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UNDERSTANDING PASSENGERS' LANDSIDE MOBILITY DEMAND, NEEDS & BEHAVIOURS

Milan Airports: passengers' landside mobility
demand, needs & behaviours

Version 2
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Written by SEA





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1. Introduction

This report focuses on the analysis of Milan Airports' passengers' landside accessibility demand and travel behaviours. It is structured as it follows:

- Chapter 2 present the passenger survey developed by SEA Milan Airports, its scope, size and sample description in terms of socio-economic characteristics.
- Chapter 3 includes the survey results with focus on travel behaviours, surface access choice, spending, travel preferences; it also includes an analysis of the Airports' catchment area.
- Chapter 4 includes passengers' surface travel choice forecasts.
- Chapter 5 includes the conclusions.
- Appendix 1 includes classification tables supporting the analysis.



2. Passenger survey

2.1. Survey objectives and methodology¹

The survey on passengers' demand focussed on travel behaviours and patterns at both Linate and Malpensa Airports. SEA Milan Airports developed the survey as part of a wider research aimed at providing a solid analytical base for the infrastructure investment concerning the extension of the railway connection from Malpensa Airport Terminal 2 to the *Sempione-Gallarate* railway line.

Despite the targeted focus on rail transport at Malpensa Airport, the survey collected valuable information concerning travellers' surface access choices at both Linate and Malpensa Airports.

The survey lasted 7 months (from February to August 2016) and covered 3 terminals and 6 areas at Malpensa and Linate Airports. Passengers of 75 airlines travelling to 153 destinations participated in the survey. The survey encompassed "face-to-face" interviews in the departure area during the pre-departure waiting time in the proximity of gates. This guaranteed a very high rate of response. The survey targeted people older than 18 years old and it was delivered in 5 languages (Italian, English, French, Spanish and German).

The following Table provides details on the survey dimension and timing.

Table 1. Passengers' survey by period and terminal

Terminals	Low season (February - March)	Middle season (May)	High season (July - August)	Total interviews
Malpensa Terminal 1	929	1,625	2,089	4,643
Malpensa Terminal 2	1,471	2,575	3,311	7,357
Linate	-	2,100	2,800	4,900
Total interviews	2,400	6,300	8,200	16,900

Source: Gruppo CLAS for SEA, Indagine demoscopica a supporto della pianificazione della nuova accessibilità ferroviaria a Malpensa, 2016

The survey focused on the following main aspects:

- demographic data;
- knowledge about the means of transport to the Airports;
- point of departure and traveller's destination;
- surface travel choices for both Malpensa and Linate; and
- other information on landside mobility services.

2.2. Sample description

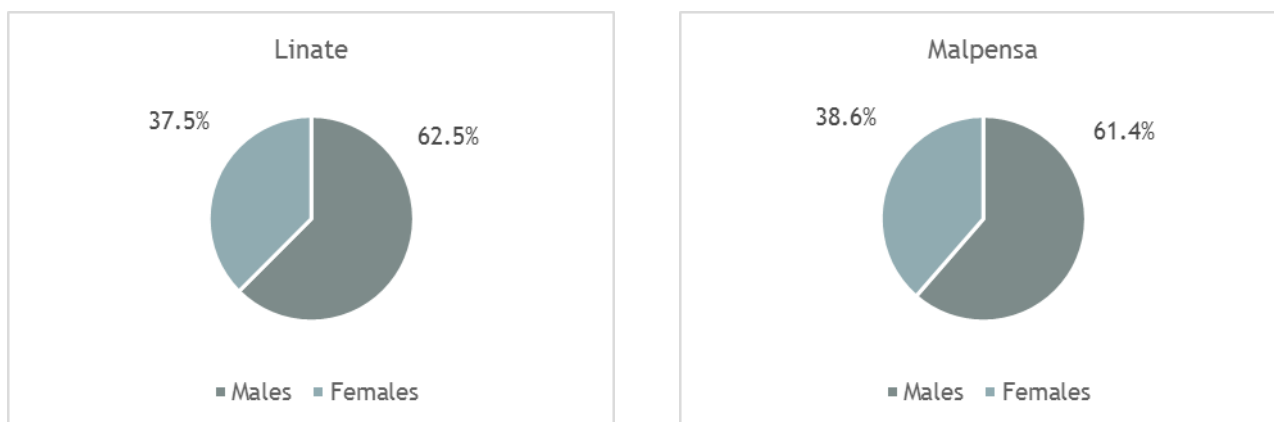
The survey sample was segmented with the aim of guaranteeing a sound passenger profiling, according to the following main criteria: gender, age, education level, employment type, travel destination, reason for travelling.

The following Figure reports information on the sample gender. Male travellers prevail at both Linate and Malpensa (slightly more than 60% at both Airports).

¹ The survey methodology refers to the study that SEA Milan Airports commissioned to Gruppo CLAS: "Indagine demoscopica a supporto della pianificazione della nuova accessibilità ferroviaria a MXP", 30 November 2016



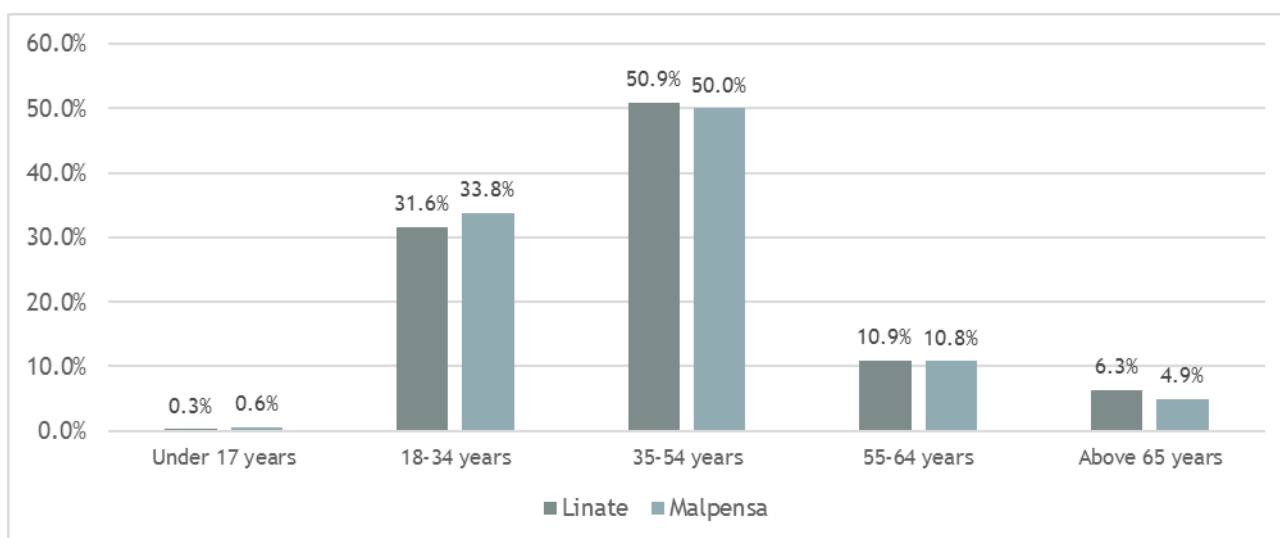
Figure 1. Malpensa and Linate passengers by gender



Source: Data from Gruppo CLAS for SEA, Indagine demoscopica a supporto della pianificazione della nuova accessibilità ferroviaria a Malpensa (2016), Steer graphic elaboration

The sample age distribution also has similar patterns at Linate and Malpensa, as reported in the following Figure. Approximately one third of all passengers are under 35, half of passengers are in between their mid-thirties and mid-fifties; the remaining interviewed passengers are older.²

Figure 2. Malpensa and Linate passengers by age group



Source: Data from Gruppo CLAS for SEA, Indagine demoscopica a supporto della pianificazione della nuova accessibilità ferroviaria a Malpensa (2016), Steer graphic elaboration

The following Figure shows passenger’s education level according to seven categories: Primary School (or no-school degree), Secondary School, High School in progress, High School completed, University Degree in progress, University Degree completed, or Not Answered.

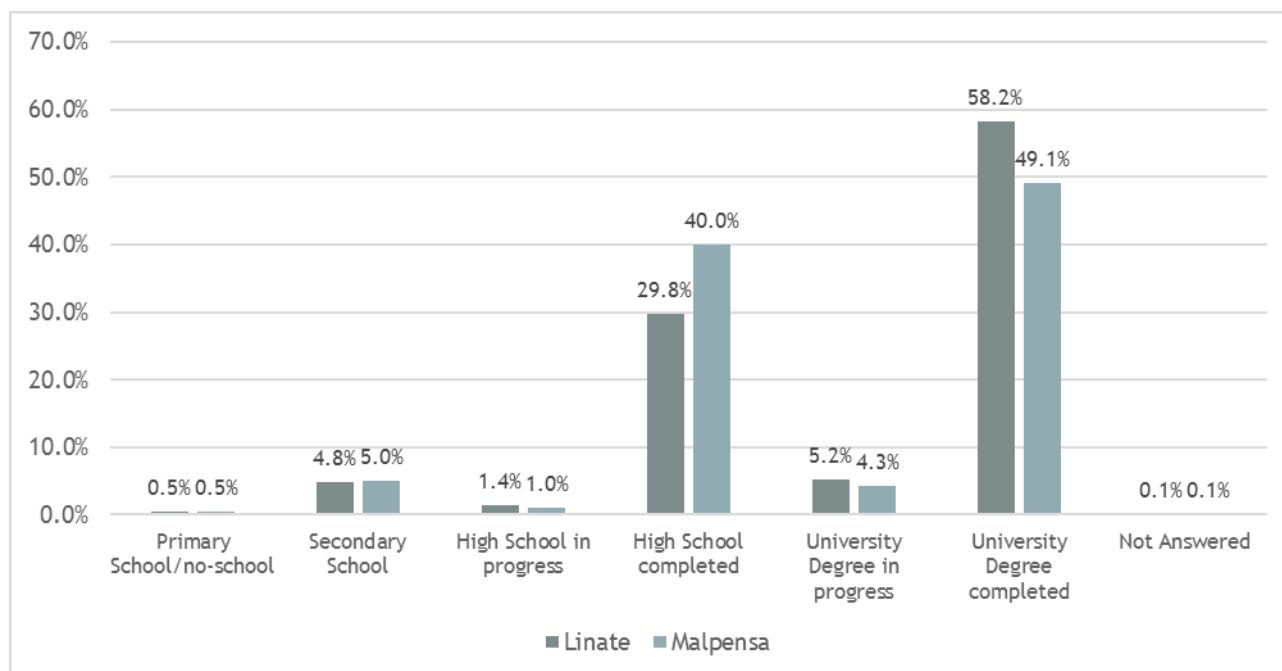
Most passengers at both Airports have a University Degree; Linate passengers have a higher level of education compared to Malpensa (58.2% with a University degree compared to 49.1%). This seems to be in line with Linate positioning on business clients, that we can expect having a higher education level.

High School graduates plus University students amount to 44.3% of the Malpensa passengers and for 35.0% of the Linate passengers. Other categories could be undercounted due to the survey age restrictions.

² It should be noted that the share of passengers under 18 could be misrepresented, because interviewers were instructed not to approach younger passengers (due to their dependent status from others and lack of legal capacity).



