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Article

Can Transport Operator Schemes Deliver Regional Sustainability Benefits? The Case of the UK Northern Powerhouse Region

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Abstract: UK devolved responsibility for planning future transport demands is shared amongst regional and local transport administrations. In Northern England, Transport for the North (TfN) provides a unified transport strategy, encompassing planning for future demand, highlighting the importance of freight transport movements throughout the Northern Powerhouse region. Given the importance of transport in fostering economic growth, this paper demonstrates the applicability of compliance and recognition schemes targeted at the UK's commercial fleet transport operators for achieving the wider sustainability goals of the Northern Powerhouse. The research investigates the benefits of operator recognition and compliance schemes, and their alignment with strategic agendas, including the implementation of clean air zones. Results explore the extent to which Total Quality Management (TQM) and continuous improvement support regional sustainability agendas through transport operator schemes. This research is based upon surveys and interviews with transport operators from across the UK, including the Northern Powerhouse region. Thematic analysis examined responses relating to the perceived barriers and opportunities around scheme membership and the extent TQM and continuous improvement support regional agendas. Analysis reveals ideal transport operator profiles for deriving the greatest benefit from scheme membership, whilst introducing a set of business readiness conventions for benchmarking transport operator compliance activities.

Keywords: transport; planning; total quality management; road freight; air quality; multi-stakeholder

1. Introduction

The research presented in this paper aims to assess the potential benefits of different transport operator recognition schemes for delivering regional sustainability. The Northern Powerhouse agenda and the Transport for the North strategy in the UK provide the context for this research. Thus, the main purpose and focus of the study presented in this paper is to identify opportunities with regards to gaining competitive advantage that are brought about for transport operators from their participation in operator schemes, and the wider geographical environmental benefits that may arise from operator scheme memberships, specifically, the current challenges faced by the road freight sector, such as the need to operate efficiently and comply with restrictions around current and planned clean air zones. The results will also explore the potential to implement Total Quality Management (TQM) and continuous improvement measures, regardless of operator size or scale, amongst scheme (and non-scheme) members operating within the case study area of the Northern Powerhouse region. According to the DFT [1], the UK road freight sector is made up of over 48,000 haulage operators,

who together contribute around £12 billion to the UK economy and employ over 260,000 individuals. Therefore, the value and importance of this research lies in its analysis of current schemes and the development of adapted theory leading to the development of industry tested conventions that are readily scalable. It is also important to note that the vast majority of UK operators fall into the category of micro, small, or medium sized enterprises—MSMEs that wish to advance value without incurring additional costs. The main factors determining whether a company is an MSME are: (1) Number of employees and (2) either turnover or balance sheet total. Table 1 provides the EU recommendation (2003/361) [2] regarding category size of an enterprise (where the ceilings apply to the figure for individual firms only).

Table 1. EU categories of company.

Company Category	Employees	Turnover	or Balance Sheet Total
Medium-sized	<250	≤€ 50 m	≤€ 43 m
Small	<50	≤€ 10 m	≤€ 10 m
Micro	<10	≤€ 2 m	≤€ 2 m

The specific research objectives were:

- To determine the opportunities and barriers perceived by transport operators in relation to scheme membership; particularly organisations based in the Northern Powerhouse/Transport for the North strategic geographic area, and those who frequently traverse through it;
- To explore the extent to which TQM and continuous improvement can support the Transport for the North agenda through operator scheme membership;
- To assess which type of operator has the potential to gain maximum benefit from membership of transport operator recognition schemes;
- To develop a set of business readiness conventions for transport operators to benchmark their compliance and knowledge management activities.

This paper aims to demonstrate the applicability of compliance and recognition schemes targeted at the UK's commercial freight and fleet transport operators, to act as business readiness tools for TfN and the wider goals of the Northern Powerhouse. The paper further discusses how the establishment of such schemes in the North of England has the potential to align with the sustainability needs of the local government agenda around clean air zones; debating how schemes could promote the integration and adoption of Total Quality Management (TQM) within organisational strategies. The findings of the research reported in this paper consider multiple-stakeholders across road freight transport operations and compliance in the UK. It provides a novel insight into the suitability of membership schemes and the potential benefits for different operator profiles, building upon the TQM literature by adding further context.

