

Business Case Support for the Implementation of a Clean Air Zone in Southampton

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1 Appreciation of the Brief

Southampton's Air Quality Strategy includes, among other measures, the implementation of a chargeable Clean Air Zone (CAZ) by 2020. As part of this strategy, Southampton City Council plan to work with local businesses and organisations to promote the uptake of low emission vehicle technology and to encourage sustainable working practices.

Implementation of a CAZ seeks to discourage the most polluting vehicles from entering the most polluted areas through charges. Southampton's CAZ was initially implemented in 2017 on a non-charging basis. Charges will start to be introduced in 2019, with an aim of reducing emissions rather than raising revenue. The extent of the charging CAZ in Southampton and the vehicle liability is currently under review.

There is a recognition that businesses will need to be supported in the move to low emission vehicles, in terms of expert advice and also potentially through a financial subsidy. Southampton City Council (SCC) have asked TRL to provide a summary of the advice available, the benefits of these schemes, and how they could be implemented in the Southampton area, in order to contribute to the outline business case for the CAZ. This document outlines the recommended approach.

2 Freight Consolidation – the need for support

2.1 Air Quality in the UK

Total emission levels of the main air pollutants in the UK have shown a long-term decreasing trend for the past two decades, as can be seen in Figure 1 below. However, exposure to NOx levels is currently resulting in approximately 23,500 deaths per year associated with respiratory diseases, and greenhouse gas (GHG) emissions remain a significant concern.

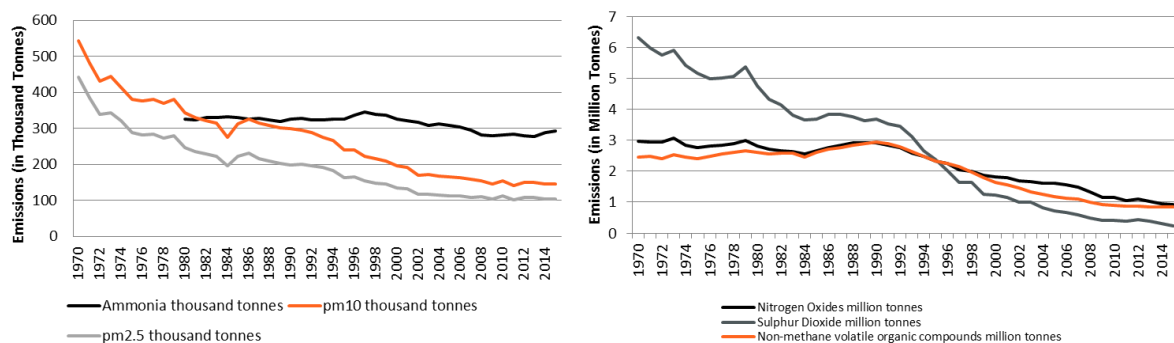


Figure 1: UK Emission Trends

Source: Ricardo Energy & Environment (2015)¹

The major sources of air pollution in the UK are energy supply, transport, business, residential (e.g. heaters, aerosols, municipal solid waste, etc.), agriculture, waste

¹ Accessed from <http://www.defra.gov.uk/statistics/environment/air-quality/>

management, industrial process, public and land use change. Amongst these, energy supply (28%) and transport (23%) are the major contributors of emissions, especially regarding GHGs.

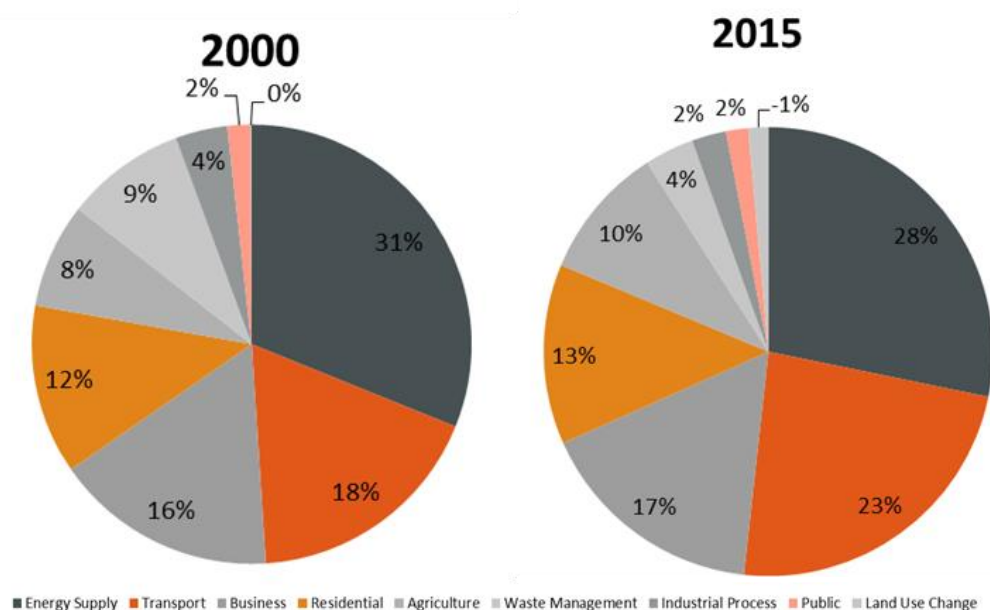


Figure 2: Greenhouse gas emissions by sector²

Road transport is the largest single source of NO_x in the UK contributing 34% in 2015³. When looking at particulate matter, road transport is the third largest source, contributing 14% of PM₁₀ and 13% of PM_{2.5} in 2015. Diesel vehicles are a key contributor.

Exhaust emissions can have particularly adverse effects on the elderly and vulnerable. In serious cases air pollution can result in premature deaths.

2.2 Application of Clean Air Zones (CAZs)

A Clean Air Zone as defined by Department for Transport (DfT) is a geographic area where specific actions are taken by local authorities to:

- improve air quality, addressing all sources of pollution, including NO_x, particulate matter, and
- prioritise and coordinate resources in order to structure urban environment such that they promote health benefits and economic growth^{4,5}.

² UK's GHG Inventory by source, excluding international aviation and shipping, accessed from https://uk-air.defra.gov.uk/assets/.../1706130905_DA_GHGI_1990-2015_v02-02.xlsx

³ National Atmospheric Emissions Inventory, 2013 accessed from http://naei.beis.gov.uk/overview/pollutants?pollutant_id=6

⁴ DfT (2017) Clean Air Zone Framework Principles for Setting up Clean Air Zones in England Department for Transport UK

CAZs may or may not include charging zones, depending on the local authorities that will implement them. In a charging CAZ, the drivers will be charged a fee to enter the area if their vehicles fail to meet the minimum set of environmental standards. According to a study by DfT, charging CAZs, if considered feasible, can help in bringing forward compliance to the scheme by drivers⁵.

2.3 Impact on industry - the case for consolidation

CAZs currently often include limiting the type of large vehicles (buses, coaches and HGVs) to Euro VI standards. However, if implemented too quickly, this can impose significant costs to businesses and consumers negatively impacting the local economy. According to a study published by RHA, the fleet of modern Euro V vehicles is forecast to be substantial until well after 2020⁷. Replacing this fleet in a short time period will pose big financial risks to businesses, especially small operators, who risk being phased out in the process.

According to a report by the London Assembly Transport Committee, smaller operators are most impacted by various charging zones (such as London's Congestion Charge zone, Low Emission Zone, Ultra-low emission zones, or Dartford crossing)⁸. The report also highlighted a Congestion Charge survey (2014) carried out for the Federation of Small Businesses, which found that such charging zones have disproportionate impacts on smaller businesses, who are already operating on tight margins which, if not acted upon, may force these operators out of London or out of business altogether due to increased operational costs.

Freight in the City have reported the concerns of trade associations for HGV fleets and small business impacted by charging zones, citing Defra's impact assessment study which stated that financial impacts would be significant for smaller HGV operations or small operators as measures requiring them to upgrade their vehicles will have a major impact on their costs⁹. Transport is usually the second highest operating cost component after wages. The charges and emission standards imposed will significantly increase these costs and therefore pose additional burden on these small operators, many of whom already operate on tight financial margins.

