MXP T2LINK-UP
MALPENSA TERMINAL 1 – TERMINAL 2
RAILWAY CONNECTION
FINAL DRAFT

Environmental Impact Study

Non-technical Summary

Prepared by:
Nord_Ing srl – SEA SpA

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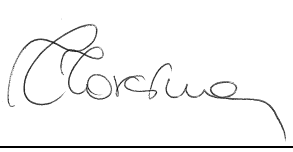
Project Director



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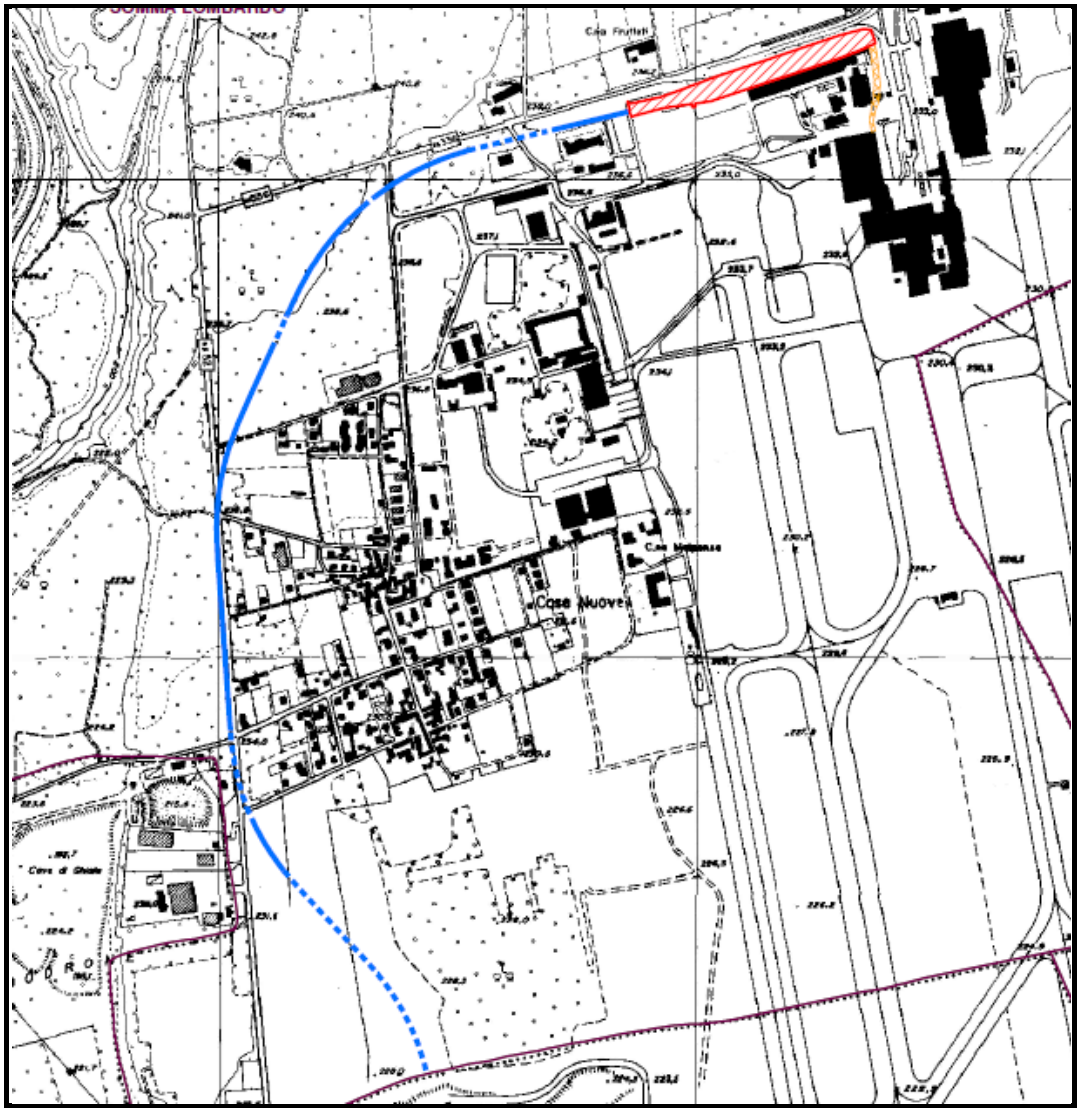
1 INTRODUCTION

This document is the Non-technical Summary of the Environmental Impact Study for the extension of the Milano-Malpensa railway connection between Terminals 1 and 2 of the airport.

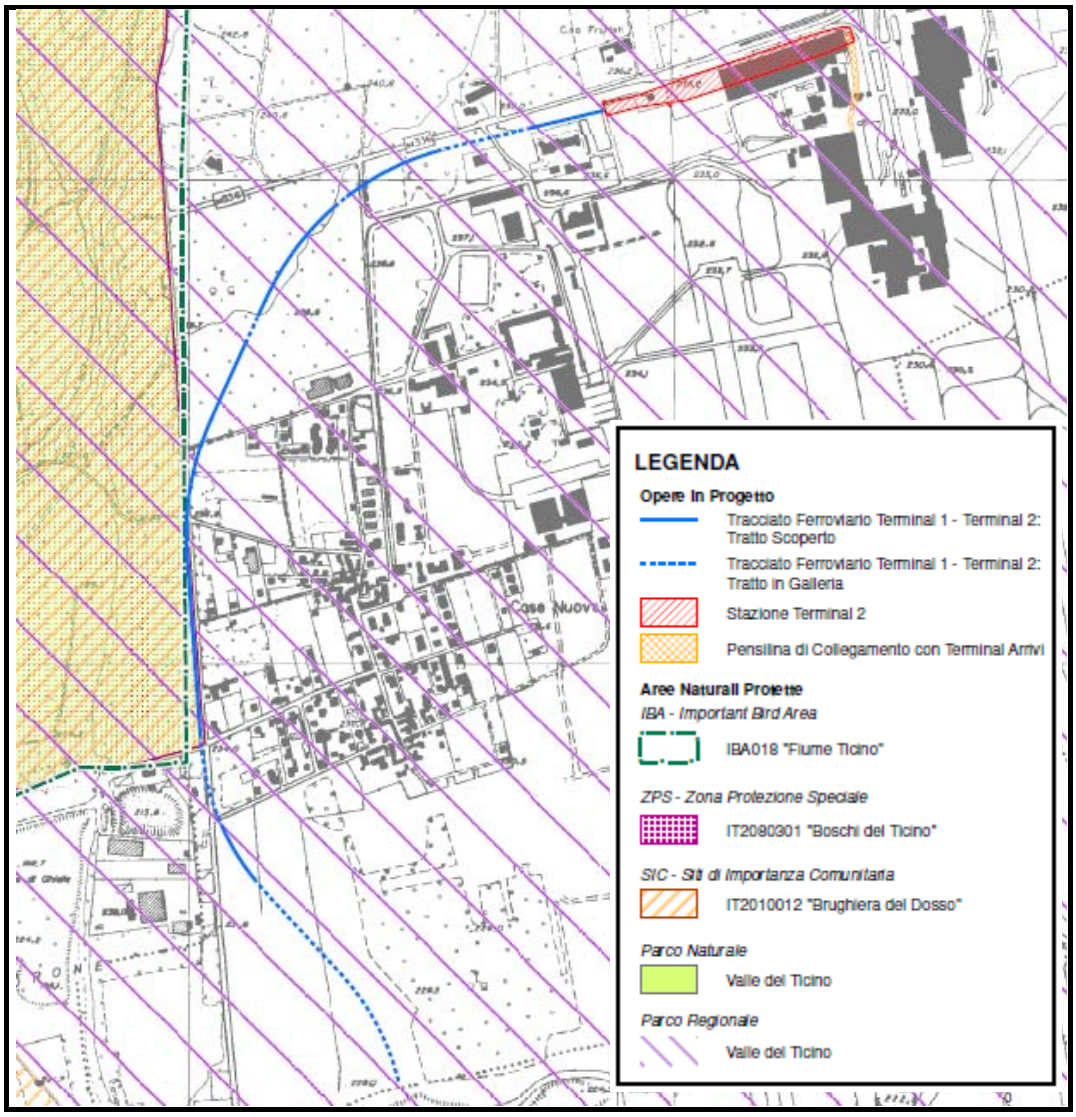
In order to create this connection, the creation of a new stretch of railway is anticipated, approximately 3.15 km in length and with a new station in Terminal 2 joined by a new platform roof to the existing terminal (*Figure 1a*).

Figure 1a ***Location of the Construction***



Part of the course, for around 550 m, occurs within areas comprising the Lombardo Nature Park in the Ticino valley (*Figure 1b*).

Figure 1b ***Nature Park in the Ticino Valley***



The Terminal 1 station is underground, at a depth of approximately 8.7 m from the ground level, terminates with straight turnout track. The railway course being planned will develop from this turnout, after approximately 250 m from the T1 station exit, at distance marker 48+922.

The railway bed will always be maintained under the ground level, partially in the open and partially in a tunnel, for the entire way, up to the new station, which will be created at a depth of 9.80 m.

The operation will terminate at distance marker 52+073 at the end of the new station.

With regard to elevation, the course will first climb and then descend until arriving at the new station, with an overall change in elevation of 10.90 m.

The potential connector track between this project and the future connection to the North with the RFI network, stipulated by Law No. 443/01 (Accessibility from the North to Malpensa), starts from this point.

The entire project will take place in the city of Somma Lombardo.

1.1 REASONS FOR THE OPERATION

Right now, only Terminal 1 at the Malpensa airport can be reached by railway connection.

Terminal 2, which currently serves approximately 6 million passengers/year, almost a third of total airport passenger traffic, can only be reached by road.

The two terminals are currently connected by free shuttle bus services, but the need for an additional transfer, combined with the additional time and uncertainty about the length of the trip, make railway service for passengers using Terminal 2 unattractive.

Consequently, direct bus services generally end up more competitive for Terminal 2 users. These operate between the airport and Milan's Central Station, despite the length of the trip (around 46 km) and above all the uncertainty of its duration, since the A8 highway is extremely congested, with frequent traffic jams at rush hour.

The new railway connection between Terminal 1 and Terminal 2 offers the following advantages to Terminal 2 users:

- It makes it possible to reduce travel times between Milan and the airport, not only for railway service, but also compared to road services;
- It makes it possible to reduce uncertainty on how long trips will last, an aspect of considerable importance if related to the risk of missing schedules, above all for the potential of missing a flight.

The *"T1-T2 Connection"* also incorporates the first and indispensable stage for the *"Accessibility from the North to Malpensa"* (the *Global Project*), the preliminary plan of was presented in 2003 by RFI and was included in the first strategic infrastructure program from Law No. 443 dated 21 December 2001, referred to as the "Target Law", in particular within the scope of the *"Po Valley multimode corridor - railway accessibility to Malpensa"* Program.

In fact, the *Global Project* includes the creation of connections from Malpensa Airport with the national railway network, towards Gallarate and Domodossola, and in the international lines from the Sempione and Gothard borders.

1.2 BACKGROUND

This plan incorporates the development, limited to the line between the two Malpensa Airport terminals, from the project presented in 2003 by RFI (the Italian

Railway Network), within the scope of the "Accessibility to Malpensa from the North" preliminary project.

1.2.1 *The RFI Plan*

The RFI plan provides for building a connection line towards the north of approximately 14.9 km, between Terminal 1 of the Malpensa airport and the RFI Gallarate-Varese line, with interconnections to the Gallarate-Sesto Calende line, in order to make direct railway services possible to the airport, even from the Gothard and Sempione border crossings, as well as to ensure an additional option for a rail connection with the Milan hub, via Gallarate (Figure 1.2.1a)

Figure 1.2.1a RFI Plan Course in the Malpensa Area

This line was conceived as infrastructure independent and separate from the FN facilities, with one course that was developed to the west from the current staging station (peeling off to the southern medium-long distance trunk and to international intercity connections "passing by" the Malpensa Airport (such as the Milan-Zürich via Varese and vice-versa).

This planning assumption contained the creation of a stop next to airport's Terminal 2 and, in this way, met the infrastructure objective of ensuring a railway connection between the two terminals that Malpensa airport is divided into.

The RFI/Italferr plan was presented to the Region of Lombardy on 22-Dec-2003, and submitted to the approval procedure stipulated for operations included in the First Program from Law 433/2001 (Target Law).

1.2.2 *Observations and Requirements from the Region of Lombardy*

The preliminary procedures triggered by the Region concluded on 11-Feb-2005 with the expression of a specific opinion contained in Resolution No. VII/20.644/2005 by the Regional Council.

This resolution expresses favorable opinions only to the plan details concerning the so-called "First Phase", related to the connection between the airport's two terminals, and conditions the development to the implementation of a series of requirements.

The Region of Lombardy requirements concern:

- While the RFI project provided for a new T1 station placed next to the existing one, the Region asked that the tracks for the new RFI line coming from T2 lead to the existing FN line; consequently the entire planning proposal, including the new RFI station, to be removed and replaced with the insertion of two tracks integrated into the existing FNME station;
- Adaptation of the T2 station with lengthening of the platforms to a useful length of 360 meters;
- Terminal 2 station to be developed with 4 tracks, instead of the 2 tracks stipulated by RFI, in order to enable the staging and the "rebound" of freight coming from the south, and therefore be able to ensure the staging of passenger services even for this terminal.
- The course in the intermediate stretch between the two terminals is to be changed to avoid various urban planning and environmental interferences encountered (in particular interference with the Case Nuove community).

1.2.3 *Planning Developments*

The "*Program contract for investments into the regional railway network awarded to FERROVIENORD SpA*", (signed on 7-Mar-2005 and renewed on 9-Dec-2009, based on Lombardy Region Council Decree VIII/10625 dated 3-Dec-2009) stipulates, among others, the creation of the railway connection between Terminal 1 and Terminal 2 at Malpensa.

In 2008, FERROVIENORD conducted at feasibility study on this connection that acknowledges the instructions and requirements from the Lombardy Region on the RFI plan.

Subsequently, following the publication by the European Commission of the "*TEN-T Annual Call 2010*" announcement, on 30-Aug-2010 FERROVIENORD and SEA presented a joint proposal to the European Commission to finance drafting of the Final Plan for the railway connection between Terminal 1 and Terminal 2 of the Malpensa International Airport, which integrates Phase 1 of the "T1-T2-Gallarate Global Project".

The European commission gave a positive evaluation of the request, considering it deserving of financial support.

The plan that is the object of this study constitutes the conclusion of this planning activity.

It should be noted that the plan in question is included in the list of infrastructure projects connected with the “EXP 2015” international event.

1.3 AUTHORIZATION PROCEDURES

1.3.1 EIA Procedure

The construction plan will go through the EIA Procedure and an Impact Assessment with the Region of Lombardy.

In effect, the plan falls within the scope of Annex IV to the second part of Legislative Decree No. 152/2006 as amended, Point 7 (Infrastructure Plans) Letter i) *regional and local roads and railway lines*.

Annex IV identifies plans subject to verification for whether they are subject to a regional EIA, although Article 6, Paragraph 6 Letter b) of Legislative Decree No. 152/2006 as amended specifies that plans under Annex IV that fall within protected nature areas, even partially, as defined by Law No. 394 of 6 December 1991, are subject to EIA procedures.

The plan affects an approximately 500 m stretch of areas belonging to the Ticino nature park, as highlighted in *Figure 4a* below, taken from the Region of Lombard Geographical Information System, and therefore will be subject to an Environmental Impact Assessment, which will occur in the final construction plan.

Figure 4a Ticino Park Protected Nature Areas

The competent authority for carrying out the procedure is the Region of Lombardy, as indicated in Annex B of Regional Law No. 5/2010 as amended, which identifies the project type in Point 7, Letter i) “Regional and local railway lines, light rail and metropolitan lines; freight connections with lengths greater than 200 m.”

The EIA procedure takes place according to the following stages:

- Consultation between the advocate and the competent authority for the definition of the environmental impact study contents (an obligatory stage for mobility infrastructure plans - Article 5, Paragraph 2 of Regional Law No. 5/2010 and its amendments);
- Start of the EIA procedure and, potentially, the approval procedure (under Article 4, Paragraph 2 of Regional Law No. 5/2010and its amendments, the two acts do not have to be concomitant for mobility infrastructure plans);
- Presentation and publication of the plan and the environmental impact study;
- Call for services conferences. Participated in by: Public agencies involved in the issuance of the subsequent authorizations and approvals (Region - Transportation, Province and Towns involved, Parks Agency, Nature Conservation Region, Regional MIBAC Office);
- Carrying out of consultations;
- Preliminary investigations, including
  - Examination of the administrative technical documentation;
  - Examination of observations from the public;
  - Acquisition of competent opinions from local agencies and from other public entities involved;
  - Preliminary final determination for the preparation and adoption of the EIA measure;
- Assessment of the environmental impact study and the consultation results;
- Decision by the competent authority;
- Report on the decision;
- Phased monitoring of execution/implementation.

