

Final Report

Synthesis and recommendations

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Project

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- Studiengesellschaft Für Unterirdische Verkehrsanlagen e.v. - DE
- Société des Transports Intercommunaux de Bruxelles - BE
- Ingeniería y Economía del Transporte - ES
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- Metro de Madrid s.a. - ES
- Sociedade de Transportes Colectivos do Porto s.a. - PT
- Société d'Economie Mixte des Transports de l'Agglomération Grenobloise - FR
- IGKM - Chamber of Urban Transport - PL
- Estonian LT Consultants - EE
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Foreword

This is the final report of a research project co-financed by the European Commission under the Transport RTD Programme of the EU's Fourth Framework Programme for Research, Technological Development and Demonstration. It is based on empirical investigations which have been carried out throughout the EU as well as in the Baltic States, Hungary, Norway and Poland. It is not a consultancy project aimed at a specific set of clients. Its recommendations must not be interpreted as directly applicable to any specific case.

Although the Quattro consortium includes a number of urban public transport operators and authorities, besides consultants, universities, and official research institutes, we completed this research in a climate of great intellectual independence. As for our associated partners from the field, the participation of one particular organisation does not mean that this organisation necessarily subscribes to all the views and recommendations expressed in this report.

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Partnership

The Quattro project was jointly carried out by the following organisations:

Project Co-ordinator

- OGM – Organisation Gestion Marketing (BE)

Project Manager

- TIS – Transportes Inovação e Sistemas (PT)

Other Full partners

- NEA – Transport research and training (NL)
- TØI – Institute of Transport Economics (NO)
- Calidad Estrategica (ES)

Associated partners

- CERTU – Centre d'Etudes sur les Réseaux, les Transports, l'Urbanisme et les Constructions publiques (FR)
- ELT – LT-Konsultite Eesti AS (EE)
- ERASMUS – Erasmus University Rotterdam (NL)
- FEDERTRASPORTI – Federazione Nazionale Trasporti Pubblici Locali (IT)
- IGKM – Chamber of Urban Transport (PL)
- INECO – Ingeniería y Economía del Transporte (ES)
- ISIS – Istituto di Studi per l'Informatica e i Sistemi (IT)
- LT – LT-Consultants (FI)
- Metro de Madrid (ES)
- SEMITAG – Société d'Economie Mixte des Transports de l'Agglomération Grenobloise (FR)
- STCP – STCP Sociedade de Transportes Colectivos do Porto (PT)
- STIB/MIVB – Société des Transports Intercommunaux de Bruxelles / Maatschappij voor het Intercommunaal Vervoer te Brussel - BE
- STUVA – Studiengesellschaft für Unterirdische Verkehrsanlagen (DE)
- TRANSMAN – Közlekedési Rendszergazdálkodási Tanácsadó kft (HU)
- UTP – Union des Transports Publics (FR)

Members of the Quattro Advisory Committee

- BEUC – Bureau Européen des Unions de Consommateurs – The European Consumers' Organisation
- EFQM – European Foundation for Quality Management
- CEMR – Council of European Municipalities and Regions
- Euro Team of UITP – Union Internationale des Transports Publics
- CEN – Comité Européen de Normalisation – European Committee for Standardisation

Executive summary

1. Quattro is a research project carried out under the Transport RTD Programme of the EU's Fourth Framework Programme for Research, Technological Development and Demonstration.
2. The present situation in urban public transport (UPT) seems somewhat paradoxical: while the general context (road traffic congestion, raising environmental concerns, general demand for better living conditions, etc.) seems favourable to a development of public transport, the evolution of their modal split share does not reflect these expectations.

It appears that quality is one of the key dimensions in the provision of UPT that should receive more attention from authorities and operators in the future. Public transport is a service which European citizens may decide to use or not. Successful service industries world-wide now focus on customers through continuous improvement programmes and customer satisfaction surveys. UPT should do the same.

Public transport is a complex business: it offers a daily service to all citizens living in large areas, it is organised with a series of interconnections facilities, it is not only a question of transport: information and sales systems are part of the service. Moreover, the citizen expects a "zero default" service, as they expect to get where they intend to go, at the planned time and in an organised way.

3. An enhanced focus on quality will be all the more successful as it is based on a sound understanding of quality determinants as well as on the most appropriate tools for assessing and enhancing them. Quattro reviews and develops a series of tools and concepts designed to help decision-makers in these processes. Its objectives are:
 - to identify current and emerging quality management practices in contracting and tendering in the urban public transport (UPT) sector, which includes initiatives in the field of quality definition and measurement, clarification of the contracting parties' responsibilities, evaluation procedures and their impact on continuous improvement programmes;
 - to evaluate these practices and try to figure out how the existing trends in quality management in other fields than UPT could be implemented in UPT with identification of best practice and well developed total quality management;
 - to suggest guidelines to authorities and operators involved in UPT provision on issues of tendering, contracting and performance monitoring, with a strong focus on quality.

The geographical scope of Quattro covers the European Union, Norway, Poland, Hungary and the Baltic States.

4. The objective pursued in introducing quality indicators into tendering and contracting procedures is to increase the effectiveness of Urban Public Transport (UPT) through the delivery of higher quality operations. This greater effectiveness, which should translate into ridership development and an increasing modal-split share is considered essential in order to meet the objectives stated in the transport policy paper "The Citizen's Network"¹. Effectiveness enhancement is indeed one of the main motivations of the Quattro project. In this respect, Quattro may be considered as an attempt to address some of the questions uncovered by Isotope². The emphasis in Isotope was on the efficiency of the alternative organisational models found in UPT. Whereas Isotope concluded that the introduction of competition usually led to significant efficiency improvements and, consequently, to lower subsidy requirements, its conclusion as to the impact of liberalisation on effectiveness were far more ambiguous. There was a need for remedies to the quality flaws sometimes observed in the more competitive regimes.
5. As a first research stage, Quattro analysed the situation of the European UPT sector with respect to quality management and compared it with that of other industries. A 10 year gap is thought to exist between UPT and other sectors. Given the society's need for effective public transport, this gap must disappear as quickly as possible. Among the "signals" reflecting that positive evolutions and promising reforms are already being implemented, Quattro more particularly identified and investigated:
 - the evolution of the legal and regulatory framework in a number of countries to introduce more competitive pressures in service provision (directly through competitive tendering or indirectly through benchmarking);
 - a number of success stories in quality management implementation in UPT throughout Europe;
 - the existence in all European countries of organisations disseminating and supporting the implementation of total quality management (TQM) practices;
 - the actions undertaken by the EU in order to improve the awareness and the professionalism of public authorities and operators in charge of public transport, traffic management and urban development with respect to quality issues in UPT and the recognition of the attention the citizen is entitled to occupy in the system.
6. The investigations carried out in Poland, Hungary and the Baltic States confirmed the critical role UPT is playing in these countries and underlined the challenges these countries are facing. They have to deal with a situation where public transport still has a considerable market share but faces growing competition from the private car. If they are to meet the challenge represented by rapidly increasing car ownership and use combined with declining public subsidies, UPT operators and authorities will have to progress all the more quickly in the implementation of effective quality strategies in tendering, contracting and quality management.

¹ The Citizens' Network - Fulfilling the potential of public passenger transport in Europe, European Commission, Green Paper, ISBN 92-827-5812-5, 1996.

² Isotope is the acronym for Improved Structure and Organisation for urban Transport Operations of Passengers in Europe. Isotope's objectives were to describe and compare the existing legal status and organisational structures for urban public transport operations in Europe and to provide a strategic approach to the improvement of their organisational structures. The Isotope final report has been published by the office for official publications of the European Communities – ISBN 92-828-1634-6.

7. How to define service quality in public transport? In order to answer this question, the Quattro consortium teamed up with experts from the European Committee for Standardisation (CEN). The result of our joint research effort can be summarised in the following public transport quality matrix. This matrix, which is still under development in the CEN working group CEN TC 320 WG 5, offers a comprehensive framework for analysing both functional and technical quality determinants in UPT.

Figure 1 : The public transport quality matrix

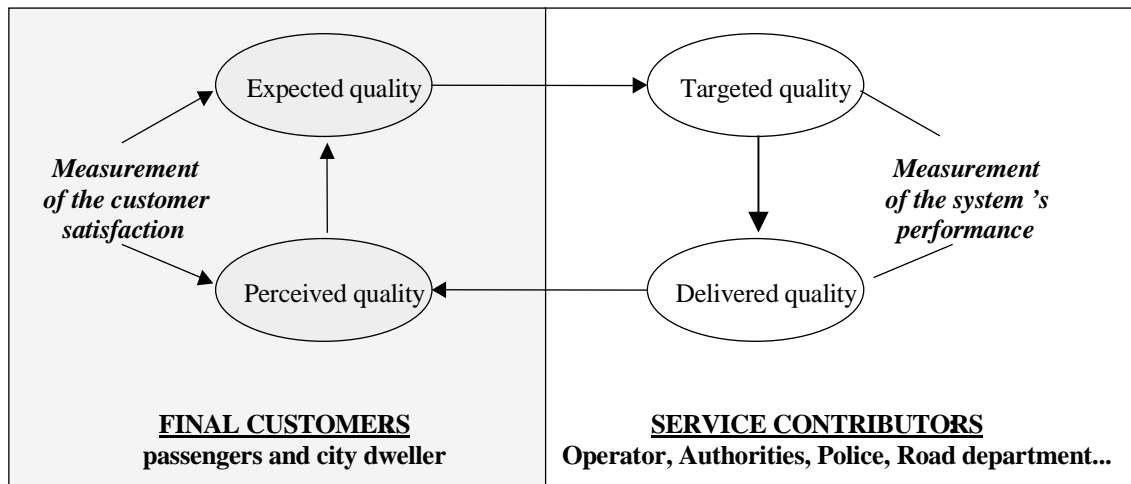
QUALITY	1. Availability	1.1 Network 1.2 Timetable
	2. Accessibility	2.1 External interface 2.2 Internal interface 2.3 Ticketing
	3. Information	3.1 General information 3.2 Travel information - normal conditions 3.3 Travel information - abnormal conditions
	4. Time	4.1 Journey time 4.2 Punctuality and reliability
	5. Customer care	5.1 Commitment 5.2 Customer interface 5.3 Staff 5.4 Physical assistance 5.5 Ticketing options
	6. Comfort	6.1 Ambient conditions 6.2 Facilities 6.3 Ergonomics 6.4 Ride comfort
	7. Security	7.1 Safety from crime 7.2 Safety from accident 7.3 Perception of security
	8. Environment	8.1 Pollution 8.2 Natural resources 8.3 Infrastructure

Source: Common work Quattro / CEN TC320 WG5

The matrix is primarily aimed to suggest a common framework for breaking up quality into its main components. It does not set any particular target for any of these.

8. It is recognised that quality in urban transport results from the capacity of the operator to manage and develop its organisation. However, it is also the result of the conditions in which this operator is working. These conditions are partly in the hands of the public authorities in charge of urban planning, traffic management, etc. The Quattro research developed a specific quality management tool, “the UPT quality loop”, which can be applied at the firm’s level as well as at the whole UPT system’s level. Just as the quality matrix is a reference for defining UPT quality and breaking it up into different determinants, the quality loop provides a reference framework for fine-tuning the level of quality standards and for optimising service provision notably on the basis of market reactions.

Figure 2 : The quality loop at the level of the public transport system



Source: AFNOR

The quality loop is based on four distinctive benchmarks:

- Expected Quality
This is the level of quality demanded by the customer. It can be defined in terms of explicit and implicit expectations.
- Targeted quality
This is the level of quality that the transport undertaking aims to provide for its passengers. It should be defined on the basis of the level of quality expected by the passengers, external and internal pressures, and budgetary constraints and competitor/market performance.
- Delivered Quality
This is the level of quality that is achieved on a day-to-day basis in normal operating conditions. Disruptions to service, whether they are the fault of the undertaking or not, are taken into consideration.
- Perceived Quality
This is the level of quality perceived by passengers during their journeys.

This loop is an “holographic” tool: it may be used at the level of the urban area, covering all public transport systems (multi-authorities, multi-operators) but it can also be used as a management tool, at the level of one route/line or one depot. It can become a corner stone of the European standard for quality in collective passenger transport.

9. These two “fundamental” reference tools should be used in conjunction with the following techniques and concepts for the evaluation of:
1. Expected quality:
 - Measures of direct quality: revealed preference/stated preference methods applied to various market segments
 - External quality (environmental impact, congestion relief, accidents, other hidden costs)
 - Revealed preference
 - Hedonic price method
 - Human capital value method
 - Damage function approach
 2. Targeted quality
 - Customer charters and guarantees of service
 - Partnership agreements
 - Quality standards and certification
 - Quality contracts
 - Quality tenders and evaluation procedures
 3. Delivered quality
 - Compensation schemes for the benefit of the users
 - Reward / penalty schemes concerning operators and authorities
 - Internal quality measurement
 - Self assessment methods
 - Benchmarking (KPIs)
 4. Perceived quality
 - Customer satisfaction index (CSI)
 - Customer charter feedback systems

In addition to the above techniques, this report also reviews the role that the following methods may play in the continuous improvement of service quality in UPT: total quality management, standardisation and certification, monitoring, benchmarking, charters and partnerships.

10. The challenge faced by PT authorities and operators also fundamentally consists in placing a greater emphasis on quality in “tenders” and in “contracts”. To help in this process, Quattro analysed and assessed many existing documents and identified a series of best practices in the drafting of UPT tenders and contracts. The project also produced a set of specific recommendations and guidelines in this respect.

In the framework of Work package 3, whose conclusions are concisely presented in chapter 5 of this report (see deliverable 3 for details), different contract scopes are identified, all within the boundaries of infrastructure design and operations. Reference is made to the use of appropriate legal frameworks and to the choice of measures to optimise quality. Such measures serve as a means to correct deficiencies in weaker legal frameworks, which only rely on market-based initiatives to produce the desired level of quality in UPT.

Different methods for sharing contractual risks among the parties are also reviewed. Net cost contracts (production and revenue risks are borne by the operator), gross cost contracts (only the production risks are borne by the operator) and management contracts (originally, all risks borne by the authority) constitute a basic classification. However, variants and combinations do exist, including clauses on rewards and penalties and other risk-sharing schemes. In long term arrangements covering the total lifecycle of a system or sub-system, other risks matter, which pertain to political, environmental, financial, administrative and land use uncertainties.

In Deliverable 3 of the Quattro project, the unfolding of a typical tendering procedure is reviewed. This document explains in great details and illustrates with practical examples the different elements making up the procedure, that is:

- the tender invitation and the methods for pre-selection and pre-qualification;
- the offer or service proposal submitted by the bidders;
- the procedures used to evaluate the different bids and award the contract, including such aspects as non compliant bids and negotiation processes;
- the contract and its appendices as well as the administrative and review procedures associated with them.

The whole tendering process must be regarded as a series of opportunities for applying sound quality management principles. Moreover, service quality needs to be envisaged in a broad perspective during the tendering process, that is, considering not only the interest of UPT passengers but also those of all the stakeholders concerned with UPT provision.

11. In order to have a positive impact on the overall quality of UPT services, the tendering and contracting of these services must be based on a consistent overall strategy, taking into consideration the importance of UPT for its customers as well as for the citizen in general. The different bodies involved should:

- optimise the use of physical and financial resources in a market driven environment;
- transform the public transport experience from “an obstacle course” to a “seamless journey”, which means proposing a door to door service to the users;
- use quality and quality management to attract customers by offering services which compete with the private car;
- consider “quality” management as a continuous search for better service and permanent progress, rather than as the pursuit of a rigid and specific level of quality;
- make sustainable mobility possible in an environment stimulated by a strong political and legal framework;
- develop a customer-orientated approach. Think “Customer”, “Customer”, and “Customer”;
- consider public transport as more than a business. It has a remarkable societal impact and therefore requires special care in the implementation of common economic and managerial considerations.

In addition to the above recommendations, which concern all the parties involved in the sector, Quattro makes recommendations to authorities, operators and in some aspects, to manufacturing industry.

12. Quattro recommends authorities:

- to define an urban development strategy including traffic management strategies;
- on that basis, to formally agree on a policy for the network and explain clearly to the bidding operators “how we will do things around here”;
- to be clear on transport policy, its expected impact on behaviours and its consequences on priorities in terms of quality;
- to be clear about what they do best in-house and what they can contract out to others for what concerns not only public transport provision but also land use planning, road network developments, etc.;
- to act to involve all the competent authorities in influencing public transport performance and all the participants in the system (like police committees or other operators who are not under the control of the authority) in the search for better public transport; quality partnerships with operators may be used in addition to tenders and contracts and may help in establishing tariff co-operation;
- to use tenders to promote quality management techniques by attaching importance to know-how and well-thought-out proposals in this respect;
- to be specific on whether they will accept non-compliant bids and, if so, how they will consider and implement innovations;
- to design penalty-and-reward systems in such a way as to avoid penalising the operator for matters beyond his control;
- to commit on the achievement of targets under their own control (concerning for example the availability and quality of road and/or rail infrastructure) and if necessary to submit to penalty-and-reward mechanisms so as to reassure the bidders/contractors on the credibility of these commitments or to compensate them for the costs they might incur as a result of any failure by the authority to deliver the agreed conditions);
- to try to develop with the operator(s) a working relationship favouring a co-operative attitude and stimulating innovativeness on the part of both parties;
- to be clear on what they expect from the contractual relationship;
- to use a balanced basket of objective and subjective performance indicators to evaluate the effectiveness of their programme and to try to involve customers in service quality assessment;
- to encourage a positive “no blame” culture in their organisation and to try to achieve excellence in management through established principles;
- to act as a learning organisation within the system, resorting to internal and external benchmarking with other cities and with other sectors to identify improvement opportunities: benchmarking may provide innovative and implementable solutions by looking at how traffic/mobility/public transport management but also other sectors (tourism, leisure, shopping centres, etc.) work in other cities;
- to build experience in real situations by regularly using public transport themselves;
- in their specific regulatory system, to use contracts, tenders and licensing to stimulate the operators to take the decision and orientations described hereafter.

13. Quattro recommends operators:

- to know their market;
- to appreciate their service performance as it is (good or poor), compared to demand and competition;
- to consider their activity as more than a business: the impact of passenger transport activities on the local community and on the quality of life must be taken into consideration in UPT strategies, objectives and priorities;
- to seek to establish a visible professional competence by reaching standards set for formal qualification (ISO 9000, XP X 50-805) and/or by implementing total quality management principles in the running of their operations;
- to develop a customer satisfaction measurement system and to use its results in connection with those of the internal quality monitoring system;
- to achieve excellence in management and operations through established management principles (e.g. EFQM);
- to use front-line management development and continuous improvement programmes to improve customer-contact related performance;
- to continuously assess customer satisfaction;
- to innovate within secure business boundaries and principles;
- to cultivate a positive “no blame” approach to the coaching of staff;
- to adopt an open and honest approach to service problems and to compensate customers in case of service flaw;
- to benchmark their performance with others, formally or informally, within the public transport sector or with other sectors.
- not to forget that the people who ultimately influence service quality in public transport are the bus driver, traffic warden, the person in charge of complaints or vehicle maintenance, etc. Their working conditions will influence directly their willingness and capacity to provide good service. Listening to the staff, communicating with them on their working conditions, on the firm's traffic management strategy, on the results of their work and on the practical consequences for them of the management's decisions is therefore essential;

14. Through their responsibility in equipment and vehicle design, development and production, manufacturers play a key role in the quality provided to citizens. They are recommended:

- to recognise that customer demands are driving the market, not the operators or the authorities' wishes;
- to be ready to respond and support innovation in equipment design;
- to fully support the operator by the establishment of adequate after-sales services;
- to make customer-supplier chains an accepted business practice;
- to benchmark against competitors and other industries;
- to seek to establish a visible professional competence by reaching standards set for formal qualification (ISO 9000, XP X 50-805) and/or by implementing total quality management principles at their level;
- to achieve excellence in management and operations through established management principles (e.g. EFQM).

Reading guide

The main body of this final report presents in approximately 150 pages the main scientific and technical insights produced in the framework of the Quattro project. At the end of this research report, we present an annex entitled "Practitioner's Handbook". It is more concise (less than 50 pages). It is intended to provide decision-makers from the field with very accessible tips and guidelines for dealing with service quality in contracts and tenders.

This report comprises six chapters outlining the main scientific and technical aspects of the project.

In the first chapter, we essentially present the context, the objectives and the methodology of the study. First, we underline the need for a more systematic approach to quality monitoring and management in UPT. We also present the European policy and some of the Commission's initiatives in this matter and describe the current status of quality in general and in urban public transport throughout Europe. Finally, we briefly introduce the main tools investigated in the framework of the study and the main organisations co-operating with the Commission in promoting quality inside the European Union.

Chapter 2 provides a comprehensive review of the concept of quality in general as well as in its applications to the UPT sector. Quality in UPT is considered using a systemic approach and taking into account the managerial conception of Quality. Chapter 2 also describes the present situation with respect to quality development in the European UPT sector. Additional information on the development of Quality in Poland, Hungary and the Baltic Republics is included as a result of Quattro 's extension to the CEEC.

Existing and future Quality measurement tools are developed in Chapter 3, on the basis of the research undertaken in work package 2.

Chapter 4 presents and illustrates with examples six efficient and practical Quality improvement tools used in UPT. The tools analysed are:

- the quality loop, a dynamic process of quality improvement;
- self assessment methods and more specifically the EFQM model used for the European Quality Award;
- benchmarking, as a method of identifying "best practices" and of sharing knowledge and experience of them;
- standardisation and certification, as tools for the improvement of Quality management through a more systematic service specification and measurement/assessment;
- quality partnerships, i.e. co-operation between authorities and operators in order to improve service co-ordination and service quality;
- guarantee of service, i.e. commitment made by service providers to deliver a given level of service quality to their customers.

In Chapter 5, the major implications of the introduction of quality in tenders and contracts are presented on the basis of the research undertaken in the framework of work package 3.

Chapter 6 discusses the main issues raised during Quattro's intermediate seminar held in Lyon, France in mid January 1998 and draws general conclusions. It also refers the different parties involved in the UPT system (authorities, operators and equipment manufacturers) to the attached Practitioner's Handbook for practical recommendations on the implementation of Quality in UPT.

In addition to a detailed bibliography, this report also contains a presentation of the abbreviations used in the study as well as a glossary.

In annex, the Quattro Practitioner's Handbook focuses on the presentation of useful tools and recommendations.

1. Background and methodology of the study

1.1. General context: the need for quality improvements in UPT

It is estimated that 80% of Europe's citizens live in urban areas³. In urban areas alone, this represents nearly 500 billion trips every year. On average, each citizen of the EU makes between 1,000 and 1,300 journeys per year. There can be various reasons for these journeys. Most of the people need to travel to and back from work, school, a variety of leisurely activities, family and friends, shops, etc.

For each individual journey, people have the choice between different transport modes, each with specific characteristics, advantages and disadvantages, and costs. In other words, public transport competes with other modes and will only be used if it can meet the expectations of the travelling public, that is, if it can deliver an attractive, accessible, reliable, responsive (at the tactical level: adapting promptly to market changes, competitors and the general environment; at operational level: customer oriented and quick to react and minimise inconveniences when service disruptions occur) and yet affordable service.

Like other service industries, the UPT sector is characterised by:

- the intangibility of some of its features (notably the attitude of contact personnel which is of the utmost importance);
- a degree of simultaneity in the production and consumption of its output (traffic units);
- the perishability of its output (a seat which is not occupied on a given journey cannot be stored and sold the next day; it is lost for good);
- the participation of users in the production process (the service cannot really be delivered if the customer is not present and customer attitudes influence the comfort of their fellow-users).

When public transport improves its market position at the expense of cars, it is not only good news for UPT customers who are likely to benefit from subsequent increases in travel opportunities (increased production to meet demand increases), it also increases the system's value for the community as a whole as it means less pollution and less congestion for an equivalent number of journeys. The modification of individual travel behaviours that may be expected from the delivery of higher quality public transport may therefore play a positive role in allowing a more sustainable development of our cities.

Public transport is more than a business. Its missions are so closely related to the quality of life and to the economic development of a town that its provision cannot always be driven by market forces alone; it sometimes seems appropriate for public authorities to intervene on or in the UPT services in order to ensure their delivery in adequate conditions of quantity and quality. However, the need for public intervention depends heavily on local situations.

³ Source : European Commission : « L'Europe des villes - Actions communautaires en milieu urbain » - ISBN 92-828-0287-6.

Public transport is a collective mode of transport. It must answer a wide variety of needs and expectations which depend on the diverse characteristics of the population and areas they serve. Public transport may differentiate its service, but not discriminate. For young and elderly people, public transport is often the only motorised transport option available or affordable.

Despite increasing congestion problems and ever more constraining parking conditions, the use of private cars continues to gain ground, i.e. market shares, in most cities around Europe. This is notably due to the continuous improvement that have been brought to cars and road infrastructure over time. These have improved the conditions of car driving dramatically in terms of comfort, safety, reliability and functionality. Coupled with favourable financial conditions for car use and ownership and increasing living standards, and backed by aggressive marketing policies, these changes have stimulated the development of car travel in the East as well as in the West.

In the face of such a fierce competition, the public transport sector cannot limit itself to maintaining its current level of performance. It must continuously improve its quality and enhance the services it offers so as to regain passengers. Unfortunately, our day-to-day experience is that much of this remains to be done:

- the reliability of public transport may, as a rule, be improved;
- assistance to users in case of service disruption tends to be unsystematic and somewhat amateurish;
- waiting and travel times and interconnections within the UPT system as well as with other modes could often be hastened and facilitated;
- public transport still fails to offer the global transport solutions which many people expect (with real time information, better network design, and so on);

to name but a few areas for improvement.

This is not to say that UPT services have not changed over recent years. Many improvements have made their way to the practical application stage. These include the introduction of low floor vehicles, the provision of better and more timely information, improvement in interconnection areas, etc. In order to encourage further development in the right direction and to realise the full benefits of the positive experiences and practices that already exist, we need to examine these experiences and practices more closely so as to derive guidelines for professionals in the sector.

Whilst car manufacturers are promising and already delivering more performance to drivers by tapping into the source of improvement provided by information technologies and while they are addressing some of the critiques voiced against their product by producing environment-friendlier models (including compact/electric cars) public transport may not afford to remain idle.

A critical step in any service improvement consists in gaining a realistic view on the level of quality delivered in the first place together with a sound understanding of the public's satisfaction and expectations with respect to these services. If they are to deliver any benefit at all, future improvements also need to be visible by the users and advertised adequately. Finally, the changes must be radical enough to overcome the inertia of modal choices, that is, to convince travellers to shift to public transport.

Recent research on innovation in the UPT sector⁴ indicates that:

- users and potential users react strongly and positively to innovation in service;
- excellent innovations do not always imply difficult and expensive solutions;
- the needs and expectations of passengers vary significantly from one segment of the market to another;

and pinpoints eight key innovation possibilities:

- eliminate or, failing that, reduce the variability of journey times;
- improve travel conditions for the individual passenger with better entry and exit, better temperature control and fresh air provision, improved cleanliness, quiet and better riding conditions by eliminating noise and vibrations - in short, replicate desirable private car features;
- respect the urban environment;
- provide easy and effective interconnections between all modes, including cars;
- develop “an adult relationship” with passengers through a more responsive handling of suggestions and complaints and by giving them more possibilities to choose (price formula, type of services, etc.);
- offer added value services (information systems, practical services making the daily use of public transport easier);
- instil a feeling of safety and security (human presence, action and reaction);
- ensure a human presence in service delivery (visible and customer-oriented staff).

⁴ Survey on Innovation in Urban Public Transport, by Marc Gilles & Associés, in co-operation with Adème, Drast, EDF, Gart, RATP and UTP, Paris 1997.

1.2. General presentation of the Quattro project

Quattro is a research project undertaken within the Transport RTD Programme of the Fourth Research and Technological Development Framework Programme of the European Commission (task 5.2.14).

The objectives set for the project were:

- to identify current and emerging quality management practices in the contracting and tendering of urban public transport (UPT) provision with a particular emphasis on issues of quality definition and measurement, on the clarification of the contracting parties' responsibilities, as well as on evaluation procedures and their impact on continuous improvement programmes;
- to evaluate these practices and to figure out how they could be improved by looking at quality management trends and best practices in other fields than UPT;
- to propose a series of guidelines to authorities and operators involved or interested in tendering, contracting and performance monitoring in UPT, with a strong focus on quality.

The empirical scope of the project covers the European Union, Norway, Poland, Hungary and the Baltic States.

The experts most directly involved in this research belong to twenty different European organisations representing no less than eleven countries. Throughout the project, these Quattro partners benefited from the support of an advisory committee comprising the BEUC (The European Consumer's Organisation), CEMR (Council of European Municipalities and Regions), CEN (European Committee for Standardisation), EFQM (European Foundation for Quality Management), and the Euro Team of UITP (Union Internationale des Transports Publics).

The authors strongly believe that the diversity of their respective countries of origin and professional backgrounds (transport companies, unions, consulting firms, universities, public transport authorities and research institutes) resulted in a unique combination of expertise and practical experience which allowed them:

- to concentrate on the most salient problems and challenges faced by practitioners in the design, delivery and assessment of public transport operations;
- to submit the various contributions made to the project to a series of intensive and wide-ranging discussions and peer reviews so as to guarantee their relevance and complementarity with one another and to ensure the comprehensive nature of this study;
- to illustrate the main conclusions and recommendations of the project with case studies, practical applications and other concrete examples.

The project started in December 1996 and was completed by the end of May 1998. The contract was modified on August 1st, 1997 in order to integrate in the consortium new partners from East and Central Europe, namely from Estonia, Hungary and Poland.

The final recommendations have been prepared after an intermediate seminar (held on 15 and 16 January 1998) during which consortium members discussed Quattro's main issues with forty participants representing public transport authorities and operators as well as other interested parties from all over Europe.

During the project, the consortium received and examined a number of inputs from more than 130 operators, authorities and other organisations from Europe as well as from overseas (Brazil, Australia, USA). Most of these organisations participated in the survey and/or provided the consortium with information on practices of interest, advice, opinions, specimen contracts, examples of tender documents and monitoring instruments.

In order to ensure an adequate dissemination of the project's findings and recommendations, the consortium set out to provide:

- a specially designed Web site (<http://www.eur.nl/quattro>) hosted by Erasmus University Rotterdam (NL) and regularly updated in order to provide visitors with the latest information on the project;
- a widely distributed general information booklet published in English in mid 1997;
- an intermediate seminar held in Lyon (FR) on 14-15-16 January 1998, whose purposes were to discuss in depth, after 13.5 months of research, the main issues which had already been raised and analysed by the project and to gather additional input for the final report;
- three workshops specifically dedicated to the Baltic States and Central European countries, held in Budapest (23 March 1998), Warsaw (3 April 1998) and Tallinn (24 April 1998);
- a final conference held in Luxembourg (LU) on 14-15 May 1998 during which the project's conclusions and recommendations were presented;
- a final report composed of a Research Report and a Practitioner's Handbook presenting the main findings and conclusions of the research and outlining the practical recommendations derived from it;
- a summary leaflet providing decision-makers in the UPT sector with a clear and concise set of guidelines on quality-sensitive tendering and contracting;
- the publication of some of the project's insights in professional journals and reviews and their presentation by members of the consortium in conferences and congresses.

1.3. Improving quality in the UPT sector through contracts and tenders: the Quattro approach

1.3.1. The parties involved in UPT provision: roles and responsibilities

The improvement of quality in UPT relies on three fundamentals:

- stimulating the UPT environment, including the political, legal and regulatory framework, which was the object of the Isotope research project;
- using the best tools, in particular when it comes to the tendering, contracting and performance monitoring of UPT services;
- improving management practices, notably in terms of organisational behaviour, so as to instil more customer-oriented attitudes on the part of contact personnel.

The provision of good public transport services in urban areas always requires the involvement of both public authorities and transport operators. Besides the control and regulation of the UPT sector, public authorities play a critical role in managing the place and level of priority awarded to public transport in the city or town they administer.

When we refer to “the authority”, we are not only talking about the authority that is directly in charge of public transport. Other public bodies and political authorities may play an essential role in the development of UPT through city planning and overall traffic management or even in addressing the public need for security.

Similarly, when we refer to “the operator”, we do not only limit his responsibility to the production of a certain amount of traffic. Depending on local regulatory frameworks as well as on other organisational arrangements, the operator may be in charge not only of the operational aspects of UPT provision but also of more tactical decisions. The operator's responsibilities may include for one or several modes:

- traffic provision;
- the management of interconnections and/or of the related infrastructure;
- sales and ticketing system;
- information, permanent and/or real time;
- a variety of peripheral services to UPT users, etc.

Public transport authorities and operators need to be quite clear about their own field of responsibility and action. Any potential service improvement is in their hands. They need to understand that it is their responsibility to provide better services and to promote the expansion of each mode in relation with its individual and collective advantages, disadvantages, costs and contributions to a sustainable development. The distribution of the responsibilities and risks involved in the production and marketing of UPT services (and their financial consequences) is a key issue in quality improvement.

Public transport has long been dominated by a purely production-oriented approach (modes, large investment, vehicle operations and maintenance priorities, etc.). But it is now gradually moving towards a more service and customer-oriented approach. Public transport is a people intensive industry. Therefore, a service driven vision should be shared by those responsible for its strategic management as well as by those responsible for actual service provision.

All the people involved (drivers, traffic and highway staff, public servants, sales and service staff, maintenance staff, etc.) need to share the same sense of purpose and vision. This cultural dimension of service quality is the responsibility of both authorities and operators, who must instil in the system a culture of focus on the needs and expectations of local communities.

The European perspective on the achievement of a Citizens' Network⁵ provides a clear strategic improvement programme, at European, national and local level. The citizens' network calls for quality and aims at placing the citizens at the centre of the debate on public transport design and operation.

It is expected that tomorrow's public transport will be provided to the citizen in a totally different organisational framework. A new « public transport » landscape is under development which comprises the following vital landmarks:

- the world of operators is under fundamental changes with the development of pan-European operators operating different modes in different countries, at local, regional, national or trans-national levels; they know how to compete and orient their strategy toward more efficient production and more effective operations;
- authorities in charge of public transport are developing new structures, integrating different responsibilities like public transport and environment, public transport and road development, or public transport and urban planning. They tend to leave more responsibility to operators in the design and operation of UPT services so as to concentrate on strategic planning and sustainable development policies;
- new regulatory frameworks are being implemented, introducing competitive pressure in UPT and modifying the allocation of responsibilities and risks between authorities and operators.

The Isotope project indicated that public transport operations could be carried out under a variety of sometimes complex organisational and regulatory frameworks. This sector will remain complex and diversified in the years to come, even if some organisational forms, more competitive and transparent, are developed at European or national level. The importance of these contextual elements is such that it seemed inconceivable to restrict the present study to a mere analysis of tender documents and contracts. Section 1.4. provides a presentation of the main regulatory and organisational models used throughout Europe in the provision of UPT.

The fundamental issue of responsibilities allocation among the actors involved in UPT provision has led to an in-deep reflection by a common work group of Quattro and CEN (TC 320 WG5) members. This research should provide specific guidelines for the development of a European standard intended as a practical management tool for the allocation of responsibilities among authorities and operators.

⁵ The Citizens' Network - Fulfilling the potential of public passenger transport in Europe, European Commission, Green Paper, ISBN 92-827-5812-5, 1996.

1.3.2. The Quattro approach

The search for quality in UPT has been carried out in different stages. In this section, we present these stages and explain how we approached this study, starting from a search for quality criteria and concluding with recommendations for the implementation of total quality management in UPT systems.

The starting point was the identification of quality criteria, as defined in the specification of the task by the Commission. Could these criteria be used in tenders and contracts in order to specify the services to be provided by the operators and to clarify the responsibilities of the authorities and operators in the delivery of the contracted services?

Quattro studied this question in three distinctive steps:

1. A joint task force has been set up with the European Committee for Standardisation (CEN TC 320 WG5). A specific standard for quality in collective passenger transport was under preparation within the CEN. Since the scope of the CEN project was very close to Quattro's, it was decided to work in close co-operation. The result is a list of quality elements, a passenger transport quality mix, which will be part of the future European standard.

These elements provide a functional definition of quality in UPT, which may be progressively applied technically and adapted to the characteristics of each UPT system in terms of infrastructure and equipment and to local service demands. The advantage of this standard is to provide operators and authorities with a common language in their analysis, negotiation and monitoring of quality issues.

2. A specific review has also been carried out on the subject of externalities and a description of the elements that may be taken into consideration when specifying the environmental performance of public transport is provided.
3. The concept of quality in UPT services must be strongly user-oriented, that is, based on their preferences, characteristics and attitudes. The list of quality determinants has to be prioritised and converted into verifiable indicators and measurable targets. Specific attention has been paid to the methods available to tighten up the link that should exist between those quality indicators and the expectations of passengers. Needless to say, this is a critical aspect of contracts and tenders. The contracting authorities must be able to get to grips with the characteristics of expected quality (What are the most pressing demands of passengers? What improvements do they expect from the system?), to translate them coherently into clear contractual assignments as well as in appropriate monitoring criteria (Does the system indeed provide the expected quality?).

This part of the research also outlines the connection that exists between quality and financial performance as a result of the impact of quality on the system's revenues and operating costs. The idea is that quality management does not only bring extra users (and revenues) in the system and increases the willingness to pay for the service provided, it may also result in improved processes and in a reduction of non quality costs.

Besides the definition of quality criteria and their integration in tenders and contracts, it appears from current practices in public transport as well as in other sectors, that it is useful to consider “quality” in a broader sense - total quality management. By observing the organisations where total quality management has been applied since the 80s, it has been demonstrated that the search for excellence must be supported by specific management techniques, of which criteria and measurement are only an important element.

These management techniques have specific applications in service industries, where the final quality depends heavily on those who actually provide the service to customers (the driver, the commercial staff, and all the persons who are direct contact with passengers) as well as on users themselves.

Services like public transport are used at the same time as they are produced. Moreover, services are perishable, which means that, unless they are consumed right away, they are lost. This simultaneity between production and consumption and the perishability of transport services increase the need for excellence in service delivery as a way to maximise load factors. Other characteristics of the production of public transport such as the customisation dilemma (mass-production intended to fulfil thousands of relatively specific mobility needs) add to the complexity of quality management in this sector.

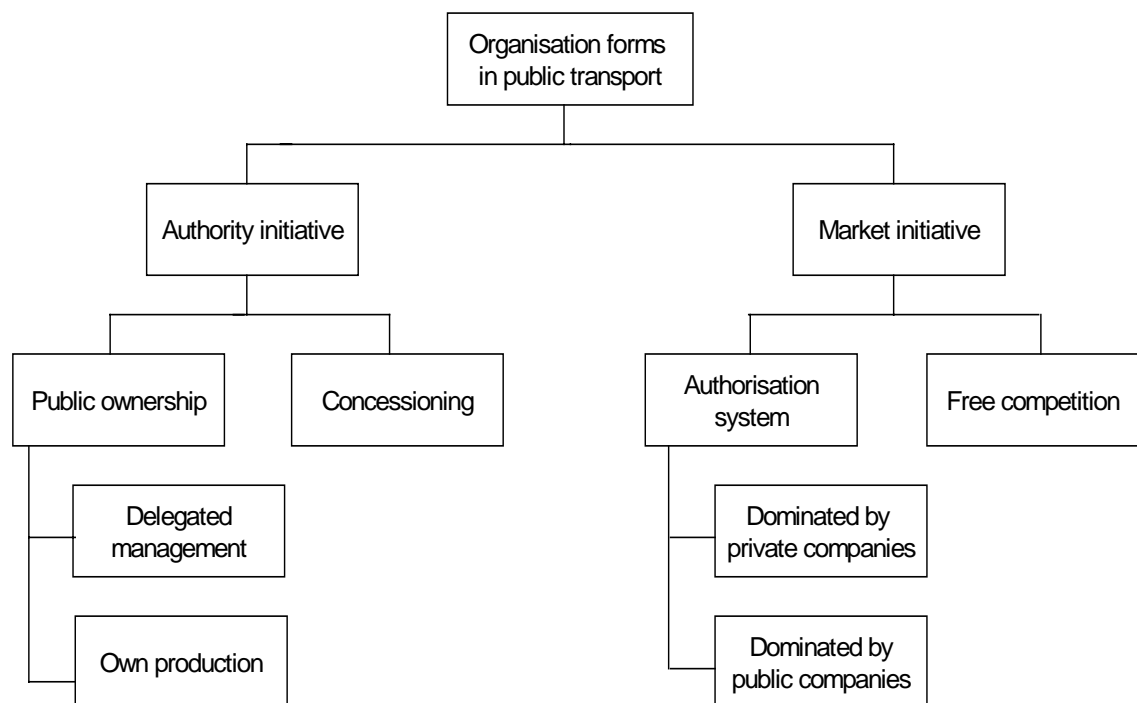
Total quality management goes far beyond quality criteria. It requires a change in the management culture. This change is encouraged by the European Foundation for Quality Management through a comparison between traditional management and management for business excellence. Total quality management has been developed in Quattro in three different ways:

1. A specific quality loop, linking the expectations and characteristics of the market with the production of the service, has been developed as a management tool. This loop shows that the quality of the service provided depends on the whole system of production. As a consequence, the quality of the service is not only a responsibility of the operators, it is also a responsibility of the authority in charge of traffic management, for example. This is why tenders and contracts should promote TQM at the level of the system rather than simply at the level of operators or authorities.
2. Several specific tools for quality management in UPT systems are proposed in this study. These tools, which for the most part may be applied within the framework of any of the regulatory regimes existing in Europe, are the following:
 - quality loops;
 - self-assessment methods;
 - benchmarking;
 - standardisation and certification;
 - quality partnerships;
 - guarantee of service and service charters.
3. In order to stimulate the development of quality tenders and quality contracts, specific guidelines are proposed to authorities and operators by Quattro. These guidelines cover both the content of the documents and the procedures associated with them.

1.4. The regulation and organisation of UPT in Europe

This research on issues of quality monitoring and management in the tendering and contracting of UPT provision required from the outset a clear understanding of the institutional and organisational frameworks in which these regulatory instruments are used. As outlined in the Isotope⁶ research project, public transport is a service which can be produced in a number of distinctive organisational frameworks. A wide variety of such frameworks co-exist in Europe, including the French 'delegation of public service', production by an authority (municipal corporations), tendering of centrally planned networks, open entry and regulated markets. The various organisational models existing in Europe may first be classified in public versus private initiative regimes as well as according to the level of authority intervention in service production. Figure 2 below illustrates this classification.

Figure 3 : Organisational forms in public transport



Source: Didier Van de Velde, Erasmus University Rotterdam

Throughout the Quattro project, we used yet a more schematic classification based on three broad categories:

- countries where de facto publicly owned companies provide UPT services, either through a public monopoly or on the basis of an authorisation system (AT, BE, DE, ES, LU, GR, IT, NL, PT);

⁶ Isotope is the acronym for Improved Structure and Organisation for urban Transport Operations of Passengers in Europe. Isotope's objectives were to describe and compare the existing legal status and organisational structures for urban public transport operations in Europe and to provide a strategic approach to the improvement of their organisational structures. The Isotope final report has been published by the office for official publications of the European Communities – ISBN 92-828-1634-6.

- the limited competition models, with two main variants: the “Scandinavian model”, which is based on minimum cost tenders at the level of a route or of a limited area (DK, FI, SE), and the “French model”, which is based on network management contracts;
- the deregulated, free market system, dominant in the UK, outside London.

This classification applies to CEEC as well, although in Poland, for example, the situation is less homogeneous and presents a mix of regulated and deregulated features.

It is important to note that contracting and tendering can theoretically be used as tools to achieve better quality within each of the above frameworks. But the status and ownership regimes applicable to the parties involved (authority, public company, private company) and the institutional and organisational frameworks in which they interact significantly influence the usage and enforcement of quality requirements.

In practice, tendering procedures are implemented only in the limited competition models and in complement to the deregulated systems. Contracts exist in the three categories of regulatory frameworks but their nature is fundamentally different depending on the regulatory framework considered:

- in public ownership regimes, the contract is primarily considered as a clarification of the parties' roles and responsibilities; Some competitive pressure is sometimes introduced by way of benchmarking mechanisms or by the use of internal tendering processes;
- in limited competition regimes, contracts tend to vary considerably in scope; they may involve a fairly restricted assignment (operation on a particular route) or they may set broad objectives to UPT operators (development, design, financing, running of a light rail system). The time scale associated with these contracts may also vary from one or two years to twenty or thirty years;
- in the deregulated model, where no contract is really required between the operators and the competent authority (as the basic principle is competition on the street), “partnerships for quality” are sometimes used to encourage authorities and operators to improve an existing situation.

In order to easily understand the structure and functioning of UPT systems, it is enlightening to break them up in a series of distinctive levels of control and decision. Throughout the Quattro project, we made a distinction between the strategic (aims), the tactical (design) and the operational (production) decision-levels. This classification illustrates the fact that, whatever the organisational framework considered, a number of decisions have to be taken in UPT and these can, in principle, be taken by different bodies.

Figure 4 : The organisational framework

Decision level	General description	Decisions							
		(Software)	(Hardware)						
STRATEGIC Long term (~5 y)	<i>What do we want to achieve?</i>	<p>General Aims Transport policy Market share Profitability</p> <p>General service characteristics Areas Target groups Intermodality</p>							
TACTICAL Medium term (1-2 y)	<i>Which services can help us to realise the aims?</i>	<p>Detailed service characteristics</p> <table border="0"> <tr> <td>Fares</td> <td>Vehicles</td> </tr> <tr> <td>Image</td> <td>Routes</td> </tr> <tr> <td>Additional services</td> <td>Timetable</td> </tr> </table>		Fares	Vehicles	Image	Routes	Additional services	Timetable
Fares	Vehicles								
Image	Routes								
Additional services	Timetable								
OPERATIONAL Short term (1-6 m.)	<i>How to produce these services?</i>	<p>Sales Selling the services Providing information Sales personnel management</p>	<p>Production Vehicle rostering and mngt Personnel rostering and mngt Infrastructure mngt Purchase of consumables</p>						

Source: Didier Van de Velde, Erasmus University Rotterdam

1.5. Structure of the research and data collection

1.5.1. Presentation of the different work packages of Quattro

The research agenda followed by the consortium consisted of five major steps or work packages, which were all synthesised in an independent document (or deliverable). The main work packages can be summarised as follows:

Work package 1 consists of a broad data collection exercise whose purposes are:

- to survey operators and public transport authorities throughout the European Union and Norway on issues of quality and quality management in their respective countries;
- to use the answers received from 128 of the surveyed organisations in addition to other sources of data and information to describe and assess the situation prevailing in each country covered by Quattro with respect to the quality of public transport and to quality management practices in general;
- to identify best practices in the field of public transport as well as in other sectors.

Work package 1 briefly describes the main principles and theories developed to date for dealing with quality and notably the total quality management (TQM) movement. More specifically, WP 1 examines the approaches developed by Deming, Juran, Crosby, Ishikawa and Taguchi and the following Quality Management Models: EFQM, Malcolm Baldrige, Australian, ISO 9000 and a Brazilian model specifically developed for the UPT sector.

Work package 2 provides most of the theoretical background necessary to the Quattro project. Its result is a comprehensive presentation of quality definitions and assessment tools. Work package 2 also examines the links that exist between quality and the other economic aspects of UPT (price for the user, subsidies, financial performances, reward and penalty schemes, etc.).

Work package 3 provides an analysis of quality contracts and quality tenders and offers guidelines to authorities and operators on how to draft such contracts and tender documents. It also examines the connection that exist between this concern and some of the most widely used quality standards (ISO 9000 / ISO 14000 standards).

Work package 4 analyses how internal quality indices can relate to external quality indices and establishes a systematic relationship between internal quality measures (at the level of operations) and external quality measures (at the level of the users and the citizens). Work package 4 confirms the results of a recent survey by UITP and demonstrates the need for more coherence between internal quality monitoring systems and customer satisfaction indicators.

In addition to the above work packages, the Quattro project also investigated service quality in UPT services in Central Europe and the Baltic States. The organisation of public transport in these countries has already undergone radical reforms since the early nineties and more changes are to be expected. The best practices identified throughout this part of the project have served as inputs in addressing the other issues covered by Quattro.

1.5.2. Survey and data collection

As already indicated, the main purpose of Quattro's first work package (WP1) was to collect and organise most of the data and information needed in the subsequent work packages devoted to the in-depth analysis of specific research topics.

This data-collection phase of the research consists of:

- a literature survey aimed at collecting information and bibliographic references from partners as well as from external sources on existing approaches and techniques of quality management;
- a review of procurement and regulatory documents covering the identification, description and analysis of the way quality aspects are accounted for in these documents (laws and regulations, tender documents, contracts and related agreements, management information systems of operators, customer charters, partnership agreements, monitoring instruments of operators, etc.);
- a quality survey designed to gather as much information as possible on the aspects and determinants taken into account by public transport authorities and operators in different countries to define and monitor service quality;
- national reports presenting, on a country-by-country basis, existing quality management approaches in the UPT sector as well as in general, with a focus on their impact on tender processes and procurement contracts;
- a series of accounts on "Best quality management Practices" in UPT as well as in other sectors with, in this latter case, an assessment of their potential use in UPT.

The questionnaire addressed to the authorities and operators of the countries covered by Quattro was essentially built drawing from two major inputs:

- the quality check-list provided by the Green Paper on the Citizens' Network;
- the work developed by CEN TC320 WG5 in close collaboration with the Quattro consortium.

The aim of the survey was to obtain information regarding:

- the importance attached by the surveyed organisation to the quality determinants listed in the questionnaire;
- the use of objective measures of service quality in tender documents, contracts, management information systems, performance monitoring systems and customer satisfaction surveys;
- the impact of quality indicators on the relationship between the contracting parties as well as on the relationship between them and their passengers.

The national reports drafted for each EU Member State as well as for Norway are built on approximately the following structure:

- national framework description:
 - quality management in general;
 - quality in UPT;
- quality management processes;
- impact of the national approach to quality on the selection and contracting processes applied in UPT;

- impact of external policies and practices (European and others) on the national approach to quality management in UPT;
- innovative quality management practices in other sectors than the UPT sector;
- quality aspects and determinants accounted for in the relevant documents.

1.5.3. Preliminary conclusions of Quattro's initial survey

Briefly stated, the main conclusions of work package 1 are:

As far as quality management in general is concerned:

- there exist significant imbalances in the development of quality management practices across European countries;
- a majority of countries have adopted as their national framework the EFQM model for quality awards;
- certification processes based on ISO standards are widely disseminated and implemented across Europe but this does not mean that the management principles underlying these standards are equally applied;
- there is a proliferation of organisations in European countries which are dedicated to the support of quality implementation and which provide a privileged forum for the discussion of quality-related topics;
- for a majority of countries, quality, although it is recognised as a very important management tool, is still a fairly subjective concept.

As far as quality management in UPT is concerned:

- the differences observed in the level of development of quality management across European countries tend to be even more significant when considering the UPT sector specifically;
- there exists no specific quality management model for the UPT sector in Europe. The few organisations that have adopted a TQM approach are following the general framework provided by EFQM which has so far proved to be applicable to organisations in the transport sector;
- in the majority of the countries surveyed, UPT policies only refer to service quality in rather imprecise terms; no national (or regional) quality policy is explicitly defined for the UPT sector;
- in a few countries, there exist specific and objectively defined (measurable) quality standards for UPT;
- the increased use of tendering and contracting procedures is driving the development of new quality criteria and specifications. Almost all tenders include quality aspects in the evaluation criteria, and more and more contracts (even without tendering) are now following the same path;
- partnership agreements, quality charters, and benchmarking techniques are emerging as powerful tools for the improvement of quality management in UPT;
- the bodies certified by the EFQM and/or following its quality management model seem to consider all quality aspects as equally important; also, their sensitivity to quality issues is very different from that of the bodies that do not rely on a systematic approach to quality except for engineering and maintenance works;
- customer satisfaction surveys are a widespread practice;
- quality-related bonuses and penalties are more often imposed on operators than on authorities.

