Delivering on Sustainable Logistics by thinking inside the Box – a case study of a successful business model

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1 Abstract

Much research and EU research funding has been devoted to identifying the key factors that lead to a financially sustainable urban freight consolidation centre. Despite much 'success' with this at the academic level, to date no EU funded pilot has survived beyond the project termination date. This paper takes a critical overview of the whole area of urban freight consolidation centres, and in doing so identifies the key areas where the economics of the market and the logistical operation of delivery are found to be particularly challenging. A case study is then undertaken of a cycle logistic provider in Glasgow, which through a franchise/license agreement, is part of the wider UK Zedify distribution network of franchises. Key organisational and operational elements within the business are identified, and how these overcome some of the economic issues discussed. Key to success is found in a business model that enhances existing delivery outlets rather than one that attempts to subjugate them. Other key elements are in the structure of the organisation, which as a small owner-controlled firm provides strong leadership and is established through incremental progression and employee 'buy-in' rather than a big bang approach. These principles are supported through strong employee orientated company policies and adherence to ethically sound business practices which possess a very strong sense of corporate social responsibility. In many ways, the successful business model could be said to be more an extension of community economic development principles, i.e. 3rd sector organisations, rather than a capitalist orientated enterprise. Therein however lies the biggest challenge, which is how such a model can be developed to a larger scale and hence successfully shift the scale from an owner to a manager controlled firm.

2 Introduction

J.K. Galbraith argued in *The Affluent Society* (Galbraith, 1958), that at some point society's primary concern should switch from the sole creation of wealth to wider goals focused on improving the quality of life. In doing so, Galbraith recognised that the latter was a higher goal to attain. It could be argued that such views are no more encapsulated than in the issues surrounding the provision of transport services, particularly those relating to urban freight transport. Such a key economic driver comes with a multitude of social and environmental 'bads', particularly with regard to the disruption of public spaces and pollution of the natural and urban environments. In a similar vein with regards transport planning, Hickman (2017) has put forward the argument that the focus for transport investment should be on environmental, social and built environment goals, and not simply short-term economic aspirations. This general perspective is similar to the key ideas behind the triple bottom line (Elkington, 1999). Hence economic goals are pursued where these are consistent with meeting wider social and environmental targets. Within in the modern age, where issues of wealth distribution may still remain, pursuit of certain quality of life goals should be viewed as a progressive measure as the benefits are distributed far more evenly across the whole population.

Rather than focus on such positive outcomes however, most, if not all, academic papers on sustainable city logistics highlight and discuss the problems created by urban freight in city centres. Concern therefore is centred on the eradication of the negative externalities associated with urban freight

transport, an issue which is perhaps systematic of freight transport policy in general (see for example CEC, 2014). What this completely overlooks however is the wider issue of the creation of better public spaces. Why this difference in perspective may be viewed as 'important' is whilst the addressment of the externalities created by (urban) freight transport may be viewed as one that comes at an economic cost, the improvement of public spaces is the consequence of a trade-off that results in increased social welfare, which as noted, is a higher goal to achieve..

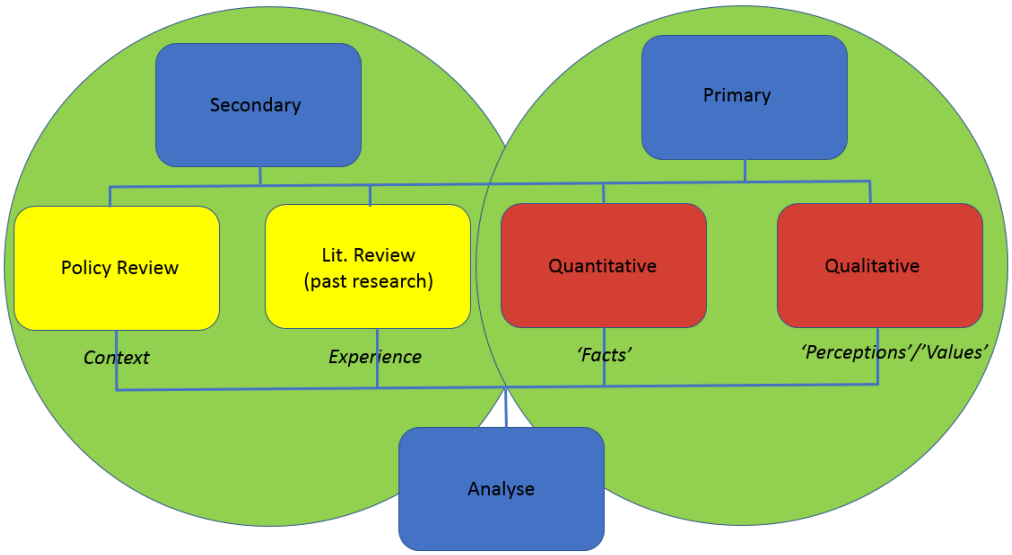
In order to address such issues, one proposed solution that has received considerable attention in the academic literature is the idea of consolidation of urban deliveries over the last mile. Despite this high level of academic interest, the practical implementation of such measures has been almost exclusively short term. Most have either been EU project funded or local authority supported, and have almost always resulted in termination of the initiative once the public funding has ceased. Several notable exceptions do exist, however examples of purely commercially successful enterprises are extremely rare.