1.3.2 Approval of the Preliminary Plan

With Executive Decree No. 2778 of 30-Mar-2012, the Infrastructure and Mobility Directorate General approved the preliminary plan for the Malpensa airport T1-T2 railway connection, with requirements for the subsequent planning stages.

The final plan and the Environmental Impact Study complied with these requirements and were written in compliance with these.

1.3.3 *Consultation for the Definition of the Contents of the EIS*

On 17 February 2012, the advocates presented a petition to the Directorate General for the Environment, Energy and Sustainable Development Networks and Environmental Assessments for the Region of Lombardy for the activation of the consultation stage for the definition of the contents for the environmental impact study, an obligatory stage for mobility infrastructure plans under Article 5, Paragraph 2 of Regional Law No. 5/2010 and its amendments.

On 23-May-2012, the responsible director communicated the conclusions from the consultation stage, confirming that the final plan and the environmental impact study were informed by the instructions from Executive Decree No. 2778 of 30-Mar-2012, as per the preceding paragraph.

1.4 *CONTENTS OF THE ENVIRONMENTAL IMPACT STUDY*

1.4.1 *Scope and Drafting Criteria of the Environmental Impact Study*

The purpose of the Environmental Impact Study is to analyze environmental impacts resulting from the creation of a new connecting railway between Terminal 1 and Terminal 2 of the Malpensa airport.

In particular, it describes the technical and environmental reasons that have determined the planning choices and the various effects on the environment that the plan will have both during construction and operation.

The Environmental Impact Study extended to connected and complementary works stipulated by the plan, in particular for the creation of the new passenger station at Terminal 2.

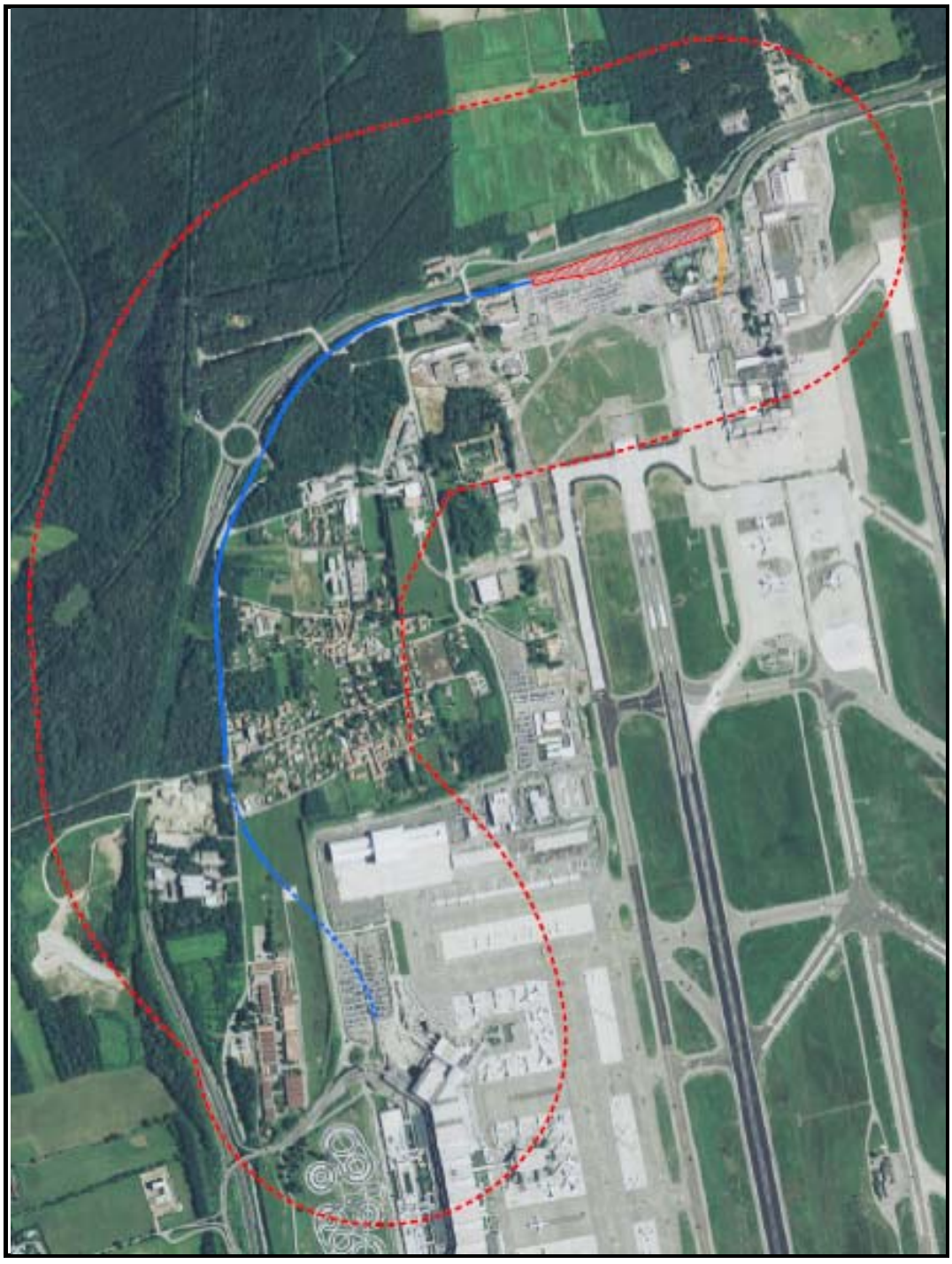
1.4.2 *Structure of the Environmental Impact Study*

The Environmental Impact Study was conducted in compliance with the guidelines for Environmental Impact Studies contained in the Prime Ministerial Decree dated 27 December 1988, as commented upon by the UNI 10742 and UNI 10745 standards (Environmental Impact: purpose and requirements of an environmental impact study and Environmental Impact Study: terminology). Their contents are also in compliance with the instructions contained in Annex A "*Directions and recommendations for the development of successive planning and implementation stages*" from Executive Decree No. 2778 of 30-Mar-2012 from the Infrastructure and Mobility Directorate General, and with the conclusions of the Directorate General for the Environment, Energy and Sustainable Development Networks and Environmental Assessments for the Region of Lombardy related to the consultation stage for the definition of the contents of the environmental impact study.

In addition, its contents are in compliance with *Annex VII "Environmental Impact Study contents"* to the *Second Part of Legislative Decree No. 152/2006and its amendments.*

Unless specified otherwise, the Environmental Impact Study extends the analysis of the current status of the various environmental components to a *Broad Study Area*, with a width of 1 km on either side of the railway course and from the station area (*Figure 1.4.2a*).

Figure 1.4.2a Study Area for the Environmental Impact Study



The effects of the plan on the various components are studies inside differently sized areas depending on the maximum distance of possible impact. Any changes to this study area are indicated in the handling of the individual components in the Environmental Reference Framework.

In addition to this General Introduction, the *Environmental Impact Study* and this *Non-technical Summary*, it includes:

- a *Policy Reference Framework*, in which the relationships of the plan with current plans and laws are analyzed and plan implementation times are reported;

- a *Planning Reference Framework*, which reports the information related to the current state of the site and describes the plan, the alternative technologies considered, the use of resources, emissions and wastes, any malfunctions and potential interferences with the plan on the environment in the construction stage and during operation;

- an *Environmental Reference Framework*, separated into an introduction that identifies the reference area and then into the various environmental components involved in the implementation of the plan. Information on the current quantitative and qualitative status is reported for each component, and then the significant environmental impacts are described, estimated and assessed, applying the appropriate methodologies for determination, and using predictive mathematical models, both in the construction and operating stages;

- *Monitoring Guidelines*: Instructions are reported in relation to the creation of the environmental monitoring plan according to the criteria agreed to with ARPA.

The Environmental Impact Study is accompanied by the Non-technical Summary, written in simple language with the purpose of informing the interested public.

The incidence study is presented as an attachment to the environmental impact study, given that the plan involves a Nature Network 2000 area.

2 POLICY REFERENCE FRAMEWORK

Table 2a summarizes the relationship between the plan and the policy and planning tools analyzed.

Table 2a Plan Compatibility with the Local Government Tools Examined

Plan/Policy	Requirements/Instructions	Analysis of the Relationships with the Plan
Regional Local Plan (RLP) and Regional Local Landscape Plan (RLLP)	The Regional Council for Lombardy approved the Regional Local Plan with Resolution No. 951 of 19-Jan-2010. The RLP was updated as stipulated by Art. 22 of Regional Law 12/05, based on the input resulting from the regional planning for 2011. The Regional Local Plan also has the nature and effect of a Local Landscape Plan.	The compatibility of the planned operation is checked against the Regional Local Plan, being included among the priority objectives of regional or supra-regional interests and included in the list of "necessary works" for accessibility to the 2015 Universal Exposition. The planned railway connection and the new station fall within the "Ticino Valley Regional Park"; in addition, the T1-T2 railway connection affects, for about 500 m, the "Ticino Valley Nature Park", a section which also corresponds to Site of Community Interest IT2010012 "Brughiera del Dosso" and to Special Protection Zone IT2080301 "Boschi del Ticino". For the preliminary planning of the operation, a special Incidence Study has been drafted with positive consent by the Lombardy Park Agency for the Valley of Ticino, with Opinion Prot. No. 2012/506 CP/VP. A special Landscape Report was also prepared (reported in an annex to the Final Plan).
Local Coordination Plan for the Ticino Valley Lombardy Regional Park	The Ticino Valley Lombardy Regional Park was created with Regional Law No. 2 of 09-Jan-1974 "Urban Planning Standards for the Protection of Areas Included in the General Regional Plan for Reserves and Nature Parks. Establishment of the Ticino Valley Lombardy Park."	The initial and final stretches for the railway connection and the new station are being developed within the "Malpensa airport perimeter"; the line also falls within a "Guided Municipal Initiative" IC Zone, governed by the general zoning plan and into a G1 "dry plans primarily for forestry use" Zone, also already affected by the development of S.S. No. 336, in adherence to which the new T1-T2 connection will be implemented, in the artery road buffer zone, and therefore in an area already compromised and in fact unusable for other purposes, minimizing the consumption of territory. Despite this, a Landscape Report was prepared (reported in an annex to the Final Plan).

Plan/Policy	Requirements/Instructions	Analysis of the Relationships with the Plan
Local Coordination Plan for the Ticino Valley Lombardy Nature Park	The Ticino Valley Lombardy Nature Park was established with Regional Law No. 31 of 12-Dec-2002.	The T1-T2 connection is being developed within the Ticino Valley Nature Park for a short stretch of approximately 520 m, affecting a C1 "Agricultural and Forestry" Zone "primarily affecting wildlife"; in this stretch, the T1-T2 connection will be implemented in adherence with S.P. No. 52, making use of the same infrastructure corridor. The potential technical possibility of "shifting" the course was examined within the scope of planning, in order to avoid interference with the Nature Park. However, the analysis indicated that any displacement towards the east did not appear practicable due to the presence of the Case Nuove community which, in this way, would end up more adversely affected by the course, in contrast to the requirements of Regional Decree No. VII-20644 of 11-Feb-2005 by the Region of Lombardy for approval of Phase 1 of the RFI project (concerning the railway connection of the "Terminal 1 (T1) - Terminal 2 (T2) - Gallarate" route).
Local Coordination Plan for the Province of Varese	The Provincial Local Coordination Plan for the Province of Varese was approved with Provincial Council Decree No. 27 of 11-Apr-2007.	The PTCP therefore incorporates strategic directions and guidelines for regional planning tools and inserts planned works among those prioritized for the development of the existing infrastructure system into the broader plan for improvement and expansion of accessibility to Malpensa Airport. Analysis of the plates indicates that the planned works fall within the territory of the Ticino Valley Lombardy Regional Park, subject to protection under Art. 142, Paragraph 1, Letter f) of Legislative Decree No. 42/2004 and its amendments. In addition, a stretch of approximately 500 m of the T1-T2 railway connection also affects the Ticino Valley Lombardy Nature Park, a section which also corresponds to Site of Community Interest IT2010012 "Brughiera del Dosso" and to Special Protection Zone IT2080301 "Boschi del Ticino". Therefore, a special Landscape Report was prepared (reported in an annex to the Final Plan).

Plan/Policy	Requirements/Instructions	Analysis of the Relationships with the Plan
General Development Plan for the Municipality of Somma Lombardo	The municipality of Somma Lombardo has a General Development Plan, approved by C.C. Resolution No. 92 of 28-Nov-2003 and Regional Council Resolution No. VII/18765 of 17-Sep-2004.	The plan is not included in the zoning from Somma Lombardo's municipal general zoning plan, however, it is acknowledged as a strategic construction project and a priority by the Region of Lombardy, particularly in the perspective of the "Expo 2015" international event. It is also noted that the new T1-T2 railway connection will be developed, where possible, next to existing road infrastructure, such as S.P. No. 52 and S.S. No. 336, consequently limiting interferences with the urban planning functions of the areas involved. Finally, it is noted that the plan has been developed according to the guidelines required by the Region of Lombardy with Regional Council Resolution No. VII/20.644/2005, which requires limiting interferences between the new infrastructure and the existing settlements: the current structure of the plan actually avoids directly affecting the Case Nuove subdivision.
Air Quality Standards	The Regional Air Quality Plan and Regional Law dated 24-Dec-2006 "Standards for the Prevention and the Reduction of Emissions into the Atmosphere and Protection of Health and the Environment" have been analyzed.	The plan is well aligned with the strategic objectives established by the current standards in question for air quality in the Region of Lombardy, insofar as it enables reducing polluting emissions and the greenhouse effect that would otherwise be generated by vehicles used for performing the same service.
Hydrological Structure Plan	The project in question belongs to the territory governed by the River Po Basin Authority, in particular within the hydrographic sub-basin of the Ticino River.	The works do not fall within the areas as heightened hydrological risk, into the areas of hydrological instability, or within the active river flooding zones, either for the Ticino River or the Arno River.
Water Protection Plan	The Region of Lombardy has indicated the "Hydrographic Basin Management Plan" as the planning tool for the protection and use of water, establishing that, in its first draft, this Plan constitutes the "Water Protection Plan" stipulated by Art. 44 of Legislative Decree No. 152 of 11-May-1999 and its amendments.	Given the type of planned works, no interference has been identified with the water resources protection system defined by the WPP for the zone in question.
Areas belonging to the Nature 2000 Network (SIC and ZPS) and to Protected Nature Areas	-	The planned railway connection and the new station fall within the "Ticino Valley Regional Park"; in addition, the T1-T2 railway connection affects, for about 500 m, the "Ticino Valley Nature Park", a section which also corresponds to Site of Community Interest IT2010012 "Brughiera del Dosso", to Special Protection Zone IT2080301 "Boschi del Ticino", and to IBA018 "Ticino River".

3 PLANNING REFERENCE FRAMEWORK

The Planning Reference Framework for the Environmental Impact Study has analyzed:

- *Primary Purposes and Objectives of the Plan*, summarized in the *Introduction*;
- *Analysis of Constraints to the Definition of the Plan and Analysis of Alternatives Considered*;
- *Description of the Proposed Plan*;
- *Operating model*, which presents the railway operating model expected after implementation of the plan;
- *Construction Site Phase*, which describes the necessary activities and times anticipated for the implementation of the plan;
- *Use of resources*, which refers to an analysis of the use of resources and of interferences with the environment in the construction and operation stages;
- *Identification of Potential Environmental Interferences*, which refers to an analysis of the potential interferences of the Plan, for environmental components, in the construction and operation stages;
- *Mitigation and Compensation Measures.*

3.1 CONSTRAINTS TO THE DEFINITION OF THE PLAN

Constraints to the definition of the plan are made up first of all by the requirements that the Region of Lombardy has formulated in the approval of the RFI project, then from those resulting from the local and environmental characteristics of the site.

With regard to the first aspect, the Region has in fact asked for a complete re-examination of the T1-T2 connection course, in particular for:

- Using the existing tracks from the Terminal 1 station;
- Ensuring an adequate transit capacity for the number of trains forecast for the medium to long term;
- Ensuring compatibility between railway services of a different rank (metropolitan and/or regional basin, long distance, high-speed, international);
- Ensuring continuity of the railway line northwards towards Gallarate/Varese;
- Minimizing interferences with built-up areas (Case Nuove subdivision), the surrounding road network and the areas inside the airport grounds;
- Adoption of construction methods that are as fast as possible and suitable for maximum containment of construction costs.