1.6. Quality management in Poland, Hungary and the Baltic States

1.6.1. Motivations for East-West comparisons with respect to quality management

Initially, Quattro was only meant to cover the UPT sectors of Western European countries. However, it soon appeared that an extension of the project to Central and Eastern European Countries (CEEC) could be of interest to both DG I and DG VII which finally co-operated to make it happen. The Quattro consortium was also extended in order to incorporate partners from the newly involved countries: ELT and LT-Konsultite Eesti AS in Estonia, TRANSMAN in Hungary and IGKM - Chamber of Urban Transport in Poland. Despite this geographical extension, the main research objectives of the project remained unchanged.

The reports produced by IGKM, Transman and ELT demonstrate the mutual benefits made possible by the extension. The involvement of CEEC countries opened a wider field of research to the consortium and consequently allowed us to gather an even more diverse set of relevant tools and best practices. East-West exchanges of experience are all the more beneficial as the systems and practices that exist in these two areas have developed in near isolation for many years and have sometimes produced interesting results and achievements in different domains. The early involvement of partners from the East in the project also made it easier to plan and to ensure an adequate dissemination of the project's conclusions and recommendations in CEEC. And this seemed to be particularly important in the perspective of their future integration in the European Union.

One of the main objectives pursued by the integration of CEEC in the project was to facilitate the dissemination of Quattro's conclusions and recommendations in East and Central Europe. This required a clear demonstration of the relevance of Quattro's insights for these countries and a good understanding of the difficulties involved in their implementation in CEEC.

The interest of CEEC practices for Western European countries is confirmed by the different country reports which have been drafted for each of the CEEC included in the study. Conversely, the relevance of Quattro's different work packages to CEEC is clear from the following highlights:

- Work package 1 constitutes an important source of reference material for dealing with quality in UPT and this is as useful to authorities and operators in CEEC as it is for their counterparts in the West. WP 1 notably provides a clear reference framework for comparing the organisational and legal regimes as well as the experiences of countries and cities East and West with one another. Finally, the examples of best practices it presents may offer valuable insights to UPT professionals in the East.
- Work package 2 provides an overview of the theoretical foundations and definitions necessary for understanding and dealing with the integration of quality standards and targets in tendering and contracting procedures. It is worth noting that our CEEC partners have formulated a number of constructive criticisms and suggested different additions to the list of quality determinants listed in the report associated with WP 2.

- Work package 3 challenges the CEEC countries to review their own regulatory framework for dealing with the provision of UPT. This leads to interesting discussions on the classification framework used under the Quattro project. Furthermore, the examination of Western practices with respect to the integration of quality targets in tendering and contracting procedures provides useful pointers on how to deal with the challenges they represent for authorities and operators in CEEC.
- The methodology oriented approach of work package 4 raises concerns in relation to the limited availability of data in all CEEC countries and questions the approach chosen in work package 4. However, the final version of D4 will contain useful suggestions and practical recommendations on issues of data collection, aggregation and analysis.

In addition to their similarities, CEEC present important differences in the way they deal with the organisation of their UPT sectors. These similarities and differences are only very briefly presented below but they are examined in more detail in the national reports devoted to these countries.

2. Development of quality management in Europe

2.1. The evolution of quality management in Europe

2.1.1. Introduction

The term “quality” is widely used in a variety of sectors of our society and, within each sector, at different levels. The concept of “quality” has long been considered like a fairly vague one, a concern of little practical value to the business world, almost like a philosophical construct. By contrast, the general perception nowadays is that quality is so important that it is a “sine qua non” in the production and delivery of products and services alike. Yet, despite the emphasis now laid on quality issues in a number of specific applications, it seems to remain fairly underrated or unsystematically dealt with in some sectors including the UPT sector.

Until a few decades ago, quality was not so formally emphasised in the service sector. The importance of quality management was mainly related to its applications in the production of manufactured goods. With the globalisation of world markets and the resulting increase in competitive pressures, companies understood that they needed to be more responsive to the expectations of their customers as the latter were becoming better informed and more demanding.

A number of studies provided evidence that customers are willing to pay for better service and product quality. In cases where customer information and/or market pressure appear inadequate, regulatory authorities may also impose strict quality standards before granting access to the market. Security, safety, health and environmental protection are typical concerns leading to this kind of interventions. The growing importance of quality in the production and delivery of goods and services alike is leading to a situation in which quality will be a «sine qua non» to be in the market.

In the European Union, evolution in the field of quality closely followed international trends, although with different approaches and initiatives from one country to the other. Some countries, such as Germany, Great Britain and the Nordic Countries already have a long tradition of focus on quality. Others have engaged in quality enhancement initiatives only later. The development and content of self-assessment practices, benchmarking and continuous improvement techniques is also far from homogeneous.

CEEC are lagging behind in these developments as their transition from former command systems to market economies only took place in the early 90s. Nevertheless, there is already a clear progress in the direction of the other countries and they will certainly benefit from the experience and mistakes of others, enabling them to move faster.

Finally, the development of quality management is not identical in all sectors. It started to be considered as a critical concern in the service sector, particularly in public services, well after it had become a prominent issue in manufactured goods. This partially explains why there is still much scope for improvement and best practice dissemination in public services in general and Urban Public Transport (UPT) in particular.

2.1.2. The history of quality

The roots of quality management can be traced back to the 20s. That is when quality really became an important issue in the production of manufactured goods. The focus was then on quality inspection, which required specific measurement tools in order to test, analyse and compare outputs.

The following years witnessed a development towards quality control as applied to production processes. The information gathered by means of product inspection was processed statistically in order to improve production processes. Because services are usually not as easy to standardise as goods and because they are consumed at the same time as they are produced (simultaneity and perishability), their quality is not as easy to specify and to assess as that of manufactured goods. This clearly encouraged the development of more proactive approaches to quality management in service industries.

In the next step, a concept of quality concentrating on the human factors emerged. Quality management now had to involve the entire organisation; from being mainly the responsibility of one or a few specific departments, quality management started to concern everybody in the company. Quality became something of a management philosophy; the concept of Total Quality Management (TQM) was born. Stahl, amongst others, defined it as «a system approach to management that aims to continuously increase value to customers by designing and continuously improving organisational processes and systems»⁷. The increased acceptance and use of TQM principles, which started in the second half of this century, is mainly due to a number of factors which we already pointed out:

- increasing domestic and global competition;
- increasing complexity in the make up of stakeholders interests;
- a need to achieve a sustainable commitment at all organisational levels;
- a need to improve processes to achieve a better use of available resources and reduce waste.

The implementation of TQM is based on quality management models, such as ISO (International Standard Organisation) and EFQM (European Foundation for Quality Management) models, the best known in Europe. However, the ISO-model used for certification is often considered a system killing creativity and leading to bureaucracy. On the other hand, the EFQM-model is based on important management values such as customer and staff satisfaction. It helps to identify the weak and strong points of the organisation and so provides a starting point for continuous improvement. Other frequently used models in other parts of the world include the Malcolm Baldrige and the Deming (Prize) Model, both of which are also strongly based on consolidated management principles.

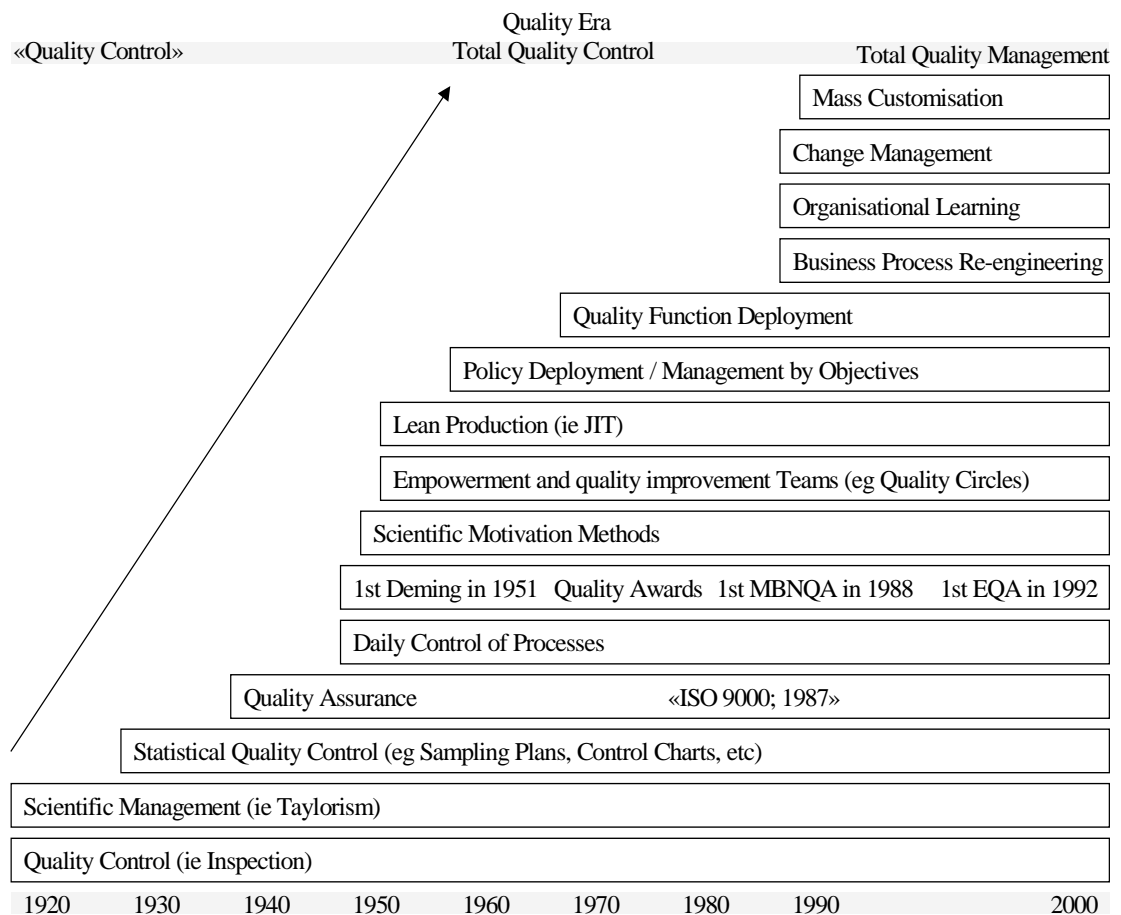
Provided that it faces appropriate economic incentives, it is often in the interest of a company to have an effective internal quality management systems because avoiding defaults is often less expensive than producing a flawed and consequently less attractive service or paying compensations to customers.

⁷ M. J. Stahl, Management: Total Quality in a Global Environment, 1995.

Finally, as a result of the increased importance attached to quality by all kinds of businesses, certification, in particular ISO certification, is now widely implemented in the goods sector and to a lesser extent in service sectors. Certification is notably used as a way to enforce the internal review of production processes, and can be an interesting first step in the implementation of TQM in the sense that it enables organisations to identify their critical improvement areas.

The following graph illustrates the historical evolution of quality management techniques from quality control towards a total quality management approach.

Figure 5 : Quality Era



Source: EFQM, *Economic Aspects of Quality*

2.1.3. European policy and quality

How does the European Commission approach the concept of quality and how is quality promoted by European authorities? A background document of the Commission entitled “Communication on the Competitiveness of the European industry”⁸ presents a brief overview of the history of Quality and of Commission initiatives in this field.

⁸ Quality series nr 1- The European Quality Promotion Policy- European Commission DGIII – Industry.

On 5 December 1993, the Commission introduced quality into its White Paper on “Growth, competitiveness, employment” to promote activities with a high degree of added value. In the communication “An industrial competitiveness policy for the European Union”, quality figures amongst the intangible investment measures proposed. In its Resolution of 21 November 1994 on industrial competitiveness, the Council of Ministers approved the initiative of presenting a quality promotion policy. These three examples show the importance attached to quality by European authorities.

The European Internal Market and the concept of free circulation of goods have led to the need of technical harmonisation at the level of the European Union. “*The technical harmonisation Directives provide the proper instruments to satisfy this principle by creating the necessary conditions for the mutual recognition of conformity assessment procedures by the Member States National Authorities*”⁹.

Standardisation activities have been fundamentally influenced by the European Union and increased dramatically over the last ten years. A more European image for standards appears to be contributing to transparency and easier trade flows.

2.1.4. Organisations involved in quality development Europe-wide

*“National and European quality organisations play a very important role in promoting quality policies and in contributing to the information and the motivation of company managers to the use and the benefits of a quality management strategy”*¹⁰.

Different bodies promote and develop quality and quality management on a European scale. The most prominent ones are:

- the European Organisation for Quality (EOQ), an organisation of quality professionals;
- the European Foundation for Quality Management (EFQM), promoter of the European Quality Award model;
- the European Committee for Standardisation (CEN).

All three play a role in developing the appropriate tools and in disseminating them throughout Europe. “*These organisations play their own roles in the market place, but can contribute considerably to the success of the Quality Policy by committing themselves to its objectives, by initiating activities coherent with it, participating in their implementation and by supporting public authorities’ policies*”¹¹.

The European Quality promotion policy is designed to “develop a favourable environment in which companies and public administrations in Europe aim to achieve excellence in term of their output and internal organisation for the benefit of society as a whole”¹². Five specific actions can be identified and are described below:

⁹ The European Quality Promotion Policy- European Commission DGIII – Industry. Page 9.

¹⁰ Idem. Page 13.

¹¹ Idem. Page 14.

¹² Idem. Page 15.

- The European Quality Award
The award was created in 1992 by EFQM and the EOQ, with the support of the Commission, with the objective to “encourage and recognise the achievement of excellence by companies in terms of quality management as the key to continuous improvement and consequently the best strategy to improve competitiveness”¹³.
- Benchmarking
This is another means of spreading best management best practices. The Commission promotes benchmarking either directly or with the help of special bodies involved in Quality promotion (EFQM is examining the possibility of developing European Benchmarking networks).¹⁴.
- The European Quality Week
Inspired by similar initiatives at international (World Quality Day) and national levels, the Commission requested the EOQ and EFQM to examine the feasibility and relevance of an event that would bring together the different national quality initiatives and give them a European dimension and objective. A pilot project to measure market reactions to such an event took place during the week of 6-10 November 1995. It resulted in more than 90 different quality promotion initiatives such as international conferences, workshops and activities in schools.
- The European Quality Observatory
The idea is to develop at the European level a tool to measure and provide feedback on the progress of Quality in Europe. No such system currently exists in Europe.
- The European System for the Qualification of Quality Professionals
In this field, the objective of the Commission is to encourage organisations that have competences in the development of training programmes to develop specific programmes in the field of quality and to “respond to the constantly increasing demand of companies to have properly trained engineers and managers with a European vision”¹⁵.

2.1.5. Certification and standardisation

On this subject, a basic distinction has to be made between the certification of a product, the certification of a quality management system and the accreditation of a laboratory. The norm family ISO 9000 is a set of five world-wide standards that establish requirements for the management of quality. In contrast, a laboratory (or certifying body) will be judged regarding its qualification and certified according to the 45000 standards (accreditation). Companies can also certify their environmental management system according to the ISO 14000 standard series (similar in outlook to the ISO 9000 quality assurance standards) or follow an Eco-Audit (Environmental Management and Audit Scheme).

¹³ Idem. Page 17.

¹⁴ See also « Benchmarking the competitiveness of European Industry », Commission Communication, COM (96)463.

¹⁵ Idem. Page 19.

The latter is a new approach set up by the European Community to encourage companies of all sizes and from every industrial sector to commit voluntarily to the improvement of their environmental performance. The goals of Eco-Audits are to promote the proper environmental management of industrial activities and to favour an adequate communication with the general public on these topics. With its Eco-Audit, the company prepares an environmental management system, i.e. a set of in-house procedures based on a series of environmental management parameters.

At the national level, a number of institutes for standardisation define quality standards that can be used in contracts and regulations. In all European countries we have National Standard Associations (such as the Association Française de Normalisation (AFNOR) in France, the Ente Nazionale Italiano di Unificazione (UNI) in Italy, the Service de l'énergie de l'Etat in Luxembourg, the Netherlands Normalisation Institute, the Standardiseringsen i Sverige in Sweden, the Portuguese Quality Institute, the National Entity for Accreditation in Spain). These national organisations set out national standards and participate in the activities of the International Organisation for Standardisation (ISO) and of the European Committee for Standardisation (CEN, CENELEC and ETSI) where they represent their national interest.

It is thus important to distinguish between different types of standards:

- national standards: those published by the different national bodies, which can be seen as a mirror of the quality development in a particular country;
- European standards: they are developed by organisations at European level. Examples are: CECA - Communauté européenne du charbon et de l'acier (European Community for Coal and Steel), Euronorm, CEN - Comité européen de normalisation (European Committee for Standardisation) and CENELEC - Comité européen de normalisation électronique (European Committee for Standardisation for the electronic sector);
- world standards: they are developed by ISO - (International Standardisation Organisation), CEI - (Commission électrotechnique internationale), CEE - (Commission internationale de réglementation en vue de l'approbation de l'équipement électrique).

2.1.6. Instruments and institutions that promote quality in Member States

In different European countries, there exists a number of institutions and agencies whose purposes are to promote quality management techniques and the use of common certification standards (e.g. Belgian Centre for Quality, Mouvement Français pour la Qualité (MFQ - French movement for quality), Finnish and Norwegian Society for Quality, Spanish Association for Quality (AEC) and «Club Gestión de Calidad» (Management Quality Club), National Quality Council in Portugal). In addition, there are national associations for the promotion of Total Quality Management (e.g. Portuguese Quality Association) which aim to improve the functioning and performance of companies by implementing the philosophy of Total Quality Management (TQM). At European level we have the European Foundation for Total Quality Management performing this role. The interest of quality certification is notably highlighted by the way major insurance companies in Norway have started to take into account the certification or absence of certification of their customers to set the level of their insurance premium. Their reasoning is that businesses implementing quality management programmes tend to have fewer accidents and incidents than others.

In a number of countries, national governments have started to promote quality in several sectors through the adoption of Customer or Service Charters (e.g. Great Britain, Portugal and Italy). Such charters focus on principles such as customer protection and participation, transparency, information and increased efficiency. Throughout the EU as well as in Norway, there is an increased awareness of quality management in public services.

In nearly all countries there are quality awards or prizes (e.g. the Finnish Quality Prize which is mainly based on the Malcolm Baldrige National Quality Award (USA), the Italian Quality Award (Associazione Premio Qualità Italia) directly inspired by the EFQM award but with a number of modifications to make it more flexible, French Prizes for Quality and the regional Quality Prizes, Excellence Award-Portuguese Quality System based on the criteria of the EFQM model). These Quality awards are given to companies that demonstrate remarkable progress and/or achievements in terms of quality. These companies are not necessarily ISO certified. Quality awards encourage other organisations to improve their quality management techniques.

2.1.7. Quality in Eastern Europe and the Baltic States

The fairly recent move towards market-oriented economies in East and Central Europe led us to treat these countries separately. Our research in this region is based on information collected in Hungary, Poland and in the Baltic States.

In some of these countries, quality management is based on a very long tradition. This is the case in Poland where in the 16th century the Polish philosopher and writer A. Frycz-Modrzewski published a political petition¹⁶ in which he suggested, among other things, the establishment of a government institution to control quality of all products sold on the market. The first real attempts to approach quality in a systematic way in industry were made in the 30s and, immediately after the second World War, an obligatory system of quality control in industry was introduced.

Under the centrally planned economic system, which came to an end in 1989, quality control and management did not exactly flourish. The economy was characterised by a complete lack of competition and by the near absence of driving forces for quality improvements. In some countries, the importance of product and service quality was formally recognised and quality targets did exist in certain sectors, but these were insufficiently geared to customer expectation. Internal control was also poor and the conditions for the evolution of quality management did not exist. Nevertheless, in 1959, the Central Office for quality Control was established in Poland to promote a quality control system.

The transition to a market economy in Poland and Hungary and led to fast and substantial developments in the field of quality management which were strongly driven by these countries' desire to join the EU and NATO.

The ISO 9000 standards were introduced and a significant number of organisations already have a quality control system that meets these requirements. This number is expected to triplicate by the year 2000. The process to get ISO certification is the same as in Western Europe. The certification is awarded by certification bodies accredited by the central accrediting body of these countries.

¹⁶ De republica emendanda (On the reform of the Republic).

Hungary and Poland also have national standardisation bodies and institutions for certification (Hungarian Corporate Body for Standard Issues, Polish Centre for Research and Certification, Council for Research and Certification) and national quality prizes to promote quality in the production and service sector.

There are however some contradictions regarding all these developments, mainly as far as the introduction of standards and certification is concerned and the heritage from the previous regime in terms of attitude and approach to quality is still perceptible (lack of business ethics, a still significant black economy, lack of practice in enforcing regulations and standards and an overall attitude that sees standards as compulsory and unnecessary administration work).

In Hungary, an important step to overcome these contradictions was the creation of the General Inspectorate for Customer Protection, a government body whose aim is to enforce the laws and standards in connection with the production and trade of goods and services. The body carries out regular inspections in the market on issues of customer protection and can be consulted by individuals in case they want to make a complaint or report illegal practices. It has the power to impose fines.

Quality is also promoted through national quality associations and similar institutions (e.g. Hungarian Quality Association, the National Customer Protection Society, the Information and Complaint Office for Customers, quality clubs for the promotion of quality management and ISO certification). A test magazine with comparisons regarding the quality of different products and services and special market analysis was recently published in Hungary. The dissemination of information on quality management and TQM (conferences, courses, promotion in the mass media, curricula at universities) and official state sponsored programmes for quality promotion also go in the same direction.

No developments were reported by the Baltic States in the field of quality management in general.

2.2. Evolution of quality in UPT

2.2.1. The origins of quality management in UPT

Only 20 years ago, quality was not an issue for the UPT sector in the European Union. It became more important at the end of the 80s and the beginning of the 90s. There are many reasons leading to this development and they vary from country to country: the general trend towards more quality has already been explained, the reduction of public subsidies with the need to improve productive efficiency, and the increased introduction of competition through tendering in certain countries, are certainly among the most relevant causes.

However, the fact that the importance of quality has been recognised does not mean that the UPT sector has made significant achievement in this field. In most countries there is no uniform quality approach for UPT and the concept of quality remains somewhat vague and theoretical. The development of quality management is not homogeneous over Europe due to the different backgrounds and experiences. Globally it can be said that Southern Countries are less advanced than, for instance, Scandinavia, Norway, Germany and Great Britain, which conforms to their general economic development. However, no clear-cut conclusion is allowed in this respect, as there are also remarkable achievements in some cities of the Southern European countries in the field of quality in UPT, that places those cities among the very best in Europe. It is also clear that in East and Central Europe, the impetus for quality in public transport has just started. Nevertheless, these countries seem to be aware of the considerable gap to be filled and they are moving fast to catch up.

2.2.2. European Commission and Quality in UPT

The position of the European Commission on quality in UPT is expressed in a variety of documents.

In the Citizens' Network Green Paper "Fulfilling the potential of public passenger transport in Europe"¹⁷, the focus is placed on system accessibility. To ensure system accessibility, passenger transport systems need to be affordable, safe and reliable. Quality requirements such as frequency, cleanliness and comfort are considered as essential preconditions to make public transport more attractive. The Green Paper gathers all the quality criteria relevant to UPT in the "Citizens' network quality checklist". It is expected that a communication to be issued by the Commission as a follow up to the Green Paper "Citizens' Network" will reemphasise the need for providing door to door travel solutions with "sustainable mobility" modes.

¹⁷ Citizens' Network, Fulfilling the potential of public passenger transport in Europe, European Commission, Green Paper, ISBN 92-827-5812-5.

Figure 6 : Citizens' network quality checklist

System accessibility	Needs of people with reduced mobility Physical design of rolling stock Design of stations including intermodality Linking trip attracting areas to public transport Linking rural and peripheral regions
Affordability	Fare levels Socially desirable services (concession fares)
Safety / security	Safety standards Quality of lighting Qualification of staff Number of staff on duty / surveillance system
Travel convenience	Journey times Reliability Frequency Cleanliness Comfort Information Integrated ticketing Flexibility
Environmental impact	Emissions Noise infrastructure

Source: Citizens' Network Green Paper

In its Green Paper on “Fair and Efficient Pricing”, the Commission developed a reflection of the impact of public and private transport on the environment. The quality of a transport system can be measured through its effects on its environment (externalities). Globally, the externalities produced by public transport systems are often considerably lower than those caused by the private transport system. By requesting a fair and efficient pricing of transport operations in order to promote the utilisation of public transport, the Commission clearly identifies public transport as a key element of a sustainable development.

2.2.3. The national legal frameworks for quality in UPT

Currently, only a few Member States of the European Union have a legal framework for quality issues in UPT, although there are often implicit references in different legal texts. The Belgian law explicitly requires the introduction of management contracts in the relationship between authorities and operators for the provision of UPT services and the inclusion of quality objectives in these contracts. The law also requires the establishment of customer consultative committees, the designation of an ombudsman and refers to quality in the framework of public service obligation.

A similar situation is found in Italy with respect to service contracts. For the time being, transport authorities still have no obligation to tender. The Italian law also requires the adoption of a public service charter in which the operator guarantees the customer a certain level of service and provides the necessary legal protection. For Italy, it is also interesting that the law states that the regions - which are the authorities responsible for public transport - have to define the minimum level of service necessary to satisfy the mobility needs of the citizens from a qualitative and quantitative point of view. However, these provisions do not seem fully satisfactory yet as they provide no guarantee that quality enhancement is indeed carried out. Besides, there is no evidence of effective enforcement for the time being.

The general legal framework under which UPT services are operated certainly influences the development and importance of quality issues in a country. A contract between a local (transport) authority and an operator is the ideal instrument to introduce compulsory quality standards and incentives. In a deregulated environment, market forces may encourage the operator to strive for more quality because quality is indispensable to customer satisfaction and therefore influences the firm's revenue. Tendering, which has grown in many countries during the last 10 years, offers a possibility to place a greater emphasis on quality.

There are only a few countries in Europe in which the relation between authorities and transport operators are not regulated by a contract. Such contracts generally contain at least some quality requirements, even if, sometimes, these requirements only relate to rather technical aspects such as vehicle characteristics. In many countries, especially those in which tendering is a current practice, the quality requirements or criteria are connected to pre-fixed values contained within a bonus/penalty system. Contracts also often include clauses on measurement, assessment and control methods (e.g. customer satisfaction survey, inspection, self-registration, reporting slips for deviations from standards, automatic vehicle location system).

The provision of effective enforcement mechanisms is important to avoid that those quality requirements become a mere formality as was the case in the recent past. Many countries had this experience with the first service contracts in which performance criteria were explicitly or implicitly included, but without provision for any effective incentive or enforcement procedure. An alternative way to enhance quality, when the precise establishment of standards is difficult, for example because the tender authority does not have enough technical knowledge, is to ensure that part of the operator's revenue is a function of ridership levels. This incentive mechanism is being discussed in the Netherlands where its future introduction in concession agreements is envisaged. This does not only represent a significant change in the risk sharing approach between authorities and operators, it is also a satisfactory mid-term solution in the process of introducing quality in tendering procedures and contracts.

The growing importance of quality requirements in tendering procedures is due to the fact that competition based only on price results in the danger of a degradation of service quality. However, despite the growing general knowledge of this evidence, tender documents do not always contain detailed indications about quality. Often they only include fairly general requirements of service improvement from a quantitative and qualitative point of view. Also, in the assessment of competing bids, quality does not always receive enough attention, although it is more and more often considered as a selection criterion. There is a clear general need for more specific references to quality in all the phases of the tendering process.

2.2.4. Quality management systems, certification and standards in UPT

Quality management systems in UPT have become popular in the 90s. However, no specific model seems to have been developed for this sector and only the most innovative transport companies are using one of their own. This seems to be slowly about to change, especially in countries where national quality programmes are being launched, and in which incentives (financial or training) are given to implement and/or certify quality management systems (e.g. Austria).

As we have already mentioned, there is no evidence to support that certification in itself should be considered as a necessary condition to provide public transport services. There are few UPT companies in Europe which are certified according to the ISO 9000 standards and even for the ones that are certified, this it is often only for specific departments of the company, such as maintenance. It is interesting that there are a number of operators complying with the ISO standards but that do not apply for a certification. This evidence reinforce our view that the main added value of the certification process in UPT is to encourage the internal review of processes for the implementation of the TQM approach, and not certification in itself.

Quality issues are still very much seen as related to the concept of standards. Some national standardisation bodies or transport associations have started to deal with standardisation in UPT. France developed an experimental standard (AFNOR X 50-805 - «Quality within transportation services - Identification of the quality criteria for passenger transportation») which was published in 1997. This standard illustrates a method for defining and assessing the modes (e.g. road, rail, air, sea) and types (e.g. urban, interurban) of passenger transportation.

It also includes 8 families of quality standards, which are divided into different sub-criteria. In Denmark an initiative of the transport authorities which is described below led to a draft standard, but work was suspended in order to avoid conflict of interests with a possible CEN standard. The working group is still in force but does not have a specific working agenda anymore. However, some of its members are actively involved in the Danish support group of the CEN project TC320 WG5 on Public Transportation. The latter is a working group of the European Committee for Standardisation (CEN) which is currently defining a European standard that includes the definition of quality criteria and the elaboration of methods for defining and assessing quality. Most countries have a representative from the public transport world in this working group, which is often supported by national subgroups.

2.2.5. Promotion of quality in UPT

Quite recently some special quality prizes for public transport were created: the Danish Prize, based on the EFQM model and launched in Denmark in 1997, the European award, created by the Council for European Municipalities and Regions (CCRE), and the award of the International Union for Public Transport (UITP).

As we have already seen, authorities have a very specific role and range of responsibilities in the promotion of quality at different levels. Besides prescribing quality levels and requirements for tendering purposes or contract negotiations (contractual or push-pull measures), there is plenty of scope for authority initiatives. However this pro-active attitude is only seen in a small number of countries where authorities actively contribute to enhance the quality level of the transport system. In Denmark, the Public Transport Department of the Committee of County Councils sponsored quality management by procuring funds and participated actively in a working group together with the Public Transport Authorities (PTA). In 1995/96, this group produced a Quality Handbook for the use of PTAs and set out a common survey model to ensure the compatibility of the customer surveys carried out in the different counties. This initiative led to the creation of the CEN working group described above. Also, in France a «Practical guide for drafting specifications integrating a quality approach» was published by the organising authorities in 1995. This guide has the objective to assist the preparation of invitations to tender for transport services.

National public transport associations also play an important role in the process through their committees or working groups, especially in the dissemination of quality management techniques and methodologies (e.g. Finland, Italy, Germany). Among their most important activities are surveys on progress of the use of quality standards, measurement methods and quality management systems by their member companies. These national organisations play an important role in the European movement towards the enhancement of quality in UPT by helping to disseminate throughout their respective countries the principles and guidelines established at European and world-wide level. The Quattro survey addressed to UPT authorities and operators revealed that the majority of the respondents (56% of a sample of 128 questionnaires covering all European Union countries plus Norway) benchmark the performance of their organisations at national level.

International public transport associations have an equally important role: in a first stage as drivers of the dissemination process; and in a second stage in the harmonisation of quality standards across countries. Benchmarking techniques are also among the most well known methods used by these organisations. A good example, among others, is the study that was undertaken by the International Union for Public Transport (UITP) at a world-wide level for underground systems. The aim of this study was to learn about the methods used by these companies in order to gain a better understanding of customer expectations and of the levels of their satisfaction as well as to examine to which extent the result of such methods were used in the establishment of policies to improve quality within the companies.

One of the most interesting conclusions of this study was that in most companies there was a difference between customer expectations and actual service standards. In many cases, the existing standards related to performance determinants which were relatively less important for the customer. Moreover, some service standards were used without being followed by a measurement of the level of quality actually achieved by the firm. This seems to indicate that there is a missing link between the quality measured by the operator's internal performance indicators and that perceived by the customers as reflected in customer satisfaction surveys. The Quattro research confirmed that this conclusion is also valid for other transport modes and makes this issue one of the most important ones to be developed in further research work.

Other quite common instruments that contribute to quality enhancement in public transport are Partnership Agreements and Citizens Charters (sometimes also called Public Service, Mobility or Customer Charters). Citizens Charters were first introduced for public sector services in Great Britain in the 80s. Their aim was to specify standards and targets for particular services and to establish the commercial practice of refunds and other compensations in case of flaw in service delivery. The underlying motivation for these Charters was to increase the accountability of public sector organisations and to improve consumer protection. Although these charters were only compulsory for publicly owned companies, most private operators adopted them on a voluntary basis. Italy was the next country to adopt Mobility Charters; Italian Charters became compulsory in the middle of the 90s.

Oslo's UPT operator went a step further and introduced the Travel Guarantee on a voluntary basis in 1995 as a tool for improving service quality in the company's tram, metro and bus operations. The system was the company's response to decreasing subsidies and to the government's willingness to introduce calls for tenders in service provision.

The Oslo system contains 12 points addressing different aspects that are considered to be important for passengers, such as information, both before and during the journey, clean vehicles, and punctuality. The Travel Guarantee provides for the refund of taxi-fares for passengers that have their journey delayed more than a certain amount of minutes due to service interruptions.

Partnership agreements, sometimes also called Charters, aim to organise co-ordination and reciprocal commitment between local authorities and public transport operators. Other objectives of these agreements are to improve the general climate and public opinion in favour of public transport, to contribute to the revitalisation of town centres and to include rural areas in regional development strategies. The collaboration of authorities and operators involved in the supply of public transport service offers a guarantee for enhanced interoperability and intermodality which is a critical factor in the quality of the whole transport system. The first examples of this kind of agreements among different operators and/or authorities date from the 60s: the *Verkehrsverbund* (association of operators including railways) in Germany encouraged the integration of tickets, timetables, information, payment methods in a specific area and thus contributed considerably to improvements in the quality of public transport systems. Today this kind of agreements are quite common in many countries: Travel Partnerships in Great Britain, Mobility agreements between transport companies, regions and urban and rural municipalities in Belgium, Co-ordination agreements in Spain, Quality Partnerships contracts in Portugal, etc.

2.2.6. UPT Quality in Eastern Europe and the Baltic States

A. General comments

Due to the historical differences between the EU and the Eastern European and Baltic States we will again consider these latter countries separately. Before the radical changes that occurred since 1989, the public transport systems of these countries were very sophisticated in terms of accessibility, frequencies and affordability. Car ownership was very limited and public transport was the only means to assure the mobility of the citizens. However, like in the rest of the economy and for the reasons already mentioned, quality was of no interest and aspects such as travel comfort, cleanliness or staff behaviour were completely neglected. Certain companies had formal quality targets but there was no internal and external (in terms of customer satisfaction) follow up of these targets and thus an absence of the basic conditions for the development of quality management.

Today a great proportion of the population still relies on public transport for car ownership remains much lower than in the EU. However, private ridership is quickly increasing and the conditions in which public transport are operated are worsening, which is leading to the degradation of the sector accompanied by a considerable loss of patronage.

In both Hungary and Poland the quality developments that took place after the fall of their communist regimes were less impressive in UPT than in other sectors, which is in line with the gap observed in EU countries. Moreover, no legislation exists on quality issues, with the exception of some provisions which relate to safety and the legislation on public procurement.

In Hungary, a law on service contracts in public transport was enforced. According to this law interurban transport passengers have to be compensated in case of service cancellation (for booked seats) as well as when unexpected delays (longer than 30 minutes) occur. Also, certain quality standards have to be respected.

The inclusion of quality requirements in contracts of this type is also becoming a common practice in Poland. This strongly contributes to the appearance of elements of quality control. About half of the public transport companies already monitor passenger satisfaction in a more or less regular way. In most cases, this is part of their contractual obligations. Quality standards in contracts are sometimes linked to a bonus/penalty system. In Poland the public procurement law also requires the inclusion of formal quality requirements and the consideration of quality aspects in the evaluation of bids.

In both countries there are important quality initiatives in certain companies, such as compensation schemes for failure to reach the promised quality standards, appointment of a quality manager responsible for the development of quality control, audit and evaluation systems, special high quality services for intercity connections by train, efforts to establish a formal quality management system and pilot schemes to obtain ISO 9000 certifications. However, no PT operator in Hungary neither in Poland is yet certified or has a well defined quality management system. Quality is also promoted at a more academic level by researchers and professional associations.

The situation in the Baltic States - before the collapse of the communist regime - was very similar to the situation in other Eastern Europe countries: very low car ownership and heavy dependence of the people on public transport which was operated by state owned companies for which quality was not a critical issue. After the independence of these countries from the former Soviet Union, their economies quickly turned towards the West. Car ownership increased rapidly and public transport patronage decreased. In these countries the whole legal framework concerning the transport sector is currently being revised and the new transport policy is based on principles such as the privatisation of the transportation system and the improvement of the conditions for competition among all modes and within modes.

In all three Baltic States a new law for public transport is under preparation or already in force. These laws mainly deal with the right to operate bus transport, financial aspects and fares. In most places, public owned transport companies still survive. However, they normally operate under private law and competition by private companies already exists, although it is mostly confined to interurban bus operations.

Generally all relations between authorities and operators are regulated by a contract and, although no legal framework for quality in public transport exists, these contracts generally do include some quality standards relating to accessibility, availability, comfort, security, information, heating and lightning and driver behaviour. The inclusion of these quality elements necessarily implies their follow up in terms of management and control. Certain cities reported to have offices for complaints and regular customer surveys. In the academic world some studies on quality in UPT exist.

B. Country report: Hungary

In the first place it must be understood that public transport plays a much more important role in Hungary than in western Europe. The current modal share (61.4%) is still high compared to western data, which shows the strong reliance of the population on public transport.

The legal framework of public transport provision is not regulated by a specific law or code. Control and operation of public transport in Hungary is on two levels - corresponding to the structure of the governance system: Urban public transport is the responsibility of local governments (municipalities), while Interurban public transport is the responsibility of the national government.

Responsibilities of authorities in relationship with the provision of PT cover the following main issues:

- network and service definition;
- fare and overall tariff determination;
- operating licence control.

The Law of Concessions makes scheduled rail and road passenger transport services that need to be licensed for operation. The responsible authorities have the choice of either founding an economic organisation (with full or majority ownership) or delegating the concession rights to another party by means of a contractual agreement following a tendering procedure. In practice, the market is served by municipal and state companies, which are legal monopolies empowered by the perpetual operating licenses granted by the law.

The organisational frameworks of the UPT sector in Hungary fall clearly into the «regulated» class with the possibilities of public initiative and publicly owned assets or regulated private initiative being employed in addition.

The second chapter gives a brief overview on quality management in general and specifically in the UPT sector. There remains the heritage of the previous regime in terms of attitude and approach to quality, which is quantity in the first place and quality in the second. For many years, there has been nobody to encourage quality, let alone pay for it. In spite of these problems it is becoming widely accepted that quality is essential if the current role of UPT is to be at the least maintained.

The main difficulties Hungary faces are partly originate from the fact that the business ethic has not been developed to western standards and the black economy hinders the economic growth of the legal sector.

The specific problems of implementing quality management are:

- the lack of practice in enforcing regulations and standards, and
- the attitude of considering standards as 'compulsory but unnecessary' administration work.

Some elements of quality control are already present in UPT, and more visibly in interurban PT. It must be understood that the standard of quality control in Hungary essentially depends on the relationship of authorities and operators, as most PT operator companies are in state/municipal ownership. In case the responsible authority is willing to cover the operator's costs not covered by fare revenues then the authority has the means to influence the operator in terms of quality expectations. Otherwise the operator has no external pressure as it is given the concession to operate unconditionally and has no real interest in increasing the quality.

Some representative examples would be the new passenger transport regulation introduced at the Hungarian State Railways, the quality control system of the InterCity rail services, the incentive to get ISO 9000 certification for five Volán bus companies and the plans for the quality management system of the Budapest Transport Company.

Tendering in public transport is an option open to authorities which is not used frequently. The current operators enjoy special rights when planning new operation in their area. There have been six small scale examples of tendering so far in Hungary.

Cities are described "city reports" (Budapest, Debrecen, Győr, Miskolc, Pécs, Szeged, Szombathely). All city reports include a general description of the city, a description of the public transport system, including organisation, financing and background of the operator companies, supported by statistical data for the last 5-6 years. For each city the description of all quality issues related to UPT is included. In the last chapter we provide a short conclusion and a summary table with a prognosis on future trends.

In the city reports we have paid special attention to Budapest, as it is the most important settlement in Hungary, having almost ten times the population of the second biggest city, accommodating one fifth of Hungary's total population.

C. Country report: Poland

It is necessary to start with basic information on UPT in Poland. The general political setting and mission of public transport are presented with emphasis placed on dynamic changes which took place in the recent transition period.

The main feature of public transport in Polish cities is a high network density and a high level of patronage. However, rapid growth in the private car sector and economic reforms have reduced the demand for public transport which lost over 30 % of its margin in the last 7 years.

The roles of central and local authorities have been totally changed as was the legal framework for UPT. The State has withdrawn from the sector and responsibility is with municipalities. The city authorities are now experimenting with various models and the process of separation of the authority function from operators has started.

The transport market has been deregulated to a high degree and, theoretically, any private carrier can start an operation. In practice, most services are provided by city-owned companies. Consequently, the regulatory regime is a mixture of deregulation and partial regulation. Contracts and tenders have become common practice.

Having this in mind, it is possible to analyse specific aspects of quality in UPT. In Poland, UPT is lagging behind other sectors in which adoption of the concept of Quality Management has already started. Nevertheless, there is evidence that there is a growing awareness the importance of quality for both authorities and operators.

In cities where contracts are used, they contain quality requirements. There has been evolution from using simple measures of quality, such as punctuality, to more complex methods of quality evaluation, with multi-criteria and advanced statistical methods of quality control. Financial incentives (bonuses and penalties) for operators have been introduced.

Marketing studies and stated preference surveys are becoming popular. While in the past availability of service (plus the ability to board the vehicle which was often overcrowded) was on the top of the list, at present features such as punctuality, regularity and comfort are considered as the most important.

Six city reports have been prepared, for Warsaw, Bialystok, Gdynia, Krakow, Lodz and Zielona Gora. They differ with regard to the size, organisational structures, extent of using tendering and contracting, modes of transport (tram, bus, trolleybus) and approach to quality.

Of 6 cities studied, in 4 transportation policy has recently been changed. In general, all these cities have chosen a *sustainable transport policy* so as to preserve and promote urban public transport and this is an important element. How far this can be implemented is still uncertain because of a very proactive automobile lobby.

D. Country report: The Baltic States

The Baltic countries – Estonia, Latvia and Lithuania - are located in north-eastern Europe on the Baltic Sea coast. From the historical perspective, after World War II, these countries became the part of the Soviet Union. All three countries, therefore, belonged to the same state. The Baltic Region was the most developed area in the former Soviet Union in all respects, especially in terms of infrastructure. This was due to western influence as well as the pre-war independence of these countries.

In the 18th century the Baltic States served as Russia's window to the west. Conditions necessary for development, therefore, have existed in the region for a long time. But during the Soviet period, as members of the same country, economic development and standard of living were regulated by the same laws and policies. The basis for change, therefore, was the same in all three countries.

In transportation the situation was as follows. Car ownership was very low in comparison with western countries. The first priority in passenger transportation was public transport. People were thereby also equal in transportation terms. The fare level was quite low and everybody had easy access to public transport. Public transport was the responsibility of the state and was developed using state resources. Due to this, the public transport networks were quite well developed offering several modes of public transport that were used widely.

After independence was regained at the beginning of the nineties, all three Baltic Countries turned towards the West with a goal of joining the European Union. As in all sectors, transportation policies are being formulated on this basis and include the following basic principles:

- to be subject to international law, join international conventions and participate in international transport organisations;
- privatisation of transportation systems;
- willingness to receive foreign investments;
- unification of regulations with those of the European Community;
- improvement of conditions for competition between and within each transportation mode;
- development of transport infrastructure utilising the latest scientific research, technology and techniques;
- application of free market entrepreneurship and equality consistent with observing the law.

The economic and political environment has therefore changed. Although the starting point for transportation and public transport improvements was not bad, new problems such as financing, new demand patterns and environmental concerns arose. The old system did not change as quickly as people themselves. Conditions, therefore, began to change in response to new goals of the population (e.g. to buy a car) and economic possibilities within the countries.

In conclusion, the initial situation for public transport in all three Baltic countries was similar, as were the development goals. The path chosen varied somewhat.

Since conditions and approaches in the Baltic countries and cities are similar in many respects, the most detailed overview will be given for Estonia, the most developed of the three. It also has the most transport data available although the lack of data is a general characteristic of all the countries and cities reviewed. Accordingly, Estonia serves as a reference point and in Latvia and Lithuania, differences to the Estonian approach will be highlighted.

The following cities have been covered by specific city reports:

- Estonia: Tallinn, Tartu
- Latvia: Riga, Liepaja
- Lithuania: Vilnius, Kaunas

2.2.7. «Best practice» related to quality in UPT

To conclude the chapter, we briefly highlight the main aspects of some successful and interesting examples of «best practice» relating to quality in UPT in Europe and in the world. Full details, of these and other cases, can be found in the WP1 report of the Quattro project.

Spanish Railways (RENFE)

The total quality approach in the Spanish Railways (RENFE) constitutes an example of the successful application of the total quality management philosophy by a transport operator.

This company began with the creation of a Quality Management Department in 1988 and has since then established a Quality Committee, published a Quality Manual, created a TQM implementation grid, set Passenger Quality and Commuter Train standards, used the Quality Manuals within the Business Units, created a Concerted Quality Programme, promoted ISO 9000 certification within the Business Units, applied with the High Speed (AVE) Unit for the European Award for Excellence in Business and received the ISO 9000 certificates for Freight and Combined Transport.

Restructuring of the urban bus transport system in S. Paulo (Brazil)

After the restructuring of the urban bus transport system in S. Paulo (Brazil) - which led to the dismantling of the public owned company, to the creation of a new company (SPTrans) and to the transfer of operations to private companies was done on the basis of contracts awarded in a tendering procedure - TQM became a main issue in this process. The principal goal of the new company was to improve the quality and the efficiency of the service and this was achieved by adopting a «differentiated remuneration system» which awards higher compensations not only to the operators with the best performance and quality level in the service provided, but also to the ones who achieved the most significant quality improvements.

This example shows the impact of the quality approach in the improvement of the system even in a situation in which departure conditions are classified as very bad and financing problems exist. It also constitutes an example of a partnership between authorities and operators, with the specific aim of improving UPT quality without the financial support of public money.

Tendering process in Adelaide (South Australia)

Quality played a very interesting role in the tendering process of Adelaide (South Australia). Indeed, a multi-criteria analysis was used not only for the selection of the tender that offered the best value for money, with due respect for quality elements, but also in a previous process in order to take a decision on the most appropriate model for tendering passenger services. In this respect, the authority in Adelaide used the multi-criteria analysis to choose among various possibilities such as area, route or another form of tendering, the detail of frequency specification and the funding approaches. They came up with a customer-oriented tendering model which for its practical application was modified due to political pressures and conservative concerns. This led to a negative influence on the expected effects of competition and recommended a much more centralised system.

Balance between public intervention and market initiative – Hong Kong

Hong Kong's government successfully combined public intervention in commercial development and land use matters with the spirit of a commercial transport enterprise thus avoiding any direct public investment in the transport system. However, it maintained a control mechanism for bus franchises and fares and required the provision of better quality and innovative services in order to increase PT ridership. The experience in Hong Kong showed that there is a «willingness to pay» a reasonable fare in a competitive market.

Quality partnership contract in Évora

A different instrument to improve the quality of public transport was applied in Évora (Portugal) where a successful partnership between a local authority and a monopolistic private operator showed how to create the grounds for the introduction of competitive pressure in this sector. The experience entails significant improvements in the relationship between agents through the creation of an entity responsible for the tactical level of the system. It also highlights the role of transport in the development of sustainable urban life conditions without disregarding regional economic development.

2.3. One step further in the evolution of quality in UPT

2.3.1. From quality awareness to quality implementation

The term quality is very widely used in different sectors of our society and within each sector at different levels. However, despite its common usage, quality is a rather subjective concept in the sense that it depends on individual perceptions, which in turn change with the specific needs of each individual at a given moment. Individual needs tend to change and different individuals have different needs. This means that the quality of a product or service is directly related to its utility in satisfying the needs of a single customer or set of customers at a given moment.

From an economic point of view, one can say that suppliers of products and services need to establish the optimum trade-off between the level of quality they will need to provide to achieve customer satisfaction, the cost of provision and a price that will be considered as acceptable to the customers given the quality delivered.

Some decades ago, the concept of quality was not a primary concern for many companies; it was almost considered like a philosophical construct with little practical value to the business world. Today, as a result of the competitive pressures caused by the globalisation of the economy, quality awareness is such that the search for it penetrates practically all sectors of the society, from defence to health care.

In the first section of this chapter we have seen (see EFQM figure on the development of quality management) that quality awareness had its historical origins in the industrial sector, with inspection techniques. The first stage of development, which started with simple physical controls and then moved to the implementation of statistical control techniques, lasted approximately until the 1940s. At this stage, quality control had become a well-defined technical process, normally performed by a specific department within the organisation. The second stage saw the evolution from product inspection to the control of production processes. This evolution represented an important milestone in the development of quality management techniques. The change of focus from the product to the process opened up the way for the management of quality in the service sector.

However, despite the importance that is currently given to quality issues in general, some sectors still seem to be lagging behind in the development of a systematic approach for dealing with the concept. The UPT sector appears to be one of them.

2.3.2. The future of TQM in the UPT sector

In the 50's the foundation of what is known today as Total Quality Management (TQM) was launched with the view that the determining factor of quality was not the production process itself, but the organisation providing the product or service. Hence, quality was upgraded to a management approach instead of a production control technique.

As we have mentioned before, the development of TQM approaches led to a stronger emphasis on the human factor within organisations. Several authors related this evolution to the development of a systemic approach to quality management in which the organisation's departments were seen as the interacting parts of the same body.

Among the basic requirements for the implementation of TQM systems, the following ones need to be underlined:

- the implementation of strategic quality management which includes market segment differentiation based on customer expectations;
- the development of a culture of quality throughout the organisation, which implies the involvement of all levels, in particular the front line staff where customer contacts take place;
- the translation of technical requirements into process specifications;
- the proposition and testing of process improvements focused on customer expectations.

One of the main goals when using TQM is customer satisfaction. In UPT, this should translate in ridership increases for public transport relative to private cars. Different types of measures can be used to achieve this: legal and regulatory, fiscal and financial. However, the most obvious and embracing goal is to provide customers with a service that answers (or «fits») their mobility needs.

However, the quality approach in UPT has two different, yet additional, dimensions:

- quality at the level of the organisation providing the service;
- quality of the overall UPT system.

So far the development of TQM theory addresses the quality of the organisation (the first dimension), assessed by the satisfaction of the users with regard to the service provided, or more widely the community as a whole – users and non-users. Several TQM models exist that, although not specifically designed for UPT, have been adapted with considerable success. Such is the case of the EFQM model, the Malcolm Baldrige model and the Australian system amongst others¹⁸.

2.3.3. Public transport needs constant improvements to maintain or increase its market share

One of the main challenges facing public transport systems in Europe lies in the further development and improvement of their services as an attractive alternative to car traffic. With car ownership on the rise, constantly changing travel patterns and the dissemination of new residential locations, shopping centres and workplace, this will require a resolute and steady effort on the part of all the parties involved, if only to maintain the sector's current modal split share. To increase their share of the passenger transport market, public transport authorities and operators must constantly be on the offensive.

An important step in the right direction will be to ensure that the conditions necessary for a targeted and continuous product development are put in place. This is not something which is not specific to public transport. Other industries have discovered to their own expense that their market share declines when they fail to improve their product. The car and the cycle have both gone through significant quality improvements in recent years.

¹⁸ See QUATTRO WP1 report for further details.

