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Governance models in the local transport industry: an empirical research on tariff integration systems

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Purpose

The aim of this research is to analyse governance models for tariff integration systems in the local public transport sector both in Italy and in some regions of Europe. In particular, it aims to study and compare coordination models chosen by the key players, their role (especially that of the political policy-driver) and the degree of decisional centralization/decentralization within the network.

Design/methodology/approach

For this purpose ten case studies (AMT Barcellona, CRTM Madrid, Formula Torino, Metrebus Lazio, Pegaso Toscana, Sitam Milano, Stib Bruxelles, Stif Parigi Ile-de-france, Stimer Emilia Romagna, UnicoCampania) will be presented and compared in the paper. Data was collected through direct (semi-structured interviews and structured questionnaires) and indirect sources (analysis of internal documents).

Findings

The analysis brings to light two organizational models for governance: the focal organization and the agency model. Features and implications of these two models will be outlined.

Practical implications

The intention of this paper is to provide strategic and operative considerations for designing governance structures for tariff integration systems.

Keywords: *Network Theory, Governance, Local Public Transport, Inter-organisational Integration.*

Introduction and purpose

The 1997 Isotope report talks about public transport integration, stating that: “[integration is] the way parts of the public transport network are embedded in the total mobility chain”.

It is possible to highlight various points by analysing the preceding definition. The first is that the transport system is made up of various parts that have to be coordinated. The second is that the mobility chain includes both public and private transport elements.

The first Interim Report (2005) defined public transport integration as: “the organisation process through which elements of the passenger transport system (network and infrastructure, tariffs and ticketing, information and

marketing etc) are, across modes and operators, brought into closer and more efficient interaction, resulting in an overall positive enhancement to the overall state and quality of the services linked to the individual travel components”.

In the first place, we should stress that in this context integration is considered more as a process than as a static dimension. In the second place, integration refers to all the characteristics of passenger transport services:

- integration of information;
- fare (tariff) integration in the strict sense;
- infrastructure integration;
- complete integration.

Historically, the rise of tariff integration systems in local public transportation systems took place at the end of the 1960s. The principal reasons for this may be found in the economic development of Western Europe, which was accompanied by a growth in urbanised areas, and therefore a rise in mass transit needs.

Introducing forms of tariff integration in metropolitan contexts had the function of acting on the coordination problems which existed between the various operators, and was in a sense, a kind of “rationalisation” (Piacenza et al. 2005). Better coordination of the local public transport (LPT) service offer had direct impact, in fact, on ease of access and ease of use of public transport. It is true that one of the main problems in tariff integration systems is the capacity to coordinate the profit-making needs of operators with the desire to provide a qualitatively superior service.

As for a more general analysis, we should see that in Europe the LPT business system is in a phase of profound redefinition. In Italy, in particular, we are facing to a process of liberalisation and privatisation, which, if fully enacted, would represent a profound modification to the regulatory framework in which LPT has operated so far (Boitani and Cambini, 2004).

Full and concrete implementation of the European Union principle that there be full and perfect compatibility between the protection of general interests and safeguarding (or introducing) free market principles in the LPT sector, will produce even more pronounced and demanding changes for LPT operators (Napoletano, 2006).

Activating tariff integration system (TIS) increases the need to establish relations with new organisational actors. Inclusion in a TIS, in fact, has immediate effects on the actions of individual operators, who lose margins of manoeuvrability and have to redesign their organisational boundaries.

The changes described are tied to other variations in LPT professionals' business system and knowledge system. Not only must they undertake tasks connected with their normal activities, but they have to take on responsibilities of a higher order as well to guarantee the functioning of a system, which has inevitably become more complex.

Each professional must try and find suitable solutions to coordinate and manage relationships with other organisations in the TISs to guarantee (Mangia, 2005):

- the development of the entire mobility system;
- coordination with mobility infrastructure managers;
- support for technological development and info-mobility.

