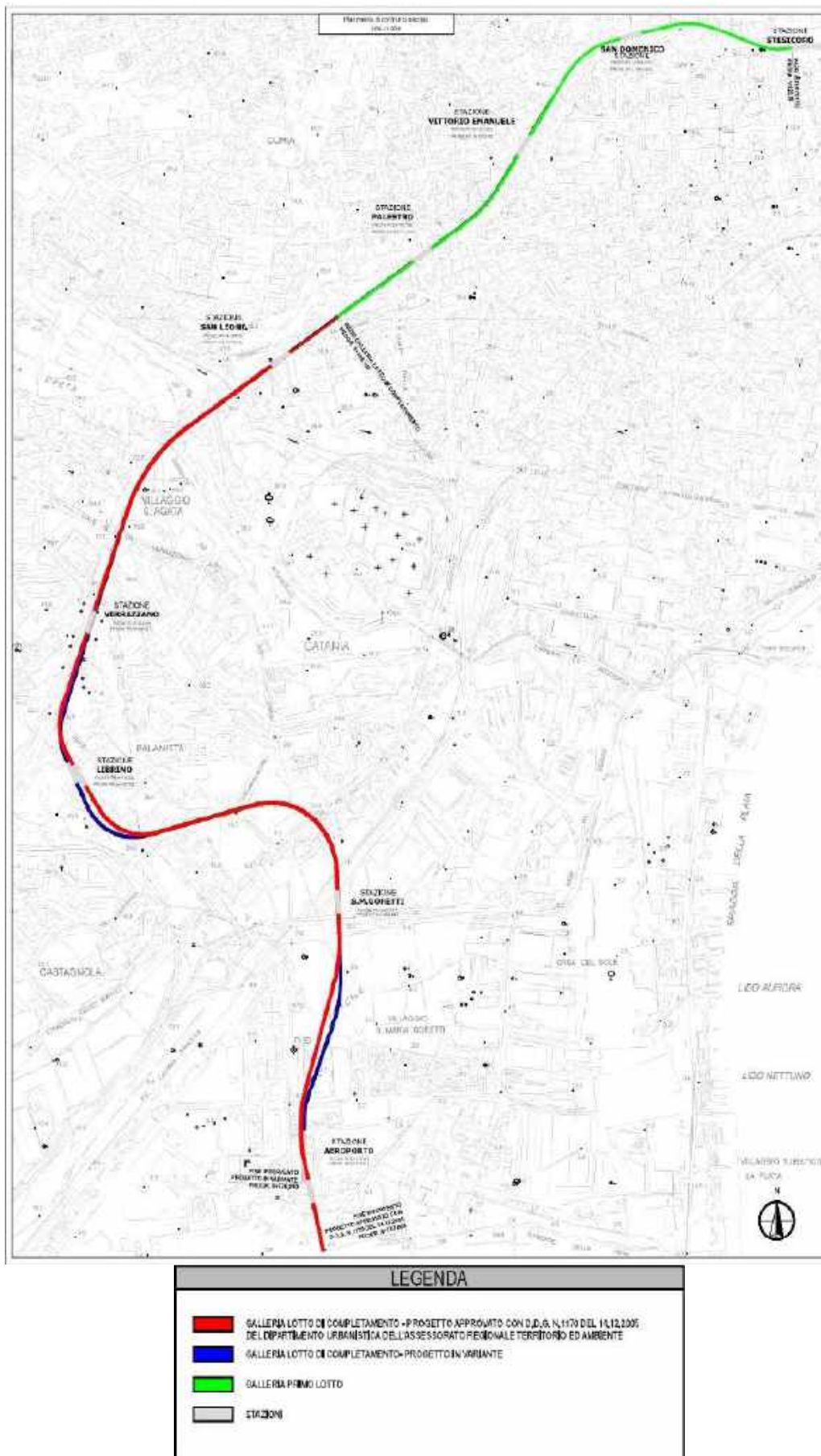
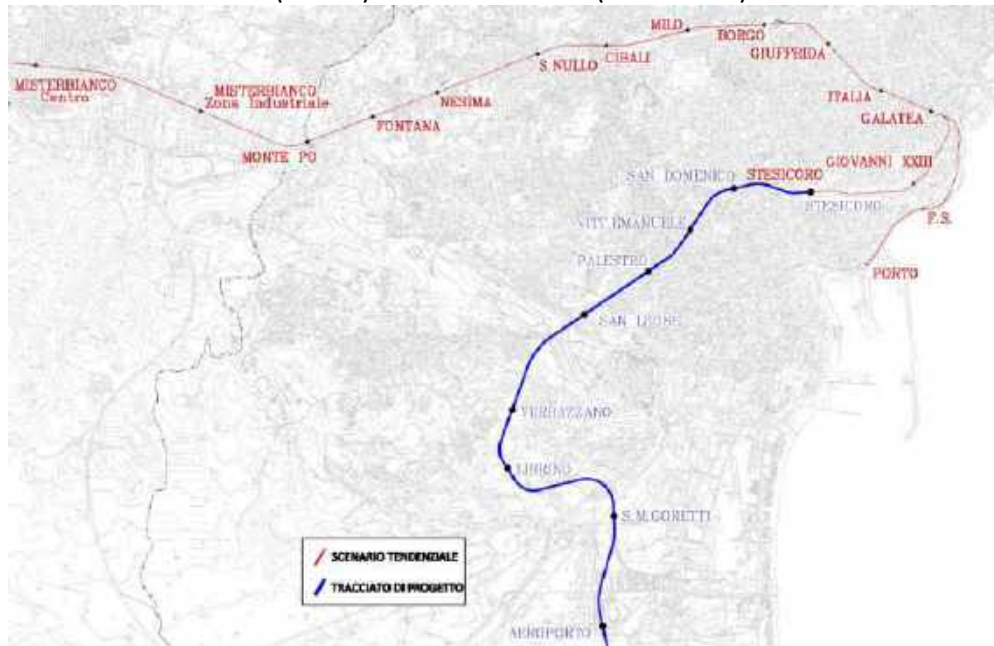


FIG.22- TREND SCENARIO (RED LINE) AND PROJECT SCENARIO (RED+BLUE LINE) OF THE FCE METRO LINE



The project is expected to cost a total of 492 million euros, including national and community resources from the Sicily ERDF Operational Programme, of which 358,685,547 are financed by the European Union.

PROJECT PROGRESS

Work on the first lot began at the end of November 2018 with the start of excavation of the tunnel. According to the timetable, the excavation of the first lot was to be completed by the first half of 2020. Consequently, the start of work on the completion lot was scheduled for the end of 2020.

On the night between 19 and 20 January 2020, a building collapsed in via Plebiscito, near via Castromarino, coinciding with the excavations for the first lot. Given the opening of criminal proceedings in this regard, the works were subsequently suspended. In April 2023, the criminal case was archived, allowing the work to restart, inaugurated by consolidation interventions on the route up to Stesicoro.

The City Council Resolution no. 42 of 12/22/2022 mentioned above, with the subject of the Project as a variation to the current PRG and related changes to the Completion lot also comes as a result of a new geological-geotechnical model carried out as a consequence of the collapse.

The completion of the Stesicoro-airport section is scheduled for the end of June 2026, the same year in which the works for the Nesima-Misterbianco Centro section are also planned to be completed. Furthermore, a further section between Misterbianco and Paternò, which allows the connection between three Etna municipalities and the city of Catania, financed by PNRR sources, should be completed the same year.

In consideration of the implementation criticalities encountered during the implementation phase, not directly dependent on the Program, but, as seen, on unexpected calamitous events, only part of the planned interventions will be expensed within the POR, i.e. the structural lot corresponding to the excavation of the tunnel (Route Stesicoro – Palestro). The subsequent works will transition to the new 2021-2027 Programme.

Below is the financial progress of the project as of August 2023 (latest official data available).

TAB.57- PROGRESS OF THE PROJECT (MEURO, AUGUST 2023)

PROJECT	SOURCE / ACTION	COST	PAYMENTS
Extension of the railway network in the Catania metropolitan section from the Central Station to the Airport – Stesicoro-Palestro (1st Lot), Circumetnea Railway	PO ERDF Sicily 2014-2020 Action 4.6.1	60,472	36,218

Source: Caronte information system

THE RESULTS

The benefits of the intervention as a whole can be traced back to an improvement in accessibility to the urban metropolitan railway network, which allows the direct connection of the center with the airport, and the reduction of car traffic.

In particular, the complete realization of the project allows:

- the reduction of congestion on the road network;
- the reduction of CO2 emissions and other air pollutants, the main causes of global warming;
- the reduction of noise pollution;
- the reduction of road accidents.

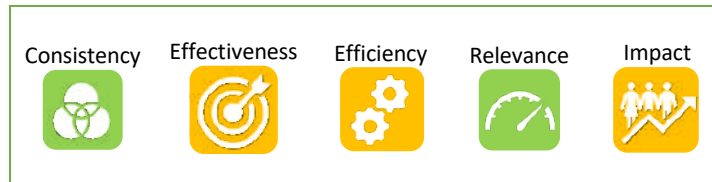
Furthermore, the infrastructure allows for fast mobility, also making it easier for students to reach the university districts located near future stops, as well as tourist flows from the Catania-Fontanarossa international airport to the city center and vice versa.

Further benefits brought by the execution of the project are:

- the development of rail transport and the pursuit of effective intermodality;
- the promotion and implementation of a low-carbon economy by increasing sustainable mobility in urban areas;
- improving the liveability of urban areas not limited to the central ones, but also focusing on the peripheral ones;
- increasing employment in an area with high levels of unemployment;
- improving accessibility to places of production and consumption;
- the reduction of transport costs.

These benefits are in line with the purpose of priority axis 4 in which the project is inserted, and in particular with the Specific Objective 4.6 of improving the quality of life in urban and metropolitan areas by implementing sustainable urban mobility strategies.

