

1. Introduction

In many economies, local public transport has for many years been losing favour to its more flexible competitor, the car.

Improving public transport as a way of attracting back lost passengers is a key goal of all public transport service providers and of policymakers. One of the ways in which public transport might be improved - and therefore have the possibility to attract more passengers - is by engaging operators in performance measurement and the sharing of good ideas within the industry. To date, very little performance measurement has taken place in the local passenger transport sector. Benchmarking is one option for enabling this process. This paper describes the relevance of benchmarking to providers of local passenger transport and reports on the performance measurement that has occurred in the passenger transport sector.

The main body of the paper considers some of the outcomes of EQUIP (Extending the Quality of Public Transport), a DGTREN project funded by the 4th Framework Programme of the European Commission (1999-2000) which developed a self-assessment benchmarking Handbook for local public transport operators. The paper will discuss the results from its implementation by a Network of operators across Europe¹ and a final section will discuss how the lessons of EQUIP are being implemented in the creation of a successful bus benchmarking group in the UK.

2. Benchmarking

2.1 What is benchmarking?

There is a plethora of management models and ideas which can be used in a business context to improve business performance (Ten Have et al, 2003). Benchmarking has been a key tool in the business improvement armoury for many years (Zairi, 1996). Benchmarking is a way to measure how good the business is at what it does, making a quantitative statement as to whether their performance is as good as other businesses and using this information to improve the business

The Benchmarking of the Internal Efficiency of Local Public Transport

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This paper proposes performance measurement for public transport as the way forward to improve the quality of services and thus a pre-requisite to attracting more passengers. Benchmarking is one performance measurement methodology.

This paper first describes the underlying philosophy of benchmarking and the relevance to providers of local passenger transport of the sharing of best practice within and between industries. Next, a review of the evidence pertaining to performance measurement in this sector is presented.

The main body of the paper considers some of the outcomes of EQUIP (Extending the Quality of Public Transport), a project which developed a self-assessment benchmarking Handbook for local public transport operators. The paper discusses the results from its implementation by a Network of operators across Europe. The final section will discuss how the lessons of EQUIP are being implemented in the creation of a successful bus benchmarking group in the UK.

process. In short, benchmarking is a tool for searching for industry best practice, leading to improvement in performance. It is an on-going technique for measuring and improving processes against the best that can be identified. It requires data gathering, goal setting and analysis. Benchmarking is concerned only with facts in contrast to other key management tools, such as balanced scorecards, which also include more subjective elements relating to business aspirations. Benchmarking can be widely applied and can cover all aspects of measurable activity: in a urban bus context, benchmarking could cover both inputs (internal efficiency) and outputs (revenue and passenger responses).

After the benchmarking phase, the organisation will have gained an in-depth knowledge of itself. The measurement process provided by benchmarking provides a baseline data

set for improvements and for target setting on a basis which can be understood throughout the organisation. The areas for potential improvement are identified, target values (perhaps with intermediate milestones) can be set and these provide an estimate of the value gain for the organisation. The team building achieved by the benchmarking activity will provide the platform for the action teams which achieve the improvements. Benchmarking is a key step in a continuous improvement process although it will not add value in itself - it is the catalyst to change. Value is only added through achieving real improvements.

Figure 1 shows the methodology of the benchmarking process. Benchmarking in general is a cyclical process in which one complete cycle of benchmarking involves nine stages. In the context of a public transport operator, the process would commence with the definition and agreement of the factors which are critical to the success of an individual company (stage 1.). This is followed by the development of appropriate performance measures known as indicators (stage 2.). These indicators are then measured by individual operators (stage 3.). Benchmarking enables an operator to