The main aim of this paper therefore is to examine the economic viability of freight consolidation over the last mile through a case study of a private enterprise cycle logistics provider, Pedal Distribution Ltd (PDL), based in Glasgow. The next section outlines the methodology used in the current research, before the paper defines the concept of city logistics and examines the general literature on the economic viability of urban consolidation centres (UCC); this is firstly from a general perspective and then through application of the business model framework. An in-depth case study is then carried out on PDL, before conclusions are drawn and some policy observations made.

3 Methodology

The research is part of a general study on identifying successful business models for the EU Interreg project SURFLOGH (sustainable urban logistics hubs), for which the overarching methodological framework is given in figure 1:

Figure 1: Sustainable Urban Freight Logistic Hubs (SURFLOGH) Overall Methodology



Source: Cowie and Fisken (2019)

The current topic is exclusively focused on the economic viability of such initiatives, hence has less emphasis on areas of policy, and more focus on the other three, particularly the literature review and the qualitative aspects of the primary research. The general methodology employed is best described as Action Research, which as defined by Bryman (2005) is where the research is an integral part of instigating change, hence involves an iterative process of plan, act, analyse and reflect. In the current study, this not only relates to the primary aspects of the research, but the whole approach has been driven by on the ground developments, complemented by past experience (from the research literature) where this has been felt to be relevant. The overall framework therefore is very much social constructivist rather than positivistic in its approach. (see Cowie and Fisken 2019 for more info).

As such, over 60 academic papers and research reports have been reviewed in the course of the research, and the main issues and themes to be investigate drawn out. This process has also helped to identify areas that have received little or no attention in past studies. In terms of the primary data, this was gathered over a period of time, and given the methodology employed, for many aspects there is no one key source. Research methods used included informal discussions during field trips (participant observation), formal theme structured interviews, telephone clarifications and a site visit to the PDL base in Glasgow. The formal annual accounts of PDL were also studied to identify critical cost and revenue drivers and used to develop some of the key issues. A thematic analysis was then employed to analyse and collate the key issues and ideas that arose from the research, and this is the main tool used to present the findings in the case study presented later.

4 The Concept of City Logistics Defined

The whole area of last mile deliveries is part of the wider concept of city logistics, which concerns the public and private planning and management of urban logistics. Benjelloun et al (2010) for example suggest that the City Logistics concept has emerged as a comprehensive approach aimed at attempting to mitigate the negative impacts of urban freight transportation without penalizing many economic, social, administrative, cultural, touristic, and other activities. From an overall perspective however, this should be considered as an idealised view, or certainly at best a long-term aim, as to some extent there must be a trade-off between one or more of the issues highlighted. In a similar vein, Cardenas et al (2017) break urban logistics down into three components, city logistics, urban distribution and the last mile. Urban distribution is the operational aspects of how goods can be better distributed in, from and

to urban areas. Last mile relates to the final leg of the supply chain, whether that be business to business (B2B) or business to final consumer (B2C), and need not necessarily be a separate stage. City logistics on the other hand focuses on the inter-dependencies between citizens' welfare, the logistics system and the public administration of urban logistics policies. According to the authors, it refers to both the decision-making process and the implementation of policy measures. Taniguchi et al. (2001) define city logistics as "the process for totally optimising the logistics and transport activities by private companies with support of advanced information systems in urban areas considering the traffic environment, traffic congestion, traffic safety and the energy savings within the framework of a market economy.". Whilst not explicit therefore, the role of the public sector would be to monitor and regulate the main externalities associated with urban freight in order to achieve a more optimal balance. It could be further implied therefore that the years of a lack of proactive policy intervention would suggest that such a position has already been obtained.

