The Difficult Relationship between Land Use Planning and Transport Planning: Evidences from the City of Turin, Italy

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Abstract: Although their strict interrelationship is widely recognized, transports and land uses are still rarely planned in a really coordinated way in urban areas. Different reasons can be individuated for this poor integration: some of them are linked to educational and institutional factors and to specific characters of planning tools, and are particularly relevant in the Italian context; but there are also "substantive" reasons due to differences in the intrinsic characters of transports and land uses. The paper investigates these substantive difficulties of plans integration, with reference to the case of Turin: the Municipal physical development plan of this Italian city identifies three main "axes" of urban transformation, strictly based on new transport infrastructures. The analysis of the realization process of these three corridors show how and why integration and coordination of land use and transport planning can turn out to be quite complex and difficult to reach, also when they are explicitly pursued by planners.

Key-Words: coordination of land use and transport planning, integrated planning, urban transformations, transport infrastructure projects, urban structure, Turin.

1 Introduction

Transport infrastructures, form and structure of settlements, residents and activities distribution are strictly interrelated factors in the functioning and evolution of urban systems. Transport networks determine the accessibility conditions of the different areas in a city, and their suitability to land uses; land uses, in their turn, contribute to define origins and destinations of trips, and the sharing of traffic flows in time and space [1,2].

This relationship has been widely studied since the founding work in 1954 by Mitchell and Rapkin, which highlighted for the first time in empirical way – in reference to the Philadelphia area – how urban traffic flows were "function" of land use [3]. So, if land uses and mobility are strictly correlated, also their planning should be integrated; on the contrary, in the Italian context but not only, land use plans and transport plans – irrespective of the spatial scale we consider: urban, regional etc. – are often devised and developed in parallel without real and effective complementarities and synergies [4,5].

2 Why transport and land use planning are difficult to be integrated

At least four reasons can be identified for this weak integration [6].

The first one is a *cultural* reason. In the academy, the two scientific disciplines of transport planning and urban planning were born in strictly related schools, but they soon developed with poor interactions, if not in totally independent and separated ways. In the Italian academic context, Schools of Architecture and Planning offer only rarely – if not for some recent exception –courses about transport planning and mobility management to their students, and the same is true about urban planning in Schools of Engineering.

This educational separation is obviously reflected in the expertise of technicians who preside over land use and transport planning in local public administration: so the second reason is tied to *practices*. Transport and planning Departments in Municipalities often work in independent and autonomous way, with poor forms of reciprocal communication and of planning and management tools integration [7,8].

A third reason concerns just *planning tools*, at least in the Italian context [9]. Land use plans have been significantly innovated by Regional laws in the last years, but their normative structure still makes them quite unsuitable for an effective interaction with transport plans. These rules aim at

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guaranteeing fair and homogeneous building rights among all land owners, irrespective of the real accessibility conditions of the different urban areas and of their transport supply; moreover, these rights are quite fixed and cannot easily be redefined as a consequence of a change of the transport system. Plans set land uses (in particular mix of tertiary uses) in quite generic terms, so that it is difficult to correctly foresee the mobility demand that will be generated by the urban transformations prefigured in plans. Parking offer is defined by the rules of the plan in minimum terms, rather than in maximum ones, so it cannot be used as way to manage traffic flows. Lastly, land use plans generally lack a time scheduling of the urban transformations they identify: as a consequence, it can be difficult to schedule transport projects so to coordinate them with the above-mentioned transformations.