compare indicators with other operators (stage 4.), so that

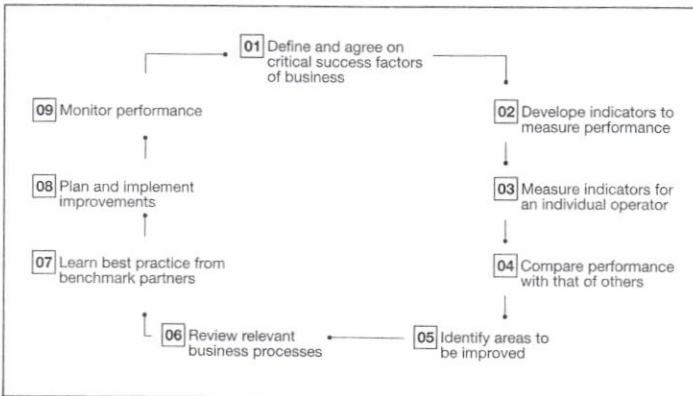


Figure 1 Benchmarking Network Methodology Chart (Hannan, 1997)

areas of relative strength and weakness can be determined (stage 5.). Having reviewed all relevant business processes, individual operators can decide the operational aspects which would be commercially valuable to improve (stage 6.). An operator will work with at least one other partner who has been identified as being best in the selected areas of operation (stage 7.). The operator is then able to plan and implement improvements to the business (stage 8.). Benchmarking in general is a permanent, on-going process: having implemented improvements, the indicators need to be monitored (stage 9.). Furthermore, since the business is not static, the operator will need to review all indicators periodically, which will require starting once again with a review of the critical success factors for the business (stage 1.). In practice, operators do not need to complete the full cycle (although this would bring most benefits) and could carry out internal benchmarking (finishing at stage 3) or compare figures with an anonymous database (finishing at stage 6).

The critical aspect of learning from best practice in a benchmarking context is that this should be undertaken within a non-competitive framework. In practice, much learning from best practice will necessitate intra industry comparison but there are process where inter-industry comparison is not only valid but desirable (Powers, 1998).

2.2 Benchmarking in the Public Transport Sector

An early interest in performance measurement was noted in the passenger transport sector over twenty years ago with the investigation by the OECD. The OECD Road Research Programme undertook an examination of the key issues to be considered in developing a technically sound approach to evaluation of performance, using various ‘packages’ of indicators. The resulting report outlines a clear conceptual basis for development of system-wide indicators in two categories of interest: efficiency and effectiveness (OECD, 1980). Effectiveness is concerned with the results of the service, while efficiency is concerned with the means of achieving these results.

The report identifies eight groups of users with each having differing needs for performance indicators: public transport

managers; municipal managers; policy makers; regional planners; street traffic system managers; central, national and state governments; public transport users; and the research community. Data requirements and sources are identified and the pros and cons of manual versus automatic data collection systems described. The recommended set of performance indicators required for the purposes of (a) service planning, (b) internal assessment, (c) comparison of different operations and (d) more global assessment are outlined. In addition, some applications for each indicator are noted, together with advice of the frequency at which the measure should be reported. However, despite this early work, no evidence of it being put into practice in a sustained way has been identified in the public transport sector. This is possibly due to the way that the report highlighted the difficulties of measuring indicators in a consistent way and suggested, as a solution, that the measurement should therefore be used within a firm over a period of time rather than as an inter-firm comparison, i.e. stopping at stage 3 in the cyclical process (Figure 1).

Since this report, there have been a number of initiatives spearheaded by the European Commission framework research programmes. The ISOTOPE (Improved Structure and Organisation for Transport Operations of Passengers in Europe) project (1995-1997) developed a set of key performance indicators for different types of public transport operators and a number of cities within the context of identifying the most effective and efficient organisational structures for urban public transport. This was followed by the QUATTRO (Quality approach in tendering urban public transport operations) project (1996-1998). This project was designed to aid public authorities define and monitor quality in the provision of tendering and contracting work and recommended benchmarking as the process for quality enhancement measurement. In addition, QUATTRO worked with the experts from the European Committee for Standardisation (CEN). In March 1999 CEN issued draft recommendations for the definition, targeting and measurement of service quality (TC 320 WG 5). The standard itself is not intended to be compulsory or to set targets - the purpose of the CEN recommendations is to standardise indicators and terminology to promote a quality approach to public transport operations and focus interest on customers’ needs and expectations. The CEN standard publication is now live and is incorporated into national standards where appropriate (BS, 2002).