However, the costs and barriers created by CAZs can be overcome with the implementation of sustainable freight initiatives such as urban consolidation centres. For example, Regent Street Consolidation Centre in London provides a means for small operators to overcome vehicle restrictions imposed due to the Congestion Charge zone, whereby stock from each

⁵ DfT (2017) Clean Air Zone Framework Principles for setting up Clean Air Zones in England Department for Transport the UK

⁶ DfT (2017) UK Plan for tackling roadside nitrogen dioxide concentrations Department for Transport

⁷ RHA (2017) Policy Paper Accommodating freight in Clean Air Zones Road Haulage Association the UK

⁸ https://www.london.gov.uk/sites/default/files/organisational_submissions_to_congestion_investigation.pdf accessed on 14th June, 2018

⁹ <http://freightinthecity.com/2016/10/complying-with-clean-air-zones-will-hit-smaller-hgv-and-van-fleets-hardest/> accessed on 14th June, 2018

supplier delivered to a consolidation centre outside the congestion charging zone and is subsequently transferred to retailers via smaller electric vehicles or bikes¹⁰.

A further example of successful urban consolidation is provided by Bristol Consolidation Centre. Situated north-west of Bristol, it serves more than 300 retailers and was implemented to reduce freight based congestion in the city centre. The centre achieved a 75% reduction in delivery vehicle movements, thereby saving 20.3 tonnes of CO₂, 660kg NO_x and 19.7kg of PM₁₀ 3 years after its inception in 2004.

2.4 Freight Consolidation Centres

The basic premise of Freight Consolidation Centres (FCCs) is to address the difference in requirements between inter-city and intra-city freight transport. The inter-city freight favours large trucks allowing the cost of fuel and tolls to be shared across larger loads, smaller trucks and vans are considered more appropriate for intra-city distribution, particularly within smaller streets and more congested road networks¹¹.

2.5 Benefits of Consolidation

As indicated by Bailey (2015), the effective utilisation of FCCs can help to:

- overcome vehicle restrictions imposed by regulatory measures, acting as a cross-docking facility to transfer deliveries into smaller and 'greener' unrestricted vehicles;
- facilitate operations with freight vehicles in loading and unloading areas and where customer loading facilities may be over-capacity;
- Improve delivery services to retailers (on-time and to-date);
- reduce the volume of commercial traffic in urban centres; and,
- Provide opportunities for added value services to customers, such as the removal of bulky packaging to increase fill-rates and reduce the generation of waste at the point of delivery.

¹⁰ https://www.clippergroup.co.uk/wp-content/uploads/2016/01/Regent-Street-Consolidation-Case-Study_LR_v2.pdf

¹¹ Bailey G. (2015) Developing Sustainable Supply Chains for Healthcare *faculty of Engineering and the Environment* University of Southampton

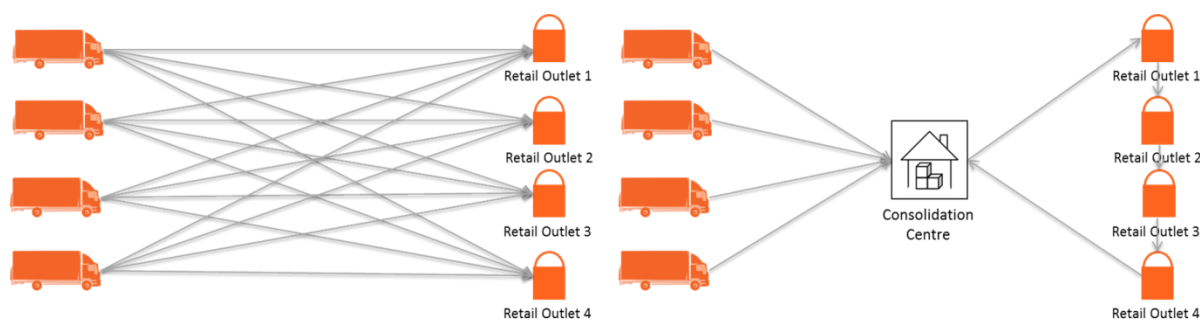


Figure 3: Example of Regent Street Consolidation Centre ¹²

The main activities and benefits of FCCs are summarised in Table 1¹¹:

Table 1: Activities and benefits of FCCs

Activity	Benefit
Consolidation	Consolidation of multiple daily deliveries to reduce requirement of vehicle number and increase fill-rates.
Cross Docking	Delivery of consignments to a FCC to suit supplier’s convenience with onward delivery to the customer as and when goods are needed.
Storage	Reduction of delivery lead times, improved product availability and customer service, through short, medium and long-term storage.
Replenishment	Smaller, more regular deliveries of products for re-stocking throughout the day as opposed to a single larger consignment at one time.
Pre-retailing	Pre-merchandising activities such as unpacking, sorting, labelling, size cubing and markdowns, enabling shops to allocate more retail space to sales rather than stock storage and management.
Returns Management	Consolidating items being returned from customers to suppliers.

2.6 How can we make consolidation centres work?

Even with the noted social and economic benefits, the main barrier for wide scale adoption of consolidation centre is lack of a sustainable business model, especially for local operators and receivers, as they have to bear the additional cost of consolidation^{13,14}.

¹² https://www.clippergroup.co.uk/wp-content/uploads/2016/01/Regent-Street-Consolidation-Case-Study_LR_v2.pdf

Due to negative impacts on supply chains such as increased operating costs, loss of contact between suppliers and customers, and the sub-optimisation of supplier logistics, the majority of FCC schemes are supported either fully or in-part by funding from central, regional and local municipalities, or from the owner of the site, e.g. Amsterdam, Monaco, La Rochelle, Nuremburg and Bristol¹¹. According to Verlinde S et al. (2012), most of the consolidation centres throughout the world rely heavily on government subsidies and shut down when subsidies stop¹³Error! Bookmark not defined.

Most of the international experiences indicate that an initial investment in infrastructure, facilities, human and technical resources (including delivery vehicles) is required, with the most successful examples being supported by financial subsidies. For example, the Bristol Consolidation Centre received 62% of the necessary funds for its operation from local government, and organisational support from public organisations¹⁵.

In order to achieve financial sustainability for an FCC, the two most important factors are scale (the area served by the FCC) and management of urban delivery operations¹³. Economies of scale, coupled with operational efficiencies can have significant impact on time savings, reduce km. per delivery and reduce the number of vehicles relatively, and can lead to additional income being generated and hence reach the break-even point for a consolidation centre.

3 Financial Model for Freight Consolidation Support

The following economic analysis for the Southampton City Sustainable Distribution Centre (SSDC) was undertaken to provide indicative cost estimates for a fictional company (representative of the numerous building / trade / industrial businesses within Southampton) transporting up to 26 United Kingdom (UK) pallets, each measuring 1200 x 1000 mm to the city centre each day, for two models of operation:

1. Transshipment, whereby goods are transferred from the supplier's vehicle to a Euro VI vehicle, using the SSDC only for the unloading, organisation and loading of goods; and,
2. Threshold consolidation, whereby all deliveries of goods to the consolidation centre are held in the consolidation centre until a pre-established time interval or volume of goods is achieved to 'trigger' the delivery of the goods to the end customer, fulfilled by a Euro VI vehicle.

¹³ Kin B. S. Verlinde, TV. Lier C Macharis (2015) Is there life after subsidy for an urban consolidation centre? An investigation of the total costs and benefits of a privately – initiated concept Transportation Research Procedia 12 (2016) 357 - 369

¹⁴ Independent Transport Commission (2017) How can we improve urban freight distribution in the UK? Challenges and Solutions Independent Transport Commission, the UK

¹⁵ Campbell J., L. MacPhail and G. Cornelis (2010) SEStrans (South East Scotland Transport Partnership): Freight Consolidation Centre Study P.b.S. Wilson

The costs for this assessment, shown in Table 2, were provided by the SSDC. It is important to note that the costs provided do not include the costs incurred for receipting, picking, generation of proof of delivery notifications (POD), and goods management.

Table 2: Cost estimates for space and staff time associated with the consolidation of goods at the Southampton City Sustainable Distribution Centre (SSDC) [costs are accurate as at 15/06/2018 and were provided by the SSDC]

Table Space Requirement Costs	£ per sq. m per week	£ per UK Pallet (1.2m x 1m)
Standard Freight	3.23	3.88
Stackable Freight (up to 5 pallets high)	2.15	2.58
'Difficult' Freight	4.31	5.17
Staff Time Costs (£ per minute, per member of staff)	0.3	

'Difficult' freight is defined as goods which are not easily stackable. The costs for the consolidation of goods at the SSDC may be divided into two key categories:

- Space requirements, relating to the amount of space required to temporarily store items for a given period of time (costed in weekly increments); and,
- Staffing requirements (staff time), relating to the staff time required to load / unload, and managed freight within the consolidation centre.