Figure 3. Malpensa and Linate passengers by level of education

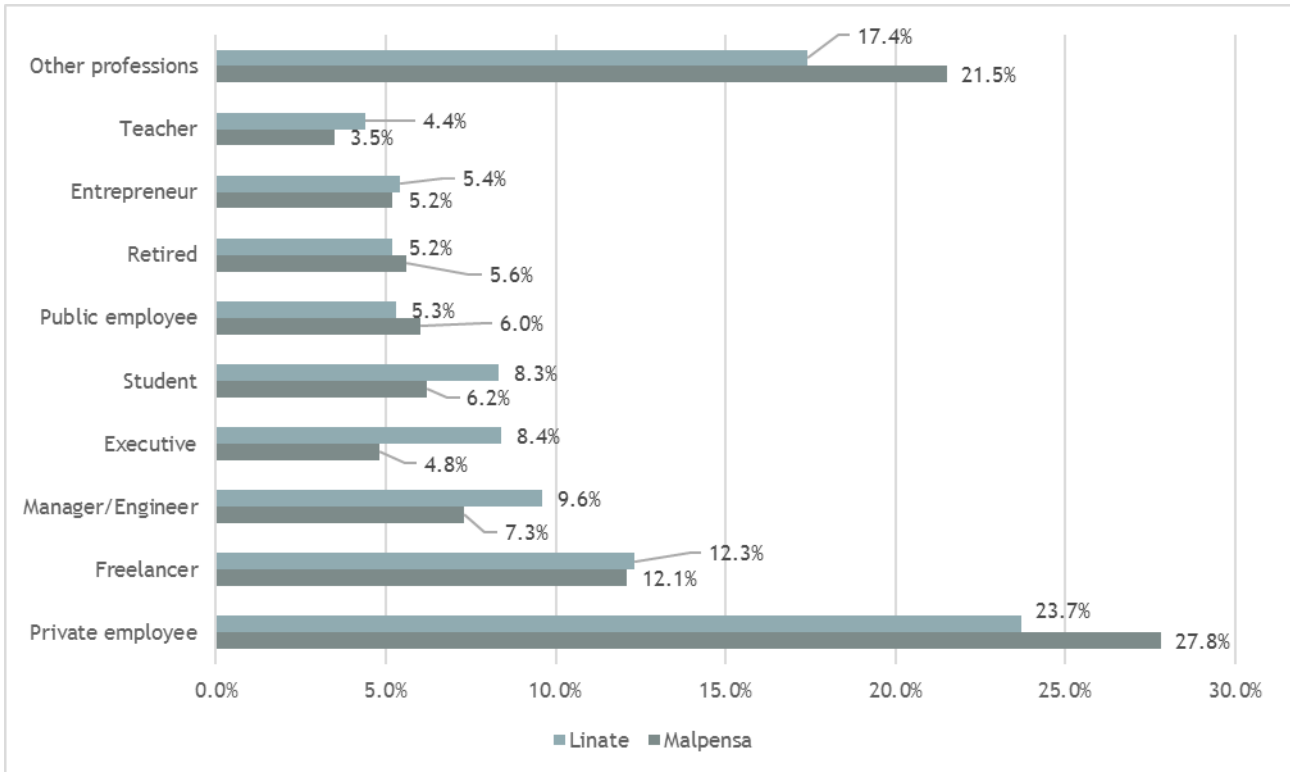


Source: Data from Gruppo CLAS for SEA, Indagine demoscopica a supporto della pianificazione della nuova accessibilità ferroviaria a Malpensa (2016), Steer graphic elaboration

The following Figure shows passengers' employment type. The highest share of passengers are employees in the private sector (27.8% for Malpensa and 23.7% for Linate). Freelancers are the second largest group for both airports (approximately 12%).

Linate Airport has slightly higher shares of entrepreneurs, managers and executives compared to Malpensa. Nevertheless, it also has a slightly higher share of students.

Figure 4. Passengers of Malpensa and Linate by employment type



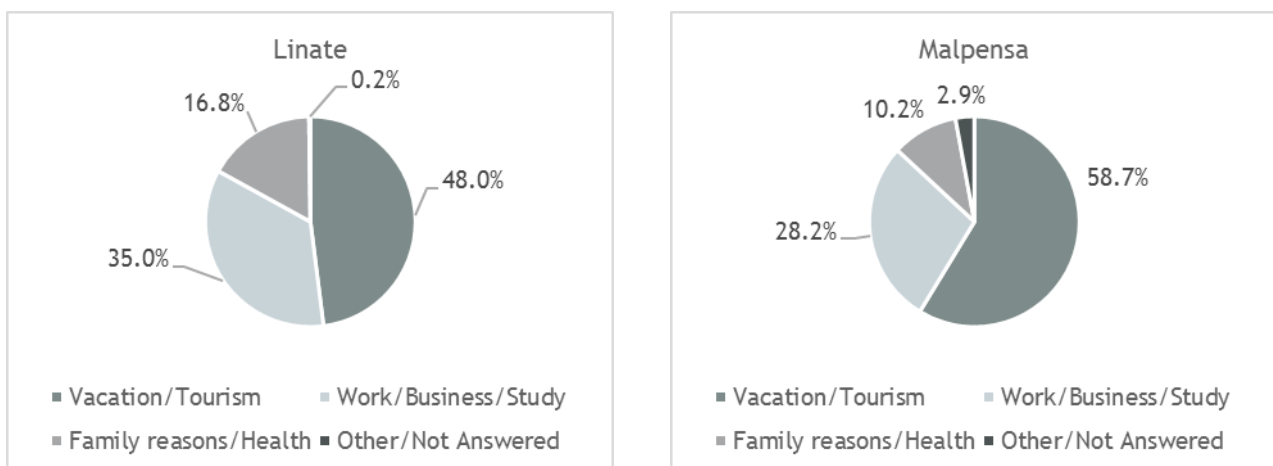
Source: Data from Gruppo CLAS for SEA, Indagine demoscopica a supporto della pianificazione della nuova accessibilità ferroviaria a Malpensa (2016), Steer graphic elaboration

Concerning the reason for travelling, the following Figures shows that Vacation/Tourism is the main reason at both Linate (48.0%) and Malpensa (58.7%).

The share of Work/Business/study travels is higher for Linate: 35.0% against 28.2% for Malpensa; we note that despite Linate has a market positioning on business clients the difference with Malpensa is not significant.

Linate has a higher share of travelling for Family reasons/Health reasons: 16.8% compared to 10.2% for Malpensa.

Figure 5. Linate and Malpensa passengers by reasons for travel



Source: Data from Gruppo CLAS for SEA, Indagine demoscopica a supporto della pianificazione della nuova accessibilità ferroviaria a Malpensa (2016), Steer graphic elaboration



3. Passenger mobility demand and behaviour analysis

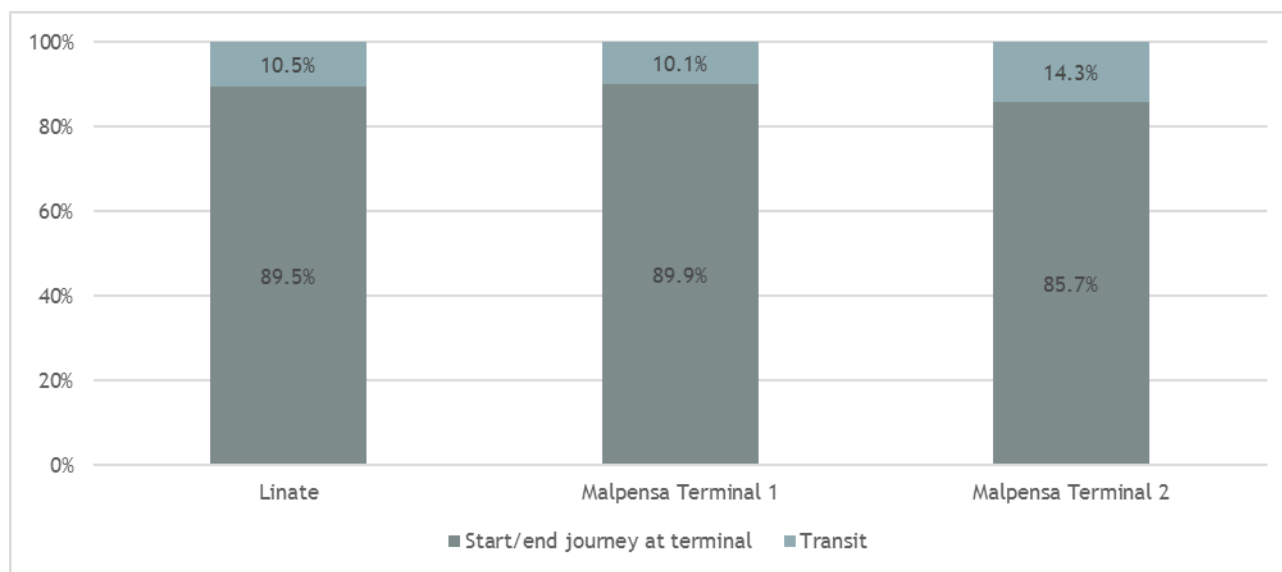
This Chapter presents the analysis of Linate and Malpensa passengers' landside mobility demand and behaviour.

3.1. Passengers at terminals

The survey analysed passengers' mobility demand in all terminals of Milan Airports: Linate, Malpensa Terminal 1 and Malpensa Terminal 2.

All of them are mostly characterized by passengers which start their journeys at the Airports' terminals, with values near to 90%. The only exception is Malpensa Terminal 2, which is slightly more oriented to transiting passengers than the other two terminals (14.3% compared to about 10%), as reported in the following Figure. This is explained by the fact that Terminal 1 hosts major full-service carriers operating on international and inter-continental destinations.

Figure 6. Transiting passengers by terminal



Source: Data from Gruppo CLAS for SEA, Indagine demoscopica a supporto della pianificazione della nuova accessibilità ferroviaria a Malpensa (2016), Steer graphic elaboration

The following Figure gives more details on passengers who transit at the terminals and in particular if they change terminal and to/from which one.

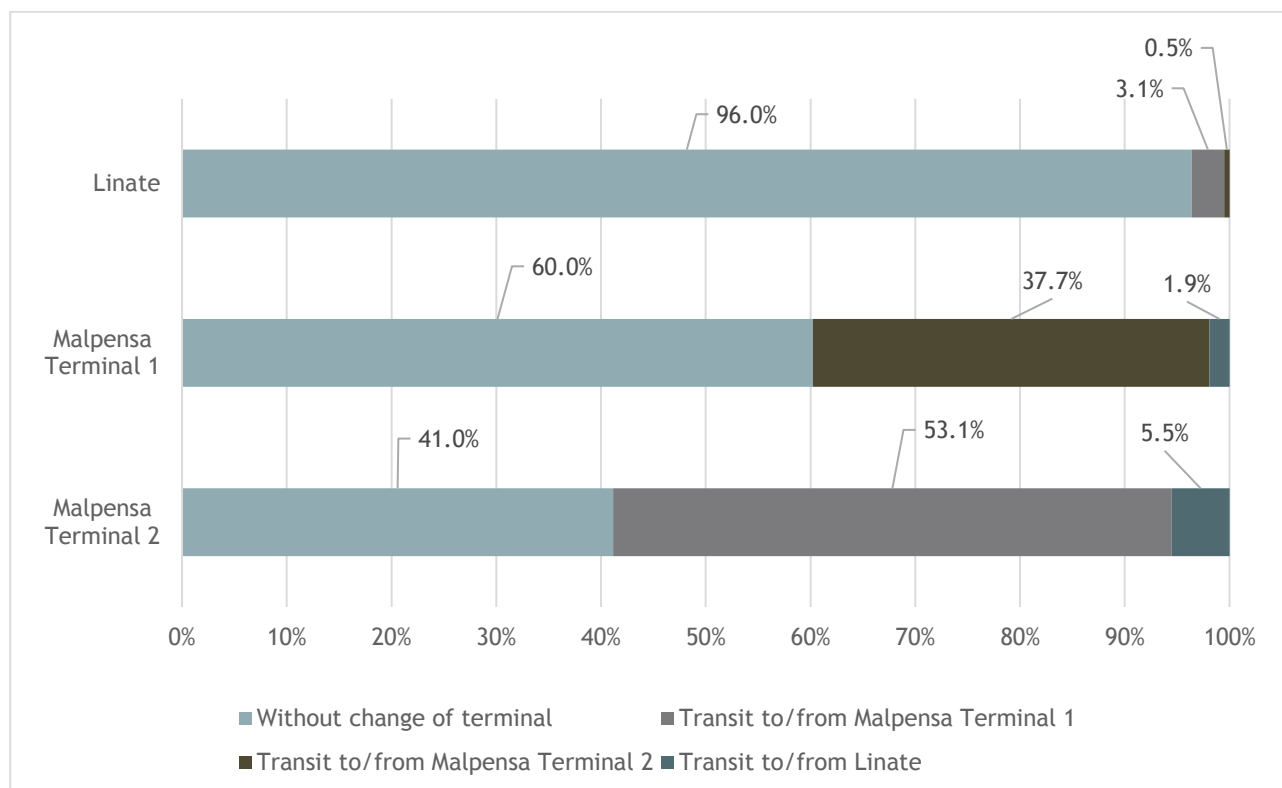
Most passengers transiting in Linate do not change terminal: only 3.6% move to Malpensa for a plane change.

