CONNECT
Co-ordination of CONcepts for NEw Collective Transport

Position Paper on Flexible Transport Systems Business Models

Cremona Workshop
Position Paper II
Version 2.2

Status:
Date deliverable due: May 2005
Document name: Cremona Workshop Position Paper
Date last saved: 09th May 2005
Dissemination level

Contract No. FP6-PLT-506959

The European Commission has financed 100% of this Co-ordination Action within the FP6 Programme
THE CONNECT CONSORTIUM

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POSITION PAPER ON BUSINESS MODELS

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EXECUTIVE SUMMARY

One of the major objectives of the CONNECT project is to organize Workshops addressing different aspects of the Flexible Transport Systems (FTS). An essential requirement for the organization of these Workshops is the preparation of a position paper providing the CONNECT point of view on the subject under consideration. The aim of the position paper is to provide the basis for discussions before and during the Workshop. Following the workshop discussions, the position paper is expected to be enhanced based on the feedback received.

This document represents the position paper on FTS business models that will be presented at the second CONNECT Workshop which will take place in Cremona on 23 & 24/05/05. The objective of this document is to consolidate the information collected within the CONNECT project with respect to the development and evaluation of alternative FTS business models.

An essential step towards the development of FTS business models is the specification of the structure of the underlying business system. This task entails i) the determination of the involved actors, their roles and relationships, ii) the structure of the services offered by the FTS, iii) the market needs served by the FTS, iv) the organizational model and v) the cost structure and streams of expected revenues. Given the FTS regulatory framework and the specific features of the market of the area under study, different applicable models may be determined. In this context, a decision has to be made by the initiator of the FTS that relates to the selection of the FTS business model that may lead to a sustainable and cost effective FTS.

This report presents a framework for specifying and assessing FTS business models. This goal is achieved through a systematic approach that involves the following steps:

1. determination of the major constituent elements of a FTS business model,
2. specification of the alternative options for each business model element,
3. determination of alternative applicable and legitimate business models given a specific regulatory and market framework and
4. application of the proposed assessment method for prioritizing alternative applicable business models.

The report is organized into six sections. Section one provides an introduction and an overview of the contents of the position paper. Section two presents the overall methodological framework used for the development and assessment of FTS business models. Section three describes the FTS business model dimensions and elaborates on the features and major issues of the FTS business models. Section four presents the methodological framework for selecting the most ‘appropriate’ business concept given a specific FTS framework, while section five identifies the key elements of the emerging FTS business environment. Finally section six provides the conclusions of the work performed.
1 Introduction

Flexible transport services include a wide range of demand responsive transport systems that provide non-conventional freight transportation and passengers mobility services. The flexibility of these transport services refers to the following features: 1) the route, 2) the schedule, 3) the types of vehicles used, or 4) combinations of the above.

During the last decade, various passengers Flexible Transport Systems (FTS) have emerged in Europe aiming at replacing or supplementing existing Public Transport Services. The scope and the objectives for providing flexible transport services depends on a set of local conditions and factors. For instance, the Flemish Transport Company (De Lijn) has developed various flexible transport services for improving the mobility in the Flemish parts of Belgium. The major incentives for providing flexible transport services were: i) the continuously increasing financial deficit of the conventional public transport, and ii) the lack of mobility services provision to rural areas (villages) of Flanders. In the Keski-Uusimaa Region, the Tuusula, Jarbenpaa, and Kerava municipalities launched the provision of flexible transport services (SAMPO) in order to reduce the cost of public transport and provide equal opportunities of mobility to all citizens. In this case the emerged flexible transport services were integrated within the existing public transport system. Another European FTS, the Rural LIFT system provides flexible transport services to the rural areas of North Leitrim and West Cavan in Ireland. The major motivation for the development of this FTS has been the poor public transport services provision which constitutes a major factor contributing to the migration of youth, social exclusion, and the impedance of the economic development of the area. In Florence, the Public Transport Company of the Florence Metropolitan Area (ATAF) has developed various flexible transport services (Personal Bus™) aiming at providing mobility services in low demand areas and non-peak hours and for special groups (e.g. disabled and elderly). Another FTS in Italy, “My Bus” service has been developed in order to reduce the cost incurred by the existing public transport system. The associated flexible transport system supplements the conventional public transport during certain times of the day. Rural flexible transport systems have also been developed at various areas in UK (i.e. “DoRiS” in West Sussex, “Village Link” in Gloucester, “Call Connect” in Lincolnshire, and “Wiggly Bus” in Wiltshire. The major incentive for establishing these systems was to improve the existing poor services provided by the conventional public transport systems.

The progress in Intelligent Transport Systems and Information Communication Technology has facilitated the establishment of the passenger FTS concept as an alternative mobility solution to urban and rural areas with insufficient provision of public transport services to social groups (e.g. elderly or disabled) or inefficient coverage of the transport demand by the existing conventional public transport.

In parallel to the passenger FTS the development of freight flexible transport services has been driven by the following major objectives: i) enabling the customers to have access on the transport services through several alternative ways (anywhere & anytime), and ii) the improvement of the management of the available transport resources in order to cover the demand in the most economic way. In this context, a set of existing Freight Flexible Transport Systems contribute to the improvement of the freight distribution and logistics processes in urban areas through the integration of e-Commerce and eBusiness Services.
(e.g. eDRUL [Ambrossino et al, 2002]). The major objective of this category of FTS is the optimal use and management of the logistics system in a way to realise flexible, demand driven goods distribution schemes. Another major category of Flexible Freight Transport Systems refers to the development of electronic marketplace application in which local transportation service providers interact electronically with their customers. The potential advantages of this approach include the facts that: (a) such applications impose minimal infrastructure requirements on the part of individual users, being accessed through the Internet, (b) offer to the local providers an electronic presence, and possibly provide a competitive advantage against other companies, (d) they could be used as a means for pooling resources and cooperating, and (e) they reduce operating and administrative costs, while providing a higher level of service (e.g. EMIRES system) [Zografos and Salouras, 2005], [CITRO, 2003].

It is apparent that the business models used for the provision of FTS varies according to the local business, socio-economic, legal, and regulatory framework. Therefore, alternative business models are in place for the provision of flexible transport services.

One of the CONNECT project objectives was to organize a workshop on FTS business models. An essential requirement for the organization of this Workshop is the preparation of a position paper that presents the information collected within CONNECT project on the specific subject of the event. The aim of the position paper is to provide the basis for discussion before and during the workshop. Following the Workshop discussions the position paper is expected to be enhanced based on the feedback received.

This document represents the position paper on “FTS Business Models” and aims to consolidate the information collected within CONNECT project with respect to the design and evaluation of alternative FTS business models.

An essential step towards the development and selection of FTS business models is the identification of the structure of the underlying business system given a set of legal, institutional, organizational, and market constraints of the area under study. The selection of the appropriate business model is a complex decision making process that involves the specification of the type of services to be provided, the identification of the stakeholders, their roles and interrelationships, and the determination of the cost structure and the potential streams of revenue in order to cover the participants incentives and achieve the development of a viable business system. It should be stressed that the specification of these issues is performed within a specific FTS context including the regulatory framework, the market opportunities, and the involved actors.

In particular, this report presents the essential elements needed to describe FTS business model(s) and provides a coherent methodological framework for supporting the selection of the appropriate business model within a specific context. This objective is achieved through a systematic process that involves: i) definition of the constituent elements of a FTS business model, ii) development of a systematic approach for determining applicable FTS business models, iii) development of a methodology for the comparative assessment of alternative FTS business models and iv) the specification of the key elements for the establishment of emerging business models.

The FTS business model development process involves the following stages:

i) The identification of the regulatory framework, the mobility needs, the existing public transport system, the potential stakeholders and their incentives

ii) The specification of the set of alternative FTS business models that comply with the aforementioned context.
iii) The assessment of the candidate alternative FTS models in terms of their economical feasibility, the level of attainment of the mobility requirements, the contribution to the transport system integration, and the improvement of the level of transport services of the area under study.

