Convenience store location planning and forecasting – a practical research agenda

Abstract

Purpose: To compare the accepted techniques of location analysis in the food sector with the realities of "real world" forecasting in convenience store (c-store) retailing. To offer a conceptual framework for c-store operators intending to become more strategic in their small store location planning but currently lacking established expertise or extensive research budgets.
Approach/Methodology: Outlines potential best practice based on industry experience, and contact and discussion with location analysts and retail consultants, as well as a wide ranging examination of the academic literature in this area.
Research/practical implications: First, to briefly detail the strategic regulatory motivations and location planning implications of the major UK food retailers entering this market. Second, to summarise the established sales forecasting techniques in food retailing. Third, to review why these established approaches are difficult to apply to convenience stores in neighbourhood markets. Fourth, to detail basic approaches that should be further developed by small store operators lacking budgets to develop specialist location planning departments.
Originality/value: Academic conceptualisations of location planning in the convenience store sector are largely absent from the literature. This paper adopts a practical perspective.

Conceptual Paper

Keywords: store location, geographical information systems (GIS), gravity modelling, convenience stores, food retailing

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INTRODUCTION

The science of site selection and sales forecasting of retail stores has been a topic that has received huge attention within both retail management and retail geography research since the 1960s (see the landmark texts: Davies and Rogers, 1984; Guy, 1980; Jones and Simmons, 1987; Birkin et al., 2002). Primarily this has focused on the conceptualisation of techniques for determining the optimal location and sales of the food supermarket (e.g. Clarkson et al., 1996; Smith and Sanchez, 2003). There are clear and obvious reasons why this has been the case: first, superstores are the principal format through which food is sold, accounting for 74% of total grocery retail expenditure in the UK (IGD, 2005). Second, given the size of such stores, there is a clear sunk cost related to each development and therefore accuracy in location planning is essential (Wrigley, 1996). Third, such stores are dependent on the regular weekly expenditure levels of consumers', involve repeated car journeys from consumers' homes that are habitual, and therefore lend themselves to statistical geo-demographic modelling.

Unsurprisingly a dialectical relationship has built up between the academy and retailers with considerable location decision-making expertise established at the leading supermarket retailers' in-house site research departments (Rogers, 2005). This has been associated with the emergence of thriving business opportunities for support companies such as Map Info, The ORC Partnership, GMAP, CACI and Experian that provide assistance in decision-making or alternatively provide geo-demographic data to support retailer's own forecasting and model development (González-Benito and González-Benito, 2005).

However, this academic focus on supermarket location has not been mirrored in research on sales forecasting and location management in small store convenience retail markets; albeit with a few exceptions arguably of limited practical value (e.g. Houston and Stanton, 1984; Lee and Koutsopoulos, 1976; Sakashita, 2000). Partly this is due to the low relative investment levels per unit (and therefore lower sunk cost and capital liability), as well as the less habitual nature of convenience retail sales which complicate forecasting. Furthermore, convenience store

operators have not historically enjoyed the scale and therefore the capital to invest in specialist location planning departments and thus 'location planning is often undertaken on the basis of subjective rules of thumb and a degree of opportunism relating to the availability of individual sites' (Pioch and Byrom, 2004, 223), 'intuition' (Rogers, 1987) or 'common sense' (Hernandez and Bennison, 2000).

More recently, however, major structural changes have occurred in the neighbourhood market with aggressive expansion by Tesco, Sainsbury's and the Co-op (Wood et al., 2006). This exposes small neighbourhood retailers to competition with dominant operators, often with international experience, that benefit from complex, efficient supply chains and buying infrastructures with a strong tradition in location management. Tesco, for example, is widely recognised to be at the forefront of location research and data analysis in food retail (Humby et al., 2003; Rogers, 2005), while Sainsbury's makes good use of its customer data and also operates a specialised location research department (Miller et al., 2003). Characteristically it is likely that these leading retailers will seek to leverage their greater degree of sophistication in location planning into this sub-market - essentially "raising the bar" in small store sales forecasting meaning competing neighbourhood retailers will themselves have to become more sophisticated in their techniques.

The aims of this paper are fourfold: First, to briefly detail the strategic regulatory motivations and location planning implications of the major UK food retailers entering this market. Second, to summarise the traditional sales forecasting techniques used in food retailing that have been well analysed within the academic literature. Third, to review why these established approaches are difficult to apply to convenience stores in neighbourhood markets. Finally, the article concludes by exploring how neighbourhood retailers can become more sophisticated in their store location planning and forecasting even without sizeable budgets for high-tech location planning solutions. This article is conceptual in nature, based on industry experience and discussions with analysts who have experience of these issues. It also will act as a useful update

to a series of easily accessible publications on practical location decision-making in this journal from the mid 1980s (see Bowlby et al., 1984a; 1984b; 1985a; 1985b).

MARKET REGULATION AND THE SEARCH FOR NEW GROWTH VEHICLES IN UK FOOD RETAILING

It has been argued elsewhere (Wood et al., 2006) that the foremost motivation for the entry of the leading food retailers into the convenience market has been the degree of planning regulation preventing the construction of the preferred large, and by definition, out of town centre formats. The primary way that this has been in evidence is via the introduction of Planning Policy Guidance Note 6 (PPG6) in 1993 – more significantly its revision in 1996, and its eventual replacement in 2005 with Planning Policy Statement 6 (PPS6)[i]. This makes the development of larger out-of-centre stores problematic through the introduction of the so-called "sequential test" which essentially prioritises town centre sites by requiring developers to consider these first (CB Hillier Parker, 2000), as well as placing the onus on the developer to prove quantitative "need" for retail space (Adlard, 2001).

