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Urban Development and Airports in Northern and Central Italy: Main Trends and a Focus on Parma Giuseppe Verdi Case Study

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Abstract

The paper aims at highlighting some major trends in the air transport system in Northern Italy, and then at presenting examples of urban development and planning issues related to airports, focusing on the case study of “Giuseppe Verdi” airport in Parma. In the last years there has been a significant increase in air passengers in Northern Italy, with a sharp growth in International and European traffic. Parma airport, despite being built in late nineteenth century, has one of the lowest traffic in Italy and suffers an important financial crisis. The case study can therefore be useful to analyse the dynamics of many so-called “service” airports, questioning their possible development and necessary integration at the National and International level, justified by the presence of key managerial, commercial, industrial and also tourist centres. Furthermore, the case study of Parma is useful to single out conflicts and incoherencies between airport planning and urban planning, which are unlikely usual in current competitive and bottom-up planning system, and to draft possible improvements.

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1. Introduction

Airports represent crucial nodes of the economic system: this paper aims at introducing an outline of Regional Air

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Traffic in Italy², analysing constraints related to the site and to the urban development. The interacting factors are multiple and complex. The first one is the intense economic development and related urban sprawl in Northern Italy after the Second World War, a phenomenon that according to World Urbanization Prospects (ONU, 2018) and ISPRA data continues today. The paper explores some effects of EU regulations and liberalization on Italian Air Transport System in recent years, highlighting the almost steady growth of Passengers Traffic (91 million in 2000; about 149 million in 2011; 151 million in 2014), the failure of the Spoke-Hub Network (Star Network) and the development of Point-to-Point connections with low cost carriers.

Then, the paper focuses on the relationships between airport sites and the surrounding territories from the regional and urban planning point of view, describing some planning trends, theories and models that have been developed to integrate airports and the city. Finally, the paper focuses on a short discussion on Parma “Giuseppe Verdi” Airport to single out conflicts and incoherencies between airport planning and urban planning, which are unlikely usual in current competitive and bottom-up planning system, and to draft possible improvements.

The paper is structured as follows:

- section 2 reports some data on air passenger transport in Italy, to highlight major trends;
- section 3 presents the role of the airports for the urban planning discipline, providing the state of the art for on the models and theories that involve airports and the city;
- section 4 and section 5 focus on the description of the case study of Parma, which is an example of non-integration between the strategic investment plan for the airport with the urban and territorial planning perspective.

The methodology adopted in the paper is descriptive, since the goal is to describe airports development from the urban planning discipline point of view. The description of the case study focuses on the origins, the strength and the weaknesses of Parma airport and on their relationship with planning instruments. However, conclusions drawn for Parma case study can be transferred also to other contexts, as highlighted in the final remarks section of the paper.

2. Air Transport System development in Northern Italy: an overview

After the Second World War, Italian urban development, especially in Northern Italy, underwent an intense sprawl: for instance, urbanized areas in Lombardia Region, which covers a total area of 23,869 km², grew from 1,000 km² in 1955 to 3,350 km² (+335%) in 2007, while inhabitants increased from 7 millions to 9.5 millions (+35%).

In the meanwhile, the Air Transport System underwent a strong liberalization and reduction of the flag carrier role in air traffic. Nowadays, Italian Airport Network follows its Polycentric Urban System: Air Traffic is more distributed than in the major European Countries, and include 50 Airports, 25 relevant ones, located in almost Urban or Metropolitan Areas.

The 2008 Official Italian Airport Atlas identifies 45 airports open to commercial traffic with 146 million passengers, about 184 million in 2018, 22 of them with more than 1 million passengers a year. To this can be added 50 airports only open to private traffic, three private airports open to civilian traffic, three civilian airports not operating, 12 military airports open to civilian traffic in various ways, as well as 11 military airports. In 2018, airports open to passengers traffic decreased to 41. Northern Italy airports (Milano Linate, Malpensa, Bergamo, Bologna, Venice, Verona, Genoa, Turin, ect.), where half of Italian population lives and higher bank savings are located, is of a 79.6 million passengers. Other airports of Central Italy gravitating on Tyrrhenian Coast, as Pisa, Roma and Firenze, count 56.8 millions passengers. The airports located in Sicily and Sardinia Islands (like Catania, Palermo, Cagliari, Olbia e Alghero) are about 15.7 million passengers. Twenty other airports produce a negligible traffic. Rome Fiumicino, the main airport at the national level, experiences an important growth between 2012 and 2018 (+16,75%). London is on top with 10 million pass/year increase (+14.3%), followed by Paris and Amsterdam Schiphol.