4) MAJOR PROJECTS: THE SS640 OF PORTO EMPEDOCLE



THE PROJECT

The SS road. n°640 “di Porto Empedocle” represents a very important artery for the regional road network of Sicily. Not only is it one of the main road axes serving internal areas, but it is undoubtedly the preferential route between south-western Sicily and the A19 Palermo – Catania motorway. It represents a direct connection between the Province of Agrigento and the main road ring of the island made up of motorway connections between the three main metropolitan centers (Palermo, Catania, Messina) also ensuring the connection of ports of national interest (Porto Empedocle and Catania).

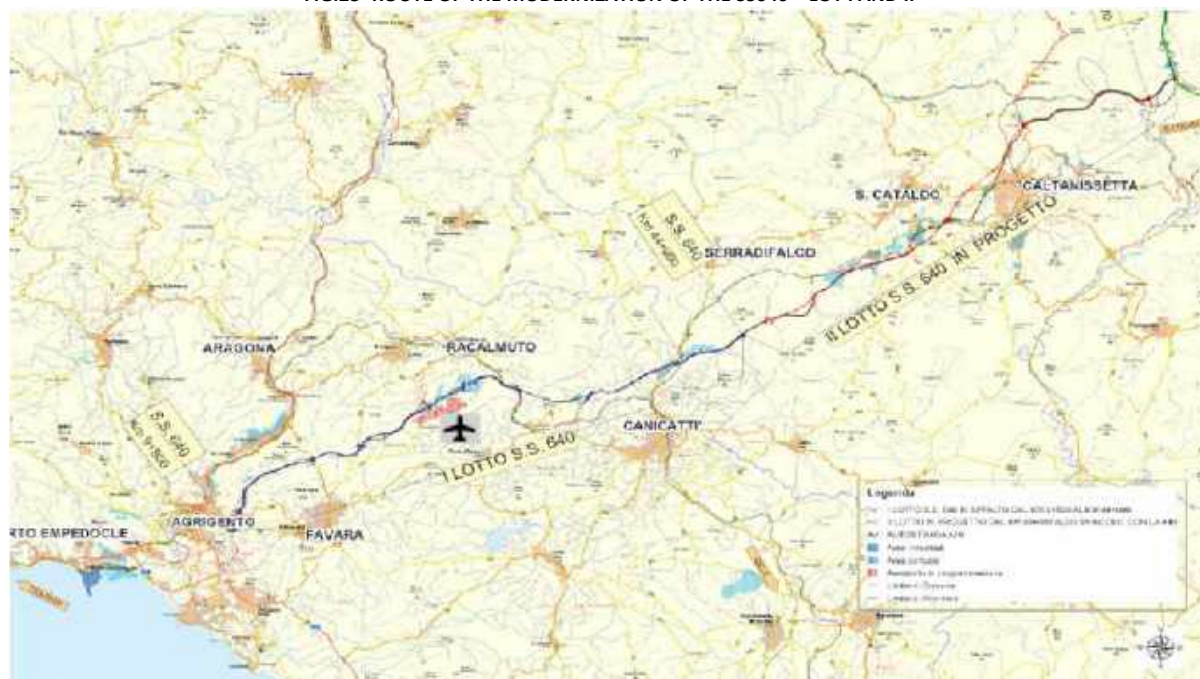
ANAS, also welcoming the numerous political initiatives of the local and provincial administrations and the regional government, has included in its programs the intervention to upgrade the SS 640 to four lanes (category B of the Ministerial Decree 5/11/2001) in relation to the most congested stretch, between the Temples area south of Agrigento (Km. 10+200) and the junction with the “Caltanissetta” junction of the A19 PA-CT motorway.

The objective of the intervention is, therefore, to fill a crucial infrastructural gap in the relational system of the island, improving the conditions of safety and practicability, and contributing to completing the modernization of the Sicilian territorial framework together with the creation of other important road infrastructures under construction or planned: completion of the Messina-Palermo, Siracusa-Gela, Siracusa-Catania, Ragusa-Catania and Trapani-Mazara del Vallo motorways and construction of the bridge over the Strait of Messina.

The intervention, included in the 1st Strategic Infrastructure Program (CIPE Resolution no. 121/2001) which falls within the scope of application of Law no. 443/2001 containing delegation to the Government regarding infrastructures and production facilities of national interest, has been divided into two sections of almost homogeneous extensions.

- Lot I: Section falling within the territory of the Province of Agrigento, with a total development of approximately 34 km, from Km 9+800 to Km 44+400 of the existing SS 640, financed under PO ERDF 2007-2013.
- Lot II: Section falling within the territory of the Province of Caltanissetta and a minimal part of Enna, with a total length of approximately 30 km, from Km 44+000 to Km 74+300 of the existing SS 640, up to the junction with the motorway At 19 Palermo - Catania. The stretch includes 6 junctions, 4 natural tunnels of which the longest measures approximately 4 km, 5 artificial tunnels, 13 viaducts.

FIG.23- ROUTE OF THE MODERNIZATION OF THE SS640 – LOT I AND II



PROJECT PROGRESS

The works for the works foreseen in Lot I were concluded in 2015. The testing of the works was completed on 06/30/2017 with the opening to traffic taking place on 03/28/2017.

The contractual deadline for completing the works on Lot II, scheduled for 12/31/18, has long been disregarded due to a serious financial crisis affecting the General Contractor.

In relation to the serious delays in execution, the intervention was included among those considered priority pursuant to art. 4 of the legislative decree of 18 April 2019, n. 32 (DL Unlock Construction Sites). With Prime Ministerial Decree of 04/16/2021, the Government appointed the Extraordinary Commissioner to give impetus to the continuation and completion of the works. With Resolution No. 58 of 05/18/2023, the ANAS Board of Directors resolved to approve the Variation Appraisal No. 4, updated to 04/17/2023, which provides for a contractual increase of Euro 28,095,891.61 and a total amount of the Assignment for works and charges of the General Contractor of Euro 843,694,945.91, defining the contractual terms of completion for the opening to traffic for parts of the work. Specifically, it is expected:

- opening to traffic, in a temporary configuration, of at least one two carriageways of the main two-lane axis on 31/12/2023;
- opening to traffic of the new San Giuliano sx viaduct (Ponte ad Arco) and of the main axis up to the Caltanissetta Nord junction and the Arenella viaduct on 06/30/2024;
- opening to traffic of the entire work on 31/12/2024.

The overall progress of the contract referring to all the processes and activities entrusted to the CG and updated to PVT 4 is equal to approximately 84.25% of the amount updated to PVT4. To date, approximately 23.2 km on 28 km of the main axis are open to traffic in a temporary configuration, of which 18.1 km are dual carriageway and 5.1 km single carriageway, equal to approximately 82% of the route, in addition to a comparable extension of secondary roads.

Below is the financial progress of the project as of August 2023 (latest official data available).

TAB.58- PROGRESS OF THE PROJECT (MEURO, AUGUST 2023)

PROJECT	SOURCE / ACTION	COST	PAYMENTS
Agrigento-Caltanissetta itinerary - A19 - Upgrading of the SS 640 of Porto Empedocle to four lanes - second section up to km 74 +300 A19 junction (Lot I)	PO ERDF Sicily 2014-2020	683,079	597,702

Source: Caronte information system

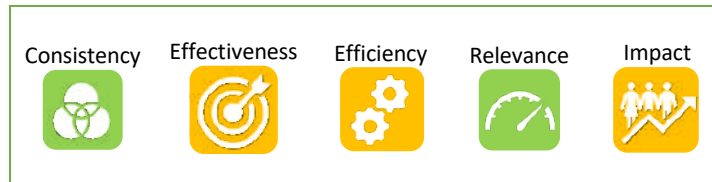
THE RESULTS

The functional redevelopment of the SS 640 through the construction of a dual carriageway is part of the need to reorganize the provincial and regional road system, aimed at supporting the economic-territorial development of the island.

The work as a whole will allow:

- ensure adequate responses to the significant demand for mobility generated by the various traffic flows affecting important tourist attraction centers in the central-southern area of Sicily;
- reduce the accident rate along the road connection that connects the cities of Caltanissetta and Agrigento to the A19 Palermo-Catania motorway;
- adapt the Caltanissetta-Agrigento itinerary in such a way as to guarantee an effective interconnection with the major road and motorway networks in Sicily;
- improve and regulate local traffic on secondary coplanar roads connected to the main artery at staggered level interchanges;
- enhance local development potential through infrastructural adaptation;
- guarantee the best conditions for integration and insertion of the infrastructure into the territory and the environment.

5) SWEET MOBILITY: THE ENNA - CALTANISSETTA CYCLE ROUTE



THE PROJECT

The project of a single infrastructure, Ciclovía Centro Sicilia Zona di Caltanissetta and Zona di Enna, aimed at creating an eco-urban/environmental cycle axis that connects the two urban poles, was the subject of a Program Agreement between the Municipality of Caltanissetta and the Municipality of Enna, signed on 18 August 2020.

The project of the first cycle route (Enna – Caltanissetta) was created to respond to the notice of selection of projects within the Sustainable Urban Development Strategy, a notice addressed to the Municipality of Caltanissetta and the Municipality of Enna, as Local Authorities forming part of the 'Urban Agenda of Enna/Caltanissetta "Central Sicily Urban Centre", as established by the Regional Council resolution n. 64 of 02/26/2019.

The financing falls within Axis 4 Action 4.6.4 of the OP ERDF Sicily 2014/2020, co-financed by the European Regional Development Fund (ERDF), relating to public works (works and systems) for the creation of cycle-pedestrian paths.

The action involves the creation of cycle/pedestrian paths that allow safe use by all users.