The remainder of the report is organized into six sections. Section two presents the overall methodological framework used for the development and assessment of FTS business models. Section three describes the FTS business model dimensions and elaborates on the features and major issues of the FTS business models. Section four presents the methodological framework for selecting the most ‘appropriate’ business concept given a specific FTS framework, while section six identifies key elements of the emerging FTS business environment. Finally section seven summarises the conclusion of the work performed.
2 Overall Methodological Approach

A crucial step towards the development of a Flexible Transport System (FTS) is the determination of the underlying business model that provides the basis for establishing sustainable, efficient, and cost-effective system which fulfils the expectations, goals, and aspirations of the involved actors (users, operators, investors, public authorities). The focus of this position paper is on structuring the FTS business model development process and the provision of a methodological framework for accommodating the FTS initiator to develop a sustainable and cost-effective FTS. This goal is achieved through the systematic approach outlined in Figure 1.

![Overall Methodological Framework for the FTS Business Model Development](image-url)
the Flexible Transportation Systems. The business model dimensions are further specified according to the requirements imposed for the provision of passenger and freight services.

Following the establishment of the three business models dimensions, the features of a FTS business model are identified. These features include the market segment that should be served, the strategy that should be established for the provision of the services, the stakeholders involved for the provision of the services, the description of the business processes that should be in place in order to offer the services, the financial basis and the organizational structure needed to accommodate the provision of the services.

The next step of the methodology is to establish business models by combining alternative characteristics of the business model elements applicable in a given business and socio-economic environment. The existence of alternative applicable business models implies that an evaluation should take place in order to select the most desirable business model for the problem under consideration. Thus, the last step of the proposed framework is to assess the performance of each business model on the basis of a set of criteria expressing the objectives of all stakeholders.
3 Foundation of FTS Business Models

The development of the business model of a Flexible Transport System (FTS) involves the specification of the structure of the underlying business system for the provision of freight or passenger flexible transport services to the area under study. The constituent components of a FTS business model are derived from the analysis of the major dimensions of the associated business system. This section provides an overview of the business model definitions that can be found in the literature and analyses the content of the major dimensions of the FTS business model.

3.1 Business Models

Although the term Business Model is widely used in the literature, there is not a common definition. In fact the definition of the business model and the associated taxonomy development constitute a field of research themselves. According to [Timmers, 1998], the business model involves the description of the product, services or information flows and the specification of the involved business actors, their associated roles and incentives, and the determination of the sources of cost and revenues. This Business Model definition seems to dominate this research field up to now.

However, several other definitions have been found in the literature which are briefly presented in order to justify the need for a systematic process for defining the business model for Flexible Transport Systems. In general the term ‘Business Model’ is used in order to provide an abstract view of the structure and operation of a business system. In particular, the definitions for the business model can be classified into the following categories:

- Simple definitions, that aim to present an integrated view of the concept behind the business model in just a few words. Along these lines, [Linder & Cantrell, 2000] define it as “the organization’s core logic for creating value”, [Petrovic et al, 2001] state that “a business model describes the logic for creating value”, while [Margetta, 2001] define it as the “story that explains how an enterprise works”.

- Another approach for defining the business model is through the specification of its constituent components. Under this category [Timmers et al, 2001] implies that the business model involves the description of the architecture of the business system i.e. product, services, and information flows, the involved actors, their roles, and their potential costs and benefits. Hawkins definition is focused on the commercial relationships between the major entities of the business system i.e. enterprise and products/services, stated as the “way of structuring cost and revenue streams such that a business becomes viable” [Hawkins, 2001]. Similar definitions have been provided by [Rappa, 2001] and [Elliot, 2002].

- A third category of business models definition refers to the missing link between the business strategy and the business functions. In particular, [Osterwalder & Pignuer, 2002] define the business model of a company as the description of the architecture of
the firm for producing, marketing, and delivering the value that the company offers to the customers in order to create sustainable revenue streams.

The business model definition used in this document requires the specification of a set of fixed components that determine the structure and operation of the relevant business system. Based on the literature, the following superset of business model constituent features has been identified:

- **Stakeholders**: This feature refers to the actors that are involved in the business system and their objectives. A major aspect of the market structure definition is the specification of the interrelationships between the involved actors and the specification of their incentives in the system. The description of the market structure may be supplemented with the assets or competences of each actor.

- **Value Proposition**: It involves the products or services offered by each actor involved in the business system.

- **Market Segment**: This feature of the business model refers to the specification of the socio-economic aspects of the potential customers of the business system and their needs.

- **Business Functions**: It includes the major business processes of the system and the actors involved.

- **Core Competencies**: It concentrates on the assessment of the capabilities and assets of the company.

- **Pricing Policy and Revenue Streams**: This feature of the business model provides the cost structure and the financial basis of the company. More specifically, it refers to: i) the categories of costs arising in the business system and their allocation to the actors involved, ii) the potential sources of revenues and their allocation to the actors involved,

- **Strategy**: It refers to the alliances among the actors, the competitive advantages and position in the value chain.

- **Regulation**: This is an external feature of the business model that implies the legal, institutional and organizational framework of the business system.

- **Technological Background**: It refers to the technologies used for the operation of the business system. This is a feature that that influences the architecture and operation of the business system.

The aforementioned constituent elements of the generic business model provide the basis for analyzing the FTS business model to its major dimensions which are presented in the following section.

### 3.2 FTS Business Models Dimensions

A FTS business model is characterized by the following three major dimensions (see Figure 2): 1) FTS service offerings, 2) FTS business strategy and functions, and 3) the FTS context. The definition of a FTS business model implies the specification of the components comprising each of the aforementioned dimensions.

The FTS service offerings dimension refers to the types of services provided by the system and the associated operational characteristics. The business strategy and functions
dimension relates to the business vision and mission of the system, the specification of the major strategic issues for the development of the system, the major processes and activities, the organizational and economical structure. Finally the third Business Model dimension called “FTS context” includes the basic parameters that define the environment of the FTS business system i.e. the target area, the regulatory framework and, the potential market. The remainder of this section is focused on elaborating the aforementioned dimensions of FTS business models.

Figure 2: Three dimensional approach for the identification of a Business Model’s Characteristics

3.3 FTS Service Offerings

The FTS service offerings dimension of a business model refers to the integrated view of the services provided (value proposition) by the FTS and consists of the following FTS business model components: i) the service typology, and ii) the service operational structure. The FTS service typology is refers to the generic type of services provided by the system e.g. transport services for special groups, rural transport services etc. Furthermore the service operational structure involves the major features of the services provided by the system including: i) the Service Scheme that defines the route and schedule flexibility of the FTS, ii) the booking system that specifies the alternative booking options offered by the system, and iii) the fleet management system that refers to the alternative types of communication between the TDC and the vehicle.

The remainder of this sub-section provides an overview of the content of the aforementioned components of the FTS service offerings dimension.
3.3.1 FTS Service Typology

The alternative generic types of FTS services are classified in the following way:

- Closed Services-specific groups
- Closed Services-single agency
- Urban periphery
- Local journeys in urban area
- Flexible routes in suburban areas
- Rural local services
- Rural flexible routes

3.3.2 FTS Service Operational Structure

3.3.2.1 FTS Service Schemes

The FTS service scheme is based on the routing and scheduling concepts used for the provision of the transport services [Engels and Ambrosino, 2004].