To put the above into perspective, the situation in most locations at present is the free market solution, which given Cowie (2017) argues this is as a consequence of an almost perfectly competitive market, then any regulatory factor, policy or any other form of interventionist measure which seeks to change that situation must inevitably come at an economic cost. In many respects, there are no simple solutions, but as discussed above, it would be expected that from a broader society perspective, any such intervention should result in a more desirable (public) outcome. It also suggests that if consolidation of deliveries over the last mile resulted in efficiency improvements in the supply chain, then operators would currently be operating such measures. Ultimately therefore, it indicates that last mile consolidation services are uneconomic, certainly without any form of policy intervention. It would therefore seem that the practice of city logistics, as defined in this section, needs to be far more proactive than it has been to this point. Certainly with regard to the current study, this is based upon an entirely market based commercial operation, and thus in some ways outlines the limits of what can be achieved without such policy intervention.

5 Sustainable Urban Consolidation Centres – Issues and Challenges

Consolidation over the last mile can be achieved over a range of different measures, but by far the most commonly found and discussed in the academic literature is through an Urban Consolidation Centre (UCC), although many if not most of the issues that arise are common to all forms of consolidation over the last mile. With the relatively brief exception of cycle logistics, the following section therefore specifically considers the research carried out on UCCs, and given the focus of the primary research, this is on two specific areas. The first is in the general area of economic viability and the issues arising from that, and the second specifically though the application of the business model framework in the study of UCCs.

5.1 Economic Viability

One factor that becomes clear from the research literature, is that in the vast majority of cases key to success in a UCC project is the ability to create a critical mass in terms of the retailer base, with reference to the size of the operation. Browne et al. (2005) for example stressed that a major factor in the abandonment of a high number of UCC initiatives was due to their failure to reach the necessary number of clients required to ensure economic viability. Morganti and Gonzalez-Feliu (2015) similarly found that the establishment of a food delivery consolidation hub in Parma was dependent upon signing up a sufficient number of retailers to ensure profitable operation. Triantafyllou et al (2014) underline the importance of securing a high level of retail participation (in order to obtain a critical mass), and that this should enable the UCC to operate along market principles. The same authors found that achieving financial sustainability was more likely in the case of single site UCCs (e.g. a shopping mall, an airport, etc), as a single party is responsible for financing the operation. This compares to an area wide UCC, where securing financial support tends to be voluntary and there is no one body responsible for financing the UCC, and as such, the whole operation becomes more challenging.

One major barrier to establishing a critical mass is the segmentation found within the urban freight transport sector. Olsson and Woxenius (2014) for example highlight that in the case of transport for larger firms, which would include retail chains with their own transport operations and supply chain terminals, these are economically efficient because relatively large trucks are used and often are fully loaded (Browne and Allen, 1998). Under such circumstances, there is little if anything to be gained from consolidating loads over the last mile with other shipments. This fits in with Allen et al (2000) division of the urban supply chain system into three sectors, namely centralised goods supply systems (where businesses receive goods from a single point of dispatch), decentralised goods supply systems (where businesses receive goods from a variety of points of dispatch and potentially different suppliers), and finally a hybrid supply system based on core goods deliveries from a centralised supply system augmented with goods received through decentralised networks. The first of these, centralised goods systems, are likely to be larger stores that belong to retail chains. Based on the Dutch experience, research by van Rooijen and Quak (2010) would suggest that in terms of the percentage of stores, this represents a large proportion of the retail market, at around 75%. Improvements therefore are seen to lie outside of the centralised goods system, assuming of course that the current provision is inefficient in the distribution of goods (Duin et al, 2010). It has also been established however that transport carriers in this sector are unwilling to use UCC facilities. For example, two surveys (Regan and Golob, 2005; Holguín-Veras et al., 2008) both estimated that carrier's willingness to participate in UCC initiatives is in the range of 16%-18%. Reasons for such small numbers are unclear, but almost certainly will relate to the need for an extra handling in the supply chain, the loss of control over the last mile and finally the very low, if any, cost savings to be made from the use of such services. What this results in is a major barrier to entry on the supply side of the market, coupled with a small percentage of retailers on the demand side who could realistically benefit from using a UCC.