Unsurprisingly the leading UK food retailers have employed some innovative approaches to achieve robust levels of growth. Most commonly this has been seen with store extensions (Wrigley, 1998) that increasingly utilise mezzanine floors and, at the time of writing, do not always require planning permission (Warren, 2004). More innovatively, we have seen previously marginal locations for superstore development becoming acceptable to retailers and given planning permission by local authorities due to retailer participation in socially inclusive regeneration schemes (see Wrigley et al, 2002), as well as the entry into new retail markets within the UK in the construction of standalone non food stores (Wood et al., 2006). Internationalisation strategies have seen mixed success (Alexander et al., 2005) though, in the case of Tesco, they have absorbed £5.5 billion of capital investment, leading to 50% of its operating space being located outside the UK by the end of 2004 (e.g. Palmer, 2005; Rogers et al., 2005).

Neighbourhood market structural change 1997-2005

In addition to the wide range of innovative approaches described in the previous section, the aggressive entry of Tesco and Sainsbury's into the neighbourhood market is another reactive strategy that has resulted in strong performance (Verdict Research, 2006). The ability of such dominant operators to enter this market is largely the result of the Competition Commission's consistent stance that there are two separate markets in the wider UK grocery sector – the 'one stop' shopping sector, which following the Commission's Inquiry of 2000 and its rulings in the case of the proposed acquisition of Safeway (Competition Commission, 2000, 2003), is now extremely tightly regulated; and the convenience store sector, historically highly fragmented, neglected by the leading firms and distinct in regulatory terms. This has meant that the leading food retailers, traditionally operating in the one-stop market, have been able to acquisitively enter the convenience sector regardless of their shares of the superstore and hypermarket markets. Despite these changes of ownership, the UK neighbourhood retail market remains relatively fragmented for the time being (see **Table 1**).

XX TABLE 1 ABOUT HERE XX

The major players were not the first to aggressively increase their scale in the convenience market: instead, it was the Co-op that, following a strategic review in 1997, concluded there should be a re-emphasis on small stores due to the dominance of the grocery majors' large formats. An acquisitive strategy then followed with the purchase of the 600 unit Alldays chain in October 2002, followed by the acquisition of Balfour, a chain of 121 stores in July 2003.

However, the balance of power in the competitive landscape was transformed with the acquisition of 862 unit T&S convenience stores by Tesco in January 2003 (Mintel, 2004). This built on Tesco's growing interest in the market, evident in the joint venture with Esso to offer small format c-stores on the oil company's forecourt locations. The initial success of that concept suggested potential to roll out a standalone convenience store concept under the Tesco 'Express' banner.

The T&S acquisition was followed with an announcement, at the end of January 2004, that Tesco had made an agreed offer to buy 45 convenience stores from Adminstore, located primarily within the M25; and in September 2005, that the grocer was purchasing 21 petrol filling stations and convenience stores from rival Wm Morrison. By the end of the 2004/2005 financial year, Tesco had c.550 Express stores (with a significant programme of conversions still to follow from the remaining unconverted One Stop stores) - considerable growth given that at the time of the T&S acquisition the company only had around 130 Express stores mainly on petrol forecourts with Esso.

Largely in response to Tesco's initial forecourt stores, Sainsbury's had similarly entered the convenience store market in 1998 with the opening of its first 'Local' store. However, in February 2004, Sainsbury's responded to Tesco's acquisition with the purchase of Bells Stores, a 54 unit chain located in the North-East of England, followed by the acquisition of the 114 strong Jacksons chain in August 2004 with a portfolio focused in the North Midlands and Yorkshire. Six more c-stores were added with the acquisition of East Midlands chain JB Beaumont in November 2004, and finally Sainsburys acquired SL Shaw Ltd, a convenience store operator with five stores in the South East of England in April 2005.

CONVENTIONAL SUPERSTORE SITE LOCATION ANALYSIS

The following section reviews the site assessment techniques that have been developed by supermarket operators before examining how these become problematic to apply when the spatial scale of analysis is narrowed to focus on convenience store catchments.

The task for the major food retailers' location planning analysts is to provide expertise to determine which sites should be developed and furnish decision-makers with reliable sales forecasts: quantitative data that ultimately determines the affordability of a site purchase or lease agreement. A 'retailer lacking this information goes blind into the land-sale auction' (Hallsworth, 1992, 177) so even in scenarios where sites are clearly appropriate for acquisition and development, there is a need to quantify expectations. Indeed:

> seniority may legitimize the use of intuitive approaches by groups such as managers and executives while employees lower down the hierarchy, even though they may be subject to their own intuitions, may…need to legitimize their decisions by rationalizing through collecting 'hard data' and analyzing it (Sadler-Smith and Shefy, 2004, 80).

Over time, the leading food retailers have developed highly data rich-methods of store forecasting that have been widely reviewed in the business and retail geography literature (e.g. Birkin et al., 2002). Typically such approaches are focused on large stores, over 10,000 sq ft in size, with correspondingly extensive catchments that can be modelled using detailed geo-demographic data. Hence, larger operators have been able 'to tackle the uncertainties by developing more sophisticated models in which they seek to incorporate all variables and interactions' (Dijst et al., 2005, 1333).

In doing so, the leading food retailers have built international reputations for accurate and canny site purchase decision-making. For example, following high initial levels of investment in the mid 1980s, Tesco has reduced average forecast store turnover error; with the company recently claiming that 80% of new units are within 15% of forecast (Hyman and Ainsworth, 2005). The sheer number of sites examined by the UK site research team is considerable with over 1,000 assessed throughout the UK annually (Rogers, 2005).

Gravity/Spatial interaction modelling and Geographical Information Systems (GIS)

A core technique used in sales forecasting at large supermarket operators is the gravity modelling of food retail expenditure alongside the analogue store method (Benoit and Clarke, 1997). Gravitational models are derived from applying the Newtonian laws of physics to the modelling of shopper behaviour based on the countervailing influences of the attractiveness of the store and the distance between the shopper's home and the store (Rogers, 1984). In short, the probability of a consumer using a given store diminishes at an exponential rate as travel time increases. While this modelling technique was theoretically useable, numerous studies during the pre-computer age found it less than successful (Openshaw, 1973).