2. Background and Context

2.1. Overview of the Northern Powerhouse and Transport for the North

The “Northern Powerhouse” forms part of the UK government’s policy response to rebalance the UK economy following the global financial crisis of 2007-2008 and its subsequent recession [3]. Through the establishment of collaborative relationships between businesses and public sector organisations, and the creation of a formal agglomeration of interconnecting northern cities of the UK—primarily Liverpool, Manchester, Leeds, Sheffield, and Newcastle—the Northern Powerhouse Partnership seeks to promote and grow the economic value of the North [4]. Amongst the strategic priorities of the Northern Powerhouse is the introduction of a Northern Transport Strategy, delivered through the first sub-national transport body in England—Transport for the North (TfN) established in April 2018.

This pan-Northern partnership aims to improve connectivity for people and goods moving within and through the Northern Powerhouse city regions, and to utilise transport to facilitate change in future land use patterns and economic growth [5]. Freight and Logistics has an important role to play in the TfN strategic plan, in particular, fostering growth of the region's road and rail freight by over 50% [5]. Through the efficient movement of freight, fuel, and raw materials into and throughout the North of England, the TfN strategy has a collective focus on creating a single freight and logistics network. This aims to develop world class transport that "...supports sustainable economic growth, excellent quality of life and improved opportunities for all" [5] (p. 6). The successful delivery of this plan is central to achieving the Northern Powerhouse's intended GVA growth [5]. These plans serve to highlight the relative importance of the freight and logistics sector in the North of England, as the region has become "the centre of gravity of the UK's freight and logistics industry" [6] (p. 28).

2.2. Overview of Transport Operator Schemes

Operator recognition and compliance schemes are not a new phenomenon, with many such schemes having been established during the last decade (since 2008), either by local authority or public funded transport bodies (e.g., FORS initially developed by Transport for London), and transport industry trade associations (e.g., Van Excellence developed by the Freight Transport Association). Each existing scheme is organised slightly differently, and the principal drivers behind their creation has usually been one or a combination of the following objectives: to address political targets around air quality and sustainability; to improve the operational efficiency and performance of commercial vehicle fleets; to improve road safety and to adhere to industry best practice standards.

The most prominent UK membership accreditation schemes targeted at vehicle fleet operators include ECO Stars; Fleet Operator Recognition Scheme (FORS); and the Freight Transport Association (FTA) schemes, "Truck Excellence" and "Van Excellence". Whilst many of these schemes were initially developed as being purely for the freight sector, the two larger UK schemes (ECO Stars and FORS) have since widened their participation to be more inclusive of fleet operators more generally, including the bus and coach sectors, and licensed taxi firms. Interest in such schemes and their potential benefits is not wholly confined to the UK; there are ECO Stars schemes operating in various European locations. The role of the EU Transport Commission is to promote mobility that is efficient, safe, secure, and environmentally friendly [7], and thus the adoption of schemes such as ECO Stars is one mechanism for achieving this. The FORS scheme has many similarities to the Operator Compliance Risk Scores programme (OCRS) [8] in that it seeks to identify and lower risk, whilst under OCRS. If you are a vehicle operator, your drivers might be stopped at the roadside by the police or the Driver and Vehicle Standards Agency (DVSA) for inspection, whilst OCRS is used to calculate the risk of an operator not following the rules on roadworthiness (the condition of its vehicles) and traffic, e.g., drivers' hours, weighing checks, etc. The central notion of FORS is to improve road safety by complying to a set of standards—bronze, silver, or gold. This promotion of standards and measures shares traits with the Sustainable Urban Movement Plan, the Sustainable Urban Goods Logistics Achieved by Regional & Local policies (SUGAR) [9], as well as the Reward and Recognition Scheme and the Auditing & Certification Scheme [10], whereby local authorities address environmental, safety and legal problems through more partner-oriented freight policies. In contrast, the ECO Stars scheme has evolved from an initial desire to reduce emissions from heavy duty vehicles in response to the introduction of Air Quality Management Areas and the "Care 4 Air" initiative [11].

2.3. Approaches to Scheme Management

Transport for London (TfL) initially established the Freight Operator Recognition Scheme (FORS) in 2008 to help freight transport operators respond to the London Low Emission Zone when it was first introduced. Under TfL, the FORS scheme was a free, voluntary accreditation membership scheme that aimed to improve the delivery of freight across central London, where it formed part of the wider London Freight Plan, providing the freight industry with a quality and performance