All of this points to what could be termed to be the paradox of the UCC, which would basically be that of the elements of the retail sector that could actually benefit from the use of last mile consolidation services, by its very nature this tends to be a small proportion of the whole market and in the majority of cases insufficient to constitute a critical mass. This basic idea is reinforced by Browne et al. (2005), who highlighted the difficulties of UCCs to reach the critical mass of users necessary to make the centre economically viable. Marcucci and Danielis (2008) further identified that businesses with frequent, differentiated and high-volume deliveries were less likely to use UCC services. This was also found to be the case for larger (independent) retailers, but the two groups probably have a high degree of cross over. Taken together, in many respects this extends the idea of the paradox of the UCC. In particular, given a critical mass is almost exclusively made up by volume, then the lower volumes from smaller retailers makes the task considerably more difficult, as far larger numbers of retailers need to be signed up in order to achieve sustainable levels.

Ogden (1992) further highlights that if there are profits to be made, then why is no one doing it? Rijsenbrij (2005), cited in Olsson and Woxenius (2014), also adds that despite technological advances, it is still difficult to distribute perishable goods via a UCC, as they often require uninterrupted delivery chains. Time sensitive goods, such as those found in the parcel and courier services (PCS) sector, are also difficult to consolidate. The many stops for deliveries in this segment consumes considerable driver time, and it is the time available during a driver's shift, rather than volume or weight, that tends to restrict the load utilisation of vans (Arvidsson et al, 2013). Effectively what most carriers do is operate their own consolidation operation. Research by Olsen and Woxenius (2014) suggests that rather than consolidate by geographical area or by economic agent, carriers employ a hybrid approach and hence a truck/van load is consolidated through a combination of deliveries to both retailers and final customers, such that the final mile may represent different types of operation in different geographical areas. What all this means is that 'urban deliveries', whether these be central, route specific or peripheral, should not be viewed as a single entity, but rather as an activity that is made up of a whole variety of different operations, and of those the areas where UCCs can be of real value (in the commercial sense), appear to be limited.

An overlooked but key work in this area is by Morganti and Gonzalez-Feliu (2015), who carried out a detailed case study on the establishment and operation of a food hub in Parma. The authors note that public authority support and the implementation of access restriction policies were both essential requirements to enable Parma's food hub to reach a viability threshold. Importantly, the authors highlight that such measures were taken by creating a strong partnership (Tavolo di Concertazione) among trade associations, logistics companies, transport operators, suppliers, producers and local retailers, and this then allowed local government to define and implement an effective scheme that optimised all stakeholder needs. This was primarily pursued through the adoption of Elvington's triple bottom line (3BL) approach. The authors themselves recognise that key to success lay in the progression of collaboration, consensus-seeking and communication between stakeholders at a preliminary stage of the project. Importantly, they recognise not only the outcome of the collaboration, but the key role played by the process of engagement that was followed in achieving these aims. One significant outcome was that it led to the revitalising of the role of the wholesale produce market. What this perhaps underlines is that in this case, the specific project had not attempted to impose a logistical framework that was radically different from what existed before it was implemented, but rather was one that was built on and developed from what was (or had been) already there. In some ways, this represents a 'bottom up' rather than a 'top down' approach, and this is one characteristic that would clearly distinguish it from less successful projects. One further element which almost certainly contributed to its success was that it was targeted at a specific sector (food), and that sector was of a sufficient size that allowed a critical mass to be created.

Many of these ideas are also reflected in the study by Taniguchi (2015) relating to the establishment of a UCC in Yokohama (Motomachi district). Three critical success factors were identified in its creation and operation, namely good leadership and enthusiasm towards achieving the main goals; collaboration between stakeholders, specifically public-private partnerships; and a business model to maintain joint delivery systems. From the paper it becomes clear that what existed was a convergence of interests, where all participants either directly saw the benefits of the initiative or more generally believed that it was the correct way to proceed. The retailers had a direct incentive to improve the retail environment, and actually traded off financial income (from shared ownership of levied car parking space) in order to achieve that aim. In many ways, a clear example of the 3BL in practice.