Specifically, the interventions concern:

- the increase of the cycle and cycle-pedestrian network through the creation of new sections with technical characteristics suited to the infrastructural, landscape, historical and environmental context of the territory crossed;
- the creation of rest areas and equipped car parks dedicated to bicycles;
- the creation of services strictly functional to the use of the cycle infrastructure;
- the installation of devices aimed at monitoring cycling mobility and video surveillance of the cycle/pedestrian path, against bicycle thefts and attacks.

The Centro Sicilia Ciclovía was born from the idea of uniting two municipalities that have a similar territory, in the center of a region dedicated to tourism, but which are located outside the main tourist flows. These are areas often overlooked not only by tourists, but also by the islanders themselves.

The cycle route therefore becomes a way to make known the beauty of a unique territory, which constantly changes throughout the year; in fact the border between the municipality of Enna and the municipality of Caltanissetta is located within one of the oriented natural reserves of Sicily, that of Monte Capodarso.

The route of the cycle route is varied and winds along arterial roads under the responsibility of various organisations. It is mixed: some sections consist of a cycle path for the exclusive use of bicycles, others involve mixed use of bicycles and pedestrians and still others exploit the existing road surface.

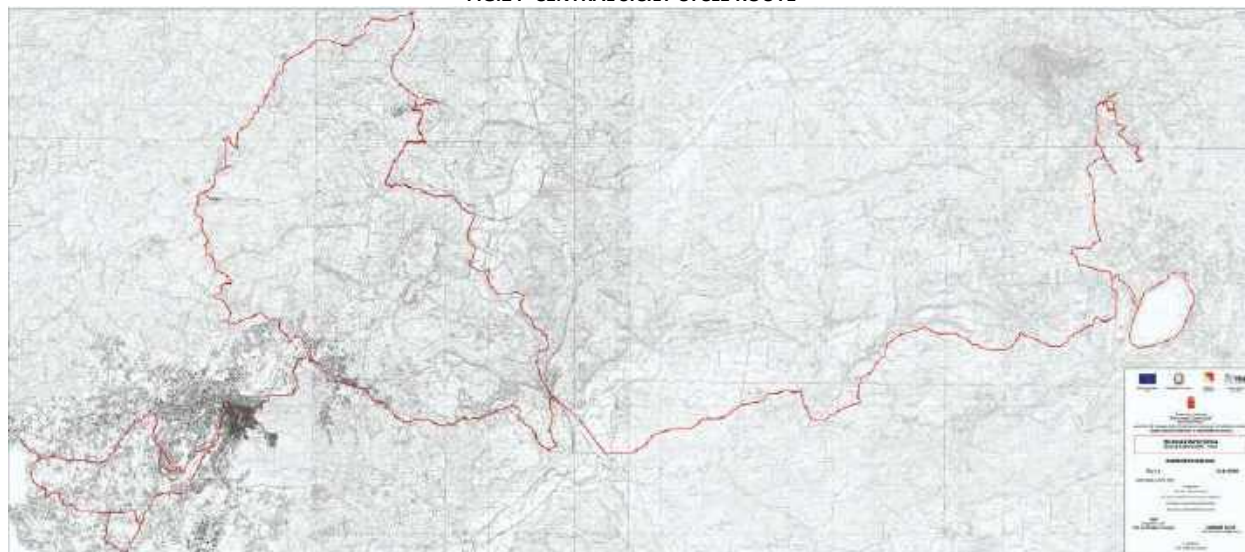
To achieve the objective of creating the cycle route, the following roads were used:

- municipal (Enna and Caltanissetta);
- state (ANAS);
- provincial (Free Consortium);
- Oriented Reserve;
- local roads;
- private roads.

The final objective is to make the cycle path a valid structure both from the cycling tourism point of view and from the point of view of sustainable mobility. In fact, the part of the cycle route that falls within extra-urban territory, running alongside Borgo Cascino and Borgo San Tommaso, as well as Lake Pergusa, will have a dual function, i.e. cycle tourism and sustainable mobility; while the one in the urban area, which crosses the Enna Bassa area along the two road axes of Via dell'Unità d'Italia and Viale delle Olimpico, will have the function of developing sustainable mobility.

The total length of the cycle route is approximately 85 km, with 29 km in the Enna area and 56 km in the Caltanissetta area.

FIG.24- CENTRAL SICILY CYCLE ROUTE



PROJECT PROGRESS

The works for the construction of the "Central Sicily Cycle Route" are nearing completion.

The contract for the construction of the cycle path was awarded for an amount of approximately 3.91 million euros through a tender, of which 2.8 million euros covered by the POR for the part of the cycle path involving the municipality of Caltanissetta.

Below is the economic framework of the contract.

TAB.59- TECHNICAL AND ECONOMIC FRAMEWORK OF THE PROJECT FOR THE CONSTRUCTION OF THE CENTRAL SICILY CYCLE PATH

TECHNICAL ECONOMIC FRAMEWORK	
a) Sum of works	
a1) Cycle path works in the Caltanissetta area	1,747,434.15
a2) Cycle path works in the Enna area	1,585,788.32
Sub - Total	3,333,222.47
<i>Special safety charges already included in the works</i>	
a3) Cycle route charges in the Caltanissetta area	19,021.58
a4) Cycle route charges in the Enna area	24,803.86
Sub-total special safety charges	43,825.44
Amount of works based on auction	3,289,397.03
Reduction made to deduct 30.5775%	1,005,815.38
They stay	2,283,581.65
Security charges	43,825.44
Contractual amount	2,327,407.09
b) Sums available to the administration	
b1) VAT 10%	232,740.71
b2) Executive planning and PSC (Enna area intervention)	59,899.40
b2.1) Pension fund 4% on b2)	2,395.98
b3) Incentives for technical functions art. 113 Legislative Decree 50/2016 – 80% of 2%	53,331.56
b4) Publications of the tender notice	10,000.00
b5) Selection commissions	10,000.00
b6) Connections to public services	33,332.08
b7) Topographic survey of the Caltanissetta cycle path	3,007.06
b8) Technical skills for project verification	8,881.60
b9) Geognostic, geotechnical and seismic investigations	5,770.39
b10) Laboratory tests on soil samples	1,606.74
b12) Unforeseen works and roundings	61,157.48
b13) Residual savings from auction reductions	1,106,397.73
Total sums available to the administration	1,588,520.73
Financing amount	3,915,927.82

Below is the financial progress of the project as of August 2023 (latest official data available).

TAB.60- PROGRESS OF THE PROJECT (MEURO, AUGUST 2023)

PROJECT	SOURCE / ACTION	COST	PAYMENTS
Project for the construction of the Central Sicily cycle path between Caltanissetta and Enna	PO ERDF Sicily 2014/2020 Action 4.6.4	2,810	1.017

Source: Caronte information system

THE RESULTS

The main aim of the project is to encourage sustainable mobility in the area between the cities of Enna and Caltanissetta, thanks to the development of the infrastructure necessary for the use of low environmental impact vehicles and the creation of a network of cycle and cycle paths. pedestrian areas, which include safety measures and adaptation of the current road axes, with the aim of:

- encourage and promote a high degree of cycling and pedestrian mobility, an alternative to the use of motor vehicles in the urban areas subject to intervention, with a particular focus on work, school and tourist mobility;
- aim for the attractiveness, continuity and recognisability of the cycle route, favoring the shortest, most direct and safest routes according to the results of surveys on the origin and destination of cycling users;
- reduction of accidents and levels of air and noise pollution.

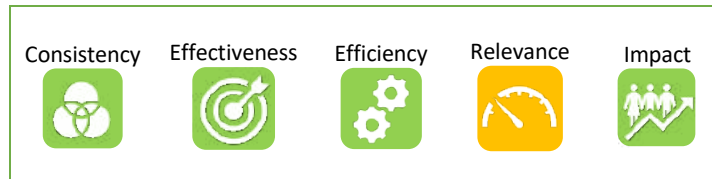
The objectives pursued with the creation of the Central Sicily Cycle Route essentially concern:

- the formation of a cycle and cycle-pedestrian network through the creation of new sections with technical characteristics suited to the infrastructural, landscape and environmental context of the territory crossed, in compliance with current sector regulations;
- the creation of parking areas dedicated to bicycles (racks with relative columns for charging e-bikes);
- the creation of services strictly functional to the use of the cycle infrastructure;
- the reduction of polluting loads from urban traffic in the urban agglomeration of Enna Bassa;
- the improvement of the urban landscape through the redevelopment and valorisation of some places of cultural and naturalistic importance, with particular reference to the extra-urban route;
- the possibility of integrating bicycle travel into sustainable mobility systems in municipalities or aggregations of municipalities with urban characteristics (Enna/Caltanissetta);

Upon completion, the infrastructure, in addition to the cycle connection between the municipalities of Enna and Caltanissetta, will allow:

- sufficient travel capacity in the urban area (workplaces, study places, commercial activities) and in the extra-urban area (rural villages and districts of environmental and cultural value).
- a modest reduction in the polluting loads of urban traffic, mainly relating to university students who gravitate to Enna Bassa, who will be able to reach the study locations by bicycle instead of private transport.
- a sufficient capacity to enhance the landscape and cultural and naturalistic places (Borgo Cascino, Feudo San Tommaso, Lake Pergusa etc...).

6) REGIONAL RAILWAY IMPROVEMENT: POP TRAINS



THE PROJECT

The projects to strengthen the railway offer of the Sicily Region involve, in addition to the adaptations of the existing lines and structural investments, also the strengthening of the circulating fleet through the acquisition of new rolling stock.

The final objective is to strengthen regional public transport services, to improve connections with the main urban, productive and logistical nodes of Sicily.

The strengthening of the railway offer was financed through Action 7.3.1 "Purchase of new trains to be allocated to the routes with greater potential demand" ('Axis 7 "Sustainable Transport Systems" of the OP ERDF Sicily 2014-2020) for a amount equal to 182.5 million euros, approved with decree no. 1647 of 3 July 2019.