With regard to local and environmental constraints, minimization of interferences on the Case Nuove subdivision has ended up affecting the Ticino Valley Nature Park, even if in a marginal position at the side of SP52. However, the choice of

keeping the course to the side of existing road infrastructure (SP52 and SS336) has made it possible to limit impacts on the most valuable natural habitats.

Concerning hydrological aspects, the presence of numerous potable wells (municipal and under *SEA* jurisdiction) has been indicated along the corridor in which the course is being developed, of which two are close to the planned course.

Finally, with regard to the station at Terminal 2, height and shape of the new manufactured objects has taken into account the aeronautical constraints determined by the proximity of the runways.

3.2 ANALYSIS OF ALTERNATIVES

The environmental impact study analyzed the planning alternatives identified within the scope of the preliminary planning of the operation, including the so-called *Zero Alternative*, to *do nothing*.

In particular, the *Zero alternative*, the so-called “do nothing” alternative, stipulates not implementing the plan and will prevent offering a concrete alternative to reaching Terminal 2 exclusively on tires, in the short term, and to inserting the airport into the broader system of railway connections to the north. Consequently, not implementing the plan would lead to:

- Maintenance and progressive growth of ground transfers for passengers in the direction of Terminal 2. It should be kept in mind that in the last few years, Terminal 2 has shown rates of growth in the number of passengers on the order of 10% greater than those recorded for Terminal 1;
- Growth and randomness of times to reach Terminal 2: the travel times for reaching the airport are very variable due to congestion on arterial roads, which present situations of saturation at rush hours and are subject to unexpected service interruptions.

Details concerning planning alternatives are summarized in the following table.

Table 3.2a Distinguishing Elements and Comparison between the Courses Studied

Primary Aspects of the Plan	RFI-ITALFERR 2003 Plan	FNM 2008 Feasibility Study with implementation of the 2005 Lombardy Regional Council Decree	Alternative T1-T2 Connection Plan (2010-11)	
			Alternative "A"	Alternative "B"
Connection into existing T1 station	Indirect; the new RFI station is separate from current FNM line and station	T1 station integrated: the new connection engages with the existing FNM rail truss in T1	T1 station integrated: the new connection engages with the existing FNM rail truss in T1	As per Option A
No. of T1 station tracks	4 FN + 2 RFI	4	4	4
"Case Nuove" subdivision passage	Strong interference. Transit in intermediate position between NEOS S.p.A. and a group of buildings at the corner of SP52 and via F. Baracca. Demolitions needed.	Beginning at 550 m from the T1 axis with transit to a position outside the group of buildings at the corner of SP52 and via F. Baracca; curve of T1 integrated connection and SP52 alignment with layout radii unsuited to the standard plan speeds.	Reversing towards the south from the beginning of the new line (at 325 m T1 axis) and transit to west of the SP52 and via F. Baracca group of buildings with curvature of radii around 500 m	As per Option A
Alignment with SP52	Curvilinear path still external to and only tangent to east side of SP52, without interference points or reversing	On an axis to and/or in alignment with SP52 for around 450 m and interference with the external and local viability.	On an axis underneath the SP52 roadway belt for about 800 meters or alongside.	As per Option A
Position with respect to the airport's north boundary	Inside the abutments in an angled position at a variable distance (from 150 to 20 m) from SS336.	Inside the abutments with angled alignment, at a variable distance (from 150 to 20 m) from SS336.	Inside the abutments in a position parallel to SS336 at a distance of 150 m.	Inside the abutments, in a position parallel to SS336 at a distance of 40÷50 m.
T2 station position	Diagonal path with significant overlapping of P5 parking lot area	Alternative study parallel to the road network mesh in a position adjacent to T2 access; reduced impact on P5 usability.	Diagonal, with significant overlapping over P5 parking lot area	Aligned with the external and internal road network; partial overlapping with P5 parking lot area
No. of tracks and T2 access	2 tracks; 150 m connection, eccentric at head	4 tracks; 150 m connection, eccentric at head	4 tracks; connection with T2 direct and central	4 tracks; connection of 180 m from north head to the air terminal
Extension towards the north by/through Sempione line	Takes place on same station alignment and avoids runway signaling equipment	Avoids runway signaling equipment through inflected insertion	Maintains course on an axis with station but has interference with buildings and reduces runway operations during construction	Does not have direct interference but requires insertion of a curve and a certain amount of runway operations
Course speed	60 kph up to distance marker 120 kph connection section (from 1+750 to 3+500); beyond: 140 kph	100 kph	100 kph	100 kph
SCI/SPZ and Nature Park interference	The course is developed externally and there is no interference	Course on east border with occupation of an SP52 parallel strip in an area internal to the protected areas	Course on east border with occupation of an SP52 parallel strip in an area internal to the protected areas	As per Option A

Based on the stated considerations, the Alternative "B" course is the one that presents the most favorable feasibility conditions both with respect to local insertion (in terms of less interference with the road networks and with the existing building, and through less consumption of land), and with regard to the execution of work (less coverage and greater length of the trenches with lateral escarpments).

In addition, it makes it possible to place the T2 station in a position suitable for being able to integrate it with the parking lots that are going to replace the existing P5 parking lot.

3.3 DESCRIPTION OF THE PLAN

The railway plan for the connection between the two Malpensa airport terminals concerns a stretch of approximately 3.8 km from the start of the existing station at Terminal 1, until the end of the future Terminal 2 station.

The plan is separated into two parts:

- Part One comprises the station at Terminal 2 and the construction of railways for connection to the railway line coming from Terminal 1. The station has a length of 400 m and the connection of 130 m;
- Part Two concerns the new railway stretch between Terminal 1 and the Terminal 2 station with a length of approximately 3.15 km;

The distance between the platform axes of the two stations is approximately 3.4 km.

3.3.1 *Description of the Railway Course*

The new course starts at distance marker 48+856 (the point at which it merges with the existing FNM line, a position 396 meters from the Terminal 1 station axis) and ends at distance marker 52+070; therefore, the operations relating to the new line concern an extension of 3,214 meters.

The distance between the axes of the current Terminal 1 station (at distance marker 48+460) and that of the future station serving the Terminal 2 (distance marker 51+865) is equal to 3,405 km.

The net width of the section is approximately 10.35 m, after subtracting construction of lateral restraints.

The new connection requires the insertion of four curves and has been structured to allow a planned speed of 100 kph.

The first stretch is made up of a succession of a curve (353 m in length), a short straightaway of 164 m, and reverse curve of 425 m of length, for a total of 942 meters.

This part of the course represents the stretch of new line, in an extension of the existing line, which makes it possible to obtain alignment with SP52. From that point forward, the course runs parallel to the provincial road for 270 m, followed by a curve 369 meters long (with a layout radius of 604 m), another short straight stretch of 164 meters, a wide curve 655 m in length (radius 594 m), which makes it possible to keep the course alongside the adjacent SS336, and concludes with a straightaway of 328 m that ends on the point at which the line splits and broadens to 4 tracks in proximity to the Terminal 2 station.

Shortly before the end of the straightaway (around 43 meters from the terminal point) the line flows into the underground chamber that precedes the new station servicing the Terminal 2.

This second section of new line measures 1,743 meters; consequently, the total length of the stretch of new construction that extends between the point from which the modification of the existing stretch starts (distance marker 48+856) and entrance of the station structure for Terminal 2 (distance marker 51+541) measuring 2,685 meters (942 m + 1,743 m).

The entrance of actual station takes place with a wide radius (2,500 meters) 183 m long that connects the line course with the station's central tracks, which in turn extend in a straight line for an additional 303 meters, for a total length of 529 meters along the station structure and the chamber (43 m as an ending portion of the straightaway line + 183 m of connection + 303 m in the station).

The length of the new double track connection to be constructed between the two terminals T1 and T2 therefore comes to a total of 3.214 km (2,685 m of line plus a 529 m stretch of station).

All of the new course will be developed under ground level, due to the fact that the departing and arriving stations are placed underground and that the intermediary connection portion cannot interfere in height with infrastructure networks and the already existing buildings, or conflict with the natural organization of the surface.

However, this need for functional separation between new line and existing surface organization (which represents a fundamental, not-modifiable requirement) does not harm the ability to separate the connection into subsections differentiated between each other by type, with the specific intent of minimizing the overall construction costs of the project.

In other words, an attempt will be made to contain the length of the tunnel portions as much as possible so as to reduce support, lateral containment and line coverage structures as much as possible. This purpose is an objective limitation of the fact of having to nonetheless ensure:

- appropriate shielding of the line towards the built up areas and/or sections of land with environmental value (SCI Brughiera del Dosso);
- maintenance of current functions in the above ground sections now used for other activities (airport and non-airport), as occurs at the two ends of the new line, placed respectively next to parking lots P4 and P5.

From this point of view, the new course may be schematically subdivided into the sequence described below:

- initial stretch of 518 meter covered artificial tunnel that is placed in continuation of the existing tunnel to the north of the T1 station;
- 130 m uncovered stretch, on the portion of the line that precedes insertion below SP52, supported laterally by wall partitions, erected to a height of approximately 4.5 meters below ground level;
- completely covered stretch of artificial tunnel next to the Case Nuove community, where the line crosses the SP52, and goes alongside these on the west side, for approximately 190 meters;
- 550 meter stretch adjacent to the SP52, within the Nature 2000 Network areas, where the line is contained by full-height partitions on the side neighboring the street and by a wall that also operates up to ground level on the outside.
- a succession of open stretches staggered with short stretches passing under covered street connections for a total length of 940 meters in which the current section is that of an open trench on both sides or with a 5 meter lateral wall on the southeast side, contained on the west side by a low embankment for separation from the adjacent SS336; the section becoming a closed artificial tunnel next to the two crossings extending for a total length of 50 + 32 meters, equal to 82 meters.
- a 157 meter stretch of artificial tunnel, made to accommodate coverage on the existing via Facchinetti local road network;
- the 168 meter stretch connecting with the station chamber in which the line is kept in a trench with a south-side wall approximately 5 meters in height.

Please note that each of the stretches of the “covered and closed” tunnel types have a length of less than 1,000 meters, which represents the threshold beyond which safety system stipulations occur, which impart greater facilities costs.

3.3.2 Terminal 2 Railway Station

The station serving T2 has been positioned so as to ensure maximum centrality for the air terminal (in order to minimize connection distances on foot between railway station and air terminal, reduce transfer times and contain the length or the need for moving walkways) and so as to not interfere with the primary access roadways to the terminal.

Having considered these needs and taken into account that the shape of the platforms was designed 400 meters long to also be able to serve the largest category of freight and, in particular, high-speed trains (similar to what has taken

place for the T1 station), the axis of the new station was placed at distance marker 51+865.

As such, this guarantees the full functionality of the future station, avoiding the occupation, during the construction stage, of areas that are currently used by road junctions for access to the terminal and connection to SS336.

As has already been pointed out, the station is provided with 4 tracks; two platforms 11 meters in width are provided for to the sides of the two central tracks; the other two tracks are placed on their outward sides, one per section, which branch off from the line at approximately distance marker 51+565. The width of the station at its "typical" transverse section is 41 m.

3.3.3 Principal Railway Facilities

3.3.3.1 Equipment

Overall, the length of track to be constructed totals approximately 3,211 m of two tracks of line, and approximately 920 meters for the two tracks preceding the new Terminal 2 station.

The choice of equipment types is in compliance with the "Guidelines for equipment planning" used by RFI.

The equipment is therefore the traditional type on a ballast for all the anticipated operating types, with Type A shape, a 1,435 mm gauge, type 60 UIC rails, and 2.30 m p.r.c. sleepers.

In particular, the characteristics of the basic components are:

- **Rails**: the rails to be used are type 60 UIC in hard steel type 900A, UIC 860.0 and 861.0 qualifications and 108 m in length, and will be welded to form the welded rail length;

- **PRC Sleepers**: the use of RFI type monoblock pre-stressed reinforced concrete (p.r.c.) sleepers is stipulated, with a length of 2.30 m to be placed at a space of 60 cm.
  Attachments will be assembled with elastic fasteners.

- **Ballast**: this will be constituted of 1st category strong gravel according to the RFI declaration, having a 30/60 size and a sub-sleeper depth of at least 35 cm.

- **Switches**: type 60 UNI switches will be placed in operation both in the creation of simple diversion and in the creation of connections between running tracks;

- **Grade crossing of tracks**: grade crossings of the tracks will be provided for each emergency exit, connected the two lateral platforms with fireproof rubber catwalks.

3.4 OPERATING MODEL

The implementation plan for the connection between the 2 Malpensa airport terminals is placed within a broader panorama of operations on the railway network for the northwest of Lombardy that can be summarized as follows:

- Phase 1, which comprises infrastructure projects that can enter into service by 2015;
  - an Italian-Swiss cross-border connection through the Varese-Arcisate-Stabio line;
  - completion of the modernization of the Seregno-Saronno stretch, with which it will be possible to activate services from/through Seregno-Carnate-Bergamo towards the airport;
  - "Connection Y" making it possible to distribute services between Malpensa and Milan by dividing them over two lines (via Saronno and via Rho-Fiera) thereby optimizing capacity and increasing reliability of service;
  - modernizing the line with Novara, ensuring the ability to enhancing what is offered at Malpensa with direct connections from/to Turin.

- Phase 2, the implementation of which is expected by 2020:
  - Connection of the T2 station to the Sempione line towards the south: this will activate "circulation" on the railway ring that, from the RFI Busto Arsizio station, will follow the course: "Connection X", FRN Busto Arsizio, MXP, T1, MXP, T2 and Gallarate;
  - direct connection between T2 and Gallarate-Varese line;
  - connection between T2 and Sempione line towards the north (Sesto Calende side).

The implementation of these connections will make it possible to plan a growth of railway services serving the Malpensa airport from a current 130 bidirectional trips to an expected 220 trips in 2015, until reaching 256 trips per day in the long term.

The start of railway services will make it possible to reduce connections that are now done on the roads, specifically in reference to bus services:

- The T1-T2 shuttle service will be eliminated, with a savings of approximately 430,000 km/year of total distance traveled;
- Third party bus services between the Milan Central train station and the Malpensa terminals will presumably be reduced by a third, with a savings of 1,285,000 km/year of total distance traveled.

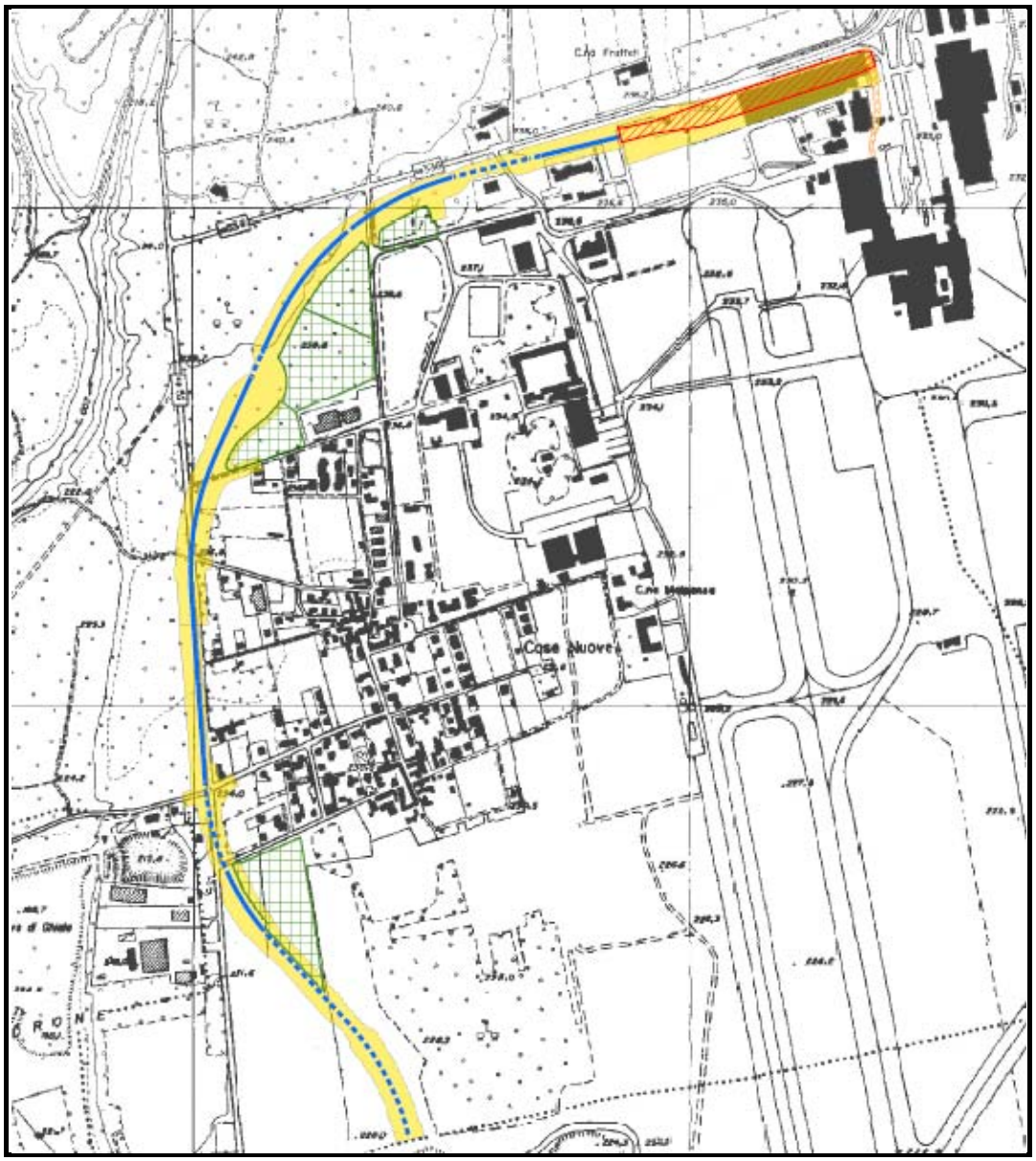
3.5 CONSTRUCTION SITE PHASE

The construction project that is the object of this plan will be done in two sections, the first related to the railway station at Terminal 2 of the Malpensa airport, and the second related to the construction of the railway course.