The impacts of each of these two categories on the costs of consolidation for a company are highly variable between each potential model of operation. For example, costs for the transshipment model will likely comprise a higher proportion of staffing requirements associated with the transfer of goods from a supplier's vehicle to a Euro VI vehicle, with low / no- costs associated with space requirements due to the transient nature of the goods; whereas, costs for the threshold consolidation of goods at the SSDC will accrue significant costs related to space requirements (depending on the characteristics of the freight, e.g. standard / stackable / difficult), with a highly variable set of costs associated with the administrative burden related to the receipting, picking and creation of POD documentation.

Whilst the transshipment model may accrue smaller costs for the supplier and improved air quality within Southampton City, it does not address congestion issues. Conversely, the use of the threshold consolidation model delivers air quality and congestion benefits within the city but at a higher cost to the supplier.

Scenario Testing

The following cost analysis has been performed assuming a company delivering 26 UK pallets within a UK compliant curtain-sided trailer measuring 2480mm wide and 13,600mm long.

Transshipment Model

As previously noted, the costs incurred for the transshipment of goods at the SSDC may be highly variable due to the amount of staff time required to transfer the freight from the supplier's vehicle to the onward SSDC vehicle. Since the staff time is costed linearly at a rate of £0.30 per minute, a doubling in staff time required will result in a doubling of the costs accrued.

Whilst the costs associated with the transfer of goods between vehicles at the SSDC is likely to be lower than those associated with the Threshold Consolidation model, since the onward delivery vehicle is being used exclusively by the supplier, the full costs of the onward journey will be accrued by the supplier only. This will likely result in a higher overall cost for consolidation.

Threshold Consolidation Centre Model

As with the transshipment model, the threshold consolidation centre model is affected by the same uncertainties relating to staff time costs incurred. Therefore the staff time cost element is excluded from this analysis. As indicated by the costs in Table 2, the costs associated with freight storage are largely determined by the type of freight being consolidated.

- a. Standard freight is characterised by goods which cannot be stacked within racking, but can be stacked on the floor and stored in an orderly and efficient manner. This type of freight incurs a cost of £3.23 per square metre
- b. Stackable freight refers to goods which can be stored within racking, thereby using the floor space more efficiently. In the scenario given in Figure 4, it has been assumed that 5 pallets can be stored within the same footprint of space when stacked in racking, therefore generating an stepped increase in the associated costs of storage
- c. Difficult freight represents goods which cannot be stacked within racking, and have to be stored on the floor in an inefficient manner thereby occupying a greater area of floor space than standard freight.

It should be noted that the space requirement costs given for each type of freight represent only the space occupied by the freight. An additional cost is applied to each type of freight to allow for SSDC staff to move amongst the freight for access and management of goods.

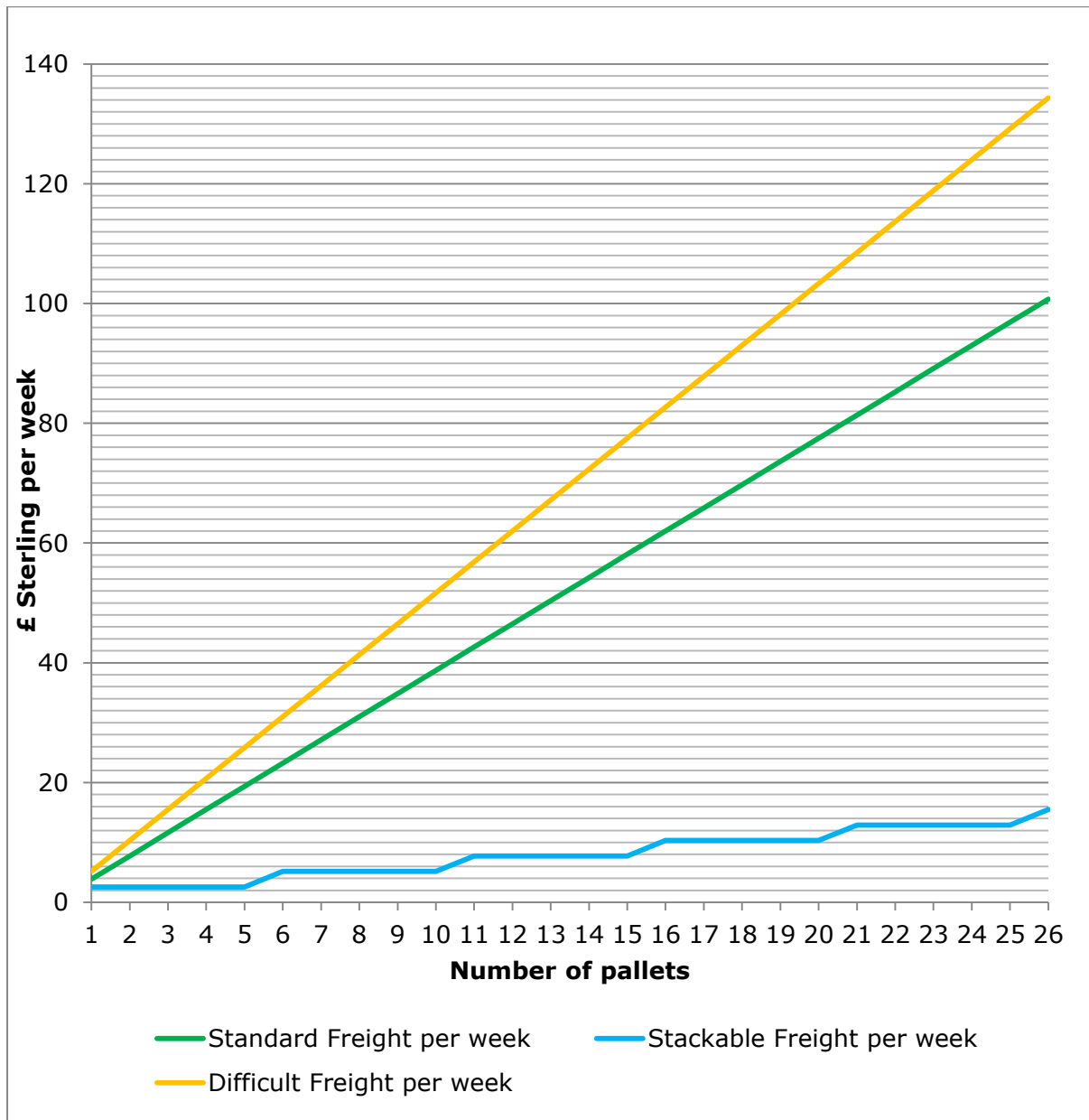


Figure 4: Cost estimates for the storage of goods per week at the Southampton City Sustainable Distribution Centre (SSDC) [costs are accurate as at 15/06/2018 and were provided by the SSDC]

Consolidation of goods by means of the threshold consolidation model, whilst incurring greater costs associated with the storage and management of goods will achieve greater reductions in the costs incurred by suppliers if a critical mass of users is reached, due to the spreading of the costs for storage, staff time and onward deliveries amongst the various users. This critical mass may be aided by the delivery of sustainable freight initiatives to the businesses affected such as delivery and servicing plans and fleet operator recognition schemes.

Southampton City Sustainable Distribution Centre Support

Since the costs for the consolidation of goods by any operation model are highly variable, it would be prudent to consider how Southampton City Council may operate the SSDC for the mitigation of CAZ related impacts on the freight and logistics sector operators.

In the event of a transshipment method of consolidation being implemented, financial subsidy would be best applied to cover, in part or in full, the costs up to an agreed number of onward deliveries per day to make the subscription to consolidation services attractive. However, if a threshold consolidation model is selected, subsidies may need to be structured to cover, in part or in full, the costs associated with the onward deliveries and the storage costs. However, it should be noted the expected total number of onward deliveries for threshold consolidation would likely be lower due to the consolidation of goods within the centre. For both models of consolidation the total benefits yielded by suppliers is dependent upon participation resulting no further requirement to travel inside of the Southampton City CAZ. For this to be achieved, an assessment of their supply chain within the Southampton City CAZ will be required as part of any successful scheme moving forward.

4 Methodology for Supporting Freight Consolidation – Practical Measures

There are two main interventions identified that can contribute to the reduction of emissions within urban centres. These are the implementation of Delivery and Servicing Plans (DSPs) and the ECO Stars Fleet Recognition Scheme (ECO Stars). Both of these interventions share the characteristics of making changes to transport and logistics management behaviour, utilising existing technologies to better effect and, if possible, utilising new, cleaner technology.