The financing allowed the purchase of 21 EMU (Electrical Multiple Units) trains of medium capacity, called "POP".

The cars are part of the ten-year service contract signed in May 2018 by the Sicilian Region and Trenitalia (FS Italiane Group), which overall provides for investments of over 426 million euros, of which approximately 325 are intended for the acquisition of new trains to enhance mobility local and metropolitan. In total there will be 43 new convoys arriving in Sicily, including the 21 "POPs" financed through European funds.

The new train is built with 95% recyclable materials and designed to have minimal environmental impact: energy consumption is reduced by 30% compared to the previous generation of trains, making it suitable to serve in the context of the ecological transition. Furthermore, the structures and characteristics of the aluminum cases contribute to improving thermal insulation, therefore cooling times during the summer season and heating times during the winter have been further reduced.

The configuration includes the presence of four carriages, with 4 traction motors. It travels at a maximum speed of 160 kilometers per hour, will have an acceleration greater than 1 meter per square second and can carry up to approximately 530 people, with over 300 seats.

The "Pop" trains have a transport capacity up to 15 percent higher than the previous generation of railway trains, and have eight bicycle racks as standard, which will travel free of charge on Sicilian regional trains.

They also offer better performance in terms of comfort and accessibility: they are equipped with a remote diagnostics system and an internal camera system that improve safety and have places specifically designed for disabled people near the access doors and toilets to facilitate the transit of passengers. people with reduced mobility.

Finally, the "POP" railway trains purchased by the Region are all branded with the hashtag EuropeLoveSicily, in implementation of EU regulation 1303/2013 on the use of community funds, which provides that "information and communication measures are implemented in accordance with the communication in order to improve visibility and interaction with citizens".

FIG.25- "POP" TRAIN BRANDED WITH THE EUROPELOVESICILY HASHTAG



PROJECT PROGRESS

The timescales set out in the timetable of the "Rolling Stock Investment Plan updated to 2026" were respected, for the provision of 42 new regional trains, all in circulation by the first half of 2023.

Thanks to these new trains, the average age of rolling stock in Sicily has been significantly lowered to seven years, making it the region with one of the youngest average age fleets in Italy.

Of the 42 trains planned in total, as seen, 21 are the new POPs financed through Action 7.3.1 of the OP ERDF Sicily 2014-2020, while another seventeen are the hybrid trains and five are the electric ones purchased through other regional funds.

Five of the twenty-one "POPs" were delivered by December 2019, seven in 2020 and nine in 2021.

Below is the financial progress of the project as of August 2023 (latest official data available).

TAB.61- PROGRESS OF THE PROJECT (MEURO, AUGUST 2023)

PROJECT	SOURCE / ACTION	COST	PAYMENTS
Purchase of new trains to be allocated to the routes with greater potential demand	PO ERDF Sicily 2014/2020 Action 7.3.1	182,500	175,414

Source: Caronte information system

THE RESULTS

The fleet of new "POP" trains is complete and is active on the regional network. To evaluate its impact on the railway service in the Sicily region it is possible to take into consideration two main aspects: the number of passengers and their satisfaction with the service.

In 2019, the monthly total of passengers boarding trains scheduled with the old "NAVETTA-POP" (ref. November) was 357,985 (for the purposes of the estimate, reference was made to the attendance campaign for the month of November 2019, with valorisation of the number of passengers boarding scheduled services with SHUTTLE material. The daily data was then reported to a monthly data).

In 2022, the monthly total of passengers boarding trains scheduled with the new "POP" trains (ref. November 2022) was 429,265 (for the purposes of the estimate, reference was made to the attendance campaign for the month of November 2022, with valorisation of the number of passengers boarding services scheduled with POP material. The daily data was then reported to a monthly data).

In the period of introduction and commissioning of the new "POP" trains, there was therefore an increase of almost 20% in the average passengers using the regional railway system thanks to the increase in offer.

At the same time, there was also a clear improvement in the degree of satisfaction expressed by passengers with the general offer, in the level of comfort and in the length of time on board the new trains (table below).

The introduction of the new trains increased the level of satisfaction recorded in 2022 compared to the pre-"POP" period of 2019 by approximately 5 percentage points consistently in all three categories surveyed.

TAB.62- LEVELS OF SATISFACTION PERCEIVED BY USERS OF THE REGIONAL RAILWAY SERVICE (% VALUE AND VARIATION)

ITEM	2019	2022	Δ
Customer satisfaction "Overall trip"	87.7	93.6	5.9
Customer satisfaction "Level of comfort"	89.1	94.2	5.1
Customer satisfaction "Stay on board"	90.8	95.5	4.7

Source: Trenitalia spa estimates Regional Passenger Division - Sicily Regional Directorate

Aspects relating to the effectiveness and efficiency of the service have also significantly improved following the introduction of the new "POP" trains into the fleet.

Two indicators were used to monitor the effectiveness and efficiency of the "POP" fleet respectively.

1. Programmed production with POP type material(percentage of annual scheduled production within the scope of the current Service Contract): for the purposes of the estimate, reference was made to the annual scheduled distance with SHUTTLE material referring to the calendar year 2019 and its impact on the total contractualized production for the year of reference due to the fact that the NAVETTA fleet will be progressively and completely replaced by POP trains.
2. Cost/train*km and revenue/train*km associated with the use of the POP fleet: for the purposes of the estimate, reference was made to the cost and revenue items recorded in the Regional Income Statement for the year 2018. These items were appropriately related to the reported annual production and, in particular, to its electricity share. In detail:
 - the portion of costs related to diesel for traction is not attributed to the item "Circulation management";
 - an efficiency gain of approximately 5% was estimated for the "Maintenance" and "Cleaning" processes, due to the lower estimated burden due to the use of new and fixed composition rolling stock.

To these indicators it is possible to add a third relating to efficiency by relating the operating revenues of the "POP" fleet to the actual km traveled by each train.

The analysis of the indicators highlights an expected increase in productivity of over 30% thanks to the transition from the service carried out with the POP SHUTTLES to that which can be carried out with the new "POP" trains.

The cost estimate also drops significantly with the transition to the new trains. Thanks to the use of a fleet of new and efficient trains, costs decrease by almost €13 per km for each train.

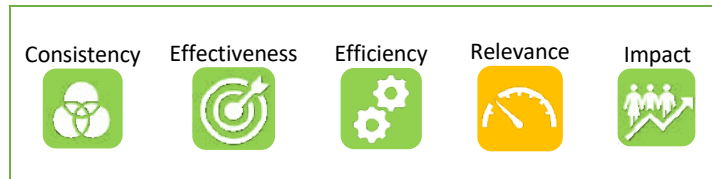
Consequently, the operating revenues recorded also rise to €14.50 per km travelled, thanks to the use of the fleet of new "POP" trains.

TAB.63- "POP" FLEET EFFECTIVENESS AND EFFICIENCY INDICATORS

INDICATOR	VALUE
1 - Production scheduled with POP type material (annual production scheduled with NAVETTA POP/annual production contracted)	32%
2 - Process costs/train*km associated with the use of the POP fleet	-€12.80
3 - Operating revenues/train*km associated with the use of the POP fleet	€14.50

Source: Trenitalia spa estimates Regional Passenger Division - Sicily Regional Directorate

7) REGIONAL RAILWAY IMPROVEMENT: THE UPGRADING OF THE LINES



THE PROJECTS

Through the ERDF PO, the Sicily Region finances five upgrading interventions of the railway lines: two on the "Palermo-Trapani via Castelvetro" line and three on the "Canicattì-Gela-Ragusa-Siracusa" line. In both cases, these are single-track and non-electrified railway lines, for which the projects mainly constituted extraordinary maintenance interventions linked to the reliability of the lines, with the aim of improving the safety of the infrastructure through an improvement of technology and armament.

As regards the "Palermo - Trapani via Castelvetro" line, it has been the only railway connection between the two most important urban centers of Western Sicily since 2013, due to the suspension of traffic due to some landslides on the most direct and fast section "via Milo", which to this day remains closed.

The line in question also involves a population residing in the Trapani area of approximately 250 thousand inhabitants, affecting several very important inhabited centers, such as Birgi Airport, Marsala, Mazara, Castelvetro and Alcamo. For this reason, the importance of this route is evident, not only for the numerous commuters who move daily from one center to another, but also for the development of tourism in an area rich in natural, archaeological and cultural resources of great importance, still little appreciated today.

The objective of the projects is to strengthen and secure approximately 75 km of railway line through two infrastructural improvement interventions and updating of performance requirements, aimed at improving the performance of trains on the line and eliminating some existing slowdowns.

FIG.26- PALERMO – TRAPANI RAILWAY VIA CASTELVETRO



As regards the "Canicattì – Gela – Ragusa – Siracusa" line, it constitutes one of the main railway routes in south-eastern Sicily, which involves four free municipal consortia (Siracusa, Ragusa, Caltanissetta, Agrigento), affecting a basin of users equal to approximately 580,000 inhabitants and a number of commuters of approximately 500 per day.

It is the southernmost railway line of both the Italian and European networks, as well as the longest secondary line in Sicily.

It is of particular importance as it crosses an area rich in UNESCO sites, architectural and landscape beauties (such as the towns of Noto, Scicli and Modica) and important areas of the protected area system (such as the area of the Ciane river, the Cassibile river and Cava Grande del Cassibile).

In this sense, the line in question has been the subject of interventions several times for its relaunch also from a tourist point of view, given the beauty of the areas it passes through, first of all the "Val di Noto Baroque Train" between Siracusa and Ragusa, a tourist service on vintage locomotives inaugurated in 2005 and still in service. Also in this case, the projects involved three infrastructural improvement and technological enhancement interventions, aimed at improving the long-criticized travel times on the line and the regularity of the service, both for commuters and tourists.