We see, therefore, a phenomenon of growing dynamism in inter-organisational relations, which presents elements of competition and cooperation at the same time. A radical change in the system of rules for functioning, which make up one of the key pillars of the business in question, produces clear effects on organisational models and solutions adopted by the operators (Aiken and Hage, 1968; Oliver, 1990).

The need to study, design and verify coordination solutions between the subjects involved in a TIS is clearly linked to the inter-organisational

division of labour and the sharing of roles and responsibilities (Grandori and Soda, 1995; Milgrom and Roberts, 1992; Thompson, 1967).

The aim of this research is to analyse governance models (Golinelli, 2001a; 2001b) for tariff integration systems in the local public transport sector both in Italy and some regions of Europe. In particular, it aims to study and compare coordination models chosen by the key players, their role (especially that of the political policy-driver) and the degree of decisional centralization/decentralization within the policy network.

For this purpose the paper is organized as follows: section (i) section 1, design and methodology; (ii) section 2, empirical research and results; (iii) section 3, findings and practical implications.

1. Design and methodology

The term “network” is used in various strands of literature and the use of the network concept varies considerably between and within the different disciplines.

In other words, a network can be labeled as a set of relatively stable relationships which are of non-hierarchical and interdependent nature linking a variety of actors, who share common interests with regard to a policy and who exchange resources to pursue these shared interests acknowledging that co-operation is the best way to achieve common goals. Beyond this basic definition, which is not completely uncontroversial either, a large and confusing variety of different understandings and applications of the concept can be found in the literature.

In this paper, our interest is connected with the vast domain of inter-firm relations. In particular, our analysis is focused on the structure and regulation of the network for local transport systems: systems in which many key players, both public and private, cooperate to implement socially relevant public policy (de Vita et. al., 2007). Networks are interpreted as an analytical tool for examining relations between organisations, by taking into

account the role played by private and public actors and the formal as well as informal relationships between them.

Facing the research we decided to consider as the main variables to analyze the role played by operators and immediately after the nature and the main features of inter-organisational mechanisms adopted (Soda et al., 2004).

1.1 The role of operators

Concerning the models used to interpret the different TIS, it is possible to identify three main levels of analysis. The dyadic level: a simple relationship between two players. The organization set level: there is a central organisation that has dyadic relationships with many other players. (Evan, 1966). This organisation is also called focal organisation. The third typology can be defined as population: there are many players, and all of them are strictly interrelated. In this hypothesis the most important point is represented by the whole system of relationships more than the analysis of the single link that can be used in order to connect the focal organisation and the other players of the network.

This brief description of the three main models used to describe the functioning of organizational network is expedient, in order to understand the role played by the most important operators within the system.

The previous distinction of different typologies of networks is also useful because it makes possible to interpret TISs as organization sets.

The main reason is that within TISs we have typically the central organization that plays the most relevant role for political reason (the focal organisation has the power to take decisions inside the network) or for economic reason (the focal organisation has the strength to influence the choices of all other players inside the TIS).

So the first goal of the research is to verify the presence of an organisation that could have a stimulating role inside the system.

To try to answer this point we studied the nature, the dimension and other features of the main operators of the systems.

The role of focal organisation was tested regarding the following core processes:

- investments;
- accounting and financial resources' allocation;
- offer's choices;
- evaluation and possible penalty clauses;
- tickets sale.

Analysing the previously indicated processes, it emerges that the functioning of a TIS implies either the presence or the involvement of a local entity, political body.

In this view, Jordan and Schubert (1992) base their typology on only three main criteria - the level of institutionalisation (stable/unstable), the scope of the policy making arrangement and the number of participants (restricted/open), Frans van Waarden (1992) uses seven - actors, function, structure, institutionalisation, rules of conduct, power relations, actors strategies - finally singling out three as the most important to distinguish between existing types of networks: number and type of societal actors involved, major function of network and balance of power. Atkinson and Coleman (1989) conceptualise six types of policy networks along two different dimension: 1) the state structure in terms of autonomy and concentration of power, and 2) the capacity to mobilise the interests of employers. Rhodes (1992) distinguishes five types of networks according to the degree to which their members are integrated, the type of their members, and the distribution of resources among them.