Both interventions have provenance and credibility, backed up by case studies across the UK and, in some cases, Europe. Both need financial support to implement as businesses will not necessarily take up the initiatives to adopt the interventions without resource and expertise support.

4.1 Delivery Service Plans

A DSP aims to identify economic, operational and environmental efficiency opportunities for businesses, related to their freight and servicing activities, that will challenge several of the business operating procedures for the receipt of physical supplies and services in their location. A DSP can take several forms:

- A single occupancy building
- A multiple occupancy building
- A business area, zone or district.

A DSP will:

- Identify the areas of a business which generate significant amounts of delivery and servicing activities to business’ premises
- Assess the economic and environmental efficiency of the inventory management processes (including procurement) and the freight and servicing activities
- Formulate a set of bespoke recommendations and solutions for a business based on the previous two aims. Solutions will be categorized into ‘quick-wins’ and ‘long-term wins’.

A DSP will help participating organisations to:

- Quantify the numbers of delivery and service vehicles visiting their premise by activity type and time
- Manage deliveries and service activity to reduce and re-time trips
- Assesses procurement strategies to evaluate how to reduce / consolidate orders that generate freight movements
- Identify where safe and legal loading can take place
- Use delivery companies who can demonstrate their commitment to environmental (and air quality) best practice
- Save time and money
- Improve safety and reliability
- Reduce the environmental impact of participating organisations
- Cut congestion in the local area

4.1.1 DSP Benefits

DSP benefits can be categorised into three areas as shown in Table 3 below:

Table 3: Benefits of DSPs

Economic	Operational	Environmental
<ul style="list-style-type: none"> • Cost savings • Reduced delivery costs • Fuel savings • Reduced parking enforcement costs 	<ul style="list-style-type: none"> • Efficient use of loading bays • Improved security • Free up time staff • Improved supply chain reliability • Improved waste management • Increased driver/vehicle efficiency 	<ul style="list-style-type: none"> • Reduced congestion • Improved air quality • Improved safety • Improved urban environment • Demonstration of green credentials • Promotes the use of low emission vehicles • Reduced damage to highways infrastructure

4.1.2 DSP Implementation – Methodology

A DSP includes an audit of a businesses' internal procurement and inventory management activities and strategies, and a survey of the resultant freight and servicing vehicle activity at its premises. Following these assessments the information collected is analysed to create a comprehensive overview of the businesses' delivery and servicing activities, and formulate a set of recommendations designed to improve the management of inventory within a business.

DSP implementation

The measures that can be taken to deliver a DSP will be determined by the nature of the organisation or organisations that are participating in the DSP implementation. Broadly, the measures include:

- Procurement:
 - Use as a strategic tool
 - Create employee awareness
 - Reduce the number of suppliers
 - Use of local suppliers
 - Centralised procurement
- Operational Efficiency:
 - Transparent ordering
 - Out of hours delivery
 - Consolidated and rationalised activities.

4.1.3 Southampton Implementation Strategy

The benefits of DSPs have been highlighted in this document from economic, operational and environmental perspectives. However, businesses require resource and expertise support to conduct the audit, assessment, analysis and initial implementation phases of a DSP. In addition, a key element of an implementation strategy would be to present the benefits to potential participants in Southampton to secure initial engagement and adoption.

There are many locations in which a DSP can be implemented, each of which essentially follow a hierarchy of ease for gaining acceptance and implementation. Influencing factors include the size of the DSP, the physical geography and the business profile and, in particular, the number of organisations occupying a target DSP site(s).

It would be beneficial to initially engage with and target those potential DSP sites which are the most likely to progress. Normally this would be a single location that has single organisational occupancy, where the DSP activities can be co-ordinated through one point

of contact and there are reduced conflicts of interest. This is particularly important when reviewing procurement policies with a view to joint procurement activity. In addition, public sector organisations can be more open to initial engagement; which can be of great benefit as many are significant recipients of deliveries and services on their premises.

The suggested strategy for Southampton is as follows:

- Identify candidate geographical areas or zones within the CAZ
- Identify the businesses by premises and activity
- Create a hierarchy of business and premises
- Make direct approaches to selected businesses
- Commence the DSP process with engaged businesses – looking at quick wins in the first year
- During the completion of Year 1 implementation, produce a series of case studies for future promotion of the benefits to other businesses
- During subsequent years target additional businesses and premises, working through the hierarchy

For the purposes of estimating indicative costs for DSPs in Southampton, we have assumed a package of DSPs at £15K per plan. In order to have a significant impact in the local area, we propose carrying out in the region of 10 DSPs per year over a three year implementation cycle. We feel that this is a conservative estimate based on previous experience of delivering DSPs in the local area.

TRL's provision of DSPs can be scaled to reflect the level of detail required or the size of business involved. For an indicative £15K plan, TRL would carry out an internal audit and a one day freight survey to determine inventory strategies. The aim is to expose inefficient practices and identify quick wins, and to promote sustainable freight delivery options, potentially including local consolidation.

A table of factors influencing the hierarchical selection of businesses and premises is given in Table 4 below:

Table 4: Selection of DSP candidate sites

Location of Business	Size of Business	Premises
<ul style="list-style-type: none"> • Core of CAZ • Within CAZ • Periphery of CAZ 	<ul style="list-style-type: none"> • Large single location business • Large organisation with multiple sites • Small or medium organisation single location business • Small or medium business with multiple sites 	<ul style="list-style-type: none"> • Single site single business occupancy • Multiple site single business occupancy • Single site multiple business occupancy • Multiple site multiple business occupancy

4.2 ECO Stars Fleet Recognition Scheme

4.2.1 *Origins*

The ECO Stars Fleet Recognition Scheme has its origins in South Yorkshire, initiated in 2008 and developed by the four local authorities of Barnsley Metropolitan Borough Council (BMBC), Doncaster Metropolitan Borough Council, Rotherham Metropolitan Borough Council and Sheffield City Council, with some additional financial support from NHS Barnsley.

The aim of the scheme was to put in place an effective mechanism to engage and influence the environmental impact of operators of commercial vehicles on local air quality. Such vehicles, utilised by freight, bus and coach operators, had been identified as significant contributors to poor local air quality in the South Yorkshire region.

The development of the Scheme began in the summer of 2008, managed by Transport & Travel Research (TTR, now TRL), and launched in January 2009. Since then, ECO Stars has grown into a programme of 26 fleet schemes (for vans/trucks/buses/coaches) in the UK, a further 2 in Europe, and 5 UK taxi schemes.

A powerful indicator of the success of the Scheme has been the growth in the number of new schemes being launched and by the number of operators participating: the original South Yorkshire Scheme now has 127 operators as members. Across the 26 Schemes there are now over 520 unique members.

ECO Stars has been funded through a variety of channels, including Department for Environment Food & Rural Affairs (Defra) Air Quality Grant, Department for Transport's Local Sustainable Transport Fund (LSTF), Local Transport Plan (LTP) funding, other internal local authority funds, Scottish Government Air Quality Grants and European Commission (EC) match-funding.

The current 26 UK fleet schemes are open to freight operators and service providers operating HGVs and vans, and to Passenger Carrying Vehicle (PCV) operators running buses, coaches and minibuses. The smallest operator has one vehicle and the largest many

hundreds of vehicles. The fleet schemes do not include passenger cars, even if they constitute part of the scheme member's fleet, such as company cars.

4.2.2 *Current Schemes*

Since the launch of ECO Stars in 2008, there has been the development of a network of ECO Stars Schemes in the UK and continental Europe reflecting a diverse set of predominantly urban local authorities, yet all with Air Quality Management Areas (AQMAs) as a common theme. The profile of ECO Stars has particularly grown in the UK with increased interest from City Regions. At present eight of the worst 20 UK cities with the highest annual mean PM₁₀ count have an ECO Stars Scheme.

The Scottish Government's Cleaner Air for Scotland strategy launched in November 2015 included reference to membership of environmental fleet recognition schemes, and continued in 2018/2019 to support ECO Stars across the country as an air quality intervention of choice. It is anticipated that ECO Stars will play a key role in the implementation of Low Emissions Zones in Scotland's four largest cities, starting with Glasgow in 2018.