If the first three reasons are – at least partially – specific of the Italian context (education, practices, planning tools), a fourth reason can be individuated with a more *substantive* nature: transport and land uses show some significant differences in their intrinsic characters, and these differences make it "objectively" difficult to plan them in an integrated approach. In particular, Alex Fubini (2008) claims that these two planning sectors show a substantial difference in their "weight"; transport infrastructure projects would "outweigh" urban transformation projects, in terms of [10]:

- *resources*. Transport plans are often focused on few projects that mobilize relevant funds, while land use plans have to coordinate multiple, scattered, fragmented projects, most of which having limited financial values;
- *times*. Transport plans have often a mid-term horizon, while land use plans involve long-term – if not indefinite – horizons;
- *promoters*. Transport projects are headed by few, strong, generally public actors; land use transformations are promoted by a great deal of – mostly private – actors, from real estate investment trusts to owners of small parcels;
- *spatial scales*. Transport infrastructures may involve large areas that often pass municipal borders; urban transformations normally interest more limited portion of space;
- *impacts*. Transport projects may generate spatial discontinuities and fractures, that urban transformations have to re-sew with their more capillary and incremental approach;
- *realization procedures*. Transport projects may often take advantage of fast-track, privileged channels, that make their realization less tortuous than in the case of many urban transformations.

3 Evidences from the case of Turin

These "substantive" difficulties have been poorly analyzed till now, both in theoretic studies and, in particular, through empiric analyses of specific case studies. From this viewpoint, the Italian city of Turin can be considered an interesting subject for research. The current Municipal physical development plan (MPDP), approved in 1995, identifies three main "axes" of urban transformation: two of them are strictly based on new transport infrastructures.

The first axis is represented by the "Railway Underpass", which crosses the city from North to South. The current rails are going to be laid underground, quadruplicated and covered in surface by a new boulevard, which is named the "central Backbone" of the city. This project will allow to re-seam the two parts in which Turin was divided by the railway trench. Along this boulevard the MPDP locates four main "urban transformation areas" (the so-called "Spine"), which are represented by vast abandoned industrial areas to be renewed and reused.

The second axis is "corso Marche", a new complex "wafer" (three layer) transport infrastructure: a boulevard in surface and, underground, a railway tunnel for goods trains (along the Lyon-Turin line of the European TEN-T corridor V) and a highway tunnel which will straight connect the North and South parts of the city ring road. The boulevard in surface will link three areas which are going to be deeply transformed: an abandoned portion of the Mirafiori Fiat industrial area, a brand new residential neighborhood, the industrial area that Alenia aeronautic firm is going to abandon (and that will be replaced by houses and tertiary activities), the impressive new Health citadel which will concentrate many hospitals now scattered in different parts of the city.

In 2008, the Municipality adopted the *Urban planning guiding act*, a strategic document that suggests guidelines to upgrade the MPDP. This document identifies a fourth "strategic axis of urban transformation", which has itself a strong infrastructural component: it comprises the urban areas which will be crossed by the second Underground line, which is now at the planning stage.

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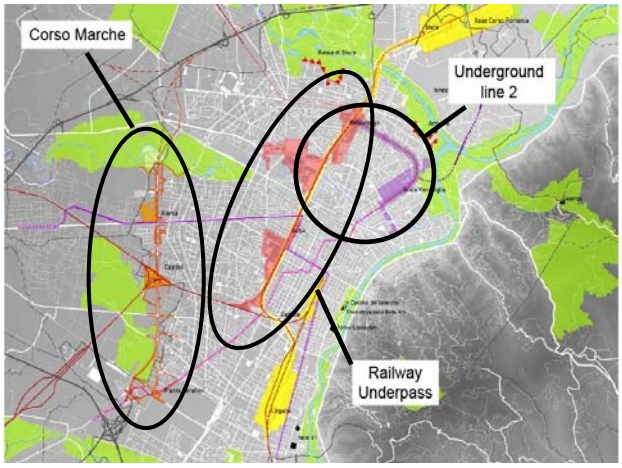
Fig.1 – The three main urban transformation corridors in the Turin Municipal physical development plan



3.1 The Railway Underpass

The Railway Underpass is interesting in particular for the time-lag between the infrastructural works and the urban renovation works. The first ones began before the second ones, but are still in progress; on the contrary, the renovation of the "Spine" areas is nearly completed. According to the MPDP, each of these four areas should have been served by a station of the Metropolitan Railway System (MRS), that the Underpass will allow to activate. Because of the time-lag in the completion of works (which is not due to delays in the realization), tens of thousands people now living in the Spine are mainly dependent on the use of their cars: the Municipality have had to provide a great deal of parking lots, which could compromise a more balanced modal sharing also when the MRS will be activated.