In 2018, the Irish low-cost company Ryanair is at the first place in Europe for National and International connections with 37.8 million of passengers. During 2015 Alitalia flew 12.8 millions passengers in National routes,

² The paper develops the presentation done by Ventura P., Montepara A. and Sollazzi J. at the 2nd COST Workshop on the Relationship between Air Transport and Regional Development (November 2015, London), held within the COST Action TU1408 “Air Transport and Regional Development” (ATARD).

followed by Ryanair with 8,9 and Easy Jet with 2.9. Among the major national connections, the route Catania-Fiumicino is in first place, with over 900 thousand passengers. Fiumicino-Charles De Gaulle (1,1 million Air France passengers) and Fiumicino-Schipol (1 million Lufthansa passengers) are the most important European connections. Outside the European Union, the most frequented routes are Fiumicino-JFK (over 600 thousand passenger) and also Fiumicino-Tel Aviv (574 thousand passengers). ENAC and Assaeroporti report a growth in traffic from 2005 to 2008 followed by a brief interruption from 2009 to 2011. The Connectivity map, drafted in 2011, shows that Northern Italy is the best linked area. In 2018 International and European Pax traffic underwent a sharp growth. Malpensa airport has the second place in traffic volumes with 24.56 million passengers, followed by Bergamo Orio al Serio and Venice Marco Polo respectively with 12.82 and 11,09. Milano Linate and then Bologna take seventh and eighth place. Bologna retains a positive trend with 8.49 million passengers and which recorded a +4% over the previous year. Linate instead has a slightly negative trend equal to -3% over the previous year (ENAC, 2018).



Fig. 1. (a) Italian airports classification within the EU Transport network TEN – T (UnionCamere, 2014, p. 13); Connectivity map (UnionCamere, 2014, p. 38)

According to the EU Transport Network TEN - T (2011), Italian airports can be classified in: Core Network Tent (the European level) with 5 Airports: all three Milan Airports, Venice and Rome Fiumicino. Comprehensive Network (at the National level): 19 airports. Other airports (Fig. 1): two small airports. Parma isn't mentioned.

The National Airport Plan (Enac, 2012) draws a more accurate hierarchy of Italian Airport System. The following categories are singled out:

- 3 Intercontinental Hubs: Milano Malpensa, Roma Fiumicino, Venezia Tessera;
- 13 Strategic Airports: Bari, Bergamo, Bologna, Cagliari, Catania, Firenze, Genova, Lamezia Terme, Milano Linate, Napoli, Palermo, Pisa, Torino;
- 8 Primary Airports: Alghero; Brindisi; Ciampino; Olbia; Trapani; Treviso; Trieste; Verona;
- 2 New Airports: Viterbo instead of Ciampino and Grazzanise instead of Capodichino;
- Cargo Airports: operating ones (Milano Malpensa, Roma Fiumicino); developing ones (Brescia, Ancona, Taranto Grottaglie, Lamezia Terme); starting ones (Cuneo, Forlì, Napoli Grazzanise, Comiso, Salerno).

Airports with related competing catching areas are:

- Milan Pole with Milano Malpensa, Milano Linate, Bergamo Orio al Serio, Brescia Montichiari (in the long term);
- Venice Pole: Venezia, Treviso, Trieste;
- Florence Pole Pisa, Firenze;

- Rome Pole: Fiumicino, Ciampino, Viterbo;
- Naples Pole: Capodichino, Grazzanise e Salerno Pontecagnano;
- Bari, Brindisi e Taranto Grottaglie in Apulia;
- Catania e Comiso in Eastern Sicily;
- Palermo e Trapani in Northern Sicily.