benchmark [12]. By 2015, TfL had ceased funding of the original FORS scheme, and it was relaunched as the commercially operated Fleet Operator Recognition Scheme (still known as FORS). Although no longer a free scheme, it remains voluntary and the benefits of membership were made more widely available to fleet and freight operators nationally across the UK. The FORS scheme still aims to assist vehicle fleet operators improve all aspects of their operations, including inter alia, road safety, fuel efficiency, emission reduction, and cost-cutting. The ECO Stars scheme was set up by four local authorities in South Yorkshire (Barnsley, Doncaster, Sheffield, and Rotherham) in 2009, as part of a regional Air Quality Initiative to promote best practice in fleet operations and improve engagement between local/regional governments and commercial fleet operators. Unlike FORS, the ECO Stars scheme continues to remain free for operators to join and aims to help them improve efficiency, reduce fuel consumption and emissions, and achieve cost savings [13]. ECO Stars has been adopted by numerous local authorities across the UK, including extensive take-up throughout Scotland, and even migrating to some European cities where it is used as a mechanism to help address air quality issues. The scheme is open to fleet operators of HGVs, buses, coaches, vans or taxis that are either based or operating in an area with a local ECO Stars scheme.

Other predominant recognition schemes in the UK are the FTA's "Truck Excellence" and "Van Excellence". The Truck Excellence certification scheme audits an operator's compliance with their Operator licence undertakings. Similarly, Van Excellence is designed to allow operators to ensure their standards of operation meet the best practice requirements determined in the Van Excellence Code, which we believe represents a local derivation of the previously identified SUGAR initiative. The FTA schemes can also arguably demonstrate the development of a scheme by a professional trade body that has adopted what the industry deemed to be the "prime cuts" of the previously mentioned EU initiatives and the original TfL FORS scheme prior to its nationwide adaptation.

3. Literature Review

3.1. Operator Schemes as Policy Interventions

As economies have evolved and supply chains have advanced on a global scale, the reliance on road transportation has increased. These increasing demands on the road freight transport sector in particular can lead to various degrees of operational inefficiencies that operator recognition schemes seek to improve. However, the benefits of scheme membership are potentially far more wide reaching than simply short-term operational improvements. Inherent in their design is the possibility to act as interventions to help policymakers achieve longer-term impacts around sustainability and air quality targets. Air quality, sustainability, and safety are key drivers behind the establishment of industry recognition and compliance schemes, with road freight transport being directly responsible for Particulate Matter (PM), nitrogen dioxide (NO₂), and carbon dioxide (CO₂) emissions leading to poor air quality, especially in urban environments [14]. With the development of concerns over urban sustainability and air quality, particularly in Western Europe, freight transport has faced increasing criticism and pressure to reduce emissions. The introduction of some EU legislation (e.g., EU Council Directive 96/62) has imposed specific responsibilities on transport policy makers to implement the necessary measures to ensure compliance with EU limits [14]. Such legislation has prompted the establishment of Low Emission Zones (LEZs) in major cities and urban conurbations to restrict the most polluting vehicles (freight vehicles are often the primary target for LEZ policies) by setting standards according to vehicle age and type [15]. The UK government has recently set the goal of achieving >40µg/m³ annual mean NO₂ in its 43 UK air quality reporting zones by 2021, to address findings from 2015 that revealed that 37 of the 43 pre-established air quality management zones still exceeded the upper threshold measure of 40µg/m³ annual mean NO₂ limit [16]. A number of UK cities and other smaller local authorities have been identified to introduce measures to tackle air quality issues. In the context of the Northern Powerhouse, Leeds is one of the five UK cities that has been mandated to introduce a Clean Air Zone by 2020; with Liverpool, Manchester, Newcastle, and Sheffield all required

to undertake assessment of their air quality and consider plans to tackle vehicle emissions. These local authorities could be regarded as having the opportunity to consider adoption of an operator scheme to use as a mechanism to help achieve air quality emission targets. For instance, the ECO Stars scheme is framed around emission reduction first and foremost, but also offers opportunities for operators to benchmark themselves within the industry and develop improvement strategies that go beyond purely tackling emissions.

3.2. Alignment of Operator Schemes with TQM

The principles of TQM are aligned to operator schemes through their ability to recognise a defined problem and foster continuous improvement within organisations and beyond. Through membership of a scheme, operators can gain operational, economic, and sustainability benefits; sharing industry best practices across scheme membership and large geographical areas. This can ultimately lead towards meeting local air quality targets. For example, commercial transport operators can indirectly address the air quality agenda and foster safer transport practices by engaging with compliance and/recognition schemes that provide access to multi-faceted socio-technical approaches (e.g., driver education around fuel-efficient driving, enhanced vehicle maintenance and lean operations). Service operations management theory forms the basis of these operator recognition schemes, but this has been implicit rather than explicit, thereby stifling the natural alignment that schemes have with TQM and continuous improvement. TQM research in a transport context remains both under-developed and elusive, limited to TQM application in public transport systems [17], service level agreements [18], and transport sector employee job satisfaction [19]. Grant [20] records a possible reason for this situation in that a “non-unionist” perspective prevails in the freight transport sector as operators are seen as being “for hire”, either within an organisation or as an external supplier. Therefore, they are often not regarded as a core function within an organisation and are left “untouched” by attempts to implement TQM and continuous improvement approaches. Another aspect working against historical adoption of TQM is relative scale, an important factor given the profile of the freight industry in which the majority of operators are classed as MSMEs.