4.2.3 *How the Scheme is delivered*

At its heart, ECO Stars is a fuel management and operational efficiency support programme, designed to help operators reduce fuel consumption, thereby improving air quality through reducing particulate emissions and vehicle carbon. It also has the added benefit of providing the tools and ongoing support for members to reduce operating costs which makes the Scheme highly attractive and beneficial to the local economy.

All ECO Stars schemes are required to engage with local fleet operators in order to recruit members. Over the nine years that ECO Stars has been delivered, various engagement mechanisms have been tried and tested. Success has been proven to result from a mix of marketing, publicity, direct approach and approach through third party organisations such as trade associations and Chambers of Commerce. Recruitment has been aided significantly with the recent introduction of the new UK ECO Stars website: www.ecostars-uk.com.

The Scheme works on the principle of reviewing operators' vehicles on an individual basis for environmental credentials, including Euro Engine Standard and any additional fuel saving technology and environmental features, such as anti-idling cut-off and in-cab fuel monitoring. All Scheme vehicles are awarded a star rating and these are then aggregated to give the operator's total vehicle star rating.

Applicants also undergo an assessment of their operational fuel management practices. This assessment focuses on the following areas: their fuel management programme, driver skills development regime, vehicle specification and maintenance, use of IT support systems, and targeting and monitoring of performance. The operational practice assessment is then combined with the aggregated vehicle star rating to provide an overall Scheme star rating between 1 star and 5 stars, with 5 stars being the optimum. The Scheme criteria are adaptable to reflect changing environmental and technological standards, and were reviewed during 2018 to take into account the introduction of the Euro VI engine standard and alternative fuel and zero emission vehicles are significantly encouraged.

Upon becoming a member of ECO Stars, operators receive a short action plan, known as a Road Map, setting out measures which would help to improve their operational practices from air quality, environmental and economic perspectives. The Road Map is based on best practice and is directly applicable to the operator. Members also receive a certificate and profiles are included on the ECO Stars website. Other features include member workshops as well as a follow-up operator contact process throughout the duration of their membership. Successful implementation of the measures contained in their Road Map, as well as improvements to their fleet, could enable operators to increase their star rating up to 5 stars, the maximum available. Ongoing engagement and improvement is one of the key tenets of the Scheme.

4.2.4 Scheme Features and Benefits

The ECO Stars scheme is a 'win-win' scheme for central government, local authorities and scheme members, as the positive environmental and financial improvements associated with clean and efficient road transport operations benefit all parties. It is a measure that a number of local authorities have chosen as part of their response to poor air quality and feature within their air quality action plans, sitting alongside other actions such as traffic management.

Central Government & Local Authority Benefits

The main benefits for local authorities running an ECO Stars scheme are improvements in air quality through the reduction in harmful emissions associated with the running of cleaner vehicles. These emissions are NO_x, PM₁₀ and PM_{2.5}.

As ECO Stars has a significant fuel management and fuel saving profile, there are benefits to the local economy - assisting business profitability - that in turn contribute to overall local economic plans. From a wider governmental perspective, the improvements to operator's fuel management helps to reduce emissions of CO₂ and related air quality pollutants such as NO_x and PM.

A further benefit of the scheme is the proactive engagement with sometimes hard to reach industry audiences, and in particular with SMEs.

Operator Benefits

ECO Stars has always accepted, as a scheme, that incentives for commercial vehicle operators to join are varied and not always environmentally led. Being a scheme that concentrates on fuel efficiency from a vehicle, driver, journey and management perspective, the economic benefits of scheme membership are highly attractive.

During the scheme's nine year life span to date, the desire for operators to improve their environmental performance has grown. Increasingly, supply chains (both private and public sector) are looking to award contracts to operators with positive and proactive environmental profiles and some of the larger national operators have environmental performance as a key business objective. ECO Stars is a perfect fit with those who are looking to demonstrate their environmental credentials.

4.2.5 Assessment Criteria within ECO Stars

As a fleet recognition scheme focused on reducing commercial vehicle emissions and improving local air quality, the criteria on which members are initially and subsequently assessed actively encourages the adoption of low and zero emission vehicles.

Ultimately the aim of any scheme member is to reduce their impact on local air quality and to improve their star rating; the highest being a 5 star member. Membership applications and in-membership re-assessments provide credit for the use of low and zero emission vehicles.

During the application process, applicants are asked to declare specific details concerning individual vehicles operating (based in or spending significant time) within their local ECO Stars scheme. A system of 'booster stars' has been devised to allow additional recognition, above basic engine emission standards, where appropriate.

The principle behind using these 'booster stars' is to encourage applicants to think beyond merely the Euro engine standards of their vehicle fleets and to consider additional technology, which could help to improve the efficiency and environmental performance of both their vehicles and drivers.

4.2.6 ECO Stars Southampton Implementation Strategy

Ultimately ECO Stars relies on three factors:

- Commercial vehicle operator awareness of the scheme
- Operator interest in becoming a member
- Members implementing the management changes reluctant from their individual bespoke assessment and action plan Road Map.

The aim within the Southampton City area will be to publicise the scheme widely across the large number of logistics and servicing organisations which use commercial vehicles either as their primary business or in support. This can be achieved through a number of channels which have been adopted in other ECO Stars scheme areas:

- Contacting businesses with ECO Stars membership in other scheme areas with operating centres in the new scheme area
- Publicity in the local press
- Publicity in the trade press
- Local radio – through interview rather than a set advert
- Through trade associations – at local meetings
- Through industry orientated events and seminars
- By direct contact with known businesses, identified in conjunction with the local authority by:
 - Email approach
 - Telephone approach

The scheme has the advantage of the central UK website that presents a professional ‘shop window’ for all operators either approached or making enquiries to join the scheme.

Southampton has in the region of 1,000 companies with an HGV operator’s licence and approximately 100 operators with a PCV (Bus and/or Coach) operator’s licence, according to the Drivers and Vehicle Standard Agency Operators License search facility. In addition, there will be many businesses with light commercial vehicles (vans <3.5t). Therefore, the targeting of ECO Stars has a very broad and deep pool of potential members in the Southampton area.

An effective strategy in Year 1 of ECO Stars implementation would be to build local momentum and to establish the scheme in the Southampton City area within the HGV and bus/coach sectors specifically, using the methodology listed above. At this stage we advise recruitment without any specific target by business type or size in order to gain a core initial membership. In Year 2 and subsequently, recruitment can start to be more targeted and selective, ranking candidate operators by size and type, and targeting those operators where the biggest impact is likely to be felt. For example, organisations with significant operations in Southampton city centre who make use older and larger vehicles.

4.3 ECO Stars Taxi and Private Hire

4.3.1 Background

Following the success of the second ECO Stars fleet scheme launched in Mid-Devon in October 2011, an application was made by Mid-Devon District Council to Defra to develop, pilot and run an ECO Stars scheme for taxi and private hire vehicles. Previous studies in Mid-Devon had attributed negative effects on local air quality to this specific sector. Following the successful development and piloting of the Taxi Scheme in Mid-Devon, through adapting the original commercial vehicle assessment criteria for the taxi and private hire industry, the scheme was adopted by the ECO Stars Steering Group. Alongside the delivery of ECO Stars for freight and fleet, five ECO Stars taxi schemes have been implemented in the UK: Fife, Falkirk, Dundee and Glasgow following the Mid-Devon pilot.

Given the variety of business models used by taxi operators, specific fuel saving advice, while given, can often be seen as lower priority than is seen in the heavier commercial vehicle schemes. Benefits instead are often found in disseminating information to support local operators in the uptake of low emission vehicles. Engagement with operators increases awareness of air quality issues and emphasises the need for all drivers to take responsibility for lowering vehicle based emissions. This is also a good opportunity to give information on how the introduction of upcoming CAZs may affect their business. With the introduction of a CAZ in Southampton, this process would be an effective and beneficial means to engage with a large number of taxi and private hire operators who may feel excluded from conversations regarding developments of air quality plans, despite the significant role they play in contributing to vehicle emissions and the potential impact on their business.

4.3.2 ECO Stars Taxi Methodology

Application for ECO Stars Taxi membership consists of a site visit to learn about the company and discuss the audit process with the potential new member. The application

form is assessed based on the ECO Stars common Taxi Scheme standards to ensure consistency between ECO Stars taxi memberships in different local authority areas. This assessment involves an individual rating of all vehicles in the fleet and business practices, to give each member an overall operational star rating. Fuel management plans, maintenance and replacement schedules, driver training, use of support systems such as telematics and satellite navigation and the implementation of Key Performance Indicators to monitor improvements are all considered as points for assessment. During the site visit there is an opportunity to discuss new vehicle technologies which may be applicable in that business.