Product development, however, is particularly challenging for UPT providers because of the need to combine an on-going quest for better services with the constraints imposed by the relative standardisation inherent to public transport operations. While the car is increasingly tailor-made to suit the requirements of various life-styles and activities, public transport increasingly faces similar demands to meet the requirements of different user-groups. Despite the difficulties involved, positive changes are being observed throughout Europe towards well developed public transport services with attractive route and fare structures.

If public transport is to meet the challenges represented by steady increases in car traffic, the development of tailor-made services, adapted to the different user-groups making up the passenger transport market, must be encouraged, with a focus on those routes and periods of the day where public transport can be most competitive. This requires a sound understanding and knowledge of the passenger transport market.

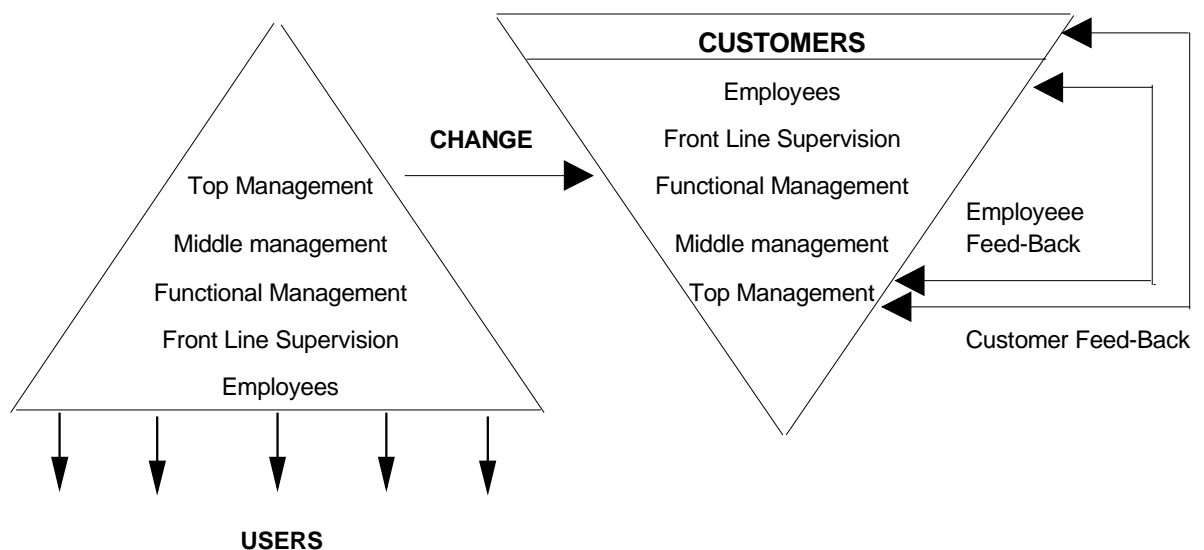
2.3.4. The need to focus on customer expectations

Quality management implies an increased focus on individual customer satisfaction. For that we need to be able to fragment the global market and create homogeneous segments, where customised services should be offered, so that customers requirements can be matched.

The identification of customer needs and the translation of these needs into organisational goals are the starting point of this process. The major challenge is to foster customer satisfaction and consequent loyalty to the service(s) provided.

The perception of this environmental reality calls for a deep change in the organisation's culture, through which the customer becomes a borderline sensor of performance. The figure below illustrates the mechanisms supporting this change.

Figure 7 : Change of the organisational culture



Source: Adapted from EFQM and Senge P. "Fifth Discipline"

While the first dimension addresses the needs of the users and potential users, the second dimension (quality of the overall UPT system) has a more demanding customer - the Community as a whole.

“Segmentation is the process of classifying customers into groups with similar needs, characteristics and behaviours”. Each segment can be characterised under various dimensions: geographic, demographic, psycho-graphic... This marketing practice helps to define the product in such a way as to make it fit with the expectations of each segment. When competition becomes stronger in a sector, marketing tools such as segmentation tend to play a more important role. The evolution of the automotive market is a clear illustration of this point.

2.3.5. Managing and improving external quality in UPT systems

The concept of external quality refers to the impacts that an activity - the production and/or consumption of a good or service - has on its environment. Consider, for instance, the classical case of a chemical factory producing a compound X and discharging its wastes into a nearby waterway. These discharges reduce the quality of the water and its suitability for other uses, such as swimming. If this water is considered a common property, its consumption or use is not sold. The costs associated with a reduction in water quality are therefore overlooked by the pricing system: it is a so called external cost. As a result of these externalised costs, the price of compound X is too low and inefficiencies arise in the allocation of the existing resources. A similar illustration may be given using air pollution resulting from factory fumes or transport.

While deterioration in the quality of natural resources is an important form of pollution damage, it is by no means the only one. Viewed more broadly, a problem of external costs arises whenever the activities of any individual harm someone else without being internalised and accounted for.

It is well known that the transport sector causes considerable external costs. Transport activities do not only affect the quality of our natural environment, which suffers from the emission of pollutants. They also result in noise pollution and threaten the safety of people (car users, pedestrians and cyclists). The time losses imposed by transport users to fellow travellers as a result of congestion may be considered as another external cost of transport activities.

In principle, a higher external quality may be achieved with the intervention of governments, which may act directly raising ecological taxes which internalise external costs (applying the “polluter pays” principle), or indirectly imposing ecological standards on production or consumption activities.

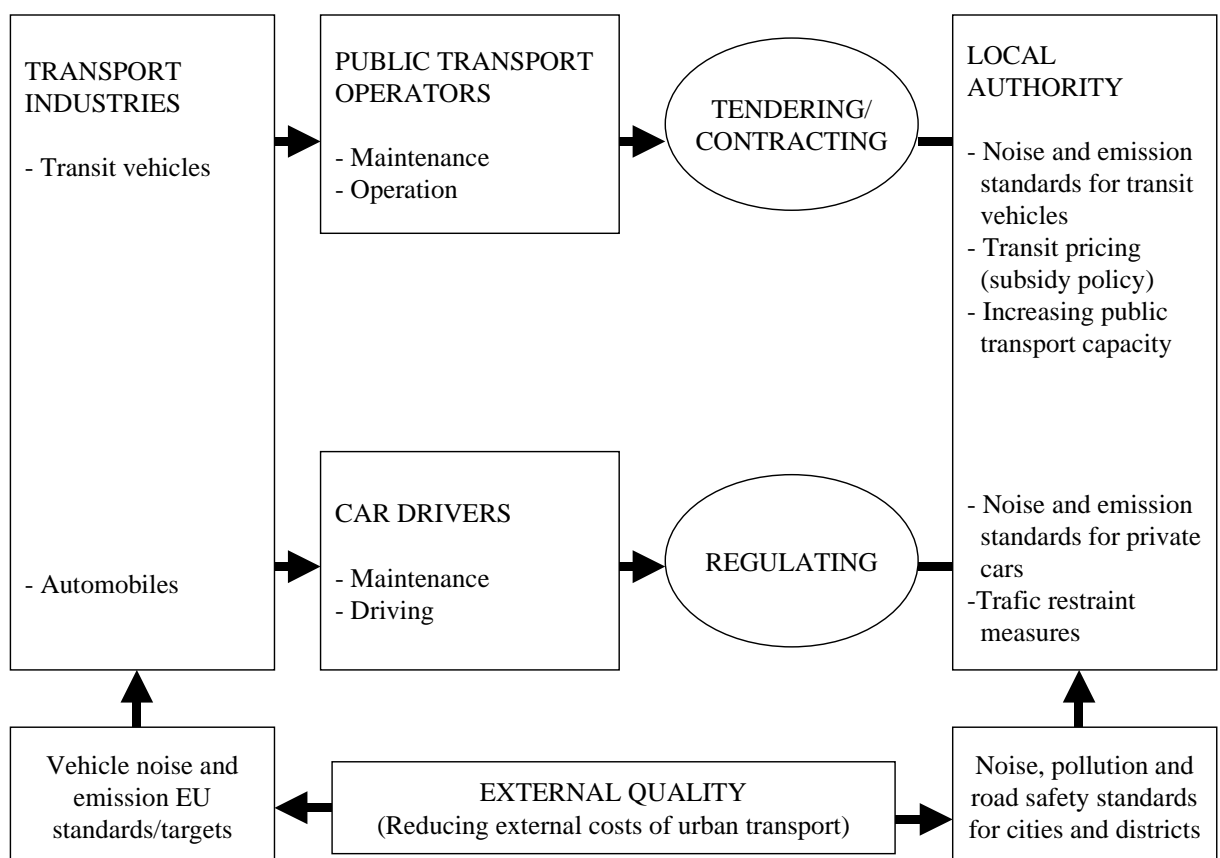
How urgent is the problem of external quality in transport may be easily grasped considering that almost all large towns are congested in the central and inner areas for much of the day and along the main arteries at peak times. Many are becoming increasingly congested in the suburbs at certain times of the day. The cost of road congestion in OECD countries is estimated to be equivalent to about 2 per cent of the GDP.

Notwithstanding the clear need for urgent solutions to the challenges posed by environmental problems in urban areas, public transport operators, at least on the basis of the outcomes of the sample survey conducted in WP1 of the Quattro project, didn't seem to be aware of the urgency and priority of the quest for environmental quality. The cause of this apparently contradictory result can probably be found in the relative position of public transport in the overall Urban Transport System (UPT), which does not favour a correct (global) view of environmental issues, as illustrated in the diagram on the following page.

As shown in the diagram, improving the external quality of UPT systems essentially means reducing the external costs of urban transport. In order to achieve this global objective, public authorities may act along two axes:

- they may impose, at the national and EU level, vehicle noise and emission standards to the producers of transit vehicles and private cars;
- and they may define, at the local level, noise, pollution and road safety standards for particular areas or categories of infrastructure.

Figure 8 : External quality



Source: Quattro

Thus, public transport operators are affected by environmental policies in a second round, because they are users of vehicles produced by others and as such have direct responsibility only for the maintenance and operation of these vehicles. The same holds for car owners.

Public transport authorities may encourage the purchase and use of environmental friendly vehicles and their effective maintenance by using their tendering and contracting procedures to select and maintain relations with the operators who guarantee the best environmental quality of collective transport, especially in the most congested hours and areas of the town. But all this is clearly not sufficient because the main external cost remains congestion, which can be offset by local authorities only by a combination of policies imposing restrictions on individual traffic and increasing the capacity and attractiveness of public transport. A recent study (ECMT-OECD 1995) makes it clear, however, that improvements to public transport systems, while bringing in more passengers, tend to have only a limited effect on the use of private motor cars: most of the new public transport users tend to be former pedestrians, cyclists or car passengers.

The main conclusion is that only the right combination of policies (car traffic constraints, upgrading of, and priority to, conventional bus/tramway systems, integration of all public transport modes, parking policy, etc.) can bring about much higher public transport patronage and a substantial reduction in the congestion and environmental pressures facing cities without hindering their economic development. The same result is not achievable, as a rule, with isolated, fragmented policies.

2.3.6. The critical importance of co-ordination in UPT provision

The UPT system has three clear levels of planning and control, with the following functional roles:¹⁹

- strategic – Defining the political objectives of the system;
- tactical – Translating the strategic objectives into service specification, assuring on one hand compliance with those specifications, and on the other hand creating motivation for continuous improvement of the service;
- operational – Delivering the service within the specification and contributing to innovative development and continuous improvement programmes.

The Isotope research revealed that in most European cities and urban areas the boundaries between those decision levels are in some cases fuzzy, in others overlapping, and in some other cases a good illustration of «no man's land». The result is a policy vacuum, of which the specific cause is often difficult to identify, but which clearly jeopardises the quality level the system can provide.

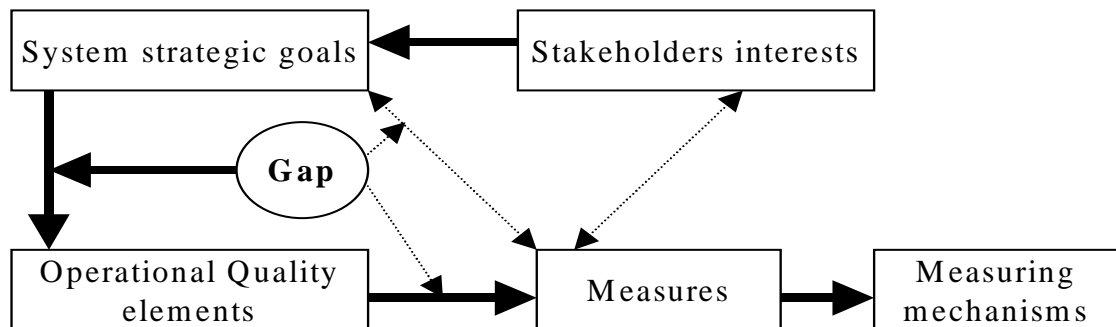
The essential characteristic of a system is the interaction of its parts. Most TQM methodologies put the emphasis on the consumers' perception of the quality delivered at the end of the production chain. However, besides output of the system there are other, equally important, levels of planning and control in which different bodies interact – the parts of the total system. For UPT system to achieve an output competitive with private car, quality approach has to focus in the interaction of the different agents (parts) of this system (Authorities, Operators, Citizens, Suppliers of equipment, etc) acting within and across the different levels of planning and control.

If significant concern and investment is made in quality at the operational level, this will be ineffective if there is no common interest achieved with the stakeholders and the other functional levels of the system.

¹⁹ See Isotope research project, EC-DGVII

The figure below highlights the gap that is spread from the definition of the strategic goals of the system down to the measurement of quality of the services provided.

Figure 9 : Gap definition



Source: Quattro

Depending on the strategic aims defined for the system, and the different stakeholders' interests²⁰, a different mix of quality aspects will emerge. These aspects should be incorporated into measurable criteria to be used in the selection and contracting of the operators, so as to assure a coherent relationship between the strategic aims and the performance of the system.

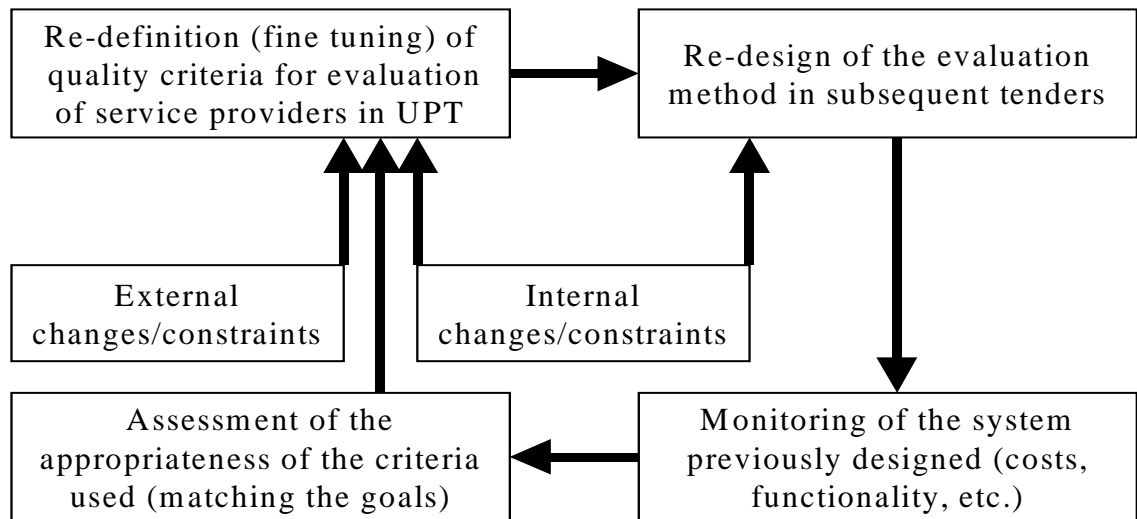
The methodology for the selection and qualification of urban transport operators should be a tool to help fill the gap between the different decision levels. In this way the overall system can improve through a coherent interaction between its main parts. This relationship has to be assured through a continuous fine-tuning of the criteria used that should always be in line with the quality aspects drawn from the strategic aims of the system.

The UPT environment is complex and the system has to be flexible enough to adapt to exogenous changes. On the other hand, there are internal changes in the system (e.g. regulatory changes) that have also to be considered in the fine tuning of the procedure for selection and monitoring of the system.

The figure below illustrates the continuous improvement loop for the fine-tuning of quality criteria to be used in tendering and contracting procedures in UPT systems.

²⁰ See chapter 7.3 of work package 3 report, now as an annex of the present report, for identification of quality aspects reflecting stakeholders interests.

Figure 10 : Continuous improvement loop for the qualification and selection of operators in UPT systems



Source: Quattro

This implies that thinking of quality in terms of a continuously renewed start-to-finish process to integrate and interrelate functions at all levels of the system, and to constantly reassess existing practices. Following this logic, it is necessary to involve the different bodies in a partnership that enables to reach an optimum balance and also maintains a constant feedback between those bodies.

The next step in the development of quality approach in UPT, in order to achieve that solid partnership and balance in the system, is the development of a Total Quality Management Model for the UPT system, while keeping the efforts in the adaptation of the existing TQM models to UPT organisations.

3. Quality measurement

3.1. The role of customers in service quality evaluation

How relevant the introduction of quality specifications in contracts is depends on the use of consistent and reliable methods for estimating the value of the different quality aspects to passengers. When the objective is to get best value for money, the passengers' preferences for different tender characteristics and service features have to be analysed. Moreover, they notably need to be compared to the objectives pursued by the operator in terms of service standards.

In order to define service quality levels in UPT, we propose to use a simplified quality loop based on the ISO 9004.2 norm loop for quality of service. The proposed loop is based on four distinctive benchmarks:

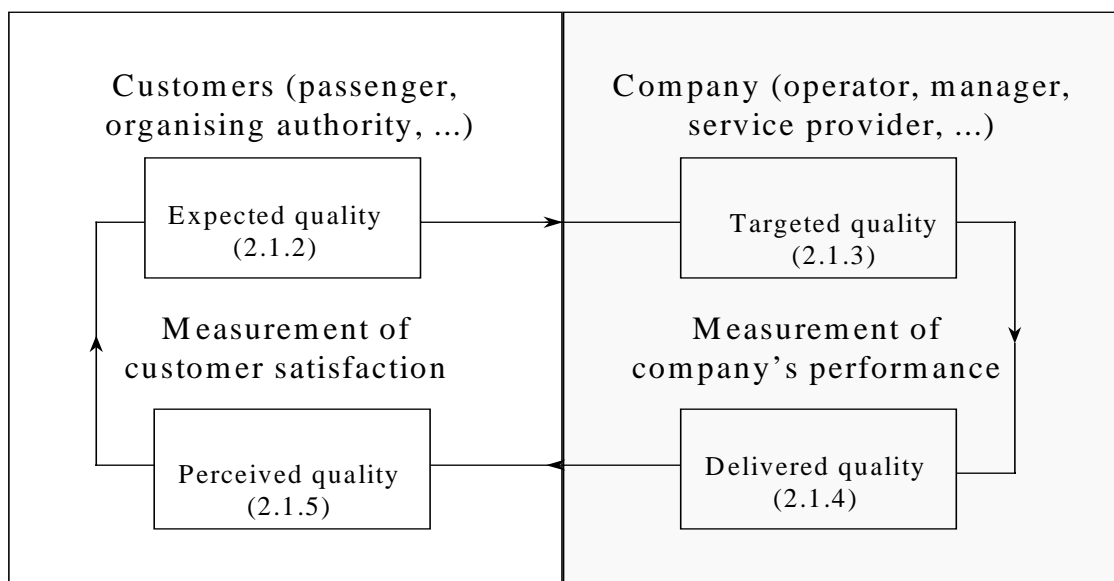
- Expected Quality
This is the level of quality anticipated by the customer and it can be defined in terms of explicit and implicit expectations. The level of quality expected by the passenger can be defined as the sum of a number of weighted quality criteria. Qualitative and quantitative surveys can be used to identify these criteria and to assess their relative importance. Implicit expectations can also be determined from such studies.
- Targeted quality
This is the level of quality that the operator aims to provide to passengers. It is dependent on the level of quality expected by the passengers, external and internal pressures, budgetary constraints and competitors' performance. The targeted service can be defined in terms of the results to be attained by the system rather than in terms of process characteristics. It is made up of an identified service, a level of achievement for that service and a threshold of unacceptable performance.
- Delivered Quality
This is the level of quality that is achieved on a day-to-day basis in normal operating conditions. Service disruptions, whether or not they are the fault of the operator, are taken into consideration. The relevant measurements are established using statistical and observation matrices.
- Perceived Quality
This is the level of quality perceived by passengers in the course of their journeys. However, the way passengers perceive the service depends on their previous personal experiences with the service or with its associated services, on all the information they receive about the service - not only that provided by the company but also information coming from other sources - their personal environment, etc.; Perceived quality is therefore subject to bias.

The quality loop results from a series of interactions between two worlds with clearly distinctive viewpoints, the world of customers and that of the supplier(s). The four above benchmarks can be used to define four critical gaps in service design:

1. The gap between perceived quality and expected quality
2. The gap between expected quality and targeted quality
3. The gap between targeted quality and delivered quality
4. The gap between delivered quality and perceived quality

Analysing these possible gaps can help decision-makers in the UPT sector to improve the performance of their service.

Figure 11 : The quality loop



Source: Afnor

Passengers' expectations with respect to the quality of a service and the extent to which they are satisfied with the service they receive are dependent upon the price they pay. The passengers' willingness to pay for a specific service will thus notably be a measure of whether or not the service meets their expectations. If the price is lower, they will be even more satisfied and vice versa. This evaluation will naturally depend upon the passenger group under consideration.

In the UPT sector, there seems to be no such person as an "average user". Individual users, with specific expectations, characteristics and needs compose the UPT market. However, the UPT product is, by definition, a mass-service, not an individualised service. Nevertheless, it is possible to differentiate the service along a few dimensions or aspects, in order to make it more attractive to specific segments of the market. This can be achieved using the following aspects of the service, for examples: network design, customer information, promotion, sales and ticketing systems, interconnection between modes and the design and provision of peripheral service features.

3.2. Expected quality

The possibility of introducing quality aspects in contracts depends on consistent and reliable methods for estimating the passengers' evaluation of those quality aspects. When the objective is to get best value for money, it is necessary to analyse passenger preferences for different tender specifications, that is to assess their actual or likely reactions on the one hand, to various price/quality combinations, and on the other hand, to conceivable trade-offs between different quality aspects.

Passenger preferences can be analysed by studying their choices or ranking of a variety of alternatives. These choices and ranking can be derived using essentially two types of methods:

- Revealed Preference (RP) methods are based on the subjects' actual choices.
- Stated Preference (SP) methods rely on their declarations.

The most important reason for choosing RP methods rather than SP methods is that the former are based on actual choices/behaviour and are therefore less subject to psychological biases or opportunistic answers. On the other hand, RP methods are more difficult to use in studies of preferences and in calculations of the passengers' willingness to pay for non-market benefits for the following reasons:

- RP data often present high degrees of difference between variables (travel time/costs, noise/air pollution, etc.);
- road users are not always aware of all the available alternatives or misjudge them; Brög (1991) showed that car drivers believe public transport to be more expensive and slower than it really is and car journeys to be quicker and cheaper than they really are;
- the researchers themselves are often not acquainted with the more detailed factors affecting service standards (regularity, stop/shelter standards, etc.);
- "objective data", for instance from network models, used in the systematisation of RP data are often too coarse when applied at a local level.

The results from SP-studies should be used with care, first because the design of these studies may affect their results. This is not only true of SP-surveys. Even RP-studies are heavily affected by their design in terms of sampling methods, basic definition of travel options and questions formulation.

3.2.1. Stated preference methods

A. Common features of SP surveys

Despite the wide differences between the simplest forms of direct question about willingness to pay and the most advanced forms of games and choice situations, one can define certain features which SP surveys have in common. They are conducted as inquiries (by face-to-face or telephone interviews or postcards), and usually comprise three clearly defined parts (Portney 1994):

- a description of the benefit to be valued;
- questions/choice situations intended to determine the value set by the respondent to one or more benefits;
- questions intended to reveal characteristics of the respondent which may affect the valuation.

Description of the benefit

Initially a scenario is presented or a description given of the benefit to be valued, e.g. low floor buses, bus shelters, real-time information, frequency, shorter travelling time etc. The benefit should be clearly defined and outlined, but such surveys have also been carried out on packages of several benefits/improvements and one or more measures which may imply both advantages and disadvantages to the respondent. If SP methods are being used to value benefits about which the respondent knows little in advance, the description of each benefit should be detailed. The description is intended to give the respondent a clear picture of the benefit that he/she will then be asked to value.

The validity of SP surveys is entirely dependent on a good and “correct” description of the benefit. A benefit can be described in many ways, and the description may affect the respondent’s valuation. If it is the case that respondents’ preferences are to a large degree created, and not just measured, by the interviews (cf. Gregory et al. 1993), descriptions of benefits can have a decisive significance in SP surveys. This emphasises the responsibility of the researcher in SP surveys and underlines what may be described as a general “objectivity problem”.

Questions/choices through which benefits are given a value

After describing the benefit, one must present direct questions or choice situations which make it possible for the respondent to indicate their valuation of hypothetical changes in the quantity or quality of a non-market benefit. Such questions can be formulated in many ways, but they have been grouped under three headings: contingent valuation, conjoint analysis, and the transfer price.

For the development of a description of the benefit, an important distinction is whether the respondent is asked about his or her willingness to pay (WTP) for an improvement, or the compensation they need to be offered before accepting a deterioration («willingness to accept» - WTA)²¹.

The decision to formulate questions as WTP or WTA must be taken on the basis of what may be called the “normal situation” and an assessment of the current formal position in the area (see for instance Magnussen 1992 and Sælensminde and Hammer 1994).

Information concerning the respondent

Questions are asked to elicit information about such social and economic variables as the respondent’s age, gender, income and education as well as variables that describe the respondents household. Questions are also usually included which may have a bearing on the benefit to be valued, for instance about the respondent’s attitude towards public transport and the extent to which he or she actually makes use of the benefit proposed. Follow-up questions have also become customary so as to check whether the respondent has understood the information given about the benefit and whether he or she has taken the hypothetical choice situation seriously.

²¹ For reasons both of economy and of psychology (such as lack of information and uncertainty), WTP and WTA usually differ. The choice between WTP and WTA also entails a choice of scale for measuring welfare, i.e. what scale to apply to individuals’ consumer surplus. In connection with service improvements, WTP entails the use of compensating variation (CV), whereas WTA entails the use of equivalent variation (EV). This is thoroughly discussed for instance in Zerbe and Dively (1994).

B. The different types of SP surveys

When dealing with evaluation methods based on hypothetical choices (SP methods), three types of methods need to be distinguished:

- contingent valuation²² method;
- conjoint analysis²³;
- Transfer price method.

The division into three types reflects that the methods were developed within different disciplines and have had different areas of application.

The contingent valuation method - CVM

Questions of a more direct nature about willingness to pay are often grouped under the joint heading of *contingent valuation method (CVM)*. The category embraces both direct and slightly more indirect formulations. Examples are given in Figure 1.

One important advantage of the contingent valuation method is that the questions and choices are straightforward and associated with specific amounts of money. This makes the material easy to analyse. Simple questions also create good opportunities to check how well the valuation has functioned, for instance by asking respondents with «zero answers» follow-up questions.

Figure 12 : Examples of questions in contingent valuation

Question type	First question	Follow up	Purpose
Direct question Open ended question	“ What is the most you would pay for.....?”		Maximum amount given directly
Bidding games	“ Would you pay 10 ECU for...?”	If “yes”, increase amount till respondent says “no”. If “no”, ask about lower amounts.	Bidding results in more exact amounts
Indirect question Question put as in a referendum	“The Government is considering measure X. It entails a tax increase of Y ECU. Will you vote for or against X?”	If “for”, follow up with: “The cost is uncertain. Will you vote for or against X if taxes rise by X+Y ECU? If “against”, the amount can be changed to Y-Z ECU.”	Shows how many who have willingness to pay greater than or equal to Y ECU. A willingness to pay function can be found by varying Y.

Source: Saelensminde K. 1995, *Stated Preference Methods, TOI-report 294/1995*

²² In principle, all these methods could be termed *contingent valuation* because in all of them the point of departure is that the respondent indicates his willingness to pay on the given conditions.

²³ In transport analyses, conjoint analyses have often been spoken of as "stated preference (SP)". This is not a precise term, however, because SP is usually used to denote all kinds of hypothetical questions and choice situations, i.e. as the counterpart to "revealed preference (RP)". "Conjoint analysis", the term used in market analysis, is therefore more precise.

Conjoint analysis - CA

Methods of valuation in which people are asked to value changes in several factors at the same time and in which the benefits/factors are valued indirectly through the respondent's choices are generally referred to as *stated preference methods* and *conjoint analysis*. The most important types of conjoint analysis (Hencher 1994) are:

- «choice» (of the best among two or more alternative packages);
- «ranking» (ranking of the available alternatives);
- «rating» (of the available alternatives on a scale).

To illustrate the kind of choice situation respondents may be confronted with, Figure 3.2 shows an example taken from Stangeby and Norheim (1993), who used choices between pairs of alternatives («discrete choice») to estimate the passenger valuation of service improvements for the public transport company in Oslo. Respondents were to choose between Metro A and Bus B²⁴. After making a choice, the respondent was confronted with a new situation comprising the same factors but at new levels. On the basis of the levels presented, and since costs also form part of the choice situations, it is possible to calculate the valuation of the factors both relative to each other and in absolute cash amounts.

Figure 13 : Example of question in a conjoint analysis. Respondents are asked to choose between Metro A and Bus B

Metro A	Bus B
Information: Only timetable	Information: Timetable + Map
5 min walking	10 min walking
Price 1,5 ECU	Price 1,5 ECU
Interchange and 10 min waiting time	Direct trip

Source: Norheim B. and Stangeby I. 1993, *Better public transport - How passengers in Oslo value service improvements, TOI-report 167/1993*

Conjoint analysis has mainly been used in market analyses and analyses of transport users' valuation of improvements in transport facilities. But environmental benefits, too, have in recent years been valued using conjoint analysis. Widlert (1993) and Ortúzar and Garrido (1994) are examples of studies that used ranking and rating, respectively.

The principal advantage of conjoint analysis lies in the valuation of several benefits at the same time. Another advantage of conjoint analysis, in which respondents make several choices, is that it is possible to control how the choice situation functioned for each respondent. One can make out haphazard answers and check whether a respondent included all the factors in the valuation or perhaps concentrated on only one or two. This is important as it can happen that a respondent is not taking a choice situation seriously, is unable to handle it or is not taking enough time to think the matter through. Examples of recommended tests can be found in Norheim (1995). For surveys of conjoint analysis as a method, we refer to Norheim and Hanssen (1990) and Pearmain et al. (1991).

²⁴ The alternatives were customised to an actual trip, and this example refers to a metro-passenger. A rail or tram-passenger would have got train-bus or tram-bus alternatives.

The transfer price method - TP

The *transfer price method* lies somewhere between contingent valuation and conjoint analysis. Methodologically it most closely resembles the simplest forms of contingent valuation both because of its relatively simple form and because respondents are asked for direct valuations.

The next figure gives an example of how transfer price questions can be formulated. It is taken from a national SP-survey conducted in 5 Norwegian cities (Kjørstad 1995). The examples are based on an actual bus journey of 20 minutes costing 1,5 ECU; the respondent is asked to value reduced travel time. All the questions were customised to an actual journey.

The MVA Consultancy (1994) discusses conjoint analysis and the transfer price method and defines the distinction between them as follows: «Ultimately, it is possible to modify the two approaches until they blur into each other. However, we have chosen to retain our terminology, whereby TP explicitly refers to the respondent's current situation, whereas SP offers a series of alternatives in which the variables of interest are systematically changed»²⁵.

Figure 14 : Examples of questions using the transfer price method

<p>VALUATION OF REDUCED TRAVELLING TIME The bus journey you described took 20 min and cost 1,5 ECU Now imagine that the journey could be made in 15 minutes. What is the maximum amount you would pay for the journey with the shorter travelling time? In other words, at what price are the two journeys equal in value? Journey 1: 20 minutes and 1,5 ECU Journey 2: 15 minutes and ECU?</p>
<p>VALUATION OF HAVING A SEAT The bus journey you described took 6 hours and cost 25 ECU. Now imagine that the journey took 7 hours and 30 minutes. What is the maximum amount you would have paid for the journey with the longer travelling time? In other words, at what price are the two journeys equal in value? Journey 1: 6 hours and 25 ECU Journey 2: 7 hours and 30 minutes and ECU?</p>

Source: Saelensminde K. 1995, Stated Preference Methods, TOI-report 294/1995

The advantage of the transfer price method over conjoint analysis is that the former is much simpler. However it does not offer equally good opportunities for checking how the choice situation functioned for the individual respondent.

The transfer price method has been used to value important aspects of a service or article the respondent buys in a real market (e.g. transport), so that the questions refer explicitly to the respondent's current decision-making process and choices. Such an application of the method considerably restricts the benefits that can be valued and relates the valuation more closely to «use value». Thus, one forfeits an advantage of the SP method, which is the possibility of establishing any of the «option and existence values» that form a significant part of the value of many environmental benefits.

²⁵ In the quotation, SP denotes conjoint analysis and TP the transfer price method.

3.2.2. Recommended guidelines for SP-studies

The results from SP-studies must be used with care, first of all because the design may affect the results and the value of quality included in the contract. This is not an exclusive conclusion for SP-surveys. Even RP-studies are strongly affected by the design of the study, both according to sampling methods, basic definition of travel, formulation of questions. The results from SP-surveys are more dependent on the design stage because the development of SP-designs is at an early trial and error stage.

Secondly, there is no absolute “right” design for SP-studies of public transport quality. They depend on the context as well as on the quality aspects to be measured. In other words, there is no perfect recipe but rather a set of guidelines for the development of a “best possible design” adjusted to local conditions.

It is recommended that the following guidelines based on the recent methodological experience of SP-studies be adopted:

1. Pilot surveys/testing of the design
2. Balanced design
3. Targeted sample
4. Stated choice/Conjoint analysis
5. Customised design
6. Control questions
7. Block design – hierarchical survey structure

Targeted sample

The main objective of a SP-survey is to evaluate passenger preferences for different quality improvements. The only possible alternative is therefore to concentrate on regular passengers. It is recommended to focus SP-surveys on a targeted sample comprising experienced public transport users who are able to distinguish between the different service levels presented and for whom the alternative service levels presented are perfectly clear. The implication of this recommendation is that targeted services for special market segments must be evaluated among those passengers who have some experience with the service to be evaluated.

In the same vein, the experience from different SP-surveys indicates that it is important to resort to realistic and concrete hypothetical alternatives which is easier to do with passengers who have some experience with the service they are asked to evaluate.

The last reason for targeted samples is that different passenger segments have varying preferences for service improvements. Evaluation of narrowly targeted quality improvements based on the “average” passenger will then create biased or irrelevant results. For example, “high quality” commuter services should be tested amongst the passengers most likely to be interested in such services. There are also targeted service improvements within normal routes, for example low floor vehicles, travel information etc. which are of special interest for some passengers and of no interest for others.

The importance attached by different passenger groups to service improvements can vary significantly. For example, elderly people tend to value short walking distances more than younger people who are likely to accept longer walking distances as long as they arrive quickly at destination. Thus a targeted service cannot be based on a mean figure but must be related to the wishes and needs of various user categories.

Figure 15 : Example of “soft” and “hard” quality elements

SOFT quality elements	Hard quality elements
<ul style="list-style-type: none"> ➤ Service level ➤ Information ➤ Vehicle standard ➤ Accessibility 	<ul style="list-style-type: none"> ➤ Travel time ➤ Walking time ➤ Frequency ➤ Interchange ➤ Regularity ➤ Seating

Source: Quattro

Indications of heterogeneous preferences

Experience from different countries shows that there can be considerable variation in importance attached to time, dependent upon the purpose of the journey and the passenger type (Bates et al. 1987, Bradley and Gunn 1990, Algiers and Widlert 1987). The most comprehensive surveys have been taken in The Netherlands and in the UK. The main findings of these surveys are given below:

Short travel time is more important for commuter than for leisure journeys

The value attached to shorter travel time for commuter journeys is 20 to 75 per cent higher than for leisure journeys. This is partly due to the fact that different types of passengers with different motivations undertake these two types of journeys.

Value of time increases with income

The Dutch survey shows a clear correlation between household income and valuation of time . Time used in work journeys has a higher value than time used on other journeys, but for all three types of journeys, the value of time increases in accordance with income. Equivalent results are obtained among public transport passengers in Oslo (Norheim and Stangeby 1993). There is a clear tendency for those with a high income to evaluate frequent departures higher than persons with a low income. This applies to all types of public transport.

Rapid transport is most important for younger passengers

Both in the UK and The Netherlands it has been observed that the value of time decreases with the age of the person surveyed. The English report concludes that pensioners value time approximately 25 per cent less than the rest of the population. The Dutch survey obtained a difference of about 17 per cent. On the other hand, the Dutch survey found that persons under 21 years on work journeys placed a high value on time, while those on leisure-time journeys were some 12 per cent lower than the basic group (21-35 years) (Bradley and Gunn 1990). This is due to the fact that most persons in this group are students/school pupils with a restricted income, but less time constraints. The UK survey also found that students have a lower value of time, on average, than the rest of the population.

Family circumstances influence passengers' value of time

A person's family situation also influences the value given to travel time and cost. The Dutch survey showed considerable variations among household categories as to their respective values of time for work journeys. Families with children and households whose members are all actively working have a 15-20 per cent higher value of time than the rest of the population. It is also interesting to observe that some part-time workers who frequently work part-time to combine work and home obligations, have as much as 39 per cent higher value of time than the rest of the population regarding work journeys. Some others have an 18 per cent lower value of travel to work. This depends heavily on the type of job these part-time workers have.

Short walking time is of little importance for younger passengers

Generally, walking time and waiting time are viewed more negatively than the time used on public transport. The Dutch survey shows that the picture is far more complicated. Passengers under 50 years value walking time 60 per cent lower than time spent in a bus or tram but whereas older passengers value walking time 150 per cent higher than travel time. In Oslo, the eldest passengers of 80 years and above value shorter walking times twice as much as the average passenger whereas younger pensioners do not differ markedly from the average.

Although marketing can be considered as a recent practice in UPT (major development in the '80s), market segmentation is now fairly common. Before concluding on segmentation and its link with tendering, contracting and performance monitoring in UPT, let us briefly examine a few frequently used dimensions for market segmentation in UPT. These examples are given in order to show how segmentation can be implemented. In fact, there is no limit in segmentation design.

Other relevant determinants of preferences:

Frequency of use (Non-user, new user, regular user, frequent user, indirect user, etc.), general attitude with respect to related matters (environmental friendly, pragmatic, etc.), trip purpose, ticket type, etc.

There are different possible recruitment procedures for the collection of targeted samples, depending on the sample size. Normally recruitment should be based on telephone interviews among a representative sample. The selection of the desired sample can be quite an expensive procedure, especially for small market segments. An alternative is direct selection among the passengers and "hall tests" where the interviews take place in central locations. This is a more efficient and cheap selection procedure but it is complicated to secure a representative sample.

Stated choice/conjoint analysis

There is no guarantee that answers to hypothetical situations are consistent with those which could be derived from real choice situations. In both cases, much depends on the context and it is important to distinguish the choices that concern only one mode from those that try to compare different modal options. Modal choices, for example between car and public transport, will depend of several "external" situations so that it is all the more important in these cases to combine RP-studies and SP-studies for those purposes.

The evaluation of internal quality variations is not affected by external biases but it is still important to resort to RP-tests to verify the realism of the results obtained using SP-surveys. The use of stated choice/conjoint analysis is recommended with absolute choice and orthogonal/fractional design. This makes the design more realistic and makes it possible to test the consistency of the answers with RP-methods.

Customised design

The reliability of the answers obtained in hypothetical choice situations depends on how realistic and understandable these choice situations are. The challenge of the design of a SP-survey is to put the respondent in a realistic and not over complicated choice situation. It is recommended that the surveys use portable computers to make it possible to customise the design according to a specific journey for each interviewee. A customised design will make the questionnaire more realistic and comparable to the kind of trips the respondent normally does; it may recreate all the quality aspects of any specific journey and simulate variations of differing amplitudes in travel times or prices, for example. This produces choice situations which are as close as possible to RP-situations while at the same time allowing wide variations in the quality aspects to be evaluated.

A customised design is only possible if portable computers can be used during the interviews. However, this ideally requires personal home interviews, which can be expensive. When interviewees possess their own computer, it is possible to send the questionnaire on a diskette to reduce the costs but this is not always the case. So, this method is only possible for very special samples with good access to PC's and cannot be recommended in all cases.

Control questions/testing of the design

The basic criterion of a good design is the possibility to test the reliability of the answers given by the respondents. It is not enough to verify their statistical significance. The answers obtained for each hypothetical question must be tested and critically evaluated based on:

1. Consistency tests
2. Lexicographic answers
3. Irrational answers
4. Interview duration

Consistency tests

It is recommended that the design of SP-surveys include control questions to make it possible to test the consistency and reliability of the results. This is possible if the design combines direct preference questions, willingness to pay and/or conjoint analysis in the same questionnaire. An example of consistency tests based on passenger preferences with respect to seat availability could be:

- Rating/ranking of the importance
- Willingness to pay for a reserved seat
- Relative importance based on conjoint analysis

The consistency test is based on the use of a direct preference question in the conjoint choice analysis. This is possible in various ways, as a classification of dummy variables or weighting of the quality parameters based on stated importance.

Lexicographic answers

Using conjoint analysis for data collection is more complicated than using direct questions. Several factors have to be valued at the same time, and the choice becomes difficult for the respondent. One result may be so-called *lexicographic answers*, given because respondents simplify their decisions by only concentrating on one or two of the factors that form part of the choice situation. Widlert (1994) has shown how various designs can affect the proportion of lexicographic answers.

It is also important to “*balance*” the levels of the factors included in the choice, to make the weighing of the factors against each other realistic for the respondent. If the factors are not balanced, one may become “dominant” and another one “neglected”. Dominant or negligible factors can make it difficult to obtain a correct valuation of all the factors in the process.

It may prove difficult to distinguish dominant/negligible factors (resulting from an unsatisfactory balancing of factors) from lexicographic answers (resulting from over-simplified decision-making procedures). Future methodological studies should investigate how lexicographic answers and the balancing of factors included in the choice situation affect valuation and should look for ways to compensate accordingly.

Irrational answers

Irrational answers are typically answers presenting stated preferences that are in conflict. For example, many choice situations are transitive, that is, if A is preferred to B and B is preferred to C, then C cannot be preferred to A. In some surveys, “absolute best” or “absolute worst” alternatives are included to test the level of irrational answers. Other more advanced tests use boundary values derived from the first choice to sort out “irrational” choices in the following answers. Another indicator for possible irrational answers is to test the coincidence for the preference model based on the number of choices with extreme low probability (outliers), for example under 5 per cent.

It is important to underline that the different indicators for irrational answers will depend on the preference structure. The use of indicators for irrational answers must first of all be used in relation to other indicators, for example, interview duration.

Interview duration

The complexity of the questionnaire will possibly affect the interview duration. Both extremely short and long duration times for an interview may be an indication that respondents had problems answering the questions. It is recommended to test the sample against interview duration:

- if the value of quality for the sample with extremely short or long interview times are significantly different from the average;
- if the indicators for irrational answers for the sample with extreme short or long interview times are significantly higher than the average;
- if the indicators for irrational answers are significantly higher for the last part of the interviews.

Every SP-design should also be tested in a pilot survey to check the consistency of the answers obtained and should be revised if the tests carried out indicate some bias or problems in the way respondents answered the questionnaire.

Block design - hierarchical survey structure

The results of SP studies can be affected by so-called focussing or packaging effects, that is, by a disproportionate focus on the only non-market benefits available in a hypothetical market, for example. Traffic noise, for instance, is one of the environmental problems caused by road traffic. It can therefore be assumed that many will perceive the noise problem as representative of the “package of all environmental problems caused by road traffic”. Similarly, travelling time by public transport forms part of the “package of all standard factors” with a bearing on a total assessment of the public transport journey.

The question of how focussing effects in SP-surveys can affect the valuation of standard factors relating to public transport will depend on whether the factors in question are major or minor. The relative influence of the packaging effect is most important for minor (“soft”) standard factors because they are dependent on how benefits are valued in relation to each other. The solution of the focussing problem is therefore to value those benefits which one is seeking to improve in a total package.

In order to avoid packaging effects and a possible over-estimation of any single quality aspect, it is recommended to build SP-surveys on a clear and consistent hierarchy of quality aspects. The hierarchically designed survey will comprise different quality blocks and will be based on a combination of external and internal quality aspects. One way to classify accordingly the main quality elements in public transport is to constitute 8 groups of quality determinants under the following headings:

1. Availability is about the basic coverage of the service, in geography, time and transport mode.
2. Accessibility describes the interface with other transport modes and the physical access to transport services.
3. Information covers the availability of information pertinent to the planning and execution of a journey or a pattern of journeys.
4. Time is for the time used for planning and executing a journey or a pattern of journeys.
5. Customer care contains the elements needed to make the journey(s) easier and more pleasant, typically through human presence.
6. Comfort describes the physical comfort obtained through the design of or use of installations and vehicles/vessels, or resulting from ambient conditions.
7. Security is about the actual degree of safety from crime or accidents and the feeling of security resulting from that and from other psychological factors.
8. Environmental impact describes the different effects on the environment resulting from public transport.

The overall quality of public transport is composed of a large number of elements. Which factors should be included in a quality index will depend upon local conditions and priorities. Members of a CEN working group (TC 320 WG 5) developed, in association with Quattro partners, a hierarchical list of service quality determinants for the UPT sector. The list aims to define areas where customers or potential customers may have certain expectations or demands, and where they can express a degree of satisfaction from the use of the service.

The list of quality elements is based on the notion that three basic elements determine the position of a service on the market: its quality, its price, and its marketing.

It is important to note that, although price itself is of course not included in the proposed list of quality elements, a number of price-related characteristics of the distribution process, i.e. the availability of various types of tickets and passes corresponding to the special needs of the customers, are considered a quality parameter.

Marketing is not included. It is true that one way of marketing public transport is to spread factual information about fares, time tables and other factors pertinent to the planning of a journey so that it is often difficult in practice to distinguish marketing initiatives from the dissemination of information. In this context, however, a distinction must be made between the dissemination of information pertinent to the planning or execution of a journey or a pattern of journeys - which are included in quality elements - and general promotion of transport services - which is excluded.

The list is intended to be useful in two ways:

1. Providing a way to define public transport by its qualities. The list cannot claim to be complete and final. The aim is, however, to provide a list as comprehensive as possible but also to count on its users to amend it according to their own needs, in accord with future developments within the sector.
2. Providing raw material for the operation of tools useful in specific situations, for instance, a matrix showing quality elements against:
 - i) "quality carriers" (terminals, intermediate stops, vehicles, staff etc.): The matrix can be used for the allocation of responsibilities in a contracting/tendering situation;
 - ii) journey stages: It can be used to analyse if appropriate levels of service quality are delivered throughout the complete journey;
 - iii) customer segments: It can be used to analyse the conditions offered to specific market segments, for example mobility impaired.

The following figure provides a functional and technical break up of quality in a variety of components. The list of quality aspects it represents is still under development in the CEN working group CEN TC 320 WG 5. The proposed pyramid of quality determinants commences with general functional quality expectations and progressively evolves towards more technical determinants. This structure illustrates the translation of functional quality into practical solutions. In such a structure the same technical solution can be applied to improve different superior quality objectives.

Figure 16 : Hierarchy of quality determinants in public transport

QUALITY	1. Availability	1.1 Network	1.1.1 distance to C/D points 1.1.2 need for transfers 1.1.3 area covered
		1.2 Timetable	1.2.1 operating hours 1.2.2 frequency
	2. Accessibility	2.1 External interface	2.1.1 pedestrians 2.1.2 cyclists 2.1.3 taxi users 2.1.4 private car users
		2.2 Internal interface	2.2.1 entrances/exits to C/D-points 2.2.2 internal movement at C/D-points 2.2.3 access to vehicles 2.2.4 internal movement in vehicles
		2.3 Ticketing	2.3.1 home ticketing 2.3.2 ticketing within system 2.3.3 ticketing at other locations
	3. Information	3.1 General information	3.1.1 availability 3.1.2 accessibility 3.1.3 time 3.1.4 customer care 3.1.5 comfort 3.1.6 security 3.1.7 environment
		3.2 Travel information in normal conditions	3.2.1 street directions 3.2.2 C/D-point identity 3.2.3 vehicle direction 3.2.4 route 3.2.5 time 3.2.6 fare 3.2.7 type of ticket
		3.3 Travel information in abnormal conditions	3.3.1 current network status 3.3.2 suggested alternative 3.3.3 refund/redress 3.3.4 suggestions and complaints 3.3.5 lost property
	4. Time	4.1 Length of travel time 4.2 Punctuality 4.3 Reliability	
	5. Customer care	5.1 Commitment	
		5.2 Customer interface	5.2.1 enquiries 5.2.2 complaints 5.2.3 redress 5.2.4 suggestions
		5.3 Staff	5.3.1 availability 5.3.2 attitude 5.3.3 skills/ 5.3.4 appearance

QUALITY	5. Customer care	5.4 Physical assistance	5.4.1 at service disruptions 5.4.2 towards mobility impaired 5.4.3 towards inexperienced customers 5.4.4 movement of luggage etc 5.4.5 persons with prams 5.4.6 inexperienced customers
		5.5 Ticketing options	5.5.1 exchangeability 5.5.2 flexibility 5.5.3 concessionary tariff 5.5.4 through ticketing 5.5.5 payment options
	6. Comfort	6.1 Ambient conditions	6.1.1 air quality and temperature 6.1.2 weather protection 6.1.3 cleanliness 6.1.4 brightness 6.1.5 congestion 6.1.6 noise 6.1.7 other intrusive activity
			6.2 Facilities
		6.3 Ergonomics	6.3.1 ease of movement 6.3.2 furniture design
		6.4 Ride comfort	6.4.1 starting/stopping 6.4.2 during travel
	7. Security	7.1 Safety from crime	7.1.1 staff/police presence 7.1.2 lighting 7.1.3 visible monitoring 7.1.4 layout 7.1.5 identified help points
			7.2 Safety from accident
		7.3 Perception of security	7.3.1 conspicuousness of safety measures 7.3.2 "mastery of network" 7.3.3 press relations
	QUALITY	8. Environment	8.1 Pollution
QUALITY	8.2 Natural resources		
QUALITY	8.3 Infrastructure		8.3.1 effect of vibration 8.3.2 wear on road etc 8.3.3 capacity demand 8.3.4 disruption

Source: Common work Quattro / CEN TC 320 WG5 - Updated January 1998.

The pyramid is a theoretical model for the development of quality indicators and the successive layers of technical solutions should be viewed as examples rather than “definitions” of quality. It is also important to emphasise that the development of quality within the public transport sector is a continuous process. New technical solutions will contribute to the periodic updating of this list. It is therefore essential to develop a dynamic rather than a static definition of quality within the public transport sector.

3.3. Targeted quality and customer charters

All UPT companies will have some kind of internal quality targets. The new and growing development during recent years is that those targets are calculated and externalised through customer charters. UPT operators who issue a customer charter agree to commit on a series of service targets. By virtue of the Charter, the right to receive a reliable and attractive service is considered as a customer's right.

The use of customer charters should be promoted throughout Europe on the basis of the CEN criteria of quality for collective passenger transport. It is interesting to note that the implementation of a pan-European framework for the drafting of customer charters and service targets could facilitate comparisons between UPT systems throughout Europe and could therefore represent an important first step in the development of a pan-European benchmarking system. However, such a framework should offer enough flexibility to accommodate local specificities.