Within this network, the more densely populated and richer Northern Italy undergoes the most of the Air Traffic (Table 1).

Table 1. Airports and economic indicators in North, Central and South Italy. Source: Data elaboration from (ENAC, 2011) and (ISPRA, 2015).

Italy	Airports volume pax Millions	Airport Surface Growth [%]	Population [millions]	GDP [€]	Bank Deposit
North: Val d'Aosta, Piemonte, Liguria, Lombardia, Veneto, Friuli, Trentino, Emilia Romagna	78.82	47%	28.89	33.500	43%
Center: Toscana, Umbria, Marche, Lazio, Abruzzo	54.22	38%	22.45	28.000	33%
South-Islands: Molise, Campagna, Puglia, Basilicata, Calabria, Sicilia, Sardegna	28.94	15%	17.22	17.600	24%

The main passengers volumes of air traffic (Fig. 2) are concentrated in the two Poles of Milan (3 airports) and Rome (2 airports), and in 10 Regional poles with about 500 thousand pax per year, while Cargo Traffic is much higher in Northern Italy.

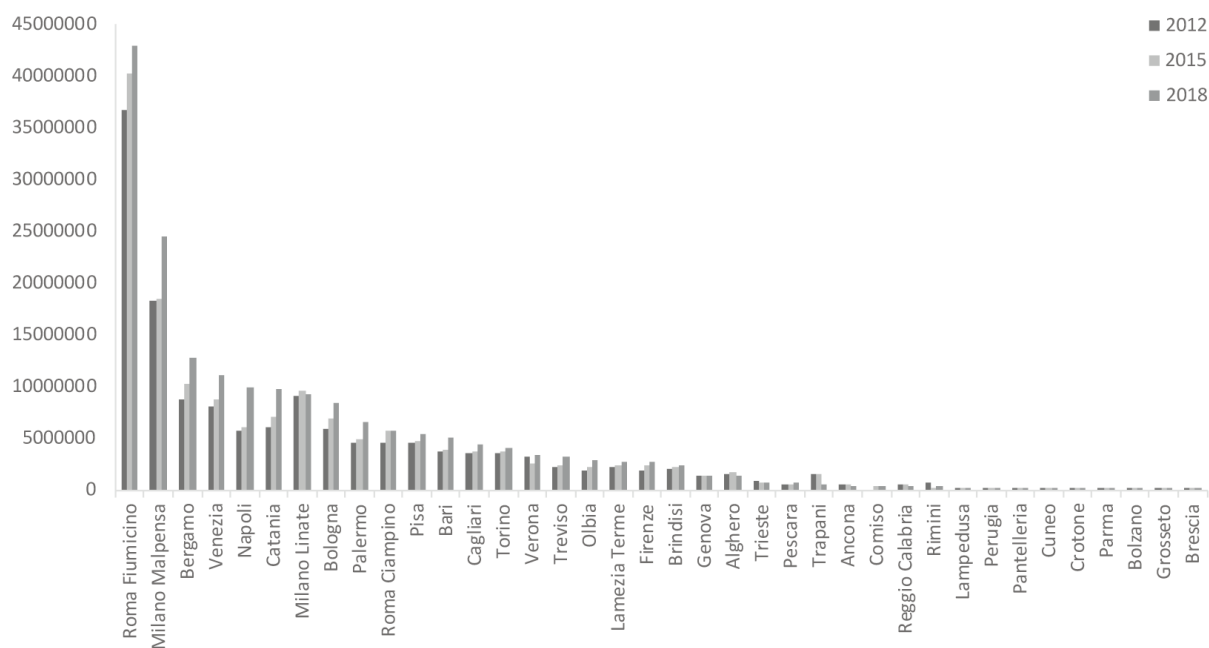


Fig. 2. 2012-2018 Passengers volumes in Italian airports. Source: (ENAC, 2012), (ENAC, 2015), (ENAC, 2018).