3.3. Applying Aspects of TQM

Ebrahimi and Sadeghi [21] argue that TQM represents an integrated management philosophy, whereby quality is mandatory in meeting customer expectations by retaining customer focus (see also: [22–26]). Meanwhile, others identify the multidimensional aspects of TQM, indicating its ability to be “cherry picked” for application by small businesses [18]. This concept of a customised performance management approach is further developed as an iterative closed-loop process [27]. Thus, TQM can be viewed from differing perspectives in relation to corporate culture and strategy [28], cycles of continuous improvement [29], and as an overarching set of beliefs [30], to continuously improve to meet customer demands [31].

A culture of continuous improvement in relation to the value of customers requires a rolling programme of development for colleagues [32], indicating that service quality satisfies demands and expectations for both internal and external customers. The transport sector as a service provider has definable service measures related to time, destination, quality of shipment upon receipt, and driver/vehicle performance—regarded as a totality of features [33]. TQM remains a paradigm of objective intentions to improve customer service [34], contemporaneously delivering competitive advantage [35]. These factors reinforce the potential relevance and transferability of TQM through operator recognition and compliance schemes. They bring benefits to both the logistics sector generally and the wider Northern Powerhouse localities that support membership schemes. As an example of this, there is a clear relationship between continuous improvement for a customer-facing organisation and the overarching goals of the TfN strategy. For instance, TfN proposals to improve connectivity along the east-west Northern corridor, and to tackle congestion on the strategic road network, will strengthen businesses’ access to supply chains and better serve their markets, thus forming a more sustainable

transport network that improves both quality of life and operating efficiency whilst protecting the environment. These intentions are not wholly at odds with the needs of the freight transport sector to have faster transit time, improved journey time reliability, and more rapid access and egress for final mile deliveries.

3.4. Operational Efficiency through Improved Knowledge Management Practices

Knowledge management (KM) can also contribute to operational efficiencies in freight transport organisations. This is particularly relevant in relation to MSME transport organisations that have the potential to benefit from TfN's strategic transport plan. Smaller organisations offer the opportunity for greater control at both an operational and strategic level. Thus, these operators seek to gain advantages from operating within a stronger regional environment, such as the Northern Powerhouse, where they can be more visible and impactful, regardless of their relative size. For example, they can be more proactive and resilient in adapting to local or regional changes such as the introduction of a clean air zone. There is also a natural extension of these MSME relevant factors in relation to the need for skills acquisition, and planning for changes in regulatory compliance such as driver CPC periodic training, and benefitting from operator earned recognition schemes. High staff turnover and driver shortages in the freight transport sector [36–38] further increase operational risk as colleagues leave an organization, taking implicit knowledge with them [39,40].

4. Methodology

The research approach adopted an industry-focused survey that was supported by a small sample of qualitative interviews with industry and scheme representatives. Purposive sampling was utilised from the outset [41], commencing with an examination of existing UK schemes and their membership demographic across a fixed period of time. Both operational and strategic roles were identified for participation in the research; they are of equal and critical importance, especially in relation to emerging phenomena, and the role of tacit knowledge in scheme adoption in relation to scale.

The findings presented in this paper are drawn from current, lapsed, aspiring and non-scheme members, scheme administrators, local authority policy makers, and other industry stakeholders based in the UK. The focus of the questionnaire remained on UK schemes, including FORS and ECO Stars, along with other smaller schemes as discussed in Sections 2.2 and 2.3. The criteria for target participants were driven by the need to comprehend “same but different” operations in the freight transport sector. Initial data collection occurred via an autonomous self-administered questionnaire, sent electronically to a wide population of freight transport operators, irrespective of their involvement with a scheme, which enabled views from existing, lapsed, aspiring, and non-scheme members to be captured. To a certain extent, the survey represents an adaptation of the Transport for London Report: Attitudes to TfL's Freight Operator Recognition Scheme [12]; the original questions posed were de-constructed and reframed to give greater contextual and contemporary relevance to the targeted respondents, to capture both views on historical and future attitudes [42]. Further questions were also added with respect to exploring the role of compliance and recognition schemes in a wider Northern Powerhouse and TfN agenda; to understand operator views on the perceived advantages and disadvantages of freight and fleet operator schemes generally; and also questions to help identify potential areas for scheme improvements and recommendations for increasing uptake.