Charters detail the commitment of the operator to the customers and set out the standards against which the operator is working, how it publishes its performance against those standards, how it looks after the customers and compensates them if things go wrong and how they can contact the operator. Customer charters are a fairly recent way of publicising the quality levels targeted by the operator. As already indicated, the targeted quality is dependent on the level of quality expected by the passengers, on external and internal pressures, on budgetary constraints and on competitors' performance. The customer charters makes it possible to introduce a “quality barometer” in UPT at different stages in the quality loop.

Charters can be classified into four categories:

1. The charter of intention, which sets general values and principles;
2. The charter of commitment, which specifies the levels of service the customer is entitled to receive by virtue of the charter;
3. The charter of actions, which defines the methods envisaged by the operator in order to achieve various service standards;
4. The “agreement” charter, which details the rights and duties of the parties involved.

The charter of commitment

Figure 17 : The content of customer charters of commitment

Travel time	Punctuality Regularity Travel time	98-99% 65-95% 95%
Accessibility	Lift/escalators Walking distance	Functioning 90-96% Max 4-700 metres
Cleanness ¹	Frequency of sweeping/washing Remove graffiti/hazard	
Comfort	Having a seat	Always seats in off-peak periods Max 15 min. standing period in peaks
Information	Reply of complaints Telephone reply	7-15 days 0,5-3 min.
Ticket selling	Waiting time Ticket machines (giving change)	Max 3 min. Functioning 98%

Source: Quattro

Charter of agreements

Ideally a guarantee ought to be:

- Unconditional,
- Easy to understand,
- Meaningful,
- Easy to refer to,
- Easy to fulfil.

Oslo Sporveier Travel guarantee:

1. The service will depart when they announced it would depart;
2. No early departures will ever occur;
3. They will inform passengers when approaching stops and stations;
4. They will always inform passengers about the destination of the service;
5. Travel information will be available before boarding;
6. Travel information will be available on board;
7. The staff will answer customers' queries;
8. Passengers will be informed when things go wrong;
9. Their vehicles will be clean and the journey pleasant;
10. They will reply to all written complaints;
11. They will listen to customers' complaints;
12. They will pay a compensation to passengers if they arrive late.

See section 4.6. for more.

Figure 18 : Charter of agreements

GOAL	RESULT
To make it easier for the public to make their opinions known	The number of comments from the public has increased 20-fold
To give compensations when service fails	Almost 600 passengers have received refunds for a total cost of about NOK 120.000 a year
To increase pressure for internal improvements	Ex: Bus stop advertising has increased from 22% Feb-94 to 70% in Sept-94
To show that OS is serious about quality improvements	The public sees an improvement on every point in the guarantee from March 93 to 94 through the monitoring process
To increase traffic	Traffic increased by 3,7% in 1993

Source: Oslo Sporveier 1995

Figure 19 : Compensation systems

Operator	Necessary condition to be given a compensation	How to obtain it?	Kind of compensation	Amount of the compensation
London Underground	Waiting or being delayed for more than 15 minutes because of some failure by the operator	Filling a claim form	Refund voucher	100% of the value of the delayed journey
Newcastle-upon-Tyne Metro	Waiting or being delayed for more than 15 minutes because of some failure by the operator	Filling a claim form	Refund voucher	100% of the value of the delayed journey
Oslo Public Transport (OS)	Negligence by OS leading to a 20 minutes or longer delay	Filling a claim form (prepaid postcard)	Taxi fare refund	Maximum NOK 200
ACTION	Waiting for 5 minutes or longer than you should	Filling a claim form	Ticket	Value of the delayed journey

Source: Quattro

3.4. Delivered quality

The quality actually and objectively delivered by a UPT operator can only be evaluated with respect to a few tangible or quantifiable determinants. Punctuality, reliability, commercial speed, etc. are among the quality determinants whose level can be internally and objectively measured.

Regularity is usually calculated by taking into account the percentage of trains experiencing delays of, for example, over 5 minutes during a whole day as well as the number of trains cancelled. Information on the day in question can be - available the following day. Results are traditionally published weekly and monthly. Not included in these statistics are days of heavy disruption due, for example, to strikes or major incidents. The measurement difficulties involved are illustrated by examining the introduction of a service charter in RATP.

Example: the RATP's service charter

In 1995, the management of RATP decided to put in place service standards. One of these standards for RER lines A and B concerned train regularity. RATP guarantees a journey time for each passenger travelling by RER. This journey time must not exceed the theoretical journey time by more than five minutes. Standard RER service regularity is defined as follow:

- Over 95% of passengers should arrive on time or be no more than 5 minutes late.
- The service is considered « unachieved » or undelivered if passengers are over 15 minutes late (After 9:00pm, the threshold is 30 minutes).

A change in measurement techniques

As the new unit of measurement for the charter is the passenger himself, the RER department designed a real-time method of calculation based on the number of passengers experiencing delays. This calculation is dealt with in real time.

Using this new tool the operator is able:

- to view in real time the repercussions of each incident by the number of passengers affected;
- to assess the effectiveness of the traffic management actions he implements.

The principle

The software used to make these calculations was developed according to the requirements of the service standard regarding regularity as explained above. An in-house IT team was responsible for the design. The number of passengers experiencing delays is calculated by way of three different data bases:

- a matrix of expected journey patterns for each couple of stations (departure point/arrival point), drawn up from a theoretical timetable chart;
- a matrix of the number of passengers entering each couple of stations by half hour periods;
- real-time monitoring of trains supplied by automatic operating systems at central control rooms.

Data processing

- Chart showing theoretical timetable
- Expected journey pattern for each couple of station
- Passenger matrix by station couple and half-hour period
- Processing
- Actual situation of trains at each station
- Results / Curves

Checks carried out for each train and station

- Late arrivals < 5 minutes are not taken into account
- Late arrivals > 5 minutes
- Late arrivals > 15 (30) minutes are included in the first indicator and then taken into account for the second indicator, namely « unachieved service ».

Description

The pointsmen based at each central control room can consult a real-time situation chart on their operating screens.

Each half-hour period is represented graphically with three histograms:

- a curve representing 5% of passengers which corresponds with the maximum number of delayed passengers as laid down in the standard;
- a curve representing the actual number of passengers experiencing delays of over 5 minutes;
- a curve representing passengers who have been subject to an unachieved service, i.e. a delay of > 15 (30) minutes.

Internal indices

The information about internal quality indices is very poor and very different for each company. For the quality point of view, the most reliable are those referring to claims, regularity/punctuality and safety and security (number of incidents). The establishment of a good monitoring system for internal quality management is essential.

3.5. Perceived quality

Customer satisfaction index (CSI)

From the information supplied by the companies studied and from our own experience, it can be concluded that the evaluation of customer satisfaction in urban transport companies is not a rare practice in companies with more than 300 vehicles. Besides, the methodologies used to survey passengers tend to vary greatly. The differences are mainly concentrated in:

1. The procedure - Usually personal interview at stop/station/vehicle and by mail.
2. Frequency – Usually once a year. Sometimes monthly, quarterly or twice a year.
3. Scale - From 2 (satisfied - unsatisfied) to 11 possible grades (from 0 to 10 points).
4. Items measured - Usually from 11 to 20 items.

Are always included:

- Safety and security
- Cleanliness
- Waiting time/frequency
- Information
- Ticketing system
- Staff/driver attitude

Are occasionally included:

- Punctuality
- Commercial speed (Trip duration)
- Response to claims/correspondence.

Importance of items

Some companies measure the importance of all the items. They determine the importance of each item during the interview. None have studied separately the real importance that every item has for the customers and, consequently, nobody has a mathematical model for the integration of all measurement items within an evaluation of customer satisfaction at the level of the firm. The average level of customer satisfaction in the European transport companies selected is 6.7 points on a scale going from 0 to 10 points. The differences in the levels of satisfaction recorded vary on a 40% range and respondents vary themselves on a range of about 70%. Both values are higher than in other sectors. Urban transport companies should try to reduce this spread in the future.

The scales used in the measurement of customer satisfaction are very different from company to company, not only in the number of alternative grades proposed in the questions but also in the formulation of the possible answers. The results obtained depend on the precision as well as on symmetry (balance between positive and negative answers) of the scale. The information obtained is always higher when more alternatives are presented. However, more extensive scales tend to be more difficult to understand by the interviewees and less easy to answer usefully.

Taking into account all these problems, the recommendations are:

- To use a simplified scale (satisfied / unsatisfied) for the questions that do not require very precise answers or when the time available for the interview is short.
- To use an 11 step scale (0 to 10) where we need the maximum accuracy (for instance for the aspects that build the customer satisfaction model).

Items selected

The items to measure should be selected on the basis of a preliminary “qualitative market research” and after a specific “quantitative phase” weighting the different factors and allowing the selection of the most important ones for the clients. It is very important to limit the correlation between the surveyed aspects. Correlations indeed have a strong effect, not only in the efficiency of the questionnaire, but also in the mean values obtained creating a systematic bias.

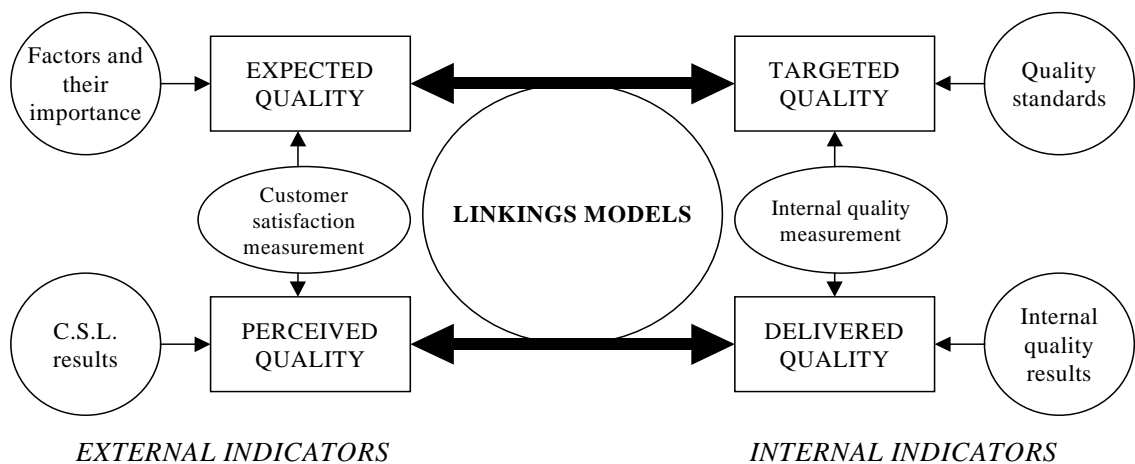
Another effect that should be avoided is what is known as “closeness effect” (the answer to a question influences the answer to the next one). This effect may be tackled by rotating questions. Only with this improvement can the sample size be reduced by up to 20%.

The main advantage of CSI is to provide measures of internal quality aspects that are difficult to identify with precision. Several of them are also impossible to measure objectively, for instance, the friendliness of the driver. The development of CSIs in quality contracts must therefore be concentrated on these “soft” quality as is already included in several quality contracts.

3.6. Link between customer satisfaction and quality indices

The main objective of WP 4 was to examine the links that exist in UPT between, on the one hand, the results obtained in customer satisfaction surveys and external quality measurements and, on the other hand, the internal quality indices. The purpose of this WP is illustrated in the following diagram:

Figure 20 : The WP4 objectives in the quality cycle



Source: Afnor

To fulfil this objective, we used primary data originating from transport companies that could provide us with both customer satisfaction indices and internal quality indices. To complete this phase of the research, the consortium benefited from the collaboration of six UPT companies operating underground trains, buses, tramways and trolley buses. This allowed us to cover a wide range of urban transport modes, towns of 300,000 to more than 5 million people, company sizes ranging from 300 vehicles to more than 1,000 in the most diverse European locations.

In order to get to know what the situation of the different companies studied is with respect to the integration of quality aspects, we carried out a major survey whose results were analysed in details in WP 4. The survey includes questions on a large number of quality aspects.

Although they would all belong to the higher end of a ranking of UPT operators in terms of service quality, if such a ranking existed, it is worth noting that the companies we surveyed measure (on average) only 31% of the 53 quality aspects included in our questionnaire by means of external measurement procedures and only 29% of them by means of internal indices. For certain groups of quality determinants, such as the group that is devoted to the "general aspect of the company", these percentages fall down to 19% and 11% respectively.

As the main objective of this WP was to examine the links that possibly exist between Customer Satisfaction Indices and Internal Quality Indices, the quality determinants used in this part of the research needed to be selected in such a way as to ensure that enough information could be collected about them to evaluate the relationships that exist between them. WP 4 studies the following 9 aspects in more detail:

- 1.- Company Information
- 2.- Station / stopping place cleanliness
- 3.- Safety and Security
- 4.- Ticketing Systems
- 5.- Comfort
- 6.- Vehicle cleanliness
- 7.- Peak hour waiting time
- 8.- Off peak waiting time
- 9.- Regularity / Punctuality

To maximise the comparability of the determinants examined and the relevance of the data collected and to reduce the risks of errors and misunderstandings, an explanatory note was sent to the companies together with the instructions concerning the data collection process.

The quantity and type of data received have met the needs of the research. Although we believe that some companies could have provided us with more information (especially with respect to internal indices), they apparently refrained to do so mainly for reasons of confidentiality and, in some cases, by lack of information about the indicators under study. It is also interesting to note that only a few urban companies are certified by ISO-9000 family.

We received enough information to fulfil the following tasks:

- to propose a methodology for measuring customer satisfaction in UPT;
- to design a system for obtaining internal quality indicators with a focus on customers;
- to provide a specific model designed to link the two kinds of quality indicators just presented;
- to analyse the main problems inherent to the models currently in use.

Indications are also provided on issues of required sample size and study process. Moreover, although the specific value of the functional parameters that link the internal and external indices are not the primary focus of this WP, this information has been included.

In summary, the results of our study indicate that: the average level of client satisfaction obtained by the companies surveyed is 6.4 (on a scale going from 0 to 10). This score is lower than the average of 7 to 8 points obtained in other business sectors. The dispersion of individual scores is high in all the companies except one.

In the present situation with the type and amount of data available it is not possible to build a model that links internal and external indicators in a comprehensive way. The main problem lies in the non-availability of internal data. The development of such links between internal and external quality indices and their study over a longer period in a sufficient number of companies could improve the statistical validity of internal quality appraisals.

Nevertheless, we have reviewed the direct link already existing between particular external and internal items and an acceptable correlation has been discovered between the following indicators.

Figure 21 : Customer satisfaction

External indicators	Internal Indices
Safety and security	Number of claims and incidents Weighted average of claims
Stop/station/vehicle cleanliness	Cleanliness budget and subjective evaluation system
Waiting time/trip duration	Commercial speed.
Punctuality	Interval standard deviation (excess waiting time)

Source: Quattro

The results from the CSI-survey carried out as part of the Quattro project show a link between internal and external quality indexes. The studies of the link between CSI and internal indexes are very interesting and further development of the technique is considered useful. At this stage, it is too early to conclude on the appropriateness of including CSI-surveys directly in quality-sensitive contracts due to the financial impact.

For some of the determinants analysed, the correlation that exists between the corresponding internal and external indices is such that it is possible to conclude that the performance of the company in their respect can be established either way, that is, using alternatively an external indicator or an internal index.

The interchangeability of internal and external quality indices entails a series of advantages for the UPT sector. Among these advantages, let us point out:

- the relevance of the idea of setting quality targets in contracts and tenders;
- the possibility to establish objectives and quality standards based on pre-established client satisfaction levels;
- the possibility to focus the company's efforts and resources on those aspects of quality whose impact on customer satisfaction are the most substantial.

The survey also underlines the importance that UPT customers attach to different quality aspects. Finally, by providing an estimation of the correlation that exists between the internal and external indices of quality, it may help in identifying ways of improving the entire quality management process.

3.7. The evaluation of the external costs of UPT

In this section, the main methods for evaluating the external costs of transport activities are summarised. A wider exposition of these methods may be found in Quattro's Deliverable 2.

3.7.1. General principles and assessment criteria

A survey of the different categories of *external costs* of transport activities leads to the following classification:

- Environmental costs (fauna & flora, energy, noise, air, water, land, landscape effects, vibrations)
- Congestion costs (time lost and the increase of other direct and indirect costs)
- Accidents (uncovered accident costs)
- Infrastructure costs (uncovered infrastructure costs)
- Transport expenditures (cost covered by others – non-users)

Generally speaking, the cost of an externality is a function of two equations. The first one describes the relationship between the physical production of the externality and the output of the transport activity. The second computes the economic cost per unit of externality. Essentially, the amount of an externality produced for a given level of transportation output is the result of the transport technology used as well as of the amount of defence and abatement measures undertaken.

For the evaluation of the external costs of *urban* transport systems in the context of the Quattro project, a *damage approach* has been considered in order to search for practical, operational measures. Following this approach, the marginal external costs of urban transportation ought to be analysed starting at the micro level (bottom-up approach). Generally, the standard evaluation procedure includes the measurement of the marginal external costs of cars, trucks and urban public transport modes. These are the costs caused by an additional car or truck that are borne not by the user himself, but by others. Marginal external costs are the necessary ingredient for computing the social marginal cost. This is the sum of private marginal resource costs paid by the user and of marginal external costs.

The calculation of external costs involves four stages:

- *Exposure and burdens (emissions)*. In the first stage the analysis starts with the exposure (number and kind of kilometres driven). Emissions in the form of air pollutants, oil, noise, or vibrations and possibly also accidents and congestion occur. These figures are summarised under the categories of burdens which are related to the transport mode and the traffic route considered.
- *Concentrations*. In the second stage, burdens are translated into concentrations. The results of this stage are levels (concentrations) of emissions related to the transport modes. For accidents, this step does not apply. Dispersion models can further calculate concentrations of emissions.
- *Impacts*. The third stage quantifies impacts, which are usually classified into: health, environmental and non-environmental effects. The burdens (emissions) or concentrations are responsible for these impacts. In this stage, the impacts have to be identified and - if possible - quantified by dose (exposure)-response-functions.

Both accidents and pollutants can have impacts on human health, i.e. mortality and morbidity. The most important environmental impacts generated by air, soil, and water pollutants are damages to material (especially buildings), flora/fauna (especially agriculture, fishery, and forests), and the climate.

- *External costs.* The last stage includes the valuation of the impacts or, in some cases, directly of the burdens. The results of this fourth evaluation stage are the external costs.

Figure 22: The valuation framework for externality calculation

Traffic mode (technology)	Burdens (emissions)	Impacts	Valuation of impacts (or burdens)
Passenger transport <i>Road traffic</i> - Bicycle - Private car (gasoline with or without catalyst, diesel, EURO 1-3 emission cars, electric vehicle) - Motor cycle - Taxi (mini bus) - Bus <i>Rail traffic</i> - Tram - Underground - City- or suburban railway Freight (goods) transport <i>Road traffic</i> - Van - Truck <i>Rail traffic</i> - City or suburban railway	<i>Pollutants</i> a) Air: Benzol, CH ₄ , CO ₂ , CO, HC, non-methane HC, particle, SO ₂ , NO _x , Pb, other heavy metals b) Soil/water: run off containing oil acidification, others - Noise - Accidents - Congestion - Others Vibrations	<i>Health:</i> - Morbidity - Mortality <i>Environmental:</i> a) materials buildings b) flora/fauna agriculture, fishery, forests c) climate: global warming, tropospheric O ₃ <i>Time losses</i> - Due to congestion <i>Non-environmental</i> - Uncovered infrastructure costs	<i>Direct valuation methods:</i> - Contingent valuation method (CVM) - Market simulation experiments <i>Indirect valuation methods:</i> - Hedonic price analysis (HPA) - Wage risk analysis (WRA) - Travel cost approaches on dose-response-functions. - Abatement costs - Costs of illness (COI)

Source: Quattro

There is one main problem with this standard (four stage) procedure, which seriously hinders its practical application: at each stage of computation, the factors influencing the outcome in the real world are growing and the evaluation of external costs is increasingly based on assumptions which make the resulting estimates less reliable. To better highlight this fundamental fact, we shall now briefly review current methods for evaluating external costs.

3.7.2. The main evaluation methods

There are different methods for evaluating the external impacts of public transport and all have their strengths and weaknesses. One fundamental rule when choosing values for external impacts is to be consistent with the values used in other projects so as to produce comparable results. In this context the value of environmental impacts and congestion costs from road traffic must be similar for public transport and other projects.

Techniques of costing are divided into three main categories:

1. Revealed preference (RP) methods
2. Stated preference (SP) methods
3. Implied preference methods

RP methods (the most direct method) are based on the observation of how individuals subject to the externality behave. SP methods are based on surveys of individuals in hypothetical situations. And implied preference methods look at the cost which is implied by legislative, executive, or judicial decisions.

Revealed preference (RP) methods

The RP approach attempts to determine the cost of an externality by determining how much damage reduces the price of a good (also including in this concept the value of human life). RP approaches can also be used to estimate the price people pay for various protection measures (defence/abatement) and the effectiveness of those measures. For instance, insulation costs a certain amount of money and provides a certain amount of effectiveness in reducing noise. The extent to which individuals then purchase insulation or double-gazed windows may suggest how much they value the resulting quietness. The main RP methods are:

1. Hedonic price methods for the evaluation of noise and pollution
2. Human capital for the evaluation of reduced accidents risk

Hedonic price method

The most widely used estimates of the cost of noise (and also of pollution in urban areas) are derived from Hedonic models. These assume that the price of a good (for instance a home) incorporates a number of factors: surface, accessibility, lot area, age of home, pollution levels, noise, etc. Using a regression analysis, the impacts of environmental damages on each of these factors are estimated. From this, the decline in the value of housing with the increase in the amount of noise (or pollution) can be estimated.

If the value of a house is, among other factors, a function of noise, this means that when individuals buy or rent a house, within their price range, they have the possibility of buying a property in a quiet location rather than a similar property in a noisy location. It is reasonable to expect that, *ceteris paribus*, houses located in noisy areas are of less value than those located in quiet areas. Therefore, the housing market constitutes a surrogate market for noise.

Traffic noise is expressed in L(eq) units while the main findings from house price studies can be summarised by means of a Noise Depreciation Index (NDSE). This index gives the average percentage change in property prices per decibel. Nelson (1982) and Pearce and Markandya (1989) summarise the results of North American Hedonic price studies on traffic noise.

The majority of the findings indicate a house value depreciation in the range of 0,4-0,5% per dB(A), with a mean value of 0,4%. According to Alexandre and Barde (1987), as a rule of thumb, a 0,5% house value depreciation per dB(A) constitutes a reasonable guide as it reflects the outcome of a substantial number of studies. However, they point to the fact that it is probable that this depreciation rate is valid only above a certain noise threshold, say 50 dB(A)L(eq), since most surveys show a very low level of annoyance below this level. Furthermore, they mention the possibility that the unit percentage of depreciation increases both with the noise level and with the value of the house. A recent survey by Maddison et al. (1995) considers a wide range of studies and concludes that the mean property price change is 0,67% per dB(A).

Human capital method

This is an accounting approach which focuses on the productive capacity or potential output of accident victims, using the discounted present value of future earnings. To the above are added costs such as property damage and rehabilitation costs. Property damage includes the costs of vehicle repair and replacement. Rehabilitation costs comprise average costs of medical treatment, emergency service, police, and legal activity per killed or injured person. Lost productivity includes wages, fringe benefits and household work lost by the injured. These costs of lost production are estimated based on the national income per person of employable age and per year. From this value, in case of death, the average value of the goods and services that the victim would have consumed during the rest of his or her further (statistical) life expectancy has to be subtracted. Productivity losses also include some indirect costs:

1. travel delay for people who are not directly involved in the crash but are caught in the backups that it causes;
2. employer productivity losses to train and hire temporary or permanent replacements for the injured, as well as productivity losses resulting from the start-up inefficiency of substitute workers;
3. earnings lost by family and friends caring for the injured.

The Human Capital approach can be used for accidents, environmental hazards and possibly congestion costs. However, the method is questionable for it raises four serious problems:

1. *misinterpretations in the measure of societal economic consequences.* Considering the most popular use of the method, the evaluation of the impacts of a crash, even direct costs do not measure the impact on the economy. Analysing a crash's impact on the Gross National Product (GNP) requires examining the multiplier effects of expenditures on different goods. Medical care is produced almost entirely with national products. That means highway crashes may actually contribute positively to the GNP by shifting spending from imported goods to domestically produced medical care;
2. *measuring productivity losses to victims and their families ignores any offsetting job creation benefits for the people who replace the victims.* So the traditional approach takes an oddly restricted viewpoint on costs;

3. *human capital costs discriminate against the young, the old, women and minorities, providing very low values for all four groups.* To lessen the gap, the value of lost household production has long been included in human capital cost estimates. Since the GNP excludes household production, this practice further divorces human capital costs from GNP;
4. *human capital costs lack comprehensiveness.* They value only the monetary aspects of our lives.

Several costing approaches overcome the last two problems. Most essentially, they add intangibles to human capital costs. One possibility is to keep those intangibles in non-monetary terms. Another possibility is to put them in monetary values. When the intangible losses are valued in ECUs, they comprise about two-thirds of total injury costs. Thus, intangibles are quite important.

In any case, these considerations might seem hardly useful for practical purposes, such as, for instance, the building of permanent procedures to measure and monitor the level of external costs produced by transport activities in an urban setting. The problem with RP methods is that the data they require to be directly relevant are not always available.

Stated preference (RP) methods

On the other side, SP approaches involve using hypothetical questions to determine individual preferences regarding the economic costs of a facility. Advantages and limits of this method are extensively described in the relevant sections of the Quattro project. The SP approach is not without controversy. In particular, it has been argued that the amount of money that people offer to pay in order to protect the environment does not necessarily correspond to the amount that they would actually be willing to pay (the free-rider problem). Furthermore, it is affected by a series of informational problems. More specifically, the people are not always aware of all environmental quality aspects and of the possible impacts their alteration may have, *inter alia*, on their health. It is therefore difficult to translate external effects into monetary expenses *via* stated preference methods. Willingness to pay will also depend on the income situation of the individuals questioned. Nevertheless, it seems important in a democratic and participatory approach to take the opinions of the people into account, even if their knowledge of the natural environment is incomplete.

Implied preference methods

Finally, implied preference methods measure the cost of externalities that are neither revealed from individual decisions nor stated by individuals on a survey. These are called implied preference methods because they are derived from regulatory or court-derived costs.

Through government regulation, regulatory costs are imposed on society with the aim of reducing the amount of noise or pollution or hazard that is produced. These regulations include vehicle standards, roadway abatement measures such as noise walls, which are essentially protection costs, as well as the many environmental regulations. By determining the costs and benefits of these regulations, the implicit cost of each externality can be estimated. This measure assumes that government is behaving consistently and rationally when imposing various standards or undertaking different projects.

On the other hand, one can look at how courts (judges and juries) weight costs and benefits in cases that come before them. The cost per unit of noise or life from these judgements can be determined. This method is probably more viable in accident cases, because it puts a monetary value on the intangibles. The values come from jury verdicts for non-economic damages - i.e. damages other than medical costs and productivity losses. Cohen (1988), Viscusi (1988), and Rogers (1993) establish the theoretical framework for estimating pain and suffering from jury verdicts. The basic notion is that pain and suffering to a survivor can be approximated by the difference between the amount of compensatory damages awarded by a jury minus the actual out-of-pocket charges associated with the injury. Several other authors use regressions on jury verdicts to value pain and suffering for serious birth defects, assault, rape, medical malpractice, consumer product injury, and burns.

3.7.3. The evaluation of external costs in practice

As illustrated in the previous paragraph, the external cost evaluation methodologies - revealed, stated or implied preference methods - may be useful in a context of theoretical economics, but not for practical purposes, due to a substantial lack of reliability of the measures of external impacts produced.

Therefore, in the context of the Quattro project, two main criteria have been considered to arrive at a practical identification of externality valuation measures:

1. First, measures of externalities are approached in relation with the different decision levels identified in the context of Isotope project: *Strategic* (definition of political objectives); *Tactical* (mobility planning and co-ordination in the urban area); *Operational* (the production of the Urban Transport Service).
2. Second, no attempt should be made to measure the unitary costs (average or marginal) of transport externalities for benchmark purposes, due to the substantial lack of reliability in comparisons. A more feasible approach has been suggested, which only considers the first stage of externality analysis, thus implying the measurement and control of the levels of *exposure to emissions* and of the levels of *congestion and accident risks*.

Based on the above criteria, practical indicators to measure externalities have been suggested, which are presented in the table hereafter, distinguishing those which relate to the general planning of mobility in the urban area (the Isotope tactical level) from those more specifically related to the operation of the public transport (the Isotope operational level):

Figure 23 : Practical indicators to measure externalities

	Air pollution	Noise pollution	Accident risk	Congestion
Tactical level (General Mobility Services)	Measures of Environmental Quality (general) - Air pollutant levels by transportation sources - Nr. of days air pollution exceeded hazardous threshold - Nr. of persons possibly exposed to hazardous levels	Measures of Environmental Quality (general) - % of areas with traffic noise above X decibels, by type of street - % of citizens stating that they are bothered by traffic noise in their neighbourhoods frequently, occasionally or rarely	Measures of Safety - Nr. of reported traffic accident and rate per 1.000 population - Nr. of deaths and/or injuries and rate per 1.000 population - Value of property loss from traffic accidents and value of loss per 1.000 population - Rate of accidents involving a contributing factor that can be influenced by a local government agency	Measures of Rapid Movement - Average peak and off-peak travel times between representative origins and destinations - Ratio of peak travel time to a "base" travel time between selected pairs of points - Length of time that peak travel times exceed X percent of the base travel time
Operational level (Urban Public Transport)	Measures of Environmental Quality (specific) - % of transit vehicles (or vehicle-days) that do not comply with local air pollution standards	Measures of Environmental Quality (specific) - % of transit vehicles (or vehicle days) that do not comply with local noise standard		

Source: Quattro

The responsibility to measure transport externalities and to take them into account must be distributed among different decision levels. All measurements regarding urban mobility as a whole, classified as "general" in order to distinguish them from those specific of public transport operations, can be divided in two broad categories. The first category includes measures of customer satisfaction, which typically come from independent surveys, while the second includes measurements of objective, physical phenomena (levels of noise and/or pollution, rate of accidents etc.)

The satisfaction of citizens should be appraised through periodic surveys carried out by the regulating authority, i.e. the political body responsible for defining a number of general aims for the transport system (as transport policy, social aims, etc.) and responsible for the organisation of public transport and/or for the regulation of autonomous action by transport companies (strategic level): such surveys, in fact, contribute to the attainment of the general objectives of the regulating authority in the area of guidance and control of mobility policies.

The most appropriate level for the management of a permanent system for the measurement and monitoring of emissions, accidents, etc. is, instead, the tactical one, which should be ideally represented by a professional body (or agency) responsible for the planning and co-ordination of the urban mobility. If such an agency does not exist, its role is usually played by a unit of the regulating authority (the municipality) or by the planning and control services of the transport operator.

Finally, measurements related to the attainment of environmental standards on behalf of the transport operator must normally be explicitly included in the procedures for the control of performances, as laid down in the service contract specifying the relationship between the regulating authority and the transport operator. In practical terms, controls can be carried out by the transport operator, who must then certify that the environmental quality standards defined in the contract have indeed been achieved by its own vehicles.

4. Quality improvement tools

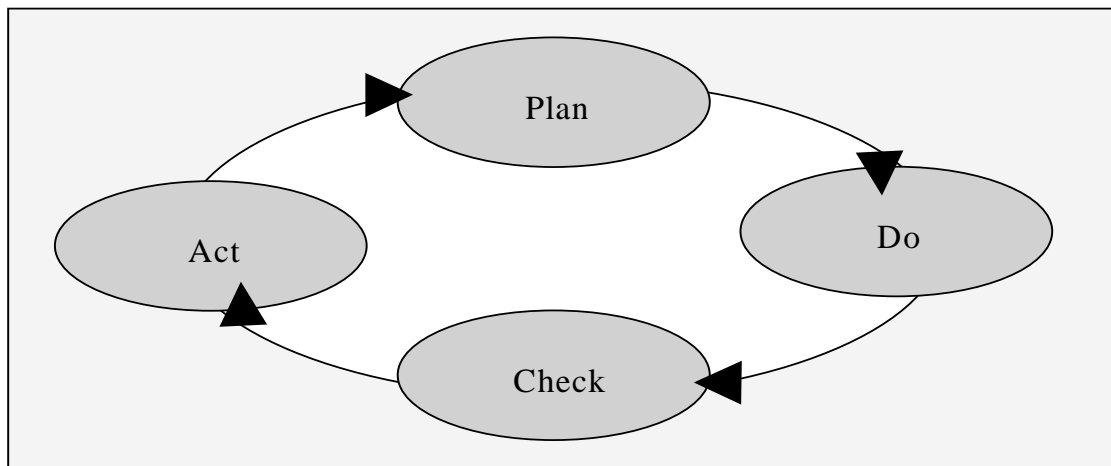
Through the Quattro research, several quality tools have been identified. The objective of this chapter is to present six quality tools not directly related to quality assessment/measurement or contractual and tendering incentives. For each of the six tools identified, a theoretical description of their use in a quality improvement process is provided. The tools are also presented through examples of practical applications. The six efficient and practical Quality improvement tools analysed are:

- the quality loop, a dynamic process for improvement that can be implemented at the level of a system and for the definition of a service;
- self assessment methods and more specifically the EFQM model used for the European Quality Award;
- benchmarking, as a method of sharing knowledge and experience of “best practices” to bring about improvement;
- standardisation and certification, as tools for the improvement of Quality management and service definition;
- quality partnerships, co-operation between authorities and operators in order to improve service co-ordination and, in consequence, service quality;
- guarantee of service, commitment of service producers (authorities and operators) towards customers.

4.1. The quality loop

The quality loop is a dynamic process based on the idea that product definition is the most critical step in service production²⁶. For Deming²⁷, the mission of any responsible person, at any hierarchical level in the company, is to continuously improve the products delivered²⁸, resources, machines, processes and so on. The definition of a product is not a linear activity. It needs to be continuously adapted to fit with customer expectations. The PDCA (Plan – Do – Check – Act) scientific process brings the necessary dynamic to the global production process from the conception stage to the actual delivery stages.

Figure 24 : Deming's PDCA loop



Source: WEKA

The planning phase, the first of the four steps, is the basic phase. At this stage, a strategy and action plan are developed and the product is defined. The second stage consists of the production of the article or service. This phase can be considered as the experimental or test phase. The checking phase (3rd stage) consists in assessing and studying the results of the production phase. The fourth step, the action phase is intended to remedy the potential flaws and possibilities of improvement identified in the checking stage. This dynamic approach can be implemented at various levels in a global quality approach: in the product definition (continuous assessment of the degree of the customer satisfaction and revision of product specifications) or in the production process (continuous assessment and revision of the production process in order to improve its efficiency).

The PDCA loop can be used to fine-tune the implementation of another important tool, the quality. The AFNOR²⁹ standard XP X-50 805: "Quality within transportation services – Identification of the quality criteria for passenger transportation" was developed to support the definition of passenger transport services. It is conceived around a quality loop process comparable to the PDCA concept and adapted for passenger transport.

²⁶ WEKA, Certification et Management de la Qualité.

²⁷ E. Deming, American professor, Quality theorist of the 20th Century. Author of, notably, « Out of the crisis ».

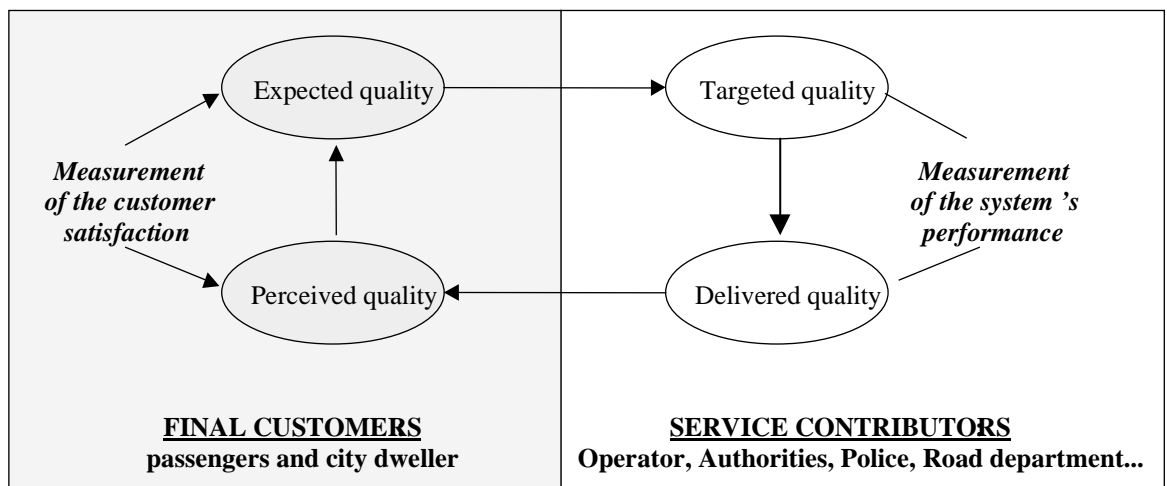
²⁸ By product, good or service can be considered.

²⁹ Association Française de Normalisation.

It is based on the definition of four distinctive quality benchmarks, which are used to implement a dynamic process of service improvement. The loop is developed and implemented at the level of the global transport system. It is divided in two parts:

- the measurement of customer satisfaction (customers or end users are passengers and city dwellers);
- the measurement of the producers' performance (producers include all the service contributors of the system: operators, authorities, traffic control and highway management departments,...).

Figure 25 : The quality loop at the level of the public transport system



Source: AFNOR

The four quality benchmarks identified in the loop are:

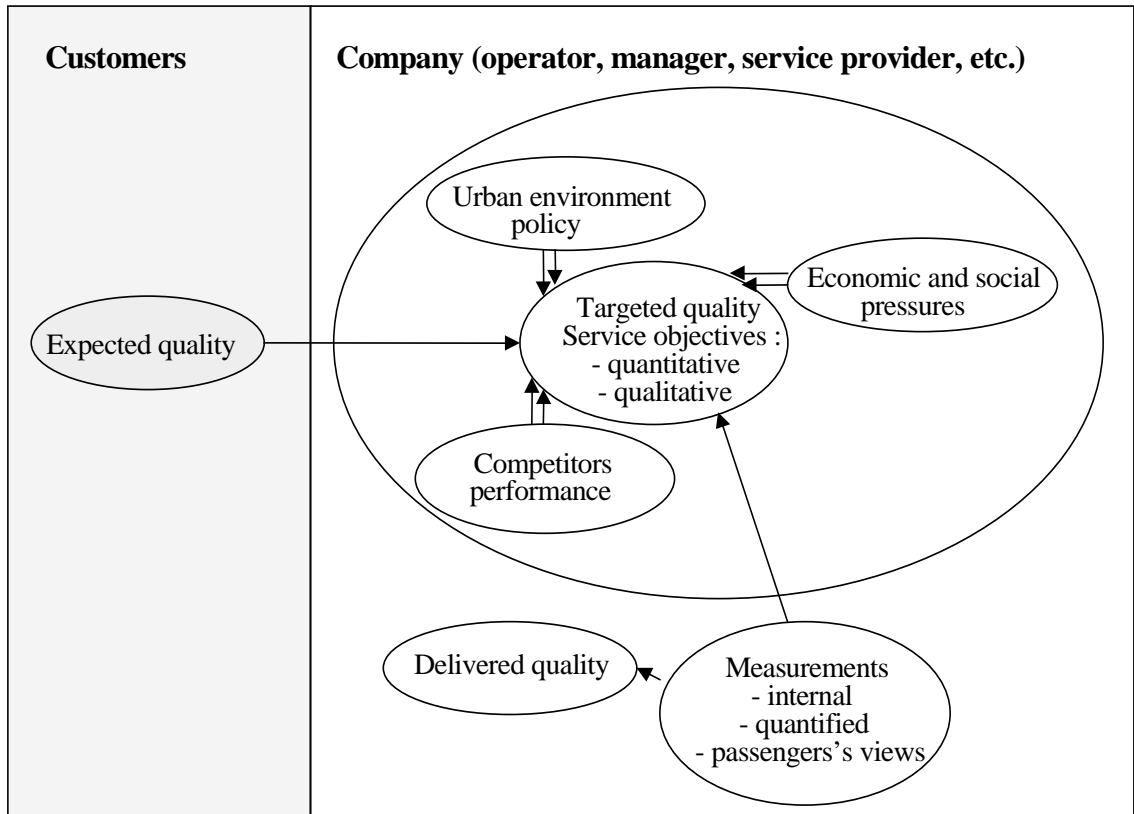
1. The expected quality

This is the level of quality desired by passengers and citizens in general. This desired level of quality should thus be defined on the basis of passenger expectations. These expectations are identified by the way of a qualitative survey and/or derived from the implicit expectations of passengers (no accidents, etc...).

2. The targeted quality

The targeted quality is the level of quality that the company wishes to reach. The targeted level of quality is determined on the basis of the expected quality (stage 1), external and internal pressures, budgetary constraints and competitors' performance.

Figure 26 : The elements making up the definition of targeted quality



Source: AFNOR

3. *The delivered quality*

This is the level of quality obtained, on a daily basis, in real operating conditions. The delivered level of quality has to be measured by quality indicators set up within the operating system. However, service performance determinants within and out of the operator's reach should be taken into account.

4. *The perceived quality*

This is the level of quality perceived, that is, appreciated more or less objectively, by the passengers during their journeys. This benchmark is useful in the service definition and revision processes. Once the production system is running, it appears essential to measure its performance in order to improve it. Two types of measures can help in this field: internal measures (by the way of internal quality indicators such as the number of passengers affected by train breakdown, the number of passengers affected by information failure, etc.) and external measures of the level of quality perceived (Do customers perceive service improvements and is their level of satisfaction evolving favourably?). The frequency of these two types of quality are very different:

- the frequency of delivered quality assessments tends towards real time because the objective of this measure is to inform service producers on the quality level actually reached in order to give them the possibility to react as fast as possible in case of performance drift;

- the measure of perceived quality serves essentially to redefine or to adjust the objectives set to the organisation, that is, the level of targeted quality. The frequency of the measurement therefore depends on the rhythm of strategic and tactical reviews, once a year generally.

A consistent implementation of the quality loop introduces an efficient dynamic in the service management system which automatically leads to the delivery of a service better adapted to customers' expectations. The active approach it represents brings about continuous improvement processes into the definition/production of the service. Contracts could be used to encourage service providers and competent authorities (political and professional bodies) to resort more systematically to this dynamic management tool. More generally, the development of quality measurement tools and of survey methods should constitute a priority for the future.

4.2. Self assessment methods

These approaches are based on the concept “to measure to improve” with the objective of bringing continuous improvement processes to the system. Self assessment is a practical way for a companies to measure their own performances and from there to improve these by adapting their organisational system. Self assessment makes comparison possible over time or with other companies.

The EFQM has recently been developing an efficient model of self assessment for quality management at the level of a company or of a production system³⁰. The EFQM defines self assessment as “*taking a hard look at your organisation and scoring it against an ideal or model (the EFQM model in this case). The results indicate the organisation’s strengths and areas for improvement and provide the basis for future strategy and improvement plans...*”³¹.

EFQM also listed several advantages of self assessment processes³². They offer:

- a rigorous and structured approach to company improvement programmes;
- an assessment based on facts and not on individual perceptions;
- a way to reach a coherent orientation and a consensus on the actions to undertake;
- a way to integrate multiple quality management initiatives to normal company activity;
- a powerful diagnostic tool;
- benchmarking possibilities.

In the public transport sector, self assessment can certainly lead to an improved knowledge of system and company performances.

Within the transport system, weaknesses can be identified in:

- Leadership and system co-ordination: The allocation of responsibilities between the different bodies involved (“Who does what?”) is not always well defined and this can lead to duplications of effort. Questions to address are: “Are the available resources efficiently exploited?” and “Do processes exist to manage the total system optimally?”.
- Policy and strategy: Strategy and transport policy are not always co-ordinated or integrated in time and in space. The importance of UPT in mobility policy is not always well understood or well developed. The UPT sector does not offer any unified image of the complementary transport modes available to the public.
- People management: In this respect, one important issue is: “Do the workers of the UPT sector receive adequate training and development opportunitie?”.
- Customer satisfaction: Customer satisfaction is mainly measured at the level of the operator: “Does the service provided by the operator fulfil the expectations of the users?”, “What about the measurement of their global satisfaction at with the transport system?”, “What about the expectations of stakeholders, non users and of potential users?”.

³⁰ European Foundation for Quality Management.

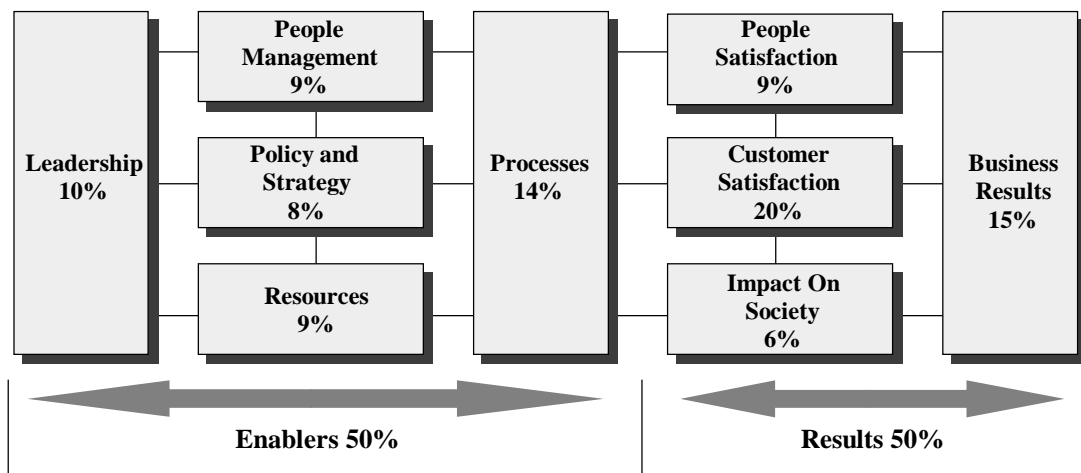
³¹ EFQM application brochure for the Award application.

³² EFQM: Self Assessment Guidelines.

- **Business results:** Business results must be measured at the level of the operator but not globally at the level of the system. Measurement tools are not always available and need to be developed to permit a more accurate measure of the system's results.
- **Impact on society:** as with business results, there is a need to develop measurement tools for the global impact of the transport system on its environment. Traffic congestion and pollution are now a very sensitive matter of concern in cities.

The EFQM model collects nine management data sources and proposes a weighted assessment method.

Figure 27 : The EFQM self assessment model



Source: EFQM

The EFQM self assessment model is composed of 9 boxes divided into 2 fields: the enablers and the results. As it consists in a work method based on self assessment, it is presented under the form of questions. For each of the nine boxes, a major question must be asked at the level of the self assessing entity in order to identify if the criterion considered is properly dealt with. A “translation” of the questions is proposed at the level of the passenger transport system, at the level of the companies in charge of passenger transport (the operators) and at the level of the public authorities responsible for passenger transport activities in the area.

4.2.1. The enablers

Leadership

“How the behaviour and actions of the executive team and all other leaders inspire, support and promote a culture of Total Quality Management.”

This section provides evidence of the involvement of the executive team (and the other managers) in Total Quality Management and investigates how they actively drive improvement within the organisation and interact with customers, suppliers and other external organisations.

At the level of a passenger transport system: "How does the body in charge of passenger transport (public authority, private co-ordination centre,...) in a given area promote quality management among the different parts of the system (operators, passenger transport executives (UK), security and safety agencies, traffic management centre,...)?" and "Is this body in contact with other organisations, transport companies outside the defined system, transport authorities (national, regional or local), other public and private entities?"

At the level of the passenger transport company: "How does the Board (and the other managers) of the company promote Total Quality Management inside the company?"; "How do they engage in quality improvement processes inside the company?" and "How do they interact with customers, suppliers and other external organisations?"

At the level of the authority in charge of public transport: "How do the members of the Board (and the other leaders) promote a Total Quality Management approach inside the public body?"; "How do they engage in quality improvement processes inside the public body?" and "How do they interact with customers, citizens, suppliers and other external organisations?"

Strategy and planning

"How the organisation formulates, deploys, reviews and turns strategies into plans and actions".

This section provides evidence on how the organisation:

- formulates strategies and plans based on relevant and comprehensive information;
- communicates and implements its strategies and plans;
- updates and improves its strategies and plans;
- formulates plans on the basis of input received from all stakeholders.

At the level of a passenger transport system: "How does the body in charge of passenger transport (public authority, private co-ordination centre,...) in the area formulate the transport strategy (promotion and priority to public transport, increase of public transport market share,...)?"; "How is the strategy translated into plans and actions?"; "How are those plans and actions communicated?" and "What is the procedure used to revise and adapt the strategies, plans and actions?"

At the level of the passenger transport company: "How does the Board (and the other managers) define the strategy and the objectives of the company (to increase market share, to implement specific management techniques)?"; "How does the Board communicate these plans and objectives inside the company (management participation)?" and "Which is the review system implemented to adapt the strategy adopted?"

At the level of the authority in charge of public transport: "Do the members of the Board define a strategy for the public body?"; "Are strategic plans communicated?"; "Does a strategy review system exist?"; "Is the strategy translated into action(s)?" and "Are the actions allocated to managers inside the body?"

People management

“How the organisation releases the full potential of its people.”

This section provides evidence on how the organisation:

- develops and reviews people plans;
- ensures involvement and empowerment.

At the level of a passenger transport system: "Is there a body in charge of the co-ordination of passenger transport in the area (public authority, private co-ordination centre,...)?"; "Does this body understand the potential of the different actors involved in the system (operators, traffic managers, highway engineers,...)?"; "Are operators only carriers or are they required to bring some additional input to improve the service delivered?".

At the level of the passenger transport company: "Is there an active people management strategy?"; "Are workers involved in continuous improvement activities?" and "Are they encouraged to take initiatives?".

At the level of the authority in charge of public transport: "Is there a people management policy in the public body?" and "Does this policy promote responsibility and initiative of managers and staff?".

Resources

“How the organisation manages resources effectively and efficiently”.

This section provides evidence on how the organisation:

- manages financial resources;
- manages information resources;
- manages suppliers and materials;
- manages other resources.

At the level of a passenger transport system: "Does the body in charge of the co-ordination of passenger transport at area level (public authority, private co-ordination centre,...) have access to network information?"; "Does this body manage the global financial resources of the network?" and "How does the body manage operators and other suppliers?".

At the level of the passenger transport company: "Does the company obtain and manage information efficiently?"; "Are financial resources efficiently managed?" and "How is supplier involvement managed?".

At the level of the authority in charge of public transport: "Does the public body get information on its own performance?"; "Is the management of financial resources optimised?".

Processes

"How the organisation delivers value to customers through the management of its processes".

This section provides evidence on how the organisation:

- focuses on customers;
- manages its Quality System;
- manages its key processes to generate excellent products and services;
- manages the process of continuous improvement;
- manages change.

At the level of a passenger transport system: "How and by whom are the management processes of the transport system organised?"; "Is one particular body in charge of these tasks?"; "Is there an integrated quality management policy at the level of the transport system?"; "Is there a process of continuous improvement at the level of the transport system?" and "Are issues such as intermodality and modal co-ordination considered at the level of the total transport system?".

At the level of the passenger transport company: "Does the company focus on customer expectations (surveys, complaints service, customer orientated service)?"; "Does the company implement Total Quality Management?"; "How are key processes inside the company designed so as to produce the transport service efficiently?" and "Is there a process of continuous improvement of performances inside the company?".

At the level of the authority in charge of public transport: "Does the public body have a Quality System?"; "How does it focus on customers (UPT users, non users and citizens)?"; "How is it managed internally?" and "Does its management system lead to continuous improvement?".

4.2.2. The results

Customer satisfaction

"What results the organisation is achieving in relation to the satisfaction of its external customers".