In particular the routing and scheduling alternative options of a flexible transport system relate to the level of flexibility of the system in terms of the routes and time-schedules of the operating vehicles. The determination of the alternative types of flexible transport services is based on the definition of four different categories of service stops: i) fixed stop implying a predefined stop always served with fixed passing times, ii) predefined stop which refers to a stop that is served only under demand within a fixed passing time, iii) relaxed predefined stop referring to a stop that is served on demand solely (not involving a fixed passing time), and iv) stop point implying any point within a specified region. The proposed approach for determining the alternative types of flexible transport services involves starting with a fixed route and timetable and relaxing gradually the fixedness of the stops and the associated passing times [Engels and Ambrosino, 2004]. Eventually, the following types of flexible transport services may emerge [Engels and Ambrosino, 2004]:

i) Deviation on a predefined conventional scheduled service. In this type of service, the stops, the routes, and schedule are fixed (as in the conventional type of service). However, the route of the service may be extended (without affecting the basic route) in order to include and set of predefined stops on demand.

ii) Deviations on a scheduled service to predefined routes in a corridor. This type of service refers to a main fixed scheduled service that can be extended within a corridor in order to serve a set of predefined stops (route deviation within the corridor is permitted).

iii) Predefined stops in a corridor. This service implies the existence of one or two endpoints (fixed stops), a set of predefined stops (i.e. fixed stops served only on demand) that specify the structure of the service, and a set of relaxed predefined stops (i.e. stops with no specified passing times served on demand).

iv) Predefined stops in an area. It refers to the service scenario where the stops are relaxed predefined (i.e. stops with no specified passing times). The existence of a
3.3.2.2 Relation to Public Transport

The following relations of a FTS service have been identified regarding public transport:

- Stand alone
- Integrated (serving different times or different areas)
- Complementary, as a feeder
- Complementary, as equal

3.3.2.3 FTS Booking System

Another major feature characterizing the provision of flexible transport services is the booking process. The following types of booking concepts have been identified [Engels and Ambrosino, 2004]:

- Non-pre-booked trips. In this case, the passenger does not need to book the trip in advance but he or she can fix the trip at the boarding stop of the vehicle by directly notifying the driver.
- Direct booking. In this booking option the passenger communicates with the operator and sets a trip request. Then the operator provides the passenger with one or more service proposals and the passenger selects his preferred service and confirms the associated booking.
- Wide time window-trip notification. The passenger communicates with the operator and sets his/her trip request. The operator allocates to the specific trip request a service with a wide time window. After collecting the trip requests the operator identifies the optimum routes and schedules and notifies the passenger to announce him/her the exact departure time.
- Collecting requests - defining service. In this booking option the operator collects the trip requests and then communicates with each passenger to announce his/her associated service and confirm it with him.

3.3.2.4 FTS Communication and Fleet Management Systems

It involves the technologies which are used for the operation of the FTS. In particular, the major FTS related technologies are the following [Iacometti et al, 2004]:

- Communication Technologies. This category includes the technologies enabling the communication between the TDC and the user. This type of communication can be achieved through: i) the telephone (manually or automatically with the use of an automated voice responder), ii) the GSM/SMS technology in terms of exchanging SMS, and iii) the Internet.
- On-Board Technologies. This category of FTS technologies includes: i) on-board computer that provides an interface between the driver and the TDC, ii) the location system (automatic or manual) that determines at each moment the location of the vehicle, iii) passenger devices for fare collection, and iv) on-board communication
network that enables the two-way communication between the driver and the TDC operator.

- TDC technologies. This type of technologies pertains to the software and hardware for the resources and travel requests management (scheduling, routing, travel request processing).

### 3.4 FTS Context

The FTS context represents the environment in which the FTS could be provided. Basically, the context consists of the following elements:

- The target area
- The framework
- The potential market
- The market opportunities

The **Target Area** specifies where the services are going to be provided. The characteristics of the target area are a key determinant of the type of services to be provided. The vehicle allocation, routing, booking system, etc, may vary if the service is to be provided in rural, urban or semi-urban areas.

The **Potential Market** for mobility services is strongly associated with the characteristics of the target area. The potential market is defined by the socio-economic, demographic and spatial distribution characteristics of the population located in the target area. Furthermore, the spatial distribution of the socio-economic attributes of the target area is also a major determinant of the potential market of a FTS.

The **Market Opportunities** are defined as subsets of the potential market. These are areas of the market (market segments) with higher potential for existing actors or new entrants to gain new business. They occur due to unmet or poorly-met mobility needs. They can also occur where an actor can offer a (perceived) step change in quality, thus targeting existing business. The set of Market Opportunities is normally background, but it can be influenced by the actors, even in the short term. They can do this through outreach, marketing, and other proactive measures. The potential passenger FTS users can be classified in to the following categories:

- Social groups that have limited access to the existing conventional public transport services or/and private car (elderly, disabled, unemployed, students etc.)
- Residents of areas (rural, urban or sub-urban) where the provision of public transport services is poor inducing undesirable social effects such as social exclusion, economic recession of the area.
- General Public. The objective of the FTS that addresses the general public needs is to replace or complement the existing inefficient conventional public transport services in order to reduce costs and improve the efficiency of the public transport system.
- Concerning the Freight FTS, the major users are the Small and Medium size Enterprises and individuals requiring and providing transportation services.
The **Framework** includes the legal and regulatory framework, the institutions, public financing arrangements, fare restrictions etc. This varies across sites, and must be taken into account. The actors cannot easily change this, and even then change is more likely to be in the medium- to long-term. Thus, the Framework forms the core constraints or ‘boundary conditions’ [CONNECT D10, 2005]. Normally, FTS has to exist within the laws and regulations which were designed for conventional buses and taxis, what may distort the FTS offer, forcing the service operators to face a set of constraints, as can be the limitation of the vehicle type and capacity, the acquisition of regular route licence, the lack of freedom in choosing the pick up and set down points or the possibility to compete against self financing regular transport.

In particular, the regulatory framework of a FTS includes to following legislative and institutional issues:

- The regulations that influence the passengers transport market. The emerging market framework includes the specification of the business initiatives, the competition and the degree of deregulation of the market.
- The regulations that determine the level and type of potential involvement of the local/public authorities in the public transport and the constraints and limitations of the public transport operators.
- The regulations addressing the associated transport modes i.e. taxi, bus, FTS
- The legislation related to the minimum level of mobility of the general public or/and special social groups.

The Legal and Regulatory Framework has a very large impact on the freedom of initiative on all of the stakeholders involved in the provision of FTS services. Among other things, it sets the framework for:

- The nature of passenger/freight transport services which can be offered
- Who can offer passenger/freight transport services
- The relationships among the different actors
- Obligations on the provision of mobility services
- Rights of citizens (including specific groups) to mobility services
- Restrictions on services and service types
- Operational and technical requirements
- Financing requirements and subsidies
- Access to the market
- Freedom or restrictions on innovation and entrepreneurship
- Protection for specific market or operator sectors

### 3.5 FTS Business Strategy and Functions

The business strategy and functions dimension of a FTS business model provides an integrated view of the scope and structure of the business system underlying the FTS operation. In this context, the business strategy and functions dimension includes the following components:

i. Business vision that refers to the long-term objectives envisaged by the initiator(s) of the FTS
ii. Business mission that involves the major course of actions in order to achieve the business vision

iii. Business strategy that defines the sources of competence, the competitive strategy and the investment model of the FTS

iv. The organizational structure including the stakeholders, their roles and interrelationships

v. The major business processes that should be in place in order to deliver the services.

vi. The economic structure defining the cost structure, the financial basis and the streams of income.

This section presents an overview of the aforementioned components of the business strategy and functions dimension of FTS business models.

### 3.5.1 Business Vision

The specification of the business vision constitutes an essential prerequisite for developing any type of business. It expresses the economic or social ideals envisaged by the initiators of the FTS. In the past two decades the following types of goals have guided the development of FTS:

i) Economic development of rural territories. Rural area communities are usually facing the problem of insufficient or/and inefficient public transport services. The poor provision of transport services constitutes a major impediment to the economic development of the area. The vision that emerges from this situation is the development of a flexible transport system that would improve the mobility of the residents resulting to better economic development prospects and better integration of the rural areas.

ii) Fighting of Social exclusion. This social phenomenon is strengthened by the lack of public transport services that can meet the special service requirements required by special social groups such as disabled, unemployed, students, youth, elderly, etc.

iii) Entrepreneurial interest to invest and seek reward.

iv) Rationalization of existing public transport system.

v) Reduction of energy consumption and environmental impacts of the transport system.

### 3.5.2 Business Mission

The establishment of the business vision leads to the specification of the associated business mission of the FTS. The business mission represents the set of the business objectives that should be targeted in order to fulfill the vision of the FTS. In this context potential business vision for FTS may involve one or more of the following business objectives:

- To provide to all citizens a specified level of transport (e.g. equal opportunities to mobility services) [CONNECT D10, 2005]
- To provide mobility services to specific social groups (disabled, elderly, etc.) [CONNECT D10, 2005]
- Provide services to complement substitute the public transport system.
- Provide FTS mobility services, as a new transport “mode”.