Over the past decade this form of market analysis has become considerably more effective through the advancement of Geographical Information Systems (GIS) – labelled in the early

1990s as a ‘paradigm shift in cartography’ (Morrison, 1994). This spatial representation of geo-demographic and retail data is particularly powerful and based ‘on a crossing of digitalized cartography in addition to relational databases’ (Mendes and Themido, 2004, 14) which ultimately allows non-GIS specialists to quickly interpret and understand complex geo-demographic patterns and trends. The introduction of GIS software has, for example, allowed site analysis to be based on modelled “drivetimes” rather than simply straight line distance.

Clearly, a GIS and gravity model is only as good as the data that feeds it: hence retailers must ‘make full use of the datasets which exist internally’ and ‘proactively seek strategies which allow the generation of additional datasets which support effective monitoring of customer activity’ (Clarke and Rowley, 1995, 5). There are numerous external data supplying agencies providing geodemographic data including CACI (ACORN), Acxiom (Personcix) and Experian (MOSAIC) (González-Benito and González-Benito, 2005). This data typically segments population in terms of variables such as lifestyle, family structure and income level and can be utilised in combination with data from the Expenditure & Food Survey (EFS) from National Statistics, the National Census (for population) and from loyalty card data. Ultimately data rich catchment maps can be constructed to ‘analyse sites based on drivetime, demographic as well as psychodemogaphic variables, competitive information, and customer information’ (Mendes and Themido, 2004, 14). In doing so, the use of GIS and gravity models allows more precise and accurate decisions to be made which becomes more important as the number of available sites reduces and those remaining are all the more marginal and complex (Byrom et al., 2001).

Analogue Stores Approach

The analogue approach is ‘directly associated with the historical sales performances of existing stores’ (Drummey, 1984, 281) and employed to forecast as well as “fine-tune” the results of spatial interaction models (see Clarke et al., 2003). The technique has a long history (see Applebaum, 1965) and is based on the measurement of market penetration (market share) by distance from the store, usually on a concentric distance or “drivetime” ring, underpinned by data from food spend levels, loyalty cards or customer surveys (Rogers and Green, 1979). These data are collated for all stores in the portfolio to allow analysis ‘by drawing comparisons (or

analogies) with other stores in the corporate chain that are alike in physical, locational and trade area circumstances' (Birkin et al., 2002, 137).

The technique is dependent on the analyst's business experience and judgment as well as the extent and variability of the store network at the time. On the one hand, a retailer with few examples of a particular format in its portfolio will suffer from a paucity of analogous stores from which to choose. On the other, a retailer with an extensive store base such as Tesco or Sainsbury's offer a huge number of potential analogues which may make the task of finding appropriate stores all the more onerous due to an extensive data set (Clarke et al., 2003; Clarke and Mackaness, 2001).

The strategic use of loyalty card data

The use of a customer loyalty card is widely known to have an array of customer loyalty inducing benefits (Humby et al., 2003; Rowley, 2005); but it also presents opportunities for understanding customer behaviour - data especially beneficial to location decision-making (Ziliani and Bellini, 2004). The challenge with loyalty card information is to realise 'data with meaning' (Byrom et al., 2001, 221) and develop a more precise understanding of how current stores trade spatially, temporally and also in terms of "classifications" of population.

In essence loyalty card data allows retailers to gain benefits in addition to those associated with 'customer spotting surveys' (cf. Drummey, 1984), i.e. larger sample sizes and associated statistical reliability. First, when loyalty card data is presented via a GIS they have the potential to allow a comprehensive understanding of "gaps" in its store estate and, therefore, where there is scope to supplement with additional units. Second, they allow a precise understanding of customer lifestyles and their requirements which further aids in the product ranging decisions of its stores. Third, in the event of competitor, or its own, store openings, loyalty card data permits a more comprehensive analysis of the degree of impact or sales cannibalisation that it can expect which can feed into the store location decision-making process.

LOCATION PLANNING CHALLENGES OF C-STORES

In contrast to superstores, academic conceptualisations of approaches to neighbourhood location planning are few and far between. Two notable exceptions include Sakashita'article in *Urban Studies* (2000) and Houston and Stanton's paper in the *Journal of Retailing* (1984) that both offer a highly quantitative analysis of optimal convenience store location. However, the very problem with forecasting c-stores is brought out with this work: it is almost purely theoretical and therefore offers no practical concession to real world conditions.

There are a number of reasons why academics have not extensively engaged in debates and research regarding location planning for neighbourhood stores. First, from the 1970s until very recently, food retail growth has been focused on larger decentralised food stores, predominantly situated out of residential areas. It is natural that academic research has tended to mirror predominate growth and ultimately neglect convenience store locations. Second, given the size of such superstores, there are extensive sunk costs related to each development and therefore the accuracy in decision-making is arguably more important in superstore, rather than neighbourhood, retailing (cf. Wrigley, 1996). Third, superstores serve large catchments, are dependent on regular weekly expenditure levels, involve repeated car journeys from consumers' homes, so are typically habitual and lend themselves to statistical geo-demographic modelling.

This final reason reveals the principal factor that largely serves to stifle academic debate on small store location planning: many of the norms of site analysis that are associated with large scale retail units become largely redundant when dealing with neighbourhood locations where micro-scale scheme-related issues and secondary shopping decisions come to the fore:

> Despite the latter-day advances in location modelling and geographical information systems, the outcome of locational decisions ultimately rests on *micro-scale* considerations; that is, the appropriateness or otherwise of the precise location *within* the chosen city centre, regional shopping centre, inner city arterial, secondary shopping district, retail park or whatever. Indeed, it has often been said – though perhaps not enough – that a few yards make all the difference between success and failure in retailing (Brown, 1994, 543, emphasis in original).