Passengers transiting in Malpensa are characterized by a greater diversity:

- 60% and 41% (for Terminal 1 and Terminal 2 respectively) of Malpensa passengers continue their journey without a terminal change;
- more than a half of Malpensa Terminal 2 transiting passengers move to Terminal 1 for further travel;
- almost 40% of Malpensa Terminal 1 passengers transit to Terminal 2.
- the percentage share of Malpensa Terminal 2 passengers transferring to Linate is more than 10 times higher than the share of passengers going in the opposite direction.



Figure 7. Transit origin/destination terminals by terminal



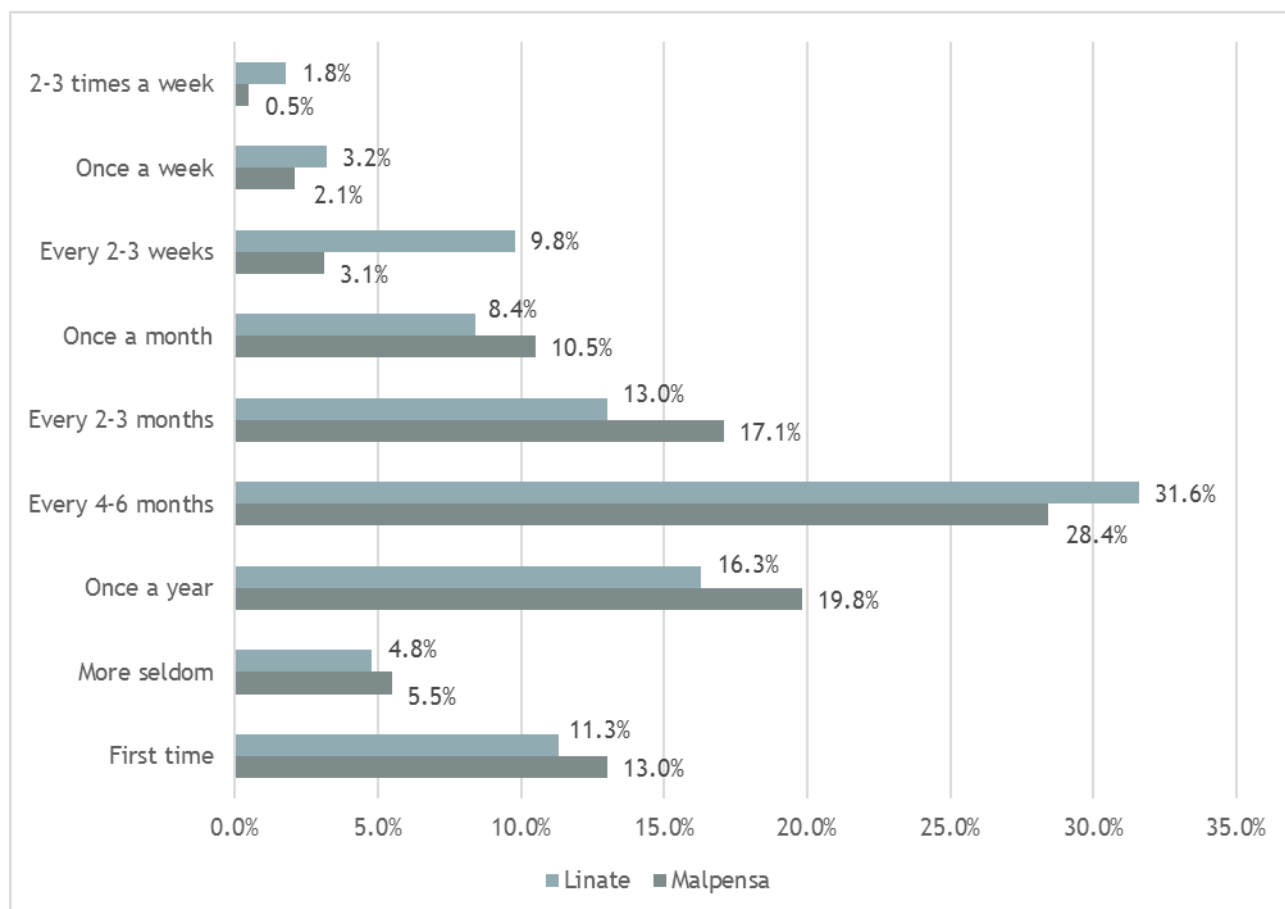
Source: Data from Gruppo CLAS for SEA, Indagine demoscopica a supporto della pianificazione della nuova accessibilità ferroviaria a Malpensa (2016), Steer graphic elaboration

The following Figure provides details on Linate and Malpensa passengers' travelling behaviour in terms of Airports choice:

- Approximately one third of Linate passengers occasionally travel via the Airport: in particular, they travelled via Linate for the first time, or travel via the Airport once a year or more seldom.
- The percentage of passengers with the same airport choice frequency for Malpensa is higher and amounts to more than 38%.
- The most frequent single category of users in terms of frequency in the Airports choice is "every 4-6 months" - approximately one third for both Linate and Malpensa.
- Frequent travellers at the Airports (travelling 2-3 times a week, once a week, every 2-3 weeks or once a month) account for 23.2% for Linate and 16.2% for Malpensa. This could be explained by the higher incidence of business travellers at Linate due to its proximity to Milan.



Figure 8. Frequency in choosing Milan Airports in the last 12 months



Source: Data from Gruppo CLAS for SEA, Indagine demoscopica a supporto della pianificazione della nuova accessibilità ferroviaria a Malpensa (2016), Steer graphic elaboration

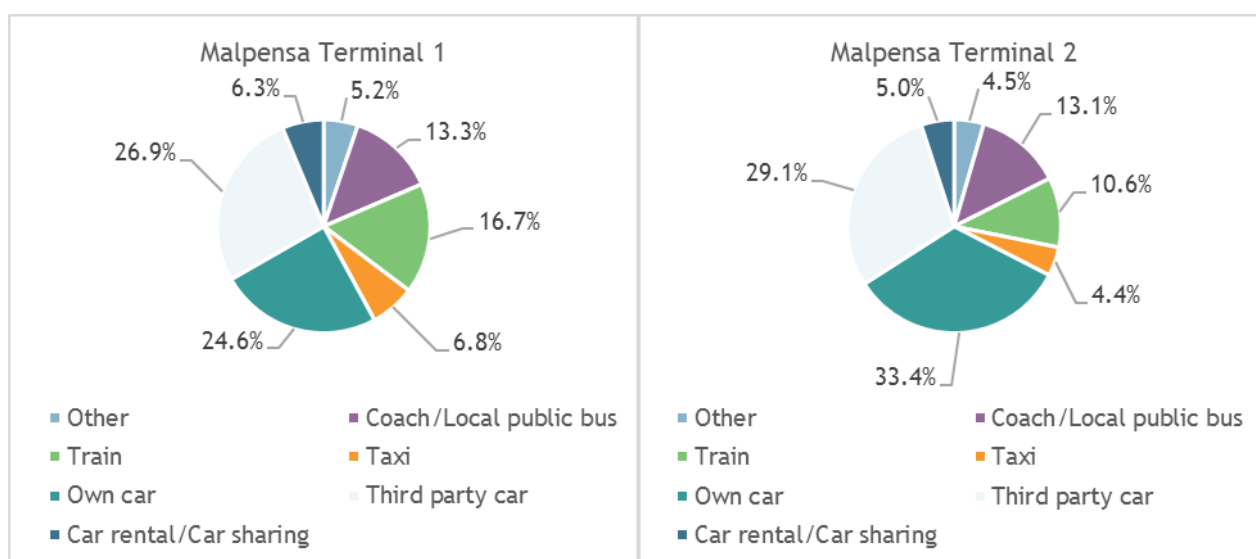
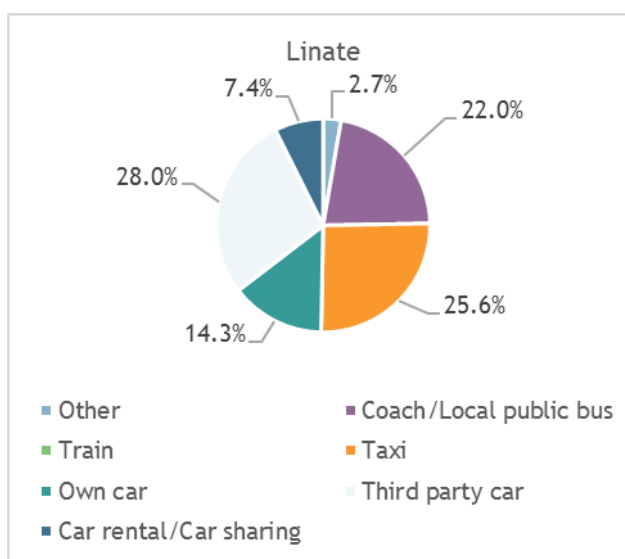
3.2. Passengers travel choice

SURFACE ACCESS MODAL SPLIT BY TERMINAL

The passenger survey at the three terminals revealed passengers’ choices on surface access. Questionnaires offered detailed options, which were subsequently grouped into transport means macro-categories for the analysis.³ The following Figure shows the analysis results.

³ Subdivision of macro categories is shown in the Appendix Table A1.

Figure 9. Passengers' travel choice by terminal



Source: Data from Gruppo CLAS for SEA, Indagine demoscopica a supporto della pianificazione della nuova accessibilità ferroviaria a Malpensa (2016), Steer graphic elaboration

28% of passengers at Linate used a third-party car to get to the Terminal, while taxi is the second most frequent travel choice (25.6%).

About one fifth of passengers chose a bus, 14.3% of passengers travelled by their own car and 7.4% of passengers rented a car or used a car-sharing service; the remaining 2.7% of passengers travelled by a hotel bus, a tour operator bus, a motorcycle, by foot or in another way (category "Other" in the Figure above).

The distribution of Malpensa passengers' travel choices is different from Linate, except for the use of a third-party car and car-rental, which have shares similar to Linate.

Concerning the comparison between Malpensa Terminal 1 and 2 we note that:

- the category third-party car has similar percentages (26.9% for the Terminal 1 and 29.1% for the Terminal 2).
- the percentage of passengers who travelled by their own car is different among the two Terminals: 24.6% for Terminal 1 and 33.4% for Terminal 2.