For the Freight Flexible Transport System the business mission may involve objectives related to the provision of services that will improve the utilization of the transport resources, reduce the associated transportation cost, and improve the competitiveness of carriers in areas with low transportation demand, great distances between potential origin-destination pairs, and low population density or economic development [CITRO, 2003, Zografos and Salouras 2005].

3.5.3 Business Strategy

Business Strategy involves: i) the sources of competence, ii) the competitive strategy, and iii) the investment model [Morris et al, 2005]. The source of competence constitutes a strategic feature of the FTS business model that refers to the core competency of the FTS business system. It basically implies the specification of the characteristics of the FTS operation and service that enhances and sustains the competitive advantage of the associated business system over the existing relevant public transport systems. Apparently the source of competence feature is not applicable in the cases that the associated FTS operates as a complementary transport service within a public transport system.

In general the competency of a FTS could be accomplished through the achievement of high value performance on the following system processes:

- Information management and communication
- Resources management
- Service dissemination and marketing
- Technology, R&D, innovative capability
- Extended service provision

The competitive strategy implies the specification of the competitive position of the FTS within the associated market. It pertains to the essential strategic decision on setting the competitive service advantages of the system. In this context the competitiveness of the FTS could be focused on the following service profiles:

- Operational efficiency and consistency
- Quality of the services provided
- Cost effectiveness
- Intimate customer relationship.

Finally, the investment model relates to the ambitions envisaged by the initiator/entrepreneur with respect to the size and scope of the FTS. Four major investment models have been identified:

- Sustainability model, in which the goal is the development of a sustainable FTS that could cover the basic financial obligations
- Income model, implies the development of a FTS that provides a stable income stream
- Growth model, implies substantial investment and reinvestment in order to produce a FTS that provides major capital gains for the investors
- Speculative model
3.5.4 Stakeholders, Roles and Relationships

This feature includes the types of actors involved within the FTS development, operation and their associated roles. In particular, the major stakeholders of the passenger FTS system can be classified as follows:

- Public Authority(ies), having the responsibility to issue legal authorization for the provision of the flexible transport services, subsidizing the provision of the services, and supporting in other ways the FTS viability (e.g. promoting and advertising the services). Public authorities can be the state, the province/county authorities, the municipality, and social insurance institutions.
- Service providers, that offer the flexible transport services to the residents of an area like taxi operators, public transport operators etc.
- Travel Dispatch Centre (TDC) Operator, being responsible for the operation of the TDC.
- Technology providers, that provide the associated dispatching software, the communication technology (referring to the user-TDC and TDC-vehicles communication channels), and the fleet management technologies (e.g. AVL).
- Other stakeholding groups whose business associates with FTS (e.g. shopping centers, health care organizations).
- Users who have needs for using FTS (e.g. general public, social groups).

It should be pointed out that the actors involved in the operation of the FTS could fall into more than one of the aforementioned stakeholder categories.

The alternative roles of the actors involved in the passenger FTS can be classified in the following major categories [CONNECT D10, 2005]:

- Policy/Strategy Maker. This role includes the responsibilities of: i) determining the regulatory and legislative framework on FTS development and operation, ii) specifying the major objectives of the intended FTS.
- FTS administrator/Initiator. It refers to the responsibilities that relate to the control, and overall management of the FTS.
- Entrepreneurs and investors. They provide services or resources to the FTS as an investment i.e. taking financial risk.
- Services Providers under contract. It involves the provision of all types of services for the operation of the FTS i.e. transport services, TDC operation under contract (i.e. no financial risk is taken).
- Funders. This role involves solely the funding of the FTS in terms of subsidies.

It is evident that each actor involved in the passenger FTS development or operation could be commissioned with more than one of the aforementioned roles.

The specification of the interrelationships among the involved FTS actors constitutes essential information on defining the organizational structure of the FTS business model. The major types of interrelationships that play key role to the organization of the underlying FTS business system are the following:

- Context of cooperation (if any) between the public and private sector actors in terms of the control and operation of the FTS.
- Degree of cooperation of the TDC operator and the transport operator.
- Context of involvement of the public sector actors to the control, operation and funding of the FTS and outsourced actors.
• Context of involvement of the private sector actors to the control, operation and funding of FTS and outsourced actors.

Concerning the freight FTS, the major stakeholders are the following [Zografos and Salouras, 2005]:

i) The transportation service providers (e.g. carriers, courier companies, freight agencies). Their incentives in participating in a FTS are the improvement of their resources utilization, minimization of the emerging transportation cost, and the enhancement of their competitive advantage.

ii) Regional Public Authorities. The major initiative in the FTS is to provide the basis for the economic development of the associated area.

iii) Small and Medium Enterprises which are the clients of the FTS. They generate the demand for the FTS through their commercial activities.

3.5.5 Activities and processes

This component of the FTS business model includes all the activities and processes that take place in order to provide the flexible transport service. The operation of a FTS involves the following major processes [Engels and Iacometti, 2004]:

- Management of Transport Service provision. This process involves the execution of a set of activities resulting to the provision of the transport services (i.e. user request registration, travel request processing, service finalization for each request).
- Resource Management referring mainly to the TDC operations.
- Customer Information which implies the dissemination and promotion of the services.
- Operations Control which involves the monitoring of the transport services provided by the FTS.
- Communication Management which includes the operations related to the communication of the TDC with the user and the vehicles.
- Data Maintenance referring to the collection, storage, and processing of the system’s data related to the routes, schedules, performance measures and financial figures.
- Fare collection.

3.5.6 Cost Structure

A major aspect of the business model of a Flexible Transport System (FTS) is the specification of the cost structure i.e. the identification of the major categories of the emerging costs and the distribution of these cost categories to the involved actors. The costs that emerge from the establishment and operation of a flexible transport system are divided into three major categories: i) fixed, ii) semi variable, and iii) variable. The criterion for this categorization of cost is the level of dependence of each cost category to the productivity of the system. Here it worth noting that depending on the business relationship established among the FTS stakeholders the classification of certain cost items may not be identical to what is proposed in the following classification scheme. In what follows there is the definition of each cost category as well as its constituent cost elements.
CONNECT: Position paper on FTS Business Models

Fixed Cost: This category involves the expenses that are independent of the system’s productivity. The cost elements of this category include:

- Premises and Depots: includes the operating expenses and the storage expenses.
- Marketing and information: includes the advertising and promotion expenses.
- Insurance and vehicles tax: it refers to the cost for physical damage insurance premiums, recovery of physical damage losses and other corporate insurance premiums.
- Overheads: refers to operating costs for the implementation of the accounting, payroll and ticketing process.
- Training: includes all the costs related to the training of the employees.
- Technology: refers to the cost accrued from the operation of the information and communication systems and includes the operating costs of the travel dispatch centre, of the in-vehicle systems, etc.
- Interest and Financial charges: refers to the expenses accrue from the financial transactions.
- Others: refers to other fixed cost expenses which cannot be consolidated to none of the aforementioned fixed cost categories.

Variable Cost: includes the expenses that are proportionate to the system’s productivity i.e. they rise and fall with business activities. The cost elements of this cost category are the following:

- Fuel and Lubricants: the costs of gasoline, diesel fuel, lubricating oil, etc. for use in vehicles.
- Contracted Services (e.g. Taxis, extra capacity): includes the costs for services that have been outsourced.
- Ticket sales (commission): This is the cost accruing from the ticket sales commission.

Semi–Variable Cost: This category refers to the cost elements that consist of a fixed cost part and an additional variable cost part depending in the system’s productivity. The cost elements of this cost category are the following:

- Maintenance (consumable, tyres): refers to lease payments for tyres and tubes and also the cost for all the consumable materials related to vehicles.
- Communications: includes all the communication expenses, such as the cost for the communication between the driver and the dispatcher.
- Vehicles: refers to the vehicles procurement cost.
- Driver, Supervisors, Dispatchers, Maintenance (staff): refers to labour costs of drivers, supervisors, dispatchers and maintenance (staff), as well as costs arising from the employment relationship, such as retirement costs, workers’ compensation insurance etc.
A major issue in defining the cost structure of a FTS business model is the specification of the allocation pattern of the aforementioned cost elements i.e. determination of the proportion of each cost element covered by each actor.