Hence, it is no surprise that the superstore retailers attempting to aggressively expand their portfolios in the c-store market have not found it straight forward. In 2004, Sainsbury's had to close 12 of its Local stores, forcing Justin King, Chief Executive, to concede: 'We got some of our early locations wrong' (IGD, 2004, 161). This has the effect of heightening the importance of the site visit rather than desk-based analysis to understand the unquantifiable micro-scale aspects of such small catchments. Indeed, one prominent location analyst commented that while superstore forecasting is determined by 80% in-office analysis to 20% site visit; convenience store forecasting is more 80% site visit to 20% in-office study (Tasker, 2005). The difficulties with forecasting convenience stores relative to superstores are detailed in **Table 2** and discussed below.

XX TABLE 2 ABOUT HERE XX

1. Small scale issues become "big" considerations

a) A concern with "small", unstandardised competition

As the focus of analysis centres on stores < 3,000 sq ft, similar sized units provide strong competition. However, commercial databases of such units are less available and, given the "churn" in this sector, less accurate. In addition, the quality of c-stores varies considerably - an independent store will not necessarily have a poor quality product offer or store environment. This places a huge importance on the site visit to understand the nature of the development scheme and catchment.

In addition, an adjacency of associated services along a shopping parade can have disproportionate effects on a store's performance. For example, the proximity of a store to a Post Office or a parking area can radically increase footfall; essentially underlining the importance of Hotelling's famous 'principle of minimum of differentiation' in gaining sales (Brown, 1989).

b) Micro-scheme quality - footfall, car parking, visibility, store design

There are four factors that are especially important in making convenience store sites viable: footfall; the degree of available car parking; store visibility; and its design. First, a field visit is

essential to determine the pitch and quality of the site in terms of pedestrian footfall. While there are data providers of pedestrian traffic rates in established centres (e.g. CACI), this must be reviewed "in the field". "Dead" areas and secondary parades must be treated with caution and footfall measured independently; particularly for sites of marginal viability.

Second, the degree of car parking can have a disproportionate effect on c-store performance. Essentially the imposition of finding a parking space can, in economic terms, be considered a fixed cost to the shopper that cannot be reconciled with such a low transaction shopping mission (cf. Bell et al., 1998, p 365). This is less important in central locations where there is a higher degree of pedestrian footfall upon which the store can depend.

Third, while a store's visibility is central to all forms of retail success, the difference with neighbourhood stores is that they are not always a customer's pre-determined shopping mission and thus clear identification is essential. Furthermore, given the small size of the units, seemingly insignificant obstructions can obscure visibility - leaves on trees located outside a store may obscure visibility in summer though this may not be a problem in winter when a site is visited and a decision made.

Fourth, the quality of the store design requires consideration even at this early stage. Thought must be given to the ability of customers to circulate throughout the store, with space to queue at peak times. This is especially important when the store is already constructed and the retailer is faced with making it "workable" in the event of progression.

c) Customer perceptions

With superstore developments there is customer expectancy that there will be an extensive car park, the store will be well-stocked, and store standards will be reasonable. Partly this is due to the size of the stores, but equally, due to the strong brand equity that such operators generate with the public (cf. Burt, 2000). In the neighbourhood market, retailer brands are weaker (though this is changing with the entry of Tesco and Sainsbury's) and, therefore, customers are more easily dissuaded if it is not <u>immediately evident</u> that the store will satisfactorily service

them. This makes the appearance and design of the development scheme essential with car parking spaces (if possible) situated at the front of the store. At worst, 'an otherwise good location may be spoiled by poor store design' (Hutchinson, 1940, 137).

d) The study of drivetimes less significant

A cornerstone of gravity modelling on GIS systems over the past decade and a half has been the utilisation of computer-generated drivetimes to aid the forecasting of supermarkets. However, when attention shifts to neighbourhood stores, the use of drivetime analysis becomes less useful given the lower level of car borne trade and the reduced propensity to undertake an extensive and single purpose journey to the store. This is widely recognised – as seen in the size of catchments considered by the Competition Commission in store divestiture assessment (see **Table 3**). While it is possible to gravity model using "walktimes" with a detailed enough road network (e.g. 100m grids), this necessitates a more detailed level of geography (e.g. footpaths). Spend allocation techniques also become increasingly complicated as one is not modelling total food spend but a form of secondary spend – an unknown proportion of the total. Clearly, spatial interaction models that are so popular in 21st Century superstore forecasting become increasingly challenging when dealing with convenience stores.

2. Not the "one-stop shop" and understanding customer shopping missions

Recent research suggests that the frequency of shopping missions is becoming increasingly confused and difficult to model as consumers are experiencing longer drivetimes to stores, more frequent top up shopping and hence less one-stop traditional shopping trips compared to twenty years ago (Clarke et al., 2006; Jackson et al., 2006; Popkowski Leszczyc et al., 2004). While this presents competitive opportunities for neighbourhood retailers, it equally makes it difficult for small stores that are rarely sure of the customer, or ultimately the shopping mission, they are attempting to satisfy.

There is a sheer diversity of the customer shopping mission with the emergence of a "cash-rich/time-poor consumer (Popkowski Leszczyc et al., 2004), as "top-up", "impulse", "distress", "treat" and "main shop" all have slightly different requirements. Research by The ORC

Partnership has shown that spend of £0-£5 accounts for 37% of transactions; while £5-£10 basket sizes claims 36% of transactions. However, the same customer may undertake different missions on the same day – something inadequately accounted for within complex spatial interaction models that typically:

> …contain unrealistic assumptions about consumer behaviour. All the store location methods are highly aggregative and assume that differences between consumers, such as the number of stops made on shopping trips, are unimportant or else negate each other. Such differences are usually overcome by assuming that all consumers make single-stop shopping trips (MacKay, 1972, 134).