1.2 Inter-organisational coordination mechanisms for tariff integration systems

Several categories of co-ordination mechanisms have been identified as a result of the analysis of cases, as given below:

- a. non-equity co-ordination mechanisms;
- b. equity co-ordination mechanisms;
- c. governmental coordination mechanisms.

The first category under a) refers to mechanisms aimed exclusively at implementing contracts, which therefore do not include any operations concerning share capital. Non-equity mechanisms presuppose recourse to the legal instrument of the contract and are highly formalised; thus, parties rigorously define reciprocal rights and duties through the legal instrument. The degree of formalisation varies, and although there is an attempt to cover all possible eventualities, a contract always effectively remains incomplete. For this reason, reference is also made to internal agreements which provide further specific elements to better define the relationship. Such elements are, however, contractual mechanisms by which the agents are under obligation to assume a particular stance, but with no intervention concerning the share capital by the parties involved, as previously stated.

Non-equity mechanisms were present in the operations of all ITS analysed in this study.

There are, however, significant differences concerning the characteristics of the organising agencies between whom such mechanisms are employed.

The use of non-equity co-ordination mechanisms is due to the presence of resource dependencies among different typologies of organizational actors involved.

The last category of co-ordination mechanisms under c) refers to governmental mechanisms, which involve recourse to third parties or super-

ordinates capable of defining and imposing development solutions on the behalf of community interests.

In this case, collective mechanisms exist which influence all organizing agents present in the ITS. Such co-ordination mechanisms enable rules to be defined which are valid for all parties involved in the system.

The role of management authorities would appear to be of significant importance within this category. In this case, new organisations have been identified created with the aim of operating within a limited area and providing the following tasks:

- control;
- evaluation;
- planning;
- regulation;
- incentives.

Governmental mechanisms possess many elements in common with hierarchical mechanisms. The role of the plan is to provide a prior definition of both the objectives and the modalities and processes, in order to increase efficiency of the economic system and the economic well-being of the community.

1.3 Methodology

The study investigates the governance models for tariff integration systems in the local public transport sector (both in Italy and some regions of Europe), through a qualitative study. As the case study approach refers to an in-depth study or investigation of a contemporary phenomenon within the real-life context, we set up ten descriptive case studies, using theoretical replication logic (Yin, 1993).

The case studies presented and compared in the paper are: AMT Barcellona, CRTM Madrid, Formula Torino, Metrebus Lazio, Pegaso Toscana, Sitam

Milano, Stib Bruxelles, Stif Parigi Ile-de-france, Stimer Emilia Romagna and UnicoCampania.

In order to do this, multiple sources of evidence was utilized. The investigation was carried out through an initial phase both of literature review on tariff integration systems and of material gathering from induced sources. Moreover data was collected through direct (semi-structured interviews with the top management) and indirect sources (internal analysis of documents). Because these data can have different origins (internal or external to the firm), we verified their mutual coherence. Each single interview lasted 90-120 minutes and was directly made at the participant's workplace. The time-span is from 2006 to 2008.

Although a large part of transport research is based on quantitative-type methodologies (Mentzer and Kahn, 1995; Mentzer and Flint, 2007; Näslund, 2002), preference was given to adopting a methodology of a qualitative-type of data collecting which Näslund considers necessary for developing the research on transport systems, as it allows the opening up of a wider perspective on the investigation object (Näslund, 2002). More especially Näslund proposes as follows: "an interesting question is: if researchers within a certain discipline do the same kind of research as everyone else within the discipline, then how useful will that research be?" (Näslund, 2002, p. 327).

2. Empirical research and results

2.1 The role played by local transport companies

The Sitam scheme covers the province of Milan involving 19 local transport companies. The main service operator, ATM, is active in the city of Milan and plays the role of focal organization. This is due to the size (ATM is larger than the other operators that participate in the integration scheme).

