Freight Consolidation Centre Study



Executive Summary

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Common terms used within this report

Consolidation	Consolidation, in the context of freight transport, refers to the reduction in the number of vehicles operating with only part full loads. This is achieved by combining loads bound for the same or similar location for at least part of the journey.
Economies of scale	Economies of scale refers to the decreased per unit cost as output increases. More clearly, the fixed overhead costs are spread over an increasing number of throughput pallets, and therefore, the marginal cost of handling additional pallets is less.
Final mile	The 'final mile' is a freight industry term used to describe the more expensive urban leg of a journey from the point the vehicle has left the trunk road network.
Mandatory participation	Mandatory participation, by whatever means, results in scenarios where all deliveries to the target location pass through the consolidation centre. This results in levels of throughput and FCC vehicles that have not been seen to date in relation to FCCs in the UK.
Pallet equivalent	This report uses the phrase 'pallet equivalent' as a unit measure of freight space for both trucks and warehousing. The specific measurement being used is a Standard Pallet which equals 120cm*100cm in size. Retail freight is typically transferred in units such as cages, rails (clothes) and boxes. The study translates these units into pallet equivalents for ease of reference. Construction freight is considerably more varied with larger prefabricated items being delivered as well as smaller boxes, pallets and tools.
Study boundary	Modelled values for mileage and emissions are assumed to be within the urban area in question, with the exception of CO_2 emissions which are considered in a life-cycle perspective, irrespective of location.

1 INTRODUCTION

Freight Consolidation Centres (FCCs) are distribution centres, situated close to a town centre, shopping centre or construction sites, at which part loads are consolidated and from which a lower number of consolidated loads are delivered to the target area. They are increasingly proposed in local authority strategic plans and industry trade publications as a tool to help achieve improvements in local air quality and greater efficiency through the optimisation of land use, faster deliveries and in the case of the construction industry reduced material and time wastage.

The Department for Transport commissioned this research to investigate the use of FCCs, including the potential costs and benefits to industry and Local Authorities, to report on appropriate uses for these Centres and to identify the issues that should be considered by anyone wishing to implement such a scheme.

The FCC concept has been introduced in the UK through a small number of high profile sites over the previous decade – Heathrow, Bristol Broadmead, Sheffield Meadowhall and the London Construction Consolidation Centre.

FCCs can benefit society and local authorities by reducing within the 'final mile' of deliveries:

- Emissions affecting air quality (reducing PM and NOx by up to 100% for affected deliveries[1])
- CO_2 emissions (by up to 55%)
- Traffic congestion (up to £2m per FCC modelled in social benefit gains over 5 years)
- Conflict between road users

FCCs can also benefit wider business interests by:

- Maximising retail space and store staff (Up to 20% space expansion)
- Reducing the delivery cost of 'the final mile' (commercial sensitivities mean that this is reported anecdotally rather than quantifiably)
- Increasing the delivery window, generating opportunity for efficiencies in the distribution chain
- Meeting corporate social responsibility targets
- For construction, helping to manage site congestion

The focus of this study was on the use of FCCs within the retail and construction sectors which is where industry experience and operational data lies. The concept could however also be applied to other sectors such as non-retail commercial premises (e.g. business parks) and light industry (industrial estates).

2 SUMMARY OF FINDINGS

This research studied a range of FCC scenarios, these variations included:

- An FCC serving a large scale construction site
- Retail FCCs serving either a shopping centre or a town centre
- Whether the use of an FCC is mandated or not

[1] Highest potential savings based on the use of electric vehicles

- Whether the FCC is a dedicated facility or part of a shared distribution centre
- Alternate delivery vehicles including an electric vehicle option

The costs and benefits vary depending on how FCCs are implemented. These variations can be seen in detail within the main report.

Logistics industry view

There is a wide spectrum of views within the logistics and distribution industry on the benefits or otherwise of retail and construction consolidation centres. Generally the industry figures consulted were supportive of the FCC concept. Construction consolidation centres in particular are broadly perceived as viable self funding ventures when managed well. However, the following qualifications were made:

- FCCs need economies of scale to work but recruiting retailers into a scheme is a long process.
- The business case for each retailer to participate is different, as each has different supply chain characteristics
- Providing incentives to retailers would benefit participation rates
- Industry believes schemes need to be voluntary to allow retailers to decide what is best for them
- A clear need for an FCC should be demonstrated to persuade interested parties to participate
- Aspirations and support for FCC success should be defined from the outset
- For retailers with supply chains which are already highly consolidated, operating efficient urban deliveries and using Just In Time methods (e.g. supermarkets), FCCs have a negative impact.
- It would be important to ensure participation of local and national retail associations
- A primary benefit of using FCCs for construction is the enforcement of best practise logistics techniques within an industry that has yet to fully adopt them

Industry considerations

If an FCC is to operate on a commercial basis, it needs to achieve a significant level of throughput. Operators need to anticipate the need for investment to cover shortfalls in operating costs, particularly during the start up period before the potential business-as-usual levels of throughput are reached.

For the retail sector, the optimum level of retailer participation is between 40-60%; however this does not apply to retailers such as supermarkets who already receive highly consolidated deliveries.

The graphs below give an indication for one scenario as to what the pallet rate charged to retailers may need to be to cover the operational costs of the centre at varying levels of throughput. The graph assumes a standard pallet rate is charged, which in practice may be variable and based on weight/value of goods/demand.