Furthermore, in recent years only Strategic Airports underwent a stable growth, while the intercontinental Hubs suffered a slight decrease. But, in the meantime, airports budgets undergo frequent economic difficulties. The main

ones are financed by central Government loans and subsidies. The minor ones suffer the Low Cost Companies power. However, it is clear that future of the air transport system in Italy lies in Point-to-Point connection services and direct routes with low cost carriers, instead that in the HUB and spoke model (“Star Network”) developed around main hubs and central airports.

3. Airports and the City: Urban Planning Theories and Models

In this context, which are the roles of urban and regional planning? What are the main urban development relationships that occur between airports and surrounding territories?

Airports are becoming nodes of the international and national economic system: they are powerful agents of local economic development, attracting passenger traffic and service activities directly and indirectly linked to the airport system (hotels, retail trade, centers of entertainment, commercial and exhibition complex, office buildings, warehouses and distribution services). The Airport, usually born as a relatively distant leapfrog development from the city, due to the large surfaces and safety levels required, becomes an attractor of urbanization with force proportional to its passenger traffic.

In recent years, many large airports have determined the construction of business centres (CBD), which have become *ex post* centers of (edge) city, as Antonio Sant’Elia had imagined in 1914 and Le Corbusier in the *Ville Contemporaine* of 1922. The cases of urban leapfrog developments catalyzed by the airport are many and varied: the Tung Chung Bay tower district of 100 hectares, annexed to Hong Kong international airport, 74.7 million passengers; Roissypole, a 40 hectare CBD near to Charles de Gaulle airport, 72.2 million passengers; Schiphol CBD of about 20 hectares near the airport of Amsterdam, 71 million passengers; Düsseldorf Airport City CBD, of about 20 hectares and next to the airport, 24.2 million passengers. The construction of shopping centers is also common. The Mall of America (1992), of 39 hectares, is located near to the international airport of Minneapolis; the Aeroville, 8,5 hectares of GLA, is located near to the Charles de Gaulle airport in Paris, and the Italian case of the Orio Center, of about 100,000 m² after recent additions, was built next to the Bergamo Orio al Serio airport. The attraction of new activities around the airport is not just about tertiary and retail activities. Starting from the 1960s, major private operators or landowners, invested in the construction of planned communities near airports. There are cases of: Reston (1964), on the main access road to Washington airport; Las Collinas (1972), Texas, near the Dallas-Forth Worth International Airport. In Europe the new satellite city of Ørestad (1992) is located near to the Copenhagen airport (Ventura, 2018).

Airport centered regional development is a relatively new concept. Models theorized until today are based on the assumption of a close and necessary correlation between the development of airport infrastructure and urban development. City-airport models include Airport City, Aerotropolis, Aviapolis and Airfront. The first, *Airport City* (McKinley Conway, 1980), describes for the first time a close relationship between commercial development and airport, both within the building and in its surroundings, such as to involve non-aeronautical structures: logistics, services, office parks, commercial complexes and residential airparks. The second and important model, *Aerotropolis* (Kasarda & Lindsay, 2011) (Kasarda, 1991) (Lindsay, 2008) is a natural evolution of the previous one, and describes a tertiary city, stretching up to 30 kilometers, with the airport in the center. The Aerotropolis model emphasizes the connectivity between airport and logistics activities: it consists of an airport core and extensive peripheral areas of aviation-oriented businesses and associated residential developments. The *Aviapolis* model, born from an initiative of the Finnish government, consists in the strategic reorganization of an existing urban area, subsequently transformed into a Global Business District, full of commercial, recreational and residential activities (it is home to around 18,000 inhabitants) (Lukin, et al., 2019), according to a perfectly integrated planning. The fourth model, *Airfront* (Blanton, 2004), pursues local and regional objectives and exploits the airport as an economic resource. Urban development around the infrastructure is based on an industrial cluster.

Those examples highlight the need to understand the role that the airport plays in urban development at the different dimensional scales of influence and dimensional rank of the settlement. The complexity of physical and intangible relations, starting from socio-economic, environmental and infrastructural impacts on urban development, must therefore be guided and strongly integrated into the planning process.