The semi-structured interviews were based on pre-existing themes extracted from academic literature and strategic Northern Powerhouse and Transport for the North documents. The interviews were used to supplement the quantitative survey data, to allow recording of particular occurrences, phenomena and underlying constructs [43] in relation to the different schemes and their relevance to freight transport operators in the Northern Powerhouse region. The semi-structured interview approach provided an essential source of information gathering for rich, textual data [44,45] from transport operators and scheme stakeholders based or operating in the Northern Powerhouse case study region. In conjunction with an interview guide informed by a literature review, the interviews

enabled the research to explore relevant topics, whilst not conforming to a rigid set of questions [41]. Thematic analysis of the interview data was conducted in relation to the following specific topics: historical context; development strategy; engagement; operating sector; operational types; barriers to membership; and geo-spatiality to confirm the validity of the questionnaire results. In particular, the interviews gathered views that have also been thematically analysed to examine the perceived benefits and disadvantages of freight and commercial fleet operator schemes, helping to determine potential areas for scheme improvements, and generate recommendations for increasing the uptake and wider impacts of schemes in the North of England to support the TfN strategy, especially in relation to skills acquisition and knowledge sharing.

Figure 1 depicts a process flow chart that summarises the research approach described.

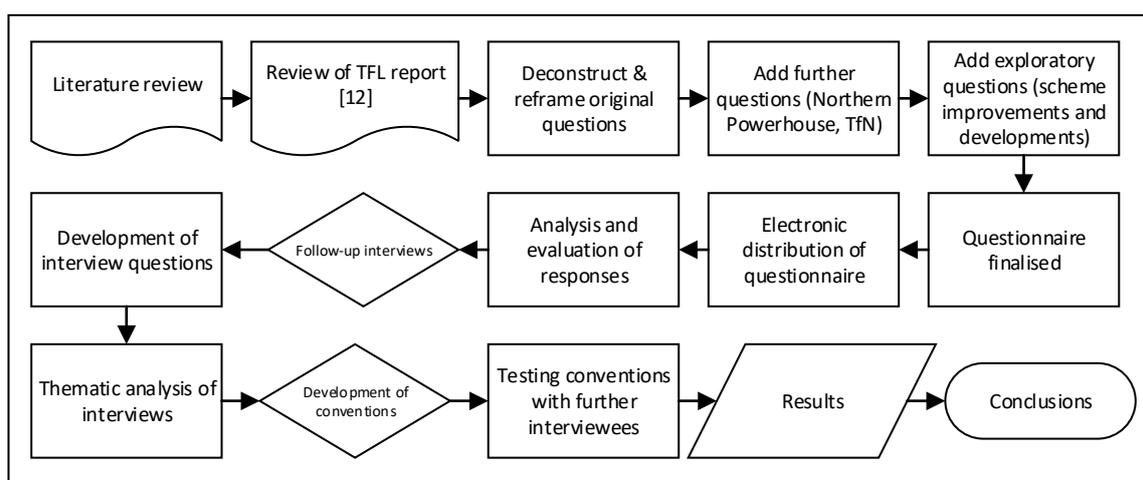


Figure 1. Research process flow chart.

5. Results

In total, the research consists of 60 survey responses and 14 semi-structured interviews that have been thematically analysed. A number of key themes emerged from the data analysis which have an influence on commercial fleet transport operations and the potential adoption or integration of compliance and recognition schemes in the Northern Powerhouse region. Table 2 provides an overview of the interview participants.

Table 2. Overview of interview participants.