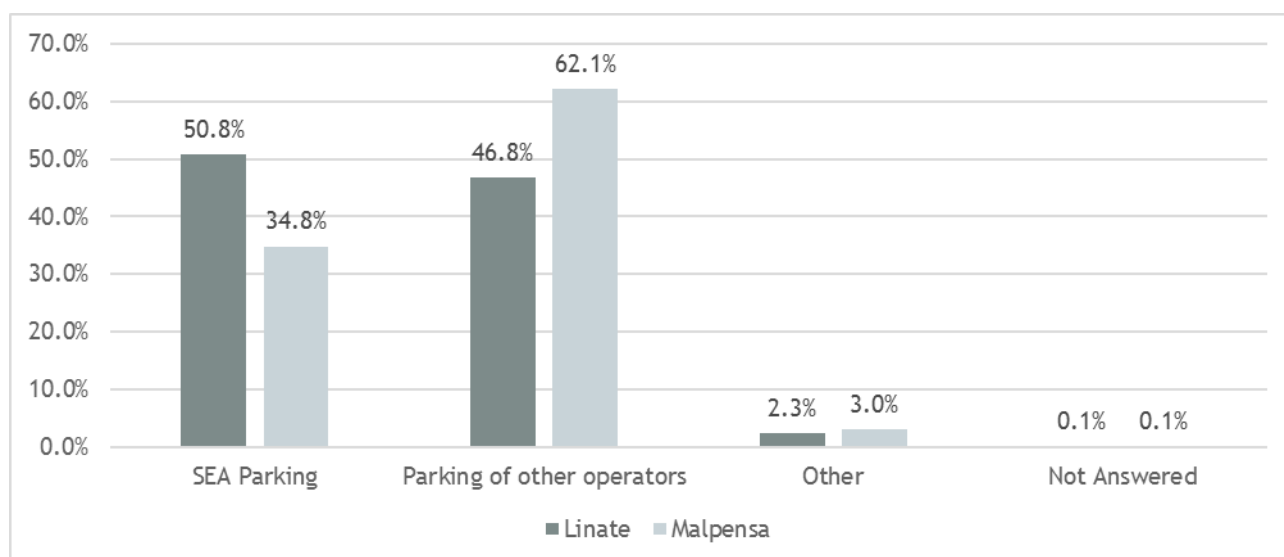
- the percentage of passengers travelling by train differs by Terminal, being 6.1% higher for Terminal 1 than for Terminal 2.
- the share of bus as travel choice is the same for both Terminals (13%).
- car-rental/car-sharing is slightly more used by Terminal 1 passengers (this could be explained by the fact that more car-rental/car-sharing operators are based there).

PARKING CHOICE

People travelling to Malpensa and Linate Airports by car have a choice between official airport parking and parking services provided by external operators, which are located nearby the Airports. The following Figure shows passengers' preferences.

Concerning Linate, preferences are almost equally distributed between the two options, while Malpensa Airport passengers most frequently choose services of other operators (62.1%), opting for SEA parking only in approximately a one third of cases.

Figure 10. Use of parking services by the passengers of Malpensa and Linate Airports



Source: Data from Gruppo CLAS for SEA, Indagine demoscopica a supporto della pianificazione della nuova accessibilità ferroviaria a Malpensa (2016), Steer graphic elaboration

CORRELATION ANALYSIS: PASSENGER PROFILE AND TRAVEL CHOICE

This section presents a correlation analysis of passengers' profiles and travel choices.⁴

The main correlation attributes selected for the analysis were age, reason of travel and GDP *per capita* of the passenger's country of residence. Passengers' travel choices were clustered into four categories with the aim of ensuring comparability of results between the three terminals, considering that they have partially different surface access types of services (and possible choices).⁵

The analysis shows that:

- the age attribute correlates with passengers' travel choices;
- the country of residence (and related GDP *per capita*) attribute has not significant correlation;

⁴ PwC for SEA, Piano Strategico dell'Accessibilità Terrestre degli Aeroporti di Milano Linate e Milano Malpensa (February 2018)

⁵ The clustering of attributes and travel choices into categories is reported in Tables A1, A2 and A3 in the Appendix.

- the reason of travel attribute shows the same travel choice by passengers taking national flights from Linate and Malpensa Airports.

The following Table shows the correlation details between age and travel choice for both national and European flights.

Table 2. Correlation of travel choices with age groups for Linate and Malpensa Airports

Travel choice	Linate	Malpensa
 Own car	35-64 years	35-54 years
 Third party car	14-17 years, >65 years	14-24 years, >65 years
 Local public transport	18-24 years	18-24 years
 Other	14-17 years, 35-64 years	14-17 years, 35-64 years

Source: PwC for SEA, Piano Strategico dell'Accessibilità Terrestre degli aeroporti di Milano Linate e Milano Malpensa (February 2018), graphic elaboration by Steer

According to the results of the correlation analysis the youngest travellers (14-17 years) show strongest preference for a third-party car and other travelling modes, which is logical due to the fact they can't drive a car yet. Young adult passengers (18-24 years) usually choose local public transport to get to both Airports, as it is the cheapest travelling mode. Middle-aged and senior travellers (35-64 years) generally opt to reach terminals by their own car or by other travel modes. The most senior passengers (>65 years) are generally accompanied to the Airport (third-party car).

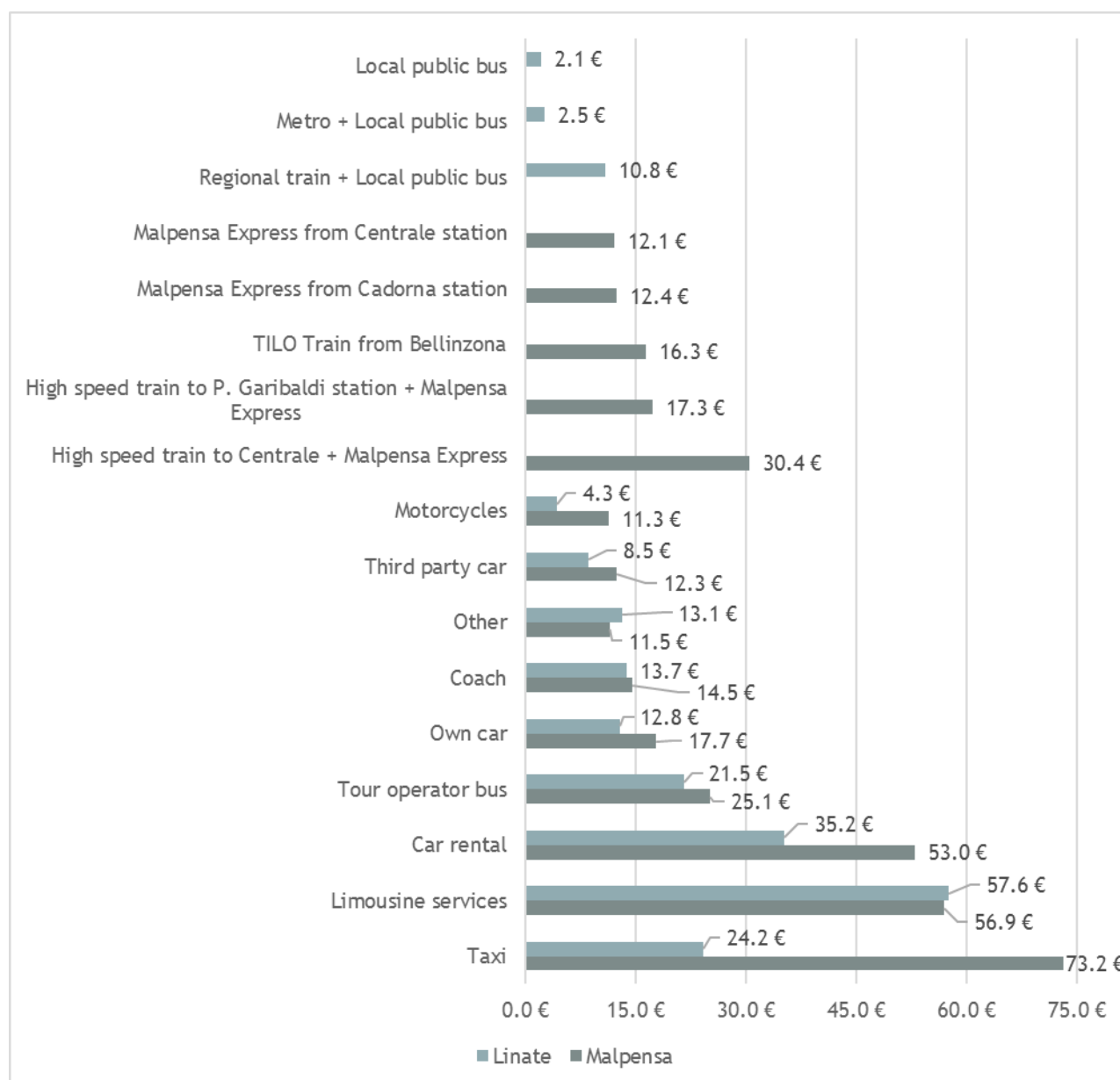
SURFACE ACCESS SPENDING

The passenger survey included questions regarding transport spending to reach Airports. The following Figure shows *per capita* spending of the passenger sample according to their chosen way of travel to a specific Airport.

Linate and Malpensa Airports differ in terms of modes of access as a railway connection is available only to Malpensa, while local public buses (plus other means of local transport) arrive exclusively at Linate.

It is evident from the graph below that Linate is more affordable in terms of travel spending as passengers' *per capita* spending is lower than that of Malpensa passengers for corresponding travel options (with the only exception of the Limousine services and the Other options). This may be substantially due to the difference in distance between the Airports and Milan.

Figure 11. Surface access spending to Linate and Malpensa Airports, € per capita



Source: Data from Gruppo CLAS for SEA, Indagine demoscopica a supporto della pianificazione della nuova accessibilità ferroviaria a Malpensa (2016), Steer graphic elaboration

FOCUS ON MALPENSA EXPRESS

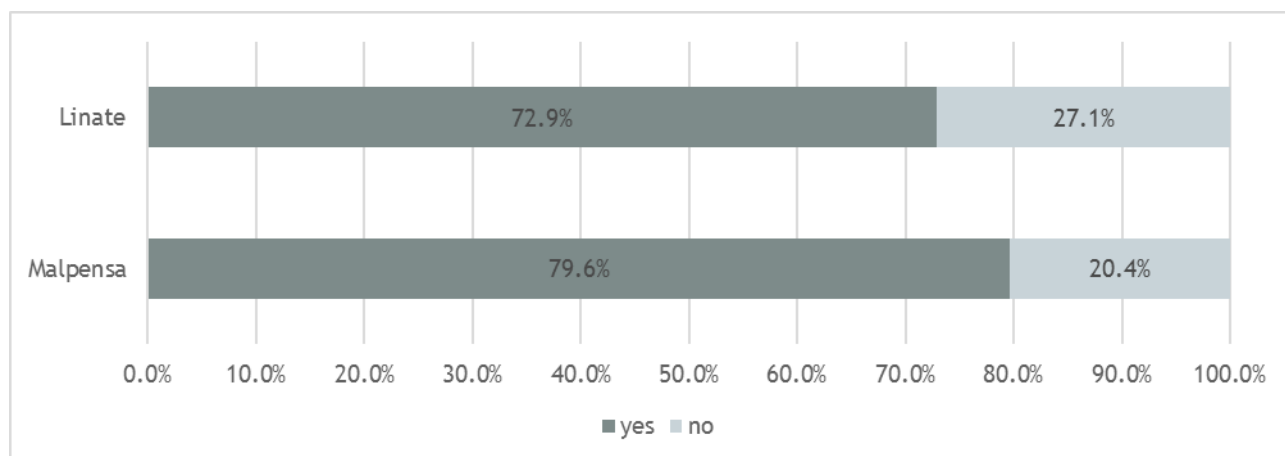
The study at the basis of this report⁶ aimed at informing the investment project concerning the railway connection of Malpensa Terminal 2 with the north rail line to *Sempione*. The study collected information concerning passengers' awareness of the existence of the Malpensa Express rail service (currently to terminals 1 and 2) and their preferences on railway stations to travel to Malpensa.

The following Figure shows results on passengers' awareness of the existence of the Malpensa Express rail service.