With increased ECO Stars membership, it is possible to build a picture of the most significant issues taxi drivers are facing as themes for discussion become apparent across a breadth of members. This is an opportunity for engagement between taxi drivers and the council that may otherwise not exist and it is a valuable means of understanding which environmental measures may be posing a challenge to the industry and how these challenges may be overcome with mutual benefit.

Ongoing communication with members is an integral part of ECO Stars taxi membership. Members are contacted every six months and a reassessment is carried out at least once per year. This allows progression to be monitored and ensures members have ongoing support from ECO Stars assessors.

Promotion and recruitment for ECO Stars taxi schemes is supported by effective marketing, promotion, engagement and recruitment activities to raise levels of awareness of the scheme among its intended target audiences, to generate interest among potential members and to engage directly with them, with a view to signing them up as members to the taxi scheme. Online research is carried out to identify local operators and invitations are sent via phone and email to potential members. An internal recruitment database is kept to record all contact with potential members. Visits are made to taxi depots and ranks in membership areas where contact can be gained with drivers to inform them of the scheme, or to carry out the assessment. Moreover, any opportunity to promote the scheme to a relevant audience is exploited; for example, speaking at any taxi industry event throughout the year, such as the Taxi Federations or local taxi forums.

To boost membership to the ECO Stars taxi scheme in some areas, it has been agreed that ECO Stars membership would be a requirement for any operator applying for local authority school or social work contracts in that area. This incentivises membership for local operators and allows a greater number of contacts to be gained, and is an option worth exploring in Southampton.

ECO Stars Taxis in Scotland has achieved success in promoting the uptake of low emission vehicles for taxi drivers. In 2016, ECO Stars members Aitch Taxis in Fife were the first to introduce an electric vehicle in to their fleet of taxis, following their ECO Stars assessment. As members of ECO Stars, Aitch Taxis were given information on vehicle options, charging infrastructure and available financial support for EV uptake in Scotland. Following this, low emission vehicle uptake of ECO Stars members has increased, including TEVCO in Dundee who run a fleet made up entirely of electric vehicles.

In April 2018, an ECO Stars event was held in Fife to disseminate information about electric vehicles, aimed at local taxi operators. This event aimed to dispel any myths that may hinder

EV uptake and demonstration vehicles were available for test drive. This style of event is useful in promoting ECO Stars, boosting membership, and promoting low emission uptake on a scale which could make a real difference to improving local air quality.

The main successes of ECO Stars taxi schemes in Scotland lie with establishing lines of communication to improve air quality awareness and disseminate valuable information on transport sustainability. It has been found in Scotland that many new members feel excluded from discussions regarding environmental protection measures. ECO Stars opens an avenue of communication between local authorities and taxi drivers and alleviates this sense of exclusion. Many members are otherwise unaware of measures that are in place to support the move to low emission vehicles. In Southampton, ECO Stars would be a useful tool by which to communicate any low emission taxi incentive scheme to local operators who may not be aware of the available funding.

4.3.3 *Implementation Strategy for Southampton ECO Stars Taxi*

A data sample of 1,945 taxi and private hire movements in Southampton, provided by Ricardo, shows that only 7.7% of these vehicles meet the Euro VI requirements necessary to operate freely within the proposed Clean Air Zone. Although the precise source of this data is unclear, it is presumed to be a typical snapshot of the local taxi fleet. If so, this demonstrates a significant member base with which ECO Stars engagement could be hugely beneficial. Engagement with operators on such a scale should be considered a vital opportunity to disseminate important information regarding environmental impact and to encourage low emission vehicle uptake, which could make a real impact to air quality in Southampton.

Table 5, below, gives the number of taxi vehicles licensed in Southampton and New Forest areas¹⁶. The size of the local taxi and private hire fleet suggests that an ECO Stars Taxi scheme would have a plentiful recruitment pool to support a 2-3 year initial recruitment plan.

Table 5: Local Taxi and Private Hire Vehicle Counts

Local Authority	No. of Taxis	No. of Private Hire Vehicles	Total licensed vehicles
Southampton	283	653	936
New Forest	129	310	439

A suggested strategy for implementation of ECO Stars Taxi and Private Hire in Southampton in Year 1 would be to build a core membership of operators, focussing on the largest operators first. Discussions should also be held with SCC procurement and licensing teams to test the feasibility of introducing ECO Stars membership as a requirement for local authority contracts, as this process can take time and, if successful, must allow time for the candidate operators to comply and carry out an assessment.

¹⁶ <https://www.gov.uk/government/organisations/department-for-transport/series/taxi-statistics>

Subsequent years will involve a balance of ongoing recruitment and member support – the split of effort dependent on the rate of membership uptake. Consideration should be given for holding an operators workshop in Year 2, based on the approach taken in Fife, to promote the use of alternatively fuelled vehicles. The need for such an event can be gauged from the member assessments carried out in Year 1.

4.4 Additional Consultancy Support

Over and above the actual assessment and analysis involved in DSPs, businesses can require resource and expert support to commence the initial implementation phases of a DSP. In addition, a key element of an implementation strategy would be to present the benefits to potential participants in Southampton to build interest and secure initial engagement. While some of these tasks can be done in parallel with ECO Stars recruitment and assessment, TRL feel it would be beneficial, and would reduce the implementation time, to set aside part of the budget to provide some additional consultancy support to research and promote the implementation of DSPs in Southampton. These tasks would include:

- Identifying the geographical areas or zones within the CAZ suitable for DSP
- Identifying the businesses by premises and activity within the areas selected
- Creating a hierarchy of business and premises that should be targeted
- Making direct approaches to selected businesses, based on the hierarchy

Following the successful implementation of the initial DSPs, this budget of support days could be used to complete some case studies, which would help to promote and further spread the uptake of DSPs in the Southampton area.

Furthermore, TRL expertise in alternative fuel research and technologies could be applied to provide advice and implementation strategies for HGV and bus fleets. TRL involvement in projects such as the Low Emission Freight and Logistics Trials and the Low Emission Bus Schemes, both for the Department for Transport, and advice schemes such as LoCITY for Transport for London mean we are well placed to provide this additional support.

5 Potential operator participation

5.1 Recruitment Targets

As mentioned above ECO Stars Southampton, in Year 1, should focus on HGV and bus/coach operators as main targets for recruitment. ECO Stars is implemented with target numbers of members in mind, and this target is directly scalable to match the effort involved and therefore budget available. Given the maturity of the scheme in the UK, a significant number of the larger UK operators are already scheme members. Recruitment can be targeted as appropriate though, and resource can be concentrated on smaller members with local operation. In this way they can benefit from the advice available via ECO Stars which can include reference to local initiatives and measures such as consolidation and CAZ discounts if appropriate. In terms of ECO Stars recruitment strategies, it is certainly possible to target businesses by type or by sector, and this approach has been used previously elsewhere.

For a proposed Year 1 budget of £70K, TRL propose to recruit a minimum of 50 local HGV, bus or coach operators, all with operations in the local area. Year 1 can also include a public launch event to publicise the scheme and encourage further uptake. Indicative budgets of £50K per annum for Years 2 and 3 will allow for further recruitment as well as support of the existing membership through reassessments, with a balance to be struck between these activities. We have estimated that a further 30 members per year would be achievable given this scale of funding.

As mentioned earlier, we have allowed for 10 DSPs per year over an initial three year cycle, at an indicative £15K per plan. We feel this strikes a balance between available budget, likely uptake and scale required to have a meaningful impact on CAZ support. Consideration should be given at a future stage to whether SCC would be fully funding the DSPs, or if local businesses would be expected to make a contribution.

5.2 Local Operator Numbers

As an indicative measure, the operator license search facility from the UK Government's Vehicle and Operator Service can be searched for those businesses with a live license who have declared an operating centre location in the Southampton area. An operating centre is defined as 'the place where vehicles are normally parked when not in use'.

This search returns 1,321 operators with a currently valid license (1,220 for goods vehicles, 101 for Public Service Vehicles). It should be noted at this point that this list may contain some duplicate records where different lists of operating centres are defined under the same operator name, perhaps depending on how the business cost centres are split. However, for the purposes of this study we believe this provides an indicative assessment of potential operator numbers.