The realization of the railway construction work will require the installation of fixed construction site areas, where construction site logistical equipment, earth and materials deposits and line rigsites along the course of the railway will be placed.

Figure 3.5a pinpoints these sites on the local land in question.

Figure 3.5a Construction Areas



The intended construction sites include areas for storage of excavated land, storage of construction materials and parking for work vehicles, as well as construction site offices, services and parking for workers. These areas will be

equipped with a wastewater and rain collection system, which will drain into the sewers through connections to municipal or airport sewer systems.

Operational sites will construct the connection for the project and will differ according to the work planned, which includes:

- Covered artificial tunnels, constructed in part with deep lateral supports (bulkheads) and in part with box-like structures built within excavated construction areas;
- Stretches in open trenches between support works that reach up to the height of the ground level on both sides with opposing struts at the top;
- Stretches in open trenches on the downstream side and support works of varying types and heights on the upstream side;
- Stretches in open trenches on both sides made by creating full-height embankments;
- Road crossing works, created using the same methodology used for the covered artificial tunnels.

Operational stages will therefore include:

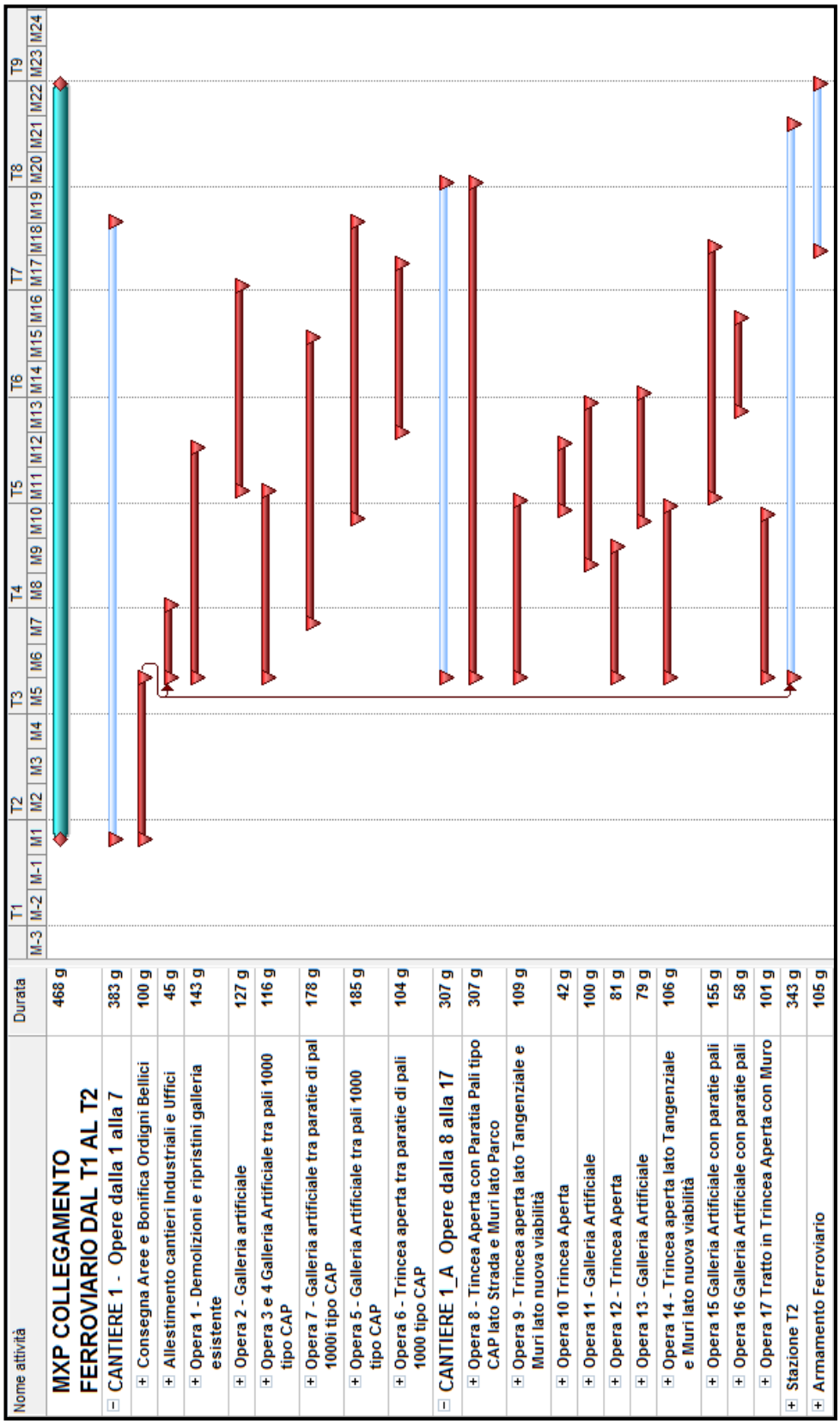
- Preparing the work areas;
- Excavating for construction;
- Building the bulkheads with large diameter bored piles;
- Installing prefabricated items that make up the works, cast in situ;
- Fills and landscaped areas.

The final project will attempt to limit the substantial earthworks necessary for construction, in accordance with the original estimates of the preliminary draft.

Excavated land will be used partly for fill and in partly for recovery activities.

Figure 3.5b (below) shows a summarized Timetable of works, which will last a total of approximately 2 years.

Figure 3.5b *Timetable of Works*



3.6 USE OF RESOURCES

3.6.1 Water Supply and Consumption

Water supply for construction sites and use in operations (T2 station and fire prevention system) will be achieved through connection to the aqueduct, municipal or airport systems.

3.6.2 Power Consumption

Power consumption for the operational stages of the project is summarized in the following table.

Table 3.6.2a **Power Consumption**

Item	Annual Consumption (kWh)
Current line-supplied track lighting from the current line box substation.	64,198,286
Current line-supplied track lighting from the box station.	11,888,571
Total lighting	**76,086,857**
Current line-supplied general services from the current line box substation.	35,040,000
Station-supplied general services from the box station.	332,880,000
Current line-supplied general services from the box station.	26,280,000
Total General Services	**394,200,000**
Traction	**5,080,434**
Total	**475,367,291**

3.6.3 Soil Occupation

The soil surface occupied during the construction stage, which includes both fixed construction site and operational sites, is approximately 270,000 m^2, of which approximately 92,000 m^2 within the airport grounds.

During operational stages, the soil area permanently occupied by structures, excluding buried structures, will total approximately 58,000 m^2, of which 27,000 m^2 within the airport grounds.

Wooded areas permanently cleared by the construction of works will be approximately 9,450 m^2, will be subject to compensation, according the manner stipulated by Regional Council Decree No. 8/675/2005 and its amendments.

3.7 IDENTIFICATION OF POTENTIAL ENVIRONMENTAL INTERFERENCE

3.7.1 Atmosphere

The table below shows the potential interference that the work might have with the atmosphere.

Table 8.1a ***Potential Interference with the Atmosphere***

Project Stage	Potential Interference	Affected Area	S/D/P *	Mitigations Measures Notes
Stage of Construction	*Production of dust* caused by activities related to trench excavation, storage of powdery materials and movement of work vehicles.	Site Construction Areas Road Access	S T R	Company requirements for: wetting of excavation and transit areas, controlling/covering accumulated materials, covering transport pathways for powdery materials, paving dustproof site roads.
	Gas pollutant emissions from work vehicle motors	Site Construction Area Road Access	NS T R	Company requirements for specifications concerning emissions from work vehicle/frequent maintenance.
Stage of Operation	*Reducing pollutant emissions* by reducing road transport between T1 and T2 and to Milan.	Surrounding Area	S P R	Positive Impact
Notes *S/D/P: Significance, Duration, Persistence of Environmental Interference S = Significant; NS = Not Significant T = Temporary; P = Permanent; R = Reversible; NR = Not reversible				

It should be emphasized that the environmental features in question present a reduced number of receptors that are sensitive to the impact on this component: in fact, the population residing in the vicinity of the operational area is reduced, and limited to persons residing in the community of Case Nuove, which is partially delocalized.

3.7.2 *Water Environment*

The table below shows potential environmental interferences, resulting from the construction of works, on the water environment component (surface and underground).

Table 3.7.2a Potential Environmental Interferences on the Water Environment Component (Surface and Underground)

Project Stage	Potential Interference	Affected Area	S/D/P *	Mitigations Measures Notes
Stage of Construction	*Water withdrawal and discharge* for construction activity needs and public use	Site Construction Areas	NS T R	Company requirements for economic use of water Water withdrawal for public/industrial use from the aqueduct Wastewater discharge into the airport sewer system, to be subjected to purification
	Spillage of polluting substances stored and used in construction areas	Construction Areas	NS T R	Company requirements for: sealing the surfaces of storage, parking and office areas, collecting and extracting oil from/preserving water coming from areas where potentially polluting materials are stored, as well as parking and office areas.
Stage of Operation	*Rainwater* run-off from the railway platform	Site	NS T R	Rainwater from the platform will be subjected to decantation before being discharged into the soil.

Notes
*S/D/P: Significance, Duration, Persistence of Environmental Interference
S = Significant; NS = Not Significant
T = Temporary; P = Permanent;
R = Reversible; NR = Not reversible

There are no surface bodies of water in the study area and the water table is at a considerable depth from the ground level.

The Ticino course is located at the base of the terrace, where the study area is situated and is 50 m below the study area. In addition, the water table surface is at a depth between 55 and 60 m from the ground level.

3.7.3 Soil and Subsoil

The table below shows potential environmental interferences, resulting from the construction of works, on the soil and subsoil environment component.

Table 3.7.3a Potential Environmental Interferences on the Soil and Subsoil Component

Project Stage	Potential Interference	Affected Area	S/D/P *	Mitigations Measures Notes
Stage of Construction	Trench Excavation	Site Construction Areas	NS T R	Limiting the areas involved.
	Management of land and rocks to be excavated.	Surrounding Area	NS T R	This aspect is subject to a specific plan attached to the final project for works.
	Spillage of polluting substances stored and used in construction areas.	Construction Areas	NS T R	Company requirements for storage of potentially polluting substances. Sealing of the surfaces involved.
Stage of Operation	Soil Occupation	Site Area	S P R	In areas affected by other operations, work will be carried out in an artificial tunnel, in order to contain surface use of these areas. Much of the course will be constructed alongside the SS336 in order to limit interference.
Notes *S/D/P: Significance, Duration, Persistence of Environmental Interference S = Significant; NS = Not Significant T = Temporary; P = Permanent; R = Reversible; NR = Not reversible				

The study area is situated on alluvial deposits of glaciofluvial gravel from the Würm and the Riss, which have optimal geological and geotechnical features for construction of works and do not appear to present a seismic or hydrogeological risk.

Soil use is characterized by infrastructural functions (airport, road infrastructure), and in the vicinity of the airport, by the town of Case Nuove, whose population has been partially localized. Free areas are mainly made up of woods.

3.7.4 *Vegetation, Flora, Fauna and Ecosystems*

The table below shows potential environmental interferences, resulting from the construction of works, on the vegetation, flora, fauna and ecosystems component.

Table 3.7.4a Potential Environmental Interferences on the Vegetation, Flora, Fauna and Ecosystems Component

Project Stage	Potential Interference	Affected Area	S/D/P *	Mitigations Measures Notes
Stage of Construction	*Vegetation eliminated* by site and construction areas. *Deposition of dust*, reducing the photosynthetic capacity of plants *Reduction of habitats* available for fauna		S T R	Limiting the areas involved. Restoring the site areas when construction is finished.
Stage of Operation	Permanent subtraction from the space occupied by works.	Site Site Areas Surrounding Area	S P R	Restoring natural values. Compensation for forest areas permanently eliminated from the woods.
Notes *S/D/P: Significance, Duration, Persistence of Environmental Interference S = Significant; NS = Not Significant T = Temporary; P = Permanent; R = Reversible; NR = Not reversible				

Vegetation in operational areas exhibit dominance of forest formations with varying ecological value depending on the degree of intrusion of exotic species (mainly Robinia and Prunus avium) that degrade native acidophilic forests. Intrusion of exotic species is mostly near road infrastructures which is included in these works.

3.7.5 *Public Health*

Impacts on this component include the secondary effects of identified impacts of other components, particular those associated with air and noise quality.

Table 3.7.5a Potential Environmental Interferences on the Public Health Component

Project Stage	Potential Interference	Affected Area	S/D/P *	Mitigations Measures Notes
Stage of Construction	*Disturbances from site activity*: secondary interferences from effects on the atmosphere and those related to noise.	Site and Neighboring Areas	S T R	Company requirements for selecting work hours, managing site layout and work vehicle maintenance
Stage of Operation	*Noise emissions* made by convoys in transit	Surrounding Area	S P R	Situating work in trenches minimizes noise emissions produced by passing freights.
Notes *S/D/P: Significance, Duration, Persistence of Environmental Interference S = Significant; NS = Not Significant T = Temporary; P = Permanent; R = Reversible; NR = Not reversible				

In fact, the population residing in the vicinity of the operational area is reduced and limited to persons residing in the community of Case Nuove, which is partially delocalized.

3.7.6 Noise and Vibrations

The table below shows the potential interference that work has on the noise and vibration component.

Table 3.7.6a Potential Environmental Interferences for the Noise and Vibration Component

Project Stage	Potential Interference	Affected Area	S/D/P *	Mitigations Measures Notes
Stage of Construction	Noise from site activities	Site Construction Areas	S T R	Company requirements for work vehicle noise levels
Stage of Operation	Noise produced by passing freight trains	Site Neighboring Areas	S P R	Situating railways in trenches contains noise emissions created by passing freight trains.
	Induced vibrations produced by passing rail freight	Site Neighboring Areas	S P R	Adopting solutions for reinforcement of the line in order to limit the transmission of vibrations through the ground and structures.

Notes
*S/D/P: Significance, Duration, Persistence of Environmental Interference
S = Significant; NS = Not Significant
T = Temporary; P = Permanent;
R = Reversible; NR = Not reversible

It must be emphasized that, also in this case, the population residing in the vicinity of the operational area is reduced and limited to persons residing in the community of Case Nuove, which is partially delocalized.

In addition, the noise environment of the study area is already affected by the presence of the airport.

3.7.7 Ionizing and Non-Ionizing Radiation

The table below shows the potential interference that work has on the ionizing and non-ionizing radiation component.

Table 3.7.7a Potential Interferences for the Radiation Component

Project Stage	Potential Interference	Affected Area	S/D/P *	Mitigation Measures Notes
Building Stage	None			
Operation Stage	Presence of infrastructure power supply works		NS P R	-
Notes *S/D/P: Significance, Duration, Persistence of Environmental Interference S = Significant; NS = Not Significant T = Temporary; P = Permanent; R = Reversible; NR = Not reversible				

It should be noted that, given the type of project, the only predictable radiation is non-ionizing radiation related to electrical fields and magnetic induction generated by conductors and power supply machines for the work.

Given the distance between electrical equipment and places where people are present for long periods, the impact is not considered significant.

3.7.8 Landscape

The table below shows the potential interference that the work might have with the landscape component.

Table 3.7.8a Potential Interferences for the Landscape Component

Project Stage	Potential Interference	Affected Area	S/D/P *	Mitigations Measures Notes
Operation Stage	Presence of work	Surrounding Area	S P R	Work is mainly carried out in trenches and artificial tunnels, limiting above ground work. Green restoration measures will enable better landscape insertion of the construction work.
Notes *S/D/P: Significance, Duration, Persistence of Environmental Interference S = Significant; NS = Not Significant T = Temporary; P = Permanent; R = Reversible; NR = Not reversible				

3.8 MITIGATION AND COMPENSATION MEASURES

In order to reduce interferences with the environment during construction and operational stages of the work, the following mitigation and compensation measures have been established, as a result of the estimate and environmental assessment reported in the following Environmental Reference Framework.