ATM played a key role in the activation of the Sitam scheme since the 1970s, having signed specific agreements with a regional railway operator (Ferrovie Nord Milano) in which there was already the chance for passengers to use both services with the same ticket.

Another fundamental partner of ATM is represented by the regional division of Trenitalia: a purpose-built agreement with such division has allowed the integration of the 80% of transport services in the province of Milan.

The city of Bruxelles represents another good example of a setting in which a focal organization is active.

The area is not very large and is mainly served by a local company, Société des Transports Intercommunaux de Bruxelles (Stib), by the national railway operator (Sncb) and by two other minor companies.

The area is made up of 19 municipalities and by further smaller areas. The main peculiarity is represented by three different local operators that cover different areas but frequently contrast each other.

In the area the organizing authority is the regional minister of transport that wants STIB as local public transport operator and claim that a 5-years contract with the operator is needed. The Minister deals with contract negotiation, changes of lines, processes of investment in infrastructures, price definition, quality effort, funding for 2/3 the public transport services. The role of managing the integration scheme is played by the operator STIB, that negotiates every 5 years the contract of exploitation of the lines with the regional minister.

In the Madrid TIS, we have a third actor who takes on the key organisational role. In the Spanish capital the key organisational role is assigned to CRTM, which is a duly constituted legal entity with a strong public element.

CRTM is an independent agency of the regional government which was created to carry out the functions of a local public transport authority. The most important CRTM activity areas include:

- planning infrastructure elements for public transport services;
- defining an integrated tariff system for the whole public transport system, including a preview of financing sources;
- planning public transport services;
- defining coordinated operational programmes relating to all the types of transport;
- defining an overall image for the public transport system in the Madrid region.

CRTM serves as a form of administrative integration since it has acquired responsibility for the Madrid region, acting as the sole LPT authority in Madrid.

CRTM also supports the development of forms of integration among different means of transport by developing its own network and its own integration services between buses (regional and local), the underground and the regional railway service.

Another example of a tariff integration system in which coordination is assigned to an authority is Paris Ile-de-France. In this case coordination is entrusted to STIF, a higher-level subject which for institutional reasons has both the task of presiding over development and management of the tariff integration system as well as being responsible for the supervision and coordination of infrastructure development. It is also responsible for superintending the creation of new infrastructural elements for transport and guaranteeing that they comply with the needs of users and the territory.

STIF, in particular, is responsible for:

- developing plans for tariff integration;
- defining the lines;
- purchasing vehicles;
- controlling operators;
- managing the penalty system;

- planning investments;
- building and managing common infrastructure elements for the TIS and technological development.

A last example of a system coordinated by an authority is in Barcelona. ATM was created in 1997 and it is responsible for coordinating the LPT system in the Barcelona area, which includes not only large public operators but also numerous private operators who have also been involved in the tariff integration system that is currently in use. The responsibilities of ATM include various areas including:

- defining the lines;
- planning investments;
- developing tariff integration plans;
- supervising operators;
- managing the penalty system.

Table 1 - The roles and the degree of decisional centralization/decentralization within the integrated tariff systems

	Investments planning	Investments and funds management	Decision on lines (activating/closing)	Lines and operators (which operator on which line)	Decision on tariff	Check/valuation/sanction	Retailing	
Parigi	x	x	x	x	x	x		Authority
							x	Operators
								Local Government
ATM								Authority
		x	x				x	Operators
	x			x	x	x		Local Government
Stimer				x	x	x		Authority
		x	x				x	Operators
	x							Local Government
CRTM		x	x	x	x	x		Authority
							x	Operators
	x							Local Government
AMT	x	x	x	x	x	x		Authority
							x	Operators
								Local Government
Pegaso								Authority
		x	x				x	Operators
	x			x	x	x		Local Government
Bruxelles								Authority
		x	x				x	Operators
	x			x	x	x		Local Government
Metrebus		x	x	x	x	x		Authority
							x	Operators
	x							Local Government
Formula								Authority
		x	x				x	Operators
	x			x	x	x		Local Government
UnicoCampania		x	x	x	x	x		Authority
							x	Operators
	x							Local Government

2.2 Inter-organisational coordination mechanisms for integrated tariff systems

As we said before, we carried out our analysis trying to investigate the nature and the characteristics of organizational coordination mechanisms adopted within the different TISs analysed.