FIG.27- VAL DI NOTO BAROQUE TRAIN



On both lines subject to intervention, the initiatives consisted in particular of:

- upgrading of the superstructure: renovation of the track through the removal of the wooden sleepers and the installation of reinforced concrete sleepers, as well as the complete replacement of the ballast, in order to adapt the railway to the new standards expected mainly for freight traffic, providing for the possibility of passage for heavy vehicles;
- technological upgrading: renovation of the transmission systems and replacement of the copper cables serving the safety, signaling and telecommunications systems (replacement of the Driver Support System - SSC with the Train Movement Control System - SCMT, more advanced and reliable, a standard currently in force on 90% of Sicilian lines).

PROGRESS OF PROJECTS

All five projects are completed and the lines are operational.

Below is the financial progress of the project as of August 2023 (latest official data available).

TAB.64- PROGRESS OF THE PROJECT (MEURO, AUGUST 2023)

PROJECT	SOURCE / ACTION	COST	PAYMENTS
Renovation with simultaneous rehabilitation of the ballast of circulation and interchange tracks in the Scicli – Rosolini section of the Siracusa – Canicattì – Caltanissetta line, as well as IS, TLC, CTC and SSC modifications	PO ERDF Sicily 2014-2020 Action 7.3.1	25,010	21,190
Palermo-Trapani railway line via Castelvetro - Alcamo section Branch-Castelvetro-Marsala-Trapani "Technological upgrading with improvement of the safety of the railway infrastructure"	PO ERDF Sicily 2014-2020 Action 7.3.1	3,400	3,368
Palermo-Trapani railway line via Castelvetro - Alcamo section Branch-Castelvetro-Marsala-Trapani "Upgrading of the equipment and improvement of the safety of the railway infrastructure"	PO ERDF Sicily 2014-2020 Action 7.3.1	54,500	53,325
Canicattì-Gela-Ragusa-Siracusa railway line "Technological and infrastructural upgrade"	PO ERDF Sicily 2014-2020 Action 7.3.1	11,900	11,186
Canicattì-Gela-Ragusa-Siracusa railway line "Upgrading and improving the safety of the railway infrastructure"	PO ERDF Sicily 2014-2020 Action 7.3.1	4,100	4,021

Source: Caronte information system

THE RESULTS

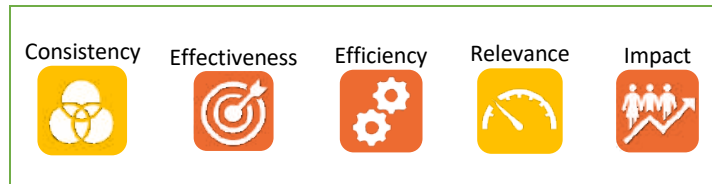
For both railway lines in question, the expected results of the interventions have been achieved, both in terms of the increase in safety standards and the increase in punctuality of the lines.

As regards the "Palermo - Trapani via Castelvetro" line, thanks to the extraordinary maintenance interventions and upgrades of the technological system for protecting the train's movement, there was a significant improvement in the punctuality index, which increased from 55.9 of 2018 to the current 92.9.

Similarly, for the "Canicattì – Gela – Ragusa – Siracusa" line, the extraordinary maintenance, speeding up and technological upgrade interventions activated in 2016 between the Canicattì and Comiso stations made it possible to reduce travel times by approximately 30 minutes.

The further extraordinary maintenance interventions have allowed an improvement in the punctuality indices of the Modica – Gela – Canicattì – Caltanissetta connection from 53.8 (2018 data) to 85.2 (current data).

8) SNAI STRATEGY: THE MADONIAS



THE REFERENCE CONTEXT

The territory of the Madonie Internal Area, in the center of northern Sicily, in the eastern part of the Province of Palermo, has faced a serious depopulation problem for many years which requires a strategic approach to revitalize the region. As of January 2015, the population numbered 61,489, a decrease of 4,900 compared to the 2011 census. This demographic decline has deep roots, with the 2011 census already showing a 25% decrease compared to the 1971 census.

This demographic decline is the result of distorted industrial development dynamics and models of growth without development, driven by huge public capital and exogenous resources. Furthermore, regional policies have long emphasized the gigantism of public works, favoring the construction industry and the extraction of raw materials to the detriment of key sectors for sustainable development and environmental and socio-cultural balances.³⁰

Among the various areas of intervention of the Strategy for Internal Areas, public transport infrastructures play a fundamental role in the revitalization of the Madonie area. The main infrastructure of the area is the A19 Palermo-Catania motorway, which connects the western to the eastern areas of Sicily. However, the Strada Statale 120 of Etna and Madonie, crucial for accessibility, remained in disaster. The railway is only used along the coast, but work on doubling the railway line and modernizing the stations is still ongoing.

The port and freight terminal of Termini Imerese, once considered a key logistics platform, have seen their role reduced due to economic problems and the closure of the FIAT factory. These infrastructures were considered central to the industrial development of the island.

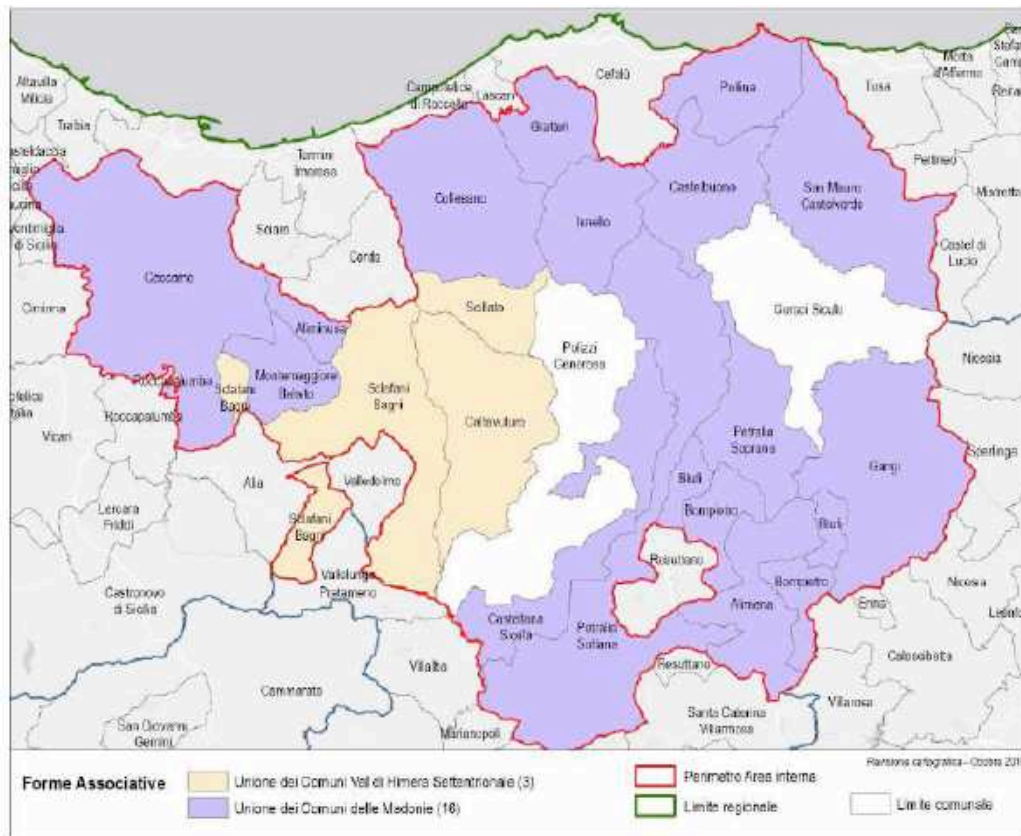
The improvement of local public transport services is a cornerstone of the Madonie strategy. It is planned to rationalize the connection services with the regional bus lines along the A19 motorway to reduce the costs of school transport and the use of private vehicles and to support the integration between bus and rail services through the coordination of timetables.

An interchange hub at the Irosa exit along the A19 motorway will allow regional bus lines to make stops, improving accessibility to the area. Internal accessibility will be guaranteed by small shuttle buses more suitable for mountain roads. This solution will help rationalize school transport services and replace part of the bus services with overlapping routes and time slots concentrated on school timetables.

A crucial aspect is the coordination between local public transport services and road and railway infrastructures. Furthermore, the redevelopment of provincial roads is essential to guarantee internal accessibility and connection with the European TEN-T network.

³⁰ Madonie Resilienti: Laboratory of the Future, "Area Strategy", 27 January 2017 (as part of the National Strategy for Internal Areas).

FIG.28- INTERNAL AREA OF THE MADONIE



THE PROJECTS

The strategy outlined to address the challenges of depopulation and development in the Madonie is supported by several integrated projects that aim to improve accessibility, mobility and road conditions in the region. These projects are essential to enable a sustainable rebirth of the area and offer new opportunities to residents and tourists. The reconstruction of the overall picture took place on the basis of project monitoring data³¹ and the interviews carried out with the project representatives during the carrying out of the evaluation activities.

➤ Strengthening of Local Public Transport (TPL) and Interchange Hub services

In the Alte Madonie, the tourism industry is experiencing significant growth with an increase in the number of visitors from 8,000 in 2013 to 14,000 in 2015. However, accessibility to the area, especially from Catania, remains problematic. Mobility costs, including those of tourists, fall mainly on citizens, and the lack of internal transport services makes it difficult to connect between the Municipalities and their neighbors in the Lower Madonie and the Torto River Basin.

To address these challenges, an enhancement of local public transport services has been proposed with the creation of an interchange hub near the A19 motorway [AIMA 11³² – Reorganization of Local Public Transport (TPL)]. This would allow regional bus companies operating on the Palermo-Catania route to connect to a network of circular inter-municipal connections using shuttle buses more suited to mountain roads. Furthermore, this approach could rationalize the school transport service and replace some bus routes with overlapping timetables concentrated on school times.