Interviewee Role	Location (UK)	Within Northern Powerhouse Region (Indirectly Covers Region)
Scheme Director	South Yorkshire	Yes
Scheme Director	London	No
Freelance Transport Manager	London	No
International Transport Consultant	West Lancashire	Yes
Transport Legal Operations Manager	National	(Yes)
Group Logistics Manager (Plant Hire)	North East	Yes
Fleet Services and Compliance Director (Parcels)	National	(Yes)
Contracts Director (Refrigerated Distribution)	National	(Yes)
Company Director (Aggregates)	South East	No
Transport Manager (Aggregates)	South East	No
Independent Transport Consultant	National	(Yes)
Transport Manager (Haulage and Storage)	North East	Yes
Transport Compliance and Safety Consultant	National	(Yes)
Transport Standards Manager (Haulage and Storage)	National	(Yes)

5.1. Geography

A clear geographic dominance based on scheme adoption has been identified, in particular the TfL legacy around the FORS scheme, which has retained a significant population of members in the South East of England who tend to operate within the London controlled zones. ECO Stars on the other hand has grown its presence outside of these areas, in particular extending beyond the Northern Powerhouse region, and into Scotland. The Truck and Van Excellence schemes appear to have a more balanced geographic spread across UK-based FTA members. However, the identified geographic scheme hotspots are not necessarily a hindrance to achieving the goals of the TfN strategy and addressing the wider air quality agenda. The findings from interviews with industry practitioners support the hypothesised view that operator schemes can indirectly benefit best practice through geographic migration that naturally occurs within the freight transport industry as vehicles cover large distances, optimising direct routes. Thus, geographic determinacy does not restrict best practice being disseminated both within and beyond the Northern Powerhouse region across the strategic road network and neighbouring transport corridors. Beyond the Northern Powerhouse agenda, the results indicate that operator compliance schemes have the potential to act as a framework for implementing continuous improvement within the commercial transport sector. Thus, scheme membership presents an opportunity for delivering safer and more sustainable operators in support of the UK Government's Transport Infrastructure Skills Strategy [46].

5.2. Addressing Sector Issues

Anecdotal evidence from the interviews with operators, regardless of scheme membership, highlights growing concern within the freight transport sector around skills and driver retention. This reflects a wider national industry problem where there are currently 40,000 unfilled driver vacancies [37,38]. The next CPC round is due later this year (2019) and there are fears that there will be a repeat or worsening of the 2013 phenomena where 9% of drivers left the industry. We also acknowledge that 11% of the current driver workforce are non-UK citizens [38] and for a sector that has been characterised by the government as a low-skilled job, this creates a significant barrier to recruitment and retention in itself, which further compounds the issue of an ageing population of drivers in the UK road haulage industry [5,37,38].

5.3. Knowledge Management and Extended Benefits

The commoditisation of data gathered in enhanced process management systems through operator earned recognition and compliance schemes can benefit freight transport operators, thus answering the call of TfN's strategy document [5] for transport operators and providers to consider enhanced skills and safety throughout the development, delivery, and operation of the North's transport network as a necessary future transport skills intervention.

A unanimous view amongst our respondents indicated that knowledge management is key to organisational performance; however, it is commonly overlooked. One particular overlooked aspect of knowledge management is digitalisation, which has resulted in large amounts of autonomously generated vehicle data. A clear example of this are the regulations; Rules on Drivers' Hours and Tachographs for Goods Vehicles in Great Britain, "GV262", which gives general guidance about drivers' and tachograph rules, for lawful compliance of the current enforcement policy for goods vehicles [8]. Amongst our respondents, the digital tachograph regulations are generally seen as onerous compliance and monitoring, rather than a data gathering opportunity.

5.4. The Value of Membership Schemes

From analysis of the survey and interview data, it can be reasonably supposed that recognition and compliance schemes are more valuable tools for crosscutting sustainability agendas and delivered in partnership for wider stakeholder good; to proffer for, rather than profit from. This further positions

the importance and potential benefits of considering the role of TQM within operator schemes for driving continuous improvement both within organisations, and externally in the localities where member vehicles are operating. Thus, TQMs' influence on an operator is not negatively influenced by scale, but rather improved upon by skill recognition and data optimization. With respect to one of the schemes researched, there is a majority view amongst interviewees and survey respondents that there is a lack of consultation on changes to scheme criterion. This viewpoint is shared amongst operator scheme members regardless of their relative scale or dominance in the sector; and is supported by an analysis of the scheme governance and its Standards Advisory Group profile. This further analysis revealed a lack of sector representativeness; thus, consultation itself is meaningless, unless it is in conjunction with a true representative profile of members. Notwithstanding these factors, a member profile with high levels of satisfaction did emerge; medium sized enterprises who were mainly involved in day operations that support major civil engineering projects. This finding directly correlates to the dominance of these actors across scheme membership and scale sub-sections. Analysis of the interviews revealed that these members were also most likely to have joined a scheme due to a mandated contractual or tender requirement.