Starting from non-equity coordination mechanisms, the first example is provided by Madrid's TIS: here, contracts are established between the authority regulating and controlling the transport system (CRTM) and individual operators. In part, even the functioning of authorities may be regulated by recourse to contracts stipulating reciprocal duties and rights in connection with local organisations. Specifically, the operators with whom CRTM defines its own relations through contractual stipulations are: EMT; Metro; Renfe Cercanias; Long distance operators.

These operators therefore possess characteristics which differ in terms of size, nature of ownership and area of operation. In the case of Brussels' public transport system, relations between the governing political body and the parties involved – in this case transport operators – are regulated by means of formal contracts which do not effectively involve any operation using share capital. Specifically, the regional Ministry of Transport has a five-year management contract only with STIB, the largest operator.

Table 2 - Inter-organisational co-ordination mechanisms for integrated tariff systems

Integrated tariff systems	Equity co-ordination mechanisms	Non-equity co-ordination mechanisms	Governmental coordination mechanisms
AMT Barcelona	X	X	X
CRTM Madrid		X	X
Formula Torino		X	
Metrebus Lazio		X	X
Pegaso Toscana		X	
Sitam Milano		X	
Stib Bruxelles		X	
Stif Parigi Ile-de-france	X	X	X
Stimer Emilia Romagna		X	X
UnicoCampania	X	X	

The second category is that of equity co-ordination mechanisms which provide operations concerning the share capital of the parties involved. Governance of inter-organisational relations often effectively involves recourse to equity as well as non-equity mechanisms.

The choice of criterion for allocation of traffic proceeds further complicates the matter. This study has identified the considerable difficulty that operators encounter in addressing a situation whereby an increase in the overall numbers of passengers transported by TIS – which underlines the considerable success of tariff integration in attracting the user – is associated with an insufficient increase in revenues. A further difficulty is due to increased operating costs which are in turn linked to an increase in demand and in the number of passengers transported.

Barcelona's local public transport system has also adopted equity co-ordination. Established in 1997, the ATM Consortium plays a fundamental role in improving co-ordination of the local public transport service in Barcelona's large metropolitan area.

The ATM Consortium has three large main partners, as follows:

- the Regional Government (Generalitat de Catalunya);
- the Local Government (Barcelona City Council);
- the Metropolitan Transport Authority (the Spanish acronym being EMT), comprising 18 electoral constituencies in the central area of the metropolitan region.

The operators present in the Barcelona metropolitan region are as follows:

- Transports Metropolitans de Barcelona (TMB) – the operator managing metro and bus services in the city of Barcelona
- Ferrocarrils de la Generalitat de Catalunya (FGC) – the operator belonging directly to the regional government. The FGC manages suburban railway and metro services. Rodalies Renfe – the operator belonging directly to the central government which manages local railway services

- Private operators: numerous private operators provide urban and inter-city bus services within the metropolitan region of Barcelona.

The Barcelona transport authority is responsible for managing co-ordination between different categories of operators.

AMT regulates its own relations with public operators (Transports Metropolitans de Barcelona TMB, e Ferrocarrils de la Generalitat de Catalunya FGC) also adopting service contracts. Such contracts regulate the coverage modalities of current account deficits and financing modalities for investments concerning maintenance works and replacement of rolling stock.

Operators and other organising agents which are part of integrated tariff systems (through recourse to the various inter-organisation co-ordination mechanisms which have been analysed) may make use of more effective channels for transmitting and circulating information and strengthening the sense of loyalty and belonging, thus displaying a greater degree of cohesion. The existence of such relationships enables them to be activated if necessary – and subject to requirements manifested by one of the parties – in order that the exchange of services, goods and information between partners proceed both effectively and efficiently.