The locally sensitive nature of the convenience store market necessitates a return to less technical techniques of site evaluation. Hence, we argue later that in the absence of one model for all neighbourhood markets, analysts must pursue multiple approaches including the segmentation and study of analogues, regression modelling and basic catchment analysis to determine a forecast sales level.

3. Small scale data availability

As with all store location analysis, there is a high level of importance attached to the quality of data that are manipulated and applied to individual sites. However, given the localised nature of investigation, there is often an importance on data quality at a spatial scale at which the data are not designed for. While the most important data are derived from the Census, this survey has broader goals; of use to 'government departments, local authorities, businesses and to the general public' (Brito and Malerba, 2003, 497). Hence, the data are not always presented in a particularly user-friendly fashion, though this is improving.

Pre-2001, the smallest areal unit area collected for analysis in the UK Census was an enumeration district (ED) that consisted of nearly 200 households which made practical use of the data difficult (Leventhal, 2003). However, the Census of 2001 developed Output Areas (OAs), which, while largely similar to EDs, consisted of only c.100-125 households. In addition, the 2001 Census data is freely available and contains useful geodemographic information such as representations of social grades: the National Statistics Socioeconomic Classification (NS-SeC) (Sleight, 2004).

For retailers seeking to forecast small neighbourhood stores there are a range of Census data that can be extremely useful. There is scope for catchment analysis with the use of Census Area Statistics (CAS) – a collection of approximately 7,000 counts for each Output Area which are the data that inform commercial geodemographic classifications such as ACORN and MOSAIC (Leventhal, 2003). For the ambitious, statistically competent analyst, this provides the opportunity to create one's own complex picture of store catchments (as detailed in Sleight, 2004).

The Census is not the only data upon which forecasting and neighbourhood retail decision-making can be based – other potentially useful sources of information include:

- Local workforce information (e.g. Blue Sheep)
- Footfall data in town/city centres (e.g. CACI)
- Population (e.g. Census data)
- Population classifications (e.g. MOSAIC; Personcix and ACORN)
- Where people live in relation to where they work (Census Travel to Work Area data)
- Food expenditure (e.g. Expenditure & Food Survey [EFS])
- Traffic flow data (e.g. Capita Symonds; Morgan Tucker Associates)
- Datasets on the location of schools, Post Offices etc (e.g. Landmark Information Group)

The importance of these data in forecasting will often be specific to the site in question. Clearly sites in city centres will require good quality data on workers and footfall data but these may be redundant when forecasting potential units in small district centres in residential developments, where the proximity of other amenities becomes more important.

A PRACTICAL FRAMEWORK FOR NEIGHBOURHOOD STORE FORECASTING

If, as Clarke and Bennison (1997, 62) suggest, we examine the 'environment of locational decision-making' it quickly becomes clear that the budgets of neighbourhood retailers do not typically facilitate high levels of investment in store location research. Hence, in this section, we suggest a broad framework formalising convenience store location planning for a smaller retailer lacking established in-house expertise – to move beyond the use of experience and intuition as the only decision-making tools (cf. Hernandez and Bennison, 2000). This model (**figure 1**) is targeted at a retailer that is likely to have a limited portfolio of stores at present but has not historically appraised store sites in any depth; instead adopting what Tesco founder, Jack Cohen

always considered 'gut instinct' (Bevan, 2005, p 56). It is not so much the size of the portfolio that is important (though smaller networks will limit the degree of statistical analysis that can be conducted on analogous stores) as the degree of expertise (or lack of it) that is currently employed. Larger operators, particularly the established food multiples that have recently entered the sector, will have more sophisticated methods and tailored data sets that can be utilised but are beyond the remit of this paper.

We start with the decision as to whether location planning is to be focused on incremental site-by-site assessment or alternatively a holistic strategic review of store expansion. If the latter approach is required, it is likely that building in-house expertise will be difficult, lengthy and prohibitively expensive. This is not the focus of this paper. Given the scale and complexity of such a task, it is logical to outsource to location agencies that are well versed in the basic approaches and the use of appropriate data. However, over this period, it is essential that the consultant regards the boundaries of the firm as permeable - they must not operate as an 'outsider' but more as an 'insider' whereby the transfer of knowledge is encouraged and internal expertise fostered with the ultimate goal of the retailer taking site appraisal "in-house" (cf. Kitay and Wright, 2004). If, on the other hand, the c-store retailer wishes to improve its site selection on an incremental, site-by-site basis then there are some low-tech approaches that the retailer can trial without outside consultancy assistance. It is these that make up the focus of the rest of the paper.

XX FIGURE 1 ABOUT HERE XX

In forecasting and advising on new site development it is crucial that the location analyst is situated outside of the property department in order to gain an independent perspective rather than from within an environment where bonuses are related to store development.

The data purchase decision

While this analysis has underlined that the key to success in c-store site evaluation is the site visit and understanding the nuances of the local catchment essentially "on the ground", it has also repeatedly underlined that data are also key to decision making. The evaluation of whether

and which geodemographic data to purchase is largely determined by the in-house statistical ability to manipulate the Census data; the budget of the retailer; the "type" of catchments in which it is locating; and the scale of the plans for store development. If the choice is made to acquire external data such as ACORN, MOSAIC, traffic flow or footfall, it is essential that the retailer is clear what it is going to get and how this will benefit forecasting in excess of Census data. Since this is potentially expensive, it is essential that the researcher gains a good understanding both of the potential benefits and the costs via a dialogue with the supplying agency.

Basic site evaluation techniques on the site visit

Over and above all factors, it is essential that the proposed model of forecasting and decision making is straightforward to implement – not least given the likely lack of operational research knowledge within the retailers for which it is designed to appeal. Indeed, simplicity is often key as '(e)xperience has certainly shown that the simpler the model, its development, working and output, the greater the comprehension by retail managers and the easier the acceptance of the model' (Simkin, 1996, p 237).