Despite this background of interest and promotion, there has been little performance measurement in the public transport sector. Notable exceptions are the CoMET and Nova Benchmarking Clubs facilitated by the Railway Technology Strategy Centre at Imperial College, London, UK, involving 16 urban railway operators from around the world. The CoMET Club of operators was established in 1995 and it comprises BVG (Berlin, Germany), MTRC (Hong Kong), LUL (London, UK), STC (Mexico City), MoM (Moscow, Russia), NYCT (New York, USA), RATP Metro and RER (Paris, France), MSP (Sao Paulo, Brazil) and TRTA (Tokyo,

Japan). The Nova Club of urban railways was established in 1998 and consists of SPT (Glasgow, UK), KCRC (Hong Kong), Metropolitano de Lisboa (Lisbon, Portugal), Metro de Madrid (Madrid, Spain), Nexus (Newcastle, UK), AS Oslo Sporveier (Oslo, Norway) and SMRT (Singapore).

For road passenger transport, one of the first initiatives towards benchmarking in public transport was the project for developing and realising competitive transportation services (KiPa) in Finland. The project was led by Bussialan Kehittämispalvelut Oy, a development company owned by the Finnish Bus and Coach Association. This initiative was applied first to inter-urban bus services as an extension of work based on the road haulage sector and subsequently to a number of more local bus operators by TransControl, a company who developed and extended the KiPa work for this purpose. The TransControl benchmarking methodology is a process whereby a public transport company is evaluated by an external expert using a comprehensive set of indicators that measure the quality of the operator's performance. However, it relies heavily on the firm not only wanting to carry out benchmarking but also having the financial resources to employ the experts to do it.

It is against this background that the most important project for this paper, the EC EQUIP project, is set. EQUIP was concerned with the benchmarking of efficiency in local public transport. Specifically, EQUIP dealt with the "internal" efficiency of the public transport operator – in other words, the capability to achieve planned outputs within performance targets, and the optimisation of the use of resources to achieve this. "Quality" of service and customer satisfaction were considered as "external factors" and were only considered within EQUIP where they had internal relevance. This was not to say that these factors were somehow less important – it was simply that the external factors were well considered in other work as shown above, whereas EQUIP focused on the operator. Unlike any previous study, EQUIP was concerned to produce a self assessment handbook so that operators could carry out the measurement themselves and not need to rely on bringing in external experts.

The major, and most tangible, output of EQUIP is the Handbook which was developed through an iterative process with deep participation by the industry sector. An extensive search was carried out to identify relevant indicators which were then refined and clustered, and supported by a comprehensive measurement methodology. The first version of the Handbook was developed and used by the EQUIP Network of operators for self-assessment. This provided validation and feedback to produce the final version for public release which has been approved by the European Commission (EQUIP, 2000a).

2.3 The EQUIP Handbook

Four clearly identified stages marked the development of the EQUIP Handbook over a period of eighteen months. It began with a list of over 400 diverse indicators sourced from an extensive literature review (EQUIP, 2000d), followed by an

iteration of these into clusters which were examined by operators and authorities in the EQUIP Network. This output contributed to the draft Handbook, which was piloted throughout the EQUIP Network in six European countries². Feedback led to the production of the final documents. The Handbook is available in printed or electronic formats.

The final Handbook is available in a number of formats. There are five separate but compatible Handbooks for each of the land-based modes (bus, trolley bus, tram/light rail, Metro and local heavy rail) as well as a shorter version, for each mode, of 27 'super' indicators to provide an entry to benchmarking. The final EQUIP Handbook is composed of two parts. Part I contains the Method, which covers the background to benchmarking and the motivation for carrying it out. Part II is divided into two sections: the list of indicators is in a format that is ready to be completed by the users. It is accompanied by a separate Guide to Completion. For this paper, the most interesting aspects are the indicators and the lessons learnt from the project.