TRL carried out a 'spot check' of 102 of these companies, spread across the alphabetical return of results and cross checked with entries on Companies House. This check indicated that 65 of those 102 businesses are flagged as either a microbusiness or a small business (64%).

Of those 65 small or microbusinesses, the average fleet size - taken from their operator license register - is 5.8 vehicles.

5.3 Southampton Fleet Analysis

ANPR data was provided for one site over a one week period, Monday 5th to Sunday 11th December 2016. TRL have not been able to confirm at which specific site this data was recorded, but for the purposes of this study we have assumed that the site is representative of an entry point into the Southampton CAZ and reflects average traffic flow in the area.

5.3.1 Daily ANPR Results

Table 6 to Table 9 below show the raw ANPR data counts for HGVs and for Bus/Coach for the site provided.

HGV

Table 6: HGV Counts by Euro Rating

HGV counts by Euro engine rating								
Date	0	I	II	III	IV	V	VI	Total
Mon 5th Dec 2016	8	9	28	341	672	1,818	1,846	4,722
Tues 6th Dec 2016	8	6	26	343	687	1,890	1,885	4,845
Wed 7th Dec 2016	5	5	39	331	708	1,856	1,921	4,865
Thu 8th Dec 2016	6	9	43	322	696	1,829	1,800	4,705
Fri 9th Dec 2016	7	6	34	301	656	1,727	1,679	4,410
Sat 10th Dec 2016	4	6	20	80	193	549	636	2,544
Sun 11th Dec 2016	9	5	9	48	93	280	321	765

Table 7: HGV Percentage by Euro Rating

HGV vehicle by Euro engine rating – breakdown by %							
Date	0	I	II	III	IV	V	VI
Mon 5th Dec 2016	0.2%	0.2%	0.6%	7.2%	14.2%	38.5%	39.1%
Tues 6th Dec 2016	0.2%	0.1%	0.5%	7.1%	14.2%	39.0%	38.9%
Wed 7th Dec 2016	0.1%	0.1%	0.8%	6.8%	14.6%	38.2%	39.5%
Thu 8th Dec 2016	0.1%	0.2%	0.9%	6.8%	14.8%	38.9%	38.3%
Fri 9th Dec 2016	0.2%	0.1%	0.8%	6.8%	14.9%	39.2%	38.1%
Sat 10th Dec 2016	0.2%	0.2%	0.8%	3.1%	7.6%	21.6%	25.0%
Sun 11th Dec 2016	1.2%	0.7%	1.2%	6.3%	12.2%	36.6%	42.0%

This data suggests that approximately 63% of HGVs entering Southampton are not Euro VI compliant and are therefore liable to a CAZ charge. The majority of vehicles are Euro V or Euro VI, and the counts of older, most polluting Euro 0-II vehicles are low, at approximately 1% of all HGVs recorded per day.

Bus and Coach

Table 8: Bus/coach Counts by Euro Rating

Bus/Coach counts by Euro engine rating								
Date	0	I	II	III	IV	V	VI	Total
Mon 5th Dec 2016	1	12	28	126	195	242	183	787
Tues 6th Dec 2016	2	11	28	118	209	197	171	736
Wed 7th Dec 2016	1	10	26	119	201	192	153	702
Thu 8th Dec 2016	0	14	29	113	212	197	158	723
Fri 9th Dec 2016	2	11	36	119	218	253	191	830
Sat 10th Dec 2016	3	9	21	67	149	140	139	528
Sun 11th Dec 2016	1	4	24	64	124	104	107	428

Table 9: Bus/coach Percentage by Euro Rating

HGV vehicle by Euro engine rating – breakdown by %							
Date	0	I	II	III	IV	V	VI
Mon 5th Dec 2016	0.1%	1.5%	3.6%	16.0%	30.7%	30.7%	23.3%
Tues 6th Dec 2016	0.3%	1.5%	3.8%	16.0%	26.8%	26.8%	23.2%
Wed 7th Dec 2016	0.1%	1.4%	3.7%	17.0%	27.4%	27.4%	21.8%
Thu 8th Dec 2016	0.0%	1.9%	4.0%	15.6%	27.2%	27.2%	21.9%
Fri 9th Dec 2016	0.2%	1.3%	4.3%	14.3%	30.5%	30.5%	23.0%
Sat 10th Dec 2016	0.6%	1.7%	4.0%	12.7%	26.5%	26.5%	26.3%
Sun 11th Dec 2016	0.2%	0.9%	5.6%	15.0%	24.3%	24.3%	25.0%

This data suggests that, on average, approximately 77% of buses are not Euro VI compliant and are therefore liable to a CAZ charge.

5.3.2 Weekly ANPR Results

The tables below show analysis of the ANPR data across the whole sample week supplied.

HGV

Table 10: HGV Counts by Euro Rating across week 5-11 December 2016 (duplicate vehicle entries removed)

Euro	Count	Percentage
0	34	0.3%
I	29	0.2%
II	115	1.0%
III	894	7.6%
IV	1,712	14.5%
V	4,519	38.4%
VI	4,467	38.0%
Total	11,770	

Table 11: HGV CAZ 'entries' per week

Euro Rating	CAZ Entries: No. of Days Per Week							
	1	2	3	4	5	6	7	Total
0	26	5	1	1	1	0	0	34
I	21	4	2	1	0	1	0	29
II	69	25	9	8	3	1	0	115
III	504	167	86	40	75	19	3	894
IV	883	312	168	129	158	52	10	1,712
V	2,333	806	393	340	462	151	34	4,519
VI	2,341	715	370	315	475	187	64	4,467
							Total	11,770
Of liable vehicles (Euro 0-V):								
Total	3,836	1,319	659	519	699	224	47	7303
%	52.5%	18.1%	9.0%	7.1%	9.6%	3.1%	0.6%	

Carrying out analysis of ANPR over the whole week of the supplied data, we expect in the region of **7,303 HGV CAZ charges per week** to be incurred.

It is also worth noting here that 52.5% of the vehicles incurring a charge only appear enter the CAZ once per week.

If retrofitting of non-compliant HGVs is under consideration for CAZ implementation and business support, it should be noted that of the 11,770 unique HGVs recorded during the data collection, 4,519 (38.4%) are rated as Euro V. Assuming a cost of £15,000 for the retrofitting of Euro V vehicles to Euro VI standard, £176.5M funding would be required. Assuming only the local Euro V HGV fleet are eligible for retrofitting (2,809), the cost to upgrade may be reduced to c.£42.1M.

Bus and Coach

Table 12: Bus/coach Counts by Euro Rating across week 5-11 December 2016 (duplicates removed)

Euro	Count	Percentage
0	6	0.3%
I	27	1.6%
II	68	4.0%
III	279	16.3%
IV	513	29.9%
V	478	27.9%
VI	345	20.1%
Total	1,716	

Table 13: Bus/coach CAZ 'entries' per week

Euro Rating	CAZ Entries: No. of Days Per Week							
	1	2	3	4	5	6	7	Total
0	4	0	0	1	0	1	0	6
I	14	1	2	4	1	3	2	27
II	32	13	7	1	4	2	9	68
III	120	46	25	15	31	24	18	279
IV	216	93	50	32	46	34	42	513
V	192	72	57	34	51	44	28	478
VI	141	71	37	14	35	25	22	345
							Total	1,716
Of liable vehicles (Euro 0-V):								
Total	578	225	141	87	133	108	99	1,371
%	42.2%	16.4%	10.3%	6.3%	9.7%	7.9%	7.2%	

Analysis of the bus and coach ANPR data on a weekly basis indicates that we would expect **1,371 bus/coach CAZ charges per week** to be incurred.

42.2% of the buses and coaches incurring a charge only enter the CAZ once per week. It is worth noting that this figure may be impacted by leisure traffic at the port, or football traffic (Southampton Football Club played at home on Sunday 11th December 2016), depending on the site of the ANPR camera.

If retrofitting of non-compliant buses is under consideration for CAZ implementation and business support, it should be noted that of the 1,716 unique buses or coaches recorded during the data collection, 478 (27.9%) are rated as Euro V. Assuming a cost of £15,000 for the retrofitting of Euro V vehicles to Euro VI standard, £7.17M funding would be required.

5.4 Means testing and methodology

SCC is considering providing financial support to offset the cost of the CAZ charge. These are likely to be provided as a discount to the CAZ charge on a means tested basis. This should be largely achievable, if: sufficient dissemination of information to operators as part of the CAZ; and an appropriate amount of time is built into the implementation of the CAZ to build the supporting administration required for the application of the discount. Furthermore, sufficient time should also be allowed for operators to apply for their discount before the CAZ charging becomes live. TRL cannot comment on the time and resource needed for the administration tasks at this stage due to the limited amount of information available. Provided information is disseminated, the onus should be on the operators themselves to prove eligibility and apply for the discount.