Furthermore, a key message throughout this paper has been that while statistical models can significantly 'reduce the degree of subjectivity' (Rogers, 2005, 206), the very nature of micro-scale locations means that immediate site quality remains extremely locally variable. As Moutinho et al. (1993) remind us; 'Sophisticated models are not always possible' (p 202), and therefore we need to rely on less quantitative approaches as a thorough site visit becomes essential. This serves to confirm (or dispute) the limited statistical data gathered and interpreted in the office, but far more importantly: the site visit can expose issues that cannot be expressed quantitatively (e.g. access; visibility) and is where intuition and experience becomes important.

a) Checklists and the basic use of analogous stores

An elementary approach to site forecasting that is employed by two thirds of retailers is the so-called "checklist", which is an attempt to systematically assess the relative value of a site

compared to other potential sites in the area (Hernández and Bennison, 2000). In essence it involves the analyst judging the factors that are critical to site success and 'provides a systematic procedure for evaluating information on a potential site' (Craig and Ghosh, 1984, p 20) that can go beyond general, aggregate information about the socioeconomic, competitive and demographic composition of the area to very site specific factors 'such as traffic count, parking facilities, ease of access and aggress, and visibility' (ibid, p 20) to name only a few.

In its simplest form the checklist can act as a good screening tool but is less able to predict turnover (Clarkson et al., 1996). However, the basic checklist can be further developed to emphasise or attach 'some variable points rating' to factors specific to success in convenience store retailing (Hernández and Bennison, 2000, p 360). For example, the use of a weighted checklist on a site visit, coupled with a review of available data, may reveal a need to adjust the forecast sales owing to localised issues such as a high degree of "workers" in the immediate catchment or the proximity of small but convenient car park. Indeed, when approaching neighbourhood store forecasting, it is essential to recognise the wide variety of formats and locations for stores within the sector (see **Table 4**). While this variability in "type" of store may make forecasting more difficult, it also provides an opportunity for operators to more accurately understand what drives success in different locations and with different customers. This requires a thorough analysis of the current portfolio to 'identify those variables that best explain the differences between pre-selected groups of stores' allowing new sites to be 'allocated to the appropriate store turnover group, and the sales range' (Mendes and Themido, 2004, 8). Clearly this is dependent on a wide ranging portfolio, but potentially different degrees of importance can be attached to different factors and therefore weighted differently in the checklists.

XX TABLE 4 ABOUT HERE XX

b) ***Basic catchment analysis and the "sense check"***

While data generated based on analogous stores provide a framework for tailoring turnover estimates, or may ultimately provide the basis for a simple statistical forecasting model, it is advisable to interrogate the Census, geodemographic, site and competition data in the catchment independently. This will indicate the approximate available expenditure within the catchment upon which assumptions can be made about market penetrations – much as detailed in Applebaum (1966). This is essentially a "sense check" or, what Moutinho et al. (1993) regard as a 'rule of thumb procedure' (p 202). Analysts should question: What is the average assumed expenditure per household? How is this compared to other analogue stores with similar competition? This can serve to provide confidence in the analysis or alternatively ring alarm bells and warrant further analysis.

More advanced site evaluation techniques: The value of regression modelling

As more information is collected either from customer spotting surveys, EPOS data, or catchment data, statistical relationships to sales levels can be explored. Even if the retailer is particularly "data poor" then simple customer surveys can be an insightful starting point (Bowlby et al., 1985b) – even experienced superstore operators struggle to make their loyalty card data usable at small stores with low usage penetrations for small basket sizes. With analysis, different drivers and brakes on performance will be found for different classifications of location. For example, when looking at a site likely to be classified as a "strategic high traffic flow" store, it is essential that the analyst has data on traffic through the day that s/he can compare to similar analogous stores to better calibrate regression models for this particular "type" of location.

Such an approach of dividing the store estate into analogous groups and determining like trends and drivers has a long standing academic background that can be further developed to identify quantitative relationships and ultimately basic forecasting models. Ross Davies, in a classic series of papers (notably 1973; 1977), makes a convincing case for the use of factor analysis and principal component analysis in the generation of store typologies upon which further statistical

relationships can be based. Similarly Rogers and Green (1979) make the argument for 'analog groupings' - by identifying and measuring the variables that distinguish groups, analysts can identify relationships and ultimately develop multiple regression models to better inform the forecasting process (see also Bowlby et al., 1985a; 1985b). However, again, this is dependent on individual analyst's quantitative ability and its' impact is likely to be ultimately limited by the idiosyncratic nature of the unquantifiable micro-scale factors that were extensively discussed earlier.

Using such approaches is dependent on a wide ranging portfolio of stores at present – if this is not the case, such techniques should not be employed. Neither should the amount of work involved in this should not be under-estimated. Small retailers are not always aware of all of their sales areas; let alone the sales densities, and as such, it is essential that store location decision-makers 'make managers aware of data requirements; detail the burden and necessity of data collection; [and] emphasize continually the importance of the "right" information' (Simkin, 1993, p 237).

Determining affordability

The forecast sales figure should be used to determine a "bid ceiling" in the event of a site or rental auction against competing retailers. This involves the estimation of the value of the site to the retailer if developed over a long period, when the store has matured, and hence the return on investment that can be realised with different degrees of site cost/rental. Greater confidence regarding affordability becomes more important with increased competition for good sites.

Post opening accuracy assessments

This paper has repeatedly underlined the limitations of modelling of small scale retail phenomena and therefore the learning process that is necessary in store forecasting. Correspondingly, it is therefore essential that the forecasting process does not end with the issue of a sales estimate but the performance is tracked through opening and reassessed after approximately 10-15 weeks - essentially 'follow-up research to check the degree of accuracy of the original sales estimates against actual realized sales' (Applebaum, 1965, p 236). Such work

is crucial in generating future learnings within the forecast process but also essential for understanding the store's over or under-performance which can inform any further marketing activity.