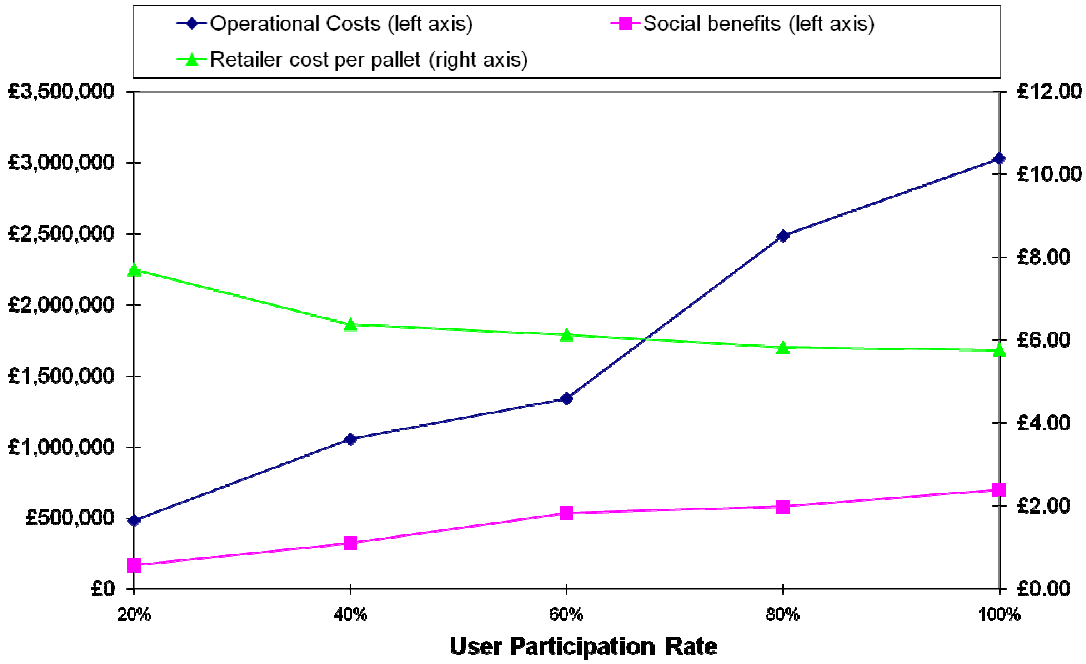


Figure 1 Analysis of annual operational costs, social benefits and the residual financial cost per pallet required for a Shopping Centre FCC using a shared facility and 17.5 tonne vehicles

The study identified significant operational cost savings where there was a shared site and staff for the location of both retail and construction FCCs.

For the construction industry an FCC will also provide savings from reducing overspend on materials. Anecdotal evidence suggests a typical large build can spend upwards of 10% of total construction budget on the stock surplus to cover against theft and damages.

Local authority considerations

For local authorities and industry to decide if an FCC is appropriate, they need to collect accurate data at the outset, in order to have a full evidence base on which an informed assessment can be made. See the FCC decision trees in the main report for an outline of the types of data needed and questions to be asked.

The report has identified a series of potential local policy measures which have been rated by some of the interested parties during the consultation phase as being of benefit to the demand levels of an FCC.

Simple measures (easy to implement in the short term):

- Stronger enforcement of existing parking and/or delivery restrictions
- Insist on the provision of Construction Logistics Plans as a planning requirement for large scale developments

Medium difficulty measures (requiring investment and/or political will):

- Tightening of delivery time windows for non-FCC vehicles or vehicles that do not meet a certain environmental standard
- Allowing a wider window for deliveries by FCC vehicles or vehicles that do meet a certain environmental standard

- Mandating the use or provision of an FCC for new developments (using section 106 agreements)
- Mandating certain environmental vehicle categories/classifications for delivery to site
- Providing financial incentives to the FCC operator
- Providing financial incentives (e.g. reduced business rates) to retailers

Difficult measures (costly and potentially needing national policy support):

- Providing better access for FCC vehicles via bus lanes, bus gates, road charging rates etc
- Mandating use of an FCC for existing retail areas
- Providing land or facility for the operation of an FCC

LAs may want to consider complementary or alternative freight policy measures which may deliver similar benefits for less cost and risk than FCCs: for example establishing a Freight Quality Partnership with local businesses, if this does not already exist; exploring the potential for quiet overnight deliveries; or promoting Delivery and Service Plans.

Social benefits

In all cases for all scenarios the introduction of a FCC is likely, on the evidence analysed, to bring benefits for the wider society. These mainly arise from reductions in congestion, from carbon dioxide reductions and from improvements in road safety.

- If implementing an FCC for a retail centre the greatest social benefits would arise from using 17T diesel or urban articulated lorries as this brings the greatest reduction in urban vehicle mileage.

- The overall benefits are lower for a construction FCC than for the other types because the centre is commonly used for the duration of the build only, and the overall delivery mileage is substantially less than in the retail scenarios studied.

3 CONCLUSION

Based on experience to date, there clearly can be potential benefits to the retail sector, the construction industry, local authorities and wider society from the appropriate use of Freight Consolidation Centres. This report should help to inform key decision makers both in industry and in local Government interested in exploring the scope for benefits to their area.

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