The EQUIP Handbook was designed to cover all modes of public transport operator and contains 91 indicators collated into eleven clusters as shown by Table 1 below.

The literature research together with the interaction with the EQUIP Network identified the problem that many definitions are affected by cultural and institutional or operating contexts. The EQUIP Handbook therefore needed to define specific system definitions for the purposes of the EQUIP indicators which formed an integral part of the Handbook.

Cluster	Cluster title	Number of Indicators in Cluster
1	Company profile	21
2	External influences on operator	13
3	Revenue and fare structure	9
4	Asset/Capacity utilisation	8
5	Reliability	5
6	Production costs	3
7	Company performance	4
8	Technical performance	6
9	Employee satisfaction	12
10	Customer satisfaction	7
11	Safety and security	3
	Total:	91

Table 1. EQUIP Cluster titles and the number of indicators

Company Profile indicators (Cluster 1) provide the background for selecting operators with which to benchmark as they describe how a company is organised and the level of penetration within its operating area. The External Influences on the Operator (Cluster 2) form a key set of indicators for determining benchmarking partnerships. The influence of the outside world in which the operator provides its service is significant for the performance of the operator and thus has implications if benchmarking is on an international level and the operators come from different market environments with varying degrees of regulation and subsidy.

Cluster 3, Revenue and Fare Structure, refers to the indicators that define the fare structure of the operator. The utilisation of

vehicles and manpower is the key to the fiscal performance of a public transport operator (Cluster 4, Asset/Capacity Utilisation). The most important indicators are those that consider how full the vehicles are, the time it takes for passengers to board the vehicle, the utilisation of the fleet and the drivers, and the distance travelled by vehicles that do not produce any revenue.

Even if an operator utilises its assets well, its performance may be impeded by poor Reliability (Cluster 5). For example, services may be delayed or abandoned at the origin or during the journey or the operator may have difficulty in maintaining the planned headway. Production Cost indicators (Cluster 6) measure how efficiently the operator is able to provide the service with the available resources and Company Performance indicators (Cluster 7) chosen to give a broad overview as well as trends over five years for indicators relating to patronage, the overall operating profit or loss, operating performance, net profit margin and interest cover. Cluster 8 looks at technical performance in two ways: by measuring indicators that directly affect on the road performance, e.g. fuel consumption, emissions, reliability and the installation of features that assist passenger mobility and second, by monitoring the on-going maintenance programme. Most of the Employee Satisfaction measures (Cluster 9) can be evaluated by the operator, using information in the company records. In contrast, the best and almost the only reliable way to get relevant information about Customer Satisfaction (Cluster 10) is to make a survey of the current public transport passengers. Survey results can be compared with the image that the operator has of its performance simply by asking the operator to complete the same questionnaires as the customers. In addition to customer opinions, hard measure indicators of customer satisfaction are also relevant for the benchmarking exercise, e.g. the number of complaints and accessibility to vehicles.

The Safety and Security (Cluster 11) covers the actual traffic safety of the operator and the safety of the working environment. It shows the number of incidents on the road, together with the number of injuries sustained by drivers and passengers.

Some of the indicators use the same information in their calculation and the Handbook contains a Common Elements sheet to assist the completion of the Handbook. This highlights those elements that only need to be identified once by the operator and cross-reference them to the specific indicators where they are used. In the electronic version of the Handbook, this data is automatically copied to the relevant indicators.