CONCLUSIONS

This study of the changing nature of neighbourhood retailing and its' implications for the science of location management leads to a number of conclusions: First, forecasting convenience stores sees the traditional techniques of market analysis for large scale food stores become largely redundant – an issue currently under-emphasised in the retail site selection literature. However, as organic growth in the superstore sector slows and major retailers continue to turn their attention to developing small stores less constrained by retail regulation, it is likely that neighbourhood store location techniques will become more sophisticated. This places an onus on smaller convenience operators to improve their approaches: it will no longer be sufficient to rely on experience and intuition. Meanwhile, the de facto challenge for academics is to become involved in generating innovative solutions to location problems –as occurred with the emergence of the food superstore decades ago.

Second, this study underlines that there is no single approach or technique that is likely to provide a universal solution to forecasting convenience stores. Instead, neighbourhood retailers are likely to manage their location decision-making by incremental steps – using 'experience as a way to discover good solutions to complex problems' (Lounamaa and March, 1987, 121). As Ireland and Miller (2004, 8) suggest, 'decision-making requires constant refinement of knowledge gained from executing decision-making processes' as experience informs understanding and gradually the competency of small store forecasting develops.

Third, for those who study location management c-store forecasting represents a move into uncharted waters; beyond the "comfort zone" of superstore retailing within which analysts can rely on 'a number of structured frameworks and tools' to 'reduce the uncertainty and ambiguity surrounding strategic decisions' (Ireland and Miller, 2004, 9). In contrast, forecasting small stores is not as data intensive as local factors have to be increasingly considered – trends that are

challenging to extract from current commercially available data. More broadly, it is appropriate to recount Rogers' (2005, 205) statement that; 'Despite attractive coloured maps and apparently seamless data integration, retailers need to constantly question and probe underlying data'. The requirements of convenience store forecasting inevitably leads to a "back to basics" approach to market analysis, meaning that the "classic factors" of location analysis are again emphasised largely due to a lack of core modelling support.

Fourth, given the paucity of appropriate micro scale data or established competence in neighbourhood forecasting, it is inevitable that the application of part-intuitive forecast experience to new sites will continue to be necessary. However, we are conscious not to over-develop this non quantifiable aspect. It is not, what Sadler-Smith and Shefty (2004) may regard as 'gut feel'; but instead where site location analysts seek to combine available data and their intuitive view based in large part on knowledge of comparable stores. We agree that 'retailers' judgment is still underplayed in existing normative models' (Clarke, 2003, 177) and adopting decision-making in the absence of high levels of quantitative data is challenging; but it is the use of site visits in combination with more quantitative techniques that will provide the most effective solutions.

Finally, as Lounamaa and March (1987, 121) commented nearly twenty years ago: a 'central dilemma in modern organization theory and operations research is the mismatch between the analytical capabilities of human institutions and the complexity of the environment in which they function'. It is the reconciliation between these two processes that is the key to effective site research decision-making: it is hoped that this article represents a starting point for increasing sophistication in neighbourhood store retail forecasting which remains vastly under-developed.

NOTES

[i] Scotland, Wales and Northern Ireland have slightly different planning legislation but the effect has largely been consistent in stunting large out-of-centre store development.

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Figures and tables

Table 1: Convenience Retail Sector Sales 2001-2004 (Actual Change)

Segment	Sales £m 2001	Share 2001	Sales £m 2002	Share 2002	Sales £m 2003	Share 2003	Sales £m 2004	Share 2004	Change 2003-4
Not affiliated independents	8,771	44.8%	8,748	42.5%	8,696	40.5%	7,644	33.2%	-12.1%
Total symbols	4,234	21.6%	4,628	22.5%	5,223	24.3%	7,221	31.4%	+38.3%
Total forecourts	3,267	16.7%	3,611	17.5%	3,618	16.9%	3,630	15.8%	+0.3%
Convenience multiples	2,271	11.6%	2,458	11.9%	1,992	9.3%	2,255	9.8%	+13.2%
Co-operatives	1,031	5.3%	1,162	5.6%	1,928	9.0%	2,273	9.9%	+17.9%
Total Convenience	19,574	100.0%	20,606	100.0%	21,456	100.0%	23,023	100.0%	+7.3%

NB Fascia stores are included in "symbols"
NB: Stores under fascias ie. Best-In, Day Today, Lifestyle/Scandia and Premier, account for approx £1.6bn sales per year.
Source: IGD (2004, p 33)

Table 2: The difference between forecasting neighbourhood and superstores

Superstores/Hypermarkets	Neighbourhood
Likely a large retailer – large budget for store location decision.	Likely a small retailer – minimal budget for store location decision.
Data rich.	Data poor. Poor micro-scale accuracy to data.
Use of geo-demographic and customer behavioural surveys aids understanding of current shopping patterns.	Data on primary shopping missions largely redundant. Care required using neighbourhood data as often aggregated over 100-200 households.
Detailed understanding of customer preferences, motivations and shopping patterns.	Very limited understanding of customer preferences, motivations and shopping patterns.
Loyalty card data aids in understanding customers.	Unlikely to have the scale or technology for loyalty card introduction. If using loyalty cards; penetration levels may not be high enough to extract meaningful patterns. Customer surveys necessary.
Gravity model.	Regression model at best. Overwhelming emphasis on site visits.
Decision-making complemented by market penetration analysis based on food spend statistics.	Market penetration analysis less appropriate for c-stores as commonly only the "secondary shop".
Overwhelming reliance on car borne trade.	Reliance on local residential catchment.
Catchment analysis to 15-30 minute "drivetime".	Drivetime catchment analysis largely redundant. Possibly resort to "walk times" depending on size of unit & data availability.