The motivation for the discounts should be to mitigate the commercial impact of CAZ on the smaller operators who, as discussed earlier, can often be disproportionately affected by such charges given low profit margins. There is no desire to offer discounts to large operators with correspondingly large turnover or profit, as to do so would undermine the effectiveness of the scheme which is designed to provide an incentive to move to cleaner, less polluting vehicles. SMEs are often defined as having fewer than 250 employees and a turnover of less than £25M, although this definition does vary (e.g. some parts of government use the EU definition, with less than 250 employees and turnover under £50M).

TRL comments against SCC's proposed criteria for discount qualification are as follows:

Table 14: Comments on proposed eligibility criteria

Criteria	TRL Comment
Not Euro VI vehicle	This is easily achievable as the vehicle registration should be provided as part of the application, and can be cross checked using DVLA data records
Sole trader/SME	The operator should be able to confirm SME status according to standard definition
Low income, turnover or profit	Declared by the operator, verifiable by accounts lodged with Companies House
Dependent on business in the SCC area	This is less easily defined. It may be that the operator has an operating centre in the Southampton area, but does not regularly enter the CAZ. Also, this leaves a grey area for the operator to define if it is dependent on business in this area. It may be sufficient to remove this element of the eligibility criteria. For instance, if a discount rather than exemption is being considered, an operator would only submit an application if they expected to make regular journeys into the CAZ, and could therefore be judged dependent.

The method of discount should also be considered. Given the automated nature of data collection and processing, consideration should be given to the placing of a 'flag' against a vehicle record to signify a qualifying vehicle. The charge levied in this case would reflect the discounted rate, rather than a full charge with subsequent refund required.

6 Implementation: Plan and Budget

Indicative costs and timescales can be provided for the implementation of ECO Stars and DSPs to support the CAZ in Southampton.

6.1 Timeframes

The Southampton CAZ is to be introduced in late 2019. This timescale means that information dissemination and support to operators who will be affected should commence as soon as possible to allow them to prepare, to anticipate any impact and potential changes to business practices required, and to consider planning for new, alternatively fuelled vehicles. DSPs can be delivered as individual pieces of work contributing to the wider picture, whereas ECO Stars is traditionally delivered in 1-3 year work packages with concentrated recruitment and scheme launch in Year 1, followed by further recruitment and ongoing member support in subsequent years.

6.2 Indicative budget requirements

Costs estimated below are for indicative purposes only and may be subject to change according to specific requirements and timescales (once known), and formal quotations would be required from TRL once requirements are clearer in order to confirm precise costs for each element.

CAZ Consultancy support

Table 15: Indicative Consultancy costs

Scheme	Year	Target	Notes	Indicative Cost
ECO Stars Commercial Fleet	1	50 members	Initial recruitment and scheme launch	£70,000
	2	30 members	Recruitment and member support	£50,000
	3	30 members	Recruitment and member support	£50,000
ECO Stars Taxi and Private Hire	1	20 members	Initial recruitment and scheme launch	£40,000
	2	15 members	Recruitment and member support	£30,000
	3	15 members	Recruitment and member support	£30,000
DSP	1	10 DSPs	At £15K per DSP	£150,000
	2	10 DSPs	At £15K per DSP	£150,000
	3	10 DSPs	At £15K per DSP	£150,000
Additional consultancy support, @ approx £750 per day	1	40 days	Call off pool of available support days - DSP site assessments and recruitment preparation; 2 workshops; HGV advice and strategy	£30,000
	2	30 days	Business implementation support and case studies; 2 workshops; HGV advice and strategy	£22,500
	3	30 days	Business implementation support and case studies; 2 workshops; HGV advice and strategy	£22,500
TOTAL (ex VAT)				£795,000

Indicative retrofit budget (Euro V to Euro VI buses and coaches): £7.17M

CAZ Charging and Discounts

The weekly ANPR data analysis indicated that, if the data provided can be considered to be a representative location and vehicle sample, we can expect 7,303 HGV charges and 1,371 bus

and coach charges per week. These totals can be used to create some illustrative charging and mitigation scenarios. The figures used below are to provide indicative scenarios only. There are several assumptions involved in reaching the final figures, and these should be noted, including:

- The spot check of Southampton businesses is a random sample, and the figure of 64% of businesses being small or microbusinesses may vary with a wider sample
- The spot check noted small and micro businesses. Including medium sized businesses would increase the number eligible for discounts
- The Euro engine breakdown in small and microbusinesses may not be the same as that seen across the Southampton commercial fleet as a whole as seen in the ANPR data. For example, larger operators may have a higher proportion of Euro VI vehicles in their fleets, distorting the breakdown across all operators.

Income Scenario: Daily CAZ charge of £100 (as per London Low Emission Zone Charge)

7,303 HGV and 1,371 bus and coach charges per week give a total of 8,674 vehicle charges per week. If Southampton were to implement a similar charge to London of £100 per day for these vehicle types, this would incur **£867,400 per week** in charges.

Of the 1,321 businesses registered in Southampton with operator licenses with 1,220 goods operators (HGV) and 101 Public Service Vehicle operators (buses and coaches). If it can be assumed - as per the sampling analysis - that 64% are small or microbusinesses, this gives illustrative values of 781 HGV and 65 bus and coach operators which can be classed as small and micro business. For the purposes of this illustration, we assume that those with an operating centre in Southampton are dependent on business in the Southampton area. (This will not be true for all – some may not enter into the CAZ as part of regular recurring business.) The average fleet size for an SME in the Southampton area is 5.8 vehicles, as discussed earlier.

This figure should be strongly caveated in that it does not account for vehicles coming in multiple times per week, which would attract multiple discounts as well as multiple charges.

Mitigation scenario 1: discount of £50 per vehicle, per day for small businesses

781 small and microbusiness HGV operators with an average of 5.8 vehicles per operator, gives a potential 4,530 HGV vehicles entering the CAZ from these operators. Weekly ANPR analysis indicated that 62.0% of the HGV sample were Euro 0-V, having entered the CAZ at least once during the week. This would equate to 2,809 HGV vehicles liable for the charge.

65 small and microbusiness bus and coach operators with an average of 5.8 vehicles per

operator gives a potential 377 buses and coaches entering the CAZ from these operators. Weekly ANPR analysis indicated that 79.9% of the bus and coach sample were Euro 0-V, having entered the CAZ at least once during the week. This would equate to 301 buses and coaches liable for the charge.

Together 2,809 HGVs and 301 buses and coaches gives a weekly total of liable vehicles of 3,110 vehicles. If a discount of £50 per vehicle per day were applied, this figure would require **£155,550 to be paid out per week in discounts**.

This figure should be strongly caveated in that it does not account for vehicles coming in to the CAZ multiple times per week, which would attract multiple discounts as well as multiple charges.

Mitigation scenario 2: discount of £75 per vehicle, per day for small businesses

Using the above figure of 3,110 vehicles from eligible operators which may apply for a CAZ charge discount, if a discount of £75 per day were applied, then **£233,250 per week would be needed for discounts**.

This figure should be strongly caveated in that it does not account for vehicles coming in to the CAZ multiple times per week, which would attract multiple discounts as well as multiple charges.

Despite the qualifications around the above discount mitigation figures, by applying a discount rather than a complete exemption for these operators, SCC should be confident that the balance between income and mitigation will always result in income if only charges and discounts are considered, ignoring for example costs of operating and administering the charging scheme.

7 Conclusion

The case for support of local operators, and particularly small operators, in relation to the implementation of a charging CAZ in Southampton has been proposed and discussed, including suggested practical measures. ECO Stars Fleet Recognition Scheme and Delivery Service Plans have been put forward as appropriate measures to provide advice to operators and to act and elements in a coordinated support programme, which would build awareness and participation in wider initiatives such as freight consolidation.

Indicative costs have been suggested in order to provide these consultancy services, itemised so that each element can be scaled up or down as required.

In addition, scenarios have been proposed to illustrate the CAZ vehicle charging income and the possible levels of support which would be required if mitigation were to be provided to smaller businesses by way of financial support. Similarly, costs of consolidation and available shipment models have been proposed to further illustrate the scenarios facing operators within the planned CAZ.



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