Mitigation measures introduced into the project in order to ensure compatibility with the environment are described by component and by project stage below.

3.8.1 *Atmosphere*

Construction Stage

During the construction stage, the most significant impact will be related to dust production generated by earth-moving activities, which will be considerable given the features to be implemented for the work.

Moistening the moved land and the unpaved areas affected by the transit of work vehicles will prevent dust from lifting.

As for gaseous emissions produced by work vehicles through construction activities, it is estimated that this will be offset by lower gas emissions due to the reduction of shuttle services between the two terminals and between the airport and Milan.

Operation Stage

It is anticipated that the operation of connecting the two airport terminals by railway will result in an approximate 1,700,000 km reduction in the distance traveled by buses which are now used for connecting services between the airport and Milan and between the two terminals.

3.8.2 *Water Environment*

Construction Stage

Analyses conducted have shown that the work areas under development are in within the minimum safety areas of two drinking water wells.

In these areas, appropriate management measures will be adopted to prevent any possible dispersal of substances that are hazardous to the environment and that could potentially lead to situations in which the groundwater is contaminated.

The water quality of the two wells will be continuously monitored during works.

Operation Stage

Well monitoring will continue for several years after initiation of the infrastructure operation.

3.8.3 *Vegetation, Plant Life, Wildlife and Ecosystems*

The project will result in the total deduction of 9,450 m^2 of wooded areas, which will be compensated for under current regulations, and the temporary occupation

of approximately 10 ha of wooded areas during the construction stage, which will be restored when works are completed.

Wooded areas that must be eliminated out of necessity (railway locations) are covered by compensation measures in accordance with what is expressed by D.G.R. [Regional Government Decree] 8/675/2005 and its amendments.

Other Compensation/Mitigation Operations

Vegetation and Plant Life

The general criteria underlying the definition of compensation/mitigation operation methods are defined according to the work stipulated by the project and the type of operation areas (nature-oriented, degree of sensitivity, etc.).

There are two main operation goals, although they greatly overlap in terms of practical planning:

- Nature restoration and conservation operations;
- Landscape-oriented and functionality operations.

Landscape-functionality operations are primarily intended for areas where it is not possible or makes little sense to recreate the natural conditions, since the environment where they are situated is particularly compromised. These areas have been defined as non-functional, in areas intended for urban design, along roadways servicing the works. Therefore, these operations are above all set-up as mitigation works.

The purpose of nature-related operations is to somewhat compensate for the loss of the deducted habitat and to mitigate the level of criticality as determined in relation to the execution of project works. It remains clear that majority of the specified types of nature and conservation-related operations are also inherent to landscape-functionality goals.

Operations to Promote Wildlife

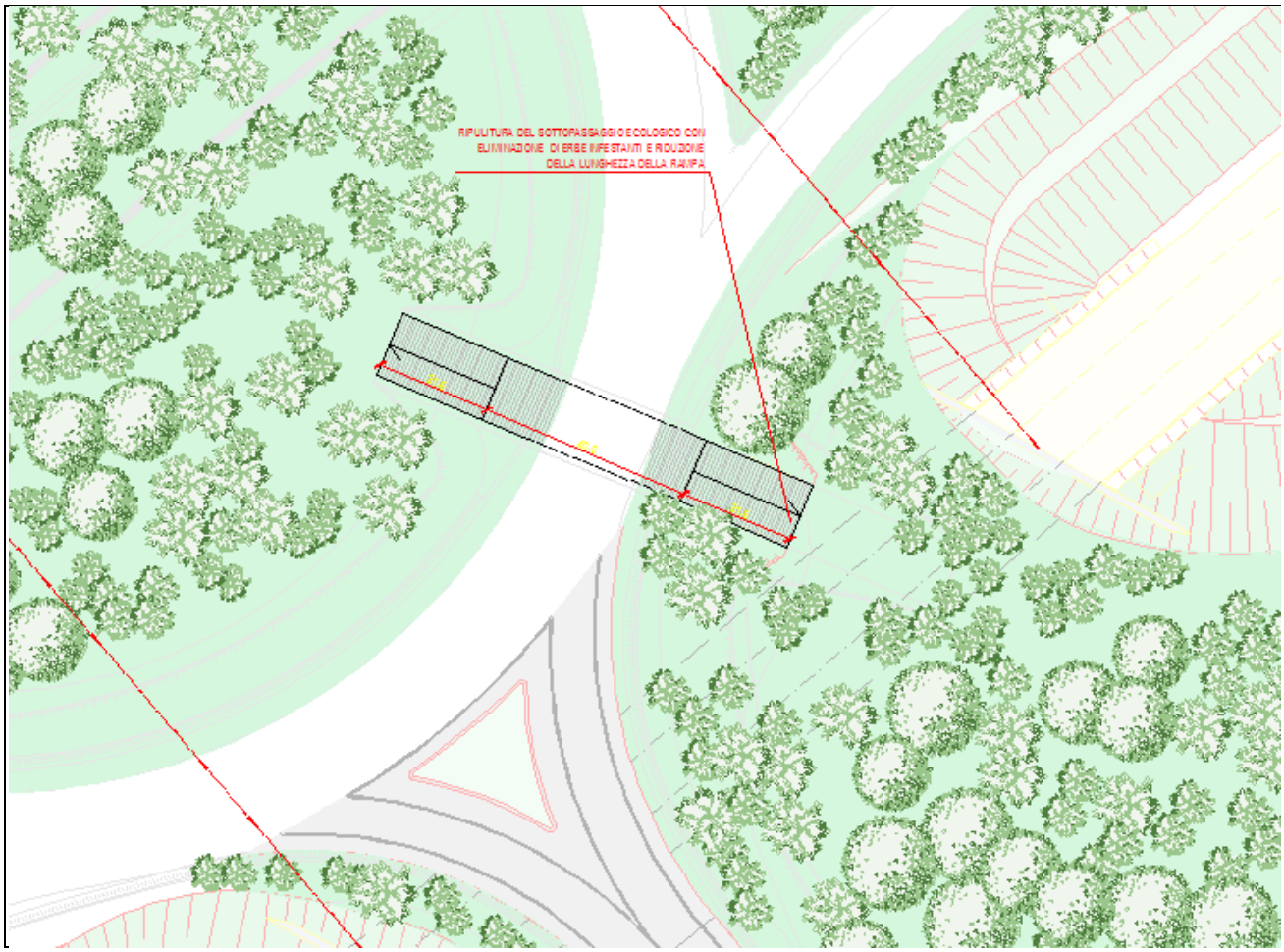
Operations to promote wildlife are aimed at increasing the mobility of wildlife and interconnecting habitats that are otherwise “separated” by the linear infrastructure. These operations include environmental rehabilitation in which vegetation plays a major role in characterizing the habitat and thus promoting wildlife. It should however be noted that other operations previously proposed (restoration of heathland, reforestation and additional forest areas) can already be considered elements that implicitly promote wildlife.

Compensatory operations regarding the following can be added to operations proposed in this section and those considered more appropriate to the environmental context:

- Restoration of the underground passage for wildlife that currently exists at the Case Nuove roundabout exit on SS336/SP52 (*Figure 3.8.2a*);

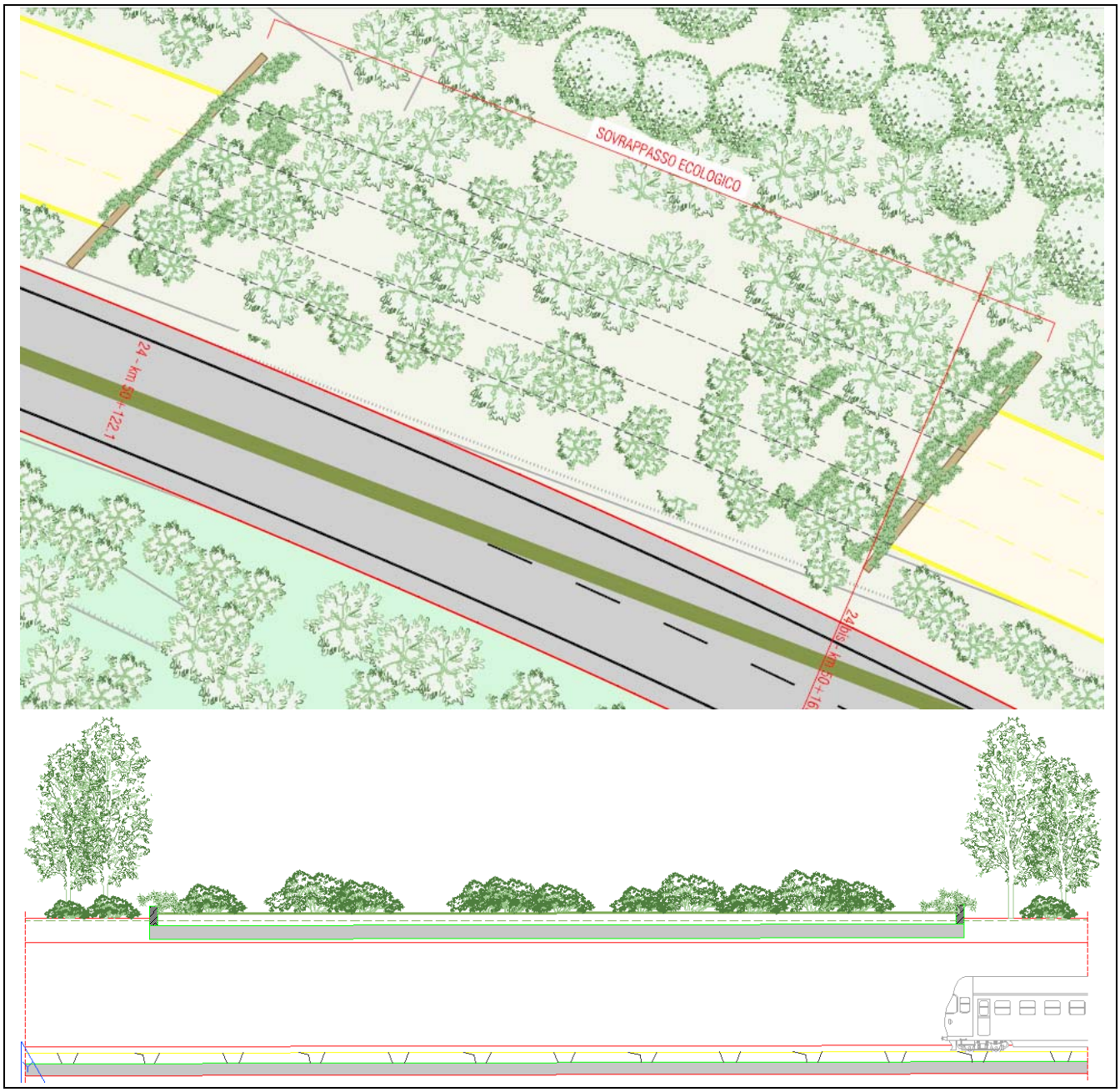
- The ecological bridge over the railway stretch interfering with the nature park area (*Figure 3.8.2b*) between distance markers 50+120 and 50+170.

Figure 3.8.2a Underground Passage for Wildlife at the Case Nuove roundabout exit on SS336/SP52



[[Illegible] of the underground ecological passage with elimination of grass infestations and reduction of the ramp length]

Figure 3.8.2b Ecological Bridge



[Ecological overpass]

3.8.4 Noise

Construction Stage

Simulations conducted for the impact estimate have shown that only in a few cases does the equivalent level assessed for receptors exceed the emission level for noise classification.

As a result, mobile noise barriers will be used for the noisiest site activities in order to protect receptors and an exception will be requested from the City with regard to zone limits and the different limits for day and night hours for construction activities.

Activities will however normally take place only during the day.

Operational Stage

Estimates carried out have show that both during the day and at night, the railway traffic anticipated for 2020 will not change the noise climate of the area and, in particular, the noise climate of receptors located in proximity to the railway course.

Consequently, it is not necessary to adopt any mitigation measures.

3.8.5 Vibrations

Construction Stage

During the construction stage, no situations were determined that necessitate mitigative operations.

Operational Stage

For the operational stage, two receptors have been determined that are located within the vicinity of the line, for which acceleration values related to vibrations generated in the freight passage exceed the permitted values for population disturbance.

Consequently, elastic pads will be installed on the stretch of railway near the receptors in question, specifically, between identification numbers 49+710 and 49+810, for a total of 200 m.

These mats, inserted between the bottom slab and the ballast impedes the transmission of vibrations to the ground and ensures complete mitigation of the impact.

3.8.6 Landscape

The project, given its nature, produces little direct interference with this component, given that this is a work being entirely developed underground.

Impacts on components are therefore mainly related to stages of building, including the elimination of heavily wooded areas affected by the temporary occupation of works being carried out.

Although the final project design is aimed at reducing the movement of earth and therefore limit the area affected by the building stage, this interference cannot be directly mitigated.

Landscape reconstruction of the locations involved is therefore to be a part of topsoil restoration operations already presented in the discussion of the Vegetation and Plant Life component.

4 ENVIRONMENTAL REFERENCE FRAMEWORK

4.1 ATMOSPHERE

4.1.1 Current Status of the Component

4.1.1.1 Weather/Climatology

The meteorological data available to date at the Malpensa station for three observation periods (Somma Lombardo) was analyzed in the Environmental Impact Study:

- 1951-1991, taken by the Servizio Meteorologico dell'Aeronautica Militare [Air Force Meteorological Service] and by ENEL;
- 2001-2006, provided by the Servizio Meteorologico dell'ARPA Lombardia [ARPA Metrological Service - Lombardy] – Lonate Pozzolo (VA);
- 2009-2011, provided by the Servizio Meteorologico dell'ARPA Lombardia [ARPA Metrological Service - Lombardy] – Somma Lombarda (VA).

Data analysis has revealed the following:

- Thermal regime: Data on average annual temperatures and extreme events taken by the Servizio Meteorologico dell'Aeronautica Militare and ENEL for the 1951-1991 observation period shows that the annual average temperature high is between 19.23 (1991) and 15.75°C (1956) and the annual average temperature low is between 3.93 (1956) and 7.9°C (1991). Extreme values are highest in the summer months (July and August), with the highest being 37°C in July 1983. The lowest values were in January, February, March and December, with the lowest being - 18°C in January 1985. Data on average annual temperatures and extreme events provided by the Servizio Meteorologico dell'ARPA Lombardia (Stazione di Lonate Pozzolo, VA) for the 1997-2007 period shows that the average annual temperature high has undergone a slight increase, less than one degree centigrade, and the average temperature low recorded has slightly increased by approximately 1.5°C. Extreme values are highest in the summer months (June - August), with the highest being 38.5°C in August 2003, while the lowest values were in March 2005 (- 11.8°C). Lastly, the available measurements provided by the Servizio Meteorologico dell'ARPA Lombardia (Stazione di Somma Lombardo, VA) for the 2009 - 2011 period showed an annual average temperature for the three-year period to be 12.5°C at the Somma Lombardo station. The highest temperatures occurred in July in 2010, and in August in 2009 and 2011, with highs of up to 34.8°C, 36°C and 35.6°C, respectively. The months when temperatures were the lowest were December in 2009 and 2010, and January in 2011, at -13°C, -11.5°C and -6.3°C, respectively.

- Rainfall: Data for the 1951 - 1991 observation period shows that the highest values recorded were recorded between October - March, with the highest rainfall recorded in November 1951 (491 mm). The lowest values were between May and September, with years when there was no precipitation during these months. In terms of total annual precipitation, the year with the highest precipitation was 1951 (1,933 mm), while the least rainy year was 1990 (507 mm). The average value for this period was approximately 1,110 mm of rain. Data from 2001 - 2006 shows that the highest values are mainly recorded between September and April, with the highest recorded in November 2002 (541 mm). The lowest values were recorded in January. In terms of total annual precipitation, the year with the highest precipitation was 2004 (1,182 mm), while the least rainy year was 2006 (375 mm). The average value for this last period was approximately 769 mm of rain, considerably less than the previous period analyzed. Analysis of the occurrence of rain recorded at the Somma Lombardo station in 2009, 2010 and 2011 shows that the total precipitation was approximately 537.4 mm for 2009, 640.2 mm for 2010, and approximately 465.0 mm for 2011. The highest precipitation values (mm) were recorded in April in 2009 and 2011, and in May in 2010. More specifically, the rainiest month with in the three-year period was May 2010, with 157.4 mm of rain. The lowest values were recorded in May for 2009, in January in 2010, in December in 2011.