⁶ CLAS for SEA, Indagine demoscopica a supporto della pianificazione della nuova accessibilità ferroviaria a Malpensa (2016)



Figure 12. Awareness of the Malpensa Express service



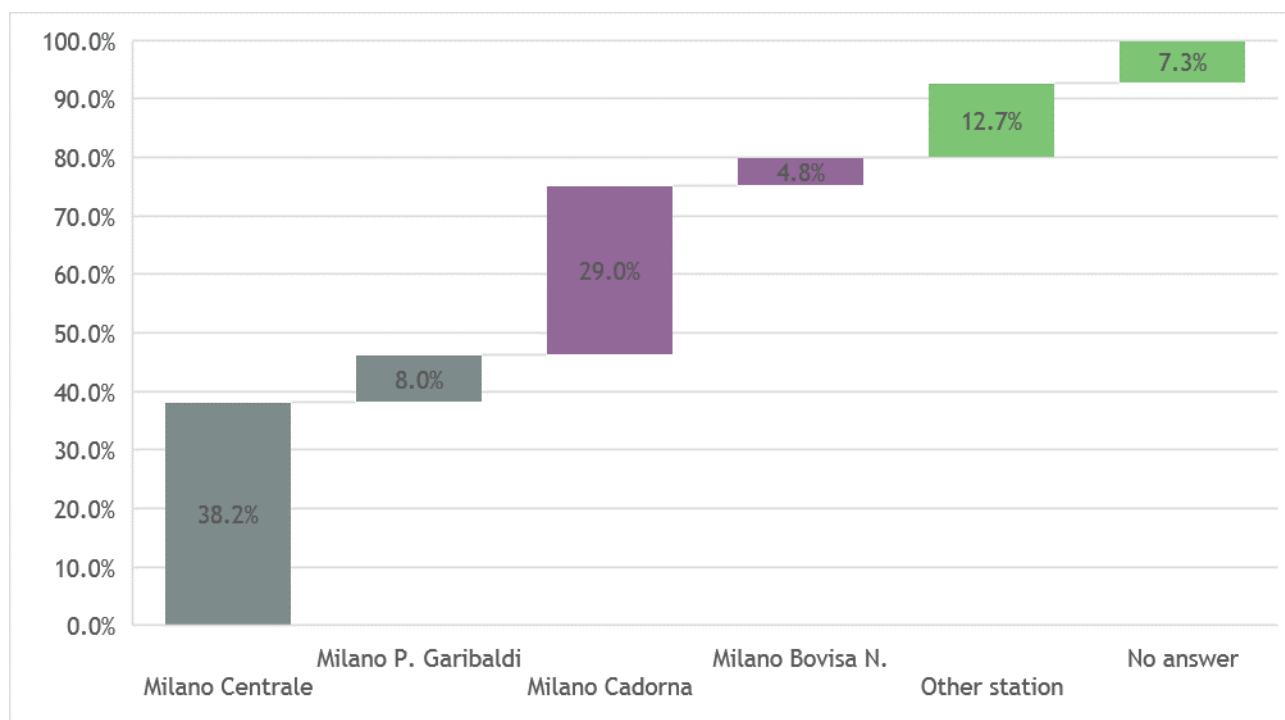
Source: Data from Gruppo CLAS for SEA, Indagine demoscopica a supporto della pianificazione della nuova accessibilità ferroviaria a Malpensa (2016), Steer graphic elaboration

Passengers were also asked to express their opinion about the convenience of the Malpensa Express stations to reach Malpensa; the following Figure shows the results.

Grey bars refer to the Malpensa Express connection departing from Milano Centrale station. It comprises Milano Porta Garibaldi station as choice to reach Malpensa.

Violet bars refer to the Malpensa Express connection departing from Milano Cadorna. It comprises Bovisa station as choice to reach Malpensa.

Figure 13. Most convenient station to go to Malpensa by train



Source: Data from Gruppo CLAS for SEA, Indagine demoscopica a supporto della pianificazione della nuova accessibilità ferroviaria a Malpensa (2016), Steer graphic elaboration



Further analysis of the data collected with the survey indicated that the railway services to the Malpensa Airport have a potential of 4.9 million new passengers a year, which would result in almost 7.3 million total passengers a year.⁷

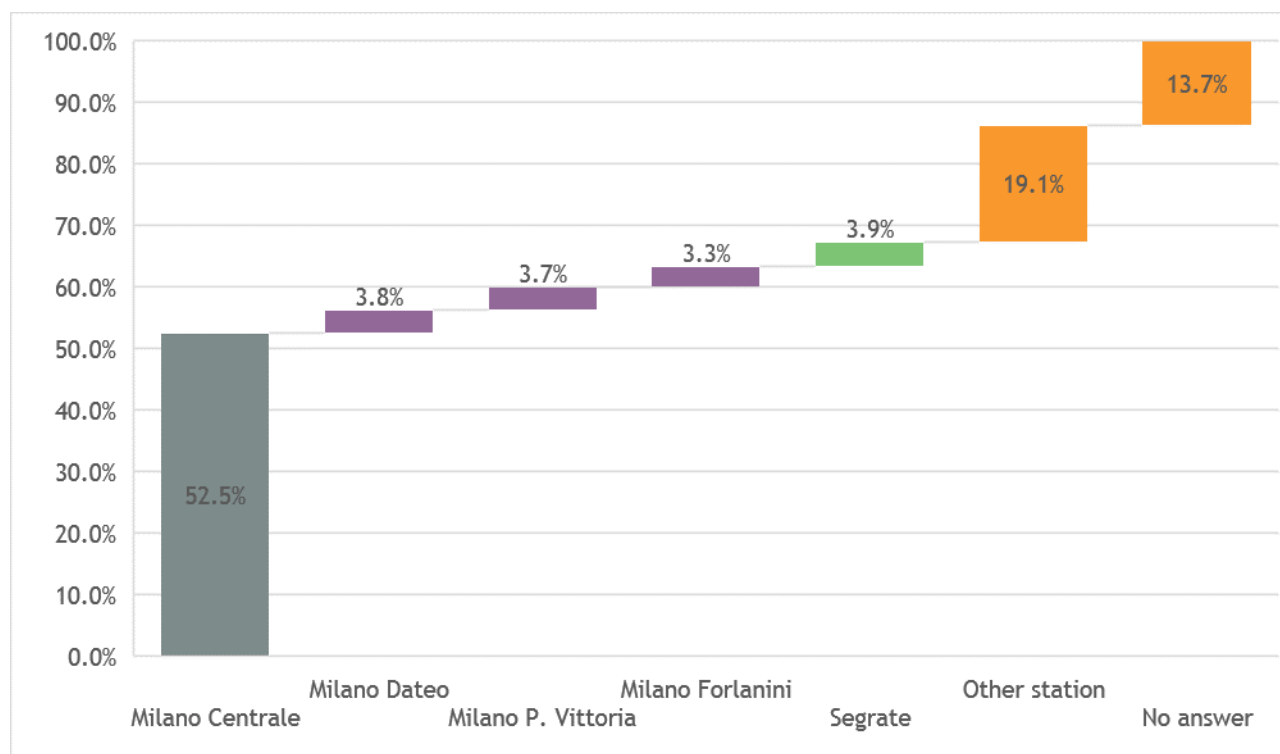
However, this is an optimistic scenario which assumes the activation of all the planned railway services to Malpensa. Considering the related infrastructural and commercial investment, the more likely scenario is 2.7 million new passengers, that by adding up to 2.4 million existing passengers (Malpensa Express and TILO trains) would amount to approximately 5.1 million passengers.⁸

FOCUS ON LINATE

Despite the fact that Linate Airport currently lacks a direct rail connection, the passenger survey inquired about which railway stations are more convenient to access the Airport. This should be interpreted in a broader sense, meaning the use of railways as a part of the overall journey also comprising other means of transport.

The following Figure reports the results. Milano Centrale station was deemed to be the most convenient accounting for 52.5% of passengers' answers. Other urban Milan stations (Milano Dateo, Milano Porta Vittoria and Milano Forlanini) have shares ranging from 3.3% to 3.8%. Segrate station (a suburban one next to Linate) was chosen as most convenient by 3.9% of Linate passengers.

Figure 14. Most convenient station to go to Linate by train



Source: Data from Gruppo CLAS for SEA, Indagine demoscopica a supporto della pianificazione della nuova accessibilità ferroviaria a Malpensa (2016), Steer graphic elaboration

⁷ Source: Data from Gruppo CLAS for SEA, Indagine demoscopica a supporto della pianificazione della nuova accessibilità ferroviaria a Malpensa (2016)

⁸ This scenario takes into consideration railways connection from Turin, the RE50 connection from Switzerland and a suburban Milan railway connection (Source: Gruppo CLAS for SEA, Indagine demoscopica a supporto della pianificazione della nuova accessibilità ferroviaria a Malpensa (2016))



Another interesting point concerns passengers' stated preference to shift from Linate to Malpensa in case of improvement of the railway connectivity to Malpensa (more service routes) and in case of flight destinations expansion from Malpensa (not available from Linate). The passenger expected shift is 10%.⁹ Passengers eventually inclined to the airport change would come from other Lombardy provinces, Switzerland, Piedmont and Liguria regions, Ancona and Venezia provinces.

3.3. Passengers origin and travel time

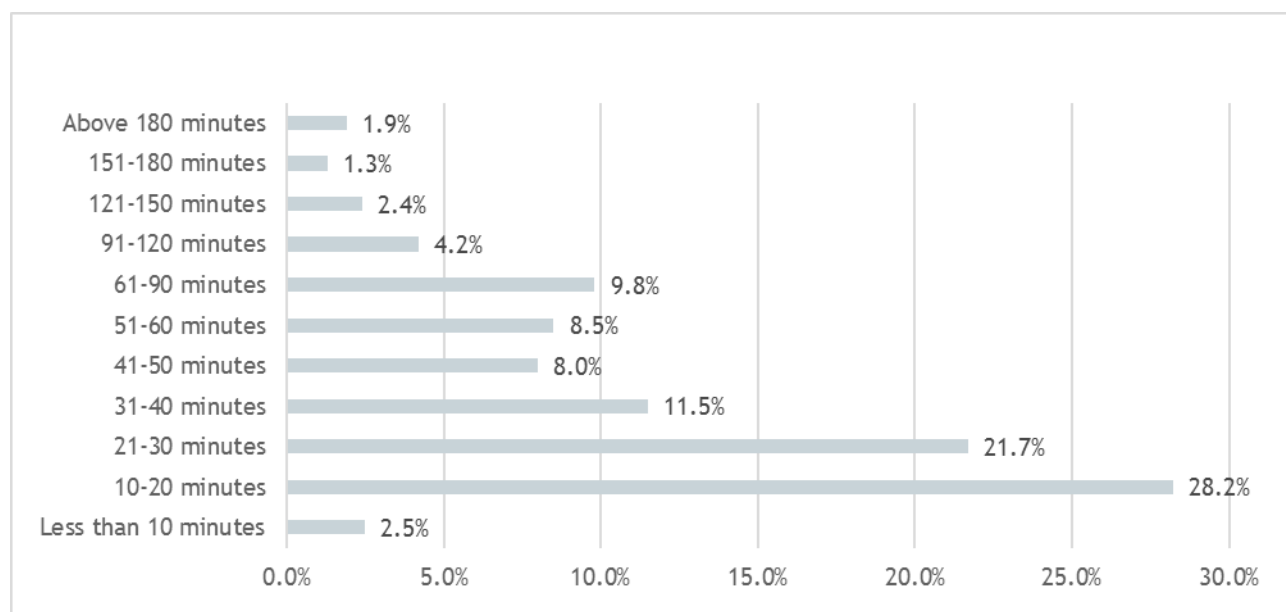
TRAVEL TIME TO THE AIRPORT

Travel time to Linate and Malpensa is determined by the Airports' different distance from Milan and by differences in the range of available mobility services. Due to proximity of Linate to Milan, 50% of passengers get to the Airport in less than 30 minutes, while the same percentage of passengers reaches Malpensa within 50 minutes.

Linate is reached by 80% of passengers in less than one hour, whereas only 66% of passengers arrive at Malpensa in less than one hour. This is of course due to Linate proximity to the city of Milan.

The following two Figures report more details on travel time.