This section provides results with respect to:

- customer perception of the organisation's products, services and relationships;
- additional measurements relating to the satisfaction of the organisation's customers;
- evidence of positive trends in performance.

At the level of a passenger transport system: "Is there a global management of customer satisfaction at the level of the transport system?"; "How is customer satisfaction measured?" and "How are the results of these measurements used?".

At the level of the passenger transport company: "Does the company measure customer satisfaction regarding the service it provides?"; "Which tools does the company use (surveys, interviews)?"; "How are the results used?" and "Is the information gathered used for the improvement of the service provided?".

At the level of the authority in charge of public transport: "How does the public body listen to its customers (UPT users, non users and citizens)?"; "How is the information gathered used?" and "How is the customer expectation measurement system managed internally?".

People satisfaction

"What results the organisation is achieving in relation to the satisfaction of its people".

This section provides information with respect to:

- staff perception of the organisation;
- additional measurements relating to people satisfaction;
- evidence of positive trends in attitude and performance.

At the level of a passenger transport system: "Is there a total management of staff satisfaction at the level of the system?"; "How is staff satisfaction measured?" and "How are the results used?".

At the level of the passenger transport company: "Does the company measure staff satisfaction internally?"; "Which tools does the company use (surveys, interviews)?"; "How are the results used?" and "Does the information gathered serve to improve the internal management?".

At the level of the authority in charge of public transport: "How does the public body measure the satisfaction of its own staff?"; "Which tools are used?"; "How is the information used?".

Impact on Society

"What results the organisation is achieving in satisfying the needs and expectations of the community it is supposed to serve".

At the level of a passenger transport system: "Is the global impact of the overall transport system on the satisfaction of the community measured?"; "How is people (users, non users, citizens and staff) satisfaction measured?"; "Are the results coordinated?" and "How are the results used?".

At the level of the passenger transport company: "Does the company measure the impact of its activity on the community?"; "Which tools does the company use (surveys, interviews)?"; "How are the results used?" and "Does the information gathered serve for the improvement of the internal management?".

At the level of the authority in charge of public transport: "How does the public body measure the overall satisfaction of the community?"; "Which tools are used?"; "How is the information used?".

Business results

"What results the organisation is achieving in relation to its planned business objectives and in satisfying the needs and expectations of everyone with a financial interest in the organisation".

This section provides results with respect to:

- financial measures of the organisation's performance;
- other non-financial measures of the organisation's performance;
- evidence of result trends.

At the level of a passenger transport system: "Is the global (financial, economical, social, etc.) performance of the transport system measured?"; "Are the results co-ordinated?" and "How are they used?".

At the level of the passenger transport company: "Is the company's financial and economic performance measured?"; "Which tools does the company use?"; "How are the results used?"; "Is the information gathered used for the improvement of the internal management?".

At the level of the authority in charge of public transport: "Does the public body measure its performances (financial, economical, social, etc.)?"; "Which tools are used?" and "How is the information used?".

In the framework of contractual relationships, self assessment methods or self improvement or benchmarking could be considered as a minimum requirement for the company to show its ability to introduce and manage a continuous improvement programme.

4.3. Benchmarking

4.3.1. Definition and goals

Benchmarking can be described as the systematic comparison of the performance of an organisation against that of:

- other departments/subsidiaries (internal benchmarking);
- other organisations, competitors or leading industrial companies (external benchmarking).

The main goal of benchmarking is to build on the successful experiences of others instead of "re-inventing the wheel". The idea is simple: the most efficient way to implement change is by learning from the positive experience of other organisations. Benchmarking top companies in a similar type of activity and with similar work processes can help an organisation to identify the practice(s) behind success so as to adapt them to its own needs. Benchmarking is a way of management that develops a continuous improvement imperative. It is an ideal tool to achieve more efficient use of resources, cost reductions and also to improve service quality.

By benchmarking on an on-going basis, the learning organisation is always trying to keep up with the latest best practices in its field instead of relying on dated ideas or utopia. Benchmarking is always carried out with the intention of implementing improvement. The analysis may be focused on products, processes and/or results (outputs). By doing this, the organisation gathers information for improvement and insights, which may lead to better performance.

The benchmarking process does not only design, sort and compare collected data, it also sets up a dynamic process of exchange which becomes a powerful catalyst for change. The benefits of benchmarking derive from the fact that:

- it encourages and enables the management of change through the implementation of innovation and « best in class » processes;
- it results in increased customer and people satisfaction as well as in superior competitive advantage;
- in the longer run, benchmarking can be extremely important for setting strategic goals and identifying programmes for their achievement;
- it increases awareness of what you do and how well you do it. Benchmarking can be successful because it requires significant self analysis and motivation;
- it removes «blinkers» and «not invented here» attitudes;

The applications of benchmarking are widespread: organisational comparisons and improvement, meeting best industry practices, developing product/process objectives and establishing priorities, targets and goals. Benchmarking answers three fundamental questions: "Where are we now?"; "Where do we want to get to?" and "How do we get there?"

European integration and the opening of the market encouraged organisations to continuously improve their performances by recognising EU Treaty obligations, directives and regulations. Through its competition policy, the EU more or less directly plays a major role in promoting benchmarking.

4.3.2. Benchmarking in the UPT sector

Benchmarking activities are not yet well developed in the UPT sector. Some exercises exist but their number is small and they cover only some specific aspects of management and are often limited in duration.

Internal benchmarking

Internal benchmarking is not specific to public transport. Administrative management, financial management, people management or other general management practices can be and are benchmarked between departments inside many companies using value analysis techniques.

In the UPT transport sector, both authorities and operators can benefit from the implementation of internal benchmarking. Senior managers play an important role in encouraging these processes. At the level of the public transport operator, internal benchmarking can be undertaken between lines (metro, bus, etc.), between depots, between administrative departments as well as between technical support functions (workshops, etc.). At the level of the transport authority, internal benchmarking is possible between administrative departments to improve the way in which contracts and relationships are managed.

External benchmarking among operators

External benchmarking between operators is not common. The main reasons are:

- confidentiality;
- the lack of efficient tools to identify comparable practices;
- a reticence to openness and “no blame” cultures.

The present and likely future development of the public transport market and its increasing competitiveness leads more and more companies to improve their performance. But as this happens, innovative and successful management practices are also becoming the operators' primary source of competitive advantage. In consequence, they tend to be more and more reluctant to divulge such strategic information.

In order to identify possible interesting practices for benchmarking, operators need efficient identification tools. Usually, operating companies start the benchmarking process by comparing their performance through existing and publicly available statistics. Existing statistics suffer from a lack of accuracy because of the existence of different definitions or understanding of the underlying concepts. This leads to difficulties in the identification of possible and interesting fields for comparison.

The culture of the public transport sector is generally open to bilateral exchanges. With incentives from authorities or operators, small groups of companies benchmark some specific areas. These exercises are generally limited in time and do not lead to further work. Benchmarking groups with more than 5 operators, established for long periods and sharing information are quite rare. The CoMET club illustrated below is a rare exception of benchmarking in the UPT sector.

Benchmarking clubs: a case study of the CoMET group

In early 1995, five of the world's largest heavy metro railways – Berlin, London, Hong-Kong, New York and Paris formed a benchmarking consortium, co-ordinated by the Railway Technology Strategy Centre (RTSC) at Imperial College, London, to compare each system's performance indicators and to use them to find ideas for Best Practice. Since then, three more systems – Mexico City, Sao Paulo and Tokyo - (TRA) – have entered the group, which is known as CoMET – Community of Metros.

The basic idea of the benchmarking club has been to collect among the different members the basic data necessary to develop:

Key Performance Indicators (KPI). This task consists in:

- the definition of indicators within the areas of financial effectiveness, efficiency, asset utilisation, reliability and service quality and safety;
- the design of appropriate survey techniques;
- the collection and validation of relevant data;
- the improvement of the comparability and understanding of the data.

Case studies. This activity is part of the data collection and quality improvement programme with both quantitative and qualitative insights into different practices in different areas of the business. The case studies are designed to test the implementation of KPI and to define best practice. These case studies concern metro railways and other relevant industry experiences.

Best practice. This task gives the opportunity to participating companies to identify revised practices and procedures and to introduce the "best practice" identified on the basis of the KPI and of the conclusion drawn from the various case studies.

After three years, the first examples of best practice implementation are related to:

- capacity: several systems are implementing operational changes to improve the capacity and the reliability of their service;
- contracting out: the lessons learned on contracting out non-core activities are being shared and applied by several participating metros;
- staffing levels: early work of the consortium has indicated significant opportunities to improve cost effectiveness related to staffing – implementation analysis is now underway;
- reliability: the importance of reliability management has been demonstrated and London Underground is now implementing changes on two lines;
- rolling stock investment maintenance and staffing.

The CoMET consortium is one of the rare benchmarking groups in urban public transport established for a long period (no deadline was fixed at the creation of the consortium). The objectives of the 4th year plan (1998) are:

- to gain full value from the existing database and the work done in previous phase;
- to assist metros to put in place passenger quality KPIs;
- to improve the implementation rate of Best Practice proposals;
- to start to draw conclusions from time series data to establish trends and impacts of given policies and action programmes;
- to continue to define Best Practice in high priority areas that can lead directly to implementation.

External benchmarking among authorities

In the framework of the Quattro research, no practice of benchmarking between authorities in Europe has been identified. Nevertheless, benchmarking among authorities could be considered in the following fields:

- authority behaviour during a transition period;
- authority relation to operator(s);
- authority involvement in system management;
- sharing of responsibilities between authorities and operators.

Benchmarking work could be very useful in the development of tendering and contracting procedures. Tendering procedures are not at the same level of development throughout in Europe. More advanced and developed practices exist in the UK as well as in France, for example. Benchmarking could be useful for both authorities and operators to identify efficient practices and avoid errors by authorities and operators in tendering procedures.

Similarly, contractual relations are not equally developed throughout Europe. Differences exist in the sophistication of service specifications. In a number of cases, quality has yet to be formally introduced in contracts. Benchmarking could help to avoid errors and to disseminate innovative and proven practices.

4.4. Standardisation and certification

Standardisation and certification are part of the quality assurance process. Quality assurance consists in “all the planned and systematic activities implemented within the quality system and demonstrated as needed to provide adequate confidence that an entity will fulfil given requirements for quality”³³. The standard defines the “systematic activities” and certification, the assurance that the standard will be respected.

The International Organisation for Standardisation (ISO) defines standards as «documented agreements containing technical specifications or other precise criteria to be used consistently as rules, guidelines or definitions of characteristics, to ensure that materials, products, processes and services are fit for their purpose”³⁴.

4.4.1. Quality system standards: standardisation of the production process

ISO 9001, 9002 and 9003 are quality systems standards. ISO defines the quality system as “*organisational structure, procedures, processes and resources needed to implement quality management*”³⁵.

ISO 9001, 9002 and 9003 standards focus on the production process. This process has to be optimised and managed to produce the best output. Two different certification approaches by the mean of quality system standards are given below: the cases of SEMITAG in Grenoble (FR) and STIB/MIVB in Brussels (BE).

Example: The management strategy of Semitag (Grenoble)

SEMITAG³⁶ manages an urban transport network in the urban area of Grenoble (23 towns) on behalf of the organising authority, SMTC. The company operates 20 routes, has 800 workers and 300 vehicles (tramways, trolley bus and bus). SEMITAG carries 220.000 passengers a day and its annual budget reaches 300 million FF.

After a rapid increase in patronage due to the opening of two tramway lines in 1987 and 1990, the management decided to focus on the improvement of both the service provided by the company and its organisation. This led, in June 1993, to the launch of a company project entitled PAQT 97 (Plan d'Action Qualité Tag). This plan defines the strategy and the main objectives of the company for the next 5 years. The three thrusts of PAQT 97 are:

- *Better serve the customer;*
- *Better enhance the value of staff and their competencies;*
- *Better manage the economic and financial constraints.*

³³ ISO 8402 : Quality management and quality assurance-Vocabulary. Second edition-1994, pp.15-16.

³⁴ Internet :<http://www.iso.ch> : Introduction to ISO.

³⁵ ISO 8402 : Quality management and quality assurance-Vocabulary. Second edition-1994, pp.15-16.

³⁶ Société d'Economie Mixte des Transports de l'Agglomération Grenobloise (SEMITAG), BP 258, 380444 Grenoble Cedex 9.

Quality is the common denominator of the three approaches. They include some elements of a Total Quality Management approach: the customer approach, the greater concern of the workforce for the business and a more efficient use of resources. Inside these three approaches, 8 main objectives have been defined for the period 1993-1997.

Approach 1:

- *Finishing the South-North extension;*
- *Opening of a new depot;*
- *Launching a quality process;*
- *Improving service quality;*
- *Certification.*

Approach 2:

- *Modernisation of operational structures;*
- *Individual assessment interviews;*
- *Optimisation of the organisation and working time arrangements.*

Approach 3:

- *Installation of a decentralised budgeting systems ;*
- *Installation of a new ticketing system.*

Certification is thus a major objective of the management plan for the period 1993-1997. Nevertheless, it is only a part of the quality process of the company. The quality process, a major theme of PAQT 97, has two aspects:

- action for the improvement of customer service quality;
- action for the improvement of internal operations with the objective of being ISO 9001 certified.

The first part of the quality process has been split into three phases:

- a satisfaction survey to identify customer expectations and their opinion on the service (September 1993);
- a service commitment to the public with a charter and quality objectives (March 1994);
- a change in existing practices in order to reach the objectives defined (from 1994).

Example: the ISO 9000 certification of STIB-MIVB (Brussels).

In order to stimulate the different departments of STIB-MIVB to progress towards total quality and to reinforce the competitive position of STIB-MIVB in preparation for any possible liberalising Directive or Regulation of the Council, STIB-MIVB decided to get certification based on ISO 9000 standards.

Instead of having all the departments of the company certified in the same period, STIB/MIVB managers decided, in close co-operation with the Quality Department of the company, to select a reduced number of departments in the first instance. The criteria used for this selection were:

- Volunteer basis and involvement of managers;
- Representativeness of the different departments;
- Involvement of the different departments in direct customer contact.

Four departments are certified or under a certification process:

- The department responsible for passengers assistance in case of metro breakdown (ISO 9002 certification foreseen for March 1998);
- The workshop for tramcar bodywork (ISO 9002 certified in December 1997);
- The department Security - Hygiene – Ergonomics (ISO 9002 certified in October 1997);
- The drivers' training centre (ISO 9001 certified in December 1997).

A cumulative effect is expected inside the company and other departments are being attracted by management practices implemented in the departments already certified. It seems that decision-makers in other departments of the company are keen to receive information about the management practices of the certified departments. A benchmarking process is also under way.

4.4.2. Quality management standards: standardisation of the management process

ISO 9004 (parts 1 to 4) is a quality management standard. Quality management is defined by ISO³⁷ as “all the activities of the overall management function that determine the quality policy, objective and responsibilities and implement them by means such as quality planning, quality control, quality assurance and quality improvement within the quality system”. The management standard deals with process management inside the company. ISO 9004 standard provides a reference for quality management (guide of good practices) and does not involve certification.

Example: the implementation of ISO 9004/2 by STIB/MIVB in Brussels

The quality management process as applied by STIB-MIVB is based on a simple leitmotiv “Satisfaire le client au juste prix - Voldoening voor de juiste prijs”, meaning “customer satisfaction at the right price”. Four major items can be identified:

- fulfilment of the expectations of the region;
- continuous research and measurement of quality for client services;
- use of a common and customer-orientated language inside the company;
- search for the best relationship between the different interests.

Four underlying principles are that:

- monitoring the development of satisfaction should be a first priority;
- any activity should contribute to a recognised outcome;
- the company must function in harmony with its environment;
- the company can only change when the complete community is involved.

The approval of the above quality policy was contained in the first management contract signed between the government of the Brussels Metropolitan Region and STIB-MIVB. This contract, which was valid for four years (1991 - 1994), indicated the tasks STIB-MIVB had to fulfil and required STIB-MIVB to satisfy the customer, to search for the highest cost-effectiveness and to set up a progressive quality system based on ISO 9000-standards.

³⁷ ISO 8402 : Quality management and quality assurance-Vocabulary. Second edition-1994.

A. LOTS training (Logical Thinking System)

The general management started a training cycle intended for all members of the staff, top to bottom. The LOTS method (Logical Thinking System) imbued every participant with:

- one message: the customer is at the centre of the business;
- a management technique;
- a common language.

As an exercise, each group had to study and develop an improvement project for some activity within the company. The training of 5,500 STIB-MIVB members, divided in four major categories (executive staff, employees, drivers, technical staff) took place between 1991 and 1996.

B. Functional analysis

A functional analysis of all the company's departments was started in 1992. It consisted of:

- the definition of the functions carried out by each department and section and of the services they provide;
- the classification of these functions on the basis of customer expectations;
- the organisation of discussions between the departments and users;
- the validation of the functions in comparison with the tasks assigned to STIB-MIVB.

The tasks specified in the contractual agreement signed in 1990 were slightly changed and refocused in the second version dated 1995. The specification of STIB-MIVB missions comprises:

7 customer functions (CF) for STIB-MIVB:

- transport;
- sales;
- action vandalism and criminals;
- fraud protection;
- transport co-ordination (with other companies);
- collaboration with the ombudsman;
- knowledge of the existence of the users' consultative committee.

4 resource functions (RF):

- human;
- financial;
- technical;
- resource specific.

4 functions for the environment:

- Regional;
- Municipal, Federal and European Authorities;
- Maintenance of the infrastructure;
- Respect for the community.

3 tasks delegated by the Region (TR):

- Realisation of a network infrastructure works;
- Support for the mobility policy of the Region;
- Availability to the Region of particular STIB-MIVB competencies.

Following this, an inventory of each function was carried out. Over 800 products/services have been recorded with, for each of them, an identification of several beading such as the ordering, the frequency, the volume, the supply delay and the users.

C. Process control

Each product/service or group of products/services is the result of a process, which is a succession of activities from recognition of the need and concept to final completion. The description of those processes, which often involves activities exercised by several company departments, required the development of a transverse vision of the company, which did not exist yet. The updating of each process was made by a coordinator in collaboration with the managers or responsible staff of all relevant activities, who had to be made aware of the interaction and interface between all the departments involved. About a hundred processes have been identified, to decide on "who is responsible for what?" as well as on the criteria on which the staff involved had to agree (quality, quantity, time).

With the knowledge of the company functions and the formalisation of the various processes, measurable indicators were established for each function, enabling the creation of the quality needed to assure the function. The STIB-MIVB quality manual summarises the 18 basic functions, realised by about a hundred processes and 800 resulting products/services.

4.4.3. Output standards: standardisation of output characteristics

This concept consists in the definition of the characteristics of the product. Credit cards dimensions and photographic film sensitivity are the most famous examples. In the service sector, the idea is the same: the standard defines the characteristics of the service. In public passenger transport, AFNOR³⁸, the French organisation for standardisation published in April 1997 a French standard (ref. NF X50-805) entitled "Quality within transportation services – Identification of the quality criteria for passenger transport". It constitutes a unique example of output service standard laid down for public passenger transport.

The standard gives guidelines on how to develop a comprehensive process of quality management starting from the identification of customer expectations, then defining service specification on the basis of the expectations identified and other external and internal constraints, then producing the service and checking if targeted objectives are fulfilled, and finally checking how the service is perceived by the customer leading to the revision of service specifications if necessary.

Example: The service certification of three RATP bus lines

RATP is, since 27 February 1998, certified for the service of three bus lines. In accordance with the French decree n° 95354 of 30 March 1995, which outlines the terms for service certification, a frame of reference has been drawn up and approved in conjunction with all interested parties, namely: two groups representing passenger and consumer interests, the organising authority, an official from the Ministry of Transport, the certification board and representatives from RATP.

³⁸ Association Française de Normalisation.

At the request of the organising authority, the *Syndicat des Transports Parisiens* (Paris Transportation Agency) the frame of reference is to be applied to all bus services in the Ile-de-France region and not just those operated by RATP. The frame of reference is flexible and includes the following:

- ❶ 14 service commitments of which 9 are generally applicable and 5 are line specific. The 9 general commitments must be applied to each bus line in the Ile-de-France region seeking certification. The line specific commitments are to be drawn up individually to take into account the characteristics of each line. All the commitments must conform to the French standard NF 50-805 and must, in addition, cover all groups of criteria belonging to the standard.

RATP's 14 service commitments:

- Distance information services
- Information at points of sale
- Information at bus stops
- Information at bus stops during service disruption
- On-board information during service disruption
- Driver behaviour
- Regularity / punctuality
- Comfort / rate of occupancy
- Fight against fraud
- Driver appearance
- Bus reliability
- Fight against pollution
- Clean bus stops in good condition
- Clean buses inside and out

Each commitment carries with it:

- A reference service
- A targeted level of achievement
- Unacceptable situations
- Responses to unacceptable situations

- ❷ Methods used to measure and calculate results for each commitment as well as a description of how measurement is organised (Who is responsible for what).
- ❸ Organisation of the implementation of service.
- ❹ Methods of control and auditing applied by certification body.
- ❺ Passenger information regarding the commitments.

The certification body is responsible for a number of checks, including:

- The relevance and effectiveness of the system of measurement
- An assessment of whether the delivered quality matches commitments

The certification body must also analyse any customer complaints it receives and has the right to conduct passenger surveys. Certification is renewable annually and is subject to a follow-up audit.

4.4.4. The standardisation and certification of UPT services in practice

At system level:

The UPT system can be considered as a co-ordination of different service providers: the responsible authority, transport operators, traffic management and highway controllers. The management of the system needs to be optimised:

- in order to exploit as efficiently as possible the competencies of the different bodies in the system at the production stage;
- in order to guarantee an efficient co-ordination of the bodies involved.

The final objective is to organise an operating system guaranteeing the provision of the best possible performance for the customer. In this framework, ISO 9000 standards can be useful as guiding principles.

Quality systems and quality management standards provide conceptual and managerial frameworks that guarantee efficient concept for the operating system and efficient co-ordination of the different bodies involved in the UPT system. An example of system certification exists in Grenoble where the SEMITAG network is ISO 9001 certified.

Output standards can also be defined at the level of the total transport system. Together, the different bodies of the UPT system can define the specifications and the characteristics of the service to be provided. These criteria can be formalised in a document: as a standard.

The implementation of the concept of output standard at the level of the system is a major benefit. All the bodies responsible for the quality of the service provided can be involved in the definition and can be encouraged to express a degree of commitment relative to the quality of the output. Implemented at the level of the actors taken individually, the concept can show weaknesses due to the partial mastering of the production process by the different actors.

At the level of the transport operator

The views expressed above about the transport system are also valid with respect to the transport operator. Quality systems and quality management standards provide conceptual and managerial frameworks that guarantee efficient development of the operating system of the company and more efficient co-ordination inside the company. Several examples of the implementation of ISO 9000 standards and ISO 9000 certification exist some of which have already been described.

Within the authorities:

In this context, the Quattro research did not identify standardisation or certification as an accepted practice. The comment made about operators above in respect of quality systems and quality management standards is equally valid for authorities.

In respect of output standardisation and certification, it is important to insist on the issue of responsibilities for service quality. Responsibility sharing and allocation between the different bodies in the transport system condition their influence on the characteristics of the service and thus on the level of quality. Service standardisation is then only possible as the result of a global agreement between all the bodies involved in the production of the service. An authority can play a major role in the process if it is also in charge of the co-ordination of the transport system.

4.5. Quality partnerships

4.5.1. The quality partnership

The concept of “quality partnership” is relatively recent in the public transport sector. It first appeared in the UK in the beginning of the nineties as a consequence of the deregulation and privatisation in 1986 of the UK Bus Industry (outside London). In fact, the need for quality partnerships is a direct consequence of the reduction in service co-ordination in public passenger transport that followed deregulation.

The initial outcome of deregulation was to produce a marked lack of ability of the Passenger Transport Executives in conurbations and the County Councils and Unitary Authorities elsewhere, to influence the way in which the inter-modal facilities and the numerous support facilities for passengers (e.g. bus stops, bus stations, information services) were maintained in conditions appropriate to the local circumstances.

A review of the deregulation process conducted in Parliament in 1992 indicated substantial dissatisfaction with services but also much criticism of other facilities by customer representatives as well as operators. The need for partnership in the passenger transport sector is a direct consequence of the fact that different bodies are involved in the production chain. Service quality thus depends on the competence and the co-ordination of many participants. For example, the speed of buses depends on the type of bus (technical specifications), but also on the characteristics of the network (number of stops, priority at crossroads, protected corridors,...). Many of these functions are under the responsibility of different bodies. Poor quality of the service is often a direct consequence of a lack of co-ordination between authorities (bodies in charge of the organisation and the co-ordination of the service) and the operators.

The Department of Transport which, through the Minister is responsible for local transport and bus services, has requested the Passenger Transport Executives and the County Council to consider improvements to overall service by improving relationships with the operators.

The partnerships are implemented with:

- “commercial bus” service operators;
- “supported” bus service operators;

with new developments so as to include “franchised” rail operators.

The agreements cover the provision of “ground” infrastructure and information systems by the Authorities in return for the support of operators seeking to provide higher standards of operation and higher quality vehicles. In addition, operators must be committed to provide information on service levels and changes and timetables outside the statutory framework for commercial services. The Operators are also encouraged to co-ordinate service provision at interchange points with operators with whom they are not in competition.

The benefits and drawbacks of the scheme itself are that:

- customers and passengers will benefit from improved local infrastructure and arrangements for intermodal transfer as well as enhanced information systems and facilities;
- a partnership has no legal enforceability and no direct return on investment for the Authority is possible whilst the Operator can capitalise on the improved service infrastructure to increase viability and profit margins;
- the improvements visible to the customer will tend to be credited to the Operator and the inadequacies to the Authority;
- the “lower quality” operator may benefit disproportionately to the value his company can contribute to the operation. There are no minimum standards of entry into the market in excess of those prescribed by various laws and structures.

4.5.2. Travel partnerships in the UK

Following the initiative by the Passenger Transport Executives and County Council with strategic support (but limited financial incentives from HM Government), useful discussions have taken place and a few schemes have been introduced. Schemes have been initiated in:

- Merseyside (where bus timetables and information have hitherto been very poor and ineffective) to improve information and facilities.
- Hampshire (Southampton) with the ROMANCE real-time information system utilising GPS equipment for bus location finding.

In each case support funding from European and worldwide Agency sources has been used to initiate the projects.

The Travel Partnership scheme was originally proposed by HM Government and subsequently the concept was supported by the Chartered Institute of Transport (CIT) in its publication “Bus Routes to Success” (1993).

The 1994 Royal Commission report also identified many measures which would improve the quality of the bus network.

The Travel Partnership can address many aspects of these requirements but, because of its one sided nature, does not guarantee the full commitment of operators to its principles and practice.

It is therefore the view of the Passenger Transport Executives and County Councils that the principles of Travel Partnership will require legislation as part of a modification of the 1986 Deregulation Act for Buses.

The current UK Government is considering legislation to solve the problems. The Passenger Transport Executives have preferred proposals for changes in legislation:

- to facilitate route or network tendering within the existing deregulated framework;
- to improve vehicle quality;
- to stabilise service provision;
- to improve infrastructure control by Authorities;
- to facilitate through-ticketing and inter-modality;
- to facilitate franchising.

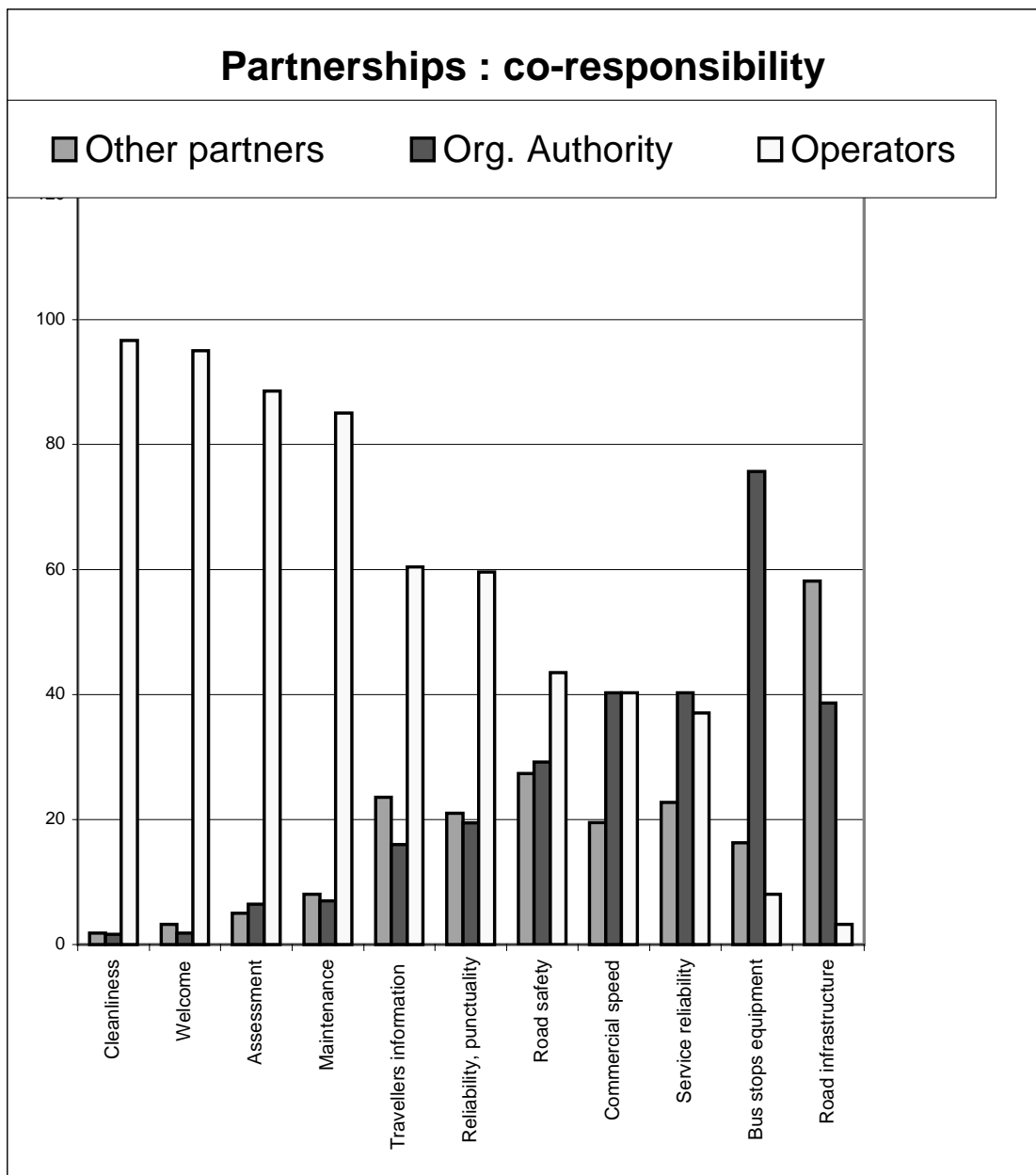
Quality partnerships can be considered as an additional instrument with respect to existing contracts. Their role is to fill the gaps and deficiencies existing in current contracts as well as in the new organisational structure that appeared after the deregulation. Bilateral contracts between a responsible authority and different operators has led to a disintegration of the service. One of the major objectives of quality partnerships is to bring more integration in the present systems. Most recent developments in Manchester, UK, have seen the concept of “partnering” introduced through the various interested parties forming a limited Company to jointly facilitate the improvement of public transport services.

4.5.3. Fields for partnerships in France

Figure 28 a: Partnerships between Authorities and Operators

	Other partners	Org. Authority	Operators	
Cleanliness	1,79	1,61	96,60	100,00
Welcome	3,22	1,79	94,99	100,00
Assessment	5,01	6,44	88,55	100,00
Maintenance	8,05	6,95	85,00	100,00
Travellers information	23,56	16,00	60,44	100,00
Reliability, punctuality	20,97	19,46	59,57	100,00
Road safety	27,37	29,16	43,47	100,00
Commercial speed	19,50	40,25	40,25	100,00
Service reliability	22,72	40,25	37,03	100,00
Bus stops equipment	16,28	75,67	8,05	100,00
Road infrastructure	58,14	38,64	3,22	100,00

Figure 28 b: Partnerships between Authorities and Operators

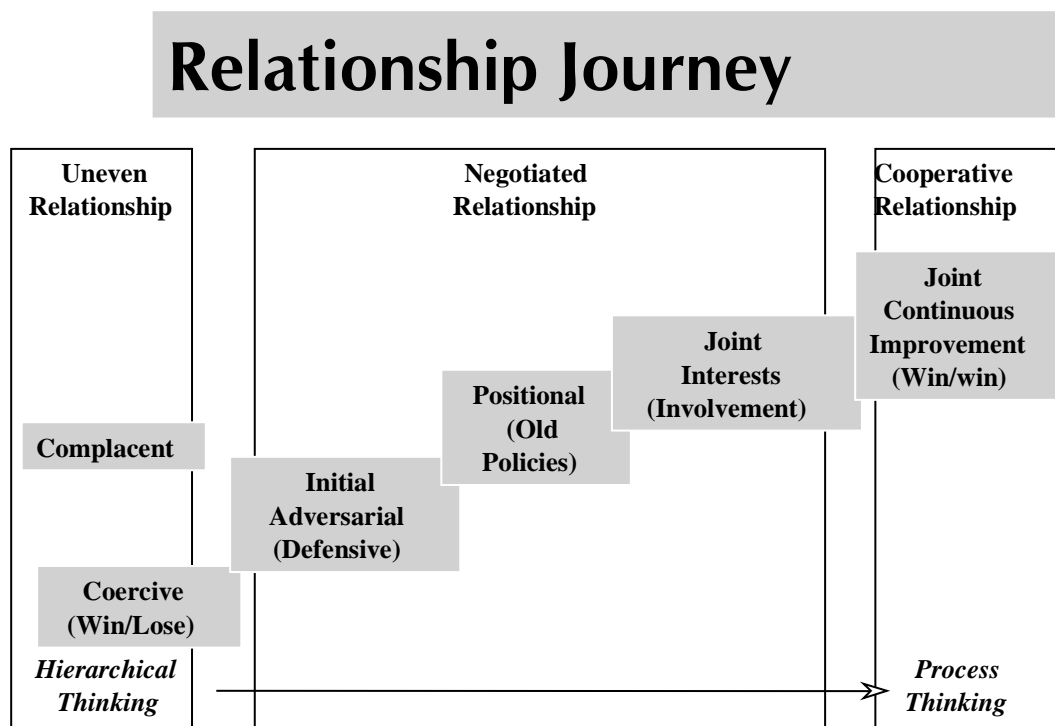


Source: Study of Union des Transports Publics

4.5.4. Relationship journey

Partnerships can be considered as the final step of an evolving process of relationship. EFQM, the European Foundation for Quality Management, presents the “Relationship Journey” as the move from a situation of “Uneven Relationship” to a “Co-operative Relationship” passing through a stage of “Negotiated Relationship”. The three diagrams below present the move from a “win-lose” to a “win-win” situation, identifying the possible critical situations and listing the characteristics of relationships which will produce a level playing field. The diagrams are reproduced with the authorisation of John Carlisle Partnerships.

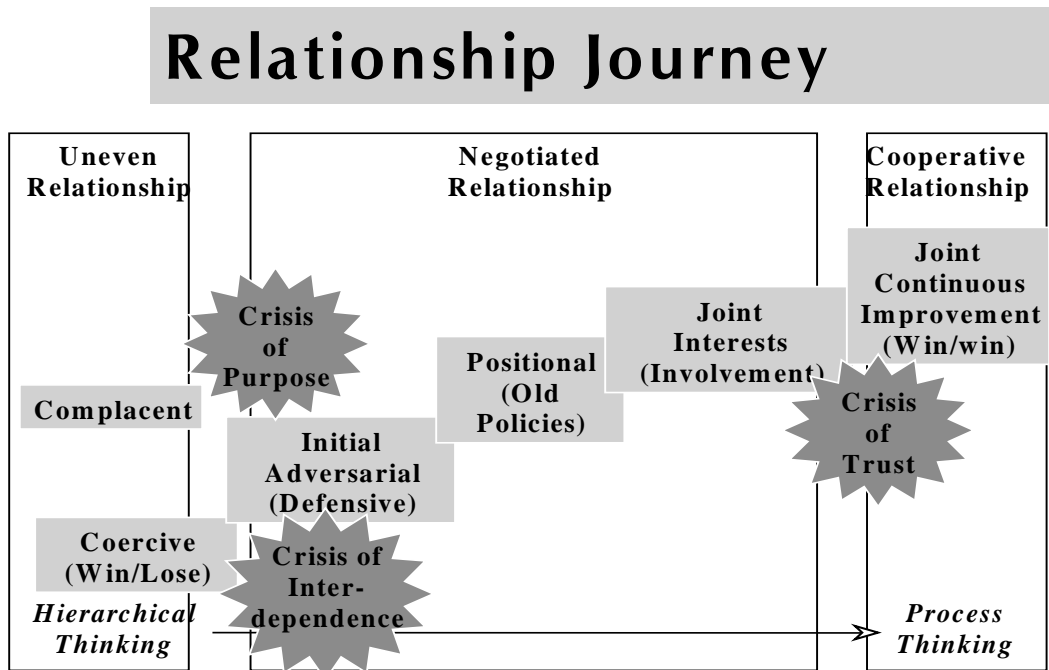
Figure 29 : Relationship journey



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Source: John Carlisle Partnerships

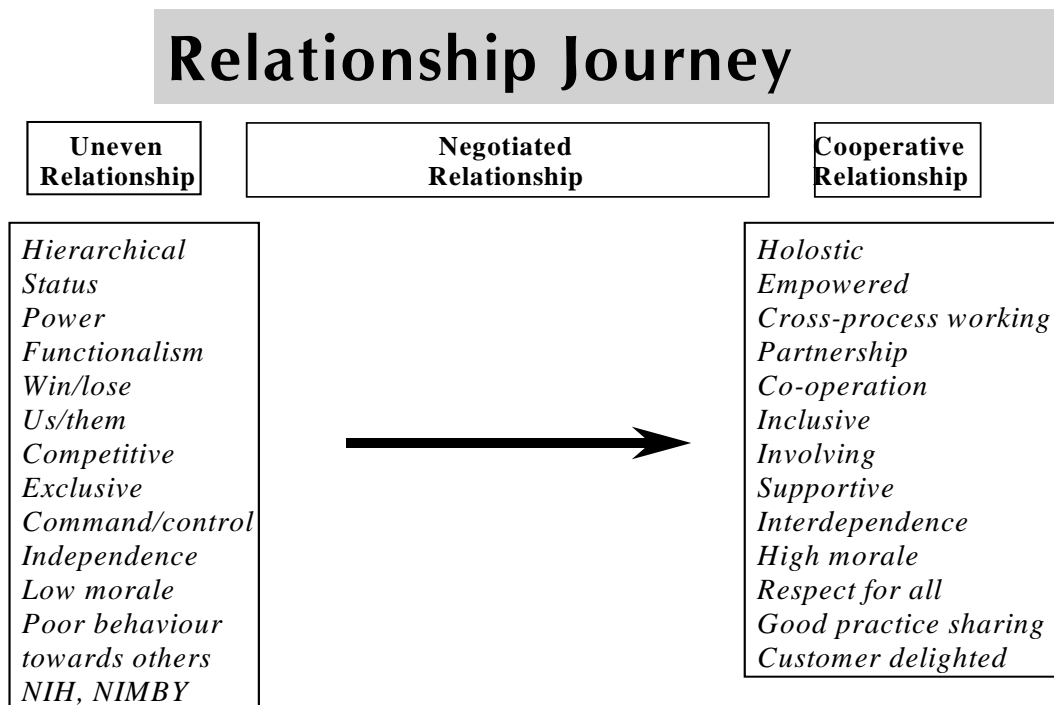
Figure 30 : Relationship journey



Copyright John Carlisle Partnerships

Source: John Carlisle Partnerships

Figure 31 : Relationship journey



Copyright John Carlisle Partnerships

Source: John Carlisle Partnerships

Example: City of Birmingham - route 33

The jointly managed “Quality Bus Showcase Project” - with the marketing title of “The Line” - has been in operation in Birmingham since early 1997. The route is a commercial operation by Travel West Midlands Ltd. and runs from the Birmingham City Centre on a 13 km route along the A34 Walsall Trunk Road (via Aston University, Newton, Six Ways, and the One Stop Shopping Centre to Perry Barr, and then via wide secondary roads built in the 1930’s to Kingstanding and a large post - 1945 Housing Estate - The Pheasey Estate in the Walsall Metropolitan Borough Council area.

There are 15 new floor accessible kneeling Volvo buses with 30 dedicated drivers, specially trained in customer care and disability awareness, to ensure adequate cover. There is “real time” hi-tech travel information on both audio and screen display in the vehicles and the bus stops. These newly created bus stops have special kerb stones shaped to enable buses to snuggle up against them, without causing the tyre damage that occurs from standard kerbs. They are imported from Kassel in Germany. Bus shelters are fully lit and are specially designed to accommodate wheelchairs.

The route is intended to use as much as possible of the 24 hour bus lanes and traffic signals with bus priority along most of its route. The main intention is to make bus travel more attractive to the car users in the hope that it will reduce traffic congestion. Route 33 is the first of its kind in the Midlands, the cost being financed by a joint venture between Birmingham City Council, Walsall Metropolitan Borough Council, Centro, Travel West Midlands and some EC funding through the UK Department of Transport. There has therefore been joint investment between the Operator (TWM) - who have provided new low floor vehicles and dedicated, specially trained drivers - and the Authorities who have upgraded and enhanced the bus infrastructure and adapted traffic management facilities.

For a Partnership in respect of a Commercial Operation, the results have been spectacular. The rise in customer satisfaction and acceptance of the traffic management measures has been high and will be fully monitored after a 12 month period. The ridership in the first 6 months of the scheme has risen by 26% and this has provided great encouragement to all concerned.

Example: Shropshire / town of Shrewsbury - park and ride

Shrewsbury, the County Town of Shropshire, is a small, attractive medieval town on an island site almost surrounded by the River Severn. The town has had a long history of difficulty with the conflict between the private car and public transport in narrow, historic streets.

Shrewsbury is like many other historic towns in having a conflict of interests. It wants to encourage more people into the town to use the shopping facilities whilst trying to retain the character of the town without giving it over to private cars. To this end the Shrewsbury Traffic Management Working Group was set up with officers of the County and Borough Council seeking to find solutions to the problems of getting people into the town and retaining its character. The Group soon realised that Park and Ride in conjunction with other traffic management measures could be the main answer to the Town Centre problems.

This proposal was accepted by both authorities and the sum of £80,000 was allocated on a 50/50 basis to establish a six day week park and ride from Harlescott Cattle Market site to the north of the town. This was seen as the best site for an initial six day service as the car park was available for 700 cars on five days a week and even on Market Days well over 400 spaces would be available.

In April 1991 tenders were issued for the new six day a week Harlescott Park and Ride. The tenders included a very tight vehicle specification as a previous criticism of the scheme had been the high floor coaches used. Two options were given for Harlescott both to a similar specification to London Transport schedule X and giving full DIPTAC disabled passengers specification. One was for new vehicles and the other was for vehicles under ten years old. In both options vehicles were required to be painted in a new "Shrewsbury Park & Ride" livery.

The contract for the six day Park & Ride service was won by Williamson's Motorways of Shrewsbury who purchased two Carlisle bodied Dennis Darts to operate the service in the distinctive Blue and Yellow Park & Ride livery chosen as these colours are those of both councils involved and are not used by any other operator in the Town.

The revised scheme was introduced on 9th August 1991. New Park & Ride specific stops were put up throughout the town and a large shelter and information board was erected at the Harlescott site along with remarking of the car park. At the official preview of the service the vehicles were well received and after the preview a display was mounted The Square in Shrewsbury to show the vehicles to the public and distribute publicity. A large amount of publicity was produced and distributed throughout the town and displayed in a large number of shops.

The figures for the first week were very encouraging and on the Friday and Saturday of the first full week of operation Shrewsbury Flower Show took place and additional vehicles were put into service. Over 1,800 passengers were carried each day, an increase of 805 over the previous year. The new scheme proved so popular that a third dedicated vehicle was purchased in August 1992 to increase the frequency to every 10 minutes.

After the success of the six day service from Harlescott to County and Borough Councils began to seek for a permanent car park to the south of the Town. A number of sites were considered and a site near new superstore at Meole Brace on the A49 was chosen.

Shropshire County Council design team set to work to design a purpose built Park & Ride site in close discussion with the Public Transport Unit and the Borough Council who had experience of the operation of the site at the Harlescott Livestock Market. The final design incorporated a bus only turning area, closed circuit television surveillance, pedestrian priority within the site. The final design incorporated within the site parking for 490 cars with space for expansion to 690.

Tenders were issued for the construction of the new site and operation of the bus service. These were won by Shropshire County Contracting and Midland Red North respectively. The contract for the bus service was awarded for Scania MaxCi low floor buses with body work by East Lancashire Coachbuilders.

The service was commended on Tuesday 1st November 1994 after an official opening by the Chairman of the County Council and the Mayor of Shrewsbury and Atcham. After four weeks of operation the service was carrying approximately 3.000 passengers a week (equivalent to keeping 320 cars a day out the Town Centre) with weekly growth of 27%.

This success led to further introduction of “Park and Ride” services between principal approach points to the town and services now run 6 days per week at 10 minute intervals. Each uses Super Low Floor Buses in a dedicated livery and operated by drivers from Midland Red North Co who are specially trained in customer care and assistance. The vehicles are maintained by the same bus company.

The standard Monday - Friday services require 9 - 10 vehicles, Saturday 14 - 15 vehicles and for major town events 20 vehicles. At present some supplementary services may not be low floor but it is guaranteed that alternate vehicles will be of low floor design.

The services currently cost 65p per person including free parking and is operated under a subsidised contract. The current subsidy is about £200,000 per annum but is falling as the services become established. The contract also provides that any vehicles not required on a day - to - day basis for “Park and Ride” will be used on normal town services to benefit, in particular, the local inhabitants without cars and with mobility problems.

The principal benefits have been:

- A reduction in on - street parking in the town centre.
- Up to 1.000 cars daily parking on the edge or town.
- Ability to create a “slow - speed” traffic circulation through the town centre, and encouraging buses and discouraging cars .
- Permanent closure of the pre-Christmas “in town” temporary car parks.

Other examples

Country: Italy

Partners: Region of Emilia-Romagna, the province of Bologna, the Municipality of Bologna and the public transport companies.

Objectives: Parties are aware of the negative consequences of the increase in private traffic, especially in urban areas and the difficult financial situation public transport is facing, and they recognise the need to improve mobility, to make access to services easier, to integrate transport services, etc. They go on to stipulate that they would accept agreements at a second level (service contracts) and to co-ordinate the financial provision (regarding operations and investments) of all participants. The service contracts regulate the rights and obligations between local authorities and public transport companies. In general little emphasis is general is placed on the quality issue.

Country: Portugal

Partners: Municipality of Évora, Operator and the private company of parking meter.

Objectives: In the city of Évora, south of Portugal, a quality partnership agreement is being developed between three entities: an authority (municipality of Évora), a bus operator and a private company operating parking meters. Through this partnership the municipality aims to promote conditions for a sustainable mobility through the limitation of private cars in the city centre and simultaneously promote urban public transport. To achieve these aims some measures have been introduced in several respects, since the idea has been launched³⁹:

These are:

- * parking - creation of several peripheral parks (free) outside the city and installation of parking meters inside the city;
- * road circulation - changes in the arrangements with a basic idea of making access difficult to the city centre but making exit easy;
- * urban public transport - the public transport is being improved through the use of small bus as service provision, readjustment of timetables and routes, service provisions, etc.

At the moment the tender document for selection of the operator is being prepared and will be launched in 1998. After that selection a company will be created between the three bodies, which must occur in the first quarter of 1998, with the objective of planning and managing overall urban public transport.

With the creation of this company it will be possible to cover with the revenues of the parking meters the losses of the UPT system.

Country: France

Partners: France Voyageurs, SNCF and Sceta Voyageurs.

Objectives: Promote the conditions for a sustainable mobility through the partners. Promote the conditions of networks, tariffs, creation of integrated information systems and promotion of the lines with interchange with the SNCF.

This involves the development of a quality charter that focuses on:

- * market analysis
- * frequency and reliability surveys
- * service surveys
- * staff roles and behaviour
- * customer welcome
- * customer information
- * timetables and interchanges
- * infrastructure interchanges
- * respect of the law
- * financial position of the partners

Country: Great Britain

Partners: Operators, Local Authorities and Traffic Commissioners

³⁹ For more information see WP1 - Best Practices.

Objectives: Raise the quality of services. It imposes duties on each of the parties.

Operators have to provide:

Vehicles of low floor where appropriate.

Vehicles that meet the latest emission standard.

Levels of service provisions which meet the locally agreed transport statement.

High quality staff with customer care training.

Modern fare collection systems.

Information provision including real time information.

High quality marketing of services.

Local authorities are asked to provide:

Regular meetings with local operators about local transport and traffic planning.

Traffic management measures.

Modern, accessible stops and bus station infrastructure.

Convenient interchanges.

Traffic Commissioners should ensure:

Licences issue subject to the above conditions.

Responsibility for registration and use of power to restrict services when needed.

A range of services which encourages the stability that customers want and simultaneously provide operations with flexibility to change services according to passenger requirements and the market.

4.6. Guarantee of service

4.6.1. Service guarantee and charters

The UPT user has a certain level of expectation and is not concerned with the way the service provider manages production activities in order to reach this level. The user is concerned with the service (Does the service fulfil its expectation?) and one of the main expectations concerns the reliability of the service (Can they expect the same level of service each time it is used?). Reliability is identified as one of the most important weaknesses of UPT nowadays.

In consequential, the questions are: How can the UPT user “trust” the service? How can the consumer of the UPT service be sure of what he will get for the money he pays? How can the UPT consumer be sure to reach their final destination well satisfied?

The concept of the service guarantee has been introduced answer these questions. An operator or responsible authority needs to guarantee the UPT user the service they will get. The guarantee must be applicable at every hour of the day and every season of the year and anywhere on the network.

A charter details the commitment to the customer; it sets out the standards to which the operator works, how it publishes its performance against those standards, how it looks after the customers and compensates them if things go wrong and indicates how they can contact the operator.

Charters can be classified into four categories:

1. The charter of intention which sets out general values and principles.
2. The charter of commitment which explains the formal commitments set up to establish the values and principles defined in the charter.
3. The charter of means which defines which actions will be taken to fulfil the commitments and, finally.
4. The “agreement” charter which details the rights and duties of all parties.

Some detailed examples of charters and commitments are given later in this section.

4.6.2. Charters and continuous improvement

Charters or travel guarantees are a means for Quality Improvement. They show very clearly which minimum level of service the public can demand from a public transport operator and what happens when these expectations are not fulfilled.

Example: Oslo Public Transport (OPT)’s customer charter:

Oslo Public Transport (OPT) implemented a very innovative system. The “Oslo customer charter” and the compensation scheme related are very different from other “classical” charters. It is the only charter that offers a compensation equivalent to the inconvenience lived by the customer. The objective of the customer of public transport is to reach its final destination. The Oslo Travel Guarantee ensures the customer that he will get to its final destination by covering the taxi expenses in case of service failure (see comment on compensation below).

The objectives of OPT were to increase the rights of their customers and offer compensation when disruption occurs, so as to make it easier for their customers to express themselves and suggest improvements and also to show how seriously service quality is taken. The internal effect of such a guarantee has been to show where quality can be improved. The guarantee applies to all operators within the Oslo Public Transport metro, tram and bus routes, including subcontracted bus routes. The Travel guarantee is an ongoing process for quality improvement, leading to more satisfied customers and not a project that is finished the day the guarantee was launched.