- Hygrometric regime: Date on humidity for the 1951 - 1991 period shows that the maximum annual frequency (80.02‰) corresponds to a temperature between 0.1 °C and 5 °C and a relative humidity between 91 and 100%. Data for the 2001 - 2006 period confirms what emerged in the previous observation period, where the maximum annual frequency, at 75.16‰ corresponds to a temperature between 0.1 °C and 5 °C and a relative humidity between 91 and 100%. Lastly, the average, maximum and minimum humidity values recorded at the Somma Lombardo-Varese station in 2009, 2010 and 2011 show an average annual relative humidity of 73.5% for 2009, 77.7% for 2010 and 74.2% for 2011. The minimum value recorded was in March and May in 2009, in May in 2010, and in April in 2011. The highest relative humidity values for this area have also been confirmed. Its daily distribution shows that 38% of the time, the area always has more than 90% humidity.

- Anemological regime: Calm winds (speeds between 0 and 1 knots) are largely predominant, present approximately 60% of the time. The prevailing wind direction is northwest, however, this direction is the least intense (prevailing speeds between 1.5 and 3 m/s). Between 2001 and 2006, there was a decreased persistence of calm winds (approximately 41% of the time), while weak winds (speeds between 2 and 4 knots, 49% of the time) became more significant, with the prevailing winds coming from the north. At the Somma Lombardo station between 2009 and 2011, calm winds became more significant and no speed exceeding Class 5 - 7 was recorded, contrary to what was seen in data monitored in 2001 - 2006. In addition, we have shown how the prevailing wind direction goes from 247.5 to 260 degrees.

- Atmospheric stability: the annual trend shows a clear predominance of Neutral Class D and Stable Classes F and G and that there is often fog in the winter months.

4.1.1.2 Air Quality

Characterization of air quality for the area study was carried out and referred to the results reported in the "Report on Air Quality in the Varese Province" created by the ARPA [Environmental Protection Regional Agency] - Varese region for the fixed monitoring station, Somma Lombardo Malpensa (located near the project area), for 2008, 2009 and 2010.

The data analysis shows the following:

- Nitrogen dioxides: during the three-year period evaluated by the Somma Lombardo MXP station, the alarm threshold, the hourly limit value and the average annual limit established by Leg. Decree 155/2010 for the protection of human health, were never exceeded.
- Carbon monoxide: the regulatory limit for CO, established for the "protection of human health", has always been compliant for all the years in question.
- Ozone: the Somma Lombardo MXP station has recorded a number of instances in which the safe target value for human health, the legal limit is 25, has been exceeded. In addition, there were no instances in which the 180 $\mu g/m^3$ warning threshold, or the alarm threshold, were exceeded.
- Benzene: for all three years evaluated, the average annual limit for benzene concentration, which is 5 $\mu g/m^3$, was never exceeded.

4.1.2 Impact Estimate

4.1.2.1 Construction Stage

Dust Emissions

The estimate for diffuse dust emissions references the methodology recommended by the ARPA Toscano Guidelines.
These guidelines propose methods for estimating dust emissions that are mainly based on the U.S. Environmental Protection Agency's data and models (US-EPA: AP-42 "*Compilation of Air Pollutant Emission Factors*").
Using complex numerical processing performed with statistical and technical methods for modeling the dispersion of pollutants in the atmosphere, these guidelines propose emission threshold specifications for the parameters indicated in Annex V to Part V of Leg. Decree No. 152/2006 and its amendments, in order to assess the impact on air quality for the determined activities, properly modulate any mitigation measures (wetting, canning, etc.), and to arrange any monitoring in the area neighboring works.

High hourly emission factors, caused by elevated excavation production, are determined through calculations.

ARPAT guidelines specify two methods for the control and reduction of dust lifted by the transit of vehicles in unpaved areas:

- Limiting the speed of vehicles in transit, using the standard recommended both by US EPA AP-42 and the BREF's *Emissions from storage*. In this case, given the short distance involved, speed will be limited to 10 km/h.

- Treatment of surfaces through wetting (*wet suppression*) and chemical suppression (*dust suppressants*). The latter references the use of chemical substances, specifically water-based polymers, which require less frequent application, but may result in a change in the particle composition and increase silt, the finer component.

In order to reduce the amount of dust emitted, the following mitigation measures will be taken:

- Limiting the truck loading area with mobile barriers that are 3 m high, which is the amount of material that may be released from the bucket.
- Installing a *Fog Cannon*, which vaporizes water in the material unloading area.

The effectiveness of reduction through this system is assessed at 94% of emitted dust.

Gas Emissions from Work Vehicles.

In order to assess the impact of gas emissions resulting from the execution of construction works related to the connecting rail between Terminal 1 and 2 of the Malpensa airport, annual emissions calculated at the SIA are compared with total emissions for large sector emissions, *7 - Road Transport* and *8 - Other Mobile and Machine Sources,* for the Varese province in 2008. The results of this comparison show that the incidence from works is extremely lower than the adopted reference values.

4.1.2.2 Operational Stage

In order to assess the amount of gas emissions prevented by installing the connecting rail between Terminal 1 and 2 of the Malpensa airport, the amount of emissions generated by services that are to be canceled, due to the new connecting rail, will be estimated.

The results are presented in the following table.

Table 4.1.2.2a Annual Emissions Prevented by Canceling Road Services

Emissions Prevented	CO (kg)	NO_2 (kg)	$PM_{2,5}$ (kg)	PM_{10} (kg)	CO_2 (t)
T1 - T2 Shuttle	1,146	439	143	159	330
MI C.le – MXP Bus	1,936	1,094	244	266	828
Total	**3,082**	**1,534**	**388**	**425**	**1,159**

In order to estimate prevented emissions, the total emissions for large sector 7 in 2008 for Varese province are compared with prevented emissions. The comparison shows that the incidence of prevented emissions, compared with the reference value, is reduced.

In addition, calculated in terms of time, the estimated prevented emissions for the operation stage equal the emissions calculated for project construction. Evaluations have shown that, in little more than two years, the amount of emissions prevented by canceling automotive services that are to be replaced by increased availability of rail will compensate for the emissions emitted during the project construction stage.

Consequently, it is confirmed that carrying out the project will have an advantageous positive impact for all the subsequent years of its operation.

4.2 WATER ENVIRONMENT

4.2.1 Current Status of the Component

4.2.1.1 Surface Water Environment

Hydrology

The rail line is on a sub-level area that averages between 230 m above sea level on the Terminal 1 side and 235 m above sea level on the Terminal 2 side and is part of the AdB del Po [Po River Basin Authority] and is in the hydrographic area for Ticino water intake, as recognized by the Lombardy regional government's Groundwater Protection Plan.

The main waterway, the Ticino River, originates in Switzerland near St. Gotthard Pass, and is 284 km long in total. The railway course and the T2 station for the project are to the east of the Ticino River and the minimum distance between them is approximately 1.2 km. Also to the east are two artificial canals called the Canale Villoresi and the Canale Industriale, which are approximately 520 and 1,000 m away from the course, respectively. The Torrente Strona [tributary] runs north of the work for the project and is approximately 3.9 km from it.

Water Quality

Evaluation of the quality of water from the surface hydraulic network was carried out by analyzing the chemical characteristics - both physical and microbiological - of the Ticino River (main waterway) and its tributary, the Strona.

The ARPA of the Varese region has evaluated the quality status of the primary and secondary hydrographic network through the following analyses:

- Evaluation of the physico-chemical and microbiological parameters (NH_3, total N, total P, COD, dissolved O_2, BOD_5, etc.).
- The Extended Biotic Index (EBI), a methodology based on biotic analyses, required for the classification of waterways under national regulations.

Analysis carried out by ARPA Varese, on the qualitative/quantitative status of the Ticino River during the 2000 - 2005 period, which has shown that the river is fairly able to partially absorb loads of incoming pollutants due to its high naturalness, which promotes a healthy flow of water.

However, with regard to the qualitative status of the Strona tributary, the pollution levels identified by the macrodescriptor parameters monitored by the ARPA Varese for the 2002 - 2003 period have determined that it has a precarious Ecological Status.

The ARPA Varese ST 3 monitoring station, located in the town of Somma Lombardo, reports that the Strona's water has a "bad" ecological status, because for most of the year this stretch of the tributary, which coincides with where it flows into the Ticino River, is dry due to the lack of water uptake from a nearby quarry.

This phenomenon, one the one hand, reduces the pollution load input into the Ticino, but on the other, means a negative event for the Strona tributary, because the lack of water prevents a stable biological community from developing and inhibits its ability to purify itself.

4.2.1.2 Surface Water Environment

Hydrology

The work for the project falls within Ticino-Adda hydrological basin No. 3 and Busto Arsizio hydrological sector 5. The basin stretches from the Ticino River in the west, the Po River in the south, the Adda River in the east, Lecco and Varese in the north, and stems from the first moraine bodies in the Como province.

The zone is characterized by a series of overlapping aquifers that are only separated locally because of the several interdigitations of deposits with different relative permeability. Shallow and deep aquifers are still distinct from one another.

The entire length of the course is going to interact with Wurmian fluvioglacial deposits from the Upper Pleistocene that take the form of gravel and sand that is sometimes nearly all secondary level clean sand. More rarely, there is interleaving silty clay that sometimes is interleaved meters-thick, coarse, horizontal, and weakly cemented.

Hydraulic conductivity values (k) were measured during previous monitoring visits to the site area, using the Lafranc method at depths ranging from 9 to 30 m from the ground level, and were within a range of values from $1.36*10^{-3}$ to $1.59*10^{-5}$ cm/s, which confirmed the moderate permeability of the earth that makes up the shallow aquifer.

Water Quality

In order to evaluate the quality of the wide area of groundwater affected by the planned railway course, the follow reports were assessed:

- Report on the Environmental Status of the Lombardy Region (2007), in which the Groundwater Chemical Status (GCS) index is defined.
- Reports for 2005 on chemical analysis carried out by the ARPA Varese for chemical compliance under Leg. Decree 31/2001.

Of the six points of groundwater monitored by the Province of Varese, the data for which is reported in the Environmental Status of the Lombardy Region (2007), three have a GSC value of 1 and three have a GSC value of 4.

From examining test reports for wells analyzed by the ARPA of Varese, it is been determined that, in general the qualitative distribution of the groundwater is chemically compliant with Leg. Decree 31/2001. The only chemical quality non-compliance was related to three wells, two of which are near the work area in question and are located within the Malpensa airport, and respectively named Wells No. 9/1 and 9/2 of Lonate Pozzolo. These have the highest number of pesticides.

Aquifer Vulnerability

According to Table No. 2, “Hydrographic Character”, from the Town of Somma Lombardo’s 2009 Preliminary Environmental Report, the area affected by the project’s work is defined as having “Weakly Protected Shallow Aquifer Conditions.”

The aquifer has been deemed weakly protected because of the high permeability of the deposits that make up the shallow aquifer, which has been confirmed through tests on-site.

But it should also be taken into consideration that the high depth of the water table, with respect to the ground level, is such that it indirectly protects the layer, facilitating prolonged self-purifying water infiltration along the topographical surface up to the free surface of the layer.

4.2.2 Impact Estimate

4.2.2.1 Construction Stage

With regard to the interference of work for the project with groundwater, it should be noted that the flow of groundwater will not be altered in order to carry out the construction of underground works, because the high depth to the water table level will always be more than 45 m for the stretch that will be affected by the course.

In addition, appropriate measures will be taken to prevent the possibility of spills related to chemical products/combustibles used. Particular attention will be paid to the area that falls within the drinking well zone.

Areas located near fixed construction sites will be equipped with a wastewater collection and disposal system which will be connected to the sewer system with plastic tubing.

This will not infer with the surface water or groundwater environments during the stage in which works for the project are being carried out.

4.2.2.2 Operational Stage

During the operation stage, the rainwater intake system collects water that directly falls on the rail platform and in the escarpments in the open trench lines.

All collected rainfall is put into tanks that are located beneath the rail line and are before the tunnel entrance. These tanks are connected to leak wells. Passage into the collection tank ensures that water is decanted of any accompanying solids.

These wells disperse collected water directly into the earth.

The hydraulic plan for the new T2 station includes a storm water collection and treatment system.

The rail line will be connected to water mains to supply to the fire-extinguishing system.

Water supply for the new station at T2, intended for sanitation services for restaurant activities and the fire-extinguishing system, will be provided by the airport water system and will not result in a significant increase in current consumption.

Therefore, with appropriate planning, the proposed project will not significantly interfere with the surface water and groundwater environment during the operational stage.

4.3 SOIL AND SUBSOIL

4.3.1 Current Status of the Component

4.3.1.1 Geology and Geomorphology of the Extended Area

The project that connects Terminal 2 with Terminal 1 of the Milan Malpensa Airport through a connecting railway course is within an area characterized by a fairly simple geology and is characterized by fluvioglacial and quaternary fluvial deposits organized into several connected terraces, generated by interglacial erosive stages, the most recent being the Ticino River.

Most of the course will run underground and will be laid on an area below ground level that is 230 m above sea level for Terminal 1 and 235 m above sea level for Terminal 2. In the western section of the course, the morphology slopes significantly downwards, reaching the height of the bed of the Villoresi canal at 186 m above sea level.

Given the projected characteristics of the stretch of railway in question, numerous geognostic visits have been made to the study area to facilitate a good geological/technical characterization.

As a result of these visits, it has been determined that the land along the entire length of the course is granular, substantially unstable and classifiable as silty and slightly sandy gravel with pebbles. The presence of pebbles is significant and their particle size is generally less than 30 cm, but there are some clasts whose dimensions are approximately 1 m.

Intersecting data from direct and indirect surveys has enabled reconstruction of the geotechnical stratigraphy, which includes three main layers (0-5 m, 5-15 and >15 depth intervals) that are characterized by a high degree of thickening as depth increases.
These observations have been used to create a geotechnical study with a positive aggregate of good strength and deformability parameter values.

NORD_ING carried out stability tests on the slopes of the trench lines. Tests conducted, the details for which can be found in project documentation, have obtained safety coefficients that are always higher than those required by law, at 1.1, and these results verify the stability of the escarpments for the project.

4.3.1.2 Soil Quality

The qualitative reference limits for the entire area involved in the construction of the new connection are identified by the Contamination Threshold Concentrations (CTC) reported Leg. Decree 152/06, Part IV, Heading V, Annex 5, Table 1, Column B – Areas for Industrial and Commercial Use.

In order to verify the effective compliance of the ground affected by the excavation operations with reference to quality limits, the performance of a preventative survey sampling is stipulated, the specifics of which can be referenced with planning document M19-D-d-301, attached to the Final Plan.

In addition, the survey sampling will be conducted after the Weapons Reclamation stipulated before the start of construction site activities.

Following the sampling, ground which is compliant with the qualitative reference limits identified by Contamination Threshold Concentrations (CTC) indicated in Legislative Decree No. 152/06, Part IV, Title V, Annex 5, Table 1, Column B - areas for industrial and commercial use, may consequently be reused in place for the filling stipulated by the plan and reused at other sites suitable for uses stipulated by current standards.

In the event that CTC limits have been exceeded, the character description plan will provide for the performance of environmental survey sampling aimed at defining the extent of the non-compliance situations that may be detected.

4.3.1.3 Seismic Risk and Hydrogeological Instability

In the areas included within the study area there is no record of landslide and/or flooding events.

Flooding events, recorded only once, close to the study area for the planned course and present in the Somma Lombardo locality, have been checked both to the north in two distinct areas, respectively about 2.7 and 3.5 km from the course, and to the south in proximity to the communities Ferno and Lonate Pozzolo, approximately 5 km distant from the project.

With regard to landslide events, only 2 have been reported in the vicinity of the course, and occurred only one time in proximity to the communities of Cardano al Campo and Ferno, the first about 3.9 km distant from Terminal 2 and the second about 3.8 km from Terminal 1.

Given what is described above, no criticalities have been detected in the study area that would lead to interfere with the planned construction work.

Seismic Activity

The municipality of Somma Lombardo is classified in Zone 4.

Soil Use

The course, for the majority of its run, and the planned Terminal 2, involve airport areas, both in its initial section and in its final route, for approximately 1.4 km and 0.9 km respectively.

On its central stretch, the planned railway course will cross, for approximately 118 m, an area currently classified as an “extractive area”, the “discontinuous urban fabric” of the Case Nuove community for approximately 480 m, and “wooded areas” for the remaining section of its run.