At the surface, the boulevard over the Underpass is going to effectively re-seam parts of the city, much more than the Spine renovation did: in effect, their transformation in most cases has recreated the barriers and discontinuities previously represented by the big factories here localized. Moreover, the MPDP designed the whole boulevard according to a coherent and uniform pattern, so to give formal and stylistic continuity to the transformation of the four Spine along it; but because of the wide range of involved owners and developers, at the end the four Spine has been each designed and realized independently, and this homogeneous pattern was lost.

Fig.2 – The surface boulevard over the Railway Underpass

3.2 Corso Marche

The project of corso Marche show similar difficulties in the coordination of times and stakeholders, but in different forms. In this case, it is the infrastructural project to be more complex: it requires to put in coherence a surface boulevard inside an existing densely built urban fabric, and underground, on two layers, a railway tunnel for good trains and a highway tunnel (with their surface exits), which at the same time have to avoid to intersect the existing perpendicular Underground line 1.

Because of this complexity, the developers of the infrastructural project have to define with extreme precision, right from the start, the interrelationship with the surface urban transformation (where the highway exits will be localized, where the biggest buildings will pose their foundations etc.). But this transformation, although promoted by few developers, is till now quite undefined: the current financial-economic crisis slowed down the progress of some planned hypotheses (in the case of the Mirafiori area) or led to rethink other ones (the transformation of the Alenia area), while still other projects were cancelled due to different – more politic – dynamics (the Health citadel will be built in a more central location of the city).

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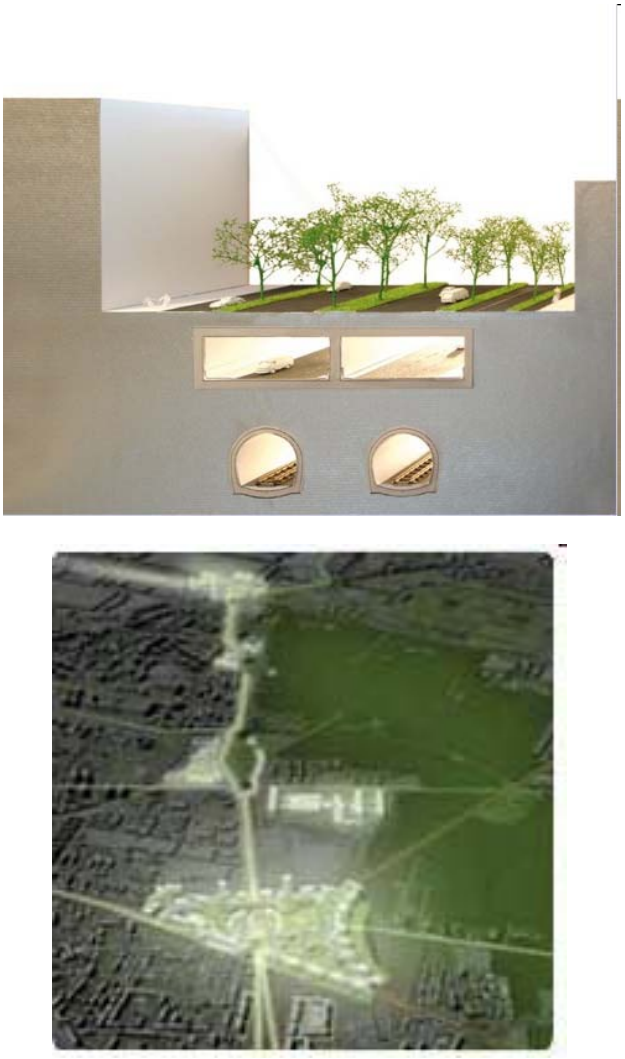
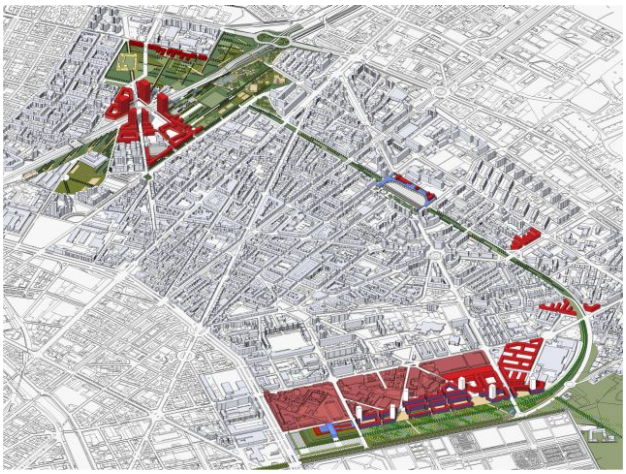
Fig.3 – Cross-sectional and surface scheme of corso Marche