6. Development of Conventions

To deliver sectorial advantage and geographic benefit for the TfN strategy and the Northern Powerhouse agenda, this research posits that a holistic approach, based upon a set of eight conventions (see Table 3), encourages inclusive and equally participative colleague development. These are a set of overarching principles that broadly fit across different operator compliance and recognition schemes in the transport sector, or can act as standalone conventions for non-scheme members seeking similar benefits and recognition.

Table 3. Eight Conventions for extending organisational efficiency.

Convention	Convention Descriptor
Convention 1	Customer Focus; including the acknowledgement of all external and internal customers in your particular sector of freight transport, their needs and the measurement of service provision in timely and efficiently addressing their needs.
Convention 2	Organisational Leadership; definition of clear measurements to drive both legislative compliance and continuous improvement of both the services offered in your transport sector and the colleagues who deliver them.
Convention 3	Colleague Development; advancement of colleague communications and their skill sets in order to deliver measurable outputs in support of steps 1 and 2.
Convention 4	Standardisation of Operational Processes; as implicit knowledge becomes explicit knowledge, to formalise knowledge as operational processes which drive repeatability and reduce variances.
Convention 5	Embedding Standard Operational Processes; here, processes become interrelated and systematic, so that they are proactive in driving efficiency rather than reactive to efficiency failures.
Convention 6	Continuous Improvement; adoption of plan → do → check → act systems of improvement, to also include analysis of service failures. This enables your organisation to move from corrective and reactive line functions as a result of service failure to move to enhanced colleague functionality and the commoditization of data to deliver proactive processed.
Convention 7	Decision Science Approach; the adoption of a standard collection of quantitative techniques used to inform decision-making at a colleague and organisational level. Note: an examination of existing systems and information flowing in to the freight transport organisation will commonly reveal sub-commoditised data that can benefit both the node of activity and the balance of the supply chain.
Convention 8	Mutual Reciprocity; a business norm of responding to a positive action with another so that a vested and sustainable outcome is achieved and the following transport/storage/supply chain function benefits accordingly.

In order to frame the following conventions within the context of continuous improvement, they adopt recent, relevant, and accepted interpretations of “Business Readiness” [47–49]. This refers to a process for managing change within an organisation. It describes the processes of designing,

implementing and controlling change, whilst ensuring all colleagues within an organisation can efficiently, safely and sustainably challenge the operational “status quo” with minimal customer facing disruptions. Therefore, business readiness is a process-based set of proprietary measures and frameworks used to proactively drive step change in an organisation. The eight conventions have been developed through analysis and evaluation of the survey data and semi-structured interviews. Subsequent to their development, they were shared for validation with a transport industry consultant with extensive experience across the freight transport sector.

7. Discussion

The research set out to determine opportunities and barriers to scheme membership, explore application of continuous improvement, profile scheme memberships, and develop a set of conventions for transport operators. These objectives have been fulfilled, and the goals of industry operators and local policy makers have been acknowledged to be more closely aligned than what is often perceived [50,51]. The research also allows for prioritization of the identified conventions in order to maximize benefit per user.

Whilst there is competition in the UK for membership across the major operator compliance and recognition schemes, there is no limit to the number of schemes an operator can join. The predominant deciding factor for operators is often the economic limit set by organisations regarding affordability of maintaining multiple scheme memberships, and the potential benefits of levels of accreditation. Notwithstanding this economic decision factor, our analysis reveals the benefits of a continuous improvement paradigm, whereby a commodity of service increases customer satisfaction and economic viability. These factors concur with prior research findings in the TQM literature [21,24,26] where TQM is identified as representative of an integrated management philosophy. Adoption of the conventions through membership of an operator compliance scheme can offer an opportunity to drive a change in organisational culture in the freight transport sector. As such, operational performance is more stable and proactive with regards to service variability, reporting, and compliance activities. However, in respect of this, it is important to acknowledge that adaptation of operational practices will likely lead towards a more holistic organisational benefit than pure adoption of generic management tools. Thus, it is apparent that integration of knowledge management in the sector can help with staff retention by ensuring that the value of individual tacit knowledge is embedded within the organisation [39,40]. Successful adaptation and application of the proposed conventions will likely lead to a better comprehension of customer needs; and who the customer, internal or external, actually is. For instance, conventions 2, 3, and 6 have scope for transport operators to flex in the short to medium term with regards to the TfN strategy and local interpretations of the Northern Powerhouse agenda. Therefore, the value of these conventions lies in their adaptation as opposed to adoption, particularly given the nature and peculiarities of the UK road haulage sector.