5.2 Cycle Logistics

Very little research exists on the whole issue of cycle logistics[i], in particular with regard to economic viability. This maybe reflects the fact that as a viable logistics provider, the concept can still be considered to be at an early stage of its development, but one that for a variety of reasons is gaining in momentum. In one of the few papers found on the topic, Maes and Vanelslander (2012) identified only 14 such providers in Belgium (at the time of writing), and even of these a high number were relatively recent start-ups. Furthermore, only one (Ecopostale) had any formal link with a recognised logistics provider (TNT), as most attempts at co-operation had terminated due to the fact that the tariffs on offer were below operators' costs. This suggests that where such services exist, these generally operate very much at the local level and outside of recognised logistical supply chains. In a three-market segmentation labelled mass, intermediate and high end, the vast majority of operators were found to operate in the intermediate sector, which basically consists of postal/package services defined by time constraints. Based on survey data, the authors also estimated a total market size of €550k Euros, which applying a generous 3% inflation rate would still only equate to an average company turnover of around €51k per operator. Many were one person businesses and operated as sole traders.

5.3 Business Models

In fairly recent years, the business model approach has become very common to assessing economic viability in all areas of business in an attempt to identify the critical elements that underpin commercial

viability. To a limited extent, the approach has also been applied with varying success to urban freight consolidation centres. Björklund et al (2017) however highlight that few researchers have actually provided profound insights into the design of viable business models for UCC success. The authors go on to state that many UCC initiatives have not materialised due to problems with business model limitations, hence suggesting that identifying the underlying business model becomes key to understanding the potential success of the UCC operation. Cowie (2019) however, in a critical view of the application of the approach in the last mile academic literature, has suggested that most studies have tended to use an off the shelf framework to break the operation down into component parts, but that what is required is a context applied framework to join it up. As an example, Quak et al 2014 in a 'business model' evaluation of the Bentobox concept broke the main costs of the operation down into its component parts (e.g. personnel costs, training costs, maintenance, capital costs), but failed to undertake any form of analysis that would categorise these to allow the costs to be matched against revenue streams. This is a basic requirement for identifying profit streams, and then extending the analysis, the extent to which profit streams may match the value proposition to the customer and potentially identify how that may be achieved, i.e. the business model.

Of more value is the work of Björkland et al (2017), in a case study analysis of 5 UCC initiatives, where the authors identified seven critical elements in the business model, specifically the ability to scale up and down the UCC solution; an ability to continuously develop and adapt to a dynamic environment; the important entrepreneurial role of the initiator; the acknowledgment of society (public recognition); the ability to introduce new innovative services; logistics and supply chain management competence; and the ability to take full advantage of advanced IT systems. Following the authors logic, what becomes clear is the importance of human capital/resources (entrepreneurial role/logistics competence), the need for flexible working, and the importance of high-end IT platforms with advanced interface capabilities. Whilst implied, this would nevertheless also tend to strongly suggest that in order to be successful, UCC operators should be small in size and be consistent with the idea of an owner, rather than a manager, controlled firm (Monsen et al, 1968). Perhaps of concern, this would also be consistent with penetration of only a small percentage of the market, and hence brings in all of the issues relating to the paradox of the UCC.

5.4 Literature Summary

To summarise all of the above, review of the literature on urban consolidation centres reveals a large body of knowledge, and as is the case with most literature, research of mixed quality. Perhaps not fully brought out, but it could be argued that in many respects the whole research area suffers to a degree from an academic bias and that the whole topic has failed to develop in recent years, but rather has entered a period of stagnation. Much research is simply being repeated, and a high level constitutes reviews or examination of case studies that have previously been analysed. There is, nevertheless, research in the area that is high in both reliability and validity and begins to gain some real insights into the realities of the issues being studied. Nevertheless, regardless of the quality, all of it has been of value in informing the current study, and in the following section some of the key issues (either by their presence or absence) with regard to the case study are drawn out and developed in the current context

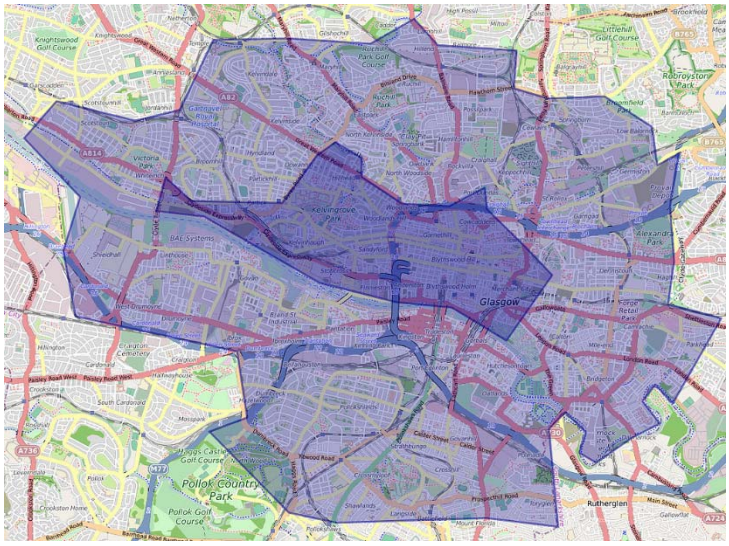
6 The Case Study – Pedal Distribution Limited (PDL), t/a Zedify, Glasgow