### 3.5.7 Sources of Revenues

A fundamental issue in defining a FTS business model is the specification of the sources of revenues and the determination of the proportional distribution of the total revenues to the specified sources. The analysis of the sixteen FTS case studies in USA and Europe within CONNECT project [CONNECT D10, 2005] concerning the streams of revenues concluded to the following major categories of sources of revenues:

- Fare Revenues referring to the revenues that the agency receives from the passenger fares.
- Local Funds: Subsidies obtained from the local authorities to assist with paying part of the costs for the provision of flexible transport services.
- Central assistance is the funds provided by Central Government.
- Non Transportation Funds, such as advertising revenues, revenues provided through a purchased transportation agreement etc.,

### 3.5.8 Income and Financial Basis

The financial operation of a system is one of the most relevant issues when describing a business model as they characterise the revenue generation model of the system under analysis. In particular the basis refers to the way that the actors involved in the operation of the system are recompensed for their contribution in the system operation.

The income basis of a flexible transport system business model involves an analysis of the potential income of the operators (actors involved in the operation of the system) and the sources of revenue and public funding.

The description of the financial basis of a business model involves a set of alternative options:

- Commercial basis. The system is established and operated by private organisations without receiving any public commission. The profit is expected to be made from fares.
- Gross cost basis. The operator is recompensed on a cost-plus basis per unit.
- Net cost basis. The operator gets paid an additional amount per unit to supplement the fare box revenue. In this option the operator carries or shares revenue risk.
- Lump sum. Either gross or net cost but not directly linked to the actual production.

The income basis refers to the specification of the site and content of the major constituent components of the operators income i.e. revenues and public funding.

When analysing the business model of a FTS system, the revenue generation can follow different strategies:
- Direct fare box revenue, coming from sales on- and off-vehicle.
- Reimbursement for free or reduced rate passengers, only if the revenues are generated on a per passenger basis.
- Participation in shared revenue schemes, as can be the integrating ticketing.
- Private hire.
- Contract work

The revenue generation process of a given FTS system will normally share some of these strategies. Part of the revenues will come, for example, from direct fare box and part of them from reimbursement for free or reduced rate passengers.

As mentioned above, part of the income basis comes from public funding. The payment basis may differ from one to another. We can identify the following payment basis:

- Per vehicle trip, kilometre or hour
- Per event
- Per passenger trip or kilometre
- Mobility index/service coverage
- Lump sum
4 Methodological Framework for FTS Business Model Development and Selection

The specification of the appropriate FTS business model (given a specified set of legal, organizational, and market constraints) involves a complex decision making process that includes:

i) the development of a set of candidate applicable business models referring to the alternative configurations of the service type provision, the involved stakeholders, their roles and interrelationships, and associated potential cost structure and revenue streams in order to cover the incentives of the involved actors and the development of a sustainable Flexible Transport System (FTS),

ii) select the most “beneficial” business concept in terms of a set of evaluation criteria.

The objective of this section is to present a systematic approach for the determination and evaluation of alternative applicable FTS business models in order to accommodate the aforementioned decision making process for the FTS business model development.

It should be clarified that the scope of the proposed methodological framework is only to provide a systematic approach for aiding the decision maker to formulate feasible business models and assess the alternative models in terms of their economic, social, and transport related impacts. Therefore, it should not be considered as a tool that determines the optimal FTS business concept, but rather as an approach that structures the decision making process.

4.1 Methodological Framework for Assessing Alternative FTS Business Concepts

An essential step towards the development of a Flexible Transport System (FTS) is the specification of the associated business model for organizing the underlying business system. The selection of the appropriate business model for the development of a FTS pertains to a complex and critical decision making process having the following features:

i) It involves multiple objectives. The selection of the most appropriate business model involves several evaluation objectives some of which may be social, economical, or transport integration related.

ii) It involves a set of business and operational limitations emerging from the relevant legal, institutional, organizational, and market environment.

iii) It embodies the cooperation and coordination of actors coming from the public and/or the private sector with different and contradicting objectives.

A systematic approach has been developed in order to accommodate the FTS business model development decision making process taking into account the aforementioned complexities. The objective of the proposed methodological framework is to support the decision makers through the systematic development of alternative applicable business
models, the prioritization of these emerging models, and the sensitivity analysis on the priorities of the alternative models. Figure 3 presents the proposed methodological framework.

![Methodological Framework for FTS Concept selection](image)

The proposed evaluation process consists of three basic phases: i) the FTS business model development, ii) the screening stage, and iii) the prioritization phase. A major prerequisite for initiating the aforementioned evaluation process is the specification of the FTS context including the regulatory framework, the potential actors and their incentives, the market and the potential market opportunities. The remainder of this section elaborates the aforementioned phases of the proposed methodological framework.

### 4.2 FTS Business Model Development

The development of the alternative FTS business model involves the specification of the alternative feasible options of each of the business model constituent elements. It is evident that the different combinations of the alternative options of the model elements provides a
superset of alternative FTS business models. A systematic approach is proposed in order to accommodate the business concept development phase. The proposed approach is based on the formulation and standardization of the alternative options for each business concept element wherever possible. Table 1 provides an overview of the aforementioned standardization [CONNECT D10, 2005].
<table>
<thead>
<tr>
<th>FTS BUSINESS MODEL DIMENSIONS (1)</th>
<th>FTS BUSINESS MODEL DIMENSIONS COMPONENTS (2)</th>
<th>FTS BUSINESS MODEL BUILDING ELEMENT OPTIONS (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FTS CONTEXT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Target Area</td>
<td>Describes the socio-economic profile of the candidate area to be served</td>
<td></td>
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<tr>
<td>Regulatory Framework</td>
<td>Identifies and describes the relevant legislation for the provision of transport services</td>
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<tr>
<td>Market Structure</td>
<td>Describe the population features of the area under study (demographic, economy, existing transport system)</td>
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<tr>
<td><strong>Service Typology</strong></td>
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<tr>
<td></td>
<td>▪ Closed Services - specific groups</td>
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<tr>
<td></td>
<td>▪ Closed Services - single agency</td>
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<td></td>
<td>▪ Urban periphery</td>
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<td></td>
<td>▪ Local journeys in urban area</td>
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<td></td>
<td>▪ Flexible routes in suburban areas</td>
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<td></td>
<td>▪ Rural local services</td>
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<td></td>
<td>▪ Rural flexible routes</td>
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<tr>
<td><strong>Service Operational Characteristics</strong></td>
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<tr>
<td></td>
<td>▪ Deviation on a predefined conventional scheduled service</td>
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<td></td>
<td>▪ Deviation on a scheduled service to predefined routes in a corridor</td>
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<td></td>
<td>▪ Predefined stops in a corridor</td>
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<tr>
<td></td>
<td>▪ Predefined stops in an area</td>
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<tr>
<td></td>
<td>▪ Points in an area</td>
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<tr>
<td><strong>Relation to public transport</strong></td>
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<tr>
<td></td>
<td>▪ Stand alone</td>
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<td></td>
<td>▪ Integrated (serving different times or different areas)</td>
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</tr>
<tr>
<td></td>
<td>▪ Complementary, as feeder</td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Complementary, as equal</td>
<td></td>
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<tr>
<td><strong>Technological Background</strong></td>
<td></td>
<td></td>
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<tr>
<td>Booking System</td>
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<tr>
<td></td>
<td>▪ Call to TDC operator</td>
<td></td>
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<tr>
<td></td>
<td>▪ Automated phone system</td>
<td></td>
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<tr>
<td></td>
<td>▪ Internet</td>
<td></td>
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<tr>
<td></td>
<td>▪ SMS</td>
<td></td>
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<tr>
<td></td>
<td>▪ Request button at stop</td>
<td></td>
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<tr>
<td></td>
<td>▪ Booking by third party</td>
<td></td>
</tr>
</tbody>
</table>
### FTS Business Model Dimensions (1)

<table>
<thead>
<tr>
<th>FTS Business Model Dimensions Components (2)</th>
<th>FTS Business Model Building Options (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technological Background</td>
<td>• AVL/AVI</td>
</tr>
<tr>
<td>Fleet Management System</td>
<td>• Fleet Management S/W</td>
</tr>
</tbody>
</table>

### FTS Service Offering

- **Business Vision:**
  - e.g. Increase mobility,
  - Support Rural development,
  - Fight social exclusion, e.t.c.