The contents of each indicator are colour-coded so that the additional aids to completion stand out e.g. comments about the measurement of the indicator, links to Common Elements and to the EQUIP system definitions. The user identifies the measurement and sampling methods that have been used. All relevant data can be recorded directly in the Handbook, including both component and final values. Users of the electronic version will find that the final values for

quantitative indicators are automatically calculated after the insertion of the component values. Finally, a commentary is added to each indicator which contains cross-references to other relevant indicators in the Handbook as well as pointing to the way in which the indicator could be further considered. A subset of 27 'super' indicators were chosen in order to help operators with limited resources to begin benchmarking – they are the 'entry level' set of indicators and a response to the demand for a set of indicators which would require a lower resource to complete. These are shown in Table 2 below. These indicators were selected because they are important to operators for benchmarking their performance, they allow operators to select suitable benchmarking partners and because they have been found to be important in a survey of nine other reports of benchmarking performance.

Cluster and Indicator Number	Name	Cluster and Indicator Number	Name
1.1	Subcontracting of services	7.1	Operating profit or loss
1.3	Type of service area	8.2	Emissions
1.4	Vehicle kilometres	8.3	Fleet reliability
1.6	Fleet composition	9.1	Staff turnover
1.7	Passenger trips	9.2	Sickness
1.15	Operating speed	10.1	Passenger feedback ratio
2.9	External contributions to variable costs	10.3	Vehicle accessibility
3.3	Type of tickets	10.4	On board the vehicle
4.1	Load factor	10.5	At the stations/stops
4.2	Peak fleet utilisation	10.6	Information etc.
5.3	Abandoned service journeys	10.7	Transfers between vehicles
5.4	Delayed service journeys	11.1	Incidents
6.2	Costs per employee	11.3	Passenger health and safety
6.3	Costs per vehicle and passenger		

Table 2 The EQUIP Super Indicators

2.4 Results of the EQUIP Project

EQUIP aimed to raise benchmarking awareness through its activities and to create a network of local transport operators and local authorities as a forum for meeting key transport actors and to ensure that the work in EQUIP was relevant to potential users. The EQUIP Network was developed spanning the six European countries of the EQUIP partnership, as well as other EC countries and Eastern Europe once the final EQUIP Handbook had been prepared. The first version of the Handbook was developed and used by the EQUIP Network of operators for self-assessment. The EQUIP Network thus offered the opportunity to focus on a series of comparison procedures amongst operators in order to identify the most suitable indicators to measure the strength aspects and the areas needed to be improved.

The experiences of the Network highlighted four important issues which are relevant to the development of benchmarking in local public transport (EQUIP, 2000b). First, whilst operators in each country were overtly interested in participating in benchmarking activities, many clearly felt isolated at the start of a new exercise: this emerged during the National Workshops organised by EQUIP.

More seriously, the greatest problem facing operators in the

EQUIP Network was the lack of resource – time and manpower – to prioritise the establishment of the necessary systems to collect and record data for the Handbook. But perhaps the most serious disadvantage of self-assessment is data quality control. Despite careful detail in the definitions, it was unclear how many of the operators actually read them: comparison of data showed clear simple errors (for example, using national currency rather than the standard euro). This suggests that there should be a third party who should check and collate data for the set of companies who are benchmarking to ensure true comparison of like with like.

Throughout Europe there has been a trend towards greater privatisation and more competition for public transport services. This is reflected by rapid changes in the character of companies. Such activities were seen as obstacles to benchmarking, e.g. company accounts and other data are often reorganised, making it difficult to access relevant data and to make internal comparisons over a period of time. However, reorganisation could be regarded as an opportunity to introduce new systems such as those required for benchmarking.

Whilst many of the indicators which depend on monetary units were thought to be difficult to compare at the European level where different operational and economical environments existed, there were many indicators which are well suited to just such trans-national comparison, for example the asset/capacity utilisation indicators. This is, of course, a very important issue for international benchmarking but one which evidence suggests that the many difficulties are perceived rather than actual (EQUIP, 2000c).

In the context of this paper, it is worth noting that none of the ‘big’ UK private bus companies joined the EQUIP Network: they participated in-house benchmarking suggesting that private firms do have a greater incentive to monitor performance. Outside the UK, all EQUIP Network members were public sector owned: the complexities of the stakeholder map may well explain the difficulties of achieving agreement on which indicators were particularly important and the lack of incentive to produce the appropriate management information to complete the Handbook. The UK Network included one small private operator whose ability to complete the Handbook was frustrated by lack of time resource but who commented on the potential usefulness of the process.