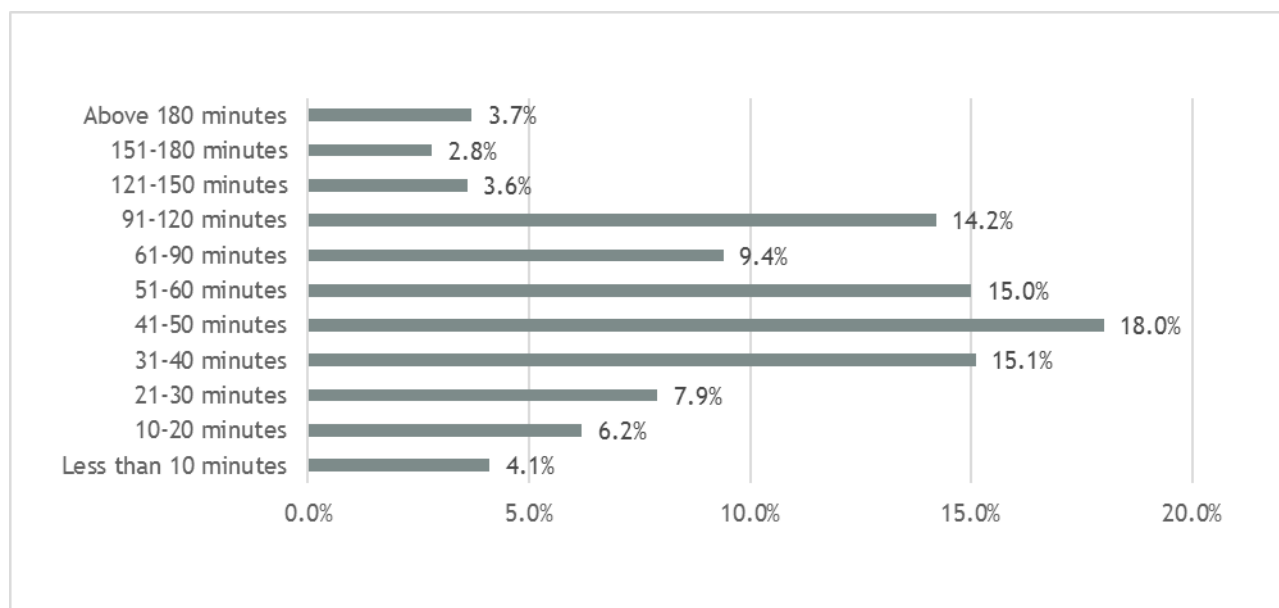
Figure 13. Travel time to the Linate Airport



Source: Data from Gruppo CLAS for SEA, Indagine demoscopica a supporto della pianificazione della nuova accessibilità ferroviaria a Malpensa (2016), Steer graphic elaboration

⁹ Source: Data from Gruppo CLAS for SEA, Indagine demoscopica a supporto della pianificazione della nuova accessibilità ferroviaria a Malpensa (2016)

Figure 14. Travel time to the Malpensa Airport



Source: Data from Gruppo CLAS for SEA, Indagine demoscopica a supporto della pianificazione della nuova accessibilità ferroviaria a Malpensa (2016), Steer graphic elaboration

CATCHMENT AREA

The passenger survey allowed identifying the geographical distribution of passengers' departing points, in terms of regions and provinces from which they started their travel to reach the Airports.

Most passengers travelling to Linate and Malpensa Airports started their journey in Italy (98.9% for Linate and 93.4% for Malpensa). The second largest origin for Malpensa passengers was Switzerland (6%).¹⁰

The following Figures show the distribution of Linate and Malpensa passengers by Italian region¹¹. The origin of passengers' travel gives indication on the Airports' catchment area.

Passengers come from the entire northern Italy; nevertheless, different regions have significantly different importance:

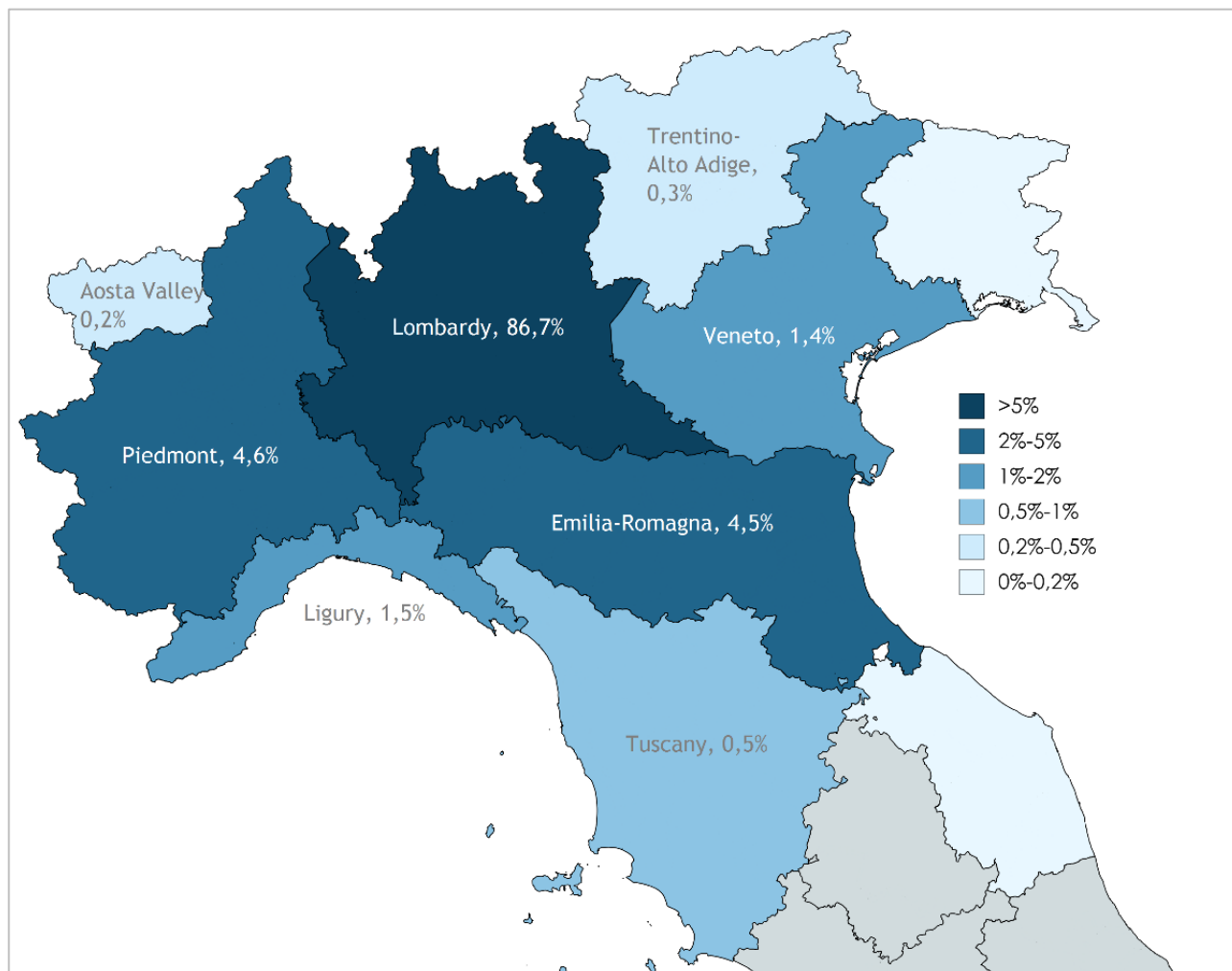
- the most important region for both Airports in terms of passenger demand is Lombardy (86.7% for Linate and 76.9% for Malpensa);
- the two most important regions to Linate after Lombardy are Piedmont and Emilia-Romagna (nevertheless with shares of about 4%);
- the most important region to Malpensa after Lombardy is Piedmont (13.3%), followed by Emilia-Romagna (3.1%) and Liguria (2.3%).

¹⁰ Source: Gruppo CLAS for SEA, Indagine demoscopica a supporto della pianificazione della nuova accessibilità ferroviaria a Malpensa (2016)

¹¹ Data thresholds for Linate and Malpensa Airports have been chosen to ensure comparability of results for two Airports. These are: >5%, 2%-5%, 1%-2%, 0,5%-1%, 0,2%-0,5%, 0%-0,2%



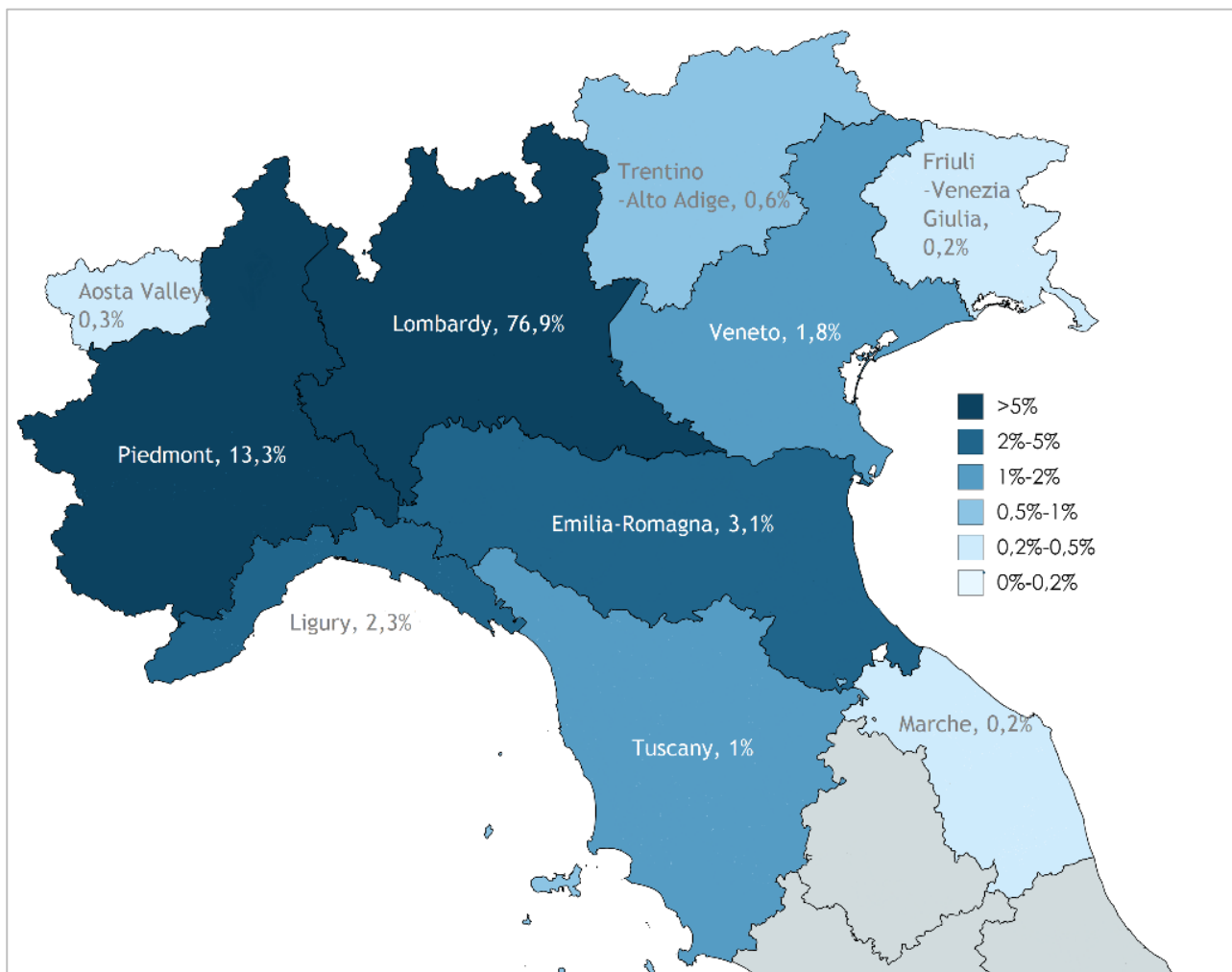
Figure 15. Linate Airport passengers' distribution by the originating region¹²



Source: Data from Gruppo CLAS for SEA, Indagine demoscopica a supporto della pianificazione della nuova accessibilità ferroviaria a Malpensa (2016), Steer graphic elaboration

¹² The remaining 0.2% of the passengers come from other regions which were not specified in the survey; data for Friuli Venezia Giulia and Marche are not available.