Table 3: Analysis levels in submissions to the Competition Commission, 2005

Store type		Location	Drive time limit
Convenience	Less than ~ 3000 sqft	Urban	1 mile radius
Convenience	Less than ~ 3000 sqft	Rural	1 mile radius
Mid-range	~ 3000 sqft to ~ 15000 sq ft	Urban	5 minutes
Mid-range	~ 3000 sqft to ~ 15000 sq ft	Rural	10 minutes
One-stop	~ 15000 sq ft or larger	Urban	10 minutes
One-stop	~ 15000 sq ft or larger	Rural	15 minutes

Source: Geobusiness Solutions (2005), 2

Figure 1: A suggested "low tech" decision-making process for a convenience store operator seeking to pay greater attention to store location strategy

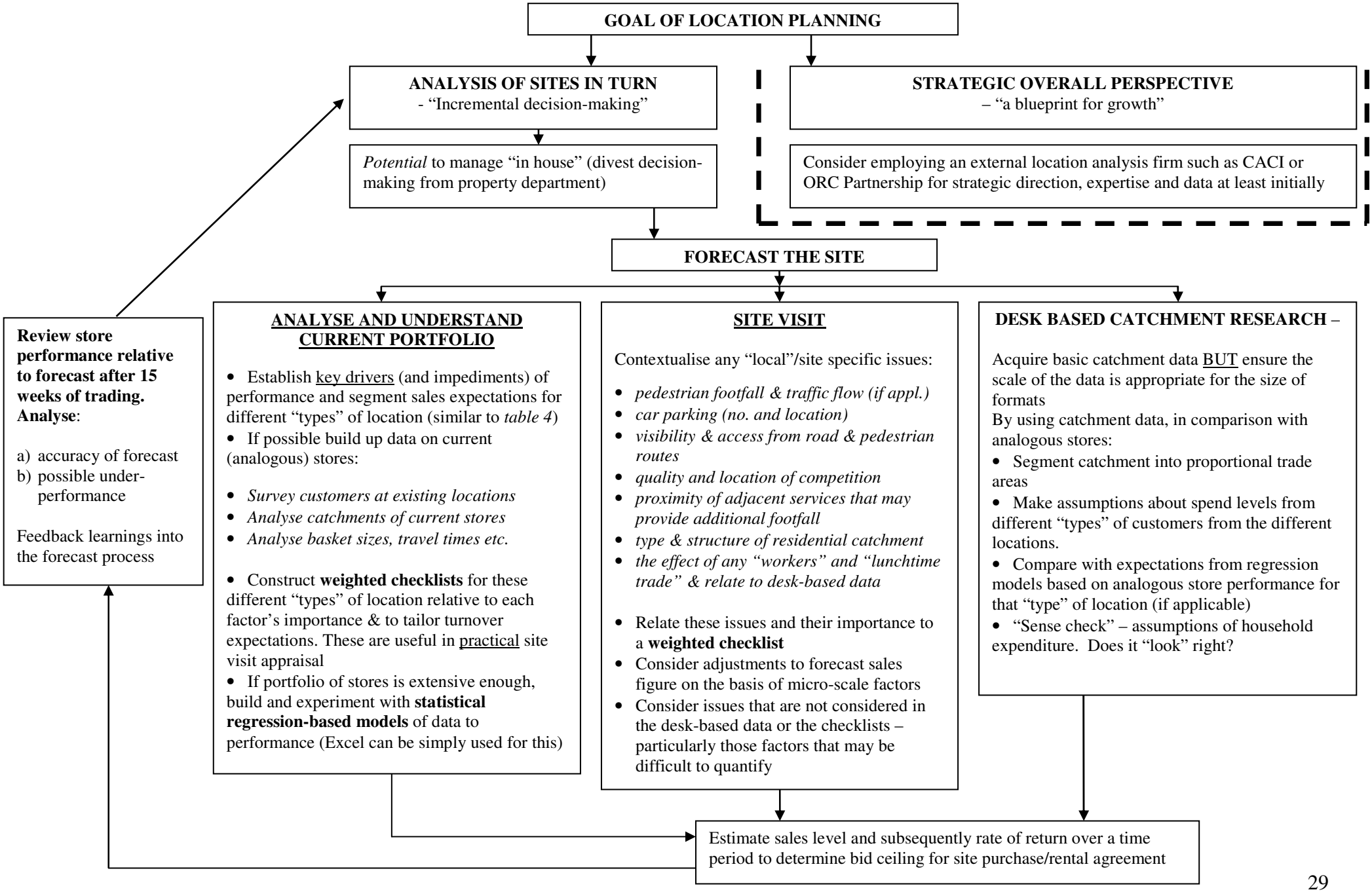

Table 4: Generic typology of convenience store locations and understanding different trade "drivers" and customer "types"

	Residential/Neighbourhood locations	Central locations	High traffic flow/Petrol filling station kiosk
Location	Local residential catchment. Likely poor visibility due to location in housing area. Minimal "passing" traffic flow	High street and city centres off high traffic flow/footfall in central locations. High competition with city/town centre superstores. Convenience factor important resulting in "pitch" becoming essential to performance	Well located on road network. Not necessarily adjacent to residential catchment. Likely low footfall
Catchment	Constrained as residential and lack of footfall or traffic flow. However, within restricted catchment, high market shares may be possible	Extensive as located in an established centre but market shares are likely to be low due to competition	Larger neighbourhood catchment due to strategic location on the road network. Places an emphasis on ability to park even if not purchasing fuel
Customer & mission	Families and singles on top-up, distress missions. Some single households' "full shop"	Workers and shoppers often for specific products (e.g. lunch/snacking) but also top up	Passing trade, top-up, distress missions. Possible meal solutions.
Accessibility	Car and foot – parking important and expected	Foot – site unlikely to have dedicated car park. Reliance on town centre car parks and spend from workers in the area	Car – Small car park a bonus and not expected