The case study of Parma “Giuseppe Verdi” airport, presented in the following paragraphs, is an example of wild competition and non-integration between the strategic investment plan for the airport and urban planning.

4. Parma Airport: a case study

Parma airport was conceived as a military base for airships, related to the near harbor of Spezia. It was completed in 1923 (fig. 3). The runway was located in a slightly different position from the current one.

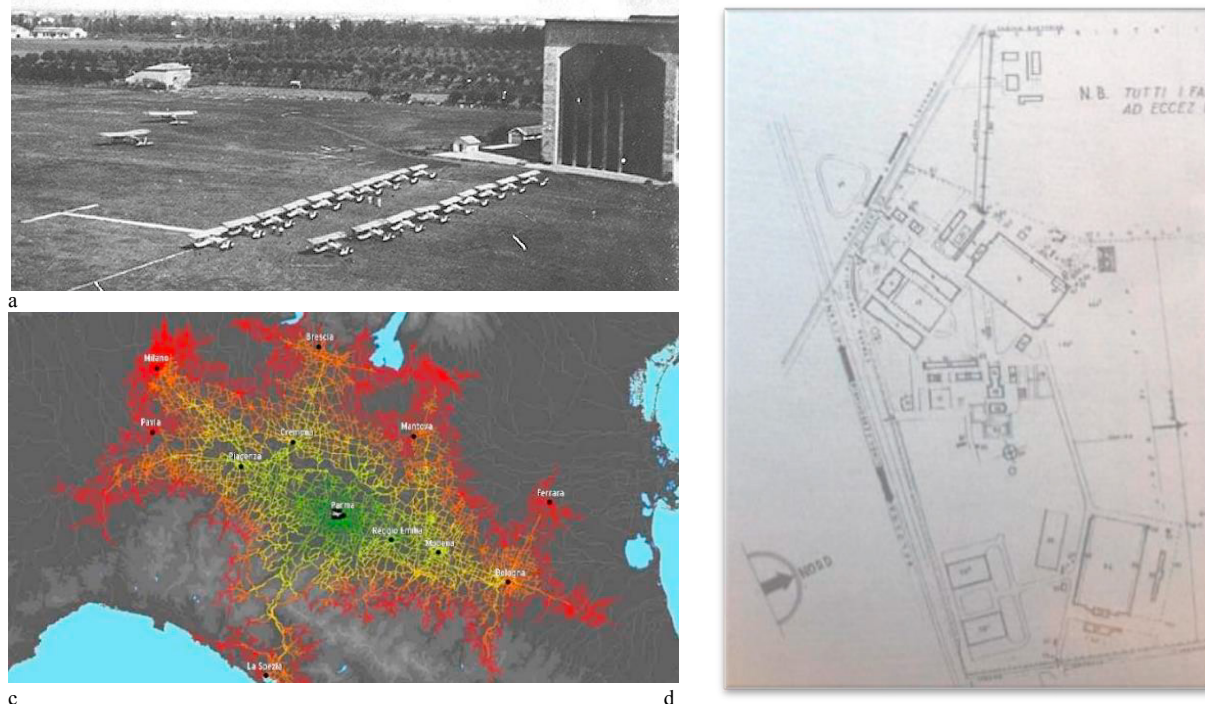


Fig. 3. (a) Parma N. Palli Airport in 1938; (b) Airport Layout in 1923; (c) Parma airport Catchment area

The airport, despite being built in late nineteenth century, has one of the lowest traffic in Italy and suffers an important financial crisis. The maximum peak of passenger traffic was reached in 2008 with a total of approximately 285.500 units with an increase of +100% on previous year. After this period, traffic statistic decrease until the first half of 2015 which passengers traffic were 202.000 with an increase of +4% on previous year. It underwent a steady slow growth, which challenged with organizational, nationwide structural and regulatory issues. Nevertheless, in the last three years this growth has been completely reversed: in 2018 passengers' number was 75,253 with a variation over 2015 equal to more than -59%.