- **Business Mission:**
  - e.g. provide transportation services special population category,
  - complement conventional public transport services, e.t.c.

### FTS Business Strategy and Functions

**Sources of Competence**
- Information management & communication
- Resources management
- Service dissemination and marketing
- Technology, R&D innovative capability
- Extended service provision

**Competitive Strategy**
- Operational efficiency and consistency
- Quality of services provided
- Cost effectiveness
- Intimate customer relationship

**Investment Model**
- Sustainability model
- Income model
- Growth model
- Speculative model
### FTS Business Models

#### FTS Business Model Dimensions (1)

<table>
<thead>
<tr>
<th>FTS Business Model Dimensions Components (2)</th>
<th>FTS Business Model Building Options (3)</th>
</tr>
</thead>
</table>
| Organizational model                        | ▪ The FTS is operated by private sector actor  
                                            ▪ Public body with its own resources operates the FTS  
                                            ▪ The FTS is operated in cooperation with public body and private sector actor  
                                            ▪ The public body has contracted the TDC and transport operations as a comprehensive service to the one operator  
                                            ▪ The public body has contracted the TDC and transport operations separately to the two operators  
                                            ▪ The public body has contracted the TDC operations to the one operator. Multiple operators handle the transport operations.  
                                            ▪ FTS operator is private company, but accountable to public bodies and/or community representatives. |
| TDC role                                    | ▪ The transport operator operates TDC so that it fulfils its needs for FTS  
                                            ▪ The main occupation is TDC operations, but also own transport capacity for FTS. In addition the subcontractors are used for the transport operations.  
                                            ▪ The TDC operator is not a transport operator. |
| Public Bodies Role                          | ▪ The FTS is not controlled or funded by public bodies  
                                            ▪ A private sector actor operates the FTS, but there are public bodies that fund FTS operations  
                                            ▪ A single public body controls the FTS, but there are many public bodies that fund the FTS operations  
                                            ▪ A single public body funds and controls the FTS  
                                            ▪ Multiple public bodies are funding and controlling the FTS in cooperation |
<table>
<thead>
<tr>
<th>FTS BUSINESS STRATEGY AND FUNCTIONS</th>
<th>FTS BUSINESS MODEL DIMENSIONS COMPONENTS(2)</th>
<th>FTS BUSINESS MODEL BUILDING OPTIONS (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tariff System</strong></td>
<td>Vouchers or pay per trip</td>
<td>Combination of proceeding systems</td>
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<tr>
<td></td>
<td>Zonal system with special tariff but integrated in the PT-environment</td>
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<tr>
<td><strong>Sources of Revenues</strong></td>
<td>Fare Revenues</td>
<td></td>
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<tr>
<td></td>
<td>Local Funds-Subsidies</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Central Funds-Subsidies</td>
<td></td>
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<tr>
<td></td>
<td>Non-transportation funds</td>
<td></td>
</tr>
<tr>
<td><strong>Financial Basis</strong></td>
<td>Commercial Basis-i.e. No public money, operator hopes to make profit from fares.</td>
<td></td>
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<tr>
<td></td>
<td>Gross cost basis-i.e. Operator gets paid on a cost-plus basis per unit.</td>
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<td></td>
<td>Net cost basis-i.e. Operator gets paid an additional amount per unit to supplement the fare box revenue, operator carries or shares revenue risk.</td>
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<tr>
<td></td>
<td>Lump sum-i.e. either gross or net cost, but not directly linked to the actual production</td>
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</tr>
<tr>
<td><strong>Income Stream</strong></td>
<td>Direct fare box revenue, coming from sales on- and off-vehicle.</td>
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<td></td>
<td>Reimbursement for free or reduced rate passengers, only if the revenues are generated on a per passenger basis.</td>
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<td></td>
<td>Participation in shared revenue schemes, as can be the integrating ticketing.</td>
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<td></td>
<td>Private hire.</td>
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<td></td>
<td>Contract work</td>
<td></td>
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<tr>
<td><strong>Cost Structure</strong></td>
<td>Cost structure by considering: Fixed Cost, Variable Cost, Semi-Variable Cost</td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Options for defining FTS business models
Given this standardization of the alternative options for every business concept element, the development of the alternative business model implies the identification of all the legitimate and logically consistent combinations of the alternative selected options for every such element.

4.3 FTS Business Model Concept Applicability

The application of the systematic approach for the business model development results to a set of alternative legitimate business models. However, two major undesirable outcomes may emerge: i) the multiplicative nature of the options combination process may result to an unmanageable number of alternative business models, ii) not all of the emerging models may be applicable since there may be serious conflicts between the options of different elements of the same model. In particular, concerning the former bottleneck, assuming that five (5) of the elements may be specified between two (2) alternative options while a single option applies to the remaining elements results to 32 alternative concepts. Furthermore, the issues arising in the FTS context may prevent the simultaneous inclusion of options of different elements e.g. if it is decided that the FTS should be integrated to the existing public transport system then the FTS should be controlled by a public body thus excluding from consideration any other option.

These two issues can be overcome by introducing a screening process that would check the feasibility of the emerging business models and determine those concepts that qualify to be further assessed. The objective of the screening process is to determine the set of FTS business models that comply with a set of criteria expressing possible logical conflicts within a concept. Concepts that fail to satisfy any of the criteria is excluded from consideration for the next phase of the proposed evaluation framework.

In particular, the specification of the applicable FTS business models can be implemented by a checklist method. The objective of this method is to test each candidate concept under a set of applicability criteria. The proposed checklist method is presented in Table 2.

The first column of the table includes the applicability criteria. The remaining columns of the table include the outcome of the pass/fail test of each business model under the associated applicability criterion. The criteria that have been incorporated in this checklist method are the following:

i) The level of attainment of the stakeholders’ objectives. This criterion examines whether the business incentives of the interested actors (from the FTS context description) are covered by the provided services.

ii) Economic Feasibility. The objective of the assessment of each concept under this criterion is to determine whether the expected size of the intended market is adequate for establishing the associated FTS.

iii) Organizational feasibility. This criterion determines whether the organizational model of each of the candidate concepts can be implemented by the interested actors (in the FTS context) of the market area under study and their incentives.

It is pointed out that the assessment of each alternative concept under the aforementioned criteria involves a pass/fail test in terms of covering the associated criteria.
<table>
<thead>
<tr>
<th>Criteria</th>
<th>Concept 1</th>
<th>Concept 2</th>
<th>.....</th>
<th>Concept n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of attainment of the stakeholder objectives</td>
<td>(Yes/No)</td>
<td>(Yes/No)</td>
<td></td>
<td>(Yes/No)</td>
</tr>
<tr>
<td>Economic Feasibility</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Organizational Feasibility</td>
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</tbody>
</table>

Table 2: Checklist method for testing the applicability of the candidate FTS business concepts.

The FTS concepts that fail to satisfy any of the applicability criteria are discarded from the list of alternative concepts. The concepts that cover every applicability criterion are considered as the candidate FTS concepts and they are included in the prioritization stage of the proposed methodology.