2.5 Lessons from EQUIP

The EQUIP results suggest that there is a need for face-to-face discussions between operators undergoing benchmarking. Mutual support in benchmarking is extremely valuable and the EQUIP Network highlighted the problems for operators (especially small ones) if they work in isolation. Language can be a serious impediment to benchmarking and native languages must be used in the context of an understanding of the institutional arrangements of operation. It is clear that whilst self-assessment in benchmarking is possible, some external help is often very helpful at keeping

the process going.

A nationally-based grouping, whilst reducing the potential number of operators who might be ‘compared’, does have the advantage of ensuring that differences in indicators are not simply the result of different institutional environments as well as being based on a common language. It has been shown that formal networks generate informal networks and that can yield additional benefits. Data needs to be held by a trusted third party to ensure quality data is produced to underpin the like with like comparison.

One of the key results of the EQUIP project was the necessity to move towards the institutionalisation of the benchmarking process. It is clear that effective benchmarking must be a permanent process in order to increase quality and competition in the public transport sector. Similarly, a permanent process needs an institutionalised framework with clear responsibilities for managing the benchmarking exercise³

2.6 More recent experience in the UK

Following EQUIP, a group of 15 UK bus operators, all having similar characteristics, agreed to join to form a bus benchmarking group. This has pioneered bus benchmarking in the UK outside the big bus groups. The work with this group has been designed to overcome the problems identified by the EQUIP project and to put into practice the lessons learnt from EQUIP.

All these companies operate in the same UK institutional framework, in the private sector and share similar evolutionary backgrounds as former publicly owned companies. The Transport Operations Research Group of the University of Newcastle act as the third party in facilitating the process and holding the company data in confidence and reporting – following the model of Imperial College in its role as mentor for the Metro benchmarking. Initially, the companies had diverse expectations from the benchmarking process perhaps illustrating the effects of their former background in the public sector: for some it was a defensive move to demonstrate good performance to their shareholders whereas for others it was to identify the better elements of their peers and to learn from best practice.

The process began by choosing and modifying appropriate indicators from the EQUIP Handbook as it was found that many of the indicator definitions were compromised by the European setting of the EQUIP Handbook. A pilot first year was undertaken which highlighted the difficulties for some companies of providing comparable information but also identified areas where there was potential for a more in-depth focussing of attention. The Handbook that developed used EQUIP indicators as its basis but provided a completely new look. This change was not simply cosmetic: the change was to reduce the level of bias in the numbers which were reported by the companies and to reflect the way in which this new process was not self assessment, but assisted assessment. A reduction in bias was achieved by breaking indicators into their constituent parts and requiring the

completion of the parts separately. Whilst this suggests additional work was created, this was not the case as many of the indicators had common elements (used for standardising for company size) which were only collected once. By asking for information in a way which was separated from the indicator as reported, companies were not able to provide spurious data. This is not to suggest that companies would do this knowingly but the data collection process did identify a number of instances where assumptions were made that led to significant inaccuracies in the data.

Following the first year of benchmarking, this group is now continuing to benchmark but is beginning the improvement cycle by undertaking a more in-depth study. The first area of close scrutiny has been the engineering part of the business, with 10 key performance indicators (KPI) being derived to focus methodically on vehicle and maintenance performance as shown in Table 3 below:

Title of Key Indicator	Purpose statement
Days off road for non-planned maintenance	This KPI records days off road due to mechanical failure reflecting a number of potential causes including the effectiveness of planned maintenance (as a preventative measure), the reliability of the vehicle category and the quality of manufacturer support (availability of parts and other support).
Abandoned service journeys	This KPI records the percentage of scheduled mileage not operated, broken down by reason.
Repeat defects	This KPI identifies how often faults are not rectified on the first occasion. This may give rise to information on persistent problems which may be specific to a vehicle type or to a maintenance process.
Peak Vehicle	Requirement (PVR) by vehicle type. This shows PVR and engineering spares in relation to the overall fleet, broken down by vehicle type.
Fuel consumption	This KPI looks at fuel usage (kilometre per litre) both by fleet type and vehicle category.
Material cost	This KPI indicates the material cost associated with vehicle categories.
Maintenance staff	This KPI shows at a point in time the number of maintenance staff employed to maintain buses relative to the fleet size and PVR.
Maintenance costs	This KPI looks at the maintenance costs (not including running costs) per kilometre of operation.
Age profile	This information will also be used in association with other indicators, since some engineering costs may be age as well as vehicle related.
PCV pass rate	This KPI will record the success rate at MOT

Table 3 The Key Indicators for Engineering

3. Conclusion

Benchmarking is about measurement and comparison. It helps the organisation move from perception to facts, and provides a holistic view of the organisation. It is important that relevant, measurable and comparable indicators are selected which can describe the processes of the organisation and the EQUIP project has played an important role in carrying out this, on behalf of – and in consultation with – the industry.

As a tool, benchmarking is proven to be of help in a wide variety of circumstances – not just in local public transport. One of the key aspects of benchmarking is the way in which it implies that companies who benchmark are committed to an ever increasing level of improvement as part of a self

reinforcing pattern of continuous improvement. The organisation recognises that it must evolve to meet the changing environment and market, and its customers (external and internal) have ever-increasing expectations. The organisation identifies its weak points, and implements actions to adapt or restructure itself for better performance. This assures customer satisfaction, and minimises opportunities for competitors. Overall, the process aims to add value throughout, by optimising both efficiency and effectiveness.

This cyclical process is an inclusive one, encouraging team-building within the organisation, and involving all layers of management, administration and staff. It is also a cyclical process, which challenges complacency. At no point does the organisation consider that it is perfect, so that even after a full iteration, it presumes that more improvements can be made. A commitment to this process therefore gives more than just the improvements that were originally sought but a host of positive effects to reinforce them.

The basic requirement for a successful benchmarking exercise in public transport includes motivating the operators to put effort into participating in the process and this relies on there being evident benefits that are easily available and noticeable from the use of the tool. It is important that there is a clear definition of the indicators that measure the performance of the operator, including the methods for calculating values.

The EQUIP project addressed these issues and the practical exercise of testing the Handbook with the Network of operators raised the awareness of critical success factors for operators and the need to learn from best practice in order to improve competitiveness. However, operators need to realise that to take benchmarking seriously is more than simply to measure indicators – there is a significant resource commitment. It is also necessary to remember that whilst benchmarking is a key step in a continuous improvement process, it does not add value in itself – it is only the catalyst to change. The true value is only added through achieving real improvements.

The results of the EQUIP project have been used to develop the Handbook for the bus benchmarking group. The bus benchmarking group in the UK has shown that a nationally based grouping does indeed work well and with the benefit of hindsight, it is not clear what further benefits could accrue specifically from an international comparison unless the barriers or language and institutional frameworks are resolved. Against this, if international benchmarking were to bring additional observations in the database of results, it would give more security to the results.

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Any errors remain the responsibility of the author.

NOTES

¹ The information and conclusions for this paper come from a number of sources which are by necessity inter-linked. They include EC reports, projects undertaken in the Transport Operations Research Group (TORG) at the University of Newcastle upon Tyne, and other primary and secondary sources. The Bibliography contains some of these sources in addition to those directly referenced in the paper in an attempt to demonstrate the wide nature of the information base which has been utilised.

Austria, Eire, Finland, Italy, Netherlands, UK

In the UK this is beginning to happen. 'Best Value' performance indicators are now required by central government of local government. However for public transport this cannot include indicators of internal efficiency of operators as the operators (with few exceptions) are wholly in the private sector.

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