In the airport compound several infrastructural works have been carried on both in the *land side area* and in the *air side area*; both the Runway End Safety Area of head 20 and the strip and shoulders of the 2/20 runway have been adjusted. Further implemented works concern the safety measures in the *air side area* and the passenger terminal. The structure of the latter consists of a space of about 4,000 m², divided into two levels: the area of arrivals and departures and its services are distributed on the ground floor, while the offices and activities for catering and trade are located on the first floor.

5. Current Land-use Planning Conflicts with the Airport in Parma

The constant low traffic of Parma airport traffic with its recent sharp decrease is useful to analyse and foresee the dynamics of many so-called “service” airports, questioning their possible development and necessary integration at the National and International level. Parma G. Verdi airport suffers not only from a reduced catchment area in competition with the airports of Bologna and Milan Linate and Orio al Serio, but also important inconsistencies with the Urban Plan (fig. 4), that hinder its development.

The airport site, located in the northern peripheral area adjacent to the Milan-Bologna Motorway, is scarcely linked with the city centre by public transport or pedestrian and cycle paths. The general land-use urban plan (PSC) of Parma

in 2012 declares that it wants to increase the flow of passengers and of goods, despite of very negative trends since 2008, through a series of operations of spatial and functional integration with more attractive activities and services. In reality, the expected improvements, which are: new green buffer strips, new bus lines and special cycle-pedestrian paths with the city centre and the railway station, are not carried on. On the contrary, the plan envisages a new residential development south of the airport, adjacent to the existing settlements, even if it falls within the risk band 3 according to the Airport Risk Plan (PRA). An appreciable intervention concerns the connection with the trade fair centre to the north, next to which a large commercial complex is planned, which would determine the displacement of the passenger terminal to the north-west. However, this commercial complex, which includes users of about 7 million visitors a year, falls, albeit to a small extent, in Zone A of the PRA. For this criticality, the construction site area, about 74,000 m² wide, was seized and subjected to precautionary constraint. No new intervention improves the connections with the motorway network or the CEPIM, the largest rubber-rubber interport in the Emilia-Romagna region. No public transport connection is foreseen with the Mediopadana high-speed railway station in Reggio Emilia.