3.3 The Underground line 2

As for the new Underground line 2, the Municipality would like to realize it through project financing: it should co-finance the project (40%) selling its building rights in the area, so to internalize the growth of the property values due to the better accessibility that the new Underground line will assure. But in the current stagnation of the real estate market in Turin, the interest of developers for a further consistent increase of the residential stock (after the 25.000 new apartments built from 1995 to 2008) is quite questionable; and the project financing should require them to manage a transportation infrastructure that has no profitability (tickets cover only 30% of the costs). Moreover the foreseen procedure, if it is undoubtedly virtuous from some point of view, carries this risk: in the transformation plans, around the Underground stations residential and commercial land uses could be maximized (just because they guarantee the major revenues for the Municipality, to be used to finance the transport infrastructure) to the detriment of other locally important land uses like parks, services etc.

Fig.4 – An hypothesis of urban transformation along the Underground line 2



4 Conclusion

The analysis of three infrastructural corridors, in just one city, obviously does not allow great generalizations. At the same time, it permits to warn against jumping to easy and abstract theoretic conclusions. The case of Turin confirm that differences in “weight” can often be recognized between urban transformations and transport infrastructure projects, but these differences can vary case by case both in importance and in direction. Sometimes a transport infrastructure project can “outweigh” correlated urban transformations, which are somehow dependent on the former; sometimes this relationship can reverse.

Projects can show different speeds, at different stages: at the planning stage, transport infrastructure can slow down because it has to await that urban transformation plans are defined in more detail (see corso Marche); in the realization stage, urban renovation can be completed before the correlated transport infrastructures (in particular when the latter should be partially financed through the former) but in this way the new urban areas can turn out to be temporarily poorly served from a transport point of view (see the Railway Underpass).

A virtuous circle of integrated land use – transport planning, like in the case of the Underground line 2, can turn out to be not so profitable in the long term, if land uses are assigned by the MPDP mainly in order to maximize the fees

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to finance the transport infrastructure rather than to balance the use of this infrastructure. For example, favoring only residential and commercial uses around the stations of a radial Underground line can imply the risk to have unbalanced mobility flows in rush hours (centripetal in the morning and centrifugal in the afternoon), just because no significant traffic attractors are localized in the peripheral portion of the line.

Sometimes, a single subject presides at the infrastructure project, while the correlated urban transformations are promoted by a multiplicity of developers that can find it difficult to organize an uniform project (see the Railway Underpass with the Spine). In other cases, like corso Marche, several subjects (different for spatial scales of competence, objectives, logics etc.) can have to interact in a complex intermodal transport project: this complexity can subject the correlated urban transformations to constraints which are difficult to manage, even for a single property developer.

In other words, integration and coordination of land use and transport plans can really turn out to be complex and not at all simple, also when they are explicitly pursued by planners, due to "substantive" difficulties that can emerge in multiple and heterogeneous forms.

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