Coordination between road services and rail services is expected to improve efficiency, and real-time information on vehicles will be accessible at stops through a GPS tracker-based infomobility system, made available in open data

³¹ Caronte Information System, August 2023

³² The projects relating to the Internal Madonie Area are referred to with the wording used in the Framework Program Agreement of the Sicilian Region relating to the Internal Madonie Area "Resilient Madonie: Laboratory of the future" of 5 July 2018, to distinguish them from the more generic wording of the Caronte Information System which recalls the project portfolio with the generic action 7.4.1.

mode. To date, however, the project has not started and for this reason it is impossible to quantify the impact on the reference variables (accessibility of the area, mobility costs for citizens and tourists, connection to inter-municipal connections, coordination between services on road and railway services, effects of the introduction of an info-mobility system).

Improvement of provincial roads for greater accessibility

One of the main axes to guarantee internal accessibility is the SP 9 state road, which connects various municipalities in the Madonie. However, this road has been plagued by landslides, road surface failures and other problems due to adverse climatic events. The interventions proposed under the strategy [AIMA 12 A – AIMA 12 D] aim to improve safety and reduce travel times. These works include drainage, consolidation of the road body, reclamation of the road edge, resurfacing of the road surface and the installation or replacement of safety barriers. The implementation of these improvements on the SP 9 will contribute significantly to strengthening the connection between the municipalities of the Alte Madonie and encouraging the development of the area. To date, however, the project has not started and for this reason it is impossible to quantify the impact on the reference variables (improvement in safety, reduction in travel times).

Among the projects that aim to strengthen Local Public Transport (LPT) services, there are also extraordinary maintenance works for the arrangement of the road surface and the reconstruction of the damaged sections of the SP 11 [AIMA 12E]. In particular, the project aims to improve the connection section between the A19 motorway and the SS 290 and, consequently, between the municipalities of the area and the main road arteries. The projects aim above all at the reclamation of the road box and the resurfacing of the surface to improve transit conditions, which are strongly hindered both by the disruptions due to the morphology of the territory and the increase in the transit of heavy vehicles after the opening of the new Irosa junction.

The intervention is currently completed and, with respect to the objectives set in the strategic design phase, especially the improvement of road conditions and related access to transport, these have been achieved to the extent that the SP 11 of Blufi favors accessibility into and out of exiting the Madonie Internal Area, thus contributing to the improvement of internal mobility.

In fact, the SP 11 connects the hamlets of the town of Blufi, also connecting hamlets belonging to other municipalities, such as the municipality of Bompietro.

It should also be highlighted that the stretch subject to the ERDF PO intervention appears to be the quickest for moving around the district, since alternatively the only connections are mainly made up of country roads that are not easily passable by motor vehicles.

The intervention also contributed to the removal of restrictions affecting the road section which limited the carriageway, the alternating direction of travel, speed limitations and further bans on passing for certain periods by municipal ordinance.

Ultimately, the intervention significantly reduced the accessibility time to the area (both in and out) and the transit and travel time, ensuring that the inhabited centers located along the efficient road section were more accessible and, consequently, the primary services located there (medical-health services, post office, bank, supermarket) and also other secondary services (gyms, football pitches, library, etc.).

The overall effect on local economic actors was positive, both in terms of safety of the road section and better accessibility (in terms of reduction in travel time) for local companies that manage to reach the main road/railway axes of the network TEN-T. The improvement also involved the public transport service as it made it possible to make roads previously not accessible to LPT accessible and passable.

The intervention also contributed to improving the levels of accessibility to the cultural and landscape heritage present in the Madonie area, in particular with reference to the Madonie Park (member of the European Geopark Network), the Sites of Community Interest and the Areas of Special Protection which are part of the Natura 2000 Network and which represent approximately 26% of the territorial surface.

Restoration of Road Safety on SP 28, SP8 and SP58, SS120, SS52 and SS60

In the Madonie area, road connectivity is of fundamental importance for the connection between the municipalities of Lascari and Gratteri, as well as with the SS 113 and the A20 motorway at the Buonfornello crossroads. However, this stretch of SP 28 has suffered in recent years due to adverse climatic events, which have compromised its safety and efficiency. An extraordinary maintenance intervention aims to restore safety and accessibility on this approximately 10 km stretch of the SP 28. The works involve various phases, including the implementation of drainage to

address water stagnation problems, the reclamation of the road verge, the resurfacing of worn road surfaces and the installation or replacement of safety barriers. These efforts aim to ensure safer and easier transit on this important road artery. In fact, the SP 28 promotes accessibility to and from the internal Madonie area and allows the connection from the coastal area of the Madonie (Campofelice, Cefalù, Pollina) to the mountain municipalities of the SNAI Madonie, connecting the municipalities of Lascari and Gratteri. The intervention also made the tourist areas of the area, such as the Madonie Park, more accessible. Furthermore, the intervention has favored economic exchanges and the arrival of tourists, also making commuter travel faster.

Similar road improvement works are also underway on the SP 8 “DI Valledolmo”, with particular attention to the initial stretch of approximately 3.6 km, and on the SP 58 “Di Sclafani Bagni”. This stretch has been damaged by adverse climatic conditions in recent years and requires drainage, road consolidation, reclamation of the road edge, resurfacing of the road surface and the installation or replacement of safety barriers. This road section is of significant importance as it serves eleven farms linked to the Beef District of the Internal Areas of Sicily, together with other companies affiliated with the Dairy District. The intervention has allowed significant improvements in the accessibility and safety of the road section, in particular through the restoration of an existing road and the removal of obstacles to normal transit, both through the resurfacing of the road surface and the replacement of the guardrails. Ultimately, the interventions mentioned have reduced accessibility time (in and out) and reduced transit times. This also allowed quicker access to inhabited centers where there are fundamental primary services (doctor, post office, supermarkets, etc.) and secondary services (sports facilities, libraries, etc.). For companies in the area, the ultimate benefit can also be found in the improvement of access to the main road/railways axes of the TEN-T network. Finally, it is also important to keep in mind the positive impact that these interventions have generated on the local community, making travel quicker for commuters and allowing the two communities involved to keep contacts alive through improved connections, avoiding the risk of remaining isolated.

The SS 120, in the stretch between kilometer 10 and kilometer 82, suffered serious damage due to adverse climatic events. To improve road safety and accessibility, drainage works, consolidation of the road body, reclamation of the road edge, resurfacing of the road surface and the installation or replacement of safety barriers are planned. These interventions are crucial to guarantee safer driving conditions and an effective connection on this important road artery, especially because the stretch involving the Snaì, traveled in its entirety, crosses various municipal territories such as: Caltavuturo, Castellana Sicula, Polizzi Generosa, Petralia Sottana, Petralia Soprana, Geraci Siculo, Gangi, and continues towards eastern Sicily. Along the Madonita route of the SS 120 there is the SS 286 towards Castelbuono, the SS 290 coming from Alimena, the SS 643 coming from Polizzi Generosa. *The intervention allows, in particular, to remove the limitations present before the intervention regarding the reduction of the roadway and the limitation of speed. We proceeded with the restoration of the existing road through safety operations, the removal of obstacles to normal transit, the resurfacing of the road surface and the replacement of the guardrails, as well as the arrangement of the road surface and consolidation of the rough sections. The package of interventions on the affected road section made it possible to reduce the accessibility time to the area, also reducing the transit time, making it easier to reach the inhabited centers and the related services located there. The roads were made safer following the intervention and also allowed local companies to reach the main road/railway axes of the TEN-T network in less time, improving overall travel times also for public transport.*

The intervention planned on the SS PP 52 and 60 concerns the road axis which appears to be the only access road to the municipality of San Mauro Castelverde and, furthermore, connects it on one side with the SS 113 and consequently with the A20 motorway and on the other with Gangi and the other towns of the Madonie. The route as a whole measures approximately 50 km. The intervention in question connects the hamlets involved to the inhabited centres, intervening on the restoration of landslide sections, the reclamation of damaged sections through the reconstruction of the road box, the installation and/or replacement of safety barriers in order to improve the conditions of safety. Overall, the interventions mentioned have made it possible to reduce the accessibility time to the area (both in and out), also reducing the transit time of the road and making access to the inhabited centers where the essential primary services are located more accessible. The road section subject to the intervention is also much safer and has also allowed local companies in the area to more easily reach the main road/railways axes of the TEN-T network. The overall improvement of the road section subject to the intervention has also contributed to the improvement of the public transport service, making roads passable that were previously not accessible to local public transport, both in terms of safety and travel times.

PROGRESS OF PROJECTS

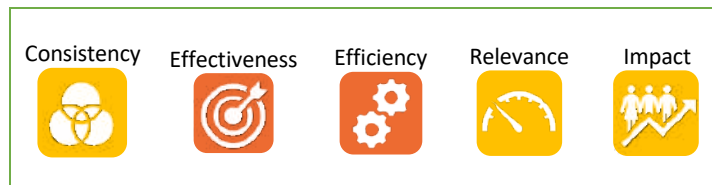
For all the projects mentioned above, as of 31 August there was no progress in expenditure due to delays in recording the progress reports on the regional information system (Caronte).

THE RESULTS

The interventions carried out, although limited in size, have made it possible to improve the level of accessibility to the area and, even more importantly, mobility within the area.

Furthermore, the possibility of restoring local public transport services on arteries that were devoid of them in an area where the supply of local public transport is almost absent and severely limited by the state of the local roads is important.

9) COMPETITIVENESS OF THE LOGISTICS SYSTEM: THE PORT OF SCIACCA



THE PROJECT

The origins of the port of Sciacca date back to the 12th century, in that period it was a small cove near the San Paolo cliff, equipped in a rudimentary way for the landing and loading of ships.