The Norwegian experience also illustrated “Eight points to consider when introducing a guarantee”. Those points are quite interesting for those who plan to introduce the same kind of document. They are:

1. Take time to convince the management. First, it is of vital importance that management is behind a guarantee.
2. It is vital to give good information to all employees. Any change in the Guarantee creates uncertainty. It is important to have continuous up-dating for everybody involved.
3. Allow plenty of time for the internal processes. It will probably take longer than you think.
4. Internal courses should be conducted professionally. Use outside specialists and staff with a good knowledge of the company.
5. There is sure to be a wide variety of opinions about a guarantee. Use surveys to test the different concepts and base further development upon these surveys.
6. Do not be afraid to introduce a guarantee. The consequences for the company are usually exaggerated. They estimated that the taxi refunds would be 1,3 million Norwegian crowns per year (most said that this was far too optimistic), instead they are paying 120,000 Norwegian crowns.
7. Use extensive and good marketing. Do not take media coverage for granted. By presenting the guarantee yourself you avoid misrepresentation or misinformation.
8. Do not lose momentum. Continue monitoring, develop and change the guarantee after the introduction to meet changing circumstances.

Since the introduction of the travel guarantee in Oslo, contract has been considerably improved with the customers at every level.

4.6.3. Compensations

If the level of service promised is not reached, compensation must be given to give more credibility to the commitment expressed in the Charter. Compensation can be considered under two approaches:

- Financial compensation: the principle of “satisfied or reimbursed”. The objective is to guarantee “what” the user will get for the money he pays. If the level of service is not reached, the customer gets his money back. This principle is common in goods purchase but not often developed for the service sector.
- Other compensation: there exist several examples of alternatives to the financial compensation. The objective can be to provide totally different compensation (gifts, free subscriptions, ...) or guarantee a minimum level of service (free taxi to reach its final destination, guarantee of reaching its final destination).

The following examples illustrate these two types of compensation.

Example: financial compensations at London Underground

The reimbursement system functions well at London Underground (UK) and illustrates the financial compensation concept very well. London Transport (LT) has two customer charters: the metro charter and the bus charter. Only the metro charter includes a payback system.

The metro charter is presented in a simple and practical form. The commitments expressed in the charter concern the train service (it must be « *fast, frequent and reliable* »), stations (they must be « *welcome, clean and safe* »), information (it must be « *updated* ») and staff (they must be « *polite and courteous* »).

The charter includes a compensation clause «*equivalent to the value of the trip during which the delay occurs*». The compensation is made by a refund voucher in case of delay more than 15 minutes «*due to the responsibility of LT*». The charter includes a complaint form to be completed by the complainant. In addition to general information (details), the complainant must provide his ticket as proof of the delay. More than 250.000 refunds are made every year. The annual cost of the operation is less than 0,9 million ECU against a total income of 1,1 billions ECU.

Example: The “Sporveiens Travel Guarantee”

The “Sporveiens Travel Guarantee” of Oslo (NO) represents an alternative to the concept of financial compensation. It ensures the customer reaches its final destination. In case of delay of more than 20 minutes due to the failure of Oslo Sporveiens (OS) the main operator, the company covers the cost of a taxi for a maximum amount of 200 Norwegian crowns (25 ECU). Launched on 11 April 1994, 70.000 customers claims related to the travel guarantee had been received by December 1996. The total amount of reimbursement was 1,9 millions of Norwegian crowns (250.000 ECU).

4.6.4. Service guarantees and contracts

The service guarantee is a contract in itself between the bodies responsible for the production of the UPT service (authorities and operators) and the final customer of the service (the users). By the way of a service guarantee, the authorities and the operators commit themselves to offer a certain level of service.

In the contractual relationship between authorities and operators, service guarantees can be considered as a standardisation of a minimum level of service quality directly related to the production capacity of the system. For both the authority and the operator, the inclusion of a clause related to a service guarantee in the contract implies the availability of the system to fulfil the commitment expressed in the service guarantee and in consequence commitments of the different bodies involved in the production process. Service guarantees can then initiate a process of commitment and responsibility of the bodies and increase and improve the relations between the bodies.

5. Quality applied to tenders and contracts

5.1. Motivations

5.1.1. Methodological background

In this chapter, we investigate in more details the inclusion of quality aspects in contracts and tenders. Our objective is to propose a guide for authorities and operators wanting to improve the sensitivity of their tendering and contracting processes to issues of service quality.

Quattro's Deliverable 3 extensively describes the integration of quality aspects in contracting and tendering procedures. The present chapter mainly focuses on basic principles as well as on the most essential instruments. The objective is to provide the authorities and operators wishing to include quality targets in these processes with a useful guide for doing so. In WP3, we identified different scopes of contract, all within the boundaries of infrastructure design and operations. Reference has been made to the use of various legal frameworks and to a series of measures available to optimise quality (Chapter 6 of Deliverable 3 of Quattro). These measures depend very much on the type of legal framework considered (See section 1.4.). Some models involve considerable constraints whereas others rely mostly on market based initiatives to produce the desired level of quality.

Contracts may also differ significantly in the way they allocate risks among the parties involved. Net cost contracts (production and revenue risks are borne by the operator), gross cost contracts (only the production risks are borne by the operator) and management contracts (originally, all risks borne by the authority) represent a basic classification. However variants and combinations exist including clauses on rewards and penalties and shared risk. Moreover, other types of risks exist. Especially in long term arrangements, which sometimes cover the whole lifecycle of a (sub)system, other risks are involved, in political, environmental, financial and administrative fields and in land use planning

WP3 also reviews the life cycle of a tendering procedure (Chapter 7 of Deliverable 3). The following elements of the procedure are presented using practical examples:

- the tender invitation document, including methods for pre-selection and pre-qualification;
- the offers or bids prepared by bidders;
- the procedures used for the evaluation of bids and the award of the contract, including such aspects as non compliant bids and negotiation processes;
- the contract and its annexes as well as the administrative and review procedures associated with them.

The focus is on the use of quality in all the different stages of the tendering procedure and in relation with quality management principles.

A broad approach has been chosen which does not only include the operational aspect of the sector but also examines its strategic and tactical levels of decision (the design and planning stages). Drawing from the quality circles approach, the management of quality in public transport is recognised to be a continuous process. Where applicable, this view is extended to the analysis of contracts and tendering procedures.

WP 3 also investigates the links that exist between the legal (and organisational) framework and the application of quality elements. The instruments available for optimising quality are identified in relation with the different organisational models. Eight forms of practical contract applications are identified and these forms are described and illustrated with examples. The scope of these illustrations is particularly broad and includes applications in which the design of the network and the provision of infrastructure are part of the tendering procedure, such as in BOT contracts.

Finally, WP 3 provides a description of the stages that usually constitute tendering procedures and of the way quality criteria are integrated in these stages. In this respect, WP 3 can be considered as a checklist for decision-makers in the field. In addition, we also provide a few examples of best practices. Because they are critical both in the design of tendering procedures and in the drafting of contracts, evaluation procedures constitute a key aspect of WP 3.

5.1.2. Tenders are essentially aimed at increasing the cost-effectiveness of operations

The objective is to obtain the best possible service for the subsidies invested in the UPT system or to make public transport sufficiently attractive so that it does not require subsidy. This implies that quality targets be set for UPT operators, beyond basic traffic requirements, and linked to the compensations granted to them. In other words, competitive tendering is essentially focused on the need to increase the cost-effectiveness of operations and to reduce subsidies. This can result in:

- similar services at lower cost;
- better services with altered routes and lowered costs;
- services from new operations with increased quality.

In practice, the aim is usually to maintain the existing level of service, but at a lower cost. The consequent release of physical and financial resources may enable the authorities to develop new services or to increase the overall quality of the already existing services.

However, other objectives than pure internal cost-efficiency are important in European urban areas and their achievement depends on the framework governing public transport. It is important to closely link any discussion on quality contracts to the basic economic structure of public transport. A system without subsidies may result in an inefficient use of capacity. On the other hand, a system with subsidies raises the question of how efficiently these public funds are being used. In other words, low subsidies in absolute terms do not necessarily imply high levels of efficiency and vice versa.

The main reasons for State intervention and public investment in UPT are the following:

1. Public transport is a “collective good” so that service improvements benefit all passengers while the resulting increases in traffic revenue only come from new passengers. The benefits involved for the system's initial passengers are therefore not taken into account by the profit-maximising company, unless it is able and allowed to price-discriminate, which is never fully the case in UPT.
2. “Marginal cost” pricing of public transport will generally cause public transport companies to run a deficit. The reason for this is that, because of the relatively high investments a transport system requires as compared to its operating costs, its cost structure involves substantial economies of scale.
3. Public transport may be considered to produce relative external benefits insofar as it represents an effective alternative to car traffic. The benefits of reduced car traffic are not included in the operating companies’ economic analysis.
4. Public transport also (like cars) cause accidents, consume road space and produce all manner of negative external effects on the environment that are not included in their internal economic analysis.

As far as the external costs of car traffic are concerned, it is possible, in theory, to devise a system with cost effective road pricing, both for private cars and public transport. In this situation there will be no extra benefit caused by changes in modal choices. However, as already indicated, high subsidy levels are no guarantee of market efficiency. Even in a system with “perfect” road pricing, there will be a need for subsidies to public transport. The first two arguments explain the reasons for an introduction of quality contracts in public transport, even in a situation without external benefits from reduced car traffic (optimal road pricing). Both free market solutions without subsidies and monopolies with fixed subsidy levels fail to deliver the economic incentives needed for operators to incorporate in the design of their services, the benefits of higher quality for existing passengers.

5.1.3. Fair competition

Fair competition is an important principle in tendering procedures. In WP3 the implications of this point are described with special attention to the bids evaluation procedure. In the evaluation process, the interests of all the stakeholders involved - citizens, tax payers, lower income groups, minorities, urban areas needing revitalisation, authorities, operators and last but not least passengers - should be considered. Another major difficulty is to include in the evaluation more intangible selection criteria such as, for example, the capability of the various bidders to develop and implement a coherent and effective TQM system. Asymmetries of information between authorities and operators or between different bidders can create serious problems too. For example, the informational advantage of incumbents in tenders for net cost contracts can lead to unfair situations and even dissuade most potential competitors to simply place a bid when they know that only the present operator has sufficient market information. In this case a procedure for a net cost contract is not possible and a gross contract or a management contract should be used. Informational concerns are therefore a critical aspect of any call for tender in UPT. Where a multi-criteria analysis is used to select the winning bid, the underlying priorities of the selection committee need to be clarified as much as possible for the bidders. This is an essential feature if one is to avoid subjective evaluations. The publication of a clear and explicit evaluation scheme also sends an important signal to the market as to the openness and fairness of the tender. This was recently illustrated by a tender organised by the city of Oporto. When it engaged in a tendering procedure for the design of a light rail system, it presented its selection criteria in the form of a decision tree.

5.2. A guide to service quality specification in tenders and contracts

5.2.1. The economics of quality: who is to pay for good quality?

The combination of increased pressure on cost-effective operations and the needs of public transport for continual product development imply that it is increasingly important to develop a system which encourages cost-effective operations. Consideration must be given to both the internal and external effects of the public transport service. This means that a “shadow price” will have to be calculated for those factors, which are not implicit in traditional subsidy contracts. This will apply to:

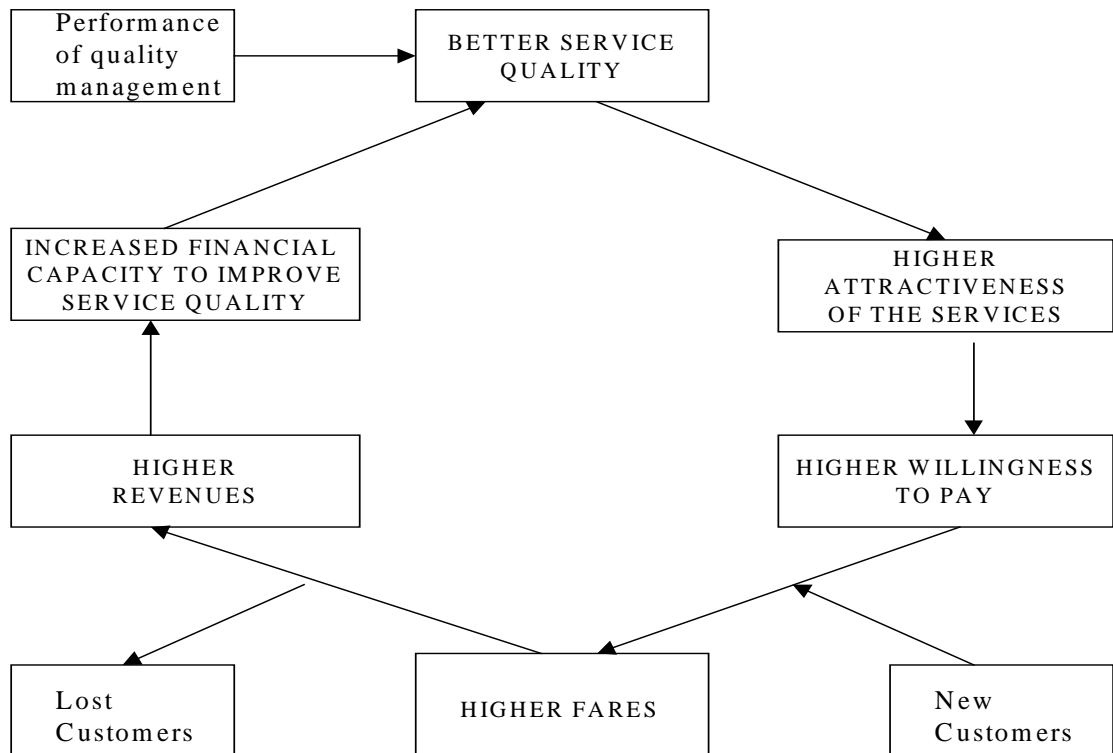
- Internal quality gains, i.e. the existing traveller’s use of an improved public transport service but which does not result in increased traffic income.
- External quality gains, i.e. those gains arising from traffic transferred from car to public transport through reduced costs associated with congestion and environmental costs from car use.
- External quality costs, i.e. external congestion costs and environmental costs from public transport, which can vary between tendered contracts for various modes of transport and quality of operation.

Given the multiple impacts of quality upgrades, the introduction of quality contracts becomes a question of who is to pay for good (or bad) quality - the public transport passenger, the authorities or the community at large.

In high quality systems, the customer is usually ready to pay higher prices but in practice, such systems initially require significant public investments in quality before the situation where customers agree to pay is reached.

A very positive outcome obtains when the customers' willingness to pay for quality is sufficient to cover the extra costs of raising quality standards. This situation which can be illustrated by the following “willingness to pay” circle. This circle represents the connections that exist between quality improvement, higher tariffs and higher ridership. The objective is to obtain the latter despite the higher tariffs. This is not always the case but it has been observed that, in general, good quality management usually produces high quality services, high ridership levels and high levels of cost coverage.

Figure 32 : The willingness to pay circle



Source: Quattro

5.2.2. The introduction of quality in contracts and tenders in practice

Tendering processes should result in the identification of the operator offering to provide the required level of service in the most efficient way. The first test to which bidders are submitted to therefore concerns their capacity to fulfil the requirements specified by the authority. Depending on the way the responsibility for service design is split between the authority and the operator by virtue of the tender, the operator will enjoy more or less leeway in improving the system's output. In certain cases, the operator has little or no control on this kind of decisions. Nevertheless, the tendering procedure should allow adequate information flows between the different decision levels so as to ensure that the strategic objectives are properly translated into tactical decisions and optimal market segmentation. A sensible segmentation of the market provides more opportunities to improve the specification of the service and may offer possibilities of sharing the responsibility for operations between different specialised operators. The method used to incorporate quality criteria into contracts is an important question. Three methods, which can be summarised as follows, exist:

1. the tendering authority defines the minimum standards of quality in the tendering documents;
2. the tendering authority uses preset quality criteria in evaluating the bids and selecting the operator. The quality of the various bids is used as well as their price in the selection process by attributing an additional cash value to the bids that announce quality goals in excess of the minimum standards;
3. the authority rewards good service and the operator has value deducted if during the contractual period, the levels of quality actually provided do not match the standards agreed in the contract.

The cash valuation of different quality criteria can be used in the two latter phases, that is, in the selection of operators and/or in the allocation of rewards and penalties during or at the end of the contractual period. Four different mechanisms can be used to attribute a value to quality:

1. each quality criteria is associated with a certain weight (%) in relation to the price of the tender;
2. the price of the tender is adjusted by a given cash sum for each quality determinant whose proposed level differs from the required level;
3. the compensations promised to the operator by virtue of the contract are decreased if the service delivered did not match the standards of quality which had been agreed in the contract;
4. the operator is given a reward/bonus depending on the rate of approval obtained for his services in customer satisfaction surveys.

The first two methods are used in the selection of operators and the last two during or at the end of a contractual period. The incentives deriving from the operator's interest to improve his traffic revenue could be regarded as a fifth way to stimulate the delivery of better services.

In the contracts studied in the framework of the Quattro project, the weighted value of quality in the selection of operators varied between 2,5 % and 14 % of the tender's value. Our survey also indicated that, in many cases, price is the only real selection criteria and quality variations do not play any role in decision making.

The penalties imposed on operators in case of failure to meet their contractual obligations are usually weighted by the costs inherent in the penalised services disruptions or service flaws, for example, by the costs of a delay or a cancelled departure. The rewards granted in case of good quality may add up to 2 or 3 % of the total value of the contract.

5.2.3. Quality under different organisational regimes

Following the fairly recent introduction of competition in UPT in many member states, the introduction of quality in tendering and contracting is still under development. Initially, most of the efforts made in introducing competition have been directed towards improving efficiency (reducing costs per vehicle kilometre and reducing subsidies). Only in a second stage were quality elements introduced with, as a main objective, to improve effectiveness (ridership and market share). This approach has resulted in considerable imbalances between the two critical aspects of performance, especially in the countries where the reforms have been most radical. However, under the regime of competition for concessions (limited competition), work to include quality aspects is now going ahead quickly and a number of deficiencies have started to be tackled more systematically.

Limited competition is one of the three main models of organisation identified in the UPT sector. The two others are the classical (regulated) and the deregulated regimes. Naturally, there also exist a number of hybrid regimes combining features primarily associated with different basic models. In the public sector, competition is possible (for instance by resorting to subcontracting) whereas in the deregulated regime, market-initiated services may be supplemented by tendering additional socially desirable services.

It is not an easy task to include quality elements in tendering procedures. One of the problems is the subjectivity of quality. Individual preferences are decisive. Furthermore quality is a moving target because needs, fashion and technology are changing, making relative quality change over time. It therefore needs proper preparation to organise fair and transparent procedures if it is decided to include quality aspects in a procedure. This demands a competent authority as well as competent bidders as the monitoring of the service becomes more complicated.

5.2.4. Quality in the design stage and in the operating stage

Most of the examples of tendering and contracting procedures concern the operational decision level. Comparatively, there is little competition in the design phase. The main reason for this is that these procedures are relatively simple to organise at the operational level, notably in terms of quality specification whereas they are usually fairly complicated at the design stage. Consequently, examples of contracting and tendering procedures including the design stage (tactical decision level) also exist but they are less common.

Within the design stage, a specific distinction exists between the procedures that include the building of infrastructure and the procedures that do not. The combination of a “design and build” contract with a contract concerning operations has the advantage that commercial viability objectives are more likely to be adequately taken into account in the design stage. A disadvantage is the long contractual period that can ensue as a result of the need to cover the lifecycle of the infrastructure: this reduces the competitive pressures to which the company is exposed during the operating stage.

An application of the possible combinations between infrastructure development and operations is the BOT contract (design, operate and transfer) and its variants. In general the concession period is long, in order to allow the consortium to recoup its investments. This type of contractual arrangement is used both in Britain and in France. In Britain, the initiative is left to the private sector and BOT contracts are used to raise funds for projects that otherwise would not be constructed. In France, the initiative usually results from a collaboration between the public and private sectors. Here, operating subsidies form part of the contract. Examples of BOT contracts are found in Manchester, Sheffield, Rouen and Strasbourg.

In most cases where competition is introduced in the operating stage, authorities are taking care of the design. As a result, no benefits (innovativeness, professionalism, etc.) can be expected from the introduction of competitive pressures at this level. The most simple mechanism used to account for quality aspects at the operational level is to define minimum levels of quality within the call for tenders. In addition, it is possible for the contracting authorities to take into account the proposition of higher or lower quality standards by some bidders in the selection procedure. All they have to do is to associate the proposed quality differences (with respect to the level suggested in the call for tenders) with monetary bonuses and penalties in order to achieve the desired quality/price ratio. The result is a multi-criteria evaluation procedures in which each quality determinant is associated with a rating and with a weighting factor. Quality determinants commonly used in tenders and contracts are the accessibility of vehicles, the environmental-friendliness of vehicles, the comfort of vehicles, the existence and development of quality programmes and of customer charters within the company, the quality of the planned customer information and so on.

5.3. The enhancement of service quality beyond specification and bid selection issues

In order to stimulate the delivery of UPT services that offer the best combination of internal gains and external costs and benefits, public transport authorities need to stimulate service quality beyond what operators would normally provide in the absence of regulatory interventions. This can be achieved through a variety of instruments including quality contracts, Customer Charters and economic incentives, to name but a few of the tools which have been developed and increasingly used in recent years.

5.3.1. Standardisation

At the time of finalising this report, the process of standardisation of quality elements in UPT within the CEN working group is still underway. The adoption of such standards will improve and simplify tendering and contracting procedures. The eight groups of quality criteria described in the CEN-proposal form a good reference document for the procedures. The ISO-norms are mostly relevant for dealing with quality issues within the operating companies. But these standards can also be used in the contracts between operators and authorities.

5.3.2. Quality - a dynamic process

Quality in contracts must be regarded as a dynamic process. Continuous improvement and total quality management are key elements of this process. They require the development and implementation of adequate instruments for measuring and monitoring quality.

Benchmarking can also provide useful information and is increasingly considered as an important tool both internally (for the operator) and externally in the relationship between operators and authorities. As already indicated, it offers an opportunity to reinforce the Citizens' Network objectives.

The quality circle created by RATP and developed by AFNOR allows a systematic analysis of quality in service design and delivery and provides an interesting approach to its assessment. The quality circle is based on four distinctive quality benchmarks. Two of these, targeted quality and delivered quality, are evaluated from within the company. Delivered quality can be measured against targeted quality to assess a critical aspect of the company's performance: does it achieve its self-imposed goals?. Outside the company, quality is envisaged from the customer's angle. Two external benchmarks are identified - expected quality and perceived quality – which can be usefully compared with delivered quality. The perceived quality can also be measured against the expected quality, through customer satisfaction surveys. Expected quality is ideally confronted to the budget constraints facing the company to determine the optimal level of targeted quality, which closes the circle.

Total quality management (TQM) should be the ultimate objective which can be defined as in (ISO 8402) as “A management approach to the organisation, centred on quality, based on the participation of all members and aiming at long term success through customer satisfaction and benefits to all members of the organisation and to society”. The TQM process can be broken up in different steps as follows:

- assessment of the existing situation;
- definition of priorities;
- formulation of the TQM system;
- translation into contractual terms.

The underlying gradual approach should encourage companies to engage in TQM, even if its final objectives at first appear highly ambitious.

The development of a TQM approach within an organisation requires that the following practical operations:

- identifying customer expectations, the company's constraints and the efficiency of the competition;
- defining the targeted service quality;
- measuring progress, analysing results and identifying gaps;
- enhancing success;
- communicating with users and stakeholders.

Many philosophies and practical approaches already exist for setting up TQM programmes. One common element between these approaches is the continuous and repetitive nature of these processes. References to the philosophies of the pragmatic organisation, to the learning organisation and to continuous improvement programmes are frequent.

5.3.3. Charters and partnerships

Under so-called deregulated regimes, authorities have little power to promote quality. Although their power is relatively weak as compared to that of formal contracts, Citizen's Charters and Partnerships can also be used to promote higher quality services. However, their impact on concerns of service integration is limited.

A charter is a statement in which the operator outlines its main objectives in terms of service quality, specifies its main customer-related targets, explains the main features of company improvement programmes, specifies the revenue protection targets and sets out the procedures that can be followed if it fails to meet its targets. The use of charters is compulsory in Britain and Italy. In a number of other countries, similar initiatives have been initiated by the authority or by the operator. An example of such a charter can be found in Brussels.

A partnership is an agreement between parties (operators and authorities) in which they state how they aim to improve the quality of public transport for the benefit of the citizens and to protect their rights to mobility. Partnerships can be used alone or in support of a contract. In Britain, for example, no contract is used, as a contract would not fit with the legal framework. Naturally, this limits the legal enforceability of partnerships. However, a new kind of arrangement, with legally binding contracts, is currently being tested in Manchester.

5.3.4. Quality incentives

One way to stimulate the provision of high quality services in UPT and to use public funds discerningly is to fully or partially condition the payment of subsidies to the operator's achievement of a variety of quality targets. In other words, performance requirements should be associated with quality-dependent subsidies. In setting service standards for the operating firm, it is essential to take into consideration the local conditions and the special characteristics of the public transport system considered. As a result of varying local conditions, quality-dependent incentive contracts may have a very different content in different European countries.

Incentives can be based on the overall effectiveness of the system. Incentives bearing on ridership levels and market shares require longer contract durations as a certain amount of time always elapses between given measures and their effects. The optimal duration of UPT contracts is difficult to establish. On the one hand, the period should be not too long so as to keep competition alive; on the other hand, investments and/or ridership-related incentives need to be taken into consideration so as to allow the amortisation of the investments possibly made by the operator and the adjustment of customer behaviours to its initiatives and service improvements.

A wide variety of quality elements can be included in bonus and penalty schemes. Basically, incentive mechanisms can be associated with all the elements of the CEN quality matrix. This represent such a number of possibilities that a selection might be in order in order not to confuse service providers with an over-sophisticated system. In any case, incentive mechanisms should only concern quality determinants on which the operator really has an influence. Failure to follow this rule will inevitably result in the abstention of potential bidders, in the payment by the authority of an undesirable risk premium and/or in frustration for the operator.

It has sometimes been suggested to use customer satisfaction indices to determine the level of a bonus or penalty. However, measuring customer satisfaction involves considerable statistical difficulties so that, in such practices should be excluded.

Where the failure to meet the agreed service standards can be attributed to an attempt by the incumbent to abuse its temporary monopoly situation to reap excessive profits, the cancellation of its contract can be used as an ultimate penalty. Conversely, it is possible to use an adjustable contract duration as an incentive to deliver better services (provided that the underlying scheme is transparent at the tendering stage). The idea is to link the length of a contract (or its conditional prolongation) to the standards of quality proposed in the bid (or delivered by the operator having won the tender).

5.3.5. Responsibilities and risks

Contracts should reflect the responsibilities and risks of both the authority and the operator. Contracts are constitute the most natural method to describe bilateral commitments.

In net cost contracts, operators should have objectives to develop ridership. The specification of optimal objectives is essential as it allows bidders to evaluate the risks they are taking and to adapt their bid in consequence.

If ridership increases are required from the operator, the objectives set forth in the tender should also give the operator the ability to propose changes to the network design, to implement service improvement, to organise marketing campaigns, and to introduce tariff differentiation. The role of the authority here will be restricted to monitoring activities and its ability to influence the result will be more limited.

When the operator bears the production risks (which is now the case in almost all contracts) the contract must specify the obligations of the authority so as to guarantee the operator a right of redress. This is particularly important if a penalty scheme on delays is enforced.

It is possible to share all the risks among the parties. This can take the form of a share out of any deviation with respect to initially agreed projections. Another possibility is to limit the risks supported by one party (usually the operator) to the levels specified in some incentive scheme, while all residual risks are borne by the other party.

5.4. Evaluating environmental impacts in tendering/contracting procedures

In section 3.6. of this report, the main results of the review of theoretical and practical methods for the evaluation of the externalities of UPT have been presented. In the present section, we focus on the practical criteria that should be introduced in tendering procedures and in contracts in order to guarantee the quality of urban transport in terms of external impacts minimisation (pollutant emission, noise, accident risk, congestion).

How to guarantee the external quality of urban public transport? A possible answer, especially suited for bus service operation, has been identified with the inclusion of optional evaluation factors in the tendering procedure aimed:

- to favour traffic demand management measures which has to be adopted by the regulatory authority to reduce congestion;
- to increase the use of environment-friendly modes of transportation.

In order to define these factors, the regulating authority should first of all:

- divide the urban area into at least two different groups of zones by distinguishing the most congested ones, characterised by high levels of traffic, congestion and pollutant emissions, from the others;
- determine the most critical periods of the day in terms of traffic (peak hours), as opposed to less critical ones (non peak);
- classify UPT vehicles into at least two classes, i.e. the environment-friendlier ones (class A) and the others (class B); sub-classes may possibly be introduced in class A (e.g. trams, electric buses, LPG vehicles, etc.).

Then, the authority should assign specific weights to each identified service category (defined in space and time) and determine how it values the use of environment-friendly vehicles, so as to be able to assess coherently the attractiveness of any proposed service portfolio.

Practically, the important factors to take into account, besides the other possible quality criteria used for the award of the public transport service contracts, are:

- the service capacity in different circumstances (first factor);
- the percentage of vehicles used for the UTP service that fall in class A (second factor).

For what concerns the first factor, the following grid can serve as a reference:

	Congested zone	Other zones
Peak hours	Minimum service capacity Capacity in excess of the minimum level	Idem
Non peak hours	Idem	Idem

Source: Quattro

For each zone and for each period, the parameters to take into account are therefore:

- the minimum capacity required (in passenger-km);
- the level of capacity offered by each operator (in excess of the minimum level).

While the first criteria may be used as a condition for eligibility (pass or fail), the second provides a clear measure of the level of service offered by the different operators and allows fairly easy comparisons between them.

Similarly, for what concerns the second factor, the following reference grid may be used:

	CONGESTED ZONE		OTHER ZONES	
	Class A	Class B	Class A	Class B
Peak hours	$2 \times \text{AEE}(\text{A}) \times \text{P}(1)$	$2 \times \text{AEE}(\text{B}) \times \text{P}(2)$	$1,5 \times \text{AEE}(\text{A}) \times \text{P}(3)$	$1,5 \times \text{AEE}(\text{B}) \times \text{P}(4)$
Non peak hours	$1,5 \times \text{AEE}(\text{A}) \times \text{P}(5)$	$1,5 \times \text{AEE}(\text{B}) \times \text{P}(6)$	$\text{AEE}(\text{A}) \times \text{P}(7)$	$\text{AEE}(\text{B}) \times \text{P}(8)$

Source: Quattro

with:

- $\text{AEE}()$ = Average Energy Efficiency of vehicles belonging to each class (A or B). AEE provides an effective means of weighing the unit environmental impact of vehicles. Clearly the average energy efficiency value can be replaced with more specific measures of the polluting emissions and/or of the noise levels produced by the various classes of vehicles, especially when comparing vehicles at a more desegregated level (sub-classes). In general, a basic distinction will be made between electric vehicles (light rail, trolleys, electric buses) and fuel powered vehicles. For electrically powered vehicles, local levels of emissions are practically nil and the energy impact may not be considered at the local level. AEE values can obviously vary quite significantly according to the fuel and technology used: as an indication of such variations, the MURE Database developed within the SAVE programme of DGXVII shows that unit consumption values for collective urban transport range from a minimum of approximately 7 to a maximum of over 30, when expressed in Toe/billion passenger-km, depending on the power technology of the vehicle.
- The coefficients proposed in the matrix (2 for the high congestion risk zones in peak hours and 1.5 for the same zones in off peak hours and for the low congestion zones in peak hours) account for the potential increase of emissions associated with congestion. The value 2 is arbitrarily picked (rule of thumb, as applied e.g. in Wellington, New Zealand). The value 1.5 represents an intermediate value between 1 (minimum congestion risk) and 2 (maximum congestion risk), typical of highly congested zones at off peak hours and of other zones in peak periods.

- Percentages P() represent the shares, calculated with reference to the total offered capacity, which the operator commits to supply through the use of the different classes of vehicles. For instance, P(1) is the percentage of capacity supplied with class A vehicles in peak hours in congested zones, while P(2) corresponds to the percentage of capacity supplied with class B vehicles also in congested zones and peak hours, etc. Finally, P(8) measures the supplied capacity for which class B vehicles are used in off peak hours, and in non congested urban areas.

In summary, the practical procedure suggested in order to attain external quality should then be based on:

1. Minimum thresholds determining eligibility to the tendering process, corresponding to the minimum capacity level to be supplied in the areas with high potential congestion risk and in the other areas, at both peak and off peak hours.
2. A given percentage of price increase with respect to the best offered price (usually 5%), corresponding to the capacity offered in excess of the minimum capacity level. In practical terms, competing bidders are ranked in descending order according to the level of offered capacity in excess of the minimum level, and the price offered by the first ranked is discounted to 95% of its quoted value, while that of the others is revised accordingly, down to the last bidder (which has offered the lowest excess capacity), which is entitled to no price discount. A possible option consists in evaluating the excess capacity offered not only at the global level, but differentiated according to the various potential congestion situation, so as to increase consistency with public policies discouraging the use of private transport means. In practice, in such perspective, the values of excess capacity offered in the various situations will be weighted with the three coefficients (1, 1.5 and 2) associated to the specific situations, as illustrated above.
3. A similar percentage of price increase with respect to the best offered price, so as to remunerate the use of environmental friendly vehicles, and promote their use in areas/time periods subject to potential congestion. In practice, based once more on the weights grid illustrated above for the second factor, scores for each competitor are calculated, and operators ranked in descending order. Price discounts are then granted to the operators along a similar principle than before. Both factors - excess capacity offered beyond the minimum level and percentage of offered capacity supplied with environmental friendly vehicles - are in fact independent variables (they do no overlap) and may therefore be added up in the framework of the global tender valuation procedure.
4. Once the contract is awarded to the winning bidder, the excess capacity offered and the percentage of capacity to be supplied with environmentally friendly vehicles in the various time/space zones must be included in the contract and penalties must be defined in case of failure.
5. Finally, throughout the contract duration, the tendering authority must proceed to the monitoring of the level of service supplied by the operator, in particular through periodic sample surveys on:
 - the actual offered capacity (frequency of service) in specific zones and time periods;
 - the actual percentage of vehicles of each class and sub-class used to supply the UTP service in each of the pre-established zones/time periods.

The operator must, on his side, provide periodical certification of the vehicles maintenance, in particular for what concerns those characteristics of the engine efficiency, which guarantee the attainment of the environmental performances.

5.5. Conclusions

The introduction of quality in the tendering and contracting processes of the UPT sector is still essentially in a development phase. This is due to the relative novelty of market-type mechanisms in UPT. Until fairly recently, the main focus of the liberalisation measures implemented in a variety of European countries had been primarily on efficiency improvements. It is only in a second stage of this process that quality elements have started to receive more attention. However, the development of new techniques and approaches to service quality issues have proceeded very rapidly since then.

The development, within a CEN working group to which Quattro partners are associated, of a general framework for specifying quality in UPT is well under way. The widespread adoption of this framework in the future could improve significantly the organisation of tenders and the contracting out of UPT services.

The integration of quality in UPT contracts should be regarded as a dynamic process. Continuous improvement and total quality management are key elements in this process. The development of new instruments for monitoring and measuring service quality needs to be pursued in a view not only to improve the management of quality by the operators themselves but also to increase their accountability vis-à-vis public transport authorities in this respect. The same is true for benchmarking.

There already exist many examples of introduction of quality standards in tendering and contracting procedures. However, these examples are mostly found in the cases where it is only the operational level of decision that is contracted out. The situation is different when it comes to the tendering and contracting of planning and design elements (tactical decision level). In deregulated models, public transport authorities are (by definition) more reluctant to intervene directly by imposing quality targets to operators. This leaves them with only a few opportunities to actively promote service quality. Passengers Charters and quality partnerships may then be employed. These instruments are, however, relatively weak as compared to contractual pressures.

A fair and equal treatment of bidders is an important prerequisite for successful and truly competitive tendering procedures. WP 3 describes the main conditions and implications associated with these concerns, with special reference to the drafting of tender documents and to the evaluation of the resulting bids.

UPT contracts should reflect the responsibilities and risks taken on by both the authority and the operator. Quality incentives can be included in contracts in order to stimulate performance but they require an adaptation of contract durations to be effective. For example, incentives associated with ridership or market share increases only make sense if the operator can remain at the helm of the system long enough for him to be able to benefit from his own impact on these variables.

An important question when dealing with the establishment of quality standards in UPT systems, is "Who is to pay for quality?". In high quality systems, customers can be expected to pay more relatively. However, it is important to note that, in practice, an initial investment in quality upgrades is often requested and may have to be financed through other sources of funds before a stable high-quality service can be provided and used to justify fare increases.

6. Final developments and recommendations

6.1. Final developments

The following elements draw from the discussions held on Quattro's preliminary findings and conclusions during the intermediate seminar which was organised in Lyon (FR) in mid-January 1998. These discussions were focused on the following themes which appeared to require additional investigations:

- prerequisites for implementing quality in UPT;
- links between innovation and quality in UPT and financial performance;
- the economic dimensions of quality in UPT;
- the impact of quality in UPT on local communities (mainly positive impact on environment, congestion and safety);
- quality in UPT and entrepreneurship.

6.1.1. Prerequisite for the implementation of quality in UPT

Quality in public transport is for the users: "Quality" is a global concept (characteristics of the service) and total quality management is a set of innovative management principles and methods; for the public transport traveller (actual or potential), public transport is a service, with specific characteristics, performances and costs⁴⁰. Basically, there is no demand for public transport as such. There is a demand for mobility, that is, a demand for an easy access to places, persons and activities.

Public transport must keep the promises made to its users with respect to service quality. And these promises should be consistent with their expectations as well as with local conditions. Public transport is under permanent quality monitoring by its users. What users buy is a way to access their destination or activity. They travel from door to door, not from a bus stop to a train station. Generally, PT offers only part of the solution to door-to-door mobility needs so that, to be attractive, their contribution needs to be effectively connected with that of complementary transport modes.

Quality in public transport is for citizens in general: good public transport benefits all citizens, not just users. The definition of quality and the aim of quality management should be extended to cover all the dimensions that concern the citizens in general (relief of congestion, environmental respect, stimulus to economic development and urban land use planning).

Public transport in an urban area is a system and must be considered and managed as a total package. The design and provision of public transport is complex and requires the involvement of a number of parties. It does not only depend on the relationship between (potential) users, operators and a public authority. The inherent complexity must be recognised and adequately addressed. Total quality management principles applied to public transport can contribute to the urban development objectives.

⁴⁰ For the user the cost of using the service is composed by the price in itself, plus the global cost of acquisition of the service. This cost of acquisition consist in time, expenses and opportunity costs.

Therefore, the first responsibility is to connect explicitly the quality objectives of public transport with the strategic objectives of the authority in charge of urban development and/or traffic management. At the system's level, the of public transport heavily depends on the co-ordination and partnership that exist between operators and authorities.

Quality must be considered as a strategic concept in UPT: it is widely accepted that total quality management improves the commercial and financial performance of firms. All other things being equal, there is no reason why it should not also be true with public transport. This means that “quality” concerns need to permeate each and every decision-level from the strategic level (what do we want to achieve?) and the tactical level (what service do we want to provide?) to the operational level (provision of service).

Quality is provided by individuals working within the public transport system; specific attention is to be given to the attitude of each individual member of the staff, which must be consistent with the strategy. “Culture” and “change” management are important dimensions to be integrated into the global approach, by authorities as well as by operators.

6.1.2. About quality and financial performance

One important question is to know how the cost of quality should be financed. The fundamental principle of quality management is that “quality pays” as has been demonstrated in WP2. Quality management aims at establishing a better market position, which should result in higher revenues, and a better organisation, which should result in a better use of resources.

A consistent economic approach to quality should be based on the following dimensions:

The price charged to the user

The price paid by a user should be linked with the quality delivered, the cost of competing modes and willingness to pay. The provision of UPT has long been based on principles of equity of access and universality. This has led to a very homogeneous level of service provision in terms of quality as well as in terms of price. During the last 5 to 10 years, higher quality services with higher tariffs have appeared, for example, airport bus links and other express services.

The observable trends towards differentiated services indicate that:

- On shorter journeys, the UPT service remains fairly homogeneous and presents only few possibilities of differentiation on the basis of price and service levels. However, it appears that, in deregulated markets, price segmentation meets customer expectations even on short journeys.
- On longer journeys, the customers' willingness to pay for higher quality of service grows. This paves the way for the introduction of differentiated services with respect to speed, comfort, peripheral services and facilities - and with higher prices.

The roles, responsibilities and contributions of authorities

The performance of the UPT system is highly dependent on the congestion of the road network as well as on the physical and functional conditions of the infrastructure and other fixed facilities. Authorities have a vital role to play in this respect and the definition of this role should receive more attention in the coming years.

Usually the UPT authority is only responsible for matters that are within the scope of practical arrangements for public transport. It is other public authorities that may be in charge of traffic management, maintenance of infrastructure and land use planning. To what extent is an operator entitled to blame congestion when his buses are running late and what actions can be expected from the authority when this occurs? Which party should be in charge of customer information and what should be considered an acceptable delay in this respect? How to make all the parties involved financially responsible for the aspects of quality on which they have an influence?

There is no single solution to these concerns but quality tenders and contracts should address them more systematically and counterbalance the fact that, although the UPT sector is progressively opening to competition or to competitive pressures (notably through benchmarking) the sector is bound to remain at least partly in the end of monopolies. The clarification of the parties' responsibilities with respect to service quality and of their financial liabilities (including rewards and penalties) is all the more important.

Reward and penalty schemes

The previous topic is linked with the different ways of introducing rewards and penalties in UPT contracts. Ideally, it is market performance and therefore the level of income generated by UPT activities that should be the principal reward and penalty scheme. Net cost contracts, for example, naturally encourage the operators to increase ridership.

Customer satisfaction indices may also provide a useful performance assessment tool. However, they are not as straightforward and reliable because they tend to be influenced by the opinions and images created in the passengers' mind and not only by the real performance of the operator. If customer satisfaction surveys were used to provide standards for granting rewards and penalties, their cash value should remain fairly low in comparison with the value of the contract or they should be developed into more sophisticated multi-source customer surveys.

Compensation to customer

One way to penalise the operator in case of flaw in service delivery is to require from the company that it pays direct compensations to its users when it fails to serve them well. Compensations directly paid to the passenger who has suffered from poor service performance or quality may be regarded as more efficient than a penalty paid to the authority because it does not depend on specific supervision by a regulator. Naturally, for the penalty to be fair and effective, it must be paid by the body really responsible for the deficiency.

6.1.3. Quality and innovation in UPT

Public transport travellers live in a context where all the services and products they consume continuously integrate new techniques. In fact, they even expect the services they consume to evolve continuously to serve them better. Innovation is present in all service industries, in particular in the automotive industry, and there is no reason why it should be different with UPT. Without innovation, UPT will continue to lose market shares. Studies in Norway have showed that even in constant quality conditions, the market share of UPT decreases by one or two percent per year. Better service for the users means that the value of the service increases, through more service available (more choice meaning less waiting time and/or reduced time of access) increased quality in itself (turning out increased quantity), or reduced time of access to the service (including the access to information, tickets and other services) and reduced travel time door to door.

Innovation can contribute significantly to quality improvements in UPT. Besides, innovativeness can, as such, be considered like an important quality aspect. Therefore, the appraisal of service quality should be treated using a flexible approach: the public transport environment is under continuous change so that the quality provided to the market and the standards used to evaluate it should be reviewed on a regular basis.

Innovation is a twofold issue in public transport:

- on the one hand, we have the hard-edge of innovation, which is mostly technical (equipment, infrastructure), and evolutions in standards which can help to reduce waste or duplication and consequently to reduce costs (European standards may promote innovation: without standardisation, the volume of production would not be large enough to allow innovation). Example: contactless smart cards;
- on the other hand, we have “soft-innovation” in service conditions, which may be linked with any level of decision (strategic, tactical, operational). Example: introduction of service guarantees.

Both sources of innovation are important and need to be systematically explored. And implementation decisions must be based on a realistic comparison of the added value expected from any given innovation proposal and its inhering costs.

Innovation must concentrate on issues which are relevant to the user and the citizen. Dynamic assessment methods should take innovations and innovativeness into account among other quality determinants. Innovation should also concentrate on areas where the expectations of the users/citizens are high, and where present performance is low.

Innovation can be taken into account at any stage in the tendering process and/or during the contract itself. Before or during the tendering process, innovations will have to be promoted or initiated by the authority or proposed by the operator at the design stage (new equipment, new service). Specific requirements in this respect can be integrated in tender documents. The tender specification should describe the global quality management system proposed by the authority for the traffic management level or for the UPT system as a whole. Another possibility is to require a continuous improvement programme proposal from the bidders. During the contract, innovation will be stimulated in the framework of the continuous improvement programmes that should exist at system level.

The joint responsibility of authorities and operators for quality applies to innovation as well. Through its traffic management policy or its land use planning policy for instance, the authority can support or hinder innovation in public transport operations. A general climate favourable to innovation is also an important factor (existence of research centres and of an advanced telecommunications system in the urban area considered, an education system favouring the emergence of a learning society, etc.) We refer here to the Green Book on innovation published by the Commission⁴¹.

Does the specification of quality (e.g. through standards) present a risk of discouraging innovation in the system?

The a priori specification of quality standards can hinder innovation in the same manner as it can promote innovation. The method of specification plays a key role in this respect. Functional or service specifications offer more opportunities for innovation as they do not impose any pre-set technical constraints the service production process. Example of service standards are:

- “the users arrive on time at destination (timetable + 2 minutes maximum)”;
- “the citizens have access to real time information on the services from their home/workplace/school”.

This type of standard leaves more room for innovation and permanent improvement of the services delivered.

Quality management demands a continuous review of service quality as well as of the production process. The search for innovations and service improvement is one of the basic requirements of those systems that are really dedicated to total quality management. The development of a learning organisation and the use of benchmarking techniques are other ways to strive for innovation in service quality management. They can be implemented at the level of the system, within the UPT authority and/or within the operator.

6.1.4. Quality in UPT and its impact on the local community

The internal and external benefits and costs of the transport sector depend on:

- the local government responsible for urban transport provision and regulation;
- the different transport operators responsible for service provision;
- the suppliers of various transport infrastructure and equipment;
- the users of the transport system (car drivers, public service users and others);
- and the community at large.

Transport externalities take three major forms:

- environmental impacts (pollution noise and vibration);
- safety problems (social cost);
- congestion problems (which involves lost time and an increase of pollution dangers).

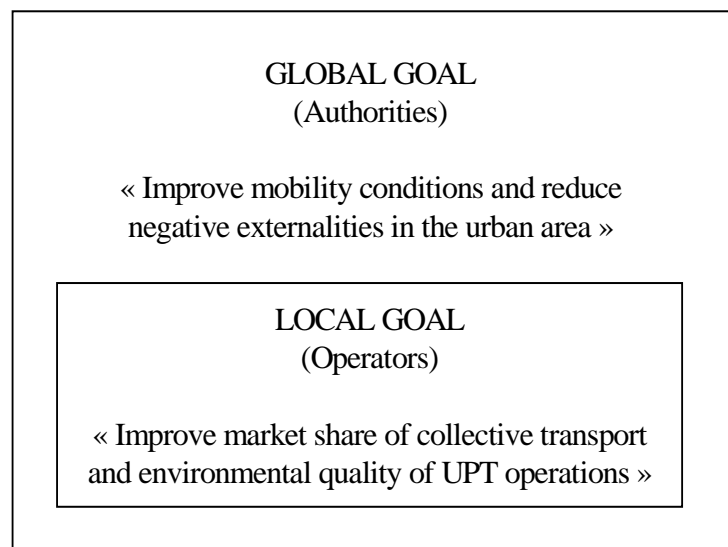
⁴¹ Green Paper on Innovation, European Commission, Directorate XIII/D, Communication from Mrs Cresson and Mr. Bangemann, in agreement with Mr. Papoutsis adopted by the Commission on 20 December 1995.

These three concerns cannot be completely evaluated and dealt with at the level of the individual transport operator's production but rather require the implementation of more global policies by the city or regional authority.

The establishment of clear and consistent relationships between the authorities on the one hand, and the operators on the other hand, is the only way to significantly improve mobility conditions while reducing the negative externalities produced by transport operations in the city. This can only be achieved by:

- a clear statement by the authority, at the strategic level, of the goals of the urban transport system as a whole and, at the operational level, of the local goals with respect to service provision;
- the identification of the aspects of service quality to be included in the tendering and contracting procedures to guarantee an effective co-operation and co-ordination between the organising authorities and the operators. In the specific case where the service provided depends on market initiatives, the specification of quality standards will be included in the licensing conditions established for all services.

Figure 33 : Presentation of goals in relation with UPT impacts on local communities



Source: Quattro

UPT operators have two objectives: one is to improve general mobility conditions and opportunities by increasing and/or maintaining their market share; the other one is to produce their transport services in a manner that is as environment-friendly as possible.

Improving/maintaining the market share of UPT operators, which is obviously an objective of TQM processes, is also a way to address some of the environmental concerns of European cities. A “World Class Public Transport Service” is a service which satisfies a (growing) number of users, convincing them not to use a private car. The daily competition for operators, after they have been chosen to operate a network or a line, is not really with other transport operators, but with the private car. Considering environmental pressures, in some areas and peak hours, a high quality public transport service can be the only practical way to reduce congestion and other external impacts without reducing overall accessibility and mobility.

However, this is true only if the level of service of public transport is really competitive with that of private cars. It has been stated that public service offsets the natural advantage of the door-to-door service of private cars only at very high quality standards: a public transport service must involve a maximum of 5 minutes walk and average waiting time of no more than 3 minutes, for example. Such levels of quality cannot be achieved without an adequate co-operation and co-ordination between regulatory bodies, operators and citizens.

In order to foster a similar strategy of co-operation for global environmental quality, some indicators should be included in tendering/contracting specifications and procedures:

- reduction of negative externalities (congestion, air and noise pollution) at the city level and/or in particular neighbourhoods are constraints whose consequences for the quality of the service requested from the operators must be explicitly specified in the tendering and/or contracting rules;
- the classical environmental quality standards, which concern the age and emission standards of vehicle fleets and their correct preventative maintenance, are targets to be included in standard processes for environmental quality certification (ECO labelling) by UPT operators (in this respect, UPT operations are similar to any other product);
- finally, the following elements should be included in tendering/contracting procedures for specific routes or services in congested town areas and/or daytime:
 1. a minimum volume of traffic on the route which allows for profitable operation, or, alternatively, a clear statement of the operator's subsidy arrangement;
 2. the guarantee (through priority lanes, traffic control etc.) of a minimum viable commercial speed to the operator;
 3. depending on the previous two conditions, the achievement of specific market targets on the local corridors and/or daytime in which the service is operated;
 4. and last but not least, procedures and guarantees to the users in case of service disruption, which may cause congestion and safety problems.

6.1.5. Quality in UPT and entrepreneurs

Six main questions emerge from the analysis of the activities of the bodies taking the initiative for service design innovation and continuous quality improvement in the various organisational frameworks existing in Europe:

1. Is it possible to organise a tendering for the service planning (tactical) level? It is desirable in principle as it may generate more innovation than negotiation with the current incumbents. This may be difficult to put in place because of the problems linked to the informational asymmetries often existing between the authority and the operators as well as between the incumbent and its challengers, notably with respect to the commercial potentialities of the network. A high level of expertise is required from the tendering authority.