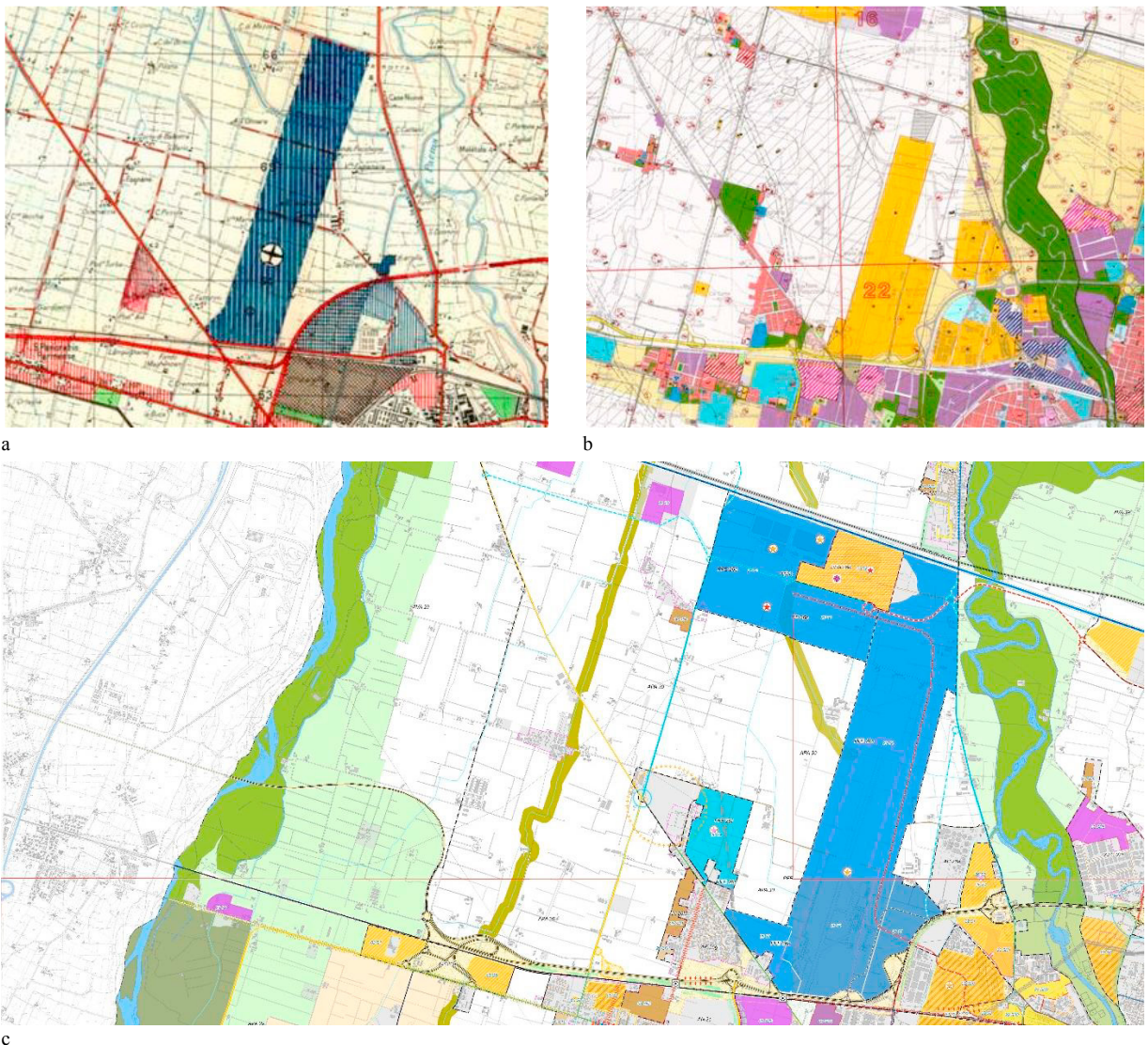


Fig. 4. (a) Parma Urban Plan (1963). (b) Parma Urban Master Plan – PRG (1998). (c) Parma Urban Master Plan – Piano Strutturale Comunale (2002)

The expectations of SO.GE.AP. SpA., the airport management company, seem optimistic, due to the lack of airport infrastructure. In the short term, it plans to transform the infrastructure into a cargo transportation hub under a contract with ETIHAD. The project involves the extension of the runway, the construction of a new yard to the south and a new storage building for the goods, turning the current terminal into a new command centre solely for the cargo sector.

In the long run a second new taxiway is planned. The new passenger terminal, of around 30,000 m², is moved to the north-west area next to the fairgrounds and the Parma Urban District shopping centre, as mentioned earlier.

6. Some remarks

In Italy, Airports have long been considered an important ingredient in regional development (Percoco, 2010). Moreover, the location of airports has resulted from a hierarchical decision process involving negotiations between the management airport companies supported by private operators and the public central and regional administrations.

This process resulted in a highly dispersed supply of airport services within the country's territory. Good quality researches have been carried on in the recent past (see, i.a., the KPGM Study on Trapani Airport on the relationships between Regional Development and the Airport). Operators nowadays are fully aware that free competition among airports can be deadly both for small and great airports. In recent years, management companies merge or buy shares of smaller airports to optimize the tasks and reply to market constraints and especially to the low cost carriers. SEA Milan is now controlling Bergamo Orio al Serio airport, which once was its competitor.

Indeed the strengthening of airports as communication poles did not always necessarily correspond to a centrality of their territorial functions from a planning perspective (Tira & Di Dio, 2006; Mazzeo, 2010; Massaro & Rossetti, 2019). Often important, costly and dangerous incoherencies between Airport development and Urban and Regional Planning can be highlighted, which are mostly generated by a remarkable weaknesses of Public Bodies face to strong economic operators.

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