6.1 Background

The case study surrounds the establishment and subsequent development of a bicycle logistics provider in and around Central Glasgow. The company concerned, Pedal Distribution Ltd (PDL), is an SME private limited company, with the shares entirely owned by Mr Charlie Mulholland, who also is the main driving force behind the enterprise, developing it initially from a one-person sole trader business. As such, it is very much an owner, rather than a manager, controlled firm.

The company began after negotiations with the established 'Outspoken' cycle logistic provider in Cambridge, with PDL setting up operations in Glasgow in 2014, initially as the first franchisee of the Outspoken brand. Since then, a further five franchisees have been added in Brighton, Edinburgh (PDL), Central London, Norwich, Southampton and Waltham Forest. Within Glasgow, the area covered by PDL is mainly focused on the city centre on the north side of the river Clyde, but the company will deliver to almost any part depending on the size and urgency of the consignment, with the current pricing structure reflecting these elements. Figure 1 gives the specific operating area

Figure 1 – Zedify Glasgow, operating area



Source: Zedify Glasgow, https://www.zedify.co.uk/glasgow, last accessed 12th April 2019

In some ways, the map reflects the historical development of PDL, as the main delivery areas were in the central postcode code areas of G1 and G2, and thus the two zones illustrated in figure 1 are based on zonal charging. This policy however is currently under review as a consequence of the balance between urgency and the areas that can be covered, and hence is most likely to move to a more general Glasgow city wide charging scheme, and hence the 'zones' will be abolished. Under the terms of the original franchising agreement, PDL paid a fixed annual fee which gave entitlement to use of the Outspoken brand in all business dealings, as well as access to a high-level knowledge base in cycle logistics. As a simple example, the current seven licensees/franchisees have the same webpage layout all linked directly to the corporate head, the only differences being the addition of text to reflect differences in operations in each of the geographical areas. What is presented to the user therefore is a unified business, whilst the reality is that it is made up of six independent companies (PDL now also operate in Edinburgh and Zedify Cambridge in London) under the same brand. Due to differences in geographical locations however, the reality was very different from the franchising business model, or 'business in a box' approach, and hence in 2018 following Outspoken's rebranding to 'Zedify', all franchisees became licensees. The business relationship however is very similar to as it was before, although Zedify are looking to develop the whole brand as a national operator, with some progress being made with this at a regional level between a number of the other Zedify licensees in England.

In terms of size of the operation, the main capital assets of PDL consist of one electric van, 5 cargo bikes (bullets) and 8 three-wheeler tricycles, all enhanced by electrically assisted drive chains, and a rented operational base located on the south side of the River Clyde opposite Glasgow Green. Including Charlie, PDL employs 10 staff in total, with most working on a part time basis. Experience suggests this works well with people in the gig economy and furthermore given the nature of the work, even with electrically assisted bikes this is an occupation that would be very difficult to work at on a full-time basis. The company structure is the simplest possible, one company head and general business manager

(Charlie) and 9 couriers. Inevitably in such an organisation, working practices tend to be very flexible, with most staff involved at one point or other in all aspects of the operational side of the business. The one area of exception is in bike servicing and maintenance, which is generally undertaken by one individual.

6.2 Critical Elements in the PDL Operation

Whilst the above represents the bare facts of the operation, presented below are the key elements drawn out in the course of the research that identify the critical factors that lead to a successful commercial operation, i.e. the business model.