The contractual mechanisms analysed in this study are typically voluntary and originate from deliberate action taken by various parties within the business system in question (Mercurio and Consiglio, 1998). It should also be noted that despite any common interests various operators and governmental agencies may have in participating in an integrated tariff system, unavoidable and partly conflicting objectives also exist, deriving from a certain degree of competitiveness amongst operators.

Recourse to forms of authority (governmental mechanisms) emerged as a widespread element during the course of research. The most significant case was that of Paris Île-de-France, where the co-ordination role is performed by STIF. The existing operators are: Régie Autonome des Transports Parisiens

(RATP), Société Nationale des Chemins de Fer Français (SNCF) and OPTILE (Consortium of Private Operators). For brevity, we report some considerations regarding the STIF case.

RATP is a public company with approximately 40,000 employees. SNCF is the second largest public operator involved in the process of tariff integration. SNCF provides rail transport, regional transport, and local transport services. The importance of SNCF is demonstrated by the fact that the regional division of Île-de-France alone employs approximately 20,000 people. OPTILE is the third largest operator within the Île-de-France transport system; it is a large consortium comprising approximately 80 road-based transport operators, mainly active in Paris suburban links.

As far as the history and development of STIF is concerned, it is important to specify that it was formed in 2000 based on STP (*Syndicat des Transport Parisiens*), to which the task of co-ordinating the Paris Île-de-France region transport system has been entrusted since the end of the 1950s.

STIF directly governs all – or nearly all – the most important processes linked to managing the transport system: namely, the process of investment planning related to transport infrastructure; the process of managing financing; the processes of infrastructure development; the process of defining the transport system; the decision-making process for the services which must be provided line by line; and the process of managing the integrated tariff system.

The case of Paris is therefore an interesting example of centralization of the level of functionality.

The sale of fares, however, occurs through a network of approximately 1,500 points of sale directly managed by RATP and SNCF. STIF is absent from this process due to the need to maintain a flexible and light structure in terms of hierarchical levels and organisation.

5. Findings and practical implications

It is possible to pinpoint several interesting aspects. First of all, after the analysis carried out in the local transport system, a widespread use of all the different categories of coordination mechanisms emerges. It means that the change process produced even by the normative and regulative transformation determines a need of coordination, that in the past was absolutely ignored.

At the same time, the different typologies of coordination mechanisms play a particular role depending on the country and on the particular case analysed. The compared analysis of the three different coordination mechanisms makes clear that even the role played by the operators changes. It means that there is a strong relationship between the typology of coordination tools adopted and the characteristics of the organizations, firms, authorities involved.

In fact, summarizing, we can state that non-equity coordination mechanisms exist in all the cases studied. Governmental coordination mechanisms have been adopted in the cases of Madrid, Barcelona, Lazio, Paris Ile-de-France and Emilia Romagna. However, equity mechanisms exist in Barcelona, Paris Ile-de-France and Campania. It is also interesting to note that in the

Table 3 - Governance models

Integrated tariff systems	Organizational model
AMT Barcelona	Authority
CRTM Madrid	Authority
Formula Torino	Focal operator
Metrebus Lazio	authority
Pegaso Toscana	Focal operator
Sitam Milano	Focal operator
Stib Bruxelles	Focal operator
Stif Parigi Ile-de-france	Authority
Stimer Emilia Romagna	authority
UnicoCampania	authority

cases of Barcelona and Paris Ile-de-France, all three types of coordination mechanism are present.

On the basis represented by the empirical results, it is possible to distinguish two different governance models:

- transport operator centred;
- authority centred.

The two different organisational models share the presence of a focal organization. In the first case, this role is played by a transport operator. Typically, by the most important one for dimension, resources....(see the case of Milan ATM).

In the second category the coordination and control role is played by a specific authority introduced with this specific purpose. The introduction of an authority entity implies the setting up a network of relationships with local bodies and institutions.

The future step of the research will imply a further and deeper analysis in the internal functioning of local authorities. This research project has been funded by Regione Campania under the legge n. 5/2002.

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