### 4.4 PRIORITIZATION OF ALTERNATIVE FTS BUSINESS CONCEPTS

The application of the Phases I & II of the proposed methodological framework result to a set of applicable FTS business models. The selection of the most “beneficial” business concepts implies a complex and crucial decision making process. The complexity of this type of decision resides in the involvement of multiple stakeholders with multiple and contradicting objectives. The objective of Phase III of the proposed methodology which is presented in this section is to provide the decision maker with an assessment methodology that achieves to incorporate the following evaluation requirements:

i) decompose the evaluation problem to criteria expressing the evaluation objectives of the decision maker

ii) rationalize and quantify the decision makers beliefs and judgement in order to assign priorities among the evaluation criteria and the performance of the alternative concepts under each criterion

iii) incorporate different stakeholders’ objectives and judgement providing compromise solutions

iv) enable the decision maker to perform sensibility analysis in order to test the validity of the assessment results

The proposed assessment methodology covers the aforementioned requirements while it aims to provide the user with a decision making tool for the comparative assessment of the alternative FTS business models. In particular the outcome of the application of the proposed methodology is the ranking of the alternative FTS business models in terms of the decision makers’ preferences. The major steps of the method are illustrated in Figure 4.
The evaluation problem can be decomposed to the following criteria:

C1. *Expected System Performance*. The objective of this criterion is to assess the expected performance of intended FTS system in terms of effectiveness and efficiency. Measures for both types of the system performance assessment may be found in the next subsection. The associated indicators are as follows:
- I1.1: Expected system efficiency
- I1.2: Expected system effectiveness

C2. *Organizational Efficiency*. A major feature of the implementation of a FTS concept is the organizational structure of the intended FTS. This feature affects significantly the level of coordination and co-operation of the involved stakeholders and therefore plays a key role in the FTS concept assessment. In particular this criterion is expressed by the following indicators:
- I2.1: Degree of coordination of the stakeholders
- I2.2: Contribution to the degree of transport integration

C3. *Financial Feasibility*. This criterion aims to assess the alternative FTS concepts in terms of the expected financial benefits derived from their implementation. It involves the following indicators:
- I3.1: Expected system costs
I3.2: Expected system revenues
I3.3: Cash-flow and first year performance
I3.4: Financial Engineering feasibility

C4. Transport Level of Service. This criterion refers to the impacts of the FTS implementation in the transport network performance. Under this perspective, the transport efficiency is expressed by the following indicators:

I4.1: Increase of comfort
I4.2: Improvement of transport reliability

C5 – Societal Impacts which refers to the potential improvements on the quality of life of the people that could use the FTS services offered. The Societal Impacts may be further decomposed to the following indicators:

I5.1: Improvement of personal mobility among target groups
I5.2: Impact on the traffic level of the target area
I5.3: Recovery/Improvement of the local economy
I5.4: Mitigation of Environmental Impacts (e.g. air pollution)
I5.5: Increase transport safety

Figure 5 provides the hierarchy of criteria and indicators emerging from the decomposition of the evaluation problem. The next two steps of the proposed methodology refer to the quantification of the decision makers preferences to a set of priorities/weights concerning the relative importance of the criteria/indicators and alternative FTS business models. The proposed prioritization scheme may be achieved by using either a simple scoring model or more sophisticated multi-criteria decision making method (e.g. Analytic Hierarchy Process).

The prioritization of the alternative FTS concepts aims to rank the alternatives in terms of the level of attainment of a set of evaluation criteria. This is a complex evaluation problem which involves multiple tangible and intangible criteria. This fact implies the analysis of the evaluation problem into several levels of homogeneous evaluation elements i.e. criteria, sub-criteria and indicators in order to capture the entire spectrum of evaluation features. In particular, the proposed evaluation problem can be decomposed into the following elements:
Figure 5. Hierarchical decomposition of the evaluation problem.
4.5 Performance measures

In order to assess and compare the performance and quality of the FTS a set of performance measures need to be defined. This paragraph provides a set of performance measures, which can be used by the early-described two main groups or stakeholders within an FTS, the public authorities and the public transport operators, to measure the performance and quality of their system comparing to other systems.

The performance measures will be linked to the business functions mentioned in the previous chapter. The measures are divided in three parts, performing the efficiency, the effectiveness and the quality of the FTS. The table displaying the performance measures describes measures that will result in very heterogeneous data. To prevent this long list of performance measures need to be filtered to a short list of data with only the relevant aspects for the FTS in question.

Efficiency: Measuring the efficiency of the FTS will give both stakeholders the opportunity to compare their system on different aspects. With this information optimisation of their system can be achieved and allows adapting to the benchmark on the specific aspect. The following efficiency measures can be considered:

- Average number of passengers per vehicle
- Average number of passenger-kilometers per vehicle
- Average operating speed (km's/hour)
- Average percentage waiting time
- Average percentage unloaded km's
- Costs of intake, planning and dispatch per trip
- Costs of intake, planning and dispatch per trip related to operating costs
- Percentage overhead costs related to total costs

Effectiveness: Measuring the effectiveness gives answers on the usage of the transport system, which can be related to the efforts made and the money spend on the system. The usage and attractiveness should be related to the number of potential users. This can be the inhabitants of the region involved, or the number of persons in a specific target group. The following relevant effectiveness measures have been identified:

- Number of passenger trips per year
- Number of passenger-kilometres per year
- Number of passenger trips per inhabitant
- Number of passenger trips per person in a target group

Quality: The quality of the system can be measured by the customer feedback e.g. in a customer satisfaction survey. Another mean of measuring the quality is to assess all quality aspects that are defined and measured during the exploitation of the transport system. The following quality measures can be considered:

- Image
- Customer satisfaction
- Percentage trips in time / within quality parameters
5 Key Elements for the Establishment of Emerging Business Models

The objective of this section is to provide key elements combination of which are likely to provide the business logic and dynamic of emerging FTS. The three key elements proposed to be used as the basis for establishing future FTS business models include: i) the fundamental nature of FTS (which establishes the vision and mission of FTS), ii) the business form of the FTS manager (which shows the evolution of the role of the FTS providers) and iii) the business dynamic of the participants (which introduces new relationships for better cost management and exploitation of opportunities).

The CONNECT review of existing FTS Business Models led to the following conclusions [6]:

- No FTS site has identified an explicit Business Model on which the FTS is based
- No FTS site identified any systematic demand modeling, revenue forecasting or revenue yield management techniques
- No FTS site identified any systematic techniques for customer acquisition, retention or customer lifecycle yield management
- There is no identified research action, literature or other visible initiatives regarding Business Models for FTS
- Nonetheless, some of the FTS sites clearly have a business-based approach
- Business Models for FTS are starting to emerge, but they have not been explicitly formulated

Therefore it is apparent that there is a need to formally define FTS business models and identify the key elements of the emerging FTS business environment. In what follows we identify three key elements, the combinations of which are likely to provide the business logic and dynamic of the emerging FTS. These elements are:

1) The Fundamental Nature of the FTS (business vision)
2) The Business Form of the FTS Manager (stakeholders, roles and relationships)
3) The Business Dynamic of the participants

Before discussing the three elements, it is worth considering ‘Motivations’. The Motivation explains why the participant gets involved in one or more role of the FTS. This will fundamentally shape their perception of the purpose and role of the FTS, what they expect to get out of it, their willingness to provide inputs, and the basis for their negotiations with other participants. It would be unwise to try to put participants together in a business venture without understanding their motivations and likely behaviour. Section 4.2.2 of this report addresses the motivation for participating in the establishment and operation of FTS.

5.1.1 The Fundamental Nature of FTS (FTS vision)

There is an apparent evolution of the vision of FTS including: i) the traditional approach of providing coverage of special transportation needs, ii) the use of FTS as an investment of rural development and/or social improvement, and iii) the more radical mission of being a “transportation mode” on its own right. There are not necessarily clear boundaries among
them, and many implementations could be characterized as one or the other. Nonetheless, they are quite recognizable in their unambiguous forms.

- **FTS as a means of meeting difficult or special needs.** This is the traditional role of FTS, although the scope, scale and diversity of implementations is quite extensive. It covers dedicated services for people with special needs, reserved services for people of reduced mobility, services for rural areas where conventional transport is impractical or unaffordable, use of FTS as a substitute for conventional transport at times or location of low demand. While the volume of these types of services is likely to continue to increase, the future innovations in FTS are likely to be in the next two types.

- **FTS as an instrument of rural development and/or social improvement.** FTS in rural areas has been provided for more than three decades. It has generally been low-frequency, offering a lifeline to people who are in remote areas, and people who risk becoming marginalized and socially excluded. These have been type (1) services. There is an increasing use of FTS as a more dynamic and powerful mobility offer, which is designed to play a significant development and/or social role. This gets the communities, agencies and other key stakeholders involved in an active manner. On the one hand, the FTS works closely with the stakeholders to develop the business and maximize the potential users. On the other, the communities and agencies can adapt their activities to take into account the existence of the mobility offer. This allows them to more directly target the user groups in their area, to offer new services. They can make outreach to people who could avail of those services, especially the socially vulnerable. The effect is to create more than simply a mobility offer, but a new and targeted dynamic that exploits the mobility opportunity on behalf of the collective community or region.