The different European schemes reviewed in this paper have generally been fixed term, time defined, and financially determined projects. For example, the SUGAR project focused on “Sustainable Urban Goods Logistics Achieved by Regional and Local Policies” that ran from 2008-2012 with 17 partners from across 10 EU countries [9]. However, incremental steps forward in the evolution of transport schemes, under the auspices and sponsorship of the European Commission, can arguably be positioned within continuous improvement and quality management paradigms. Nevertheless, the independent nature of each scheme, given the various lead project institutions, has worked against the emergence of an approach to longer-term success. This is based upon uptake in a geo-specific region where adoption of best practice also benefits other geographic areas, as vehicle movements extend beyond the geographic boundaries of each scheme.

This research reveals both the barriers to, and opportunities offered by operator recognition schemes to address sub-optimisation, particularly in the contexts of the Northern Powerhouse agenda and the Transport for the North strategy plan [5]. As previously mentioned, saturation of schemes, even within the Northern Powerhouse corridor and Transport for the North’s boundaries is not a

necessity for success with regards to environmental benefits. The nature of freight transport operations is such that vehicles and operators (regardless of membership of an accreditation scheme) frequently traverse geographical boundaries, thus naturally spreading the reach and impact brought about by scheme membership (e.g., cleaner vehicles, fuel efficient, and safe driving practices etc.). The case study of the Northern Powerhouse geographic region demonstrates that membership of a transport operator scheme can deliver regional sustainability benefits. Operational and environmental improvements will be achieved on a greater scale as freight movements travel across geographical boundaries, whereby fixed and determined geo-spatiality can be seen as a positive wider attribute rather than “best practice deserts” between areas with and those without a scheme. Voluntary operator recognition scheme membership has the potential to be a “win-win” for both operators and policy makers—with operators seeking to improve efficiency and promote best practice, whilst policy makers are tasked with achieving reductions in emissions and addressing sustainability targets.

The interview findings suggest that compliance schemes offer greater value when used as tools to span a locus across sustainability agendas, delivered in partnership for wider stakeholder good. For example, ensuring that operator efficiency is not compromised whilst clean air zones are adhered to. This further positions the importance of commoditisation of autonomously generated data and explicit organisational processes that contribute to the overall benefit of customers, be they private, or as regulatory bodies, so that operators are not disadvantaged by scale. Rather, they can benefit from internal skill development and recognition. Additionally, the research reveals that a “one size fits all policy” of one scheme works against innovation and continuous improvement. Industry interests are not practically addressed at both extremes of the scale. Under these criteria, a homogeneous approach does little more than deliver imitation rather than the innovative approaches that are required to improve competitive advantage and customer satisfaction. To this end, there are alternative government funded schemes, which create more value from shared data and performance indicators, leading to “earned recognition” and positive profiling [52]. Relatively low-cost schemes autonomously generate performance data on a periodic basis to “report upon”, therefore indicating that extensible enterprise data sets provide more value in real terms to an organisation than more expensive commercialised schemes; memberships at the first or introductory level have been sought after to satisfy customer and or construction project requirements.

8. Conclusions

This paper has addressed transport and freight movement perspectives within the contexts of skills, employee retention, and business readiness of transport operators in the UK for the Northern Powerhouse agenda, and TfN strategy. The broad set of fundamental conventions presented in this paper can be adapted and targeted to extend organisational efficiencies. Thus, maximising the benefit for the Northern Powerhouse Agenda and the Transport for the North’s Strategic Transport Plan, as well as the requirements of other stakeholders (e.g., local authorities) in addressing issues of safety and air quality. This research also concedes that reaping the benefits of a true Northern Powerhouse requires a high degree of commonality in approach to business-friendly LTPs, transport corridors, and seamless access for freight. This can only be achieved under a general consensus, which is willing to overlook bi-partisan attitudes and local political imperatives. Nevertheless, the research presented in this paper builds upon existing theory and provides a set of scalable conventions to drive continuous improvement and competitive advantage in the road freight transport sector, where operating margins tend to be small and success is dependent on repeat customer satisfaction.

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List of Notations

DFT	Department for Transport
DVSA	Driver and Vehicle Standards Agency
FORS	Fleet Operator Recognition Scheme
FTA	Freight Transport Association
GVA	Gross Value Added
KM	Knowledge Management
LEZ	Low Emission Zones
LTP	Local Transport Plan
SUGAR	Sustainable Urban Movement Plan, the Sustainable Urban Goods Logistics Achieved by Regional & Local policies
TfN	Transport for the North
TQM	Total Quality Management

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