The port of Sciacca, mainly fishing and commercial, consists of the external four-armed eastern pier and the western pier. Inside there is another pier, called the internal eastern pier, which is partially docked. There are three piers for pleasure craft managed, one by the Il Corallo nautical club (150 places) and two by the Italian Naval League (300 places). Boats with a maximum length of 15/20 m can park there.

The current port, known as the old port, was built at the end of the nineteenth century on the remains of an ancient, now submerged, cliff.

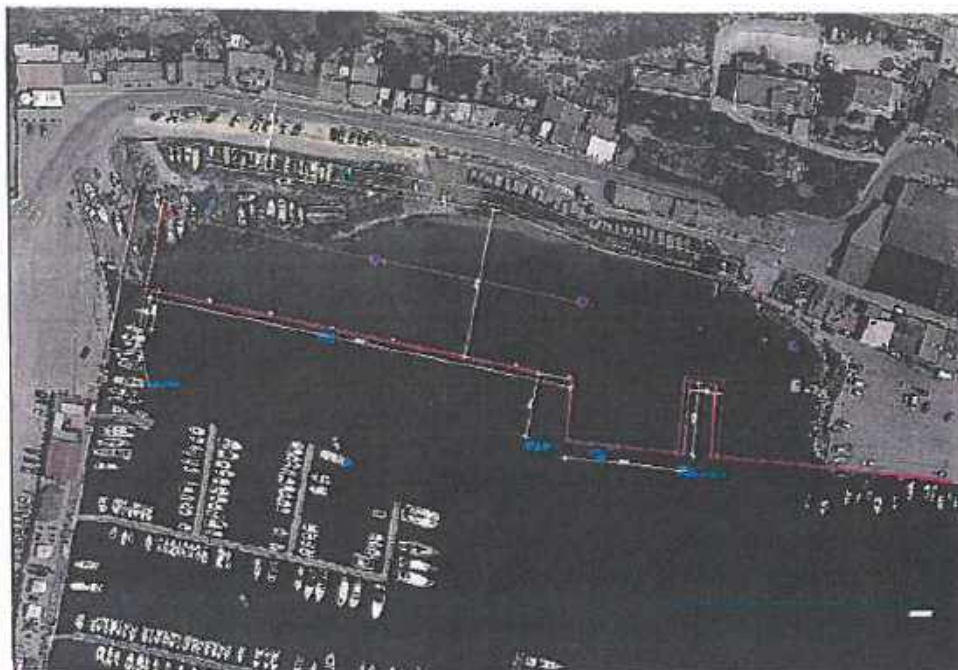
The fishing fleet of Sciacca, second in Sicily after that of Mazara del Vallo, is made up of over 155 boats that practice different types of fishing, mainly local coastal fishing. Most of the fishing boats located in Sciacca have a size between 10 and 50 GRT, with a length ranging from 15 to 20 metres, and the majority of the boats appear to be more than 25 years old.

The fishing activity feeds a thriving fish canning industry, in particular that of salting and preserving oily fish, thanks to which Sciacca is renowned in Italy and around the world.

There are four docks intended for fishing and the marketing of the fish product is carried out on the pier.

The port restructuring project is aimed at completing the North quay, carrying out the towing works and rearranging the apron on land, proceeding to complete the modernization works on the dock, already previously started with other spending programs within the scope of the policy unitary regional for transport and mobility. The project is financed by PO ERDF Sicily 2014-2020 funds for an amount of approximately 5.

FIG.29- AERIAL VIEW OF THE PORT OF SCIACCA AND PLAN OF THE WORKS FOR THE NEW DOCKS



PROJECT PROGRESS

The works to upgrade the infrastructure of the port of Sciacca began on 17 May 2020 with the construction of the boulders guarding the quay itself, which were expected to last a total of 540 days. Specifically, the excavation works of the seabed were foreseen to reach the foundation levels of the quay, the filling of the areas behind the quays themselves to be used as yards, the construction of the electrical system and the placement of mooring bollards, the protective railing and rubber fenders.

The works, starting from their first phases, suffered a significant slowdown due to the need for variations and the related environmental authorizations, until they came to a complete halt. They resumed at the end of September this year thanks also to a further amount allocated of 1.4 million euros.

Below is the financial progress of the project as of August 2023 (latest official data available).

TAB.65- PROGRESS OF THE PROJECT (MEURO, AUGUST 2023)

PROJECT	SOURCE / ACTION	COST	PAYMENTS
Sciacca – Construction works on the final section of the Riva Nord quay, the yards behind it and towing works	PO ERDF Sicily 2014-2020 Action 7.2.2	5,143	2,131

Source: Caronte information system

THE RESULTS

The completion of the project allows the consolidation of port and freight terminal infrastructures of regional interest, with the adaptation of the same to environmental, energy and operational standards of a higher level than the current ones.

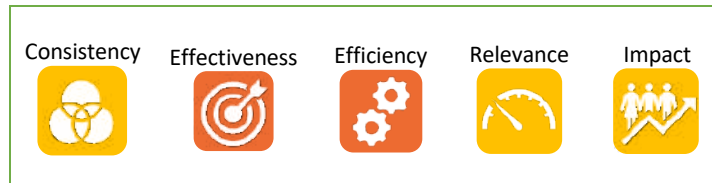
The port modernization work will take place thanks to:

- a new electrical system
- new mooring bollards
- a protective railing
- rubber fenders

Furthermore, the excavation works on the seabed make it possible to reach the level of boats on the quay and that of filling the areas behind the quays, intended for yards.

Thanks to these operations, the port will carry out its important and dual role as a base port for the activities of the second regional fishing fleet and as a commercial tourist port with greater effectiveness and efficiency.

10) COMPETITIVENESS OF THE LOGISTICS SYSTEM: THE PORT OF S. AGATA DI MILITELLO



THE PROJECT

The port of Sant'Agata di Militello, also called Porto dei Nebrodi, was created with mainly tourist purposes, given its advantageous position: it faces the Aeolian Islands, less than 30 miles away. Its position is also strategic with regard to the distance from two of the Region's airports: the Port is in fact located 165 km from Palermo airport and 205 km from Catania airport; it is therefore centrally positioned along the route that connects important tourist centers, namely Messina, Milazzo, Capo d'Orlando, Santo Stefano di Camastra, Cefalù and Palermo.

The objective of the renovation project of the port and its infrastructure is to improve its usability, thus increasing its development potential. In fact, before the intervention, the port consisted of a single rather short breakwater arm, while the breakwater was completely absent. Furthermore, the port basin was somewhat silted up. The situation in the port forced the operators to work in situations of considerable discomfort and precarious safety. Furthermore, the port hosted floating docks used only in the summer season to accommodate boats owned by local boaters.

The complete renovation of the port involves the construction of a breakwater of approximately 1,100 m rooted to the shore quay and divided into three sections:

- the first with a length of 435.50 m towards North 20;
- the second, with an angle of 28 compared to the previous alignment, of 270.00 m;
- the third, with a length of 370.00 m positioned at an angle of 30 with respect to the previous alignment.

In addition to the construction of the breakwater, the planning tool envisaged the construction of:

- a breakwater dam of approximately 610 m, also rooted to the shore quay, on the west side, with a planned extension of approximately 600 m;
- a 190 m pier inside the port, connected to the outer pier;
- the excavation of the seabed at an altitude of -8.00 m above sea level;
- the installation of docks based at a height of -8.00 m.

These works allow the protection of marine space with an extension of approximately 235,000 m².