6.2.1 Elkington's Triple Bottom Line (3BL)

As stated above, Elkington's (1999) idea of the triple bottom line (3BL) advocates that the goals of economic, social and environmental performance can be pursued simultaneously. The last two of these are generally viewed, from a business perspective, as aspects of Corporate Social Responsibility (CSR), and as such an obligation or responsibility that may compromise economic performance. The 3BL approach however suggests that companies can identify activities that improve economic performance but that avoid social and environmental 'bads'. The key issue is in not making trade-offs between the three, as these simply don't exist, but rather pursuing complementary action where this is possible. This particular area was considered by Bjorkland and Johansson (2018) to be significantly underdeveloped in the UCC literature, with very few articles considering its relevance or even acknowledging its existence. Given the context of sustainable last mile deliveries, the whole idea of the 3BL would appear to be of significant relevance. The PDL business operation in many ways reflects the successful employment of many of these ideas. One clear example is in the employment practices that exist, such as certification as a Living Wage Employer, all employees trained to Bikeability Level 3, specific cargo bike training[ii] and finally the development of all employees as all round ambassadors for good cycling. All of these practices represent a strong commitment to staff development. This is combined with a management philosophy of leading by example, and hence all staff members, from the top to the bottom of the organisation, are directly involved to some degree in the primary activity of the actual last mile delivery. Whilst no clear evidence can be given, it is clear from conversations with personnel that what this produces is a high level of employee 'buy-in' to the business, and what it represents is not merely a training cost/expense, but rather constitutes an investment in human capital, which results in low levels of staff turnover and the open discussions (over a Friday beer) on ways to increase the efficiency of the business. Also consistent with such views, this is sacrificing short term profitability (economic) in the pursuit of long-term goals in terms of company survival and continued commercial, social and environmental development. Nevertheless, it also has short term benefits, hence staff costs are lower as a result of improved working conditions which produces higher levels of staff motivation, higher productivity and less absenteeism. In a business operation where the key activity is performed outdoors in all weathers and involves an element of physical effort, this is particularly important. From a broader perspective, many of the elements within PDL reflect key 3BL principles, and it is difficult to see how such a business could operate successfully in this area under any other type of business framework.

6.2.2 Bottom up verses top down

One issue not explicit from the literature, but become clear in the process of reviewing it, is that in the vast majority of cases, the UCC component in the city logistics network has been implemented from the top downwards. Normally this occurs where the local authority takes the initiative, and sets up a UCC centre. It could be strongly argued that such an approach imposes an alternative logistics network upon a system that is not only already in place, but over time is one that has been largely developed along free market principles. As highlighted above, given the economic efficiency of the existing urban

distribution system, any attempt to replace it with something else will ultimately result in economic failure. This also reflects the already stated view of Ogden (1992), that if profits were to be made, then why is no one doing it? In other words, if this was the most efficient economic solution, then the market would have already produced it. It should be stated that successful examples of the 'top down' model do exist, for example the aforementioned Food Hub in Parma (Morganti and Gonzalez-Feliu, 2015), and the UCC in Yokohama, but as clearly shown in the literature review, one of, if not the, major key to success in both cases was the process of engagement that was followed in establishing the UCC initiative. Such attainment of stakeholder buy-in at all levels effectively incorporates key elements of a bottom up approach, so probably reflects some form of hybrid rather than pure top down model.

In the case of PDL, the model of establishment can be clearly identified as 'bottom up'. Operations began at the lowest possible level. Initial business was established through what can only be described as a modified form of the door-to-door foot salesman approach. Specific sectors were identified, particularly legal practices and local printers, and potential clients approached directly by the company, which to repeat, at the initial stage constituted a one-person sole trader. Over time, this basic approach to business has been complemented by increasing levels of partnership working.

6.2.3 Partnership Working

Whilst in the academic literature partnership working has received a considerable amount of attention (see Cowie, 2019 for a review), this has exclusively examined the issue of public-private partnerships. With reference to the current case, whilst it may be an isolated example, it would almost seem inevitable that the success of any bottom up approach will be highly dependent upon establishing meaningful working partnerships with existing carriers and other stakeholders. In many respects, complementarity is the issue rather than competition/substitution, and this would also be consistent with the triple bottom line. Hence lowering final delivery costs of the whole supply chain (economic), results in, as a minimum, improvement of public spaces through reductions in emissions and general traffic 'clutter' (social and environmental). One key advantage of cycle logistics in confined urban environments is accessibility to delivery points. In what admittedly should be considered as an extreme case, this has been found to be a major issue. Allen et al (2017) conducted a survey of delivery rounds in Central London, where the courier was accompanied by one of the researchers and measurements taken of various activities undertaken during the delivery run. What the results showed is that in an 8 hour run, on average the vehicle was parked for 62% of the time. Furthermore, whilst the total distance covered by the van was on average 11.9km, each driver on average walked 7.94km, in other words almost two thirds of the distance that they drove. What this results in is very slow average speeds, and from a highly critical perspective, only a 40% utilisation rate of the main capital input factor (the van). As stated, this is perhaps an extreme example, but does present cycle logistical operators with an opportunity to offer a viable complementary service to an existing urban logistics provider.