4.3.2 Impact Estimate

4.3.2.1 Construction Stage

The following potential interferences can be anticipated during the implementation stages for the railway course and Terminal 2:

- Excavation of the trenches, tunnels and Terminal 2 foundations: in the entire plan, approximately 1,000,000 m^3 of land will be excavated, of which approximately 250,000 m^3 will be reused for backfill and restoration. Of these

quantities, approximately 550,000 m^3 and 85,000 m^3, respectively, are produced and used within the airport grounds. The excavated earth will be set aside in work site Area 2 - Earth storage for subsequent reuse, while excess will be directed to reuse in another process. Excess earth generated from areas inside the airport grounds will be set aside in suitable areas inside the grounds themselves pending reuse. More details on the management of excavated earth are indicated in the specification document attached to the final plan;

- Spilling of polluting substances stored and used in construction site areas;
- Occupation of the ground by fixed operating construction sites for approximately 270,000 m^2, of which approximately 92,000 m^2 are within the airport grounds.

A specific plan has been drafted for the management of excavated earth and rocks, indicated in planning document M19-D-b-006, which will be referred to for details, in order to characterize the extracted materials and direct them to reuse in compliance with current standards.
In order to avoid the spilling of polluting substances stored and used in the construction site areas, requirements will be stipulated to the companies for the storage of potentially polluting substances in absolute security, and the positioning of impermeable surfaces in proximity to the stockpiles will be stipulated to ensure a greater protection of the soil.

During the railway implementation stage, the soil affected by the construction work is primarily used for airport activities and occupied by a discontinuous urban fabric, and is therefore not characterized for exclusive uses.

Therefore, in consideration of the measures that will be taken and the compensation that will be made, it is deemed that the interference with this component will be limited exclusively to the occupation of soil that, while non-exclusive, will nonetheless have a temporary character. Therefore interference is deemed non-significant.

4.3.3 Operational Stage

The impact on this component during the operating stage of the T1-T2 railway line is linked exclusively to the occupation of the soil.

The area permanently occupied by the structures, excluding those that are buried, is altogether equal to approximately 58,000 m^2, of which approximately 27,000 m^2 are within the airport grounds. The building of the tunnel stretches has in fact made it possible to reduce the surface soil taken away from other uses to a minimum.

In any case, this interference is contained insofar as the soil affected by the construction works is primarily used for airport activities and occupied by a discontinuous urban fabric. In addition to the choice of the course, a way was sought, as much as possible, to develop the railway line alongside SS 336, so as to avoid the fragmentation of grounds with infrastructure work.

Furthermore, as specified in the preceding paragraph, the wooded areas permanently taken away from their current use will be compensated according to the methods stipulated by Regional Council Decree No. 8/675/2005 and its amendments.

4.4 VEGETATION, PLANT LIFE, WILDLIFE, ECOSYSTEMS

4.4.1 Current Status of the Component

4.4.1.1 Natural Framework

The railway path falls within the following protected areas:

- Ticino Valley Lombardy Regional Park: entire course;
- Ticino Valley Nature Park: approx. from km 49+750 to km 50+230;
- SPZ IT2080301 “Boschi del Ticino”: approx. from km 49+750 to km 50+230;
- SCI IT2010012 “Brughiera del Dosso”: approx. from km 49+750 to km 50+230.

However, the railway course only marginally affects the Ticino Valley Nature Park, SPZ IT2080301 and SCI IT2010012. It should be pointed out how in this stretch, the three protected areas have administrative borders that completely coincide with each other.

4.4.1.2 Potential Vegetation

According to the paper on Italian vegetation ranges (Blasi, 2010), the west Lombardy high plains host the neutroacidophilic vegetation range for oak and hornbeam (*Carpinion betuli*). Even though the majority of these plant communities were eliminated by allowing the placement of farming and human settlements, there remain some mixed deciduous woods.

4.4.1.3 Vegetation and Plant Life

2 species of ferns, 2 conifers and 160 flowering plants were discovered in the site area, for a total of 164 vascular plant species. No protected species or species at risk of extinction in Italy or Lombardy were found.

The majority of species are native (118), but a consistent portion (39) is represented by exotic species. Among the latter, it is worth pointing out the presence of 10 species included on the black list from Regional Law No. 10/2008.

The majority of the study area is occupied by built-up and infrastructure areas (68.7%), where vegetation, including domesticated, prevails with no natural interest, while 3.5% is occupied by mowed grass.

The forested areas total 27.8% of the total. Among these, acidophilic forests (8.5%) prevail, where the dominance of arboreal species can locally determine the presence of various forest types (pine woods, chestnut woods and oak

woods), against a frequent leading distribution in mixed groups of forest species (Scots pine, chestnut and oak), and mesoacidophilic forests (9.9%), with species similar to those above, but with different numerical relationships, with locust trees and black cherries being much more frequent. The physiognomy also changes, insofar as the shrub layer becomes substantially thick and locally impenetrable, due to the presence of locust tree and black cherry refuse and due to the ingress of other exotic species. Degraded forest formations (7.8%) represent an additional worsening compared to the situation above, in which exotic species are clearly dominant (locust gum and black cherry) in the tree and shrub layer. Finally, there are needle and broadleaf plants (1.6%), which can be grouped in ecological terms with degraded woods.

4.4.1.4 Wildlife and Ecosystems

The presence of a complex mosaic with numerous precious natural and semi-natural elements means that the fauna is similarly rich and diversified, with numerous elements of interest for conservation. For example, there is a significant nesting population of nightjars; the northernmost population of field lizards and one of the few plains stations for the butterfly *Hipparchia semele*.

Furthermore, two of the primary migration routes for birds through Lombardy cross in the northern area of the Ticino Park, next to the section where the Malpensa airport is located: 1) the prealpine course, which brings migrating species from eastern ingresses to the Mediterranean coasts; and 2) the peninsular course, with birds that pass through the Swiss lakes, the valleys of the central Alps, Lake Maggiore, and following the Ticino are then directed south to winter in the Italian peninsula or to reach African wintering habitats through the Sicilian Channel.

The following assessments of the study area can be made from a wildlife point of view.

- The populations most characteristic of the site refer to populations linked to the forest areas/woodlands. These populations are differentiated and distributed in relation to the degree of human buildup, which increases the closer it gets to the roads and to population centers.
- Site-level wildlife populations are significantly affected by local man made disturbances: SP52, airport grounds.
- The site, despite being subject to severe man made pressures, could nonetheless be affected by the beneficial influx of close by adjacent areas with elevated natural features and thereby result in a continuity to the west. In this sense, it is conceivable that elements of conservation/nature interest could migrate from these areas to the site in question.

4.4.2 Estimate and Assessment of Impacts

The direct impacts are to be attributed substantially to:

- subtraction of natural habitats, as a consequence of the elimination of plant formations.

The indirect impacts are however to attributed to the following factors:
- creation of dust clouds;
- floral pollution, resulting from the expansion of exotic species;
- a barrier effect against wildlife.

4.4.2.1 Construction Stage

Impacts on flora and vegetation

Interferences during the construction stage will be the following:

- occupation of surfaces, with direct loss of vegetable species populations and of communities directly affected by the construction site works;
- creation of dust clouds, which will predominantly cause a reduction of photosynthetic capacity for the plants, insofar as the dust may be deposited on their leaves;
- dispersion of exotic invasive species, insofar as the disturbance caused to the natural vegetation may encourage the ingress of these plants, which may alter the flowering composition of the invasive community and trigger complex ecosystem degradation processes.

However the majority of the railway course (about two thirds) will be developed in a man made area of very little or no natural interest. Therefore, we have considered assessing occupation of the surfaces of the sole natural forest formations, forest plants and mowed grasses (for an overall linear distance of approximately 1,000 m).

On an overall surface area of **9,450 m^2**, which is now occupied by forests (both natural and artificial) and will constitute the base of the railway course, we have determined a transformation of the woods under Regional Law No. 31 of 5 December 2008, and its amendments, and it is therefore subject to compensation under Regional Council Decree No. 8/675/2005 and its amendments. The occupation by the construction sites (both temporary and long-term) is however temporary, insofar as the closure of the construction sites provides for the planting of native forest species (see Section 5.3 “Compensations and Restorations”); so that this is configured as a temporary transformation of the woods under Regional Council Decree No. 8/675/2005 and its amendments.

The creation of dust clouds, which will be significant during the construction stage, is however limited in terms of time, and therefore does not constitute a significant impact on the components analyzed, even in relation to washing away due to atmospheric precipitation that is relatively abundant in the local area in which the Site is located and with mitigations adopted.

Impacts on fauna and ecosystems

Based on the planned characteristics currently available, the primary interferences caused to the wildlife community by planned works in the construction stage can be grouped into the following categories:

- habitat reception capacity, diminished due to the subtraction of forests within the construction site perimeter or due to the degradation of its surroundings caused by acoustic emissions and/or general pollutants;

- greater species mortality, caused essentially by incidents (collisions with worker vehicles) and secondly by the emission of pollutants as well;

- less freedom of movement for wildlife, caused above all by physical obstacles (fences for example) and, to a lesser degree, by acoustic, visual and/or polluting emissions as well.

The combination of these negative incidences will produce:

- the reduction of available habitats and semi-natural environments (wooded areas in particular);
- an increase in the fragmentation and isolation of animal populations present in the site area;
- the lack of accesses to important natural areas (in particular places for feeding and reproduction).

Specifically, the implementation of the planned works in the construction stage will primarily affect wildlife that currently characterizes the tree stands that will be cut down. Taking into consideration that these areas will be gradually cut and, at the same time compensated by reforestation operations, this impact is configured as temporary and of a negligible extent (also considering the fact that the wooded areas are particularly diffuse both at the site and in the broader area).

The construction site activities may bring about the redistribution of territories of the wildlife resident in the area (in particular micromammals and small birds): this can in fact be assumed as a retreat and a redefinition of the territories where normal biological functions are carried out. Likewise, the approach of moving vehicles to habitats frequented by wildlife may cause some simplification of the local animal community, tending to favor ubiquitous and opportunistic species to the detriment of those that are more demanding.

4.4.2.2 Operational Stage

Impacts on flora and vegetation

During the operational stage, the only interference for the component being analyzed is the following:

- dispersion of exotic invasive species, since the rail network infrastructure will become preferential routes for the dispersion of these plants.

Problems regarding the dispersion of exotic species have been mentioned previously in the identification of the construction stage impacts. This impact remains in the operational state, insofar as the railway base may become a round for dispersion of species, predominantly herbaceous, which will find ecologically favorable conditions, such as elevated levels of light, a dry growing substrate and a lack of competition with other plants. However, the railway base is subject to frequent control operations for the eradication of all plants that may take root there. Above all, these operations are repeated constantly along railway stretches subject to regular transit, which will also be the case for the works in question.

In the operating stage, the impacts of planned construction work on the wildlife component will confirm, from a qualitative point of view, those pointed out in the construction stage.

So even during the operating stage, the primary interferences can be grouped into the following categories:

- habitat reception capacity, diminished due to the permanent subtraction of **9,450 m^2** of forests or due to the degradation of its surroundings caused by acoustic emissions and/or general pollutants;

- greater species mortality, caused essentially by incidents (collisions with trains) and secondly by the emission of (noise) pollutants as well;

- less freedom of movement for wildlife, caused above all by physical obstacles (fences for example) and, to a lesser degree, by acoustic, visual and/or polluting emissions as well.

The combination of these negative incidences will define:

- the reduction of available habitats and semi-natural environments (wooded areas in particular);
- an increase in the fragmentation and isolation of animal populations present in the site area;
- the lack of accesses to important natural areas (in particular places for feeding and reproduction).

The area subject to permanent deforestation (9,450 m^2) will be subject to compensation through the planting of native forest species as indicated in Section 5.3 “Compensations and Restorations”. In this sense, the wildlife community mostly tied to the wooded areas will be “compensated” by the subtraction of elective habitats. It is further pointed out how the wooded areas will be those that are mostly diffuse both for the site and the broader area. This is therefore not deemed critical in terms of a reduction of habitat and/or reception capacity for priority species.

The base of the railway alignment will be adequately fenced so as to prevent access both to non-authorized people and to wildlife. It has therefore been deemed that this planned measure is sufficient to avoid an increase in mortality (in particular mammals, amphibians and reptiles).

The implementation of the new railway platform will cause less freedom of movement for wildlife, due to physical obstacles (such as the fences cited in the preceding paragraph). However, it has been pointed out how the planned construction work is in trenches and adjacent to the road network infrastructure, as well as in proximity to the Malpensa airport: both these last two elements broadly cover the likely acoustic disturbance caused by the construction works.

It is furthermore stressed how the course of the planned construction work does not effectively constitute a barrier to the passage of wildlife, given that to the east of this point we find first SP 52 and then the airport grounds and the Case Nuove community. Therefore, there are no attractive elements for the wildlife (highly urbanized areas and sources of disturbance), and to the contrary, we note the presence of significant infrastructure that already in itself constitutes a strong barrier.

The final design has nonetheless acknowledged the instructions given by the Ticino Park within the Incidence Assessment (carried out in the preliminary stage), stipulating the maintenance and development of a wildlife underpass at km 50+600 as well as the creation of an ecological bridge. Both operations have been considered to ensure ecological continuity with the naturalistic areas located further to the west of the alignment.

4.4.3 Mitigation and Compensation Measures

See Section 3.8.3 above for mitigation and compensation measures.

4.5 PUBLIC HEALTH

4.5.1 Current Status of the Component

The public health component was studied both by analyzing the plan tools currently available with the Region of Lombardy, and by assessing some epidemiological indicators available in the following documents:

- "*Atlas 2007: Avoidable Mortality and Demographic Context for Local Health Authorities*", for the ERA Project, 2007. Average standardized mortality rate values for both sexes showed a good quality status for the regional population. In particular, provincial averages are in line with the corresponding regional and national averages in terms of circulatory system diseases.

- "Health for All - Italy", a geographic computerized system for health and health care indicators, updated in June 2008: the standardized mortality rate (SMR) for diseases related to the nervous system and sensory organs, for both male and female populations, shows an almost constant SMR rate for both sexes at the provincial, regional and national level; for both sexes, there was a decline around 1998: the SMR for circulatory system diseases and ischemic and heart diseases shows a downward trend for all averages examined for both the male and female populations.

4.5.2 Impact Estimate

4.5.2.1 Construction Stage

During the project construction stage, potential impacts on the public health component may be due to:

- Dust emission, mainly generated by pulverization and the surface abrasion by moving vehicles while moving earth and materials, as well as mechanical actions on unstable materials and excavations performed using excavators.
- Noise emissions generated by machines used for the construction of works and the transportation involved.
- Vibration emissions generated by machines used for the construction of works.

With regard to dust emissions, impact mitigation measures have been adopted in order to control such emissions and to avoid particular impacts on the health status of the population involved.

Impact analyses on noise and vibrations during the construction stage have not revealed circumstances that would have a significant impact on the population.

4.5.3 Operational Stage

During the operational stage, impacts are attributable to the effects of sound and emissions induced by rail freights passing through the infrastructure.

With regard to noise, it has been verified that the noise differentials induced are not significant and therefore no changes to the current noise environment have been determined.

With regard to vibrations, some receptors were identified for which the effects were slightly higher than the disturbance threshold for people: however, by introducing padded materials underneath ballasts, this phenomenon is eliminated and the impact is completely mitigated.

Lastly, with regard to the connecting course between the new Terminal 2 station and the terminal, which crosses a road, the following should be noted:

- There is no alternative to this ground-level solution due to the numerous underground airport services that exist along this path, which prohibits an underground solution at an acceptable cost.
- Changes to Terminal 2 road access and to parking areas will make this road, which is currently also used to access parking and therefore has heavy traffic,

secondary. SEA anticipates that future traffic will be up to 20 vehicles per hour, all service vehicles.

- The pedestrian crossing will have traffic flow priority and vehicular obstacles such as speed bumps and barriers different than those for service crossings will be instituted.

In conclusion, there are no public safety risks for this crossing along the course that connects the railway station and the terminal.

4.6 NOISE

4.6.1 Current Status of the Component

Between 26-28 April 2012, daily and nightly acoustic measurements were carried out at 10 receptors (referred to as R1 through R10) in order to characterize the noise climate and to assess the normal limits during railway operation for the T1-T2 project.

For both reference periods, the average sound levels measured at receptors R1, R2, R4, R5, R6 and R9, which are representative of the environmental noise level, were within the emission limits imposed by Presidential Decree 18/11/98 No. 459, for their corresponding sections of the infrastructure.

At receptor R3, the 65 dB(A) limit set for section B of the railway infrastructure was complied with during the day period, while the 55 dB(A) limit set for night period was exceeded by 2.5 dB(A).
This receptor overlooks the Via della Chiesa and is located near the Malpensa Airport, so sound levels are dependent upon the passage of vehicles near the location and aircraft transit.