Figure 16. Malpensa Airport passengers' distribution by originating region¹³



Source: Data from Gruppo CLAS for SEA, Indagine demoscopica a supporto della pianificazione della nuova accessibilità ferroviaria a Malpensa (2016), Steer graphic elaboration

The following two Figures report a more detailed overview of the passengers' origin at provincial level.

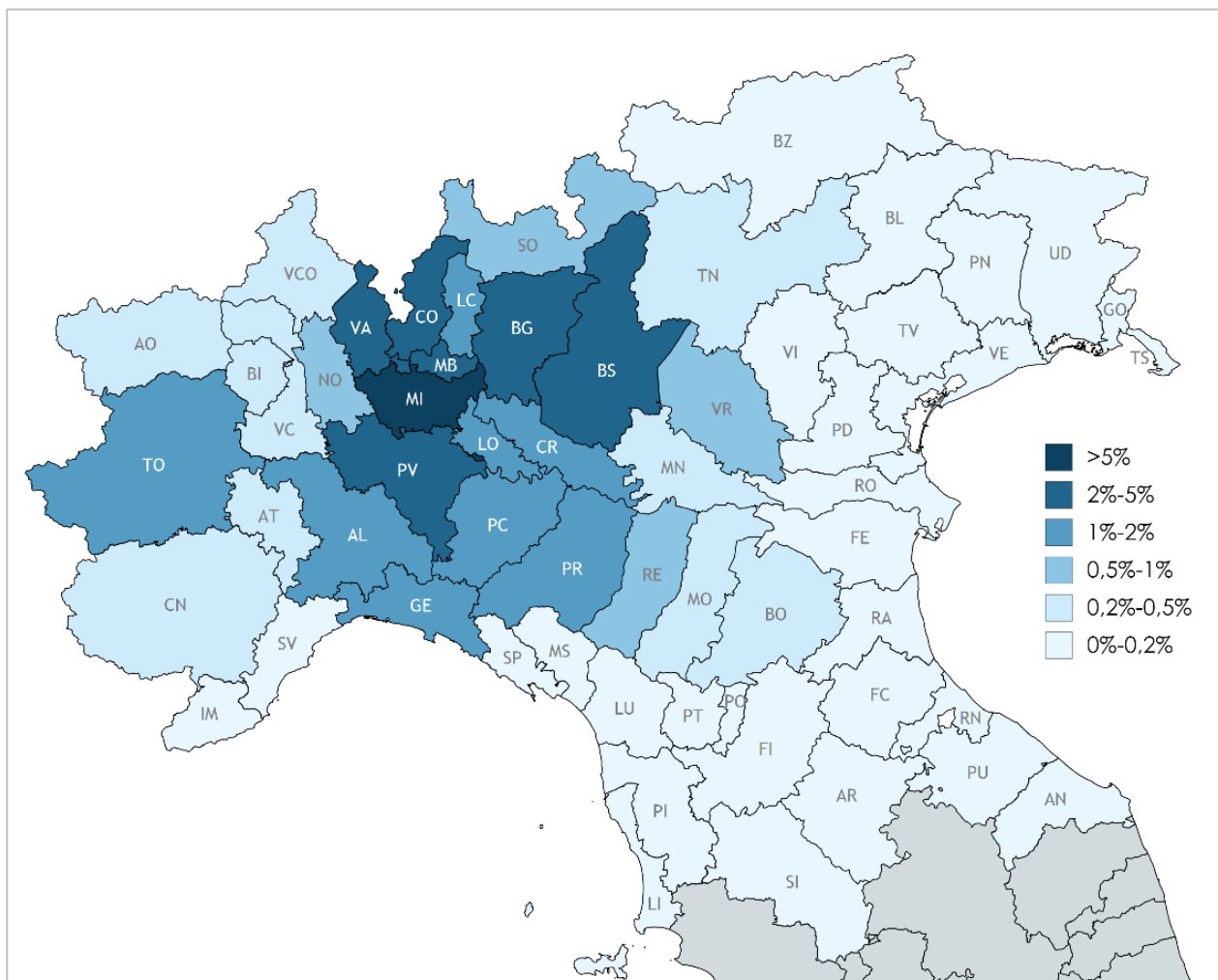
Linate Airport's catchment area is primarily centred around Milan Metropolitan area (province of Milan), which accounts for 63.7% of all passengers choosing the Airport. Other Lombardy provinces (Varese, Como, Monza and Brianza, Bergamo, Brescia and Pavia) account together for 18.6% of the passenger traffics.

Further 10.3% of travellers come from provinces of Turin, Genoa, Alessandria, Lecco, Lodi, Cremona, Piacenza and Parma.

All other provinces in the Figure have less than 1% of passenger demand each (varying from 0.02% to 0.83%).

¹³ Remaining 0.4% of passengers come from other regions not specified

Figure 17. Linate Airport passengers' distribution by originating province¹⁴



Source: Data from Gruppo CLAS for SEA, Indagine demoscopica a supporto della pianificazione della nuova accessibilità ferroviaria a Malpensa (2016), Steer graphic elaboration

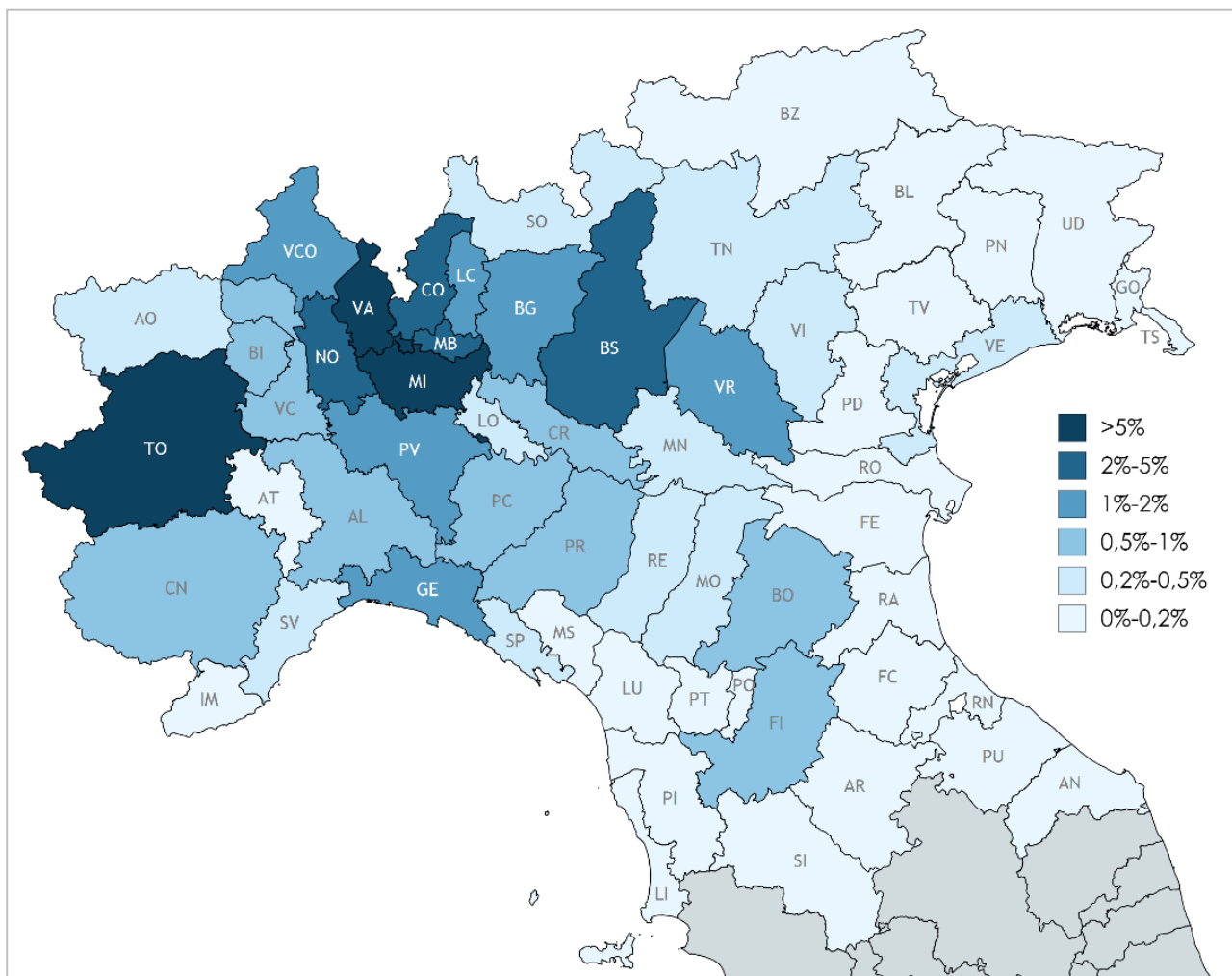
The geographical distribution of Malpensa passengers is different from that of Linate. Firstly, Milan Metropolitan area provides 45.9% of all traffics, with Varese and Turin provinces being the second and the third contributors (15.0% and 5.9% respectively). The three provinces account for 66.8% of all passenger traffics.

Other provinces with importance to Malpensa Airport are Como, Novara, Monza and Brianza, and Brescia, (total 13.3%). The provinces of Lecco, Bergamo, Verona, Genoa, Pavia and Verbano-Cusio-Ossola account for 8.1% of passengers. The remaining provinces' weight varies between 0.1% to 0.8% each.

¹⁴ List of provinces' acronyms with respective regions is available in the Appendix Table 3.



Figure 18. Malpensa airport passengers' distribution by originating province¹⁵



Source: Data from Gruppo CLAS for SEA, Indagine demoscopica a supporto della pianificazione della nuova accessibilità ferroviaria a Malpensa (2016), Steer graphic elaboration

¹⁵ The list of provinces' by regions is available in the Appendix - Table A4.