In the case of PDL, this does not lead to complete subcontracting from the prime operator, as the business case outside of London is less clear cut, but is definitely present at the margin. As an example, PDL work in conjunction with TNT to offer an express next day multi drop service. From TNTs perspective, the main reason they use PDL is purely financial, given the evidence above, using cargo bikes for the last mile in this particular sector is about half the cost per stop. TNT also have a national goal linked to emissions reductions, although Charlie's perceptions are that this is less of an issue at the local level and outright costs are the main driver of operations. At the moment, there is no integration of IT systems, each contract on the system is run for the relevant carrier, because as things stand, this is the easiest solution. In practice therefore, this would not appear to be a barrier to co-operation. In terms of future development of the business relationship, there may be possibilities of branding the cargo bikes in the carriers' brand image, but at present this is not feasible given current volumes.

On the back of the partnership with TNT, PDL have also developed a number of strong working relationships with local businesses, including dental laboratories, bookbinders and even local cafes offering lunch deliveries, such as Where The Monkey Sleeps in central Glasgow.

Future possible developments surround the issue of the first, rather than the last, mile, specifically the consolidation of consignments from retailers where these have been purchased through freight auctions. As a consequence, one retailer may have a variety of consignments for different PCS providers. The whole issue of collections is particularly problematic for these companies, as whilst deliveries can be pre-planned, the need for collections tend to arise in the course of the run. PDL would basically consolidate these consignments over the first mile, and hence the PCS carrier would collect from one single point.

7 Summary and Conclusions

This paper has examined the key issues arising from the literature on urban freight consolidation initiatives, mainly those relating to urban consolidation centres (UCCs). What it has found is perhaps a slight reluctance in the literature to accept the economic realities facing such initiatives, which can best be described as challenging, particularly given what was identified as the paradox of the UCC.

Nevertheless, the body of research does clearly show that opportunities for such initiatives do exist, and in this context, these were taken forward to a case study of an SME provider of cycle logistics in central Glasgow, PDL, but one that is a licensee of a larger national chain, Zedify. What the primary research found was a successful business model that was established with the principles consistent with a 'bottom up' approach, and built on a strong application of some of the key ideas behind Elvington's 3BL. The outlook however is entirely commercial, hence the business has been successful in partnership working in order to replace existing services where the service provided has proved to be quicker and more cost effective than what already existed, and then complemented this with the opening up new channels of distribution that had not previously existed.

The clear conclusion is that in the current environment a bottom up/hybrid approach is the only way to succeed, and unless there should be a major change in policy aimed at making the current urban distribution system less economically efficient, then the market that can be realistically accessed will be always be limited, with the research suggesting this to be around 25%, which in many cases would not be sufficient to establish a critical mass. For the remaining 75% of retailers, then the challenge of policy would be to shift the balance, and hence give opportunities for more cycle logistics, but this leads into the whole issue of scaling up the whole operation.

In many ways, the successful business model of PDL could be said to be more an extension of Community Economic Development principles, i.e. 3rd sector organisations, rather than a capitalist orientated enterprise. Therein however lies the biggest challenge, which is how such a model can be developed to a larger scale and hence successfully shift the scale from an owner to a manager controlled firm. One further extension discussed above may be through a branded subcontractor role, hence independent cycle logistics providers perform the last mile delivery, although from their perspective the potential arising from such developments may be limited. There are some early initiatives involving larger PCS providers, such as DPD, who are now beginning to use the concept of micro UCCs combined with cycle logistics in the most densely populated areas, primarily due to the cost savings this produces. From a wider perspective, this may well be how the whole concept moves forward to a larger scale of operation, although this will still leave segments open for the independent cycle logistics provider.

8 References

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[i] More has been done in sociology, however even here there is some idea as to how the whole profession has been viewed, see for example Fincham (2007).

[ii] Given there is no nationally recognised training award for cargo bikes, this is an in-house Zedify certified course.