- **FTS as a Significant Transport Mode.** Until now, FTS has been considered as a ‘mode of last resort’ or as a means of offering mobility services affordable to the funders. The potential for FTS to function as a mode in its own right is now becoming a genuine option. Especially, in urban and suburban areas, there is scope for a public mobility offer positioned as a premium product between the bus and the conventional taxi. For example, the ‘Taxibus’ concept gives a vision of a very practical and customer-responsive booking and service offer. Cities are starting to consider whether FTS could function as a mode in parallel to the conventional fixed route services, serving both the short-distance local trips currently made by car, and also the inter-suburb journeys that are difficult to make by existing public transport. It is possible that these services could be offered on a commercial or near-commercial basis.

### 5.1.2 Stakeholders Roles and Relationships

#### 5.1.2.1 Business Form of the FTS Manager
Looking at how the providers of DRT have changed in the last few years, we can consider that there is an evolution in Business Form. This can be seen especially at Vervoer op Maat in Rotterdam, and Nexus in Tyne and Wear.

- DRT services typical began as Transporters. Their primary skill is in managing the vehicles and logistics. They have a user interface to understand demand, but their business processes are centred on their transportation resource.
- As they get busier, they migrate to being call centres. Their customer base is either a list from the sponsoring agency, or people who phone in based on the publicity for the services. The call centre can have up to 40 work stations, highly computerised, and the TDC/optimisation software is one of the key business tools. The call centre, portal, and the “one-stop shop” is their biggest selling point. There is still a transportation function, but this is taken for granted and is often sub-contracted out as a semi-skilled or low-skill activity whose cost should be minimised. Despite the large call centre, generally they respond to requests rather than actively seeking them.
- The next natural step is to evolve into business acquirers. At this stage, their primary skill is in generating the business. This can be done through winning contracts from cities and social services for bulk travel, working with destinations, with travel groups, and direct marketing. There is at least as much emphasis in filling the seats as in providing them. However, this is not just about revenue maximization. They “acquire” the business for the transporters, who may be shareholders in the firm, or who have some other mutual-benefit relationship. Thus, the call centre and transporter functions are merely delivery mechanisms, but the real core skill is in the business acquisition processes. This will require a deep understanding of the markets, the customers, the acquisition and retention cycles, and the yield optimization. FAMS project has created the technical platform and some of the concepts for this, but much more has to be done for maturity.

5.1.2.2 Business Dynamics of FTS participants

Traditional forms of DRT have lacked a business dynamic. They have typically been rather functional in solving a transportation or mobility problem. The very low farebox recovery rates have probably been a significant factor in getting promoters to think in business terms.

Two underlying motivations to a change in thinking have been emerging:

1) Some FTS promoters have appreciated that applying good cost management and seeking efficiencies are quite compatible with providing socially necessary services.
2) Some potential FTS promoters and entrepreneurs are wondering whether there is viable business in a new mode of transport.

This leads to new business dynamics emerging. These range from new relationships for better cost management, to mechanisms to seek and exploit opportunities. They are presented in the order of increasingly radical approaches. Not surprisingly, the more conventional are the ones that are already becoming established.
• **Competitive procurement** of FTS services in the style of conventional transport has started to emerge. For example, Cremona has put their DRT services out to tender. Using competitive tendering allows the FTS promoter to test the market for different organisational methods and cost structures. FTS services will almost certainly need to be on a gross-cost basis for the immediate future, especially if the service offer and tariff levels are prescribed. The normal administrative burden for the FTS promoter or transport authority applies. In addition, there is the challenge of how to construct a pricing and performance framework. Nonetheless, it is not impossible and as more FTS schemes are procured in this way, the accumulated experience moves the techniques from radical to standard.

• **Turnkey contracts** have been offered in a number of cases for the FTS services. This has been seen in Helsinki and Rotterdam, for example, for the flexible mobility services for registered users. It is uncertain whether this approach is specifically suited to closed user groups, or whether it is also suited to FTS services for general use. In the turnkey contract, the contractor is responsible for all aspects of the FTS including the operation of the TDC, handling of all bookings, and provision of the mobility services. The FTS operator will seek to optimise costs through the assignment and dispatch function, by combining trips, and also by passing over single-occupant trips to taxis which have lower unit cost for that type of customer. The FTS promoter (usually the city authority) is seeking a social gain and cost optimisation function. The FTS operator (the contractor) has a clear business motivation to optimise costs within the service and performance requirements of the contract.

• **Partnerships for social gain** have also started to emerge. These seem to be more prevalent in rural areas, where there can be a combination of weak transport provision, and a tradition of community self-reliance. (In urban areas there are usually strong transport authorities, which inhibit others to organise services). Partnerships are quite different to the traditional DRT organised by either the local authority or by a single community group. Social-gain partnerships usually bring together a broad mix of stakeholders including not only the community groups, but also local authorities, statutory agencies, and local businesses. They think along business principles, which allows the social and business stakeholders to ‘talk a common language’. From the cost perspective, there is a common aim to optimise costs and efficiency levels. From the benefit perspective, the social partners seek maximisation of use of the service, with special emphasis on vulnerable and other target groups; while the commercial partners can focus on the revenue, local business benefits and other commercial motivations.

• **Partnerships for commercial gain** are not yet in existence in the FTS domain, but are clearly being sought. The Taxibus concept is a purely commercial service offer. Outside of Europe, the Russian and Central Asian *marshrutka*, the Brazilian *collectivos*, South African ‘taxis’, and Turkish *dolmus* are all profitable forms of informal or paratransit operated on the large scale, and usually involving multiple partners. The exploitation of commercial FTS – such as urban DRT - is likely to involve partnerships, bringing together the resource providers and the customer acquirers. The FAMS Virtual Agency has already proved the functional, system architecture and functional dimensions – only the business dimension needs to be solved.
6 Concluding Remarks

This report has provided an overview of issues related to the development and implementation of FTS business models. The work summarized in this report covers the following two areas of research conducted within the CONNECT project: i) Development and Evaluation of FTS business models, and ii) key elements for establishing emerging FTS business models. The research results regarding the development and assessment of FTS business models led to the development of a well structured methodological framework for classifying, describing and assessing FTS business models. This systematic representation of the FTS business models provided the basis for reviewing in a systematic way existing FTS in relation to their business model background. An important issue regarding the practical implementation of a FTS business model is how could a service provider know which is the more appropriate model to be implemented among the different existing options?

In order to answer to these questions, CONNECT has developed a tool to “create” the potential FTS systems, and an assessment methodology to select among the different possibilities which is the best option from a system performance, organizational efficiency, financial viability and transport level of service point of view. The methodology for developing and assessing FTS business models provides FTS stakeholders with a useful tool for building and evaluating alternative business structures for the provision of Flexible Transport Services.

The review of the existing FTS “business models” suggests that there is a large number of possibilities when implementing FTS depending on the target market, the legal framework, the organizational structure established, the financial basis, the funding received, etc. Actually, the main constraint that a FTS promoter has to face is the lack of a specific FTS regulatory framework, or in another way, the need to implement these services within the legal context of conventional public transport (predefined fixed and scheduled routes). Furthermore, the review of existing FTS sites suggests that:

- No FTS site has identified an explicit Business Model on which the FTS is based
- No FTS site identified any systematic demand modelling, revenue forecasting or revenue yield management techniques
- No FTS site identified any systematic techniques for customer acquisition, retention or customer lifecycle yield management
- There is no identified research action, literature or other visible initiatives regarding Business Models for FTS
- Nonetheless, some of the FTS sites clearly have a business-based approach
- Business Models for FTS are starting to emerge, but they have not been explicitly formulated

Finally, it is worth noting that a new business environment is emerging for the development and operation of FTS. This environment is characterized by combination of the following key elements: i) the mission of FTS, ii) the business form of the FTS manager, and iii) the business dynamic of the participating stakeholders.

The development of future FTS business models should take into account and try to capitalize on the opportunity provided by the emerging FTS business environment.
7 References


National Transit Database. Web Site. [www.NTDProgram.com](http://www.NTDProgram.com)