2. Is it desirable to split the tendering into two procedures: tendering for design and tendering for operations? Some observers prefer a split here, but the split can be dangerous if the commercial risk is then passed on to the operators although they are not responsible for the design; the information problem reappears as well. The main advantage of tendering at the operational level is that it facilitates the participation of smaller operators who may not have the skills to plan and design larger urban networks.
3. Can the contract have an ossifying effect on the services and their quality? It is important to allow for service re-design during the contract to recognise possible evolutions in market needs. Difficulties must again be mentioned in relation to informational asymmetries between the authority and the operator, especially in the context of unprofitable services as a re-design may involve a variation in the required subsidy.
4. Should 'strict tendering' be applied or should there be any possibility of using negotiation in combination with tendering? The advantage of opening the market to others than the incumbent, irrespective of the procedure, also lies in the inhering possibilities of innovation. In such a context, accepting non-compliant bids should be allowed so as not to restrict this innovation potential and allow enough flexibility. The complexity of urban transport networks leads to the necessity of using 'some' negotiation in the selection procedure. Besides the negotiation during evaluation, further negotiation may be needed during the contract to prevent an ossification of the services.
5. What requirements have to be specified to the tendering authority and by whom? A main matter of concern is that transport authorities must have consistent aims and must be clear about them. Given their frequent involvement in the "creation" (initiative) of UPT services, public transport authorities must pass on their objectives effectively to transport operators. The danger of inadequate and/or unclear aims is that they can result in a "rubbish-in, rubbish-out" situation where no guarantee can be given on the quality of the services delivered to the citizen. Only authorities that state their aims clearly should be "allowed" to organise tenders themselves. It is possible that minimum standards should be prescribed at this level too.
6. Is tendering necessary to improve quality? This question gives rise to positive and negative arguments:
 - the availability in information between incumbents and new entrants may be such, in specific circumstances, that tendering would not be realistic.
 - it is always desirable to open the system to innovative ideas which may otherwise never be tested in the public transport market.
 - tendering in itself is only one way but is not the total solution to all quality related concerns, as has been showed by this research work.

6.2. Recommendations to the main actors

The Quattro research calls for a series of recommendations to authorities, operators and, in some aspects, to equipment manufacturers, which are key contributors to quality in public transport. These recommendations can be found in extenso in the Practitioner's Handbook attached to the present Research Report (Chapter 6).

6.3. Conclusions

Quattro recommends appropriate practice for quality tenders and quality contracts on the basis of a broad overview of existing practice in tendering, contracting, monitoring and more generally, managing public transport and its relationship to other sectors.

Quality in public transport is a field where there are daily new initiatives, at local, regional, national or European level. Authorities and operators are very active. The importance of these initiatives is an indicator of the level of relevance of the subject to the sector, serving daily 80% of European citizens, and occasionally the remaining 20%, and employing hundreds of thousands of people.

It is generally accepted that the public transport industry will enjoy better market conditions in Europe during the next decade, and into the next century.

We are convinced, on the basis of the existing situation in Europe described in our research, that the search for improved quality and continuous improvement must be a shared objectives by the authorities and operators involved in the systems.

The bodies should be driven by an obsession: to increase the value of public transport in Europe. This implies recognition at the users and the citizens as being in a central place in the system, give them the right to chose freely their travel mode and to organise their travel easily, without having to consider the geographic and functional frontiers between authorities or the different nature of operators.

By appropriate quality tenders and contracts, this “obsession” could be encouraged and positive results should follow. Local experience demonstrates the necessity to consider the quality issue in tenders and contracts, and the effectiveness of the measures recommended by Quattro.

Quattro indicates that whatever the regulatory regime for UPT, tools exist to stimulate authorities and operators to implement successfully the reach for quality in the public transport service provided to the users and the citizens.

Example and present practice show that the market respond positively to the realisation of the aims of the Citizens’ Network, in particular in what concern the quality.

The challenge now is to put the travellers and the citizens in the heart of public transport organisation, and recognise through that central place that citizen satisfaction is the aim of the system.

List of abbreviations used in the document

1. Associations

AEC	Spanish Association for Quality
AFNOR	Association Française de Normalisation – French organisation for standardisation
BEUC	Bureau Européen des Unions de Consommateurs - The European Consumer's Organisation
CCRE	Council for European Municipalities and Regions
CECA	Communauté européenne du charbon et de l'acier - European Community for Coal and Steel
CEE	Commission internationale de réglementation en vue de l'approbation de l'équipement électrique / International Commission for electrical equipment regulation
CEEC	Central and Eastern European Countries
CEI	Commission électrotechnique internationale / International Electro-technical Commission
CEMR	Council of European Municipalities and Regions
CEN	European Committee for Standardisation
CEN TC WG5	320 CEN work group 5 of Technical Committee 320: "Transport" - working group 5: "Passenger Transport"
CENELEC	Comité européen de normalisation électronique - European Committee for Standardisation for the electronic sector
CIT	Chartered Institute of Transport
EFQM	European Foundation for Quality Management
ELT	Estonian LT consultant
EOQ	European Organisation for Quality
EQA	European Quality Award
FBAA	Belgian Federation of Bus and Coaches
IGKM	Chamber of Urban Transport of Poland
ISO	International Organisation for Standardisation
MFQ	French Association for the Promotion of Quality
OPT	Oslo Public Transport
OS	Oslo Sporveiens
RATP	Paris Network Operator
RTSC	Railway Technology Strategy Centre
SEMITAG	Société d'Economie Mixte des Transports de l'Agglomération Grenobloise
STIB	Société des Transports Intercommunaux de Bruxelles / Maatschappij voor the Intercommunale Vervoer te Brussel
UITP	Union Internationale des Transports Publics - Union for Public Transport

2. EU projects

ISOTOPE "improved structure and organisation for urban transport operations of passengers in Europe" EU-project - DG VII - task 5-2/13

QUITS Quality Indicators for Transport Systems

3. Finance

BOT Build, Operate and Transfer

GNP Gross National Product

4. Quality

KPI Key Performance Indicator

PDCA Plan - Do - Check - Act.

TQM Total Quality Management

5. Transport

coMET Comité des Métros - benchmarking group

GPS Guided Position system

PTA Public Transport Authorities

UPT Urban Public Transport

Glossary

1. Quality

1. **Benchmarking.** Systematic comparison of the performance of an organisation in relation with other departments/subsidiaries (internal benchmarking) or other organisations, competitors or industry leading companies (external benchmarking), as a method of sharing knowledge and experience of “best practices” to bring improvement.
2. **Charter.** Document that details the commitment of our entity among its customers.
 - 2.1. **Citizen’s charter.** Document explaining which services can be expected by citizens and sets out the public service’s commitments to them, whose views are taken into account when the charter is reviewed.
 - 2.2. **Customer charter.** Document that details the commitment to the customers, sets out the standards to which the operators works, how it publishes its performance against those standards, how it looks after the customer and compensate them if things go wrong and how they can contact the operator. Customer charters can be classified into four categories:
 - 2.1.1 **Agreement charter.** Charter detailing rights and duties.
 - 2.1.2 **Charter of intention.** Charter setting general values and principles.
 - 2.1.3 **Charter of commitment.** Charter explaining the formal commitments set up to put in concrete form the values and principles defined in the charter of intention.
 - 2.1.4 **Charter of means.** Charter defining which means will be put at work to fulfil the commitments.
 - 2.1.5 **Intermodality charter.** Charter giving the views of the actors of public transport involved in a transport system on topics concerning intermodality: connection centres, multimodal information, intermodal ticketing, collaboration with the automobile industry, collaboration with other transport actors such as taxis, airport operators, car rental companies or bicycles users and R&D for new transport technologies and systems.
 - 2.1.6 **Development charter.** Charter defining principles on which public transport service will be adapted in the future.
 - 2.1.7 **Public service charter.** See citizen’s charter.
3. **Continuous improvement (on-going improvement).** Need of continuous adjustment of the service design and processes of the provider organisation itself in order to maintain or increase its value enabling the identification of their strong and weak characteristics.

4. **Customer satisfaction.** Overall level of attainment of a customer's expectations, measurable as the percentage of the customer expectations which have actually been fulfilled.
5. **Delivered quality.** Level of quality that is achieved on a day-to-day basis in normal operating conditions.
6. **Desired quality.** Level of quality that the company wishes to reach on the basis of the expected quality, external constraints and financial conditions.
7. **Expected quality.** Level of quality that is requested by the customer and can be defined in terms of explicit and implicit terms.
8. **External quality.** It refers to quality aspects directly perceived by the customer.
9. **Internal quality.** It refers to quality aspects for the company not directly perceived by the customer (internal organisation, etc).
10. **Optimal quality.** Situation where the services supplied are in correspondence with the preferences of customers, expressed in the willingness to pay the accompanying efficient prices.
11. **Partnership (travel partnership).** Agreement or series of agreements between Authorities, Contracting Bodies and Operators designed to encourage co-operation at a working level so as to improve the achievement of the business objectives of each party to the agreement but without any contractual liabilities.
12. **Quality partnership.** Non contractual agreement of co-operation between parties within the public and private sectors that have common interests in promoting public transport.
13. **Perceived quality.** Level of quality perceived, more or less objectively, by passengers in the course of their journeys.
14. **Professed satisfaction.** Formalised opinion of a customer regarding the level of attainment of his/her expectations.
15. **Quality.** Totality of characteristics of an entity that bear on its ability to satisfy stated or implied needs (ISO 8402).
16. **Quality assurance.** All the planned and systematic activities implemented within the quality system, and demonstrated as needed, to provide adequate confidence that an entity will fulfil requirements for quality (ISO 8402).
17. **Quality management.** All activities of the overall management function that determine the quality policy, objectives and responsibilities, and implement them by means such as quality planning, quality control, quality assurance and quality improvement within the quality system (ISO 8402).
18. **Quality system.** Organisational structure, procedures, processes and resources needed to implement quality management (ISO 8402).

19. **Targeted quality.** Level of quality that the company aims to provide for its passengers.
20. **Total quality.** Management approach that integrates all functions and processes within an organisation in order to achieve continuous improvement of the quality of goods and services (ISO 8402).

2. Norms and standards

21. **Accreditation.** Process of ratifying the jurisdiction, capabilities and impartiality of the certifying authorities.
22. **Certification.** Situation where first, second and third parties evaluate a company's quality system against some specified standard or manual.
23. **Standard.** Documented agreement containing technical specifications of other precise criteria to be used consistently as rules, guidelines, or definitions of characteristics, to ensure that materials, products, processes and services are fit for their purpose.
24. **Quality management standard.** Standard providing guidelines and specifications concerning management process.
25. **Quality system standard.** Standard providing guidelines and specifications concerning the production process.
26. **Standard of results.** Established level for a final service quality item. It should be established taking into account the customer expectations.
27. **Tool standard.** Standard providing guidelines for the implementation of specific fields of the fundamental standards (ISO 9000-1, 9002, 9003 and 9004-1). The specific fields are the audit (ISO 10011-1, -2 and -3), the conception and the redaction of a quality manual (NF X 50-160, 161, 162),...
28. **Standardisation.** Activity that sets the unification of criteria with regard to precise goods and services and enables the use of a common language in a concrete field of activity.

3. Economy

32. **Allocative efficiency.** Relates to the production of products or services that best meet the preferences of consumers, expressed in their willingness to pay the accompanying (cost efficient) prices.
33. **Cost efficiency.** Relates to the production of products and services at minimum possible costs.
34. **Economic efficiency.** Relates to the combination of allocative and cost efficiency.

- 35. Effectiveness.** Achieving the stated objectives. Action having an effect on producing a definite or desired result in economical terms.
- 36. Externality.** Economic relationship not efficiently controlled by prices.
- 37. Market contestability.** Characteristic of certain markets in which incumbent companies are threatened by potential entrants, causing efficient results without the existence of perfect competition conditions. Baumol, Panzar and Willing (1982) hold that contestable markets guarantee the social benefits of perfect markets without the need of making strong assumptions about the number of companies that must be operating in the market. Shepherd (1984) has observed that these results are only valid under the following assumptions:
- Enter to the market is free and without limits.
 - Enter is absolute.
 - Enter is perfectly reversible.
- 38. Market failure.** Situation where the market produces inefficient results due to the existence of any of the following factors: imperfect competition, natural monopoly, public goods, externalities, common ownership of goods, lack of perfect and symmetric information, incomplete markets.

4. Regulatory framework

- 39. Bid (tender, tender procedure).** To offer a particular amount of money for something. In UPT, to offer a specific level of service for a specific amount of money.
- 40. Bidding document (tender document).** A formal written offer to do a job or provide goods and a services at a specific price.
- 41. Collective transport.** A commercial passenger transport service aiming to fulfil common transport needs in large or small communities, the needs being shared by all or large groups of community members.
- 42. Market competition.** Competition between multitude of companies in an open market, that struggle among them in order to get their products and services' sold, setting the prices that their costs and market enable.
- 43. Concession act (concession agreement, concession contract).** Kind of license granted by a local authority to a transport operator specifying an exclusive right to operate public transport in a particular area.
- 44. Public service.** A service that fulfils a mission of a common interest of which public domination has decided to ensure the authority in response to society's requirements linked to various specificities.
- 45. Public transport.** Services provided for the carriage of passengers and their incidental baggage over long or short distances, within or between urban areas, usually on a fare-paying basis with fixed timetables and predetermined routes.

- 46. Regional transport.** Transport in the surroundings of conurbations and between smaller cities in this area and the conurbation. Regional transport can roughly be described with a travel distance up to around 60 km and a travel time up to 1h on average. For very large conurbations there may be somewhat like a regional transport with higher speed and with distances up to 150 km and travel times up to 2h. Beyond these limits long distance transport takes place.
- 47. Service of general interest.** Service activity, considered by Public Authorities as being of general interest and therefore subject to public service obligation.
- 48. Service of general economic interest.** This term is mentioned in the Treaty of Rome under article 90. It refers to commercial service activities that cover general interest missions and are therefore subject to public service obligations. This is the case of transport networks, energy and communication services.
- 49. Universal service.** Public service, available to all, with reasonable conditions of access and price.
- 50. Urban transport.** Urban transport takes place in the borders of a city or a conurbation and in a small belt around it. It may be described by travel distances of up to 20 km (in public transport an usual average of travel distances is between 5 and 8 km) and a travel time of up to 0,5 h. Larger values may be valid for big metropolises and conurbations.

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**Transport RTD Programme of the EU's 4th Framework Programme
for Research, technological Development and Demonstration**

**Quality Approach in Tendering/contracting
Urban Public Transport Operations**

QUATTRO

- Practitioner's Handbook -

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Reading guide

The aim of this Practitioner's Handbook is to provide a concise review of the main concepts and recommendations presented and commented in more details in the Research Report. Like the Research Report, the Handbook consists of 6 chapters, which does not mean that the two documents are built on exactly the same structure. The Quattro Practitioner's Handbook unfolds as follows:

Chapter 1 provides a brief overview of Quattro, its framework, objectives and problem-solving approaches.

Chapter 2 focuses on the various impacts of UPT on its chief beneficiaries and on the ways to deal with its multiple goals.

Chapter 3 concentrates on people and organisations; it primarily deals with issues of responsibilities and commitments in UPT provision.

Chapter 4 briefly presents relevant quality management tools and illustrates their utilisation with practical examples.

Chapter 5 directly addresses the issue of quality specification in tenders and contracts.

And finally, Chapter 6 provides a series of recommendations to the different parties involved in the provision of UPT services.

1. The framework and objectives of Quattro

This introductory section aims to provide general information on the objectives of the project, on the general context in which the research has been undertaken and offers preliminary insights into the main results of the research. It is composed of 8 subsections.

1.1. Audience

What are Quattro results and to whom are these dedicated?

- Quattro sets out how quality criteria and quality management are ways of better serving the customer as well as giving value for money to stakeholders, authorities and local communities.
- Quattro provides to the operators, whether in the public or private sector, a way to improve their business prospects in the customer led environment of the 21st Century.
- Quattro puts a focus on practical, day-to-day situations, which affect citizens, authorities and operators with suggestions to help them do better.
- Quattro provides a broad range of suggestions corresponding to different organisational scenarios.
- Quattro is addressed to any person involved in the urban transport sector: politician, customer, organising authority, operator, manufacturer, etc.

1.2. The European context for UPT provision

Urban Public Transport plays a vital role in daily life:

- 80% of European citizens live in urban areas.
- 1000-1300 journeys per year per citizen are made by one of the available mobility modes.
- About 500 billion journeys are made each year in the European Union.
- Each citizen has the choice between different modes and is a free agent. Choice for one or another mode will be based on notions such as availability, quality, price and reputation.
- European citizens of all socio-economic groups increasingly value customer service attributes highly in every aspect of their life.
- The “added value” of good and performing local public transport benefits to individuals and the community at large.
- Public transport is a business that helps to support a good quality of life, sustainability of employment and development potential. It is both market and mission driven so as to satisfy wide ranges of demand.
- Efficient urban living demands reliable, effective, customer-conscious, inter-modally friendly, door-to-door, public transport systems.

A real time world needs a real time service and it is essential to recognise the perishability of UPT and its highly ephemeral and hypothetical value.

1.3. Quality promotion in the EU

In 1993, the European Commission White Paper advocated quality as a means to create added value for “Growth, Competitiveness, Employment”⁴².

In 1994, the European Council of Ministers approved an initiative to promote quality policies.

In 1996, Directorate-General III (Industry) published a book entitled “The European Way to Excellence” presenting 35 case studies of organisations making use of quality management.

These different initiatives identified Quality as a major intangible investment in the European Market in every area of activity.

The Commission seeks to promote quality through:

- quality assurance using the ISO/EN 9000 series of standards and methodology;
- the European Foundation for Quality Management (EFQM) and its European awards;
- the European Organisation for Quality (EOQ) - a grouping of quality professionals;
- the European Committee for Standardisation (CEN) developing Union-wide methods based on performance standards.

The European Commission Citizens Network green paper: “Fulfilling the potential of public passenger transport in Europe” developed the need for local public transport systems to be:

- accessible;
- affordable;
- safe and reliable;
- convenient for travel needs;
- environment-friendly.

1.4. Challenges ahead for UPT actors

The Urban Public Transport (UPT) sector is vital to prosperity in the European Union as a whole. People capacity to move inside the European Union has recently been highly increased by the reduction of legal constraints and the simplification of visa procedures. Further developments are expected in a near future. This leads to expectations for a significant mobility increase in the next decades.

The thrust of the Citizens' Network objectives can only be achieved by the adoption of quality principles and practices which will result in the provision and procurement of public transport in support of sustainable mobility of high quality and at a marketable tariff level.

In many parts of the European Union, research shows that both authorities and operators have handled local public transport policies in an insufficiently customer-oriented manner, leading to:

⁴² White paper on “Growth, Competitiveness, Employment”, Communication from the European Commission, Bulletin de la Commission Européenne, 2/1994.

- decline in service frequencies;
- loss of ridership;
- “cheap and cheerful” using old vehicles and staff paid at the lowest possible rate;
- further loss of ridership;
- further economy and so on;

in short, a spiral of decline with only limited adoption of quality principles and innovation. Despite some shining examples, public transport has not yet adopted in general the upward circle of quality virtues and has not been encouraged to do so by the authorities.

Interurban mobility increase by the way of PT has no sense if no connection is made with urban, local transport systems. Inter-modal interface facilities play a major role. However the growth of private personal transport - the motor car - makes it essential for the PT industry to come to terms with its own problems by:

- changing to customer rather than production driven management;
- making quality and quality driven systems an instrument of change for the benefit of front line staff, customers, stakeholders and managers in the UPT sector;
- encouraging innovation and effective spread of “Best Practice”;
- increasing overall use of public transport by the facilitation of inter-modal services where the customer has choice within a competitive structure.

Above all, by applying these principles and adopting a quality approach, local public transport will challenge its real competitors rather than fighting itself.

1.5. Understanding and clarifying the roles and responsibilities of the parties involved

Improving quality in urban public transport relies on:

- stimulating the urban public transport environment;
- encouraging quality related tendering, contracting and monitoring systems;
- developing new innovative customer-orientated cultures for front line staff and management, operators and authorities.

This requires a good understanding of the sector’s functioning and a clarification of the roles and responsibilities of the various parties involved. More specifically, in some situations:

- the operator cannot only operate but needs to make tactical and planning decisions so as to maximise the effect of marketing and innovation;
- the authority cannot only award and control contracts but can promote amongst elected representations and citizens at large the benefits of public transport and inter-modal co-ordination systems and the land use and traffic management measures associated with them.

1.6. Public transport quality in contracting and tendering

The introduction of quality in contracts and tenders is vital in achieving the better acceptance of public transport necessary to support the objectives of the Citizens' Network.

This objective requires:

- the use, in the UPT sector, of the CEN standard currently under preparation;
- the adoption of an understood and coherent concept of quality and total quality management, which is strongly related to users, their preferences, their characteristics and attitudes;
- the recognition of the connection existing between quality and revenue; Quality Management generates improved processes, reduces costs of poor quality operations, increases revenues and results in better overall financial performances.

1.7. The contribution of quality management tools

The introduction of quality monitoring and quality management in UPT provision is developed in three different ways:

- a specific quality loop linking the public transport market with service production to create strategic focussed objectives;
- additional tools aimed to facilitate continuous improvement processes:
 - quality loops;
 - self-assessment methods;
 - benchmarking;
 - standardisation and certification;
 - quality partnerships;
 - guarantee of service and service charters;
- guidelines for procedures and practices for authorities and operators in contracting, tendering and associated documentation.

1.8. Structure of the research process - a summary

To examine the above topics, Quattro developed:

- a broad data collection exercise involving 126 operators and authorities across the European Union and Norway;
- various concepts used in quality definition and assessment and links with quality and economic aspects of urban public transport;
- guidelines to authorities and operators involved in tendering and contracting as to issues of quality integration and links between quality processes and a quality environment through standards (ISO 9000 / ISO 14000);
- an analysis of how internal quality indicators can be related to external indicators and customer based surveys;
- a study of specific cases within urban public transport in central European countries and the Baltic States, which is particularly valuable to illustrate the extremes of change to be achieved in countries soon to enter the European Union.

2. UPT quality for the user and the citizen

This chapter describes the principles of quality tendering and contracting. It seeks to be a guide to authorities, operators and all others concerned in the process of making quality an integral part of the tendering and contracting process described in Chapter 5. In addition, this chapter covers aspects of:

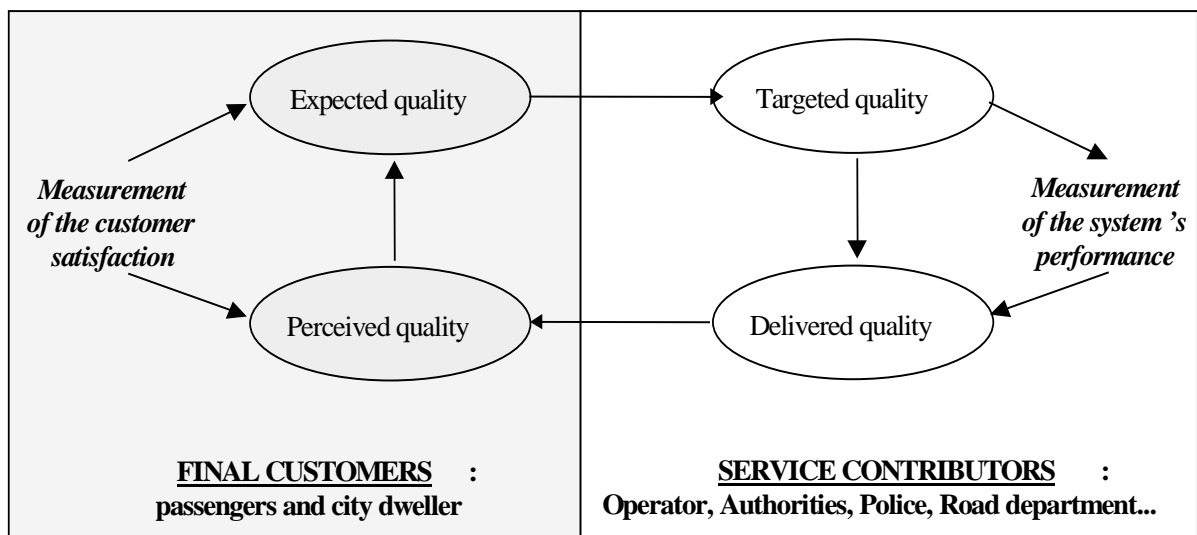
- total quality management;
- standardisation and certification;
- monitoring;
- benchmarking;
- charters;
- partnerships.

2.1. Be customer-orientated not production-orientated

At the heart of this concept is the quality loop. This is:

- a dynamic process;
- a process for improvement;
- a principle which can be applied at system level as well as within the system;
- a way to define the required service and to identify change priorities.

The quality loop at the level of the public transport system



Source: AFNOR

The quality loop results from a series of interactions between two worlds with clearly distinctive viewpoints, the world of customers and that of the supplier(s). It is also based on four distinctive benchmarks:

- Expected Quality
This is the level of quality anticipated by the customer and it can be defined in terms of explicit and implicit expectations. The level of quality expected by the passenger can be defined as the sum of a number of weighted quality criteria.

- Targeted quality
This is the level of quality that the operator aims to provide to passengers. It is dependent on the level of quality expected by the passengers, external and internal pressures, budgetary constraints and competitors' performance.
- Delivered Quality
This is the level of quality that is achieved on a day-to-day basis in normal operating conditions. Service disruptions, whether or not they are the fault of the operator, are taken into consideration.
- Perceived Quality
This is the level of quality perceived by passengers in the course of their journeys. However, the way passengers perceive the service depends on their previous personal experiences with the service or with its associated services, on all the information they receive about the service - not only that provided by the company but also information coming from other sources - their personal environment, etc.

The four above benchmarks can be used to define four critical gaps in service design:

- the gap between perceived quality and expected quality;
- the gap between expected quality and targeted quality;
- the gap between targeted quality and delivered quality;
- the gap between delivered quality and perceived quality.

Improving service efficiency and quality means closing the four gaps.

2.2. Quality elements of public transport

How to define service quality in public transport? In order to answer this question, the Quattro consortium teamed up with experts from the CEN. The result of our joint research effort can be summarised in the following UPT quality matrix. This matrix, which is still under development in the CEN working group CEN TC 320 WG5, offers a comprehensive framework for analysing both functional and technical quality determinants in UPT.

The public transport quality matrix

QUALITY	1. Availability	1.1 Network 1.2 Timetable
	2. Accessibility	2.1 External interface 2.2 Internal interface 2.3 Ticketing
	3. Information	3.1 General information 3.2 Travel information normal conditions 3.3 Travel information abnormal conditions
	4. Time	4.1 Length of travel time 4.2 Punctuality and reliability
	5. Customer care	5.1 Commitment 5.2 Customer interface 5.3 Staff 5.4 Physical assistance 5.5 Ticketing options
	6. Comfort	6.1 Ambient conditions 6.2 Facilities 6.3 Ergonomics 6.4 Ride comfort
	7. Security	7.1 Safety from crime 7.2 Safety from accident 7.3 Perception of security
	8. Environment	8.1 Pollution 8.2 Natural resources 8.3 Infrastructure

Source: Common work QUATTRO / CEN TC320 WG5

2.3. Quality and planning in urban passenger transport

“There is nothing more difficult to plan, more doubtful of success, nor more dangerous to manage than the creation of a new system”. (Machiavelli AD 1513).

To achieve success in the creation of a new process, a new way of operation, it is essential:

- to make extensive, daily use of services for which you have responsibility - not just in the morning and evening, but any time and any day. Know your product; practice MBWA - “Management by walking about”;
- to plan, prepare and evaluate, not looking at the end product alone but how you get there;
- to have vision - if you do not know where you want to go, how can the team support you;
- to communicate clearly and quickly. The team wants the real news not the T-shirt or the coffee mug;
- to clarify how “we will do things round here“ in future and give strong management support;
- to overcome “fear of failure” and “human resource inertia“ by obtaining reward systems to support a new performance driven, team-orientated environment with real incentives for changes in behaviour;
- to recognise the vital importance of human resource skills - raise standards but provide good training, improve procedures but make “HELP” the keyword.

These principles apply to companies and authorities - all have much to learn from this process in improving the effectiveness and the position of UPT on the market.

2.4. Know your customer

In Urban Public Transport we need to be “CUSTOMER FIRST”

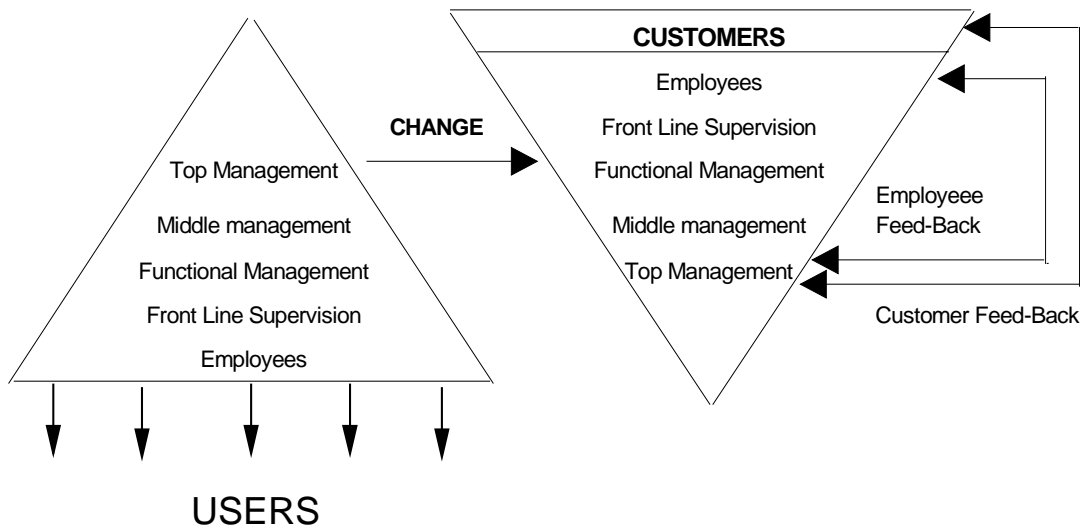
This was stated, simply and clearly by a small airline fighting a bigger one for the market and by a tough politician:

“We never forget you have a choice” - British Caledonian Airways.

“The customer should expect quality as a right” - Margaret Thatcher.

It has been shown that the identification of customer needs is the starting point for such a process. In addition, it is essential to give customers an opportunity to judge service quality and organisational performance. The dimensions of this fundamental change of perspective are illustrated by the figure below:

Change of the organisational culture



Source: Adapted from EFQM and Senge P. "Fifth Discipline"

If we are to be customer-orientated, we need to know:

- who are our customers?
- what do they think?
- what do they want?

What is the overall objective from the customer and community's viewpoint?

The general view of all these groups and individuals is to obtain the best possible public transport service:

- as a first choice, commercially viable by means of its efficiency and attractivity at an acceptable price;
- as a second choice, contracted with subsidy support, based on quality measured parameters;
- as a third choice, a contracted service with fixed subsidy based on specific contract periods.

We describe below the methods appropriate to discover customer views and requirements and their opinions on the UPT system's performance. By the nature of the overall European environment, customer expectations may vary from country to country.

How can the quality of service expected by customers be determined?

In every case, whether a service is to be subsidised from the public purse or be commercially viable in its own right, it is essential to establish for the authority and/or operator what are the passenger preferences and the "trade-off" between:

- price and quality;
- aspects of service in quality terms.

These preferences can be examined by relation to:

- actual choice (revealed preference or RP methods);
- stated choice (stated preference or SP methods).

The main reasons that specialists advocate “revealed preference” instead of “stated preference” is that RP methods are based on actual choice or behaviour. However, they are more difficult to use in preference studies and in calculations of willingness to pay for non-market benefits.

Market segmentation - An essential tool

“Segmentation is the process of classifying customers into groups with similar needs, characteristics and behaviour” (B. Norheim, TØI).

Each segment has a special character associated with:

- geography;
- demography;
- psycho-graphical factors, etc.

The overall process helps to define:

- the product scope;
- the value of the service;
- the expectations of each segment.

Market segmentation factors and research can be used to play an important part “in” tendering and contracting by:

- providing material for a “net present value” exercise on the balance of quality/price in the tender of each bidder;
- creating a link with strategic objectives, tactical decisions and market segmentation in the decision making process;
- supporting creativity in the service specification and the contracting for certain sectors (e.g. night services) by employing specialised operators.

In customer and community terms who pays for good quality?

Cost effective operations and continuing product improvements make it essential to evaluate internal and external effects of Public Transport as part of an overall process. This must include:

- internal quality gains - the use by travellers of an existing service which is improved with no revenue gain;
- external quality gains - the use by travellers transferring from private car to public transport through reduced traffic and environmental costs;
- external quality costs - the external and environmental costs of public transport operation, which varies from type to type and quality to quality levels.

It is essential to demonstrate that poor quality has a cost that must be paid by the customer and, to a certain extent, the general public in:

- monetary terms;
- non-monetary terms through spatial pressures in land use and environmental costs.

Indeed in public transport the motto for the future should be:

“They that pay the Ferryman call the tune“.

2.5. Know your market

What is the general market trend in the UPT sector?

World wide public transport has seen its market share decline markedly in the last 30 years. Europe has not been immune from this trend but has not been the worst sufferer. Public transport has often failed and in many respects continues to fail to be:

- an attractive alternative to the Private Car;
- an integrated, inter-modal facility with easy interchange between bus, train, light rail and tram;
- adaptable to changes in travel needs and patterns;
- useful for new leisure time attractions;
- accessible for new residential areas, shopping centres and workplaces.

Studies in Norway show that, even with consistent, stable quality, market share decreases by 1-2% per year. In short it has been defensive and rarely anxious to be innovative.

How can this situation be improved?

Public transport must become more innovative and market driven. Innovation drives the service industries as well as the main competitor, the private car industry. Innovation must be:

- customer-orientated to increase market share;
- cost-orientated through better production and technology processes.

The result will be:

- better service at the same cost of operations with potential lower costs of access for the user;
- much better service at slightly increased cost of operations, high cost to the user but additional revenue generation;
- same service at lower cost of production and lower user access costs.

Real life experience:

A small UK town increased its ridership on two distinctive routes by 10% over 4 months after 7 new low floor buses were introduced to run a 10 minutes service from 7 a.m. to 8 p.m. Monday through Saturday.

What is the current reality of much of the public transport market?

There is much to be improved at minimal cost before fundamental problems need to be addressed. The market says, with or without justification, that:

- public transport is not fully reliable and cannot be guaranteed;
- public transport users get little or no assistance when the service is disrupted through operational or other circumstances;
- journey times, interchange arrangements and the general level of “complete” service are uncompetitive; Seamless journeys remain a rare experience;
- public transport does not offer a service. It is still viewed as being helpful on a “crisis” basis: “use it when nothing else is practical”.

But there is good news. The typical “European public transport customer” has noticed:

- service improvements in certain places;
- new vehicles with low floors;
- route badging and special liveries with service promotions;
- new interchange facilities;
- promotional schemes for through ticketing;
- training schemes to produce “customer friendly” front line staff.

The perception of the user and the community is widely at variance with that of the operator and authority. To overcome this gap, better market analysis is essential. In conclusion, the lesson for operators and authorities with respect to the fulfilment of UPT customers' expectation is **“Mind the gap”**.

What are key areas for marketing and innovation?

Europe is a wide and diverse public transport market but some general market-orientated trends are clear:

- users and potential users react positively to well researched, well marketed innovation;
- innovation is not necessarily difficult, complex or expensive;
- needs and expectations vary between market segments; it is necessary to market UPT services to each target segment.

The key innovations that the market demands from authorities and operators are:

- reduction or elimination of extended journey times;
- better vehicles with a clean, attractive environment which more nearly replicates the private car;
- features to contribute to a better urban environment;
- efficient interchange and inter-modal facilities which recognise private cars and personal transport as a “feeder”;
- “customer-orientated, customer-friendly” services for suggestions, complaints, tariff systems, new services and facilities, etc.;
- “added value” services with information technology giving greater scope for finding out what is happening and what is available;
- enhanced safety and security with staff trained to respond efficiently;
- high quality, customer-orientated and friendly staff fully trained to play their critical role.

Example: Shrewsbury UK - Park and ride

Shrewsbury, the country town of Shropshire is a small attractive medieval town on an island site almost surrounded by the River Seven. As a historic town it has a conflict of interest. Business and commerce want to be successful without destroying the character of the town with the private car.

To reduce private car traffic, there is a “Park and ride” bus service at 10-minute intervals from 3 park and ride sites on three main routes - from South, North and West.

9 vehicles are needed Monday through Friday and 12 vehicles on Saturdays. All are new high quality, low floor buses in a dedicated livery and driven by specially trained staff who are skilled in assistance to the handicapped and mobility impaired.

The operation needs a subsidy of about £ 200,000 per year but has improved the town centre environment and allowed the creation of a “slow speed” traffic circulation. 1000 cars now park on the edge of the town.

2.6. The voice of the customer

Customer is “King” - OK?

Much of the influence of the customer on European public transport operations is of very recent origin. In 1950s and 1960s there remained a culture which derived from the difficulties of World War II and the post-war reconstruction. This was production-led and driven by the authorities and operators’ demand for survival and renewal, not service or customer satisfaction.

Example: A UK Railway notice in the 1960s:

“Please apply for season tickets 48 hours in advance as supplies are limited”.

The users of urban public transport in the 1970s and 1980s found this approach unacceptable and demanded better service and consumer influence.

Recently, the consumer in general has sought to receive assurance of standards in service industries whether it be health services or banking, public utilities or telecommunications. Such Guarantees and Charters reflect how the user - in our case in respect of UPT - now has a certain level of expectation and is not concerned about how authorities and operators will seek to meet this level of operational efficiency.

The questions are:

- how can the urban public transport user ensure the service fulfils its promises reliably?
- can the same level of reliability be expected each time it is used?
- what “trust” can be placed by the user in the service?
- will the user receive value for money?
- is there any guarantee that the user will reach their destination well satisfied?

The measures now emerging to meet these legitimate demands are:

- Customer Charters;
- Service Guarantees.

Citizens and customer charters

These have been adopted by a number of countries within and outside the European Union largely - based on an initiative started by the UK Government to raise general standards in public service, including public transport.

The charter sets out:

- the details of the commitment to the customer;
- the standards to which the operators works;
- how standards achieved are published;
- how customers will be looked after;
- what compensation will be given if things go wrong;
- how the operator can be contacted.

Within this principle, a family of charters can be defined such as:

- a Charter of Intention setting out general values and principles;
- a Charter of Commitment explaining the establishment of the values and principles;
- a Charter of Means defining the actions to fulfil the commitments;
- an "Agreement Charter" to detail the rights and duties of all parties.

Service guarantees

This new concept has grown in the service industries as a means of demonstrating that the minimum level of service demanded by the customer will be provided and sets out what will happen if the promised service expectation is not fulfilled.

Service guarantees can be highly successful but they need to incorporate certain vital principles before they are introduced. These are:

- the whole management team must support and maintain the whole concept;
- all front line staff must be fully trained and briefed. Above all, changes and periodic results must be communicated efficiently;
- internal preparations and training must be allowed sufficient time in the programme of preparation;
- specialised external training for all staff involved on a day-to-day basis must be arranged;
- test your guarantee before introduction and afterwards with the user. Also test some other ideas and have courage to change if you need to do so;
- do not be afraid of costs - it will be lower than you think even when you are directly compensating the customer.

The Service Guarantee is in effect a Contract between the authority or operator and the user. The commitment that is given serves as a foundation for a continuous improvement programme. However the conclusion from most schemes is:

The customer wants the service promised, not always compensation when service has failed.

Compensation

In principle, if the level of service promised is not reached, compensation must be given to support the credibility of the charter. There can be two types of compensations:

- financial compensation (satisfy or reimburse in full);
- other compensation (gifts or vouchers) or an alternative (a free ride by taxi). The latter shows a commitment to the user reaching a final destination.

Example: London Underground:

The reimbursement system functions well at London Underground (U.K.) and perfectly illustrates the financial compensation concept. London Transport (LT) has two customer charters: the metro charter and the bus charter. Only the metro charter includes a payback system.

The metro charter

The metro charter is presented in a simple and practical form. The commitments expressed in the charter concern the train service (it must be “*fast, frequent and reliable*”), stations (they must be “*welcome, clean and safe*”), information (it must be “*updated*”) and staff (they must be “*polite and courteous*”).

The charter includes a compensation clause “*equivalent to the value of the trip during which the delay occurs*”. In case of delay of more than 15 minutes “*due to the responsibility of LT*”, a refund voucher compensates passengers for the incurred inconvenience. The charter includes a complaint form to be completed by the complainant. In addition to general information (details), the complainant must provide his ticket as proof of the delay. More than 250.000 refunds are made every year. The annual cost of the operation is less than 0,9 million ECU against a total income of 1,1 billions ECU.

Example: Oslo sporveier

The “Sporveiens Travel Guarantee” of Oslo (NO) ensures the customer reaches its final destination. In case of delay of more than 20 minutes due to the failure of Oslo Sporveiens (OS) the main operator, the company covers the cost of a taxi for a maximum amount of 200 Norwegian crowns (25 ECU). Launched on 11 April 1994, 70.000 customers claims related to the travel guarantee had been received by December 1996. The total amount of reimbursement was 1,9 millions of Norwegian crowns (250.000 ECU).

Customer preferences - Influence on contract - Price adjustments

The customers in general prefer compensation to come from the operator to the customer where service or performance is inadequate. However there are examples of customer satisfaction ratings being used to determine additional payments being made to, or withheld from operators. Clearly there must adequate safeguards to ensure good assessment.

Example: HT Copenhagen:

The local situation is that HT:

- is a transport authority for bus services but does not directly operate but plans, co-ordinates, tenders and contracts operation;
- receives all income, fixes fares and pays operators;
- takes responsibility for marketing and public relations / communications;
- contracts 1000 buses for 295 routes;
- 195 M. customers per year.

A quality index is based on:

- passenger/customer surveys (80%);
- HT service Division records (20%);

which creates a quality bonus pool representing 1% of the total value of all contracts let within the scheme.

Contractors/operators are rewarded on the basis of:

- Highest contracts score 4/9ths of the pool;
- 2nd placed contracts score 3/9ths of the pool;
- 3rd placed contracts score 2/9ths of the pool.

Contractors/operators not reaching the minimum goal on passenger satisfaction survey will be deducted 1% of the quarterly sum payable by HT.

Quality survey with customers is:

- on a quarterly basis;
- conducted vehicle;
- with 70% completed a bus; 30% returned later by Freepost;
- all routes are sampled;
- five grades of "satisfaction" from "highly satisfactory" to "not satisfactory".

Categories of service subject to customer review:

- punctuality;
- service;
- driving quality;
- staff knowledge of routes and zones;
- drivers appearance;
- external cleaning and maintenance;
- internal cleaning
- internal condition of vehicles;
- temperature;
- ventilation;
- noise and vibration.

3. Fundamentals of quality management in UPT

3.1. UPT quality is a shared responsibility

There are three fundamentals to the improvement of quality in Urban Public Transport:

- stimulation of the market, including the political, legal and regulatory framework;
- intelligent use of the best tools and methodology, such as tendering and contracting;
- encouraging culture changes by management and staff who will see customer service improved and public opinion positively influenced.

The specific and specialist nature of public transport in urban areas means that the provision of good service to the citizens and community is the responsibility of the authorities and the operators.

The incorporation of sustainable public transport is concerned with the provision and procurement of good services as well as with the optimising of:

- land use planning;
- urban development planning.

What is the role of the operators outside tendering and contracting to encourage public transport business excellence?

The authority has a proactive role in:

- land use planning;
- urban development planning;
- strategies for public transport provision;
- traffic and highway management;
- car parking policy.

What is the role of the operator outside tendering and contracting?

The operators and their partners in manufacturing and support industries must take a proactive role in:

- operational, mini-strategic and tactical policies affecting;
- single mode or multi-modal transport service;
- interconnecting / interchange services and infrastructure;
- marketing, commercial, sales and ticketing systems;
- information service - both permanent and real-time;
- innovation of new products.

What are the joint roles of operators and authorities?

Outside the commercial demands of tenders and contracts the authorities and operators of all types need to carefully consider their political, strategic and socio-economic influence. In particular they need to consider:

- how they advocate service improvements and accept responsibility for implementation;
- how they can positively influence the decisions of political bodies in favour of public transport and highlight its contribution to sustainable development;
- how they can make effective business-orientated decisions which avoid financial losses but are not risk averse in terms of innovation and creation of excellence;
- how they can co-operate in moving to a service industry, customer-orientated culture and logic;
- how the driver, the operating staff, the managers, the planners and the technicians and engineers can acquire the same sense of purpose and vision;
- how positive general and specific partnerships can be created.

What will be the framework in public transport of the future?

The European perspective will create a new programme of strategic improvement at national local levels. It will emphasise that:

- the Citizens Network calls for quality and places the customer at the centre of the debate in public transport and its design;
- a fundamental change is needed to the operator cultures bringing in pan-European operators on a supra-national trans-modal basis who will bring in techniques of efficient customer care quality, operation and cost effectiveness;
- the development of new structures for public transport by authorities with the integration of responsibility for public transport with environmental, highway development and land use planning. Authority roles will be more constrained to strategic studies and policies for sustainable development and contracting with public transport operators to design and operate the appropriate routes and networks;
- there will be a degree of competition throughout the public transport sector to offer greater customer choice with risk sharing between authorities and operators.

3.2. If you can't measure, you can't manage

The data available to the modern management team is more detailed but also more critical than ever before. Public authorities, public companies and private companies have concentrated in the past on:

- data and statistics required by national authorities;
- data and statistics required by the laws applicable to public entities;
- data and statistics required by the laws controlling private companies.

In many countries the data required for subsidy payment is relatively simple and often related to "bottom" line "profit and loss" performance alone. In certain places, however, this has become unacceptable and standard performance data is now submitted as a supplement to "standard" company/authority data.

What do you need to manage an effective quality-orientated organisation?

It is clear that the information required for an authority or company to function efficiently and effectively within a quality regime will be based on:

- Performance against company targets:
 - customer satisfaction;
 - service performance;
 - ticketing and revenue performance system;
 - security, safety and crime matters;
 - human resource performance;
 - suppliers performance.

- Other key performance indicators:
 - customer journey times;
 - complaints, compensation claims and commendations;
 - media comment;
 - customer attitude surveys;
 - level of crowding and load factors;
 - market share;
 - human resource - Recruitment Training and loss.

- Financial statements and statistics:
 - profit and loss account;
 - analysis of gross expenditure;
 - staff costs and numbers;
 - working capital;
 - cash-flow statements;
 - project expenditure;
 - analysis of operations and maintenance expenditure.

The vital, ideal company management system for quality focuses first on:

- performance of customer related services;
- activities related to customer support;
- and last but not least, financial statements and statistics.

This is a vital hierarchy for the management team to follow and enables effective, timely and reliable bids to be made in response to tenders.

How have companies and authorities responded to this challenge?

Initiatives taken by a number of organisations have centred on improving the knowledge of what they do and how they do it efficiently and cost effectively. Customer focus also plays an increasing role in UPT revitalisation.

Example: Ferrocarriles Catalunya - Barcelona, Spain

Faced with a rundown system, this railway company, decided to find out:

- what did the customer want and need;
- what did the customer prefer to have;
- how much were they prepared to pay.

Based on this and with the help of a series of investment decisions supported by customer opinion, a successful operation in difficult geographic terrain was established together with a new marketing slogan: LA LINEA BLANCA.

Example: Semitag, the transport authority of Grenoble, France.

This Authority makes two checks per year on customer satisfaction (winter and summer) and is developing a compensation system that moves responsibility from the authority to the operator to compensate directly the dissatisfied customer. The measurement system addresses:

- services and interchanges;
- punctuality;
- journey time;
- conditions of vehicles and stops;
- ticket / season ticket purchase;
- safety and security.

There is also a systematic method of “Etablissons le contact” to collect supplementary information by:

- listening;
- dialogue;
- exchange of opinions;
- suggestions;
- ideas.

Example: Metro de Madrid, Spain

In Metro de Madrid, Spain a comprehensive customer satisfaction survey has been made since 1993. The survey is carried out:

- in November each year with 5.500 participants;
- by market research staff;
- using 19 specific questions addressing 11 different issues;
- to produce market analysis of customer views;
- to create a “perceived quality index” to company use.

The result gives important data on the relative importance of matters to the customer.

3.3. UPT and the environment

Urban public transport is not the sole responsibility of any one body. There is a positive contribution from the operators to be made but they cannot be responsible for all effects of their presence.

Urban transport has great potential for externalities (which create external costs) through:

- effects on the natural environment through pollutants and Emissions;
- effects on noise and vibration;
- effects on noise and personal safety of other transport users;
- effects on residents and business in urban areas.

External quality means, essentially, reducing the external cost of urban transport and this should be a global goal of authorities through:

- at national and supranational level setting vehicle noise and emissions standards for all vehicles of all sorts used in urban areas;
- at local level setting noise, pollution and road safety standards regarding particular areas of towns and cities.

Urban Public Transport Operations are also affected by Environmental Policies in a secondary way in that:

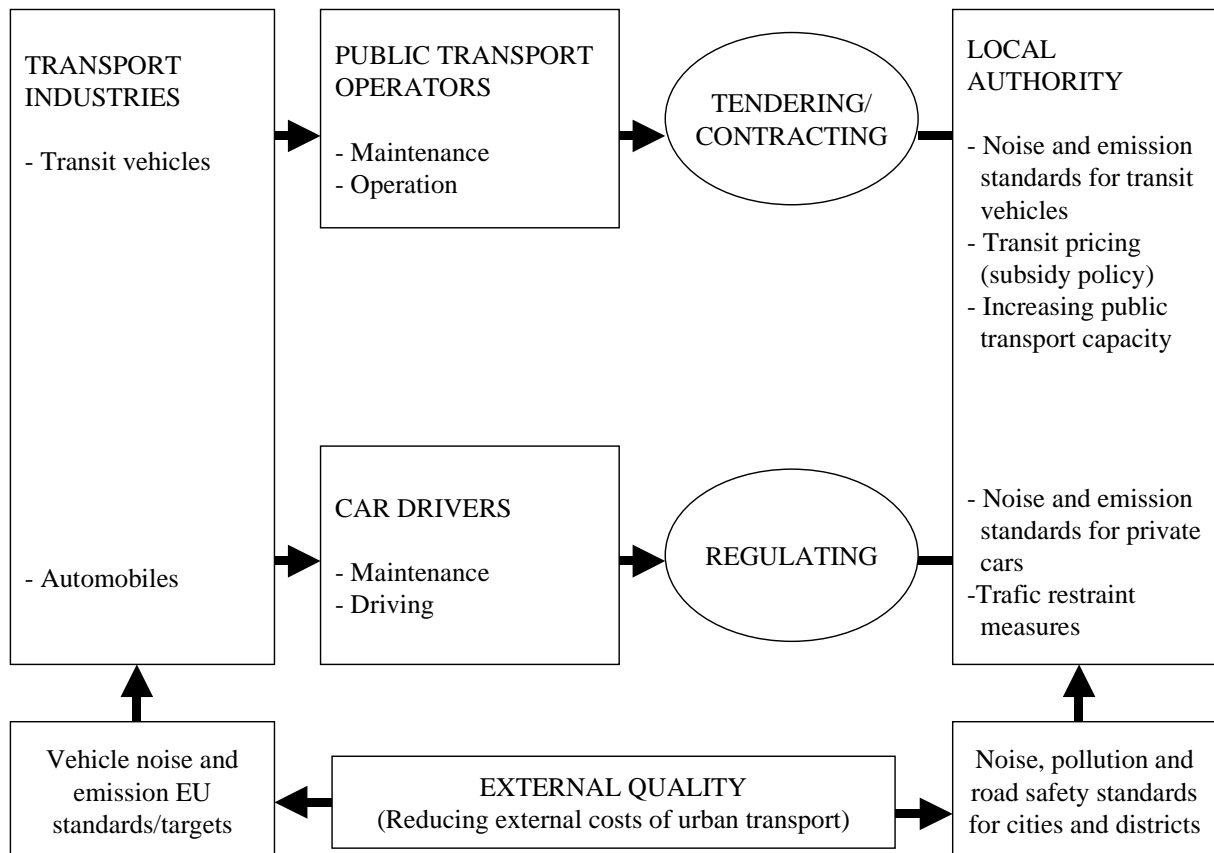
- they use rolling stock and vehicles produced by others and are only responsible for quality of maintenance;
- they can only actively campaign for manufacturers to improve their products if this does not result in increased purchase and operating costs.