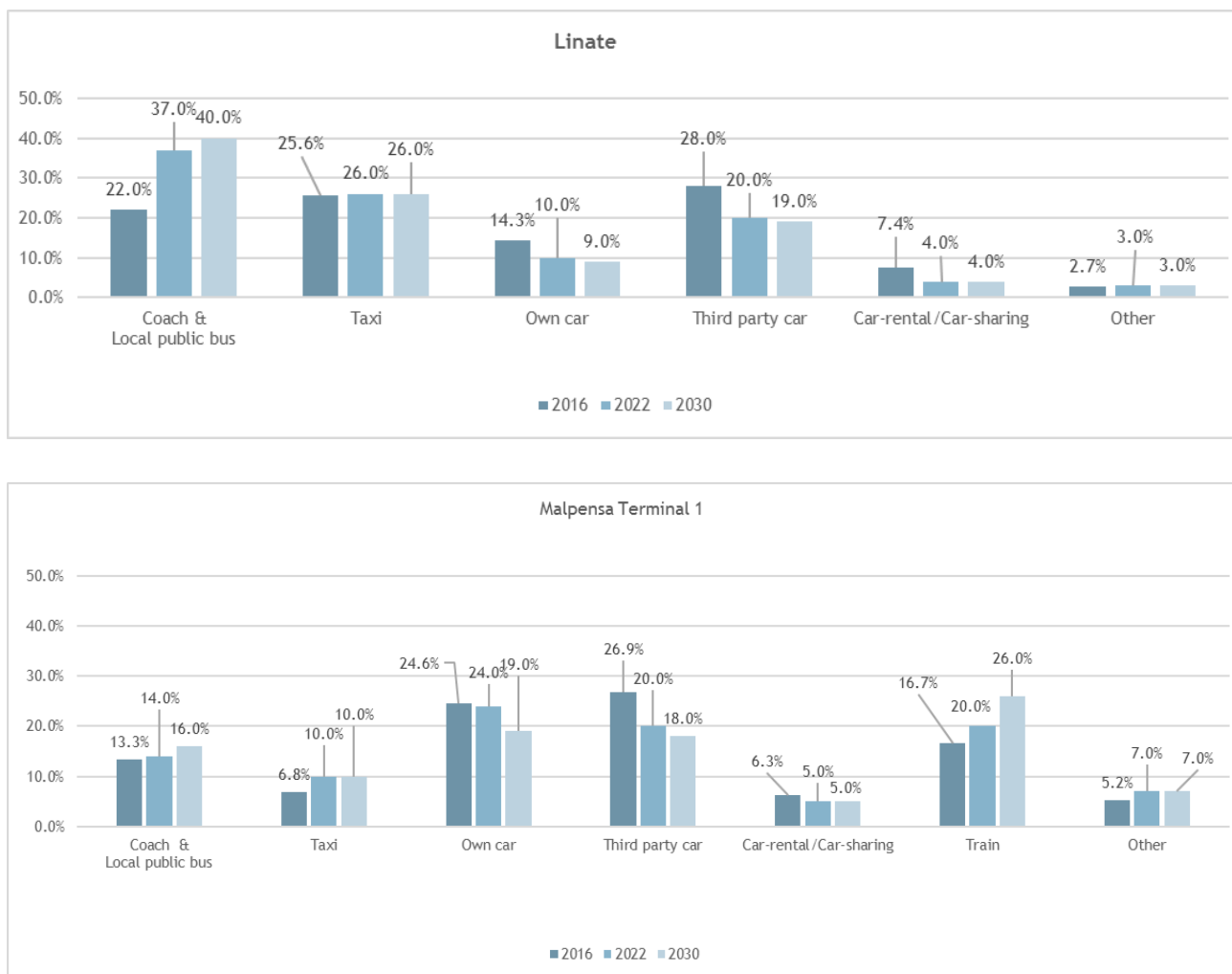
4. Passengers travel choice forecasts

Forecasts of the passengers' travel choices complete the analysis of the mobility services demand.

The year 2016 data on modal split (the latest available) was chosen as the base year for forecast.¹⁶ The forecasting model¹⁷ accounted for traffic volumes, demographic and transport behaviour data on the Airports' passengers (age, landside access travel choice, reason for travel, origin, destination, etc.), as well socio-economic data concerning the passenger's countries of origin. The following Figures report the outcomes of the analysis by terminal and for the time horizons 2022 and 2030.

Forecasts indicate an increase in the use of public transport (coach, bus, plus rail for Malpensa), a decrease in the use of own cars and third-party cars and a slight decrease in car-sharing and car-rental.

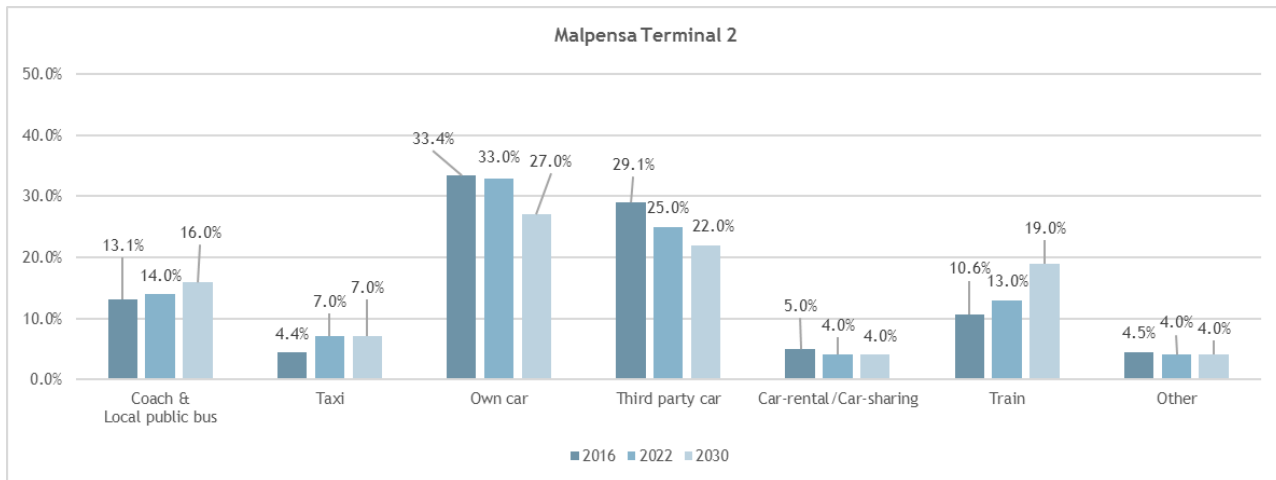
Figure 19. Forecasts on passengers' travel choices at Linate and Malpensa¹⁸



¹⁶ Data from Gruppo CLAS for SEA, Indagine demoscopica a supporto della pianificazione della nuova accessibilità ferroviaria a Malpensa (2016)

¹⁷ PwC in PwC for SEA, Piano Strategico dell'Accessibilità Terrestre degli Aeroporti di Milano Linate e Milano Malpensa (February 2018)

¹⁸ Minor data imprecisions are attributable to the numbers rounding in the source document.



Source: Data from Gruppo CLAS for SEA, Indagine demoscopica a supporto della pianificazione della nuova accessibilità ferroviaria a Malpensa (2016), PwC for SEA, Piano Strategico dell'Accessibilità Terrestre degli aeroporti di Milano Linate e Milano Malpensa (February 2018), Steer graphic elaboration



5. Conclusions

Linate and Malpensa Airports do not have significant differences in the passengers' socio-economic profile (age, gender, education level and employment type); this is probably because the catchment area for both Airports is northern Italy and passengers' socio-economic traits reflect those of air travellers in that area.

Passengers usually start their journey at Milan Airports and the share of transiting passengers is below 15% for all terminals (Linate, Malpensa Terminal 1 and Malpensa Terminal 2). Malpensa Terminal 2 have more transiting passengers and this is explained by the fact that it hosts major full-service carriers operating on international and inter-continental destinations. The share of passengers which transit between Linate and Malpensa is limited.

Concerning passengers' surface travel choices, Linate passengers use (in order of importance) third-party cars (28.0%), taxis (25.6%), coaches or public transport (22.0%) or their own cars (14.3%).

Malpensa Airport has figures comparable to Linate concerning the use of third-party cars, but a higher share of passengers travelling to the Airport by own car. The share of passengers using public transport (including rail) is comparable to Linate.

Concerning the comparison of passengers' modal choice between Malpensa Terminal 1 and 2, it is interesting noting that Terminal 1 has a higher share of passengers travelling by train.

The correlation analysis between passengers' socio-economic profiles and travel choices shows that:

- there is correlation between age and the chosen transport means; passengers in the range 18-24 years prefer travelling by public transport, passengers in the range 35-64 prefer travelling by own-car, while older passengers are generally accompanied to the Airport (third-party car)
- the passengers' country of residence does not correlate with surface travel choice.

Concerning rail transport to reach the Airports, Milano Centrale is the most convenient options indicated by passengers directed to Linate and Malpensa; Milano Cadorna is also indicated as convenient by Malpensa passengers. It is worth noting that more than 20% of Linate and Malpensa passengers is not aware of the Malpensa Express service.

Concerning the Airports' catchment areas, most passengers travelling to Linate and Malpensa Airports started their journey in Italy (98.9% for Linate and 93.4% for Malpensa) and in particular northern Italy. The second largest origin for Malpensa passengers was Switzerland (6%). More in detail:

- the most important region for both Airports in terms of passenger demand is Lombardy (86.7% for Linate and 76.9% for Malpensa);
- the two most important regions to Linate after Lombardy are Piedmont and Emilia-Romagna (nevertheless with shares of about 4%);
- the most important region to Malpensa after Lombardy is Piedmont (13.3%), followed by Emilia-Romagna (3.1%) and Liguria (2.3%).

SEA Milan Airports has important plans to enhance surface access and reduce its carbon foot-print and forecasts on passengers' modal choice indicate that public transport use will significantly increase by 2030: up to 40% for Linate and, 42% for Malpensa Terminal 1 and 35% for Malpensa Terminal 2.



Appendix 1

Table A1. Passengers' travel choices

Macro category	Travel choice
Own car	Own car driven by a passenger/ other people travelling with passenger
Car rental/car sharing	Car rental
	Limousine services
	Car sharing
Third party car (car of people not travelling with a passenger)	Third party car
	Company car with driver
Coach/local public bus	Coach
	Local public bus
	Regional train/metro + bus to the airport
Train	Malpensa Express Train from Central station
	Malpensa Express from Cadorna station
	High speed train to Central station + Malpensa Express
	High speed train to Garibaldi station + Malpensa Express
Taxi	TILO train
	Taxi
Other	Tour operator bus
	Hotel bus
	Motorbike
	On foot
	Other

Source: Data from Gruppo CLAS for SEA, Indagine demoscopica a supporto della pianificazione della nuova accessibilità ferroviaria a Malpensa (2016), Steer elaboration

Table A2. Clustering of attributes for the correlation analysis of the passengers' profile and their travel choice

Reason of travel	Age	GDP per capita of the passenger's country of residence
Work/Business/Study	14-17 years	\$0-\$10.000
Family/Health reasons	18-24 years	\$10.000-\$20.000
Vacation/Tourism	25-34 years	\$20.000-\$35.000
	35-54 years	\$35.000-\$50.000
	55-64 years	>\$50.000
	>65 years	

Source: PwC for SEA, Piano Strategico dell'Accessibilità Terrestre degli Aeroporti di Milano Linate e Milano Malpensa (February 2018)



Table A3. Clustering of travel choices for the correlation analysis of the passenger's profile and the travel choice

Travel choice cluster	Travel choices
Own car	Own car
Third party car	Third party car
Local public transport	Coach
	Train (Malpensa Express from Cadorna)
	Train (Malpensa Express from Centrale)
	Train AV (high speed) + Malpensa Express
	Train AV (high speed) / (to Garibaldi) + Malpensa Express
	Train TILO
	Regional train + bus
	Local public bus
	Metro + bus
	Taxi
	Car rental
Other	Company car with driver
	Tour operator bus
	Limousine services
	Hotel bus
	On foot
	Motorbike
	Car sharing
	Other

Source: PwC for SEA, Piano Strategico dell'Accessibilità Terrestre degli Aeroporti di Milano Linate e Milano Malpensa (February 2018)



Table A4. Main catchment area of Linate and Malpensa Airports: list of Italian provinces and their regions

Region	Province	Province acronym	Region	Province	Province acronym
Lombardy	Milan	MI	Veneto	Venice	VE
	Monza and Brianza	MB		Padua	PD
	Bergamo	BG		Vicenza	VI
	Brescia	BS		Treviso	TV
	Como	CO		Rovigo	RO
	Varese	VA		Belluno	BL
	Lecco	LC	Friuli-Venezia Giulia	Pordenone	PN
	Pavia	PV	Udine	UD	
	Lodi	LO	Gorizia	GO	
	Cremona	CR	Trieste	TS	
	Mantua	MN	Emilia-Romagna	Bologna	BO
Sondrio	SO	Modena		MO	
Turin	TO	Reggio Emilia		RE	
Cuneo	CN	Ferrara		FE	
Asti	AT	Ravenna		RA	
Alessandria	AL	Forlì-Cesena		FC	
Vercelli	VC	Rimini		RN	
Biella	BI	Parma		PR	
Novara	NO	Piacenza		PC	
Verbano-Cusio-Ossola	VCO	Tuscany		Florence	FI
Valle DAosta	Aosta		AO	Arezzo	AR
Liguria	Genoa		GE	Siena	SI
	La Spezia		SP	Prato	PO
	Savona		SV	Lucca	LU
Trentino-Alto Adige	Imperia		IM	Massa and Carrara	MS
	Trento		TN	Pistoia	PT
Marche	Bolzano		BZ	Livorno	LI
	Pesaro and Urbino		PU	Pisa	PI
	Ancona		AN		