FIG.30- THE CONFIGURATION OF THE PORT BEFORE THE RESTRUCTURING INTERVENTIONS



FIG.31- THE RENOVATION PROJECT OF THE PORT OF S. AGATA DI MILITELLO

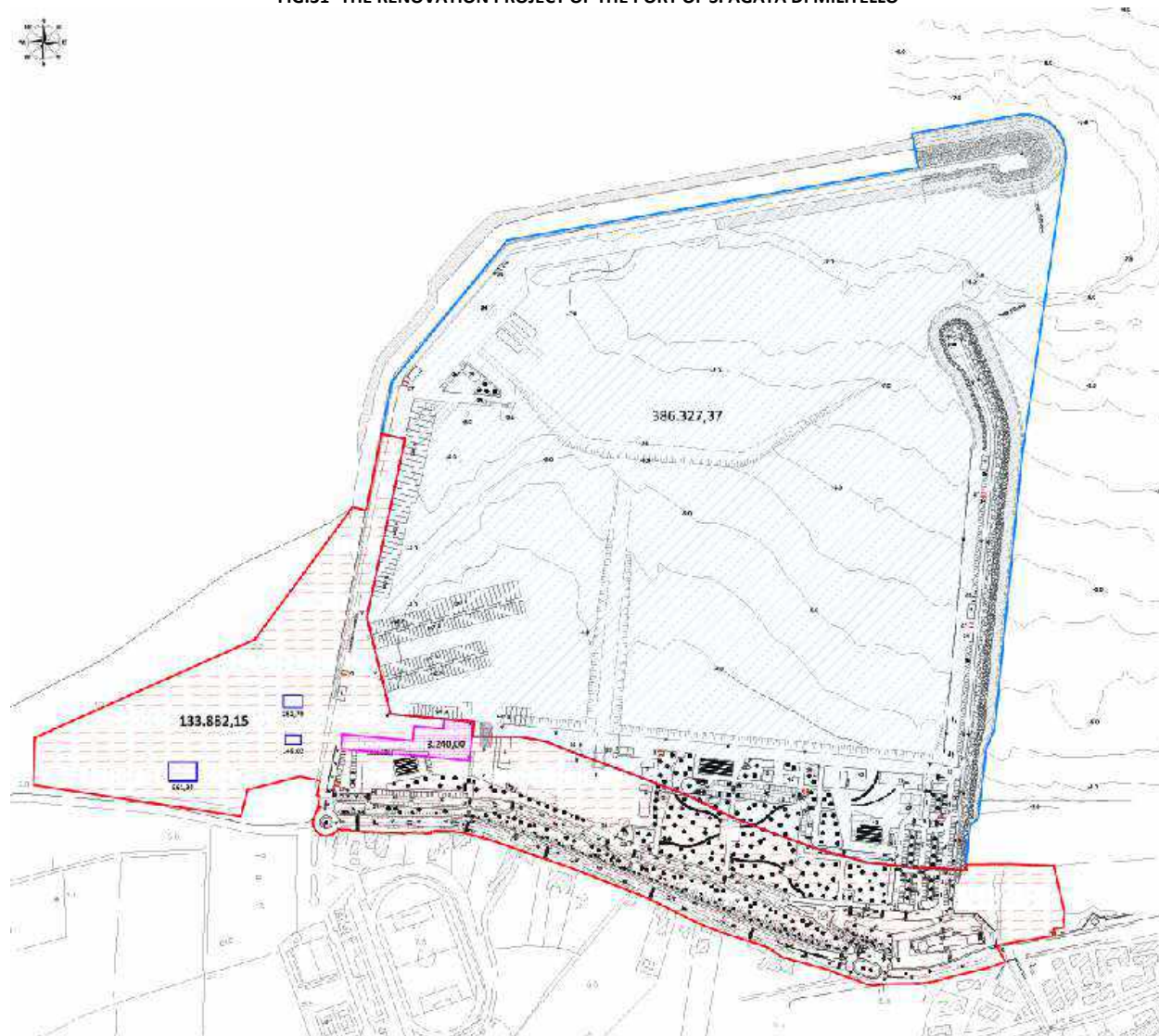
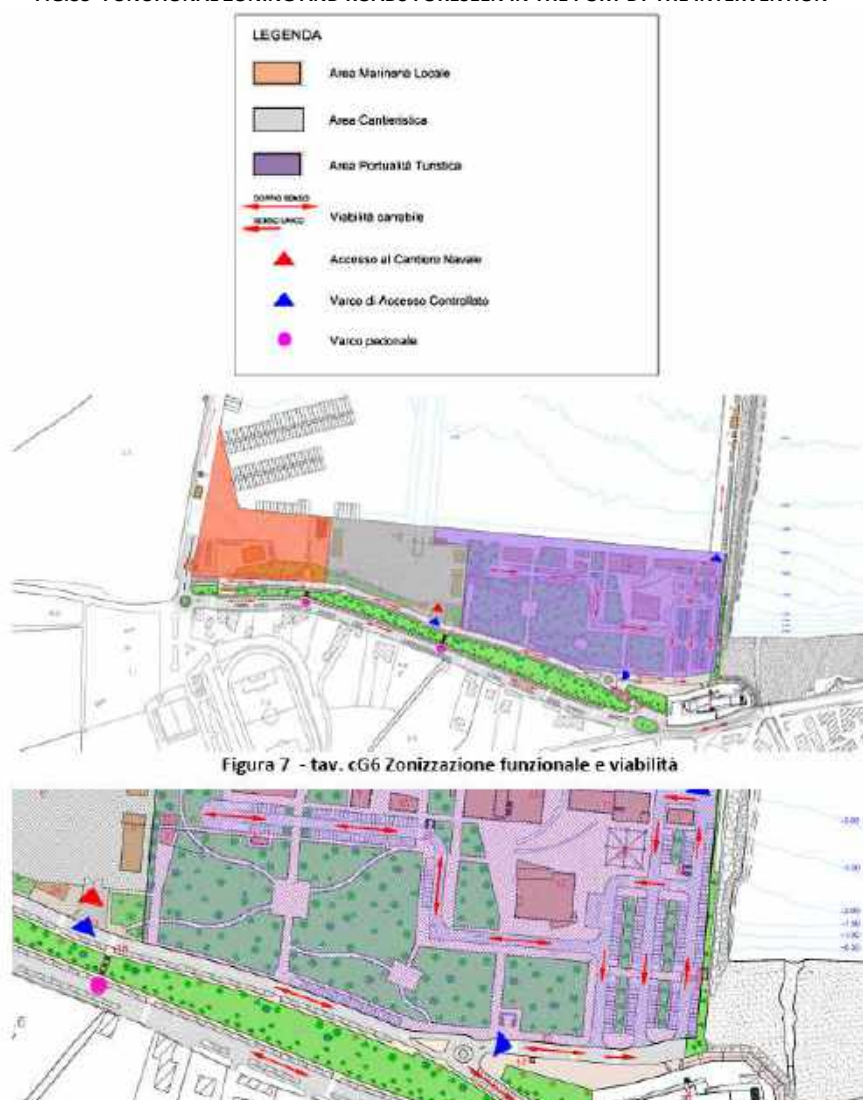


FIG.32- RENDERING OF THE PORT AND EXTERNAL STRUCTURES FORESEEN BY THE PROJECT



FIG.33- FUNCTIONAL ZONING AND ROADS FORESEEN IN THE PORT BY THE INTERVENTION



PROJECT PROGRESS

The progress of the work has suffered multiple delays. Over the years, bureaucratic problems and other difficulties have arisen, as demonstrated by the fact that the first projects for the construction of the port dated back to the Seventies.

As of 2019, there were still 50 meters left to complete the breakwater and 610 meters for the breakwater. The date set in the contract for the completion of the works was 31 December of the same year and the testing of the works had to be carried out no later than six months after completion; however, it was not possible to meet the defined deadlines.

The works resumed in March 2022. Both piers, the outer and outer piers, are completed, while some of the internal works planned by the project are missing, with works still in progress.

Compared to the initial project, variations have been made which mainly concern a "U" shaped structure which includes the breakwater (eastern arm as shown in the rendering), enlarged to guarantee its practicability, and an internal arm which will house a long building with more purposes. The larger tank, open to the outside, can also accommodate larger boats as well as commercial shipping.

TAB.66- COMPARISON BETWEEN THE COSTS FORESEEN IN THE EXECUTIVE PROJECT AND THE DEFINITIVE ONES

Riepilogo capitoli	Progetto esecutivo	Progetto definitivo	Variazioni	Importi opere progettate e realizzabili in fase II
Escavo	€ 603.185,52	€ 447.275,00	€ 145.910,00 (+ 31,91%)	€ 232.570,84
Prolungamento diga sopraflutto e riqualifica massiccio esistente	€ 3.222.659,23	€ 2.944.846,30	€ 277.812,93 (+ 9,43%)	€ 0,00
Diga sottoflutto	€ 4.009.030,84	€ 4.131.970,50	- € 122.939,66 (- 2,98%)	€ 0,00
Banchina diga sopraflutto	€ 4.132.317,17	€ 4.484.415,60	- € 352.098,43 (- 7,85%)	€ 0,00
Pontile fisso	€ 369.891,40	€ 240.342,30	€ 129.549,10 (+ 53,90%)	€ 0,00
Banchina diga sottoflutto	€ 1.837.355,77	€ 1.589.828,95	€ 247.526,82 (+ 15,57%)	€ 0,00
Banchina di riva e zona di accesso al porto	€ 6.996.195,66	€ 6.921.053,76	€ 75.141,90 (+ 1,09%)	€ 521.692,64
Impianti e attrezzature	€ 3.640.734,68	€ 3.611.713,93	€ 29.020,75 (+ 0,80%)	€ 963.535,60
Edilizia portuale	€ 3.760.985,13	€ 3.029.479,35	€ 731.505,78 (+ 24,14%)	€ 807.602,18
Totale al netto di oneri per la sicurezza e spese progettazione	€ 28.572.355,40	€ 27.410.925,70	€ 1.031.880,61 (+ 3,76%)	€ 2.525.401,26
Oneri sicurezza	€ 2.208.232,92	€ 1.580.600,00	€ 627.632,92 (+ 39,71%)	//
Progettazione esecutiva	€ 363.040,72	€ 320.000,00	€ 43.040,72 (+ 13,45%)	//
Totale complessivo	€ 31.143.629,04	€ 29.311.525,70	€ 1.832.103,34 (+ 6,25%)	//

Below is the financial progress of the project as of August 2023 (latest official data available).

TAB.67- PROGRESS OF THE PROJECT (MEURO, AUGUST 2023)

PROJECT	SOURCE / ACTION	COST	PAYMENTS
Porto di S. Agata di Militello – Completion of the existing maritime works regarding the extension of the breakwater from station 798.20m to station 1,150.00, construction of the breakwater pier from station 0.00 to station 610.00m and the shore quay	PO ERDF Sicily 2014-2020 Action 7.2.2	35,102	25,051

Source: Caronte information system

THE RESULTS

The completion of the infrastructure allows the creation of a complete port system, the result of which will be the enhancement of both the local economy and the territory more generally, without, at the same time, discouraging the tourist attraction of the area.

The port structure includes:

- passenger transport activities;
- fishing boat area;
- commercial area;
- area for boaters.

The port provides a total of 900 berths, with 50 berths dedicated specifically to fishing vessels.

Services to support nautical activities, a pleasure workshop, buildings for commercial activities in the sector, a refreshment point and a hydrofoil ticket office are planned on the shore quay.

From a tourist development perspective, some aesthetic connection works between the seafront and the port are being planned, to encourage the integration of port activities and the port infrastructure itself with the city of Sant'Agata.

Great importance for the full operation and ease of use of the port is reserved for the connections, both the road axis with the motorway junction, but also the stop along the railway line planned to correspond with the port.

Furthermore, the structure of the port of Sant'Agata was identified as part of the European Union Mission dedicated to the restoration of seas and oceans for the preparation of solutions that favor the protection and restoration of ecosystems and marine biodiversity. In addition to the implementation of measures aimed at saving and increasing energy efficiency, small wind farms and waste recovery systems can be envisaged.