There seems to be a clear need for a correct combination of policies for:

- car traffic constraints;
- upgrading and priority for conventional systems of bus/rail/light rail tramway;
- integration of transport and parking policy.

However, isolated, fragmented policies are not able to produce the necessary results.

External quality



Source: QUATTRO

Environmental impact in the tendering /contracting procedures

Especially in relation to bus service operations, it will be helpful to include optimal evaluation factors in the tendering /contracting regime aimed to:

- favour traffic demand management measures to reduce overall congestion;
- increase the use of environmentally friendly vehicles and procedures.

To do this, authorities will need:

- appropriate classification of urban areas in terms of congestion, pollution and high traffic levels;
- to determine critical periods of the day;
- classification of urban transport vehicles based on their environmental characteristics.

In respect of Public Transport Services, it is essential that authorities should include in tenders and contracts favourable assessment for:

- employment of appropriate capacity (do not use a large bus when a small one is as effective);
- use of vehicles with ECO friendly engines and equipment.

How can the shared responsibility for quantity be fairly reflected in tenders and contracts?

With the support of operators, authorities can:

- determine logical minimum thresholds to link potential capacity levels in areas of high congestion risk and other areas in peak and off-peak hours;
- offer a percentage price increase of, say, 5 % to the best (net present value) bidder if capacity in excess of the minimum calculation can be achieved;
- offer a percentage price increase on a similar basis if ECO friendly vehicles are acquired and/or guaranteed;
- arrange to penalise the successful contractor if the capacity and/or ECO friendly vehicles are not provided;
- require periodic certification of vehicles above national standards to ensure attainment of required environmental performance.

What about urban areas where contracting is not practised?

There continue to be areas in Europe where:

- services are partly or wholly on a commercial basis;
- services are operated on a management contract basis.

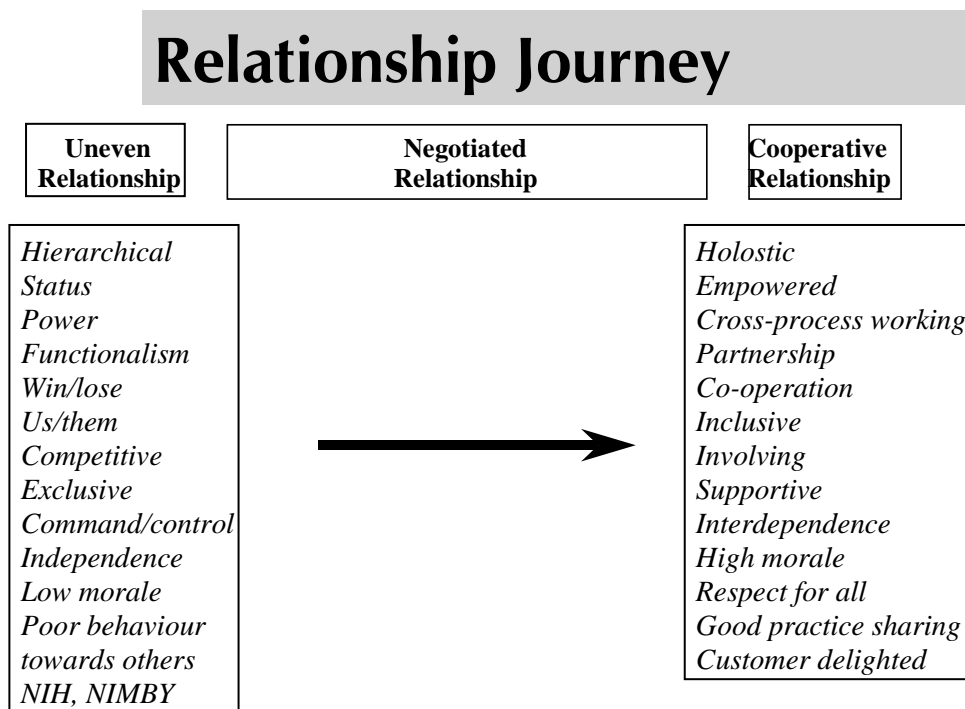
In such cases it remains to the advantage of the operator to establish his credentials as a quality operator by firmly associating the Quality Principles of operation with those of the local cities and towns. The most practical way to establish these principles is by a PARTNERSHIP process. This seeks to establish a way of working together on specific processes and objectives. The areas for non-contractual partnership are:

- provisions of interchange facilities and inter-modal opportunities;
- through ticketing and marketing;
- improved permanent and “ real time ” information;
- ECO-friendly vehicles in congested areas;
- infrastructure: measures and investment to match new low floor vehicles.

A comprehensive version of “ Partnership ” has now been developed in Manchester (UK) and this is shown on the next page. Where co-partnership is concerned, this can reflect matters not covered in contractual arrangements, but thereby creating a further integration on a dual basis.

Partnership in various forms creates a “ win-win ” situation where a level playing field is available for all partners. It is a firm but informal implementation of co-operation through practice rather than theory which can be illustrated by the Relationship Journey.

Relationship journey



Source: John Carlisle Partnerships

External costs and benefits – the joint approach

Externalities affect:

- environmental impact (pollution, noise and vibrations);
- safety and security (social costs);
- congestion (loss of effective working time and pollution).

They require a joint evaluation – they do not affect just the operator, they adversely affect gross national product and sustainable mobility. The joint approach requires:

- clear statement by authorities and operators of their common goals;
- identification of aspects to be included in tendering and contracting processes;
- identification of aspects to be included in partnership and co-partnership arrangements.

The results should be:

- reduction of negative external costs (pollution etc..) through acceptable constraints on the operators;
- increase of environmental quality standards by targeting the achievement of higher standards at acceptable costs;
- establishment of specific quality elements in the tender and contract documents;

and above all, acceptance of joint responsibility in all aspects by those concerned.

3.4. Quality in public transport results from quality in people management

One of the most undeveloped skills in the Urban Passenger Transport sector is the Human Resource factor. Since urban public transport has often been in the past purely a production process, its staff have been regarded as part of that process. In fact, the whole success of a customer-orientated business is people. This applies:

- to the staff at the front line who provide the day-to-day service;
- to the supervising, technical and management staff who support the day-to-day service and maintenance organisation;
- to the Management Team and the Board of Directors.

To achieve this there must be a clear view of: “ The Way We Do Things Round Here ”. This creates a series of guidelines for each staff member from Managing Director to the newest Operator. It gives each individual encouragement to:

- have a sense of service – “ think and act customer ”;
- have a sense of responsibility by providing service and by anticipating problems and reacting to unexpected events;
- have a sense of efficiency but with a goal of maintaining priorities and a sense of judgement.

3.5. What should be the goal for people satisfaction?

The main strength lies in the quality and skill of the people who work for us, so real progress will only come about by constantly monitoring their development and improvement skills. The correlation between the need for high levels of staff satisfaction and increasing levels of customer satisfaction should be recognised.

Staff development plays a central and most important role, as does a more open management style, the working environment and communication. All facets of employee satisfaction need to be understood, measured and continuously improved.

All managers have an obligation to maintain high levels of morale. They need to be aware of people's feelings about their perceptions, their fears, the issues they see, the problems they face.

There can be no excuse for not addressing people satisfaction. Maximise use of the Staff Satisfaction Surveys to benchmark the Business against the best in the transport industry and then take appropriate action to improve continuously

Total quality management and its relationship to people

There are four main thrusts in this context:

- listening and understanding:
 - regularly conduct staff satisfaction surveys;
 - hold regular and open briefing sessions;
 - implement an open and supportive management style;
 - leadership upward appraisal encouraged (how is the base doing);
- considering the environment in which we work:
 - consider location, space and amenities;
 - consider Health and Safety provisions and the Company facilities that we provide;
 - ensure that suitable technology is available;
 - encourage team-working events;
- recognition and reward:
 - promote role models;
 - be actively involved in recognition and reward of individuals and teams;
 - ensure that an above average performance is rewarded;
- professionalism and a responsive approach:
 - providing tools and techniques for quality improvement;
 - providing relevant education and training;
 - coaching;
 - review the "investing in People" process;
 - have evidence of continual improvement in staff satisfaction.

How can the human resources issues be analysed in a particular organisation?

The European Foundation for Quality Management suggests that self-assessment is an excellent way to improve in general terms. However, in Human Resources terms, it invites a response to the question:

"Are UPT sector workers provided with sufficient training and developments opportunities?"

An EFQM assessment will invite answers to specific points:

- does the organisation prepare and review plans for individual development?
- does the organisation ensure people involvement and improvement in its day-to-day work?
- do those in management, whether company or authorities – understand the roles of all the staff?
- are staffs at all levels involved in continuous improvement programmes?
- are staffs encouraged to suggest innovative ideas or initiatives?
- is there a human resources policy that promotes responsibility for this topic amongst managers and staff.

From the Human Resource viewpoint, each company and authority needs to become “A learning organisation”

The key principles behind the concept of “Learning Organisation” are:

- Systems Theory: The identification of specific patterns where problems recur or the capacity limits of the system are reached.
- Personal Mastery: The ability to use simple techniques to view the business from a creative rather than reactive viewpoint. This needs to include creative tension from which learning emerges.
- Mental Models: The ability of Managers to recognise the power of patterns of thinking at organisational level and the use of non-defensive enquiry into these patterns.
- Shared Vision: This must develop from personal vision. When it is established the tasks for management are seen as visions which are not seen by the Team as other than "their" vision.
- Team Learning: This demands dialogue and discussion. It is characterised by its exploration routine so as to narrow down the best alternative solutions.

Other methods to develop human resources for the benefit of all

In many cases Human Resource failings and inadequacies are revealed in the inability of the organisation to achieve its objectives and promises. To ensure that “change management” and “a new way we do things round here” can be introduced it will be helpful in many cases to introduce Cross Functional Teams where peers can meet to exchange and debate existing and proposed practices within the company:

Example: London Underground Ltd (Company Plan 1991-1992)

London Underground Ltd used as part of its process:

- Value Analysis Teams trained to work together on a cross-discipline basis to evaluate practices and processes. Staffs down to Junior Supervisor level were involved.
- Cross functional teams at all levels to produce ideas on change and change management and rationalise the processes.
- a programme-called “Front Line Management Development” – to encourage and support Supervisors and Managers when their new duties under the “change process” involved new skills, competencies and challenges.

The change programme was successful with the reduction in staff numbers of 5000 out of 21.000, nearly all on a voluntary basis and a high level of re-skilling and an annual saving of more than £ 200 million in operating and maintenance costs.

In addition, there may be scope for authorities to link EFQM principles with a programme such as “Investors in People”. In principle the programme shows how the people skills and performance of individuals can be improved by

- creation of individual portfolios;
- participation of managers as mentors and advisers;
- encouragement of individual staff to pursue future betterment.

3.6. “Quality pays”

The Quality “Upwards” Circle

To establish the benefits of quality, it is necessary to develop a shadow price and cost profile from a “traditional operation”. Using this as a base for a route or network gives:

	Quality operator cost
+	Quality additional revenue
-	Better quality costs
	<hr style="width: 50%; margin: 0 auto;"/>
=	New overall net cost

The existing customer will benefit by:

- better quality service;
- better quality staff;
- better quality vehicles;
- same cost.

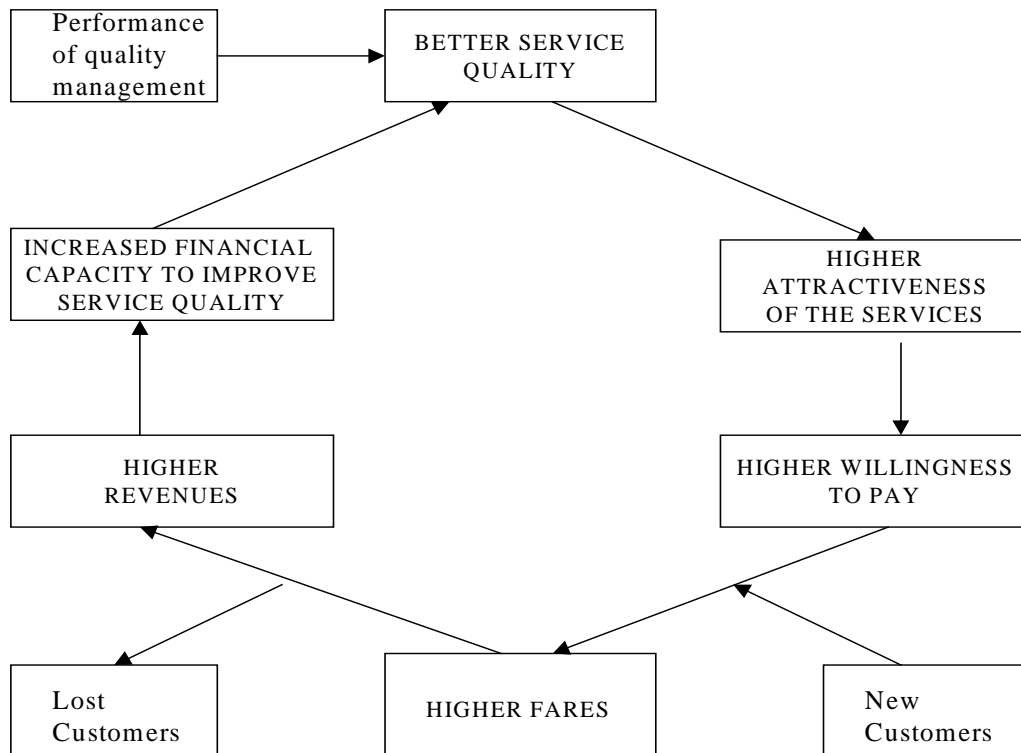
New customers will benefit from the same characteristics but will add to the revenue of the service.

The Operators and Authority should benefit from this process through:

- better revenue performance;
- better service performance;
- reduced maintenance and operating costs (such as fuel) from investments in new rolling stock and vehicles.

In short, with co-operation of all concerned, quality creates a “WIN, WIN” virtuous circle.

The willingness to pay circle



Source: QUATTRO

Examples of quality added value – the practical aspects

In UPT over the last 30 years there have been many examples of the circle of decline:

- increased costs and reduced service;
- further reductions in revenue;
- increasing costs and further service reduction.

The positive quality circle starts from:

- knowing the customer and knowing the market;
- responding to demand and refocusing service standards;
- innovation to meet the market demand.

Certain circumstances reinforce the positive aspects of the upward quality circle:

- strong encouragement for Quality Management principles in the Authority and Operators;
- demonstrable efficiency coupled with a higher pricing levels;
- support by the Authority for promotion of Urban Public Transport by parking controls, bus lanes and so on.

Public Transport is a service worth a price. Improving Quality makes a higher price level acceptable. To illustrate this, the diagram below shows cost coverage on one axis and trips per inhabitant per year on the other. The cities combining high ridership and high cost coverage are all known for their high quality approach.

	low		trips/inhab/year			high	
low	<100	100-200	200-300	300-400	400-500	500+	
		Athens					< 15%
			Rotterdam	Rome			15-20%
		The Hague		Amsterdam		Budapest	20-25%
		Brussels	Mexico				25-30%
	Cost coverage	Antwerp		Torino			30-35%
				Paris Stockholm			35-40%
		Bonn	Oslo	Helsinki			40-50%
			Lyon Barcelona Copenhagen	Hamburg Vienna New York		Zurich Munche	50-60%
	high		Dublin	Lissabon	Bern	London	

There is a particular aspect to the Quality “upwards” circle from towns and cities where there is a propensity to pay more for quality. In such cases a better market position can be established with higher quality but this will depend on the ability and willingness of the customer to pay.

Example: London Transport

London Underground operates in a market mainly drawn for socio-economic groups ABC and market research shows a high propensity to pay for quality and improved service in this group.

London Buses operate in a market mainly drawn from socio-economic groups CDE and in this case there is a substantially lower willingness to pay for higher quality.

In terms of quality and innovation, a “steady state” is not a success; innovation must result in a continuous evolution of public transport. Whether authorities and operators are in a contractual or partnership situation, they can innovate and make quality pay.

Example: City of Birmingham - Route 33

The jointly managed “Quality Bus Showcase Project” - with the marketing title of “The Line - has been in operation in Birmingham since early 1997. The route is a commercial operation by Travel West Midlands Ltd. It runs from the Birmingham City Centre on a 13 km route along the A34 Walsall Trunk Road.

There are 15 new floor accessible kneeling Volvo buses with 30 dedicated drivers, specially trained in customer care and disability awareness, to ensure adequate cover. There is “real time” hi-tech travel information on both audio and screen display in the vehicles and the bus stops. These newly created bus stops have special kerbstones shaped to enable buses to snuggle up against them, without causing the tyre damage that occurs from standard kerbs. They are imported from Kassel in Germany. Bus shelters are fully lit and are specially designed to accommodate wheelchairs.

The route is intended to use as much as possible of the 24-hour bus lanes and traffic signals with bus priority along most of its route. The main intention is to make bus travel more attractive to the car users in the hope that it will reduce traffic congestion. Route 33 is the first of its kind in the Midlands, the cost being financed by a joint venture between Birmingham City Council, Walsall Metropolitan Borough Council, Centro, Travel West Midlands and some EC funding through the UK Department of Transport.

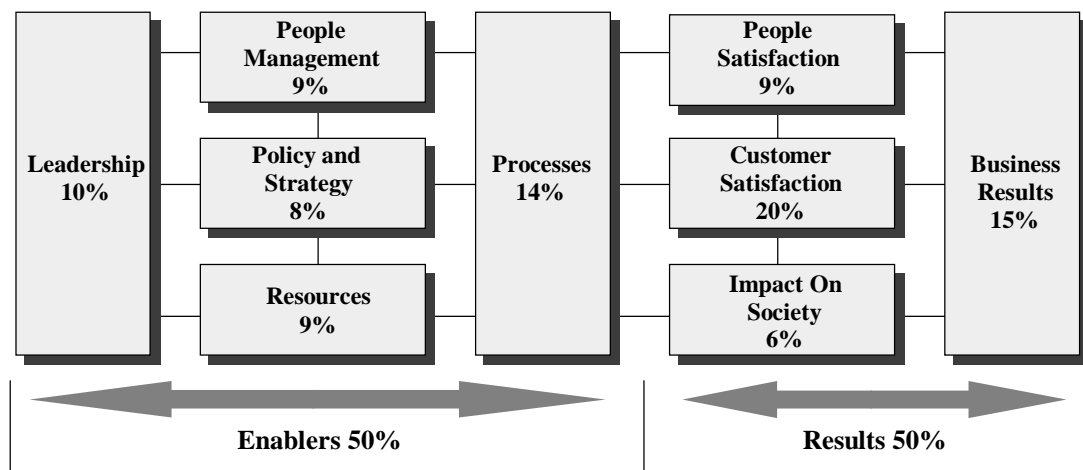
There has therefore been joint investment between the Operator (TWM) - who have provided new low floor vehicles and dedicated, specially trained drivers - and the Authorities who have upgraded and enhanced the bus infrastructure and adapted traffic management facilities.

For a Partnership in respect of a Commercial Operation, the results have been spectacular. The rise in customer satisfaction and acceptance of the traffic management measures has been high and will be fully monitored after a 12-month period. The ridership in the first 6 months of the scheme has risen by 26% and this has provided great encouragement to all concerned.

How to start the “quality pays” circle from business excellence

The European Foundation for Quality Management (EFQM) model is particularly adapted for use in the public sector and with public/private sector partnerships. This approach is based on the concept of “to measure to improve” with the purpose of starting continuous improvement programmes which are at the root of quality.

The EFQM self assessment model



Source: EFQM

The model incorporates:

- leadership and consistency of purpose;
- customer focus;
- suppliers partnership;
- people development and involvement;
- concept of process and relevant facts;
- continuous improvement and innovation;
- public responsibility;
- a result-orientated approach.

4. Tools which are recommended by Quattro

The Quattro Research has identified several quality tools and methodologies. These are not specifically related to contractual or tendering incentives but are essential to the preparation of a modern organisation involved in the UPT Industry. These tools include:

- Benchmarking (Chapter 4.2.)
- Self assessment (Chapter 4.3.)
- Quality management technique (Chapter 4.3.)
- Standardisation and certification (Chapter 4.3.)
- Quality partnerships (Chapter 2.6.)
- Service guarantees (Chapter 3.3.)

4.1. Benchmarking

Benchmarking can be described as the systematic comparison of the performance of a Company, Authority or Organisation against that of:

- other organisation, competitors or other industries (external benchmarking);
- other departments, sections or subsidiaries of the same organisation (internal benchmarking).

It is a continuing process towards improvement and a “win-win” process. The salient features are that it:

- is an ongoing circular system;
- identifies areas where the most significant improvements to the bottom line can be made with benefit to customer relationships or business excellence;
- sets standards for “best practice” which can be identified;
- examines how the “best” meets the required standards;
- allows the adaptation of lessons learnt from the studies to meet and exceed given standards;
- identifies what makes a difference to the internal or external customer.

The benefits can be identified as:

- the ability of management to focus change processes on innovation and the “best in class” principle by illustration of comparisons;
- the creation of increased customer and people satisfaction as well as better competitive advantage;
- the identification of strategic goals and the establishment and their achievement by progressive programmes;
- the awareness of what you do well and why and by contrast, through self analysis, what you do badly;
- the removal of the “we’ve always done this” and the “not invented here” syndrome.

Benchmarking is not well developed in the UPT sector nor in the transport sector generally. In many cases, this is due to the view that detailed comparisons and studies will blunt a competitive approach and break commercial confidentiality.

Obstacles to external benchmarking amongst operators include:

- concerns about confidentiality;
- lack of efficient tools and techniques to identify comparable practices;
- reticence about free exchange of views and absence of “no blame” cultures;
- poor data availability making comparisons invalid.

Benchmarking clubs: a case study of the CoMET group

In early 1995, five of the world’s largest heavy metro railways – Berlin, London, Hong-Kong, New York and Paris formed a benchmarking consortium, co-ordinated by the Railway Technology Strategy Centre (RTSC) at Imperial College, London, to compare each system’s performance indicators and to use them to find ideas for Best Practice. Since then, three more systems – Mexico City, Sao Paulo and Tokyo - (TRA) – have entered the group, which is known as CoMET – Community of Metros.

The basic project plan for the benchmarking club has been the initial collection of basic information from each company following the preparation of Key Performance Indicators (KPI). This task consists in:

- the definition of indicators within the areas of financial effectiveness, efficiency, asset utilisation, reliability and service quality, and safety;
- the design of an appropriate survey techniques;
- the collection and validation of data;
- • the improvement of the comparability and understanding of the data.

Case studies: This is part of the data collection and quality improvement programme with both quantitative and qualitative insights into different practices in different areas of the business. The case studies are designed to test KPI implementation, to understand cause and effect and to define best practice. They consider metro railway and other relevant industry experience.

Best practice: this task gives the opportunity to participating companies to identify revised practices and procedures and introduce “Best Practice” based on the KPIs and the conclusion from the case study exercises.

After three years, the first examples of best practice implementation are related to:

- capacity: several systems are implementing operational changes to improve capacity and reliability of the service;
- contracting out: the lessons learned on contracting out non-core activities are being shared and applied by several participating metros;
- staffing levels: early work of the consortium has indicated significant opportunities to improve cost effectiveness related to staffing – implementation analysis is now underway;
- reliability: the importance of reliability management has been demonstrated and London Underground is now implementing changes on two lines;
- rolling stock investment maintenance and staffing.

The CoMET consortium is one of the rare benchmarking groups in urban public transport established for a long period (no deadline was fixed at the creation of the consortium). The objectives of the 4th year plan (1998) are:

- gain full value from the existing database and the work done in previous phase;
- assist metros to put in place passenger quality KPIs;
- improve the implementation rate of Best Practice proposals;
- to start to draw conclusions from time series data to establish trends and impacts of given policies and action programmes;
- to continue to define Best Practice in high priority areas that can lead directly to implementation.

Another club of medium to large metros is now being formed in view of the success of CoMET.

External benchmarking amongst authorities was not identified at all within Europe. However, it has potential advantages in:

- assisting authorities where methods and practices are changing;
- providing a support mechanism where relations with operators are restricted;
- helping authorities who are becoming involved in management and monitoring systems;
- creating ways to identify roles and responsibilities where these are to be shared.

Internal benchmarking is used in a variety of sectors including the UPT sector. It allows all types of management practices to be internally reviewed across departmental and technical boundaries using value analysis techniques. An internal benchmarking process requires active and continuous support from senior managers.

Example: Internal benchmarking at STIB/MIVB (Brussels)

Instead of certifying all the departments of the company at once, STIB/MIVB managers decided, in close co-operation with the Quality Department of the company, to work with only a few of them to start with.

The criteria used for the selection are:

- proposals from volunteers and degree of involvement of the managers of the department;
- how representative the department is in the company;
- at least one of the activities has to be in direct contact with the customer.

At the level of the transport authority, internal benchmarking is possible between administrative departments to improve the way in which contracts and relationships are managed.

The present and likely future development of the public transport market and the higher degree of competition leads more and more companies to improve their performance. In order to identify promising management practices, operators need appropriate identification tools. Usually, operating companies start the benchmarking process by comparing their performance through existing and publicly available statistics. Existing statistics suffer from a lack of accuracy because of different definitions or understanding of concepts.

The culture of the public transport sector is generally open to bilateral exchanges. With incentives from authorities or operators, small groups of companies benchmark some specific areas. However, these exercises are generally limited in time and do not lead to further work. Benchmarking groups with more than 5 operators and established for long periods are quite rare. The CoMET club described above appears to be an exception.

Benchmarking shows great promise as a method of obtaining “best practice” standards at minimum costs. It provides:

- comparison with the best;
- a “planning experience” which will always be broader than your own;
- a way for management teams to learn that the best in one field is not necessarily the best in everything.

In summary, ***“Benchmarking is non-stop; it is a tool to bring about continuous improvement and adaptation which is the only means of survival in a continually changing world”*** (ERT).

4.2. Self assessment and quality management

In Chapter 3.2. about management and measurement, we referred to the need for self-motivated data acquisition to aid decision-making. The self-assessment process recommended by the EFQM can be defined as: “taking a hard look at your organisation and scoring it against an ideal or model. The results indicate the strengths and areas for improvement within the organisation and cue a basis for future strategy and improvements plans” (EFQM).

An effective use of the self-assessment process in a company or authority in public transport will generally identify weaknesses in:

- leadership system co-ordination: for example duplication of functions, inefficient use of resources, lack of overall management direction;
- policy and strategy: strategies, policies and tactics are not co-ordinated in time or space. No unified image seems to exist;
- People management: Human resource issues are not well developed and training/improvement issues are stipulating potential;
- Customer satisfaction: this is measured but only at the level of the operators with little reference to the global issues or the views of the share holders and non-users;
- business results: there are still many examples of “this is how we have always done it” New systems and a new focus is often needed;
- Impact on society: little measurement of the global impact of the transport system on the environment is a meaningful way.

The EFQM self assessment model (see Chapter 3.6.) enables a Company’s plan to be formulated by reference to:

- the Enablers:
 - leadership;
 - strategy and planning;
 - people management;
 - resources;
 - processes.
- The Results:
 - customer satisfaction;
 - people satisfaction;
 - impact on society;
 - business results.

Proper self assessment based on data and accurate facts will enable a vigorous but effective total quality programme and plan to be proposed.

Development of Quality Measurement Systems

To exercise proper control on Quality Standards, it is recommended that a series of Key Performance Indicators (KPIs) and Critical Success Factors be established to encourage a high standard of performance report and target setting at all levels. This is the key to delivering improvement in:

- Customer Satisfaction
- Operating Performance
- Financial Results

They could be summarised in the following way:

Customer Service	Cleanliness Information Station Service Operators Staff Helpfulness and Availability Line Route Service Levels % of Scheduled Km Operated Service Headways Revenue Collection Service
People Performance	Employee Satisfaction Index
Safety Performance	Safety and Security
Business Performance	Operating Gross Margin Cost per km

Market research surveys usually indicate that customers are interested in:

- competitive Journey Times,
- Reliable Service,
- A “ Quality ” Travel Environment.

London Underground Ltd., UK considers the following objectives as critical:

TIME	To reduce overall perceived journey <i>time</i> and provide a regular and reliable service to customers. Reducing journey time is seen as being the prime target
AMBIENCE	To improve the <i>ambience</i> of the journey for customers in terms of cleanliness, security and information
SAFETY	To improve <i>safety</i> performance by demonstrably managing risks down to a level which is as low as reasonably practicable, whilst observing all legal requirements
ENVIRONMENT	To have the lowest practicable impact on the <i>environment</i> – and to be seen to do so
MONEY	To manage <i>money</i> (i.e. gross margin) effectively by increasing revenue and reducing costs whilst optimising social benefit

Standardisation and certification

Quality assurance is needed to ensure: “ that all the planned and systematic activities implemented within the quality system and demonstrated as needed provide adequate confidence that an entity will fulfil requirements for quality ” (ISO). The international organisation for standardisation (ISO) defines standards as: “ dominated agreements containing technical specifications or the precise criteria to be used consistently as Rules, Guidelines or Definitions of Characteristics to ensure that materials, products or processes and services are fit for their purpose ” (ISO). Standards can be classified in three types:

- quality system standards e.g. ISO 9001, 9002, 9003;
- quality management standards e.g. ISO 9004-1/4;
- output standard e.g. AFNOR –NG-X50-805.

Each of these has been used in the UPT sector; the examples below illustrate how. However, standardisation and/or certification are not so widespread yet in the UPT sector, especially when considering public transport authorities. The future will demand, as a minimum, a Company or Authority Quality System or a Management plan to be put in place.

Example: the management strategy of Semitag (Grenoble)

SEMITAG⁴³ manages an urban transport network in the urban area of Grenoble (23 towns) on behalf of the organising authority, SMTC. The company operates 20 routes, has 800 workers and 300 vehicles (tramways, trolley-bus and bus). SEMITAG carries 220.000 passengers a day and its annual budget reaches 300 million FF.

⁴³ Société d'Economie Mixte des Transports de l'Agglomération Grenobloise (SEMITAG), BP 258, 380444 Grenoble Cedex 9.

After a rapid increase of patronage due to the opening of two tramway lines in 1987 and 1990, the management decided to focus on the improvement of both the service provided by the company and its organisation. This led, in June 1993, to the launch of a company project entitled PAQT 97 (Plan d'Action Qualité Tag). This plan defines the strategy and the main objectives of the company for the next 5 years. The three thrusts of PAQT 97 are:

- Better serve the customer;
- Better enhance the value of staff and their competencies;
- Better manage the economic and financial constraints.

Quality is the common denominator of the three approaches. They include some elements of a Total Quality Management approach: the customer approach, the greater concern of the workforce for the business and a more efficient use of resources.

Certification is also a major objective of the management plan for the period 1993-1997. Nevertheless, it is only a part of the quality process of the company. The quality process, a major theme of PAQT 97, has two aspects:

- action for the improvement of the quality of customer service;
- action for the improvement of internal operations with the objective of being ISO 9001 certified. The first part of the quality process has been split into three phases ;
- a satisfaction survey to identify customer expectations and their opinion on the service (September 1993);
- a service commitment to the public with a charter and quality objectives (March 1994);
- change to existing practices in order to reach the objectives defined (from 1994).

Example: the certification of three RATP bus lines

RATP is, since 27 February 1998, certified for the service of three bus routes following French standard NF 50-805. In accordance with French decree n° 95354 of 30 March 1995 which outlines the terms for service certification, a frame of reference has been drawn up and approved in conjunction with all interested parties, namely: two groups representing passenger and consumer interests, the organising authority, an official from the Ministry of Transport, the certification board and representatives from RATP.

At the request of the organising authority, the *Syndicat des Transports Parisiens* (Paris Transportation Agency) the frame of reference is to be applied to all bus services in the Ile-de-France region and not just those operated by RATP.

The terms of reference are flexible and include the following:.

1. 14 service commitments of which 9 are generally applicable and 5 are line specific. The former will apply to all bus routes in the Ile-de-France:

- | | |
|--|--------------------------------------|
| - Remote information services | - Comfort / load factors |
| - Information at points of sale | - Revenue Protections |
| - Information at bus stops | - Driver appearance |
| - Information at stops during service disruption | - Bus reliability |
| - On-board information during service disruption | - Anti pollution measures |
| - Driver behaviour | - Clean bus stops in good conditions |
| - Regularity / punctuality | - Clean buses inside and out |

Each commitment carries with it:

- a reference service;
- a level of achievement for the reference service expressed by way of results expected for the passenger;
- unacceptable situations and response mechanisms.

2. Methods used to measure and calculate results for each commitment as well as a description of how measurement is organised (Who is responsible for what).

3. Organisation of the implementation of service.

4. Methods of control and auditing applied by certification body.

5. Passenger information regarding the commitments.

The certification body is responsible for a number of checks, including:

- the relevance and effectiveness of the system of measurement;
- an assessment of whether the quality achieved matches the commitments made.

The certification body must also analyse any customer complaints it receives and has the right to conduct passenger surveys. Certification is renewable annually and is subject to a follow-up audit.

4.3. Quality implementation is progressive

As part of the normal company/authority relationship, the application of quality in organisation and managerial plans can be associated with:

- commercial activities;
- tendering and contracting;
- management contractors;
- partnerships.

For Public Transport Authorities and Operators the key actions are:

- identification of customer expectations, constraints and competitive situations;
- definition of the targeted service quality;
- measurement of progress, analysis of results and identification of “ gaps ”;
- enhancement of success;
- communication with users and stakeholders.

By these progressive steps, organisations can evolve towards the adoption of Total Quality Management through:

- assessment of the existing situation;
- definition of priorities;
- formulation of a proposed TQM system;
- use of the systems in normal business, in tenders and in contracts.

5. Quality contracts and tenders

5.1. Quality in tenders and contracts

The “ Added Value ” that can be created by Urban Public Transport over and above its functions as a “ Common Carrier ” means that in many parts of individual countries of the European Union there will be a beneficial effect by offering certain lines, routes and national to tenders from operators whether it be:

- Bus or trolley-bus;
- rail or light rail;
- tramway;
- ferry or ship.

This chapter seeks to propose a guide to these processes and to link them with quality plans. The methods and frameworks are often complex and this outline is therefore only an introduction to this broad topic.

5.2. Tendering and contracting – The legal framework

The tendering and contracting of Public Transport Services has to be undertaken within the code of law applicable in the concerned country and must conform with normal commercial law and judicial systems.

All operators and authorities will need to respect that:

- any properly qualified and competent operator as defined by national laws and regulations is entitled to seek pre-qualification for admission to the tender process;
- any legally constituted authority/body with delegated authorities to procure control and fund public transport services may call for tenders and award contracts on such terms as they may decide within the principles of fairness and equity.

In certain circumstances the authorities may adapt various procedures to lead towards the provision of public transport services.

Market regulation and tendering procedures

Procedures	Market regulation		
	regulated	limited competition	free competition
free access			
open tendering			
restricted tendering			
direct negotiation			

If projects involving infrastructure are subjected to this procedure, the EU Procurement Directives must also be observed.

These procedures can lead to services with prescribed quality standards which are contracted through:

- free access/deregulation;
- direct negotiation;
- open or restricted tendering.

Within the sphere of open or restricted tendering, there are certain principles to be confirmed in terms of the legal framework before tender bids are invited. These are:

- accessibility of data and market information to all bidders;
- communication of supplementary information (resulting, for example, from questions from one bidder) to all bidders;
- Whether a precise level of service is to be specified or whether compliant and non-compliant (possibly innovative) bids will be accepted;
- The procedure for contract award and for example, how will quality be evaluated in the bid in cash terms;
- the negotiating procedure in terms of National Contract Law and Practice;
- the procedure for additional parts of the contact package in a comprehensive bid involving:
 - purchase agreements;
 - construction agreements;
 - equipment leasing agreements;
 - operations and maintenance contracts;
 - insurance;
 - financing packages.

Contracts and risk division between principal and operator

Risks	Types of contracts								
	net cost			gross cost			management		
	prin	both	oper	prin	both	oper	prin	both	oper
political									
production									
revenue									
financial									
planning									
environmental									
contractual									

Source: QUATTRO

In this context, the types of contract are:

- Net Cost Contract – Productions and Revenues Risk borne by the operator who receives all the revenue
- Gross Cost Contract – Production Risk borne by the operator and Revenue Risk by the authority; revenues go to the authority
- Management Contract – although the basis will vary, this is effectively the same as a Net Cost Contract

In addition, a comprehensive view of various types of risk is needed:

- production;
- operating;
- social (industrial disputes);
- revenue;
- planning
- contractual;
- financial;
- political;
- environmental

In most cases, the Authority will be obliged to forecast a series of variables and to share the risk with the Operator and a view taken in advance of costs, to be added to the contract price and those risks which the authority will be able to accept.

Contract Length

In each case, the contracts can vary in length. In essence:

- Long Term Contracts can be desirable but expensive to invite, negotiate and enforce
- Short Term Recurrent Contracts can be attractive in principle but may discourage innovation (for example purchase of new vehicles) and be costly in terms of administration and operator costs which will be passed on to the Authority

Further contract variations can be:

- Gross Cost Contract with revenue incentives
- Net Cost Contract with shared revenue risk

		Production risk borne by		
		Agent (Transporter)	(Both)	Principal (PTA or PTE)
Revenue risk borne by	Agent (transporter)	NET COST CONTRACT		
	(Both)	Net cost contract with shared revenue risk Gross cost contract with revenue incentive	Management contract with productivity and revenue incentives	
	Principal (PTA or PTE)	GROSS COST CONTRACT	Management contract with productivity incentives	MANAGEMENT CONTRACT

Finally, in determining the framework within the constitution of the Authority consideration must be given to:

- application of fair competition;
- methods which optimise quality but which are legally enforceable;
- practical contractual application in the light of the type and scale of the contracts.

An example of incentivised contract is given for Norway.

Example: Quality management and rewards in tendered bus operations in Lillehammer.

Rewards for the operator is implemented in the contract from 1997 and are foreseen to be continued until the end of the contract in the year 2000. The county authority have to give bonuses or penalties to the operator according to two dimensions:

1. Traffic growth: the operator gets a bonus of 100.000 NOK/year if traffic increases by 10%. If traffic growth exceeds 13%, there is an additional bonus of 100.000 NOK/year.
2. Perceived Quality: improvement in customer satisfaction of 2 points leads to a bonus of 100,000 NOK/year. If customer satisfaction is improved by 3 points, the bonus is 200,000 NOK/year. If, on the other hand, customer satisfaction is reduced by 1 point, a penalty of 100,000 NOK is due. If the reduction in customer satisfaction is 2 points or more, a penalty of 200,000 NOK applies.

5.3. Quality in the tendering lifecycle

This section will introduce the process leading to an outline of:

- the tender procedure;
- the bid or tender document;
- the evaluation of bids and award of contracts;
- evaluation methodologies;
- the contract and contract documents.

The procedure must be designed to make a contract award to:

- an operator who can provide and has demonstrated his capability of providing services at the required standard and agreed cost;
- an operator who has had an equal opportunity to bid with and against others for the contract;
- an operator who has been made aware of the administrative requirements and the quantitative and qualitative factors applying to the bid;
- an operator who understands clearly the scope of the work to be performed and his rights and obligations and those of the authority offering the contract.

In terms of Quality, the contract must make clear that:

- quality and Continuous Improvement Systems are preferred to “ simple ” quality;
- quality of service should have priority over quality of procedures;
- quality Management at network level should have priority to Quality Management elsewhere.

Example: Soderthé, the public transport authority of the Hérault Department, France

Soderthé tendered public transport services on functional specification basis. The potential operators had to bid for the three following functions:

- operate public transport, and control the results of operation; this control include an a priori control system which stimulate the operator to prevent disruption of service;
- communicate with the local environment (e.g. schools, parents, communes, the authority, etc.);
- improve the quality of service.

On the basis of these specifications, potential operators have been invited to present their solutions to fulfil the functional requirements.

5.4. The tender procedure

This is the vital beginning to a process that must be well prepared prior to any document being issued. The first part of the process will be the issue of the invitation to tender. This will be advertised as being available unless there has been a pre-qualification process which will create an approved list of bidders.

The invitation to tender will address:

- the objectives of the tender;
- a full description of the procedure to be followed;
- the technical specifications;
- procedure for short-listing of bidders;
- the criteria by which the successful bidder will be selected and the evaluation process;
- details of the allocation of responsibilities and risk sharing.

It will be accompanied by a statement outlining the strategy and policies being followed by the Authority.

Also included will be the appropriate pricing information about:

- the network or line and route design;
- fares and ticketing schemes;
- timetables and minimum service levels (by route and including interchange etc features);
- service frequency, quality and reliability components.

Finally, the document will indicate whether non-compliant (possibly including innovation) will be accepted or not.

Example: HT tender document (1996)

Competitive route tendering was introduced in Denmark in 1994. The tendering system currently covers 50-60% of all served areas. The authority is responsible for the definition of desired service including timetables, routes and quality of buses.

The selection of bids is based on: price and quality of vehicles, environmental factors and organisation and resources.

Main aspects: some quality parameters are required and some are optional. In a value analysis fictional prices for non-delivery of optional parameters are shown. In case of optional quality parameter is not met, those fictional prices will be added to the prices quoted by a bidder in order to make the bid compatible with other bids which do include that particular parameter.

The value analysis consists of 9 parameters regarding vehicle specification, 4 regarding environmental influence of vehicles, 1 regarding the description of organisation and resources and any extras specified by the bidder.

The document also describes the HT quality assurance programme and requests that a quality manager/ co-ordinator is appointed within the organisation of the bidder.

The tender document

In response to the invitation to tender, the interested bidders will be required to submit their proposal. The bidder must respond to the invitation quite precisely and clearly and include:

- general information:
 - details of service proposal, design and operation;
 - response to specific requirements of the Authority;
- information for the Authority;
 - company management policies;
 - specific comments on public transport policies affecting the bid;
- information about the Bidders strategy;
 - specifying explicit and implicit criteria used in the bid;
- information on the competitive market position of the bidder;
 - the product in relation to the service requested;
 - particular strengths;
 - how weaknesses will be addressed;
- technical;
 - primary indicators;
 - pre-qualifications criteria;

The bidder may supplement this by:

- a statement of how “ value added ” can be created;
- a statement of Quality Programme/Company Management Systems and other relevant company policies;
- a presentation of a non-compliant bid(s) if appropriate with full details of the services this will provide.

In conclusion, the bidder must ensure that:

- all general and particular points have received a full response;
- the quality principles, professional competence and policies of the Company as an operator are fully outlined;
- all local and special factors have been recognised.

Evaluation Procedures

These are the core parts of the procedure and involve the Authority and the Operator in real time activity. It is vital that the procedures and principles are known and accepted by all concerned. The process of evaluation will start with the formal opening of tenders, either in public or private, in accord with Authority’s procedure.

The system of evaluation will then proceed:

- to review the content and check the financial aspects (including an arithmetical check);
- to check that the bidders and the tender evaluation team apply the relevant procedures;
- to check that all concerned know how late or supplementary submissions will be treated.

The tender evaluation will then start and as part of the process:

- “ questions and answer ” and contract interviews will be held;
- information from these will be distributed to all bidders and an information source of database made available;
- a short list of bidders may be decided to facilitate an award by minimising costs to both sides;
- final interviews will be held and an official contract award statement sent to all bidders.

5.5. The contract

The contract document follows the contract award but has important features without which the overall procedure is incomplete. In principle, a well drafted, soundly based contract will be a “silent” document on which principles of day-to-day contract operation and performance assessment can be managed on a non-confrontational basis. The contract documents will specify:

As standard clauses	<ul style="list-style-type: none"> • whether it is a “ Net ” or “ Gross ” cost contract • the insurance and indemnity clauses • the duration of the contract (for rail 5-7 years ; bus 3, 5 or 7 years with intermediate reviews seem equitable) • arrangements in the case of disputes and an arbitration procedure
In the service related clauses	<ul style="list-style-type: none"> • management and staffing details • employment practices • vehicles specifications and standards • vehicle procurement and maintenance • accessibility for customers and the mobility impaired • livery and badging • ticketing • publicity and information • complaints • provision of data • infrastructure matters • monitoring and performance rewards / penalties • revenue protection / ticket examination • facility charges

<p>In the revisions, prolongations and termination clauses:</p>	<ul style="list-style-type: none"> • local planing / environmental circumstances • changes in local transport patterns of use • revised education / user requirements • new legislative and regulatory circumstances • default of the operator in not fulfilling the contract • penalties imposed on the operator by a statuting authority (e.g. maintenance default) • loss of operators licence by “ disrepute ” • financial irregularity of operators • bankruptcy or financial failure of the Authority or Operator • acquisition of the operating Company by another • voluntary service withdrawal by operators • cancellation of contract by Authority if contract not met • conviction of Operator / Operator’s Manager in a criminal case • emergency situations • summary termination of the contracts following a formal warning
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To conclude, the contract must:

- be fair to all partners;
- lay down a procedure for any likely situations during the period of the contract;
- encourage quality in authority and operator procedures.

6. Concluding remarks and recommendations

The Quattro research calls for a series of recommendations to public authorities, operators and, for some aspects, to the equipment manufacturing industry, which is a major contributor to total quality in public transport.

6.1. General recommendations

In order to have a positive impact on the overall quality of UPT services, the tendering and contracting of these services must be based on a consistent overall strategy, taking into consideration the importance of UPT for its customers as well as for the citizen in general. The different bodies involved should:

- promote the best possible service to public transport customers in urban areas by applying adapted quality management practices and procedures, so as to optimise the use of physical and financial resources in a market driven environment;
- transform the public transport experience from “an obstacle course” to a “seamless journey”, which means proposing a door to door service to the users;
- avoid imposing to the user to understand the institutional organisation of the system and its production processes;
- use quality and quality management to attract customers by offering services which compete with the private car;
- consider “quality” management as a continuous search for better service and permanent progress in organisation, rather than as the pursuit of a rigid and specific level of quality;
- make sustainable mobility possible in an environment stimulated by a strong political and legal framework;
- develop a customer-orientated approach. Think “Customer”, “Customer”, and “Customer”;
- consider public transport as more than a business. It has a remarkable societal impact and therefore requires special care in the implementation of common economic and managerial considerations.

6.2. Recommendation public authorities and contracting/tendering authorities

Quality in public transport results from the capacity of the operator to offer and guarantee high standards of service quality. Contracts and tenders should stimulate the operators to achieve excellence under the financial constraints placed upon them. The characteristic of public transport and its impact on urban quality of life demands that the authority be involved in the search for improved quality beyond that provided by contracts and tenders.

Quattro recommends authorities:

- to define an urban development strategy including traffic management strategies;
- on that basis, to formally agree on a policy for the network and explain clearly to the bidding operators “how we will do things around here”;
- to be clear on transport policy, its expected impact on behaviours and its consequences on priorities in terms of quality;
- to be clear about what they do best in-house and what they can contract out to others for what concerns not only public transport provision but also land use planning, road network developments, etc.;
- to act to involve all the competent authorities in influencing public transport performance and all the participants in the system (like police committees or other operators who are not under the control of the authority) in the search for better public transport; quality partnerships with operators may be used in addition to tenders and contracts and may help in establishing tariff co-operation;
- to use tenders to promote quality management techniques by attaching importance to know-how and well-thought-out proposals in this respect;
- to be specific on whether they will accept non-compliant bids and, if so, how they will consider and implement innovations;
- to design penalty-and-reward systems in such a way as to avoid penalising the operator for matters beyond his control;
- to commit on the achievement of targets under their own control (concerning for example the availability and quality of road and/or rail infrastructure) and if necessary to submit to penalty-and-reward mechanisms so as to reassure the bidders/contractors on the credibility of these commitments or to compensate them for the costs they might incur as a result of any failure by the authority to deliver the agreed conditions);
- to try to develop with the operator(s) a working relationship favouring a co-operative attitude and stimulating innovativeness on the part of both parties;
- to be clear on what they expect from the contractual relationship;
- to use a balanced basket of objective and subjective performance indicators to evaluate the effectiveness of their programme and to try to involve customers in service quality assessment;
- to encourage a positive “no blame” culture in their organisation and to try to achieve excellence in management through established principles;
- to act as a learning organisation within the system, resorting to internal and external benchmarking with other cities and with other sectors to identify improvement opportunities: benchmarking may provide innovative and implementable solutions by looking at how traffic/mobility/public transport management but also other sectors (tourism, leisure, shopping centres, etc.) work in other cities;
- to build experience in real situations by regularly using public transport themselves;
- in their specific regulatory system, to use contracts, tenders and licensing to stimulate the operators to take the decision and orientations described hereafter.

6.3. Recommendations to operators

The value of the operator is linked to its capacity to win tendering procedures and to negotiate good quality contracts. This will be the consequence of its ability to provide the users and the citizens good quality service. Quattro recommends operators:

- to know their market;
- to appreciate their service performance as it is (good or poor), compared to demand and competition;
- to consider their activity as more than a business: the impact of passenger transport activities on the local community and on the quality of life must be taken into consideration in UPT strategies, objectives and priorities;
- to seek to establish a visible professional competence by reaching standards set for formal qualification (ISO 9000, XP X 50-805) and/or by implementing total quality management principles in the running of their operations;
- establish a well designed customer satisfaction measurement system base in the customer expectation;
- establish a well designed quality monitoring system and quality “tableau de bord” using the indicators related to customer satisfaction aspects measured;
- to develop a customer satisfaction measurement system and to use its results in connection with those of the internal quality monitoring system;
- to achieve excellence in management and operations through established management principles (e.g. EFQM);
- to use front line management (front line: in direct relation with the user) development and continuous improvement programmes to improve customer-contact related performance;
- to continuously assess customer satisfaction;
- to innovate within secure business boundaries and principles;
- to cultivate a positive “no blame” approach to the coaching of staff;
- to adopt an open and honest approach to service problems and to compensate customers in case of service flaw;
- to try to develop a partnership with the authority as a support;
- to benchmark their performance with others, formally or informally, within the public transport sector or with other sectors.
- not to forget that the people who ultimately influence service quality in public transport are the bus driver, the traffic warden, the person in charge of complaints or vehicle maintenance. Their working conditions will influence directly their willingness and capacity to provide good service. Listening to the staff, communicating with them on their working conditions, on the firm’s traffic management strategy, on the results of their work and on the practical consequences for them of the management’s decisions is therefore essential.

6.4. Recommendations to public transport equipment manufacturers

Through their responsibility in equipment and vehicle design, development and production, manufacturers play a key role in the quality provided to citizens. They are recommended:

- to recognise that customer demands are driving the market, not the operators’ or the authorities’ wishes;
- to be ready to respond and support innovation in equipment design;

- to fully support the operators by the establishment of adequate after-sales services;
- to make customer-supplier chains an accepted business practice;
- to benchmark against competitors and other industries;
- to seek to establish a visible professional competence by reaching standards set for formal qualification (ISO 9000) and/or by total quality management principles at their level;
- to achieve excellence in management and operations through established management principles (e.g. EFQM).

6.5. Recommendations to the European Commission

The European Commission position should intensify its support to the public transport sector at all levels, notably, by exerting a positive influence on Governments, Parliaments, Citizens and groups of opinion formers. More specifically, it should:

- set macro-principles and issue clear recommendations and guidelines for tendering and contracting procedures, through regulations or other appropriate instruments. The Commission should encourage the development within public transport of the “matrix approach” to quality specification and monitoring in tenders and contracts;
- publicise and support the best practices in networks, including elements on contracts and quality management practices;
- support research in public transport equipment to foster innovation and increase as a result the attractiveness of public transport;
- stimulate a positive climate for urban public transport;
- monitor results Europe-wide, educate those who are failing and stimulate comparability in the system results;
- confirm the “Citizens’ Network” strategic orientation, and invite all bodies to play a constructive role in the building of one of the most important public services for the quality of life and in the 21st century the dynamics for the development of urban areas, where 80% of the European population lives.

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