At receptor R7, similar sound levels were recorded for both reference periods, though the average sound level for the night period was 0.5 dB(A) higher than during the day. The day sound level, at 67.5 dB(A), was compliant with the day emission level set for section A of the railway infrastructure, which is 70 dB(A), while the night sound level, at 68.0 dB(A), exceeded the 60 dB(A) limit. Sound levels recorded at these locations have mainly depended on traffic passing on S.S. 336, which is a major road linking the Autostrada dei Laghi A8 [highway], the Malpensa Airport and the Torino-Milano A4 highway and is characterized by heavy traffic flows of both heavy and light vehicles during the day and night, as well as aircraft transit. In fact, it is clear from the statistical levels recorded during the all surveys carried out at this location that there is considerable difference between L_{A01} and L_{A90}. For example, during the survey identified by the code P7_N1, an L_{A01} equal to 85.4 dB(A) and a L_{A90} equal to 56.2 dB(A) were recorded, a clear indication that the noise climate at the receptor is essentially generated by short events of a certain intensity associated with vehicular traffic and aircraft transit.

At sensitive receptor R8, which corresponds to the former local school, currently used in educational activities for the aeronautical engineer school, the day emission limit set for its corresponding class, 50 dB(A), was exceeded. In this case as well, the noise climate is affected by the vehicle traffic on the Via Francesco Baracca, which begins near this location.

At the sensitive receptor R10, which corresponds to the church in Case Nuove, the day emission limit set for its corresponding class, 60 dB(A), was compliant, while the night emission limit, 50 dB(A) was exceeded. In this case also, the noise climate is affected by the vehicle traffic on the Via della Chiesa.

4.6.2 Impact Estimate

4.6.2.1 Construction Stage

During the railway construction stage, potential impacts on the noise competent mainly relate to noise emissions generated by machines used for construction and the transport involved.

According to what is indicated in *Paragraph 6.1.2* of the *Project Reference Framework for the Environmental Impact Study*, different construction stages that produce the most sound emissions were analyzed and the noise potential was evaluated.

The results of the simulations conducted showed that only in a few cases does the level recorded at receptors exceed the emission level for noise classification. However, it should be noted that noisiest construction activities can use mobile noise barriers, to be placed between the construction area and the receptor and an exception request for the zone limit and the differential limit for construction activities will be requested from the City.

4.6.2.2 Operational Stage

Railway traffic noise has been evaluated through the *Sound Plan version 7.0* calculation code, implemented through the RMR- 2002 regulation, which uses an internal library where different types of trains and rolling stock are defined.

Data in line with project features, indicated in the document "*Railway Systems: Equipment/Track, Technical Report*" was used for the final project design.

Examination of the results shows that the sound emissions related to railway traffic in 2015, for adjoining communities during the daytime, were at a level that varied from a minimum of 25.0 dB(A), relative to the first plane of the wall facing E from the museum 28, up to 44.2 dB(A) relative to the first plane of the wall facing SW from the industrial building 30.

At nighttime, sound emissions related to railway traffic in 2015, for adjoining communities, were at a level that varied from a minimum of 21.8 dB(A) relative to the first plane of the wall facing E from the museum 28, up to a maximum of 40.6

dB(A) relative to the first plane of the wall facing SW from the industrial building 30.

The results show, furthermore, that sound emissions related to railway traffic in 2020, for adjoining communities during the daytime, were at a level that varied from a minimum of 26.2 dB (A) relative to the first plane of the wall facing E from the museum 28, up to a maximum of 44.8 dB (A) relative to the first plane of the wall facing SW from the industrial building 30.

At nighttime, sound emissions related to railway traffic in 2020, for adjoining communities, were at a level that varied from a minimum of 23.2 dB (A) relative to the first plane of the wall facing E from the museum 28, up to a maximum of 41.8 dB (A) relative to the first plane of the wall facing SW from the industrial building 30.

From examining the results, relative to railway traffic for 2015 and relative to railway traffic for 2020, we infer that during the daytime and nighttime, at receptors neighboring the railway course, the future ambient level is still less than the standard input levels stipulated by *Presidential Decree No. 459 of 18 November 1998* for infrastructure zones with the exception of those receptors where current environmental noise is already higher than those limits.

We can therefore conclude that during the daytime and nighttime railway traffic will not alter the acoustic climate of the area, and in particular that related to receptors located in the vicinity of the area stipulated for the installation of the railway line that connects Terminal 1 to Terminal 2 of the Malpensa airport.

4.7 VIBRATIONS

4.7.1 Current Status of the Component

As far as this concerns limits for the inputs of vibrations on building, we have highlighted that until now there is no specific law for a national standard.

In any case, structural damages to buildings attributable entirely to vibration phenomena are extremely rare and almost always derive from the contribution of other causes; other forms of damage, of entities defined as “threshold”, that can occur without compromising structural safety, are indicated as “cosmetic damages” in Anglo-Saxon terminology.

Vibration phenomena in general arise from the combination of three factors:

1. Energy emission method (generation effects at the source);
2. Characteristics of the base means of the propagation phenomenon (mechanical and geometric properties of the subsoil);
3. Interaction dynamics between source and recipient.

The methodology proposed and adopted in the EIS was therefore carried out in four stages:

4. Dynamic characterization of the vibration source;
5. Geotechnical modeling of the subsoil;
6. Forecasting of the vibration level transmitted with the source through analytical methods (transport equations) in free-field conditions;
7. Assessment of the response of the receiver through comparison with maximum values of the kinematic magnitudes anticipated next to buildings identified as receivers placed at an increasing distance from the axis of the infrastructure.

4.7.2 *Assessments Connected with Construction and Operating Vibrations*

Within the implementation plan for the railway connection between Malpensa's terminals 1 and 2, vibration levels caused by construction and operating activities for the works in question were compared with those anticipated by the reference technical standards insofar as it affects both potential damage to buildings (UNI 9916) and the disturbance to the population (UNI 9614).

By comparison, it emerges that in general these levels are amply maintained underneath the limits; if an excess has been found, in connection with a single group of receivers placed at the minimum distance from the infrastructure (approximately 30 meters), special equipment will be put in place aimed at the dampening and the consequent mitigation of the vibration phenomenon, made up of elastic pads to be placed below the ballast.

4.8 *IONIZING AND NON-IONIZING RADIATION*

4.8.1 *Current Status of the Component*

The layout of the high-voltage electrical lines that cross the *Broad Study Area* is indicated as follows:

- Turbigo – Vizzola Ticino – Marcallo 132 kV power line
- Input/output connection between this line and the Malpensa Energia power plant.

4.8.2 *Impact Estimate*

In consideration of the fact that there are no receivers in proximity to the new medium voltage station built at the SP52/SS336 junction, and that the construction of new aerial power lines is not stipulated for the powering of the substation, and that the electric drive system is characterized by a continuous 3 kV voltage, any impact on this component is excluded.

4.9 LANDSCAPE

4.9.1 Current Status of the Component

The study area is integrated into the Lombardy high plain: the presence of any hills of particular interest has not been detected, even if the locality is rather articulated morphologically, in relation to the presence of a series of terraces of a fluvioglacial or fluvial origin.

The Lombardy high plain is highly urbanized, with large centers that are arranged radially around the Malpensa airport area. In addition, industrial and/or services settlements have been identified, while the remaining portion of the territory presents a respectable nature connotation, especially of forests, that are in keeping with the presence of small residential centers, also of a rural type. The entire Ticino valley is scattered with quarries, many of these still active.

On the Lombardy high plain, the natural surface hydrographic network is relatively reduced, as a consequence of the high permeability of the majority of the fluvioglacial deposits, predominantly made up of gravel and sand. The most important water course is the Ticino River, which has decisively contributed to the characterization of the territory's morphology, through the formation of a series of terraces connected by escarpments.

More structured is the network of artificial canals, including the Villoresi Canal, which has been developed next to the Ticino in the town of Somma Lombardo. Beyond the canals, there are numerous artificial basins, resulting from the excavation of sand and gravel. In the quarries no longer in operation, these basins have generally been recovered as ponds for the practice of sport fishing.

The components of the historical/cultural landscape on the other hand are represented by the system of fortifications, present in particular in the Somma Lombardo territory, by the Golasecca and Arsago Seprio archaeological sites, by the industrial and paleoindustrial archeology of the Ticino and Arno valleys, and in general by the relevance placed on historical centers.

The following table indicates the description and the estimate of the landscape values found in the study area.

Table 4.9.1a Landscape Sensitivity Evaluation of the Study Area

Components	Landscape Elements	Description	Value
Morphological Structure	Morphology	The Study Area takes place in the valley system of the Ticino, and more specifically in the urbanized plain where man made morphological transformations are the most evident. One characterizing element is the Malpensa Airport, which has been a major protective barrier for the natural areas of the Ticino Valley against further urbanization, which has developed west from the Sempione channel and up to and surrounding the airport. The boundary between urban and natural areas is marked by main road infrastructures (S.S. No. 336 and S.P. No. 52) and by the edge of the terrace that separates the Ticino valley from the high plain, with a morphological jump of approximately 70 m.	*Average*
	Naturalness	The Study Area territory shows signs of "urban" evolution, which have come to characterize this geographical area over the past century. Areas of natural value include those within the Ticino Valley Natural Park (SIC and ZPS).	*Average* *Low*
	Protection	The entire territory is protected as a part of the Ticino Valley Regional Park.	*Average*
	Surveyed Historical Value	No surveyed/historical values have been reported for the Study Area. Some archaeological findings have been documented (see *Section 9.1.5*).	*Low*
Picturesque Landscape	Panoramic Views	There are no areas with extensive panoramic views, mainly due to the dense vegetation along the main road infrastructures and along the perimeter of Malpensa, which significantly masks the "backdrop". Sometimes these road structures are also significant visual barriers.	*Low*
Symbolic	Unique Landscape	The land is distinguished by fragmentation as typical of conurbations: on one hand, morphological structural characteristics make man made features not visible in protected areas, where the symbolic elements are associated with the historical evolution of the waterway, but on the other hand, the strong historical roots of deep polycentrism and the spread of economic structures in the metropolitan area has had a profound effect on the progress of cultural features and regional definers for the entire Malpensa area.	*Low*

According to the analyses carried out, it has been determined that the landscape sensitivity for the Area Study is low overall.

4.9.1.1 Archeology

Various archaeological sites that confirm that presence of humans since prehistoric times are located within the project territories.

The study was focused on both evaluating the impact on archaeological sites with regard to the type of course planned and identifying specific alignments that could indicate areas where there was a high probability of discovering archaeological finds, even where there was no specific evidence of such, by considering geomorphological mapping and the road network.

In particular, a two-fold risk assessment was carried out that included:

- An assessment of the degree of absolute risk: assessing the risk based on the distance between the reported sites and the area intended for the project. There are three distinctive degrees of risk:
  - High risk, for sites located in an area within a 100 m range of the course or construction areas. Areas with strong ancient human activity are also considered high risk, irrespective of their distance from works.
  - Medium risk, for sites located in an area within a 100 m - 200 m range of the course or construction areas. Areas where no ancient human findings have been noted are also considered medium risk.
  - Low risk, for sites located more than 200 m away from the course or construction areas or areas with low ancient human activity.

- An assessment of the degree of relative risk: taking account of all analyses conducted and assessing the degree of risk with regard to the stipulated course, construction areas and interference conditions.

Absolute Risk Assessment

The area under study has been populated by humans since prehistoric times. The Lagozza culture, which takes its name from the archaeological site near Besnate, is a very important indication of the transition between the Stone Age and the Metal Age. Prehistoric burial sites were located at Case Nuove (in the town of Somma Lombardo) and a prehistoric site has also been reported at the Brughiera del Dosso (also in Somma Lombardo).

There are also very important sites connected with the Golasecca and Protogolasecca cultures. For the area under study, these include the burial sites at the Brughiera del Dosso and at the Malpensa airport (in Somma Lombardo).

Part of the territory lies in the Ticino Park, where there are archaeologically protected areas and areas that present an archaeological risk according to Art. 12/1 of Regional Law No. 33 of 22-Mar-1980. These areas are considered to have *Medium* Absolute Archaeological Risk Potential.

Relative Risk Assessment

The following are considered to have Relative Archaeological Risk Potential:

- *High*, almost all of the railway course that falls within the archaeological risk area (Regional Law No. 33 of 22-Mar-1980) and is within the vicinity of various findings (Site 8: Brughiera del Dosso – Somma Lombardo, prehistoric site; Site 9: Case Nuove – Vizzola Ticino, settlement during the Roman period; Site 10: Malpensa Airport - Somma Lombardo, prehistoric burials and food storage sites dating back to the early stage of the Late Bronze Age; Site 11: Brughiera del Dosso – Somma Lombardo, Protogolasecca burial site findings; Site 12: Case Nuove – Vizzola Ticino, prehistoric burial mound findings; Site 14: Brughiera del Dosso – Somma Lombardo, burial site findings dating to XII-X century, BC);

- *Medium*, the final section of the line for the project and the T2 Station area, which is located in an archaeologically protected area (Regional Law No. 33 of 22-Mar-1980) (Site 16: Brughiera di Casorate, Somma Lombardo, grass-mark reported in aerial photo).

The Absolute Risk Map and Relative Risk Map for the operation area are indicated in Figure 9.1.5a and b.

Opinion of the Government Department Responsible for the Archaeological Heritage of Lombardia.

The Government Department for the Archaeological Heritage of Lombardy, through enacting Protocol No. 1906 of 12 February 2012, expressed a favorable opinion toward the preliminary draft of the project, with the following requirements:

- After explosive weapons are recovered using a metal detector, which should be performed through slow topsoil removal, making passes from 10-20 cm to approximately 1 m until the barren portion is reached.
- Each activity must be monitored by an archaeologist.
- In the event of an archaeological discovery, detection, classification, cleaning and removal of mobile materials will ensue.

4.9.2 Estimate and Assessment of Impacts

In consideration of project choices, impacts on components are mainly attributable to morphological and typological elements, following the construction of trenches and tunnels. The visual impact of the new railway line is irrelevant and only relates to the construction site stage, which is only temporary. Therefore the impacts generated will be completely restored.

The most significant visual impact is that associated with the new station at Terminal 2. However, it should be noted that this station will be built on an area that is currently used as a parking lot, adjacent to other service facilities for the Malpensa Airport.
Given the features of the project and the assessed impacts on vegetation and landscape components, mitigation measures have been instituted to reduce the direct effect of the project in question, as well as compensation measures for wooded areas which will be reduced out of necessity for the project.

The general criteria underlying the definition of compensation/mitigation operation methods are defined according to the work stipulated by the project and the type of operation areas (nature-oriented, degree of sensitivity, etc.). More specifically, there are two main operation goals, although they greatly overlap in terms of practical planning:

- Nature restoration and conservation operations
- Landscape-oriented and functionality operations (mostly aesthetic and ornamental).

Landscape-functionality operations are primarily intended for areas where it is not possible or makes little sense to recreate the natural conditions, since the environment where they are situated is particularly compromised. These areas have been defined as non-functional, in areas intended for urban design, along roadways servicing the works. Therefore, these operations are above all set-up as mitigation works.

The purpose of nature-related operations is to compensate for the loss of the reduced habitat, and to mitigate the level of criticality as determined in relation to the execution of project works. It remains clear that the majority of the specified types of nature and conservation-related operations is also inherent to landscape-functionality goals.

5 MONITORING PLAN GUIDELINES

The Environmental Impact Study contains the guidelines for creating the monitoring plan to be carried in order to control impacts generated by the construction of the new railway line connecting Malpensa Terminals 1 and 2.

Guidelines were agreed upon with the ARPA - Dipartimento Provinciale di Varese [Varese Provincial Department] at a meeting held at the organization's headquarters on 16 April 2012 that included the Agency's engineers and technicians.

The document was drafted in accordance with the *Guidelines for the Environmental Monitoring Project (EMP) for Strategic Infrastructures and Production Facilities pursuant to Leg. Decree 12 April 2006, No. 163* - Revision 2 of 23 July 2007 - drafted by the Special Commission for the Environmental Impact Assessment at the Ministry for the Environment, Land and Sea, whose prepared criteria is reported below.

Based on these considerations, and upon agreement with ARPA technicians, environmental components were defined and the environmental monitoring stages are reported in the following table.

Table 5a Environmental Components to be Monitored and Project Stages

Components	Project Stage		
	Pre-operations	Operations	Post-operations
Atmosphere	☑	☑	
Groundwater	☑	☑	☑
Noise	☑	☑	☑
Vibrations		☑	☑
Vegetation			☑

General environmental monitoring criteria will be developed in a manner that analyzes the consequences of the project on the Case Nuove community with regard to the atmosphere, groundwater, noise and vibration components.

As for vegetation components, analyses conducted through the Environmental Impact Study within the Environmental Reference Framework have, in general, shown that the types of vegetation in the operation areas have reduced conservation value because they have been overwhelmingly invaded by exotic species caused by high levels of human disturbance, as might be expected in areas that are increasing developed on one side and have natural park areas on the other side.